

Stakeholder management in complex projects- a comparative case study

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Abstract

Stakeholder management is considered as one of the success factors of projects, but the number of studies on stakeholder management in a sophisticated project setting is narrow. This study will analyze two complex projects in different sectors to contribute to stakeholder management discussion. The projects include the Äänekoski bioproduct mill, Finland, and Sydney Metro West, Australia. The first project is analyzed using public resources, and the second project is analyzed by public resources and the project owner's interview. Both cases were investigated using tools such as Martinsuo and Lehtonen's complex project characteristics tool, guidelines from the GAPPS report, Mitchell et al.'s stakeholder salience theory and scoring method. This study combines the analysis of the projects and suggests tools to determine complex projects and prioritize stakeholders in complex project setting. The study attempts to benefit project management researchers interested in stakeholder management and complex projects.

Keywords

Stakeholder management, Complex projects, Stakeholder salience, Project management.

1. Introduction

Project management (PM) is a useful tool to manipulate complex activities, and more economical than the traditional methods of management such as the practice of functional divisions in a formal hierarchical organization (Munns & Bjeirmi, 1996). It is stated that PM is an 'immature' topic to research (Davis, 2014), many articles in PM literature are dealing with various aspects of PM (Littau et al., 2010). Project complexity is another aspect of PM having both advantages and disadvantages. Baccarini (1996) and other scholars have discussed the importance of complexity in PM. Numerous scholars have examined and classified, characterized by the complexity of projects. The Development Bureau in Hong Kong refereed complex projects with contract sums over HK \$1 billion, social and economic impacts, extensive works, massive geographical coverage, significant developments, and participation of a considerable number of stakeholders (DB, 2002). Based on the definition of DB, complex projects often involve stakeholders from different background having various interests towards the project outcome (Mok et al., 2015). Project stakeholder management (SM) is a crucial part of PM in a way that Cleland (1986), Miller & Olleross (2001), Olander & Landin (2005) has mentioned its importance is highlighted. Even in ideal PM literature, there is a discussion about SM (Andersen, 2010; Jepsen & Eskerod, 2009).

Previous theoretical and practical research has been conducted on engaging the stakeholders in ordinary sized construction projects (Yang et al., 2010; Jepsen and Eskerod, 2009) but managing the stakeholders in mega projects or complex projects has not gathered much attention (Mok et al., 2015). Even though stakeholder management has been discussed as an attribute for complex projects, a well-established managerial approach in the complex project has not been developed in a way that the specific managerial approach has brought significant outcome for all sorts of complex projects. New paradigms for complex projects are needed because the reason for the project being

complex is hard to determine (Williams, 1999), and SM of complex projects does need a proper management approach for their project complexity (Mok et al., 2015). These approaches then can be utilized to identify the complex projects and develop the SM of a complex project for better management of the projects and to achieve the best project outcome.

Therefore, the purpose of this article is to identify the complex project and to manage the stakeholders by prioritizing them in complex projects and thus, completing the research gap. This study focuses on large scale complex projects having a large number of organizations within each of the primary stakeholders. For identify the project complexity, complex project characteristics by Martinsuo and Lehtonen (2009) during their empirical work with 11 projects, and GAPPS guidelines (2007) will be used. Later, to classify and prioritize the stakeholders in the complex projects, Mitchell et al.'s stakeholder salience framework (1997) and scoring method will be used for both internal and external stakeholders.

In the beginning, the existing literature on complex project management (CPM) and SM are reviewed, followed by an account of the research process. In the result section, Äänekoski bioproduct mill case and Sydney Metro West case are discussed and analysed. All these approaches are carefully selected to determine the complexity of the projects and sensitively prioritizing the stakeholders. Finally, conclusions and directions for further studies regarding these topics are suggested.

2. Literature review

2.1 Complex project management

Construction projects are deemed to be the most complex project since World War 2. Bennett (1991) indicated that construction projects are the most complex project in comparison to any industry. The complexity in projects is increasing and understanding of project complexity is significantly getting animated in a way that this topic has received attention in the PM literature (Williams, 1999). Describing the project complexity, the PM literature classified 'complexity in project' and 'complexity of project' (Maylor and Turner, 2017). Various authors have defined the complexity theories in their articles. Table 1 shows some generally accepted definitions of project complexity.

