PAPERS

Project Stakeholder Management—Past and Present

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ABSTRACT

In this special issue on project stakeholder management, the aim is to advance the understanding of this topic by looking into theory outside the project management field and by presenting findings from case studies. In this overview article, we identify the theoretical roots of the stakeholder concept and the current state of the field. We point to early proponents of stakeholder thinking. In addition, we point to recent concepts and developments outside the project management field that are relevant in the project management context; then, we introduce the articles included in the special issue; and, finally, we identify other relevant publications.

KEYWORDS: stakeholder thinking; project stakeholder management; stakeholder theory; stakeholders

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Dealing with individuals or groups who may affect or be affected by the project processes, contents, or outcomes (i.e., the project stakeholders) has been acknowledged as a core task within project management for a long time. However, many problems related to stakeholder issues can be observed (see, e.g., Dalcher, 2009), and many projects are characterized by the fact that stakeholders' expectations are not sufficiently considered or being met (Shenhar & Dvir, 2007) especially because dissimilar stakeholders may define project success factors differently (Davis, 2014).

Moreover, Killen, Jugdev, Drouin, and Petit (2012) claim that "most PM research ... remain[s] largely atheoretical" (p. 526). Similarly, Koskela and Howell (2002) claim that there is no underlying theory of project management.

In this special issue of *Project Management Journal*® on Project Stakeholder Management, we aim to advance the understanding of this topic by looking into theory outside the project management field and by presenting findings from case studies. In this overview article, we identify the theoretical roots of the stakeholder concept and the current state of the field. We point to early proponents of stakeholder management or stakeholder thinking, some of whom did not use the term "stakeholder." In addition, we point to recent concepts and developments in understanding outside the project management field that are relevant in the project management context, not the least of which is project stakeholder analysis. Then, we introduce the five articles included in the special issue. Last, we identify other interesting publications on the topic of project stakeholder management.

Views of a Firm

The origins of project stakeholder management are not found in the project management field itself, rather they stem from theories of strategic management. *R. Edward Freeman,* who was a professor at the University of Minnesota in the 1980s, published the book *Strategic Management: A Stakeholder Approach* in 1984 in which he encouraged a *Stakeholder View of the Firm*. This perspective was needed, he argued, to enhance another perspective of companies, which differed from the dominant views, in other words, *The Production View of the Firm* and *The Managerial View of the Firm* (Freeman, 1984).

Before the 19th century, companies typically were small, owner–entrepreneur founded entities, and business success depended primarily on the firm's ability to satisfy suppliers and customers. As the owner and the family members were often the only workers and the organizational entity was small, the managerial focus in this context was to procure resources from

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suppliers, turn the resources into products, and sell the products to customers, referred to by Freeman (1984) as *The Production View of the Firm*.

With the Industrial Revolution's development of new production processes, adoption of technology, rapid urbanization, and significant investments in production facilities and infrastructure, companies grew bigger and could no longer be run only by the founder and the family members themselves. In a context of hired managers and nonfamily workers, the managerial task grew to include issues concerning owners as well as employees, encouraging a new strategic perspective. Thus, owners and others began to apply *A Managerial View of the Firm* rather than *The Production View of the Firm* (Freeman, 1984).

Democratic developments in mature or postindustrial societies gave voices to more individuals and groups, for example, governmental authorities, unions, consumer advocates, competitors, environmentalists, special interest groups, and the media. Thus, Freeman (1984) argued that a *Managerial View of the Firm* was no longer sufficient for business success; rather, managers and directors should apply a *Stakeholder View of the Firm* and consider "any group or individual who can affect or is affected by the achievement of the firm's objectives" (Freeman, 1984, p. 25). Without understanding the needs and concerns of such stakeholder groups, the firm cannot formulate corporate objectives that would make the stakeholders support the firm sufficiently for its present and future survival. At the same time, stakeholders that are affected by the firm's strategies have a legitimate right to have their interests considered by the firm (Freeman, 1984).

Early Stakeholder Definitions

Even though many acknowledge Freeman as the founder of stakeholder management theory, he gives credit to a number of other researchers. He initially traced the stakeholder concept back to 1963, when researchers in an internal memorandum at the Stanford Research Institute (SRI) defined stakeholders as "those groups without whose support the organization would cease to exist" (SRI cited in Freeman, 1984, p. 31).

Recent research, however, by Robert Strand at the Copenhagen Business School in Denmark, along with Freeman, shows that the original inspiration for stakeholder management theory and the conceptual construct "stakeholder" is probably Scandinavian (Strand & Freeman, 2015). A Swedish researcher, Eric Rhenman, explicitly used the stakeholder term in his book *Industrial Democracy* in 1968. He pointed to the mutual dependencies between the company and individuals and groups like employees, owners, customers, suppliers, and creditors (i.e., stakeholders). These stakeholders were dependent on the company to be able to realize their personal goals, whereas the company was dependent on the stakeholders to realize the company's objectives (Rhenman, 1968).

As Rhenman was a visiting scholar at Stanford in 1968, Freeman's initial sources, the people associated with SRI in the 1960s, thought that Rhenman developed stakeholder thinking at Stanford (Freeman, 1984). However, new research (Strand & Freeman, 2015) shows that Rhenman's book was a translation of one of his Swedish books, *Företagsdemokrati och företagsorganisation* [*Industrial Democracy and Industrial Management*], published in 1964. One of his other books, *Företagsledning i en föränderlig Värld* [*Corporate Management in a Changing World*] (Rhenman & Stymne, 1965) was also published before he visited Stanford. Strand and Freeman (2015) provide evidence that both the Swedish and the English versions of the books' manuscripts were finished before Rhenman had his extended stay at Stanford. Indeed, the forewords were signed "Stockholm, January 1964" for the Swedish version and "Stockholm, September 1967" for the English version. In fact, Rhenman was working on other manuscripts while staying at Stanford (Strand & Freeman, 2015); thus, Rhenman must have been occupied with the stakeholder concept before he met the SRI researchers.

In his 1964 book, Rhenman used the word "interessent," which can be translated to "a person (or group) who has an interest." Mrs. Nancy Adler translated the book into English, according to the foreword by Rhenman (Strand & Freeman, 2015), so she may have proposed the word "stakeholder" in her translation. However, Strand and Freeman (2015) argue that Rhenman had clear competencies in English: Rhenman had been at the Carnegie Institute of Technology between 1959 and 1960 and at the University of Cambridge in 1962. Thus, Strand and Freeman find it very likely that he had a leading role in editing the English version himself and may have constructed the English term. Although we do not know precisely how the term came to life as a theoretical construct, we do know that management thinkers in many countries now acknowledge that managers in both private and public organizations should consider various parties with whom mutual dependencies exist.

Early Proponents, Also Within Project Management

In his book, Freeman (1984) pointed to early traces of the stakeholder concept within the streams of literature on corporate planning, systems theory, corporate social responsibility, and organization theory (even though not all of the researchers used the concept directly, e.g., Pfeffer & Salancik, 1978, as described later in this section). We can add that based on the fact that codetermination laws in Germany were introduced for heavy industries such as steel and coal in the early 1950s and applied to all industries in the 1970s, it seems very likely that the understanding of stakeholder management was already widespread in industrial countries. Moreover, in democratic

countries, thinkers within sociology and political economy were concerned with stakeholder-related issues, for example, participatory decision making in large firms. These concerns arose to protect people who were employed in risky manufacturing, mining, and other industries, with the understanding that at least the risks should be considered and proactively minimized.

William R. King and *David I. Cleland,* two researchers who have had an enormous influence on project management, worked during the 1970s in the field of corporate planning. However, both had experience in project management. William R. King had worked as a pilot and officer in the U.S. Air Force and earned a PhD in operations research in 1964. His doctoral supervisor, *Russell L. Ackoff*, was another important contributor to stakeholder theory. In 1967, King joined the University of Pittsburgh's Katz Graduate School of Business to pursue an academic career. David I. Cleland also joined the University of Pittsburgh (Swanson School of Engineering) in 1967. He had worked as project manager in the design, development, and manufacturing of weapon systems in the U.S. Air Force.

In their 1978 book, *Strategic Planning and Policy*, King and Cleland articulate a method based on their work on project management for analyzing "'clientele groups,' 'claimants,' or 'stakeholders' of the organization" (p. 149). In turn, King and Cleland (1978) point to Churchman (1968) and McConnell (1971) as examples of managerial thinkers who have suggested that the organizational clientele should be the basic foundation for setting business objectives and strategies. Further, King and Cleland (1978) explicitly state that a firm has responsibilities and moral obligations to a number of claimants, including stockholders, managers, employees, suppliers, distributors, and supporting service organizations such as advertising agencies, various interest groups, public agencies, and the public at large.

Their core argument was that

> If the diverse objectives of various claimants are to be considered by the business firm, or any organization, in determining their own objectives, some methodology is essential. Otherwise, consideration of clientele may be reduced to value musings about what they want to get out of us. ... We shall present such as a methodology. (King & Cleland, 1978, p. 149)

During the same year King and Cleland's book was published, the American researchers *Jeffrey Pfeffer* and *Gerald R. Salancik* (1978) published *The External Control of Organizations: A Resource Dependence Perspective*. In line with the Stanford Research Institute's (SRI) definition of stakeholders as "those groups without whose support the organization would cease to exist" (Freeman, 1984, p. 31), Pfeffer and Salancik were concerned with external constraints affecting organizations due to dependency. Their aim was to contribute to the theoretical framework by offering ways for designing and managing the organizations in order to mitigate such constraints. Further, they aimed to explain how external resources affect executives' behavior due to any organization's need for procurement of resources (Pfeffer & Salancik, 1978). It can be inferred, in terms of stakeholder theory, that Pfeffer and Salancik (1978) focused on the fact that stakeholders possessed resources and not (as was the case for King & Cleland, 1978) that the company had moral obligations to fulfill with various stakeholder groups.

A Matter of Stakeholder Participation

William R. King's supervisor, Russell Ackoff, is well known for his work in corporate planning (see, e.g., Ackoff, 1970). However, Ackoff was also an important contributor to stakeholder theory. Drawing on systems theory, Ackoff suggested that *stakeholders should be seen as elements of a system*. Based on this insight, he offered a method for doing stakeholder analyses of organizational systems. Furthermore, he argued that solving system-wide problems required the *participation* of stakeholders. He proposed a method for *including* stakeholder groups when analyzing and solving problems and illustrated it with case studies on designing large-scale projects (Ackoff, 1974).

During the 1960s and 1970s, the various social movements for civil rights, consumerism, environmentalism, antiwar, and women's rights fueled stakeholder thinking. These social movements emphasized the role that business enterprises have in constraining and transforming society, giving birth to the field of *corporate social responsibility* (Freeman, 1984; Strand, 2015). Following these movements, stakeholders were perceived not only as actors that controlled important *resources*—as embodied in resource dependence theory—they also became *legitimized* actors to be acknowledged by organizations. This acknowledgment arose from social movements and the political, legal, and ethical changes effected by those movements (Müller et al., 2013, 2014). The stakeholder concept was applied to nontraditional stakeholder groups, such as "the public" and "the community," and less emphasis was placed on satisfying the company owners or its customers and suppliers. In addition, the benefit from letting stakeholder groups actively participate in decision making was articulated in the strategic management literature, as Dill (1975) argued:

> For a long time, we have assumed that the views and initiative of stakeholders could be dealt with as externalities to the strategic planning and management process; as data to help management shape decisions, or as legal and social constraints to limit them. We have been reluctant, though, to admit the idea that some of these outside stakeholders might seek and earn active participation with management to make decisions. The move today is from stakeholder influence towards

stakeholder participation. (cited in Freeman, 1984, p. 38)

Recent Publications and Concepts

Leaving the first movers within stakeholder thinking behind and jumping to the present, Freeman still stands as one of the leading researchers within the field. He has produced an impressive number of journal articles, books, and other publications. Examples of recent journal articles are Strand and Freeman's (2015) "Scandinavian Cooperative Advantage: The Theory and Practice of Stakeholder Engagement in Scandinavia" in *Journal of Business Ethics*, and Haskins and Freeman's (2015) "What Managers Should Never Want to Hear: Silence" in *Management Decision*. Examples of books are *Managing for Stakeholders* (Freeman, Harrison, & Wicks, 2007) and *Stakeholder Theory: The State of the Art* (Freeman, Harrison, Wicks, Parmar, & de Colle, 2010).

Another very interesting piece of work is the book *Understanding Stakeholder Thinking* (Näsi, 1995) based on an international symposium on stakeholder thinking organized in Finland. Juha Näsi, then a professor at the University of Jyväskylä, Finland (who unfortunately has since passed away), helped organize the conference and edited the book. Näsi contributed two chapters, the introductory chapter, "What is Stakeholder Thinking? A Snapshot of a Social Theory of the Firm," and a chapter entitled "A Scandinavian Approach to Stakeholder Thinking: An Analysis of its Theoretical and Practical Uses, 1964–1980," which are reprinted in the *Journal of Business Ethics* (see Strand, 2015). In addition, just before he died, Näsi organized a mini-conference of leading stakeholder thinkers in Tampere, Finland, with sponsorship through the University of Tampere, where he held a professorship. Many of the papers presented were subsequently published as a special issue on stakeholder thinking in the *Journal of Business Ethics*, honoring Juha Näsi's work (see Freeman, Näsi, & Savage, 2010).

As previously discussed, Freeman and his coauthors differentiate between an instrumental approach, *Managing Stakeholders* or *Management of Stakeholders*, and a normative or ethical *Managing for Stakeholders* approach (Freeman et al., 2007, 2010). Whereas the former is concerned with stakeholder resource procurement, the latter suggests that all stakeholders have the right and legitimacy to receive *attention* from the organization (see also Julian, Ofori-Dankwa, & Justis, 2008). Stakeholders should not be seen only as a *means* to specific aims in the organization but also as valuable in *themselves* (Donaldson & Preston, 1995). In other words: "Stakeholders are persons or groups with legitimate interests in procedural and/or substantive aspects of corporate activity. Stakeholders are identified by *their* interests in the corporation, whether the corporation has any corresponding functional interest in *them*" (Donaldson & Preston, 1995, p. 67, emphases in original). This means that an analysis of the stakeholders' potentials for supporting or threatening the organization, as proposed by Freeman (1984) and Savage, Nix, Whitehead, and Blair (1991), should not alone form the basis of how they are treated. *Instead, all stakeholders should be embraced by the organization and win–win situations should be sought.*

However, it seems clear that this normative statement has to be qualified so as not to be too naive: organizations, and especially projects as temporary organizations, face many stakeholders with interests that conflict with the interests of other stakeholders. Moreover, organizations have legitimate interests of their own that they must fulfill in order to survive. Thus, the normative statement that organizations should search for win–win solutions, given the ability to find one—in due time, and with an appropriate effort—is very challenging, particularly for projects that are *temporary* endeavors. On the other hand, many projects have *long-term* irreversible implications. This *tension* between limited project time and long-term consequences makes the stakeholder management of and for projects such an interesting and fundamental question.

Another interesting approach in current stakeholder literature is to look at interorganizational collaborations (i.e., project networks), and the nature of the stakeholder relationships in both temporary as well as more permanent networks. Such networks could, for example, involve projects across public and private sectors developing new products, processes, or technologies for the benefit of society (see, e.g., Savage et al., 2010).

Project Stakeholder Analysis

The project management literature recognizes that project stakeholders are important for project success for at least four reasons. First, the project needs contributions (financial and nonfinancial resources) from stakeholders; second, stakeholders often establish the criteria for assessing the success of the project; third, stakeholders' (potential) resistance may cause various risks and negatively affect the success of the project; and fourth, the project may affect stakeholders in both negative and positive ways (see, e.g., Aarseth, Rolstadas, & Andersen, 2011; de Bakker, Boonstra, & Wortmann, 2011; McLeod, Doolin, & MacDonel, 2012; Morris & Hough, 1987; Sallinen, Ahola, & Ruuska, 2011; Turner & Zollin, 2012; Vrhovec, Hovelja, Vavpotič, & Krisper, 2015). The literature also identifies typical project stakeholders to include investors, suppliers, customers, users, authorities, neighbors, media, and so forth (see, e.g., Turner & Zollin, 2012).

To procure resources for the project as well as to satisfy project stakeholders, stakeholder analysis plays an important role (Eskerod & Jepsen, 2013). The aim of doing project stakeholder analysis is to increase the project team's possibility to "anticipate opportunities

and problems for the project at a time when the project team still has time and opportunity for manoeuvring" (Jepsen & Eskerod, 2009, p. 336). Doing stakeholder analysis serves two purposes: (1) to help the project representatives accomplish the project by identifying ways to procure the necessary financial and nonfinancial resources, including avoiding counter actions, and (2) to help the project representatives understand the interests and concerns of the project stakeholders.

Each of the two purposes relates both to an instrumental approach of stakeholder management, or a Management of Stakeholders approach so stakeholders do what is needed for project success, and a normative or ethical approach, in other words, a Management for Stakeholders approach in which the project does what is needed for the stakeholders (Eskerod & Huemann, 2013, 2014b; Freeman et al., 2007, 2010). The first purpose (resource procurement) concerns how the project representatives find ways to make the stakeholders willing as well as able to contribute the needed resources (an instrumental approach) in order to achieve the benefits they strive for to fulfill their needs (an ethical approach). The second approach (procurement of knowledge about the stakeholders' needs and concerns) concerns how the project representatives find ways for the project to satisfy the needs of the stakeholders (ethical approach), while at the same time figuring out how to enhance project success in the form of stakeholder satisfaction (instrumental approach).

Based on the above argumentation, we claim that project stakeholder analysis increases the possibilities of combining the "of" and "for" approaches and thereby the likelihood for both project management success (i.e., finishing the project on time, within budget, on specification, and to stakeholder satisfaction) and project product success (i.e., fulfilling the purposes of the project and harvesting stipulated benefits for the investor and other stakeholders) (Andersen, 2008). In other words, stakeholder analysis helps the project manager and the project team to see, in proper time, the project through more lenses—the project's lenses and the stakeholders' lenses—and to seek win–win solutions rather than trade-offs.

To obtain this it is, however, necessary that the applied project stakeholder analysis methods are appropriate, and neither too complex (so that they are difficult to apply or the data produced too overwhelming to make use of) nor too superficial (so that the data produced are not relevant or sufficient). Unfortunately, many authors within the project management literature claim that the current methods for project stakeholder analysis are of limited value. For example, Jepsen and Eskerod (2009) state that "the current guidelines for project stakeholder management should be considered as a conceptual framework rather than instructions on how to do a real world stakeholder analysis" (p. 335). Eskerod and Huemann (2013) have analyzed the international standards and bodies of knowledge, for example, *A Guide to the Project Management Body of Knowledge (PMBOK®* Guide), the *International Competence Baseline* (ICB), and PRINCE2, and argue that today's working forms of stakeholder management have a number of limits. The core argumentation is that the current working forms are not suited for grasping the increased complexity facing project managers and project teams.

Classical project stakeholder analysis methods typically consist of a number of steps, involving stakeholder identification and various stakeholder assessments, for example, determination of needed contributions from each stakeholder as well as each stakeholder's requirements, wishes, and concerns in relation to the project (see, e.g., Eskerod & Huemann, 2014a; Karlsen, 2002; Littau, Jujagiri, & Adlbrecht, 2010; Yang, Shen, Bourne, Ho, & Xue, 2011). Based on those assessments, strategies are chosen on how to interact with each stakeholder.

As conflicting interests may exist between the project team and various stakeholders or across one or more of the stakeholders, prioritization is often an important part of the strategy planning (Jepsen & Eskerod, 2009). Mitchell, Agle, and Wood (1997) suggest categorizing the identified stakeholders based on an assessment of three attributes concerning each given issue (i.e., the issues that lead to a need for prioritization): power, legitimacy, and urgency. For example, a powerful and legitimate stakeholder with an urgent interest should be offered more management attention than a stakeholder without the three attributes. Prioritization of stakeholders is also part of the classical work by Freeman (1984) because he differentiates between primary and secondary stakeholders in order to allocate limited management resources properly. The primary stakeholders are the ones who are essential to the organization's well-being and survival, whereas the others are secondary stakeholders.

Another characteristic within project stakeholder analysis is that it is issue driven, meaning that the focus in the analysis is on a certain challenge at a specific point in time. This approach makes it possible to reduce the analytical complexity and stay focused, rather than trying to incorporate all details, issues, and project phases in one picture. To try to construct one picture only is a common mistake among inexperienced or untrained project managers, building on the underlying, wrong assumption that the stakeholders and their interests and attributes (e.g., power and legitimacy) are stable across a long time span and various issues. This issue-specificity relates back to Freeman (1984), Savage et al. (1991), and Eskerod and Jepsen (2013) who all point to the necessity of an issue-driven analysis.

Even though exceptions exist (e.g., Ackermann & Eden, 2011; Savage et al., 2010), it is characteristic for the

project management literature that the relationships between the project and the stakeholders are seen as dyadic relationships, meaning that they should be between the project and each stakeholder, placing the project in the middle. More authors (e.g., Eskerod & Jepsen, 2013) have pointed to the weakness of this project-centric approach due to the fact that it does not acknowledge that (1) the project may not be the center of attention for the stakeholders as they have their own set of stakeholders to relate to (and some of them may even be more important); (2) the project stakeholders may relate to each other and even be more influenced by some of the other stakeholders than the project team; and (3) the project stakeholders may form coalitions and be much more powerful than a dyadic analysis can detect. Therefore, we claim, project stakeholder analysis methods will benefit from a network approach rather than a dyadic approach. This is in line with Ackoff's (1974) classical work in which he suggests "stakeholders in a system" as the proper unit of analysis.

In addition, project stakeholder analysis is an environmental interpretation process (Aaltonen, 2011) in which the project representatives have the obligation not to perceive the stakeholder as "unreasonable" or "irrational" but instead realize that the current understanding of the particular stakeholder is not adequate or sufficient (Freeman, 1984). A better analysis result will typically be obtained if a given stakeholder category, such as the government and employees, is broken down into smaller categories for the analysis, maybe even at the individual level instead of an aggregated level (Ackermann & Eden, 2011; Eskerod & Jepsen, 2013; Freeman, 1984).

Other interesting contributions related to stakeholder analysis are Heravi, Coffey, and Trigunarsyah (2015) who discuss how to evaluate the level of stakeholder involvement during the project planning processes of building projects, and Walker and Maqsood (2014) who propose that stakeholder voices can be heard through the construction of "rich pictures."

Articles in This Special Issue

All articles in this special issue draw on some of the theoretical concepts presented in this overview article, and they are all built on in-depth case studies. They all address aspects of having to deal with many different project stakeholders, which is a typical situation in contemporary project management.

The article *"Stakeholder Dynamics During the Project Front-End: The Case of Nuclear Waste Repository Projects"* by **Aaltonen**, **Kujala**, **Havela**, and **Savage** aims to increase the understanding of stakeholder challenges in large and complex projects, especially during the front-end phase. The authors have studied and compared stakeholder dynamics of two pioneering nuclear waste repository projects, one in Finland and one in the United States. Even though stakeholder dynamics is acknowledged in the project management literature (see, e.g., Eskerod & Vaagaasar, 2014), the elements of the dynamics have not been conceptualized in a detailed, systematic manner. In this article, the authors propose a new conceptual framework—*a stakeholder salience-position matrix*—which makes it possible to analyze changes in stakeholders' importance and position toward a project. The matrix is applied to the two nuclear waste repository projects, and hereby it explicates how stakeholder dynamics are influenced by the interaction of stakeholders' influence behavior, stakeholder management activities, and the project's contextual conditions.

The article *"Stakeholder Inclusiveness: Enriching Project Management with General Stakeholder Theory"* by **Eskerod**, **Huemann**, and **Ringhofer** aims to increase the understanding of project stakeholder management by discussing dilemmas related to stakeholder inclusiveness, in other words, to engage a broad range of stakeholders during the project course. The authors have undertaken a longitudinal case study of a public strategy development project in Denmark. Based on the findings, three propositions are offered: Applying stakeholder inclusiveness in a project (1) increases the likelihood of more engaged and satisfied stakeholders, (2) increases a danger of losing focus on those of the stakeholders who possess the most critical resources for the project's survival and progress, and (3) increases a danger of inducing stakeholder disappointment due to expectation escalation and impossibility of embracing conflicting requirements and wishes.

The article *"Breakthrough R&D Stakeholders: The Challenges of Legitimacy in Highly Uncertain Projects"* by **Hooge** and **Dalmasso** aims to increase the understanding of internal stakeholders in a specific kind of projects, that is, highly uncertain breakthrough R&D projects. The authors have studied the management of internal R&D stakeholders and their involvement dynamics in breakthrough R&D projects in France. Building on a longitudinal research partnership with a global car manufacturer since 2005, the research highlights the important dynamics of involvement among internal R&D stakeholders in the engineering development organization. Some stakeholders, acting as experts, innovation design strategists, or internal collaboration strategists, succeed in involving the individuals needed for the project's progress, sometimes generating an over-commitment. The success of the rationales of these stakeholders on engineering resources involvement depended on the perceived legitimacy of their holders.

The article *"Managing Project Stakeholder Communication: The Qstock Festival Case"* by **Turkulainen**, **Aaltonen**, and **Lohikoski** aims to increase the understanding on how to manage communication with the stakeholders throughout a project course. The three authors present findings from a case study of a Finnish music festival in which they have examined how the communication was facilitated and

managed across different stakeholders during the different phases of the project life cycle. By building on an information processing view and the stakeholder salience framework, the study shows how stakeholder communication practices varied from impersonal to personal and group modes and depended on stakeholders' salience and the phase of the project life cycle. The findings imply that understanding stakeholder management requires a dynamic approach; in others words, different communication practices are required over the project life cycle due to varying degrees of salience of the stakeholders.

The last article in this special issue, *"Online Stakeholder Interactions in the Early Stage of a Megaproject"* by **Williams**, **Ferdinand**, and **Pasian**, aims to increase the understanding of stakeholder social media interactions in the planning stage of large and complex projects. The characteristics for such projects are that, typically, they are embedded in a network of stakeholder relationships that range from small, local community groups to national and international bodies that may support or oppose the project. The authors have studied a public infrastructure megaproject (called High Speed Rail) in the United Kingdom. Twitter conversations for one year were analyzed using Social Network Analysis and inductive analyses of Twitter profiles and content were undertaken. The purpose was to examine the overall evolution, configuration, and composition of the stakeholder network, which emerged from the project. The analyses indicate that the majority of online stakeholders opposed the project and formed stable clusters within an overall network that had increased in stability over the period of study. The authors contribute to the understanding of stakeholder analysis as well as of mega projects. They demonstrate that social network analysis as a methodology is a useful complement to existing stakeholder analysis methods and that it may provide real-time insights into the complex evolving discussions around megaprojects seen in the project management field.

More Research Literature on Project Stakeholder Management

In the previous text, we looked for clues within strategic management to understand the issues relevant to project management, which was also done by Drouin and Jugdev (2013). However, a number of contributions within the project management field itself addressing project stakeholder management have also been identified. Recent examples of reviewed articles are Littau, Jujagiri, and Adlbrecht (2010) and Mok, Shen, and Yang (2015). Recent examples of articles that draw on process analyses that are quite rare are Beringer, Jonas, and Gemünden (2012); Jepsen (2013); Eskerod and Vaagaasar (2014); and Yang, Wang, and Jin (2014). Even doctoral theses on project stakeholder management can be identified, for example, Bourne (2003) (referred in Walker, 2014) and Aaltonen (2010), as well as these scholars' subsequent publications, for example, Bourne (2009), Aaltonen and Kujala (2010), and Aaltonen (2011). Other articles deal with leadership responsibility and ethical dilemmas (e.g., Doh & Quigley, 2014; Walker & Lloyd-Walker, 2014), yet other articles suggest that we should look into the "stakeholder relational ontology" (Missonier & Loufrani-Fedida, 2014) or apply a socio-dynamic approach to stakeholder management (Walley, 2013).

References

Aaltonen, K. (2010). *Stakeholder management in international projects* (Doctoral Thesis). Department of Industrial Engineering and Management, Helsinki University of Technology, Espoo, Finland.

Aaltonen, K. (2011). Project stakeholder analysis as an environmental interpretation process. *International Journal of Project Management, 29*(2), 165–183.

Aaltonen, K., & Kujala, J. (2010). A project lifecycle perspective on stakeholder influence strategies in global projects. *Scandinavian Journal of Management, 26*(4), 381–397.

Aarseth, W., Rolstadas, A., & Andersen, B. (2011). Key factors for management of global projects: A case study. *International Journal of Transitions and Innovation Systems, 1*(4), 326–345.

Ackermann, F., & Eden, C. (2011). Strategic management of stakeholders: Theory and practice. *Long Range Planning, 44*(3), 179–196.

Ackoff, R. (1970). *A concept of corporate planning*. New York, NY: Wiley.

Ackoff, R. (1974). *Redesigning the future*. New York, NY: Wiley.

Andersen, E. S. (2008). *Rethinking project management: An organisational perspective*. Harlow: Prentice Hall/ Financial Times.

Beringer, C., Jonas, D., & Gemünden, H. G. (2012). Establishing project portfolio management: An exploratory analysis of the influence of internal stakeholders' interactions. *Project Management Journal, 43*(6), 16–32.

Bourne, L. M. (2003). *Knowledge management reflective learning*. Assignment paper for the Doctor of Project Management, Doctor of Project Management Program, 25, RMIT University, Melbourne.

Bourne, L. M. (2009). *Stakeholder relationship management.* Farnham, England: Gower.

Churchman, C. W. (1968). *The systems approach.* New York, NY: Dell.

Dalcher, D. (2009). Software project success: Moving beyond failure. *CEPIS Upgrade, X*(5), 42–50.

Davis, K. (2014). Different stakeholder groups and their perceptions of project success. *International Journal of Project Management, 32*(2), 189–201.

de Bakker, K., Boonstra, A., & Wortmann, H. (2011). Risk management

affecting IS/IT project success through communicative action. *Project Management Journal, 42*(3), 75–90.

Dill, W. (1975). Public participation in corporate planning: Strategic management in a Kibitzer's world. *Long Range Planning, 8*(1), 57–63.

Doh, J. P., & Quigley, N. R. (2014). Responsible leadership and stakeholder management: Influence pathways and organizational outcomes. *Academy of Management Perspectives, 28*(3), 255–274.

Donaldson, T., & Preston, L. E. (1995). The stakeholder theory of the corporation: Concepts, evidence, and implications. *Academy of Management Review, 20*(1), B5–B91.

Drouin, N., & Jugdev, K. (2013). Standing on the shoulders of strategic management giants to advance organizational project management. *International Journal of Managing Projects in Business, 7*(1), 61–77.

Eskerod, P., & Huemann, M. (2013). Sustainable development and project stakeholder management: What standards say. *International Journal of Managing Projects in Business*, *6*(1), 36–50.

Eskerod, P., & Huemann, M. (2014a, July 27–29). *Advancing project stakeholder analysis by standing on the shoulders of giants*. Paper for the PMI® Research and Education Conference, Portland, Oregon, USA.

Eskerod, P., & Huemann, M. (2014b). Managing for stakeholders. In J. R. Turner (Ed.), *Gower handbook of project management* (5th ed.). Farnham, England: Gower.

Eskerod, P., & Jepsen, A. L. (2013). *Project stakeholder management*. Aldershot, England: Gower.

Eskerod, P., & Vaagaasar, A. L. (2014). Stakeholder management strategies and practices during a project course. *Project Management Journal, 45*(5), 71–85.

Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Boston, MA: Pitman/Ballinger.

Freeman, R. E., Harrison, J. S., & Wicks, A. C. (2007). *Managing for stakeholders: Survival, reputation, and success*. New Haven, CT: Yale University Press.

Freeman, R. E., Harrison, J. S., Wicks, A. C., Parmar, B. L., & de Colle, S. (2010). *Stakeholder theory: The state of the art*. Cambridge, England: Cambridge University Press.

Freeman, R. E., Näsi, S., & Savage, G. T. (Eds.). (2010). Special Issue on Stakeholder Thinking: A Tribute to Juha Näsi. *Journal of Business Ethics, 96* (Supplement 1).

Haskins, M. E., & Freeman, R. E. (2015). What managers should never want to hear: Silence. *Management Decision, 53*(6), 1300–1311.

Heravi, A., Coffey, V., & Trigunarsyah, B. (2015). Evaluating the level of stakeholder involvement during the project planning processes of building projects. *International Journal of Project Management*, *33*(5), 985–997.