Table 1. Different project complexity definitions in the literature (retell from Bakhshi, 2016).

Study	Study type	Project complexity definition
Turner and Cochrane (1993)	Conceptual	Depending on the methods of achieving the goals and methods are well defined or not
Baccarini (1996)	Review	Many varied interrelated parts and operationalized in terms of differentiation and interdependency
Cicmil and Marshall (2005)	Empirical study	Calls for the paradox and the dimensions of time, space and power of the organizing processes in project settings
Hatch and Cunliffe (2012)	Conceptual	Different elements with multiple interactions and feedback loops between the elements.
Vidal et al. (2011a, 2011b)	Case study	Difficult property of the project to understand, foresee and keep under control the behavior, even after giving complete information about the project
Tatikonda and Rosenthal (2000)	Case study	Nature, quality and magnitude of the organizational subtasks and the interdependency between the subtasks in a project
Ribbers and Schoo (2002)	Case study	Number of varieties, variability and integration amongst the system
Maier (1998)	Conceptual	Interdependency between the operational and managerial systems, geographical distribution, emergent behavior and evolutionary development
Jaafari (2003)	Conceptual	-
Benbya and McKelvey (2006)	Conceptual/ interviews	-
Remington et al. (2009) and Remington and Pollack (2007)	Conceptual/ interviews	Extremely difficult to predict the project outcomes or manage the project due to the level of speed and the number of characteristics to a degree.
Geraldi and Adlbrecht (2007)	Empirical study	The complexity in interactions, facts and faith

Grisogono (2006)	Report	The ratio of the number of wrong and right outcome
DeRosa et al. (2008)	Conceptual	Openness, interdependencies of the contributing factors and multi-secularity of the project

For a more unobstructed view of project complexity and make the research audience more cognizant with project complexity factors, a tool needs to be developed showing the differences between simple projects and complex projects. Martinsuo and Lehtonen (2009); has sorted out some common scenarios of complex project characteristics during their study with 11 project companies and those findings are as follows: projects will have more than ten stakeholders having their interests and expectations towards the project. The projects will get its content, scope, project team, steering group, duration, and funding structure. Government agencies and public associations will have pursued broader societal benefits. Multiservice society member organizations will participate in the projects to develop daily operations. All the project will include multiple subprojects and relatively significant in scope.

Locatelli et al. (2014) stated in his article that some elements are commonly seen in complex projects such as changing technology, an increase of organizations, integration of projects, combining the projects and so on. The report from GAPPS (2007) guidelines stated that if the project gets one or more of the following characteristics, the environment of the project or the project itself is a “complex project.” These characteristics are: the project will use a lot of disciplines, methods, resources, and approaches to complete the project. The project will go through legal, social and environmental implications, and the project is dependent on the majority partner organization’s resources. Close interactions between the projects and organizations will be seen, and there will be a group of stakeholders having different characteristics regarding the outcome of the project. The project will be of strategic importance to the organization and other organization involved with it.

2.2 Stakeholder management

Stakeholder theory was first developed in the US during 1960 where the researchers defined the stakeholders as a people or group of people affecting the project that can put an influence on the progress of the project (Li et al., 2013). Stakeholder and stakeholder management was introduced in project management article by Cleland (1998) stressing the importance of stakeholder identification, classification, analysis, and different managerial approach. In many project managements journals, stakeholder management along with stakeholder classification, identification, and management procedures has been considered by researchers (Aaltonen et al., 2008). Stakeholder identification is crucial, and delay may occur if the stakeholders are not identified (Achterkamp and Vos, 2008). The reason for stakeholder identification is to manage the stakeholder in an unpredictable environment (Aaltonen et al., 2008). Stakeholder management has its indispensable role in the managerial aspect that has brightly appeared in several articles of Eskerod and Vaagaasar (2014), Walley (2013), Beringer et al. (2013). Based on project success, Davis (2014) listed the significant stakeholders in a project based on previous researches which are reflected on Table 2.

Table 2. Stakeholder list according to literatures based on project success (retell from Davis, 2014).

Stakeholder	Number of Literatures	Literatures
Project manager	31	Kerzner (1987), Andersen et al. (1987), Pinto and Slevin (1987, 1988a, 1988b, 1989), Cooke-Davies (1990), Freeman and Beale (1992), Belassi and Tukel (1996), Munns and Bjeirmi (1996), Tishler et al. (1996), Shenhar et al. (1997), Wateridge (1998), Atkinson (1999), Lim and Moham ed (1999), Wenell (2000), Tukel and Rom (2001), Müller (2003), Belout and Gauvreau (2004), Smith-Doerr et al. (2004), Kendra and Taplin (2004), Turner (2004), Jugdev and Müller (2005), Turner and Müller (2005, 2006), Wang and Huang (2006), Müller and Turner (2007a, 2007b), Barclay and Osei-Bryson (2009), Turner et al. (2009), Toor and Ogunlana (2010)
Project team	24	Slevin and Pinto (1986), Kerzner (1987), Pinto and Slevin (1987, 1988a, 1988b, 1989), Pinto and Prescott (1990), Cooke-Davies (1990, 2002), Wateridge (1995, 1998), Belassi and Tukel (1996), Munns and Bjeirmi (1996), Bounds (1998), Turner (1999, 2004), Smith-Doerr et al. (2004), Jugdev and Müller (2005), Turner and Müller (2006), Wang and Huang (2006), Shenhar

		and Dvir (2007), Barclay and Osei-Bryson (2009), Turner (2009), Turner et al. (2009), Toor and Ogunlana (2010)
Client	18	Slevin and Pinto (1986), Kerzner (1987), Pinto and Slevin (1987, 1988b, 1989), Pinto and Prescott (1990), Belassi and Tukel (1996), Munns and Bjeirmi (1996), Shenhar et al. (1997), Wateridge (1998), Atkinson (1999), Bryde and Robinson (2005), Jugdev and Müller (2005), Turner and Müller (2006), Müller and Turner (2007a), Turner et al. (2009), Barclay and Osei-Bryson (2009), Toor and Ogunlana (2010)
Contractor/users/end user/consumer	15	Contractor- Morris and Hough (1987), Kerzner (1987), Tishler et al. (1996), Wateridge (1998), Lim and Mohamed (1999), Turner (2004), Jugdev and Müller (2005), Bryde and Robinson (2005), Turner and Müller (2006), Wang and Huang (2006), Müller and Turner (2007a), Barclay and Osei-Bryson (2009), Pinto et al. (2009), Turner et al. (2009), Toor and Ogunlana (2010) Users/end user/consumer- Kerzner (1987), Pinto and Prescott (1990), The Standish Group (1995), Tishler et al. (1996), Munns and Bjeirmi (1996), Wateridge (1998), Atkinson (1999), Lim and Mohamed (1999), Turner (1999, 2009), Jugdev and Müller (2005), Turner and Müller (2006), Müller and Turner (2007a), Turner et al. (2009), Toor and Ogunlana 2010)
Customer, project sponsor	14	Customer- Kerzner (1987), Cooke-Davies (1990, 2002), Freeman and Beale (1992), Tishler et al. (1996), Shenhar et al. (1997), Wateridge (1998), Atkinson (1999), Lim and Mohamed (1999), Tukel and Rom (2001), Jugdev and Müller (2005), Shenhar and Dvir (2007), Barclay and Osei-Bryson (2009), Turner et al. (2009) Project sponsor- Kerzner (1987), Morris and Hough (1987), Cooke-Davies (1990, 2002), Freeman and Beale (1992), Jugdev and Müller (2005), Barclay and Osei-Bryson (2009)
Top management	9	Top management- Slevin and Pinto (1986), Kerzner (1987), Pinto and Slevin (1987, 1989), Cooke-Davies (1990), Pinto and Prescott (1990), Belassi and Tukel (1996), Atkinson (1999), Jugdev and Müller (2005)
Organization, owner	8	Organisation- Morris and Hough (1987), Pinto and Slevin (1988b), Belassi and Tukel (1996), Shenhar et al. (1997), Bounds (1998), Cleland and Ireland (2002), Jugdev and Müller (2005), Wang and Huang (2006) Owner- Pinto and Slevin (1988b), Wateridge (1998), Lim and Mohamed (1999), Turner (2004), Jugdev and Müller (2005), Wang and Huang (2006), Pinto et al. (2009), Turner et al. (2009)
Line manager	7	Kerzner (1987), Cooke-Davies (1990), Wenell (2000), Jugdev and Müller (2005), Turner and Müller (2005), Müller and Turner (2007b), Toor and Ogunlana (2010)