Jepsen, A. L., & Eskerod, P. (2009). Stakeholder analysis in projects: Challenges in using current guidelines in the real world. *International Journal of Project Management*, *27*, 335–343.

Jepsen, L. B. (2013). Complex new product development projects: How the project manager's information sharing with core actors changes over time. *Project Management Journal, 44*(6), 20–35.

Julian, S. D., Ofori-Dankwa, J. C., & Justis, R. T. (2008). Understanding strategic responses to interest group pressures. *Strategic Management Journal, 29*, 963–984.

Karlsen, J. T. (2002). Project stakeholder management. *Engineering Management Journal, 14*(4), 19–24.

Killen, C. P., Jugdev, K., Drouin, N., & Petit, Y. (2012). Advancing project and portfolio management research: Applying strategic management theories. *International Journal of Project Management, 30*, 525–538.

King, W., & Cleland, D. (1978). *Strategic planning and policy*. New York, NY: Van Nostrand Reinhold Co.

Koskela, L., & Howell, G. (2002, July 14–17). *The underlying theory of project management is obsolete*. Paper presented at the 2002 PMI® Research and Education Conference, Seattle, Washington, USA.

Littau, P., Jujagiri, N. J., & Adlbrecht, G. (2010). 25 years of stakeholder theory in project management literature (1984–2009). *Project Management Journal, 41*(4), 17–29.

McConnell, J. D. (1971). Strategic planning: One workable approach. *Long Range Planning, 4*(2), 2–6.

McLeod, L., Doolin, B., & MacDonel, S. G. (2012). A perspective-based understanding of project success. *Project Management Journal*, *43*(5), 68–86.

Missonier, S., & Loufrani-Fedida, S. (2014). Stakeholder analysis and engagement in projects: From stakeholder relational perspective to stakeholder relational ontology. *International Journal of Project Management, 32*(7), 1108–1122.

Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review*, *22*, 853–886.

Mok, K. Y., Shen, G. Q., & Yang, J. (2015). Stakeholder management studies in mega construction projects: A review and future directions. *International Journal of Project Management, 33*(2), 446–457.

Morris, P. W. G., & Hough, G. (1987). *The anatomy of major projects: A study of the reality of project management*. Chichester, England: Wiley.

Müller, R., Andersen, E. S., Kvalnes, Ø., Shao, J., Sankaran, S., Turner, J. R., … Gudergan, S. (2013). The interrelationship of governance, trust, and ethics in temporary organizations. *Project Management Journal, 44*(4), 26–44.

Müller, R., Turner, R., Andersen, E. S., Shao, J., & Kvalnes, Ø. (2014). Ethics, trust, and governance in temporary organizations. *Project Management Journal, 45*(4), 39–54.

Näsi, J. (Ed). (1995). *Understanding stakeholder thinking*. Helsinki, Finland: LSR-Julkaisut Oy.

Pfeffer, J., & Salancik, G. R. (1978). *The external control of organizations*. Stanford, CA: Stanford University Press.

Rhenman, E. (1964). *Företagsdemokrati och företagsorganisation* [*Industrial Democracy and Industrial Management*]. Stockholm, Sweden: Thule (in Swedish).

Rhenman, E. (1968). *Industrial democracy and industrial management*. London, England: Tavistock Publications.

Rhenman, E., & Stymne, B. (1965). *Företagsledning i en föränderlig värld* [*Corporate Management in a Changing World*]. Stockholm, Sweden: Aldus/Bonniers (in Swedish).

Sallinen, L., Ahola, T., & Ruuska, I. (2011). Governmental stakeholder and project owner's views on the regulative framework in nuclear projects. *Project Management Journal, 42*(6), 33–47.

Savage, G. T., Bunn, M. D., Gray, B., Xiao, Q., Wang, S., Wilson, E. J., & Williams, E. S. (2010). Stakeholder collaboration: Implications for stakeholder theory and practice. *Journal of Business Ethics, 96*(1), 21–26.

Savage, G. T., Nix, T. W., Whitehead, C. J., & Blair, J. D. (1991). Strategies for assessing and managing organizational stakeholders. *Academy of Management Executives, 5*(2), 61–75.

Shenhar, A. J., & Dvir, D. (2007). *Reinventing project management: The diamond approach to successful growth and innovation*. Boston, MA: Harvard Business School Press.

Strand, R. (2015). Scandinavian stakeholder thinking: Seminal offerings from the late Juha Näsi. *Journal of Business Ethics, 127*(1), 89–105.

Strand, R., & Freeman, R. E. (2015). Scandinavian cooperative advantage: The theory and practice of stakeholder engagement in Scandinavia. *Journal of Business Ethics, 127*(1), 65–85.

Turner, R., & Zollin, R. (2012). Forecasting success on large projects: Developing reliable scales to predict multiple perspectives by multiple stakeholders over multiple time frames. *Project Management Journal, 43*(5), 87–99.

Vrhovec, S. L. R., Hovelja, T., Vavpotič, D., & Krisper, M. (2015). Diagnosing organizational risks in software projects: Stakeholder resistance. *International Journal of Project Management, 33*(6), 1262–1273.

Walker, D. (2014). Project stakeholder management. *International Journal of Managing Projects in Business, 7*(2), 318–320.

Walker, D., & Lloyd-Walker, B. (2014). Client-side project management capabilities: Dealing with ethical dilemmas. *International Journal of Managing Projects in Business, 7*(4), 566–589.

Walker, D., & Maqsood, R. S. T. (2014). Stakeholder voices through rich pictures. *International Journal of Managing Projects in Business, 7*(3), 342–361.

Walley, P. (2013). Stakeholder management: The sociodynamic approach. *International Journal of Managing Projects in Business, 6*(3), 485–504.

Yang, J., Shen, P. Q., Bourne, L., Ho, C., & Xue, X. (2011). A typology of operational approaches for stakeholder analysis and engagement: Findings from Hong Kong and Australia. *Construction Management and Economics*, *29*(2), 145–162.

Yang, R., Wang, Y., & Jin, X.-H. (2014). Stakeholders' attributes, behaviours, and decision strategies in construction projects: Importance and correlations in practice. *Project Management Journal, 45*(3), 74–90.

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PAPERS

Stakeholder Dynamics During the Project Front-End: The Case of Nuclear Waste Repository Projects

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ABSTRACT

Understanding stakeholder dynamics and their impact on project management is crucial, especially for large and complex projects such as nuclear waste repositories. This study examines the stakeholder dynamics during the project front-end stage of two pioneering nuclear waste repository projects. To analyze changes in stakeholders' importance and position on a project, we propose and apply a new conceptual framework: a stakeholder salience-position matrix. The study explicates how stakeholder dynamics are influenced by the interaction of stakeholders' influence behavior, stakeholder management activities, and the project's contextual conditions. Prior stakeholder literature has rarely conceptualized the elements of stakeholder dynamics in a systematic manner.

KEYWORDS: project stakeholder management; stakeholder dynamics; project front-end; stakeholder salience-position matrix; project success

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INTRODUCTION

The management of project stakeholders is widely acknowledged as an essential part of project management and a factor contributing to project success (Cleland, 1986; Olander & Landin, 2005). Prior project stakeholder research has primarily focused on the conceptual development of stakeholder management tools and frameworks in order to better manage stakeholders. However, the majority of extant stakeholder management research, tools, and frameworks provides only a static perspective of the project and are focused primarily on the project execution stage. Clearly less attention has been devoted to understanding stakeholder dynamics, both empirically and theoretically, during the early project front-end stage (Aaltonen & Kujala, 2010; Achterkamp & Vos, 2008; Brøde Jepsen, 2013; Eskerod & Vaagaasar, 2014). The aim of this article is to improve our understanding of stakeholder dynamics during the project's front-end stage. To do so, we conceptualize stakeholder dynamics as changes in stakeholders' attributes and position on the project and develop a conceptual framework to examine the changes in stakeholders' salience attributes (power, legitimacy, and urgency; see Mitchell, Agle, & Wood, 1997) and in their position on the project, in other words, the degree of supportiveness. The specific research question of this study can be formulated as follows: How can stakeholder dynamics be conceptualized? In addition, based on our inductive study we provide reasoning and explanations for the identified changes.

The importance of stakeholder management and stakeholder dynamics is especially significant in the nuclear power field, where stakeholders' negative attitude toward a project can severely obstruct project progress and cause cost overruns and exceeded time schedules. This study examines stakeholder dynamics during the project front-end stage at two pioneering nuclear repository projects: Onkalo in Finland and Yucca Mountain in Nevada, USA. Such projects can be described as the most ambitious construction projects in the history of mankind, with the goal of isolating nuclear waste for at least 100,000 years. The technology used in final disposal is mature and technically proven, but gaining the diverse stakeholder support and managing stakeholder dynamics has been challenging during the early stages of these projects.

We decided purposefully to focus on the project's front-end stage (considered to cover all the activities from the project's idea generation to the more detailed planning phase), because it is a stage when stakeholders' positions are shaped and the stakeholders' potential to influence the project management's decision-making process is the highest (Aaltonen & Kujala, 2010; Miller & Olleros, 2000). Furthermore, the current understanding of project front-end stakeholder dynamics can be considered to be in its infancy. Hence, on the practical side, the article increases our understanding of how project management can actually influence and manage stakeholder dynamics during the project front-end stage.

The article is divided into the following sections. We begin with a literature review on project stakeholder management and stakeholder dynamics. Next, based on the literature analysis we develop a conceptual framework—a stakeholder salience-position matrix—to analyze stakeholder dynamics. We then discuss our case research methods, including the sources of data and the analytical approach for applying the stakeholder salience-position matrix. The case presentations include a short brief about nuclear waste management and overviews of both the Onkalo and Yucca Mountain nuclear repository projects. We then highlight the key events for each project, and use the stakeholder salience-position matrix to visually display and analyze reasons for stakeholder dynamics. In the discussion, we discuss the implications of our analysis for project stakeholder management research and project front-end research and provide suggestions for further research.

Theoretical Background

Project Stakeholder Thinking

Freeman (1984) introduced and popularized the notion of stakeholder management within the strategic and general management literature. Two years later, Cleland (1986) introduced stakeholder thinking into the project management paradigm. Since then, the role of stakeholder management as a central project management process has strengthened. Indeed, the concept of project management is defined through stakeholders as "the process of adapting the specifications, plans, and approaches to the different concerns and expectations of the various stakeholders" (Project Management Institute, 2008). Stakeholders have their own objectives, interests, and expectations, which may conflict and cause challenges to project management (Artto & Kujala, 2008; Yang, Wang, & Jin, 2014). Stakeholder theory, thus, has been used instrumentally to enable managers to understand stakeholders and strategically manage them, typically by engendering and maintaining their support (Aaltonen, Kujala, & Oijala, 2008; Eskerod & Vaagaasar, 2014; Savage, Nix, Whitehead, & Blair, 1991).

Following Cleland's (1986) work, various definitions and categorizations of stakeholders—some broadly conceived and some more constricted—have been presented in the project management literature. Broad definitions (Beringer, Jonas, & Gemünden, 2012; Fraser & Zhu, 2008; Kolltveit & Gronhaug, 2004; Project Management Institute, 2008; Turner, 1999; Ward & Chapman, 2008) accentuate the fact that project stakeholders can affect or are affected by the project. In turn, definitions that adopt a narrower view highlight the nature of the interest or stake that a particular stakeholder has with regard to a project (Chinyio & Akintoye, 2008; Cleland, 1986; McElroy & Mills, 2000; Olander, 2007). Many of the definitions draw upon notions from the stakeholder management literature, but adapt and apply them to the project context.

In addition to these diverse definitions, project management scholars have also categorized stakeholders in various ways. Most prominent in the literature are categorizations based on the stakeholders' involvement in the project and the nature of their relationship with the project; the nature of stakeholders' claim and their position toward the project; the stakeholders' role in the project; and the degree to which stakeholders' behavior can be anticipated. Internal stakeholders are the stakeholders who are formally members of the project coalition and hence usually support the project (Beringer et al., 2012; Winch, 2004). External stakeholders are not formal members of the project coalition, but may affect or are affected by the project. These external entities are often referred to as nonbusiness stakeholders or secondary stakeholders (Cova & Salle, 2005). In addition, stakeholder categorizations in the project management literature may include the division of stakeholders according to their functional role in a project, such as client, contractor, customers, sponsors, local community members, NGOs, media, lobbying organizations, and government agencies (Cova, Ghauri, & Salle, 2002). Recently, Frooman (2010) defined stakeholders as those who have a stake in an issue instead of a firm. From the issue network perspective, stakeholders can be identified as those with grievances, resources, or opportunities with regard to a certain issue such as nuclear waste repositories.

Stakeholder Salience

Stakeholder theory provides concepts and frameworks for identifying, classifying, and categorizing stakeholders and, through understanding their motivations and likely behavior, managing stakeholders (Aaltonen et al., 2008). However, as all stakeholder needs and concerns cannot be fulfilled, the project managers need to balance various stakeholders' diverse claims in their decision-making process so that the purpose of the project is not compromised (Olander, 2007).

The stakeholder salience framework, proposed by (Mitchell et al., 1997), explains how managers regard stakeholders in their decision making. Salience, within this framework,

refers to the degree to which managers give priority to competing stakeholder claims. Stakeholder salience framework classifies stakeholders according to the power, legitimacy, and urgency of their claims. The stakeholder salience framework posits that managers use these three attributes to determine which stakeholders should receive attention. The more attributes a stakeholder possesses, the more salient it is to an organization's managers.

For example, the more powerful the stakeholders are, the more salient their requests are in the eyes of management. In the salience framework, stakeholder power is defined as "a relationship among social actors in which one social actor, A, can get another social actor, B, to do something that B would not otherwise have done." Power is exercised through the provision or withholding of material, financial, symbolic, or physical resources.

Mitchell et al. (1997) argue that the more legitimate the stakeholders' claims are, the more likely they are to receive positive responses from firms. Legitimacy is defined as a "a generalized perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions" (Mitchell et al., 1997, p. 865). Finally, the urgency of the stakeholders' request is seen as the third attribute that increases the salience of the stakeholder. Urgency is defined as "the degree to which stakeholder claims call for immediate attention." It is based on two attributes: (1) time sensitivity—the degree to which managerial delay in attending to the claim or relationship is unacceptable to the stakeholder—and (2) criticality—the importance of the claim to the stakeholder (Mitchell et al., 1997, p. 867).

The stakeholder salience model suggests that stakeholder salience is positively related to the cumulative number of the three variable attributes of power, legitimacy, and urgency (Mitchell et al., 1997). While the salience framework has been applied in empirical research, serious attempts to operationalize and create robust measures of salience attributes have been quite limited (Neville, Bell, & Whitwell, 2011). Indeed, many of the applications and empirical tests for the model consider only the simple absence or presence of the three attributes (Neville et al., 2011). Indeed, also Mitchell et al. (1997, p. 881) noted that even though their framework considers each attribute as "present or absent," stakeholder attributes function as variables operating upon a continuum, not as steady states/dichotomous and can change for any particular group or stakeholder–manager relationship.

Stakeholders' Position on the Project

In addition to the analysis of stakeholders' attributes, project stakeholders can also be divided into different classes based on their position, stake, and interests in the project. Winch (2004) proposes a dichotomous classification based on those who promote the project and those who oppose it. McElroy and Mills (2000) present a more fine-grained model with five different levels of stakeholder positions toward the project: active opposition, passive opposition, noncommittal, passive support, and active support. These positions toward the project ultimately determine the impact of each stakeholder on the project's decision making. Olander (2007), however, postulates that this distinction is problematic because it implies that the media would not be classed as a stakeholder despite having the potential ability to significantly affect a project's activities and performance. Much of the existing research seems to simply classify external stakeholders, such as local citizens, community groups, and environmentalists to those stakeholder groups who typically oppose the project and that need to be convinced of the project's worth. In turn, internal stakeholder behavior is typically considered as supportive toward the project (Beringer et al., 2012; Winch, 2004). Savage et al. (1991) divide stakeholders into groups according to their potential to cooperate or threaten the organization and present a categorization of nonsupportive stakeholders, supportive stakeholders, swing stakeholders and mixed blessing stakeholders. Their model implicitly implies that the nature of stakeholders' position toward a project may vary and multifaceted, and that there are stakeholders that may at the same time support certain project-related issues and oppose others. Olander's (2007) stakeholder impact index also suggests a more detailed treatment and scaling for the varying degrees stakeholder positions not considered as dichotomous, but may range from active opposition to active support.