Project leader, Project personnel, Team members	4	Project leader- Slevin and Pinto (1986), Pinto and Slevin (1988b), Wateridge (1998), Smith-Doerr et al. (2004) Project personnel- Slevin and Pinto (1986), Kerzner (1987), Tishler et al. (1996), Müller and Turner (2007a) Team members- Belassi and Tukul (1996), Tishler et al. (1996), Atkinson (1999), and Turner and Müller (2005)
Executive, Executive management, Internal and external Management, Public, Senior management, Supporters	3	Executive- Kerzner (1987), Jugdev and Müller (2005), Toor and Ogunlana (2010) Executive management- Kerzner (1987), The Standish Group (1995), Barclay and Osei-Bryson (2009) Internal and external- Pinto and Slevin (1988b), Morris (1997), Lester (1998) Management- Morris and Hough (1987), Freeman and Beale (1992), Bounds (1998) Public- Munns and Bjeirmi (1996), Lim and Mohamed (1999), Turner et al. (2009) Senior management- Kerzner (1987), Wateridge (1998), Jugdev and Müller (2005) Supporters- Wateridge (1998), Turner (1999), Toor and Ogunlana (2010)
Director, Engineer, External environment, Investor Management, Other interested parties, Project team leader, Supplier	2	Director- Cooke-Davies (1990), Smith-Doerr et al. (2004) Engineer- Smith-Doerr et al. (2004) and Wang and Huang (2006) External environment- Belassi and Tukul (1996) and Jugdev and Müller (2005) Investor- Barclay and Osei-Bryson (2009) and Turner et al. (2009) Management- Cooke-Davies (1990) and Toor and Ogunlana (2010) Other interested parties- Turner and Müller (2006), Turner et al. (2009) Project team leader—Pinto and Slevin (1988a, 1989) Supplier- Müller and Turner (2007a, 2007b)
Environment, External influences, another suppliers/Project executive/Senior supplier	1	Environment- Kerzner (1987) External influences- Morris and Hough (1987) Another suppliers/Project executive/Senior supplier- Turner et al. (2009)

One most predictable way to classify the stakeholders is to classify them into two groups: internal stakeholder and external stakeholder. Internal stakeholders are those who support the projects and formal members of the project, whereas external stakeholders are not formal members of the project coalition (Aaltonen, 2011; Aaltonen and Sivonen, 2009).

Stakeholder salience is another term and project managers use this to give importance to the stakeholders based on the factors (Aaltonen et al., 2008). Mitchell et al. (1997) introduced a framework for stakeholder identification and salience where there are three attributes: power, legitimacy, and urgency. The framework proposes that stakeholders having more attributes are more salient and essential to the eyes of the management (Aaltonen et al., 2008). This concept is still accepted as a clear framework for classifying stakeholders (Walley, 2013) in a way that various scholars (Gago and Antolín, 2004; Magness, 2008; Aaltonen et al., 2008; Mitchell et al. 2011; Neville et al., 2011; Weber and Marley, 2012; Thijssens, 2015) have used this framework during their research.

Power can be described as tangible and intangible resources (Salancik et al., 1974). Legitimacy is just an attribute, and stakeholders demand their legit claims. Urgency is where the stakeholder can call for immediate actions. Stakeholders having all three attributes are pointed out as the most dominant stakeholder. Then there are stakeholders having two attributes who have less influence than the stakeholders having three attributes but more influential than the stakeholder having one attribute (Aaltonen and Sivonen, 2009).