Perspectives on Explaining Project Stakeholder Dynamics

Stakeholders' attributes and their position on the project do not remain steady-state during the project, but have a dynamic nature (Aaltonen & Kujala, 2010). While empirical examinations on project stakeholder dynamics are limited (Aaltonen & Kujala, 2010; Olander, 2007; Olander & Landin, 2005), the existing stakeholder literature provides three essential perspectives for better understanding stakeholder dynamics and its drivers: research on stakeholder influence strategies, research on stakeholder management strategies, and research on contextual conditions of the project.

Stakeholders' influence strategies can be considered as important means for stakeholders to strategically shape their position and increase the likelihood that their claim will be taken into account in the project management's decision-making process (Aaltonen et al., 2008; Frooman, 1999; Hendry, 2005). Frooman (1999) discusses influence strategies as the "means" stakeholders use to try to get what they want. Aaltonen et al. (2008) propose eight different strategies through which project stakeholders can shape their salience attributes, which include the

direct withholding strategy, indirect withholding strategy, coalition building strategy, resource building strategy, conflict escalation strategy, creditability building strategy, communication strategy, and direct action strategy (Aaltonen et al., 2008). Thus, stakeholders' influence strategies can be understood as activities that may contribute to the changes in the level of stakeholders' salience or may change the positions of other stakeholders on the project. For example, in an empirical examination of a contested pulp mill, Aaltonen and Kujala (2010) showed how opponent stakeholders were able to increase their power and legitimacy through networking with local politicians, as well as, how stakeholders' influence behavior ultimately contributed to a financier's change from a supportive stakeholder to a nonsupportive stakeholder.

Stakeholder management strategies in turn are means enacted by project management to shape the attributes or positions of stakeholders and, hence, may contribute to the stakeholder dynamics during the project's early stage. Aaltonen and Sivonen (2009) have identified and described five different types of response strategies, in other words, stakeholder management strategies that project management may enact as a response to stakeholder pressures. The identified response strategies are: adaptation strategy, compromising strategy, avoidance strategy, dismissal strategy, and influence strategy. In their empirical analysis of a complex engineering project, Aaltonen and Sivonen (2009) show for example how proactive influence strategies consisting of active dialogue and early stakeholder engagement enacted by project management shifted the opposing stakeholders into neutral ones. Savage et al.'s (1991) and Olander and Landin's (2005) typologies also suggest that managers should differentiate their stakeholder management strategies based on the positions of stakeholders. Strategies of collaboration, defending, monitoring, informing, and involving are suggested (Olander & Landin, 2005; Savage et al., 1991). For example, the strategy of collaboration can be used to increase the most crucial stakeholders' degree of supportiveness and the strategy of defending to decrease the power of nonsupportive stakeholders (Savage et al., 1991). Hence, stakeholder management strategies enacted by project management can be understood as activities that may contribute to the changes in the level of stakeholders' salience or may change the position of stakeholders toward the project.

In addition to stakeholders' influence behavior and project management's stakeholder management activities, prior studies have emphasized the role that projects' contextual conditions may play in stakeholder dynamics. Indeed, Mitchell et al. (1997) noted that the salience of stakeholders may vary from one context to another. Jawahar and McLaughlin's (2001) study adopts a firm life-cycle perspective to examining stakeholder dynamics and shows how change in the context, in other words, in the stage of the organizational life cycle is a key factor in shaping the salience of organizational stakeholders. Following this line of argumentation in the context of a project Aaltonen and Kujala (2010) and Olander and Landin (2005) have also shown how the salience and particularly power of stakeholders may change as the project proceeds on its life cycle and project-related decisions are made. When the project go-decision is made, for example, the salience of opposing stakeholders decreases because their potential to influence decision making is significantly lower (Aaltonen & Kujala, 2010). In addition, prior research on international engineering projects has reported how the project's institutional context with its regulative, normative, and socio-cultural elements may generate unexpected stakeholder events and dynamics (Aaltonen, 2013; Floricel & Miller, 2001; Orr & Scott, 2008). Research on institutional conditions and their implications on large projects' governance arrangements have also highlighted the differences that large engineering projects face in terms of the regulatory frameworks, the local community opposition, and the procedures of multiple uncoordinated agencies (Floricel & Miller, 2001). Consequently, depending on the institutionalized practices and the institutional environment, projects may face quite different stakeholder mobilization patterns, legitimized processes for engaging stakeholders, as well as overall project governance arrangements that may contribute significantly to how project stakeholder dynamics play out during the project's front-end stage.

Toward Improved Understanding of Project Stakeholder Dynamics: An Analytical Framework

Based on the literature review, we suggest that project stakeholder dynamics can be analyzed through examining the changes in the degree of stakeholders' salience attributes (power, legitimacy, urgency) and in stakeholders' stance toward the project (i.e., the degree of supportiveness toward the project). In this study both stakeholder salience and position of the stakeholders are treated on a continuum, not as dichotomous variables. Figure 1 illustrates the degree of salience/position toward the project–matrix (further referred to as the salience/position–matrix). The salience/position–matrix is an analytical framework developed for the purposes of this study used to examine project stakeholder dynamics in the empirical cases.

We use the analytical framework for mapping the changes in stakeholders' salience and position and for better understanding the reasons for the identified changes. Following the argumentation in our literature analysis we anticipate that stakeholder salience attributes and position toward the project are properties that may change through stakeholder influence strategies and stakeholder management strategies. In addition, the contextual conditions of the project form the initial boundaries and basis for stakeholder

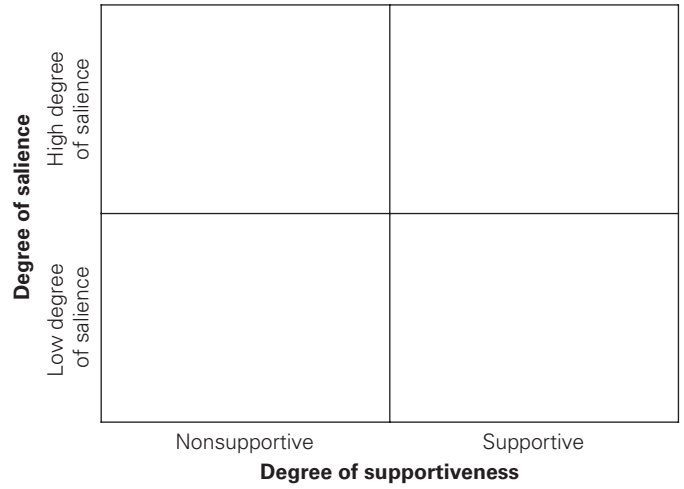

Figure 1: Salience/position–matrix.

dynamics. Our empirical analysis will explore in more detail the role of stakeholder influence strategies, stakeholder management strategies, and the project's contextual conditions in explaining stakeholder dynamics.

Research Methodology

Research Strategy

Since the purpose of the study is to improve our understanding of stakeholder dynamics during the project front-end and prior research within this area is limited, a case study approach was selected as a research strategy (Eisenhardt, 1989). We chose to study and provide detailed analyses of two multistakeholder case projects: Onkalo is a successful nuclear repository project in Finland and Yucca Mountain is a fiercely debated nuclear repository project in Nevada, USA. We selected these two, unique multistakeholder cases due to their different early-stage stakeholder dynamics and outcomes with regard to stakeholders. According to Yin (1994), a multiple case study enables researchers to explore differences within and between cases. As such, it is considered to be more robust and reliable than single-case studies, which are often criticized for their uniqueness. In addition, we believed that the nuclear waste management context would provide us with interesting insights about managing stakeholders. According to the World Nuclear Association (2011), repository projects are being planned in several countries. Gaining and maintaining stakeholder support have been the main challenges in all repository projects.

Research Data

The empirical data consist of publicly available electronic information on the two pioneering nuclear repository projects. Hundreds of Onkalo project-related articles were published in leading Finnish financial periodicals and newspapers, whereas information concerning Yucca Mountain was primarily collected from U.S. financial periodicals and newspapers (articles published between 2005 and 2013). Furthermore, independent information concerning nuclear waste decommissioning and nuclear waste field was provided on the International Atomic Energy Agency, Organization for Economic Cooperation, and Development and World Nuclear Association websites. In addition, an extensive study of scientific articles concerning both cases was also done in order to obtain rich case analyses and perspectives on the cases. The specific details concerning the used data for both cases are presented in Table 1.

The use of secondary data in the empirical analysis of stakeholder dynamics has implications for the validity and reliability of our findings. Publicly reported information on stakeholders' activities may be incomplete (e.g., due to confidentiality reasons); therefore, complementary interviews would offer a more detailed picture of the two projects' stakeholder dynamics and also serve as an avenue for validating the analysis. However, special care was taken to systematically collect secondary data from reliable data sources as well as collect data from various channels for the purposes of triangulation.

Data Analysis

During the first stage of the analysis, researchers familiarized themselves with the case materials and formed a comprehensive understanding of the series of key project events and contextual factors during the front ends of both cases. At this stage, event databases covering the key events, their timing, important stakeholders involved in these events, and the implications of the events in both cases were also created. In addition, stakeholder databases including key stakeholders, their goals and positions (i.e., degree of supportiveness/nonsupportiveness) toward the project, degree of salience (power, legitimacy, and urgency) and their influence and management strategies were formed. After this, detailed case descriptions covering the key events of both cases were written. During the empirical analysis of the data, our focus was on mapping the key stakeholders (stakeholder maps) to display the changes in their degrees of salience and position, as well as the reasons for these changes. To analyze the positioning of the stakeholders and the changes in their salience and position, we used the stakeholder salience-position matrix. The salience and position classification of stakeholders was carried out by three researchers: the empirical material was analyzed

Onkalo	Yucca Mountain
Periodicals and newspapers: Electronic articles about Onkalo published in the leading Finnish periodicals and newspapers between the years 1995 and 2013. Periodicals and newspapers include: Kauppalehti,[a] Taloussanomat,[b] Tekniikka ja Talous,[c] and Helsingin Sanomat[d]	Periodicals and newspapers: Electronic articles about Yucca Mountain published in the periodicals and newspapers in the USA and in Finland between the years 1987 and 2013. Periodicals and newspapers include: *Time* magazine, *New York Times, Las Vegas Sun*, and *Helsingin Sanomat*
Internet sites: Public information about the key actors from the following sites: Posiva (www.posiva.fi), Eurajoki (www.eurajoki.fi), STUK (www.stuk.fi), Fennovoima (www.fennovoima.fi), and the Government (http://www.vn.fi/ministeriot/tem/en.jsp)	Internet sites: Public information about the key actors from the following sites: U.S. Department of Energy (www.energy.gov), Nuclear Regulatory Commission (www.nrc.gov), Environmental Protection Agency (www.epa.gov), and Nuclear Energy Institute (www.nei.org)
Broadcasted TV documents and films (Madsen, 2010) and news broadcasts	Broadcasted TV documents and news broadcasts (CNN)
Posiva's own leaflet (http://www.posiva.fi/tietopankki/posiva_tutkii/) between the years 2000 and 2013	The Eureka County Yucca Mountain Information Office online (www.yuccamountain.org)

[a] *Kauppalehti* is the leading and oldest business newspaper in Finland focusing on marketing and economics.
[b] *Taloussanomat* is a commerce-oriented on-line newspaper in Finland.
[c] *Tekniikka ja Talous* is an economics and technology-oriented newspaper in Finland.
[d] *Helsingin Sanomat* is the largest subscription newspaper in Finland.

Table 1: Case data sources.

by coding the indicators of salience attributes and degree of supportiveness in different phases of the front-end (Tables A1 and A2 in the Appendix). Based on the qualitative data and identified indicators, each researcher mapped the stakeholders into their own matrices based on their own judgment. After this, each stakeholder's position and salience, including changes, were discussed thoroughly by the researchers and the identified differences between the evaluators were discussed so that joint agreement could be reached. Based on this discussion, stakeholders were positioned jointly to the final salience/position–matrices. Both the stakeholders' salience and the degree of supportiveness/nonsupportiveness were evaluated on a continuum.

Last, we examined the stakeholder dynamics within each of the cases and sought explanations for the identified changes in salience and degree of supportiveness. In this analysis, particular focus was put on the stakeholders' influence behavior, project management's stakeholder management behavior, and the project's contextual conditions. In addition, we attempted to theorize on the potential reasons and explanations for the different outcomes of the two project cases and the roles of stakeholder dynamics in these outcomes.

Case Background Information

Nuclear waste management

Nuclear power generation and other applications of nuclear fission or nuclear technology create nuclear waste. This waste is hazardous and can stay radioactive, depending on the waste type, for thousands of years; therefore, nuclear waste needs to be managed safely to protect human health and the environment. The nuclear waste field is still in its infancy, however, because nuclear waste is being stored in temporary storage facilities (Pickard, 2010). The International Atomic Energy Agency (IAEA) has taken a leading role attempting to achieve an international consensus and has recommended a deep geological repository as a solution (World Nuclear Association, 2011). Repository projects can be described as extremely demanding because they require taking into account not only a long list of technical factors but economic, political, and social factors as well (Won Han, Heinonen, & Bonne, 1997).

Project Onkalo in Finland

In Finland, Posiva Oy is an expert organization responsible for the final disposal of spent nuclear fuel of its owners. Posiva was established in 1995 and owned by the two biggest players in the Finnish nuclear power field: Teollisuuden Voima Oyj (TVO) (60%) and Fortum Power & Heat Oy (40%) (Posiva, 2011). Under the Finnish Nuclear Energy Act, the first step toward a new nuclear facility or final repository or power station is the so-called "Decision in Principle (DiP)." This means that the government has to consider whether the construction project is in line with the overall good of society. In particular, the government pays attention to the need for the facility, the suitability of the proposed site, and its environmental impact. Moreover, the policy also includes legislation to ensure public participation and a local right of veto on the siting process (Sustainable Development Commission [SDC], 2006). After a flexible site selection process Eurajoki was nominated as a hosting municipality. The project is on schedule because the site was selected in 2001 and the construction license application was submitted in 2012. The operation license application will be submitted in 2020 and the final disposal is planned to begin in the 2020s (Posiva, 2015). The main events of Onkalo project are presented on the timeline in Figure 2.

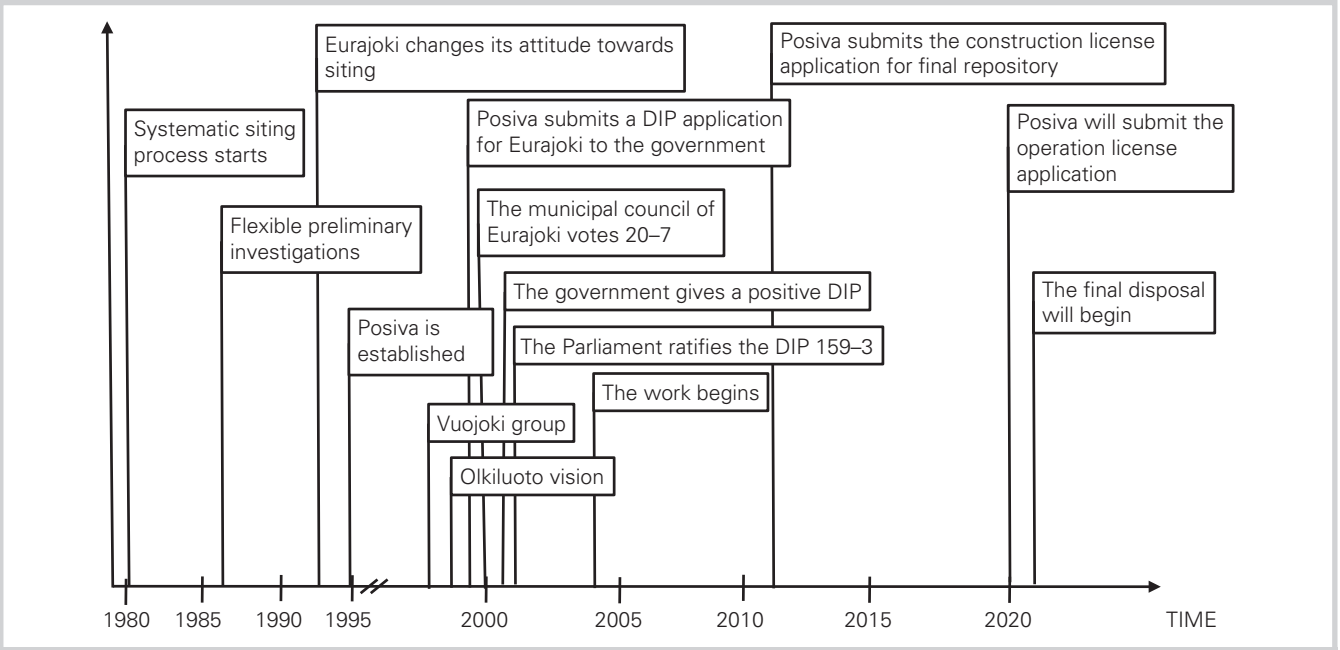

Figure 2: Main events of the Onkalo project.

Project Yucca Mountain in Nevada, USA

In the United States, the Department of Energy (DOE) is obligated to provide a permanent storage solution for spent nuclear waste and can, hence, be considered as an owner of nuclear waste repository projects. The Nuclear Waste Policy Act (NWPA) from 1982 was designed to require a fair, technically sound and comprehensive selection process for a permanent disposal site. However, in order to save money and time, NWPA was amended to focus the site characterization studies solely on Yucca Mountain in Nevada in 1987 (Widder, Calloway, & Bond, 2010). After all, Yucca Mountain was already located within a former nuclear test site and was rated number one based on all technical factors (Inhofe, 2006; Widder et al., 2010). This decision received much criticism and problems started to arise as Nevadans felt it was unfair that their state had to store all nuclear waste, especially because there are no nuclear power plants in Nevada (Rodney & Von Hippel, 2009). Under the Act, Congress set a deadline of 1998 for the DOE to begin moving used nuclear fuel from nuclear power plants. The DOE missed the date, however, and failed to remove any spent nuclear fuel from reactor sites. The delay became expensive for nuclear facilities because they needed to build additional storage facilities (Widder et al., 2010). The Yucca Mountain project has been highly influenced by politics and the DOE is under political control. Currently, the project is frozen and other options are being considered. The nuclear waste is stored onsite at various nuclear facilities around the country. The main Yucca Mountain project events are presented on the timeline in Figure 3.

Empirical Findings

In this empirical analysis, the stakeholder analyses of both cases are presented. The stakeholder maps (Figures 4–9) present the changes in stakeholders' positions and relationships with respect to the project and other stakeholders. Detailed stakeholder information is supplied in Tables A1 and A2 in the Appendix. In these tables the stakeholders are described according to their goals, positions with regard to the project, salience attributes, and strategies.

Project Onkalo

Posiva, who was a salient actor with regard to repository projects in Finland, initiated the preparations of the Onkalo project by launching the environmental impact assessment (EIA) in 1997. Posiva's strategy was to have a flexible siting approach and keep all the possible siting options open as long as possible; therefore, EIA was conducted in each of the four sites: Eurajoki, Loviisa, Äänekoski, and Kuhmo. In addition to its original purpose, Posiva also used EIA as a means to get an understanding of the prevailing atmospheres in the municipalities (Raittila, Hokkanen, Kojo, & Litmanen, 2002). Furthermore, at this stage, Posiva enacted proactive stakeholder engagement strategies by promoting the benefits of the project toward the municipalities, as well as inducing competition among them. They were active in organizing group meetings and public briefings and discussion sessions, which took place near the local residents. Communication was consistent; leaflets were published and employees' voices were used to personalize the communication. However, from

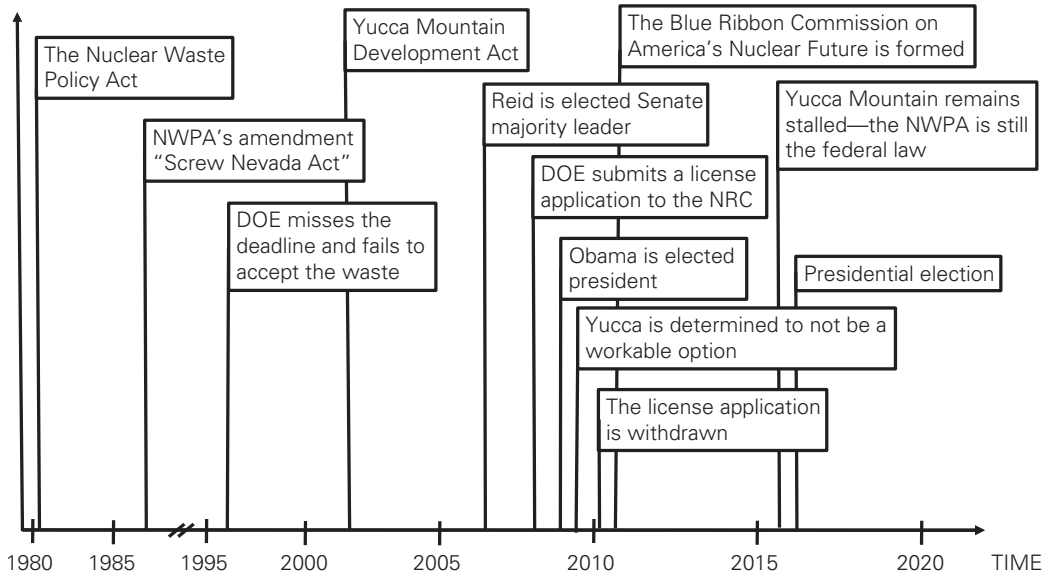

Figure 3: Main events of the Yucca Mountain project.

early on, particularly, Kuhmo and Äänekoski municipalities had a lot of civil activity and the atmosphere was rather negative toward the potential project despite Posiva's engagement attempts. The approach of the municipalities was noncooperative and both Kuhmo and Äänekoski residents organized channels for their opposition by establishing nongovernmental organizations that were registered to promote the criticality of their claims for Posiva and the surrounding community. The establishment of these protest organizations clearly increased the salience of Kuhmo and Äänekoski residents with regard to the project (e.g., through their increased urgency of the claim and resources). These nongovernmental organizations also received power and legitimacy through municipal elections, in which their primary theme was to oppose the planned project. In addition, address writing campaigns were induced and requirements for referendum presented to signal the urgency of the issue for the stakeholders. As a consequence, Posiva warned Äänekoski municipality about its passivity with regard to the local residents and their opposition (Raittila et al., 2002). Loviisa and Eurajoki, in turn, are both nuclear power municipalities and were more favorable toward the facility. Among the Loviisa residents, the opinions varied and nongovernmental organizations were formed to impact the decision makers. In Eurajoki, no nongovernmental organizations to oppose the project were founded; however, even though the municipality saw the project as highly significant for its economy, it decided to be a demanding negotiation partner toward Posiva during the initial stages of the project preparation. Still, the attitude of the municipality and its residents toward the cooperation with Posiva was positive right from the start.

In January 1998, Eurajoki, TVO, and Posiva formed a joint working group whose main task was to negotiate compensations for the municipality of Eurajoki. Posiva's aim was to safeguard the development of nuclear waste management and Eurajoki was interested in safeguarding its tax revenue (Kojo, Kari, & Litmanen, 2010). The co-operation between Eurajoki and Posiva further developed, as the local council of Eurajoki accepted the so-called "Onkalo vision," where the municipality took a positive position toward additional nuclear power. The Onkalo vision was signed in May 1999 after Eurajoki received its required change in real estate tax and approximately €7 million compensation for hosting the repository (Kojo et al., 2010). Figure 4 presents Onkalo project's stakeholder map in 1999.

Because of the Onkalo vision, Posiva submitted a decision in principle application to the government for Eurajoki only. As a result, all the opposing groups in the other municipalities ended their opposing activities (Raittila et al., 2002). For the decision in principle, the government requested statements from the municipality of Eurajoki and from the Radiation and Nuclear Safety Authority (STUK). STUK submitted a preliminary safety appraisal of Eurajoki to the Ministry of Trade and Industry (MTI) in January 2000. In this appraisal, STUK concluded that the prerequisites for a DiP from the standpoint of nuclear and radiation safety had been met. The municipal council of Eurajoki approved Onkalo as the site for the repository in January 2000. Earlier, the local council had decided that a referendum would not be needed (Raittila et al., 2002). After having received these statements,

the government saw no obstacles to a positive DiP. Despite Greenpeace campaigning against additional nuclear power and referring to it as "the fifth mistake" and nuclear waste decommissioning, the government made a positive DiP in December 2000. The proposal was further discussed in Parliament, which ratified the government's positive DiP in May 2001. The unanimity of Parliament can be explained by the Finnish decision-making procedure (Raittila et al., 2002). After the environment and economy committees had taken a positive stand, there was not much that individual members could do and, moreover, they did not want to bring up their opposing views anymore. An interesting point related to the DiP procedure, however, was, that no alterative options and sites were presented. Figure 5 presents the Onkalo stakeholder map in 2001.

After submitting the construction license application in 2012, Posiva has continued testing and simulating the final disposal. In addition, Posiva is also required to provide further clarification concerning the copper canisters used in the final disposal. Posiva needs to maintain the positive atmosphere not only at the local level but at the national level too. The fact that there is no support from other nuclear power nations, as they are still at the starting point with their repository projects, does not make the task any easier. Figure 6 presents the Onkalo stakeholder map in 2009.

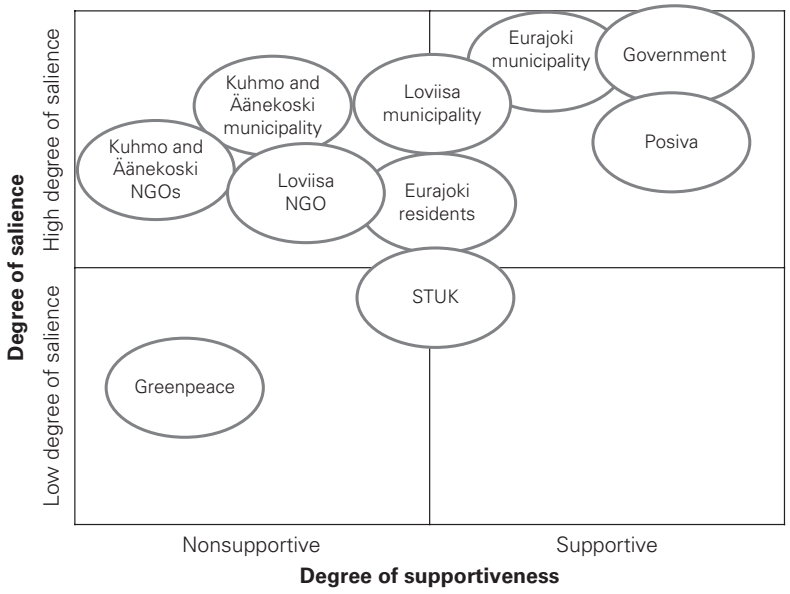

Figure 4: Onkalo stakeholder map 1999.

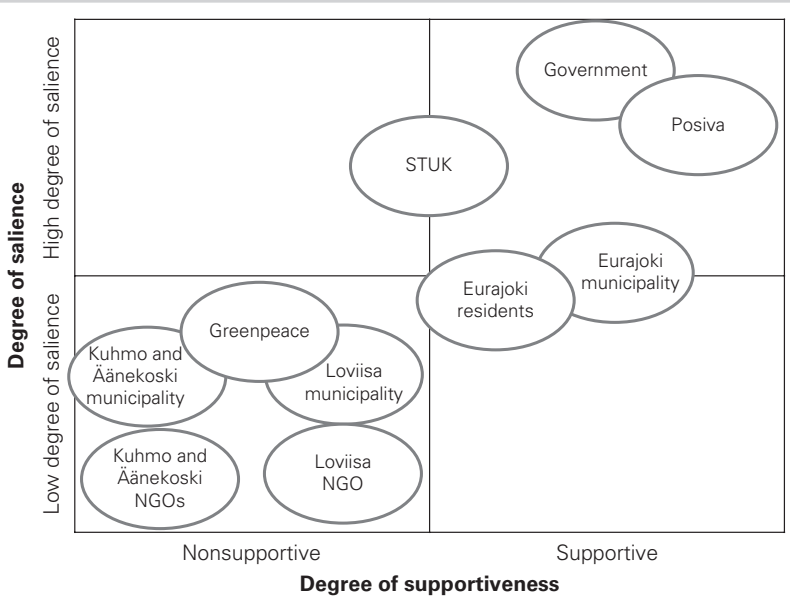

Figure 5: Onkalo stakeholder map 2001.

Project Yucca Mountain

In the Nuclear Waste Policy Act of 1982, Congress authorized different federal agencies to perform different functions related to Yucca Mountain. The Environmental Protection Agency (EPA) sets standards to protect human health and safety. The Nuclear Regulatory Commission (NRC) was responsible for implementing EPA's standards and determining if the Yucca Mountain facility could be safe enough to contain nuclear waste. The Department of Energy (DOE) owns, constructs, applies for licenses, and operates the facility. Generators and owners of spent nuclear fuel and high-level radioactive waste in turn are required to pay the costs of the disposal. In 1987s amendment, known as the "Screw Nevada Act" (Fialka, 2009), Congress narrowed the site search to Yucca Mountain, violating provisions of the original legislation, which mandated that several locations would be studied to find the most suitable site. The majority of Nevadans have been against the project the whole time (Interrante, 2011). Later, it was speculated that Congress chose Nevada because Nevada had a small population

and limited political influence compared with the other Texas and Washington, the other two finalists, two states with larger and more influential congressional delegations (Teller, 2011). Figure 7 presents the Yucca Mountain stakeholder map in 1987.

Because Yucca Mountain was deemed scientifically and technically sound and the public hearings did not bring out any major obstacles, the Secretary of Energy at the time recommended the site to President George W. Bush, who approved the recommendation. Nevada Governor Kenny Guinn objected to the Yucca Mountain plan and vetoed President Bush's recommendation, which, however, was overturned by the simple majority in both houses of Congress. In 2002, President Bush signed the approval into law as the Yucca Mountain Development Act (YMDA) (Inhofe, 2006). As a reply, the State of Nevada filed multiple lawsuits against the federal government during between 2001 and 2002. Most of Nevada's claims were dismissed, except for the concerns over the EPA's safety standards. As a result, the coverage period was extended from 10,000 years to 1 million years in the future (Inhofe, 2006). Furthermore, in 2000 Las Vegas made it illegal to ship high-level radioactive waste through the city. In turn, the DOE, filed a lawsuit against Nevada over water rights at Yucca Mountain, because Nevada had denied water to Yucca Mountain in 2003 on the grounds that the area was not in the public interest. (Yucca Mountain Information Office, Yuccamountain.org, 2010). Figure 8 presents the Yucca Mountain stakeholder map in 2002.

One of the greatest objectors to the Yucca Mountain project has been Nevada Senator, Harry Reid. In the 2006 congressional elections he was elected as a Senate majority leader, which gave him the position to greatly affect the future of the project. Furthermore, in the 2008 presidential election campaign, Barack Obama promised to abandon the Yucca Mountain project (Teller, 2011).

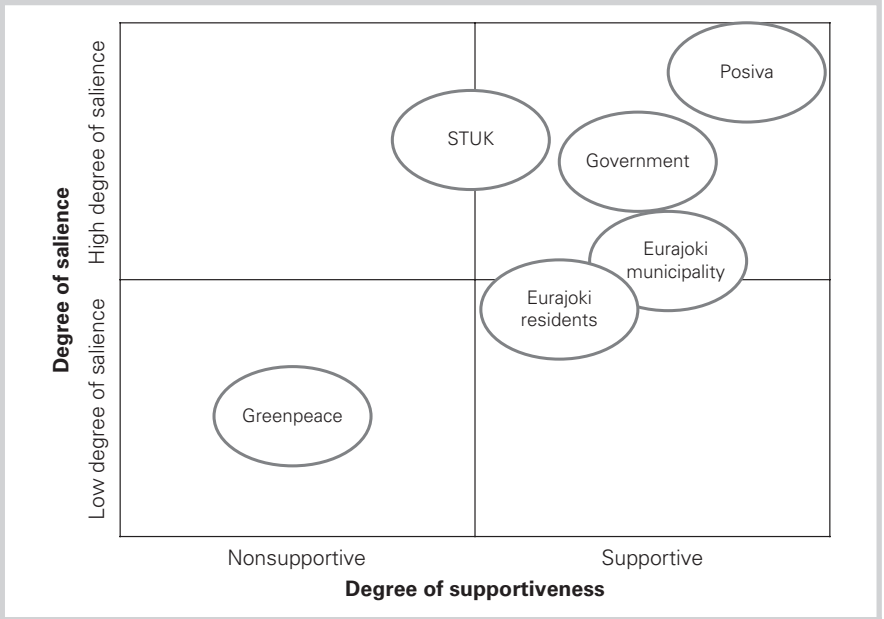

Figure 6: Onkalo stakeholder map 2009.