3. Research process

The aim of this research is tantamount to understand how stakeholder management is being handled in complex projects. Research being realized in multiple projects enables making a cross-case analysis of the findings (Yin,

2009). The research was conducted on two projects, and the first project is Äänekoski bioproduct mill, the largest bioproduct mill in northern Europe. The second project is the Sydney Metro West Project in Australia. This project is connecting two CBD's of Sydney and will deliver 31 metro stations, and more than 66 kilometres of new metro rail. Äänekoski bioproduct mill has its different environmental impact, the effect of the mill and several conflicts, whereas Sydney Metro West project has a critical scope of work, variety of sub-projects, industry and stakeholder engagements. Both projects are from the different origin of the world and have different business operations but have various complexities and stakeholder engagement which are the substantial reason for choosing these projects.

Choosing a study method is and always been an essential and critical step in the research since it is rarely possible to study the whole population (Marshall, 1996). Two different methods can be applied: a quantitative method and a qualitative method. Marshall (1996) stated in his article that choosing the method can be given by the research questions and aim of the study. The quantitative method often answers to "what?" questions whereas qualitative method answers to the "why?" or "how?" questions (Marshall, 1996). Build on the research questions, a qualitative method was the best-suited method to answer the research questions.

The study began with a literature review on stakeholder management and complex projects. From the synthesis of the literature review, a list of interview questions was formed to understand the ongoing complexities and stakeholder management process in a project. The questions were cross-checked, copies of the questions were sent to the company representatives. In an empirical study for the first project case study, available public resources such as project newsletters, project websites, data archival and DOT reports were used. For the second case study, interviews over email with the project owner were conducted, and online public resources such as project newsletters, project websites and DOT reports were used. The information was collected and analysed by implementing several tools in both the case projects, and the research questions were answered from the comparative analysis.

4. Results and discussions

4.1 Complexity of the projects

The first case project is "Äänekoski bioproduct mill," which is going to be built under Metsä Fibre and its location is in Central Finland. This bioproduct mill is the most substantial investment (EUR 1.2 billion) in the history of the Finnish forest industry. Creating 2,500 jobs amongst which 1,500 of them are new jobs, this mill is the first next generation bioproduct mill in the world. This bioproduct mill will be producing high-quality pulp, tall oil, turpentine, bioelectricity, and wood fuel. Potentially new product includes textile fibers and lignin products. Its annual pulp production capacity is 1.3 million tons and will produce 20-gigawatt hours of biogas a year. The possible uses of the biogas include transport fuels. The reason for building this bioproduct mill is to fulfill the increasing demand for softwood pulp. The demand for softwood pulp was around 24 million tons back in 2014 and expected to increase up to 26 million tons by 2025. The mill is employing more than 6,000 persons per year and creating 2500 jobs in Finland's value chain, mostly affects the forest industry and transportation. Rather than using fossil fuels, this bioproduct mill is using 100% of raw materials and side streams to produce bioproducts and bioenergy. Majority of the energy that is needed by the mill will be produced from wood.

Sydney Metro is Australia's most significant public transport project. This new standalone railway will deliver 31 metro stations and more than 66 kilometers of new metro rail all around Sydney which will be a revolution for Australia's most significant city travels. Sydney Metro is also working on a new underground metro railway connecting the CBDs of Parramatta and Sydney and linking communities along the way that have not previously been serviced by rail. The NSW (New South Wales) government has announced the Sydney Metro West project in November 2016. This metro railway is the city's next underground metro railway that connects the Parramatta and Sydney central business districts (CBD). This project will serve the critical precincts of Westmead, Greater Parramatta, Sydney Olympic Park, The Bays Precinct and the Sydney CBD. In Parramatta, the number of jobs is expected to double over the next 20 years to 100,000. By 2030, more than 23,000 residents will be located, and 34,000 more jobs will be created in Sydney Olympic Park. Sydney's innovation hub with regenerating 95 hectares of land is the Bays Precinct. New South Wales has declared in their 2018-2019 budget that Sydney Metro West project will receive an amount of USD 3 billion.