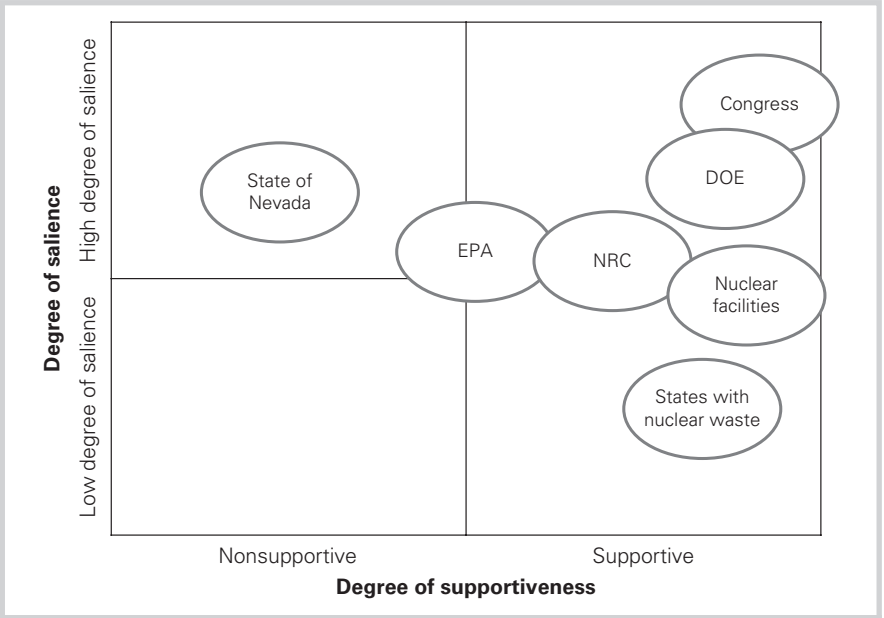

Figure 7: Yucca Mountain stakeholder map 1987.

As Obama was elected the president in 2009 his new administration, including the new Secretary of Energy, Steven Chu, started to suspend the project. Without any scientific justification, Yucca Mountain was doomed simply as "not a workable option" (Carter, Barrett, & Rogers, 2010). As the expenditures for repository development were subject to annual congressional appropriations, President Obama started defunding the Yucca Mountain project in 2010. To formalize the abandonment, Secretary Chu withdrew the Yucca Mountain license application. In order to resolve the waste problem, Secretary Chu announced a

panel of experts, called "The Blue Ribbon Commission on America's Nuclear Future" (BRC), to analyze other options for nuclear waste disposal (Widder et al., 2010). Later it had been speculated that Obama and Reid had a deal where Reid helped Obama to get his agenda, which included the healthcare bill, through the Senate, while Obama in turn removed the funding for Yucca Mountain (Carter et al., 2010).

However, the fight over Yucca Mountain was not over. In 2010, the licensing board at the NRC stated that the withdrawal was illegal because it superseded the DOE's authority under the NWPA of 1982. The licensing board stated: "unless Congress directs otherwise, DOE may not single-handedly derail the legislatively mandated decision-making process" (Carter et al., 2010). In January 2013, DOE issued a new strategy for the management and disposal of used nuclear fuel and high-level radioactive waste based on the recommendations made by the BRC. The new strategy was based on a consent-based siting process, a reformed funding approach, and the establishment of a new organization with greater autonomy to implement the program. The strategy contains a pilot interim storage facility, a larger full-scale interim storage facility, and a geological repository. The geological repository should be operating by 2048 (Department of Energy [DOE], 2013). Figure 9 presents the Yucca Mountain stakeholder map in 2012.

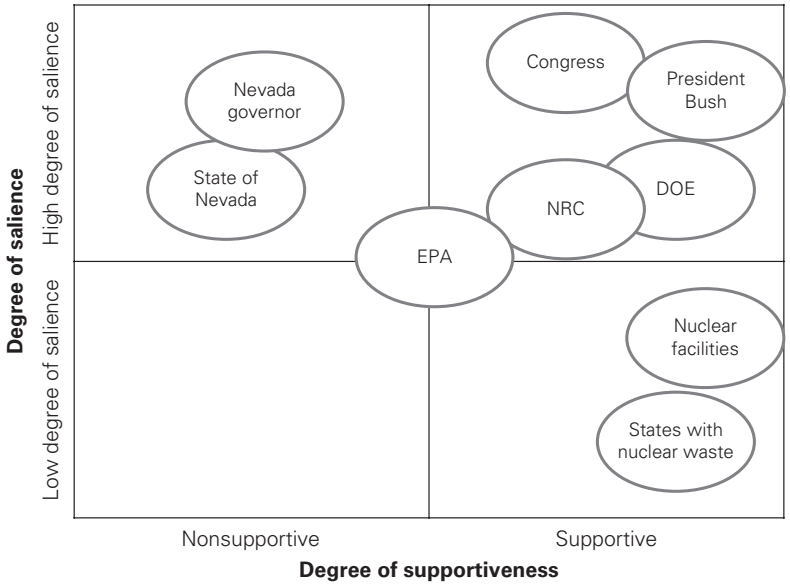

Figure 8: Yucca Mountain stakeholder map 2002.

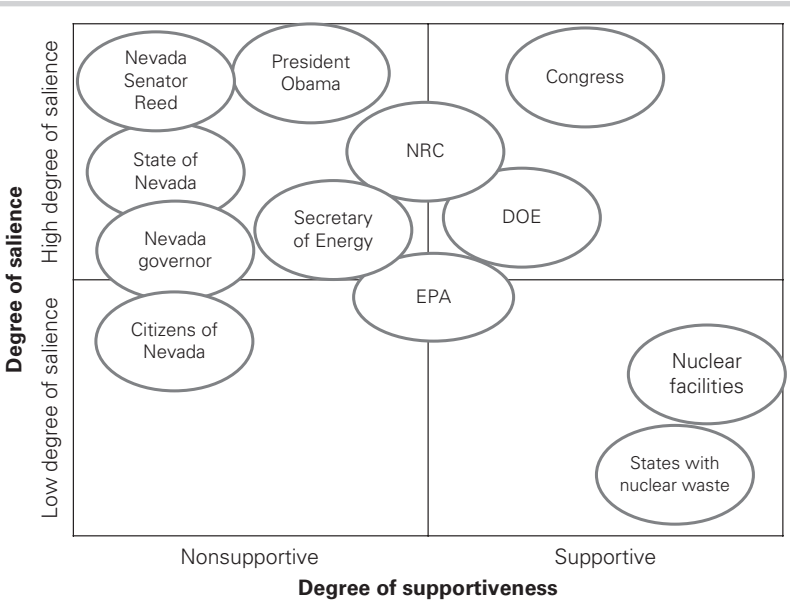

Figure 9: Yucca Mountain stakeholder map 2012.

Empirical Discussion on Stakeholder Dynamics

In the two cases, stakeholders' stances and salience were by no means static during the front-end phase of the projects, yet changes in the degree of different stakeholders' salience levels and the degree of supportiveness and nonsupportiveness occurred. From the two cases, case Yucca Mountain clearly featured more dramatic changes in the positions of salient stakeholders, primarily due to effective stakeholder influence strategies and the way the decision-making and siting processes were carried out. In this case, stakeholders' movement was out of project management's control and mostly toward the nonsupportive–salient quarter.

In addition to, the Onkalo and Yucca Mountain cases well demonstrating the different types of stakeholder dynamics during the early phases of a large and complex project, they offer valuable empirical evidence on the reasons behind the changes in stakeholder salience and position toward the project. The empirical observations in our within-case analyses emphasize, particularly: (1) the role of stakeholders'

influence activities in shaping their salience attributes and position, (2) the role of the project management's stakeholder management strategies in shaping stakeholders' salience attributes and position; and (3) the role of the contextual conditions and their shift in amplifying and driving project stakeholder dynamics.

The Role of the Stakeholders' Influence Strategies in Stakeholder Dynamics

In both the Onkalo and Yucca Mountain cases, the stakeholders used various influence strategies to shape their salience attributes and other stakeholders' positions. In the Onkalo case, the opposing municipality citizens (Kuhmo and Äänekoski) were able to increase their salience through using stakeholder influence strategies such as forming nongovernmental organizations to oppose the repository projects—a strategy that highlighted the urgency of their claim and increased their power as well as legitimacy. In addition, address-writing campaigns requiring a referendum were used to communicate the urgency of the claims as well as increase the opponents' legitimacy. The citizens' movements also gained legitimacy and power in municipality elections where their primary theme was to oppose the planned project. Opponent stakeholders also expressed their voices and opinions in the environmental impact assessment process, which increased their legitimacy. The enacted influence strategies increased the salience of the local stakeholders and impacted the project management's decision making concerning the siting decision.

In turn, in the case of Yucca Mountain, the citizens of Nevada protested intensely with letter-writing campaigns and public demonstrations to increase their legitimacy, urgency, and power. Furthermore, the State of Nevada protested with lawsuits and refused to issue environmental permits in order to increase power ad signal urgency. In addition, Senator Reid created political alliances and used his role as an opinion leader to influence the positions of stakeholders toward the project. As a consequence of the opponents' increased salience, the decision makers who were able to influence the proceeding of the project also started questioning their support of the project.

Both the Onkalo and Yucca Mountain cases demonstrate how stakeholder influence strategies may be used by stakeholders primarily to increase their salience. As the Yucca Mountain case demonstrates, successfully used stakeholder influence strategies may also lead to changes in the degree of supportiveness of certain salient stakeholders of the project.

The Role of Project Stakeholder Management Strategies in Stakeholder Dynamics

Case Onkalo and Case Yucca Mountain featured different types of approaches for managing stakeholders, which were also visible in stakeholder dynamics: while in the Onkalo case the project owner engaged stakeholders actively, thereby attempting to increase the number of supportive salient stakeholders, in the Yucca Mountain case, stakeholder management strategies were not proactively used for facilitating the positive stakeholder orientation of salient stakeholders.

In the Onkalo case, the owner of the project, Posiva, was also able to enact stakeholder management strategies, which were effective in terms of modifying, particularly the position of the Eurajoki municipality and its residents to being more supportive of the project. Information sessions and public briefings were held, communication leaflets distributed, a local information office opened, and an environmental impact assessment process entailed careful gathering of the opinions of local residents.

More importantly, the siting and decision-making process was open, flexible and sensitive toward the varying opinions and signals from the different municipalities; enough time and effort were put into carefully evaluating all potential sites and stakeholder environments. Finally, having put enough effort into framing the social context of the waste repository, Posiva decided to proceed with the Eurajoki site only. This decision to engage with Eurajoki and dismiss the other municipalities decreased the level of salience of other municipalities. At the end of the front-end stage, the majority of the salient Onkalo project stakeholders were positive toward the project. In other words, through effective stakeholder management strategies and a flexible decision-making and siting process, Onkalo's project management was able to induce favorable stakeholder movement toward a supportive-salient quarter and to move nonsupportive stakeholders to a nonsalient quarter. Posiva was able to proceed with the project because it had the salient and supportive stakeholders Eurajoki municipality, STUK (Radiation and Nuclear Safety Authority Finland), and the government and Parliament behind it.

In the Yucca Mountain project, the location of the site was fixed at quite an early stage of the project despite the opposing opinions and movements of salient stakeholders, such as the State of Nevada and its citizens. Clearly, the stakeholder engagement and management process of diverse stakeholders in different potential site locations during the earliest stages were not open and transparent enough, because the decision to focus solely on Yucca Mountain was made quickly. Hence, from the stakeholder management strategy point of view, the siting process was not flexible and open, as other potential site locations were not thoroughly considered and the opposing stakeholders in Nevada were also not actively engaged. It seems that the decision-making process was framed in a manner that transitioned too quickly from the political decision-making phase to the actual technical decision-making phase. Consequently, in this case the project owner, DOE as well as the nuclear facilities and the

states with nuclear waste that highly supported the project, lacked the adequate salience to begin with. The way in which the decision-making process was carried out and the opposing voices were dismissed generated a conflict in a late phase of the project front-end. Because the project management team was not able to engage opposing salient stakeholders effectively, the project was exposed to political scheming that was unfavorable considering its length. As the controversial project extended, the number of opposing stakeholders increased and the opponent stakeholders gained enough salience to terminate the project through the employment of influence strategies. Consequently, the inappropriate use of stakeholder management strategies led to unfavorable dynamics from the project's point of view, where the opponent stakeholders gained more power and were opposing the project even more.

The Onkalo case shows how project stakeholder management strategies may be used by the project management team to either shape the position of the stakeholders toward the project as well as to decrease the salience of those stakeholders who are not supportive of the project. In turn, the Yucca Mountain case highlights how the inappropriate use of dismissal strategy toward certain key stakeholders may lead to increased degrees of nonsupportiveness, among them: Nevada citizens and state government were not actively engaged, which led to even more intense opposition and the employment of influence strategies to increase their salience.

The Role of the Contextual Conditions in Stakeholder Dynamics

The Onkalo and Yucca Mountain cases didn't operate in a vacuum and isolated from their context. From the stakeholder dynamism perspective, it is evident that the contextual conditions of the two projects, such as the national legislation concerning nuclear waste repositories, approved and legitimized processes of engaging stakeholders, legitimized ways of stakeholders' to use influence strategies, as well as the way the project's governance model was defined, set the basis and boundaries for the observed stakeholder dynamics. Although the contextual conditions can be considered to moderate the appropriate ways of stakeholders to use their influence strategies and project management to use stakeholder management strategies, they may also directly induce stakeholder dynamics. For example, in the Onkalo case, the stakeholder engagement process was expected to be transparent and broad from the beginning, while the institutional context of Yucca Mountain allowed a more closed and fixed siting process, resulting in different types of stakeholder dynamics. In addition, the governance model and decision-making process of the Yucca Mountain case, in which the project owner, Department of Energy, is politically directed, creates a situation where shifts in political power may create quite dramatic stakeholder dynamics in terms of key stakeholders' degree of supportiveness toward the project: for example, when Obama was elected president, the funding of the project was frozen. Consequently, the project's governance model that allowed political interference led to a change in the position toward the project among key stakeholders (from highly supportive to opposing). In turn, in the Onkalo case, the investment funds were allocated for Posiva, whose only objective was to take care of nuclear repository projects. This ensures the permanent nature of the project owner's position toward the project and diminishes the political influence and stakeholder dynamics during the later phases of the project. Finally, based on our empirical analysis the project's decision-making life cycle during the front-end stage is a contextual condition that plays a role in the observed stakeholder dynamics. As the project's decision-making process proceeds, the salience of different stakeholders changes so that some stakeholders may become more salient and others may lose their salience; for example, when the decision on project siting in Eurajoki was made, the salience of other potential site municipalities decreased, while the salience of the munipality of Eurajoki increased. Also in the Yucca Mountain case, the salience of The State of Nevada and the governor increased when the siting decision was made.