Various public resources and interviews were analyzed to have an overview of the complexity of the Äänekoski Bioproduct Mill, Finland and Sydney Metro West, Australia. In Table 3, both the cases are compared, and different managerial approaches are pointed out by the use of project complexity characteristics of Martinsuo and Lehtonen, and GAPPs report to understand the complexity of the projects.

Table 3. Comparison between Äänekoski Bioproduct Mill and Sydney Metro West

	Äänekoski Bioproduct Mill	Sydney Metro West
Project budget	The investment of this project is around 1.2 billion	The investment of this project is around 3 billion
Project timeline	The project is on schedule and began operations in August 2017	The project is on schedule and expecting to end in the second half of 2020
Project management	The project is owned by Metsä Fibre	The project is owned by the Government of NSW
Number of stakeholders	This project has thirteen stakeholders. (Metsä Fibre Oy, EcoEnergy SF Oy, Aqvacomp Oy, Metsähallitus, the monitoring team, Forest industry in Central Finland, Central Finland ELY Center, People from residential areas, Finnish media, LUKE, Greenpeace, WWF, Normal citizens of Finland)	This project has eight group of stakeholders and this group has also a number of stakeholders. (Government departments and agencies, Local government, general managers, officers and administrators, State and federal Government, Sydney Metro team members and Board, Peak bodies, representative groups and organizations, Local communities and businesses, Major projects and/or landowners along alignment, Industry)
Stakeholder Management	Stakeholders were on the priority list for the project manager. Stakeholder engagement was done through sharing information via company website and newsletter, keeping in mind all stakeholder to get acceptance both internationally and locally. The focal company always tried to exceed their stakeholders' expectations to ensure good cooperation from the stakeholder. Some more actions taken by the project to manage the stakeholders are: minimising the environment impacts, issuing the environmental and water abstraction permit, using most effective technology, reducing normal thermal load and increasing the usage of wood. The project welcomes enquire and complaints, and for this purpose, the project introduces a 24-hour available phone number and email address. operations. This project is an example for next generation bioproduct mill in the world.	Being a governmental project, the project engaged all its stakeholder and industries at every phase of the project using various engagement process. The project is accepted by all group of stakeholders. Engagement activity includes industry briefing, media release, community newsletter, website, Facebook, YouTube. Sydney Metro understands and respects the need of communities and other stakeholders to have a voice in the planning, development, and delivery of major city-shaping projects such as this. Throughout the various stages of development, Sydney Metro has provided opportunities for these stakeholders to have meaningful opportunities to influence outcomes, whether it is the location of stations or how environmental impacts are mitigated. Also, there was a communication and engagement with a broader range of stakeholders including consumers, potentially impacted communities, community and environmental groups, councils, utility providers. This process will provide preliminary information about the project and the opportunity to early feedback. This project has a dedicated enquiries and complaint management system
Stakeholder interest	Each of the stakeholders had their own interest towards the project. The interests of the owners were mostly financial and fulfilling project requirements. Finnish media and LUKE were responsible for providing information whereas Greenpeace and WWF were creating opponency. Other stakeholders such as monitoring team, central Finland ELY center has their own individual interests.	Stakeholders from this project had their own individual interests. Government department and agencies, Sydney metro team member and board were concerned on creating an integrated transport system. Industry has their financial interests. Other interest includes traffic impacts, school impacts, property damages, station design and more.

Table 3 indicates that both the project has more than ten stakeholders who have their claims and benefits from the project, and government agencies and public associations are included in the stakeholder list. The project budget in

both projects is more than 1 billion USD and has a fixed timeline to complete the project. Moreover, there are several project teams in Sydney Metro West, and the project director collaborates with the teams and reports directly to the chief executive. Äänekoski Bioproduct Mill project has to face a lot of legal, environmental and social implications. Both the project defined their project goals at the beginning stage.