Discussion and Conclusions

Contributions to Project Stakeholder Management Research

Understanding stakeholder dynamics and their impact on project management is extremely important in order to evaluate the viability of large and complex projects, such as nuclear waste repositories. The results of this study provide new knowledge for project stakeholder scholars, since the stakeholder literature has rarely conceptualized stakeholder dynamics and the elements of stakeholder dynamism in a systematic manner (Aaltonen & Kujala, 2010; Olander & Landin, 2005; Yang, Shen, & Ho, 2009). The study is also valuable because it further deepens and elaborates our understanding of the reasons for dynamics and shaping strategies during the project's front-end stage (Floricel & Miller, 2001; Morris, 2013). Specifically, our empirical study, which utilizes the developed salience-position matrix, demonstrates how both stakeholder influence strategies and stakeholder management strategies may play a crucial role in the changes of stakeholders' salience attributes and positions toward the project. Indeed, the connections of stakeholder influence and management activities with project stakeholder dynamics have rarely been addressed in prior literature. Moreover, systematic empirical evidence on the role of these activities and how they are practiced in real-life projects has been limited. Additionally, by closely examining the stakeholder dynamics during the project front-end stage for two nuclear repository projects, the current

study starts revealing how changes in stakeholder attributes and position during the project front-end result from the complex interactions of stakeholder influence strategies (Aaltonen et al., 2008; Frooman, 1999), stakeholder management strategies (Savage et al., 1991), and the project's contextual conditions (Aaltonen & Kujala, 2010; De Schepper, Dooms, & Haezendonck, 2014). With regard to contextual conditions, the empirical analysis particularly highlighted the impact of institutional context and governance model of the project on stakeholder dynamics. However, more dedicated empirical analyses are needed to form a more detailed picture about the relevant factors in the project's context, which may contribute to stakeholder dynamics.

The article can also be considered to make an addition to the "toolbox" of project stakeholder management. The most current stakeholder frameworks and matrices do not take into account the degree of supportiveness of stakeholders for an issue or decision, nor do they examine potential reasons that may lead to changes in stakeholder positions. Therefore, we suggest that the developed stakeholder salience-position matrix offers a more useful analytical framework for stakeholder analysis and management than the widely applied power–interest matrix (Johnson & Scholes, 1999; Olander & Landin, 2005). Furthermore, the power–interest matrix does not take into account the nature of stakeholders' interest toward the project (i.e., whether the stakeholders are supportive or less supportive toward a project). This is actually surprising, since the nature of the stakeholders' position toward the project can actually be considered a key element in stakeholder analysis and strategy formulation. In practice, the employed stakeholder management strategies are likely to be dependent on the direction of stakeholders' interest, which has not been addressed in the power–interest matrix. Further empirical research should test the applicability and usefulness of the developed salience-position framework in analyzing and classifying stakeholders in a variety of project settings.

Contributions to Project Front-End Research

Over the years, the assertion that early developments and preproject phases should also be included in the study of projects and their management, has received increasing prominence (Cova et al., 2002; Miller & Lessard, 2000; Morris, 2013). In general, the early project stages can be characterized by high levels of uncertainty, ambiguity, and dynamic stakeholder interactions (Floricel & Miller, 2001; Hellgren & Stjernberg, 1995; Kolltveit & Gronhaug, 2004). Indeed, the role of project stakeholders and their influence behavior is highly important in terms of understanding the early-stage dynamics and goal formulation processes in the context of multifirm projects that bring together a number of firms and nonbusiness organizations. Our empirical analysis of stakeholder dynamics during this stage lends support to prior research that describes the front-end phase as an iterative and drifting process of organizing that is influenced by various stakeholder influences and stakeholder management episodes. Moreover, our analyses of the Onkalo and Yucca Mountain cases show that in a system of various business and nonbusiness stakeholders with multiple and potentially contradictory goals, it is important that the different actors' interests and claims are taken into account in a flexible manner in the stakeholder management processes. Indeed, the Onkalo case demonstrates how well-planned stakeholder management and flexible planning processes may contribute to a successful front-end phase, whereas too fixed and closed processes in terms of stakeholders may lead to unfavorable dynamics in the later front-end stages of the project. The cases also demonstrate how the early stages are highly political processes, in which the nonbusiness stakeholders actually play a central role in the decision-making and influence activities.

Managerial Implications

The empirical findings about stakeholder dynamics and the reasons for changes in stakeholder positions and salience raise important lessons for project managers as well. First, these findings confirm previous work about how important, yet challenging, it is for project management teams to evaluate the stance and position of the stakeholders and the potential changes within them (Jepsen & Eskerod, 2009). The empirical results highlight the importance of building a project stakeholder coalition in which the central stakeholders and decision makers are supporters with a high degree of salience. For example, in the Onkalo case, project management was able to strengthen the salience of such stakeholders who supported the project. Furthermore, the flexible and open siting process ensured that the opposing stakeholders were identified in the early stage of the project, giving project management enough time to engage with these stakeholders and to shape the social and political context of the project into a more beneficial direction. Unfortunately, in the Yucca Mountain case, the key stakeholders who wanted to take it forward didn't actively pay attention to a number of local stakeholders who were opponents and didn't attempt to change their stance or decrease their salience. This earlier lack of attention allowed the opposing stakeholders to mobilize and to increase their salience significantly by employing stakeholder influence strategies. As the increasing opposition was combined with a project governance framework that enabled political involvement during the later stages of the front-end, the project became an arena for political scheming and a channel for politicians to seek their own benefits. Hence, it is also important for project managers to carefully evaluate the capability of different stakeholders to shape their salience attributes

through stakeholder influence strategies (Aaltonen et al., 2008) as well as the probability of the project becoming a platform for advancing political aspirations. The Yucca Mountain case also underscores the importance of governance structures so that project decision makers are primarily interested in the success and effectiveness of the project; otherwise, the project will be altered by political scheming, thus, often strengthening the stance of opposing stakeholders. It would be best, therefore, to try to seek governance solutions in which decision makers would be as permanent as possible during the project. In Finland, for example, the investment funds were allocated to a company whose only objective is to take care of nuclear repository projects.

Furthermore, we believe that the developed salience/position–matrix is of practical use for project managers in their stakeholder analysis processes. In addition to providing support for project managers in the categorization of project stakeholders and the analysis of potential stakeholder dynamics, the developed matrix may also facilitate the building of joint understanding and common ground for project stakeholder landscapes among project actors.

Avenues for Further Research

Prior stakeholder research has focused mostly on the management approaches that can be used to classify, analyze, and manage stakeholders (e.g., Bourne & Walker, 2005; Olander & Landin, 2005) and on strategies that stakeholders may use in order to increase their salience (Aaltonen et al., 2008). Based on our results, a fruitful avenue for further research would be to examine in more detail the role of contextual conditions in inducing stakeholder dynamics, particularly how they interact with and moderate the use of influence strategies and stakeholder management strategies.

Operationalizing salience and stakeholders' position toward the project as well as measuring them based on qualitative data have proved to be challenging (Neville et al., 2011). We acknowledge that the developed salience-position framework is a simplification with regard to the treatment of the position of stakeholders and the varying degrees of their stakeholder attributes. For example, different salience attributes may be emphasized in different situations and contexts differently; hence, the development of more fine-grained models for measuring and conceptualizing stakeholder dynamics is an avenue for further research.

Our research is particularly focused on stakeholder dynamics during the project front-end; the nature of stakeholder dynamics may be quite different during the later life cycle stages of projects (i.e., project execution and operations). Further research could focus on the analysis and comparison of stakeholder dynamics during the different stages of a project.

Our case analyses also provide a rather complex picture of stakeholder environments during the project front-end stage. Clearly, understanding and dealing with complex stakeholder landscapes of projects are major challenges in project management and keys to ensuring project success. Although an increasing body of knowledge, theoretical frameworks, and conventional techniques exist for the analysis and management of project stakeholders, very little work has been reported with respect to projects in general, specifically on how to assess their stakeholder environments and the vulnerability of the project to stakeholder conflicts. Further research could develop fine-grained conceptual frameworks for characterizing and classifying project stakeholder landscapes, their key dimensions, and for identifying the challenges that are inherent within them.

In addition, our findings clearly reveal that during the project's early stage there are multiple strong stakeholders who try to influence and participate in the project's decision-making processes. In line with Frooman's (2010) recent work on issue networks, our study challenges prior project stakeholder research that makes an implicit assumption that the decision-making process is centralized and it is the role of the project management team to balance the interests of multiple stakeholders. We suggest that in a fragmented multistakeholder decision-making context each stakeholder actually evaluates the salience of other stakeholders independently, rather than a centralized project management organization. In particular, projects with significant societal and environmental impacts feature front-end decision-making processes that include multiple stakeholders and, hence, the actual role of project management may be rather limited at this stage. Further research could focus on studying the implications of this finding for project stakeholder management.

References

Aaltonen, K. (2013). The establishment of legitimacy: The case of international projects. *International Journal of Managing Projects in Business*, *6*(1), 13–35.

Aaltonen, K., & Kujala, J. (2010). A project lifecycle perspective on stakeholder influence strategies in global projects. *Scandinavian Journal of Management*, *26*(4), 381–397.

Aaltonen, K., Kujala, J., & Oijala, T. (2008). Stakeholder salience in global projects. *International Journal of Project Management*, *26*(5), 509–516.

Aaltonen, K., & Sivonen, R. (2009). Response strategies to stakeholder pressures in global projects. *International Journal of Project Management*, *27*(2), 131–141.

Achterkamp, M. C., & Vos, J. F. (2008). Investigating the use of stakeholder influence strategies in global projects. *International Journal of Project Management*, *26*(7), 509–516.

Artto, K., & Kujala, J. (2008). Project business as a research field. *International Journal of Managing Projects in Business*, *1*(4), 469–497.

Beringer, C., Jonas, D., & Gemünden, H. G. (2012). Establishing project portfolio management: An exploratory analysis of the influence of internal stakeholders' interactions. *Project Management Journal*, *43*(6), 16–32.

Bourne, L., & Walker, D. H. T. (2005). Visualizing and mapping stakeholder influence. *Management Decision*, *43*(5), 649–660.

Brøde Jepsen, L. (2013). Complex new product development projects: How the project manager's information sharing with core actors changes over time. *Project Management Journal*, *44*(6), 20–35.

Carter, L. J., Barrett, L. H., & Rogers, K. C. (2010). Nuclear waste disposal showdown at Yucca Mountain. *Issues in Science and Technology*, *XXVII*(1), 80–84.

Chinyio, E. A., & Akintoye, A. (2008). Practical approaches for engaging stakeholders: Findings from the UK. *Construction Management and Economics*, *26*(6), 591–599.

Cleland, D. I. (1986). Project stakeholder management. *Project Management Journal*, *17*(4), 36–44.

Cova, B., Ghauri, P., & Salle, R. (2002). *Projecketint marg: Beyond competitive bidding*. Chichester, England: Wiley.

Cova, B., & Salle, R. (2005). Six key points to merge project marketing into project management. *International Journal of Project Management*, *23*(5), 354–359.

Department of Energy. (2013). *The strategy for the management and disposal of used nuclear fuel and high-level radioactive waste*. Retrieved from http://energy.gov/sites/prod/files/Strategy%20for%20the%20Management%20and%20Disposal%20of%20Used%20Nuclear%20Fuel%20and%20High%20Level%20Radioactive%20Waste.pdf

De Schepper, S., Dooms, M., & Haezendonck, E. (2014). Stakeholder dynamics and responsibilities in public–private partnerships: A mixed experience. *International Journal of Project Management*, *32*(7), 1210–1222.

Eisenhardt, K. (1989). Building theories from case study research. *Academy of Management Review*, *14*(4), 532–550.

Eskerod, P., & Vaagaasar, A. L. (2014). Stakeholder management strategies and practices during a project course. *Project Management Journal*, *45*(5), 71–85.

Fialka, J. J. (2009). *The "screw Nevada bill" and how it stymied U.S. nuclear waste policy*. Retrieved from http://www.nytimes.com/cwire/2009/05/11/11climatewire-the-screw-nevada-bill-and-how-it-stymied-us-12208.html?pagewanted=all

Floricel, S., & Miller, R. (2001). Strategizing for anticipated risks and turbulence in large-scale engineering projects. *International Journal of Project Management*, *19*(8), 445–455.

Fraser, C., & Zhu, C. (2008). Stakeholder perception of construction site managers' effectiveness. *Construction Management and Economics*, *26*(6), 579–590.

Freeman, R. E. (1984). *Strategic management: A stakeholder approach*. Boston, MA: Pitman.

Frooman, J. (1999). Stakeholder influence strategies. *The Academy of Management Review*, *24*, 191–205.

Frooman, J. (2010). The issue network: Reshaping the stakeholder model. *Canadian Journal of Administrative Sciences*, *27*, 161–173.

Hellgren, B., & Stjernberg, T. (1995). Design and implementation in major investments: A project network approach. *Scandinavian Journal of Management*, *11*(4), 377–394.

Hendry, J. R. (2005). Stakeholder influence strategies: An empirical exploration. *Journal of Business Ethics*, *61*, 79–99.

Inhofe, J. M. (2006). *Yucca Mountain: The most studied real estate on the planet*. Report to the Chairman, U.S. Senate, Committee on Environment and Public Works, Majority Staff, March 2006.

Interrante, J. (2011). *Nevada's Yucca Mountain nuclear site a dilemma for Republican hopefuls*. Retrieved from http://thehill.com/homenews/campaign/169745-nevadas-yucca-mountain-a-dilemma-for-gop-hopefuls

Jawahar, I. M., & McLaughlin, G. L. (2001). Toward a descriptive stakeholder theory: An organizational life cycle approach. *Academy of Management Review*, *26*(3), 397–414.

Jepsen, A. L., & Eskerod, P. (2009). Stakeholder analysis in projects: Challenges in using current guidelines in the real world. *International Journal of Project Management*, *27*(4), 335–343.

Johnson, G., & Scholes, K. (1999). *Exploring corporate strategy*. London, England: Prentice Hall Europe.

Kojo, M., Kari, M., & Litmanen, T. (2010). The socio-economic and communication challenges of spent nuclear fuel management in Finland: The post site selection phase of the repository project in Eurajoki. *Progress in Nuclear Energy*, *52*, 168–176.

Kolltveit, B. J., & Gronhaug, K. (2004). The importance of the early phase: The case of construction and building projects. *International Journal of Project Management*, *22*(7), 545–551.

Madsen, M. (2010). *Into eternity: A documentary film about a nuclear waste repository in Finland*. Denmark: Films Transit International.

McElroy, B., & Mills, C. (2000). Managing stakeholders. In R. J. Turner & S. J. Sinister (Eds.), *Gower handbook of project management* (3rd ed., pp. 757–775). Aldershot, England: Gower.

Miller, R., & Lessard, D. (2000). *The strategic management of large engineering projects: Shaping institutions, risks and governance*. Cambridge, MA: MIT Press.

Miller, R., & Olleros, X. (2000). Project shaping as a competitive advantage. In R. Miller & D. R. Lessard (Eds.), *The strategic management of large engineering projects* (pp. 93–112). Massachusetts Institute of Technology: Cambridge, MA.

Mitchell, R. K., Agle, B. R., & Wood, D. J. (1997). Toward a theory of stakeholder identification and salience: Defining the principle of who and what really counts. *Academy of Management Review*, *22*(4), 853–886.

Morris, P. (2013). *Reconstructing project management*. Oxford, England: Wiley-Blackwell.

Neville, B. A., Bell, S. J., & Whitwell, G. J. (2011). Stakeholder salience revisited: Refining, redefining and refueling an underdeveloped conceptual tool. *Journal of Business Ethics*, *102*(3), 357–378.

Olander, S. (2007). Stakeholder impact analysis in construction project management. *Construction Management and Economics*, *25*(3), 277–287.

Olander, S., & Landin, A. (2005). Evaluation of stakeholder influence in the implementation of construction projects. *International Journal of Project Management*, *23*(4), 321–328.

Orr, R., & Scott, W. R. (2008). Institutional exceptions on global projects: A process model. *Journal of International Business Studies*, *39*(4), 562–588.

Pickard, W. F. (2010). Finessing the fuel: Revisiting the challenge of radioactive waste disposal. *Energy Policy*, *38*, 709–714.

Posiva. (2011). *Posiva tutkii*. Retrieved from http://www.posiva.fi/tietopankki/posiva_tutkii/

Posiva. (2015). *Posiva Oy: Nuclear waste management expert*. Retrieved from http://www.posiva.fi/en/

Project Management Institute. (2008). *A guide to the project management body of knowledge (PMBOK® guide)* (4th ed.). Newtown Square, PA: Author.

Raittila, P., Hokkanen, P., Kojo, M., & Litmanen, T. (2002). *Ydinjäte Suomalaisittain*. Tampere, Finland: Tampere University Press.

Rodney, C. E., & Von Hippel, F. N. (2009). Nuclear waste management in the United States—Starting over. *Science*, *325*, 151–152.

Savage, G. T., Nix, T. W., Whitehead, C. J., & Blair, J. D. (1991). Strategies for assessing and managing organizational stakeholders. *Academy of Management Executive*, *5*, 61–75.