4.2 Stakeholder prioritization

For prioritizing the stakeholders of the projects, the internal and external stakeholders are identified in both the projects are identified first. Later, Mitchell et al.'s (1997) stakeholder salience framework are used to find out the stakeholder salience attribute for internal and external stakeholders. Attribute for the stakeholders is then scored depending on the number of attributes of each stakeholder. Table 4 shows the internal and external stakeholders for the Äänekoski Bioproduct Mill project and Sydney Metro West project.

Table 4. Internal and External Stakeholders of Äänekoski Bioproduct Mill and Sydney Metro West

Äänekoski Bioproduct Mill		Sydney Metro West	
Internal Stakeholders	External Stakeholders	Internal Stakeholders	External Stakeholders
Metsä Fibre Oy, EcoEnergy SF Oy, Aqvacomp Oy, Metsähallitus, The monitoring team	Forest industry in Central Finland Central Finland ELY Center, People from residential areas, Finnish media, LUKE, Greenpeace, WWF, Normal citizens of Finland	Government departments and agencies, Local government, general managers, officers and administrators, State and federal Government, Sydney Metro team members and Board	Peak bodies, representative groups and organizations, Local communities and businesses, Major projects and/or landowners along alignment, Industry

In Table 5, stakeholder salience of internal and external stakeholders for both projects are analysed using Mitchell et al.'s stakeholder salience theory and depending on the number of salience gained; the stakeholders are prioritized.

Table 5. Stakeholder prioritization using stakeholder salience and scoring method

Äänekoski Bioproduct Mill			Sydney Metro West		
Stakeholder	Salience Gained	Score	Stakeholder	Salience gained	Score
Metsä Fibre Oy	Power: supplying the main resources Legitimacy: cooperating with the focal organization Urgency: non-governmental organization having urgent claims.	3	Government departments and agencies	Power: one of the core investor in the project Legitimacy: cooperating with all the focal organization Urgency: urgency claims to finish the project within budget and time	3
EcoEnergy SF Oy	Power: supplying the main resources Legitimacy: cooperating with the focal organization Urgency: non-governmental organization having urgent claims.	3	Local government, general managers, officers and administrators	Power: has the power to influence the project at local level Legitimacy: cooperating with the focal organization	2
Aqvacomp Oy	Power: supplying the main resources Legitimacy: cooperating with the focal organization Urgency: non-governmental	3	Peak bodies, representative groups and organizations	Legitimacy: by their status Urgency: Non-governmental organization has urgent claims	1

	organization having urgent claims.				
Forest industry in Central Finland	Power: for their supplying pulpwood as, raw material Urgency: their claims towards the focal organization	2	State and federal Government	Power: influencing the project Legitimacy: by their status	2
Central Finland ELY Center	Legitimacy: the organization will be monitoring the EIA procedure and the safety and environmental permits required for the project	1	Local communities and businesses	Urgency: non-governmental organization and has critical claims from the project	1
People from residential areas	Power: to give their feedback Urgency: as they are non-governmental organizations	2	Major projects and/or land owners along alignment.	Urgency: Non-governmental organization has critical claims from the project	1
Finnish media	Legitimacy: for their status and they are connecting the people of Finland and other organizations of Finland with the project.	1	Sydney Metro team members and Board	Power: gained by working inside the project Legitimacy: connecting with all the project team	2
Metsähallitus	Legitimacy: as they are independent agency and they provide trusted information.	1	Industry	Power: Being independent and influencing the project through feedback Legitimacy: they have status in the project Urgency: has urgent claims towards the organization	3
LUKE	Legitimacy: as they are independent agency and they provide trusted information.	1			
Greenpeace	Power: being independent international agencies having the rights to speak on environmental issues Urgency: for their direct claims from the project.	2			
WWF	Power: being independent international agencies having the rights to speak on environmental issues Urgency: for their direct claims from the project.	2			
Normal citizens of Finland	Urgency: have critical claims on the project's act	1			
Monitoring team	Power: influencing the project Urgency: urgent claims depending on the information and the EIA feedback.	2			

Table 5 indicates the stakeholders salience attributes and the scores depending on the salience gained. Stakeholders having all the attributes are scored '3', and stakeholders having only one attribute are scored as '1'. Based on the scores, the stakeholders can be prioritized.