Sustainable Development Commission. (2006). *The role of nuclear power in a low carbon economy*. Paper 5: Waste and decommissioning.

Teller, E. (2011). *The politics of highly radioactive waste disposal*. Retrieved from http://www.123HelpMe.com/view.asp?id=24182

Turner, J. R. (1999). *The handbook of project-based management: Improving the processes for achieving strategic objectives* (2nd ed.). London, England: McGraw-Hill.

Ward, S., & Chapman, C. (2008). Stakeholders and uncertainty management in projects. *Construction Management and Economics*, *26*(6), 563–577.

Widder, S., Calloway, T., & Bond, J. R. (2010). Nuclear waste policy in the United States. *Chemical Engineering Progress*, *106*, 36–40.

Winch, G. M. (2004). Managing project stakeholders. In P. W. G. Morris & J. K. Pinto (Eds.), *The Wiley guide to managing projects*. Hoboken, NJ: Wiley.

Won Han, K., Heinonen, J., & Bonne, A. (1997). *Radioactive waste disposal: Global experience and challenges*. Special Report. IAEA Bulletin.

World Nuclear Association. (2011). *Nuclear waste management*. Retrieved from http://www.world-nuclear.org/info/inf04.html

Yang, J., Shen, Q., & Ho, M. (2009). An overview of previous studies in stakeholder management and its implications for the construction industry. *Journal of Facilities Management*, *7*(2), 159–175.

Yang, R., Wang, Y., & Jin, X.-H. (2014). Stakeholders' attributes, behaviours, and decision strategies in construction projects: Importance and correlations in practice. *Project Management Journal*, *45*(3), 74–90.

Yin, R. K. (1994). *Case study research design and methods* (2nd ed.). London, England: Sage.

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The Case of Nuclear Waste Repository Projects

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Appendix: Classifications and Descriptions of Stakeholders

		Position Toward the Project		Salience Description			
Stakeholder	Primary Goal	Degree of Supportiveness	Degree of Non-Supportiveness	Power	Legitimacy	Urgency	Influence Stakeholder Management Strategy
Posiva	Bury the nuclear waste and maintain the positive atmosphere in the future	According to The Atomic Energy Act, amended in 1978, the nuclear power license holders are responsible for all measures and costs relating to nuclear waste management (supportive)		Induced competition between the municipalities In 1992 TVO names Eurajoki, Kuhmo, and Äänekoski for the research sites In 1997 Posiva added Loviisa to the site investigations Marketized the repository and its economic benefits In 1998 TVO, Posiva, and Eurajoki formed a Vuojoki-working group to discuss the compensation	The EIA was launched in 1997 and it was conducted in all four sites According to the site investigations, safety analyses, and the EIA all the sites were suitable During the EIA Posiva took a very positive role in communication, while the authorities were criticized for their passivity	In 1983 the government set the preliminary schedule, including site selection by 2000 In 1994 TVO applied a zoning modification for Kuusienmaa Island located in Eurajoki's neighbor municipality Rauma, in order to put the pressure on Eurajoki and its real estate taxes	Flexible approach on siting Keep options open as long as possible Offer repository project as a ready package "take it or leave it" (milestones, timetable, technology) Promote the benefits of the project Induce competition Act locally Open local offices Organize small group meetings, public briefings, and discussions Cluster decision makers and local residents using different communication tactics on them Pursue cooperation and comply with compensations Publish own leaflet "Posiva investigates" Use employees' voices Organize excursion to nuclear power plants Conduct EIA in all four municipalities Found EIA organization including a EIA contact person Ask for clear positions before DiP application and warn Loviisa for its passivity

(Continued)

		Position Toward the Project		Salience Description			
Stakeholder	Primary Goal	Degree of Supportiveness	Degree of Non-Supportiveness	Power	Legitimacy	Urgency	Influence Stakeholder Management Strategy
Eurajoki	Improve the municipality's economy and remain as an independent municipality Gain international recognition as an "nuclear power center" As a compensation plan repair historical Vuojoki mansion	In 1994 the sentence forbidding nuclear waste disposal was removed In 1998 the Vuojoki-working group was formed to discuss the compensation A new municipal strategy was launched in 1999 Vuojoki contract was signed in 1999 Olkiluoto was approved as the site for the repository in January 2000 by 20 votes to 7 (supportive)	Until 1993 Eurajoki municipal report included a sentence forbidding the disposal of nuclear waste in its area	In 1980 TVO committed in a written agreement not to dispose of nuclear waste in Eurajoki The new Nuclear Energy Act was modified in 1987 and guaranteed the right for veto for potential hosting municipalities The local council decided in 2000 that a referendum will not be needed by arguing that the facility does not generate disagreements After the siting decision in 2000, the power attribute of Eurajoki municipality increased		The most convenient option for Posiva increased the urgency of its claims	Negotiate first and close cooperation later Turn down suggestions of a referendum
Eurajoki residents	Benefit from the positive side effects given work opportunities, better services, and increased real estate value	No nongovernmental organizations were formed (majority supportive of the project)	The preliminary site studies started in 1987 and gave rise to some civil action	Potential referendum provided an opportunity to influence until the local council in 2000 decided that a referendum is not needed		After the siting decision in 2000, the urgency attribute of Eurajoki residents has increased toward Posiva	One person made an appeal considering the land rent negotiations between Posiva and Eurajoki About 10 people appealed against Eurajoki's positive dictum 11 people expressed their views in EIA by writing (Raittila et al., 2002)

Stakeholder	Primary Goal	Position Toward the Project		Salience Description			Influence Stakeholder Management Strategy
		Degree of Supportiveness	Degree of Non-Supportiveness	Power	Legitimacy	Urgency	
Loviisa	As a potential compensation plan create Loviisa Energy Center	Nonsupportive/ supportive: divided views		The new Nuclear Energy Act was modified in 1987 and guaranteed the right for veto for potential hosting municipalities			Bystander
Loviisa residents	Mixed goals: impact the decision makers both preventing Loviisa from getting the project and having it	In 1997 Pro-Loviisa was founded (local businessmen supportive)	In 1997 Loviisa-Liike was founded and was active during the EIA in 1997–2000 After the DiP in 1999 Loviisa-Liike celebrated and finished their activity (majority nonsupportive)			Nongovernmental organization (Pro-Loviisa and Loviisa-liike) were registered to promote the criticality of their claims	Register as nongovernmental organizations Impact the decision makers Start to collect petition signatures
Kuhmo	As a potential compensation plan improve roads and build an airport		In 1990 the local council of Kuhmo took a denying stand because of a nonsupportive group called Romuvaara-liike In 1996s municipal elections an active member of Romuvaara-liike became a vote-puller	The new Nuclear Energy Act was modified in 1987 and guaranteed the right for veto for potential hosting municipalities			Noncooperative attitude Negative stand toward the project

(Continued)

		Position Toward the Project		Salience Description			
Stakeholder	Primary Goal	Degree of Supportiveness	Degree of Non-Supportiveness	Power	Legitimacy	Urgency	Influence Stakeholder Management Strategy
Kuhmo residents	Majority wanted to prevent Kuhmo from hosting the facility	Mahdollisuuksien Kuhmo was founded in 1998, more than 10 years after the preliminary studies (local businessmen were supportive)	The preliminary site studies started in 1987 and gave rise to the first civil action In 1989 Romuvaara-liike was founded and was active until the DiP was submitted in 1999 (majority nonsupportive)	In 1996 municipal elections, an active member of Romuvaara-liike became a vote-puller		Nongovernmental organizations (Romuvaara-liike, Yrittäjät ja Mahdollisuuksia Kuhmo) were registered to promote the criticality of their claims, which induced urgency	Address writing campaigns 68 people expressed their views in EIA by writing Register as nongovernmental organizations Impact the decision makers Use a direct impact through municipal elections
Äänekoski	Prevent Äänekoski from hosting the facility		In the 1996 municipal elections, the Green Party got four members to the local council (nonsupportive)	The new Nuclear Energy Act was modified in 1987 and guaranteed the right for veto for potential hosting municipalities			Noncooperative attitude
Äänekoski residents	Prevent Äänekoski from hosting the facility and develop independent information about nuclear power		In 1996 Kivetty-liike prepared an initiative for a referendum After the DiP in 1999 Kivetty-liike finished their activity (nonsupportive)	In 1996s municipal elections, the Green Party got four members to the local council		Nongovernmental organization (Kivetty-liike) was registered to promote the urgency and criticality of its claims	Register as a nongovernmental organization Have a direct impact through municipal elections; Green Party got four members (Raittila et al., 2002) Require for referendum Participation in Posiva's meetings was exceptionally low

Stakeholder	Primary Goal	Position Toward the Project		Salience Description			Influence Stakeholder Management Strategy
		Degree of Supportiveness	Degree of Non-Supportiveness	Power	Legitimacy	Urgency	
Government	Support the realization of the project according to the nuclear waste policy	In 1983, the government decided on the objectives and the program for nuclear waste management and set the timetable for the final disposal using TVO's schedule as a base The 1987 policy included legislation to ensure public participation, and a local right of veto on the siting process In December 2000, the government saw no obstacle to a positive DiP (supportive)		In the DiP, the government decided whether the construction project is in line with the overall good of society The construction license application was submitted to the government in 2012 The operation license application is to be submitted in 2020	The status formalizes the legitimacy	Urgency increases when approaching the decision-making process	Favorable attitude toward the deep underground disposal throughout the project Convince public of the safety of the project Not to interrupt the local decision-making process
Parliament	Support the realization of the project according to the nuclear waste policy	The Atomic Energy Act, dating from 1957, was amended in 1978 to take into account nuclear waste management The 1994 Act forbids importing and exporting nuclear waste In 2001, the Parliament ratified the government's positive DiP by 159 votes to 3 (excluding a couple of MEPs, the overall attitude was supportive)	In referral discussion in 2000, before the committee work, the members of the Parliament were much more critical compared to the closure discussion	The DiP ratification	The status formalizes the legitimacy	Urgency increases when approaching the decision-making process	Reserved in media before Parliament handling in 2000 Keep voters satisfied

(Continued)

		Position Toward the Project		Salience Description			
Stakeholder	**Primary Goal**	**Degree of Supportiveness**	**Degree of Non-Supportiveness**	**Power**	**Legitimacy**	**Urgency**	**Influence Stakeholder Management Strategy**
STUK	Ensure the safety of the project	In 2000, STUK submitted a preliminary safety appraisal of Eurajoki to MTI (supportive)		Possibility to influence the DiP	The role as an independent agency whose word is trusted and respected		Act as a link between Posiva and the authorities Advocate the residents by visiting the municipalities Act passively in the media
Researchers	Improve the realization and make observations	Onkalo offered an interesting subject for studies (supportive)			Independent opinion leaders		Communicate inside the research community instead of coming public
Greenpeace and NGO	Oppose nuclear power and prevent decommissioning		In 2000 and 2001, approximately 1,000 people demonstrate against nuclear power and decommissioning (nonsupportive)			Already organized groups have critical claims toward nuclear industry	Publish papers and articles Organize campaigns Insist on further studies

Table A1: Onkalo stakeholder identification

Stakeholder	Goal	Position Toward the Project		Salience Description			Influence/ Stakeholder Management Strategy
		Supportive	Non-Supportive	Power	Legitimacy	Urgency	
DOE	Realize the waste burying project: owns, constructs, applies for licenses, and will operate the facility	According to the NWPA from 1982, DOE is obligated to provide a permanent storage solution for spent nuclear waste Issued new strategy for the management and disposal of nuclear waste in 2013 (supportive)		A cabinet-level department of the United States government	Authorized by Congress		Act according to the NWPA and in the best interest of the nation
Chu Secretary of Energy (2009–2013)	Cancel Yucca Mountain and search for other options		In alliance with Obama (non-supportive)	In 2010 withdraw the Yucca Mountain license application Set up the Blue Ribbon Commission on America's Nuclear Future	The head of the U.S. Department of Energy	Urgency was highest after the elections in 2009	Simply to state that Yucca Mountain is "not a workable option" Appeal to the best interest of the nation in order to search for alternative options
EPA	Ensure the safety of the project by setting the public health and safety standards	To have a permanent storage site to protect the public and the environment (supportive)		Enforces regulations based on laws passed by Congress	An agency of the federal government of the United States		Use the best available scientific approaches and issue a standard that will protect public health for a million years
NRC	Implement EPA's standards and license Yucca Mountain as it fills the requirement	Operates according to NWPA (supportive: despite the different position of the chairman)	Chairman Jaczko's (2009–2012) tried to cancel Yucca Mountain	Stated in 2010 that the withdrawal is illegal because it supersedes the DOE's authority under the NWPA of 1982	An independent agency of the United States government, authorized by Congress		Act according the NWPA
Congress	Keep Yucca Mountain alive in order to have a permanent storage site to protect the public and the environment and to have additional nuclear power	Long-term supporter of Yucca Mountain In 1987s amendment, Congress narrowed the search to Yucca Mountain (supportive)		All legislative powers are vested in Congress Has the power to make changes to the NWPA and to president's budget proposals			Stick to the original plan and respect NWPA

(Continued)

Stakeholder	Goal	Position Toward the Project		Salience Description			Influence/ Stakeholder Management Strategy
		Supportive	Non-Supportive	Power	Legitimacy	Urgency	
President Bush (2000–2008)	To conduct the process as far as possible before resigning	Republican and supports the industry (supportive)		In 2002 signed the approval into law as the Yucca Mountain Development Act (YMDA)	The status formalizes the legitimacy	Urgency increased to sign the approval into law in 2002	Speed up the whole process
The Senate Majority Leader Reid (2007–)	Cancel Yucca Mountain and boost his political career		Used the case as a theme in congressional elections in 2006 Personal affairs with Obama (nonsupportive)	Became Senate majority leader after the 2006 election, which gave him the position to greatly affect the future of the project	The status formalizes the legitimacy	Urgency increased during the campaign and right after the selection	Use his position as a means to spread Yucca Mountain objection Create alliances
President Obama (2008–)	Cancel Yucca Mountain and stay loyal to his voters		During the presidential election campaign in 2008, Barack Obama promised to abandon the Yucca Mountain project Personal affairs with Reid	In 2010, the Obama administration started defunding the Yucca Mountain project and established the Blue Ribbon Commission on America's Nuclear Future	The status formalizes the legitimacy	Urgency was highest during the presidential campaign and the first term in office	Eliminate funding Use his role as an opinion leader Spread the alliance
Nevada governor	Cancel Yucca Mountain and boost his political career	(Nonsupportive)		Vetoed the site recommendation in 2002 but both houses of Congress overrode the veto	The status formalizes the legitimacy	In 1987 when NWPA was amended urgency increased President Bush's action in 2002 to sign the Yucca Mountain Development Act increased urgency	Maintain Yucca Mountain opposition among Nevadans

Stakeholder	Goal	Position Toward the Project		Salience Description			Influence/ Stakeholder Management Strategy
		Supportive	Non-Supportive	Power	Legitimacy	Urgency	
Nevada	Cancel Yucca Mountain		In 1987 NWPA was amended to focus the site characterization studies solely on Yucca Mountain in Nevada People felt it was unfair for their state to host a nuclear repository when there are no nuclear power plants in Nevada (nonsupportive)	In 2000, Las Vegas forbade the shipment of high-level radioactive waste through the city Filed multiple lawsuits against the federal government during 2001–2002 Denied water to Yucca Mountain in 2003		In 1987 when NWPA was amended urgency increased President Bush's action in 2002 to sign the Yucca Mountain Development Act increased urgency	Prolong the project Protest with lawsuits, letter-writing campaigns and public demonstrations Refuse to issue environmental permits and deny water Las Vegas passed a law making it illegal to haul nuclear waste through the city
Nuclear facilities	Get Yucca Mountain in operation as soon as possible	The main supporters of Yucca Mountain Pay the costs of the disposal (supportive)				Urgent claims throughout the project, since 1998 the utilities have filed some 70 lawsuits against DOE to try to recover the extra costs incurred	Want to get rid of the waste but not on the expense of additional nuclear power File lawsuits
States with nuclear waste	Get Yucca Mountain in operation as soon as possible	Concerned that temporary storage sites will become permanent Have perception of the risks of an on-site storage: earthquakes, accidents, or terrorist attacks (supportive)				Increasing claims concerning the safety of an on-site storage	Filed lawsuits

Table A2: Yucca Mountain stakeholder identification