In the literature review section, stakeholder characteristics methodology of Martinsuo and Lehtonen (2009) and the report of GAPPS (2007) has been discussed. Applying the tools in the empirical study, the complexity of both projects has been drawn in Table 3. To answer the first research question, it can be said that the methodologies used in this research work to define and identify the complexity of the project has successfully worked with both the projects fulfilling all the requirements. Thus, it concludes from this research that the methodologies of Martinsuo and Lehtonen (2009) and GAPPS guideline (2007) are an excellent approach to identify the complexity of complex project. According to the knowledge from the prior studies and the case analysis, it is strongly suggested to use the mentioned methodologies to identify the complexity of the project.

To answer the second research question, firstly the internal and external stakeholders are identified in both projects. From the literature review, ideas are gained, and internal and external stakeholders are separated in the first case project. However, the stakeholders are disintegrated clearly by the second case project during the interview. After that, Mitchell et al.'s (1997) stakeholder salience framework is used to find out the stakeholder salience attribute for the internal and external stakeholders of both projects. This attribute for each stakeholder is then used to prioritize the stakeholders. To conclude, Mitchell et al.'s stakeholder salience have successfully implemented in Äänekoski Bioproduct Mill case and Sydney Metro West case, and the internal and external stakeholders are prioritized by scoring the salience attributes. Different scholars highly use Mitchell et al.'s stakeholder salience framework, and it is also used in this research work, and strongly recommended to use the framework to prioritize the stakeholders in complex projects.

5. Conclusions

SM in a complex project environment is a laborious topic for research because of its limited number of works. With the period, SM in a complex project environment is getting attraction both in industries and academia due to its importance in balancing the stakeholder interest and gaining support in a complex project environment. Challenges encountered by the project managers in identifying the project complexity and managing the stakeholders have made the researchers to make concerted efforts in making a proper complicated project guideline and stakeholder management theory.

The goal of this study was to identify project complexity and management of stakeholders through case studies. The case studies were conducted through public resources and interviews. Through this proceeding, the complexity of projects was verified using complexity characteristics of Martinsuo and Lehtonen, GAPPS guideline, and stakeholders were identified and prioritized using Mitchell et al.'s stakeholder salience theory and scoring method. The cross-case analysis and comparison with the case projects helped to identify the common issues of the studied projects. Although the project cases were identical, from different origins and sectors, have different goals and atypical investors, the case projects were successful in terms of budget and timeline. So, it can be assumed that both projects have successful project management, which leads to efficacious stakeholder management. Thus, the lesson derived from this study can be helpful for future SM in complex projects.

The findings of this research support the theoretical and empirical foundations of project management. Though it is difficult to point out every possible complexity and manage each stakeholder in a project, the findings of this research may enable project managers as a starting point for identifying the project complexities and prioritizing the stakeholders. The identified variables may support the project managers to predict the characteristics of the project and increase the probability of project success. The result of this research is advantageous for the project manager, but the project manager needs to identify the project characteristics and the stakeholders using the proper methodology in the very first place. This study proposes some best and applicable practices for defining project complexities and prioritizing the stakeholders in a complex project environment. Different stakeholders have their interest in the project, and it is the project manager's responsibility to take actions according to stakeholder's priority, which can be supported by this research. For the project success, the manager needs to handle the stakeholders. Managers can use this study as a guide to handling project situations if it gets complicated or conflict arises. The study also supports other studies done by the researchers and an example for the future researchers to work with or take as a reference in the field of complex project management. The field of a complex project is vast, and the projects are getting more complex day by day. New practitioners can study various aspects of complex projects and different conceptual or theoretical ways to manage the stakeholders in the complex project.

There are several significant areas for further research. Firstly, the research can be conducted on more projects from diverse sectors. Secondly, further research can be done by involving with projects for a more extended period to deepen the understanding of stakeholders and managerial approaches. Third, more empirical studies are needed to follow and verify this study. Moreover, frameworks and methodologies of other scholars can be used to define project complexity and SM. Further research is thus to be carried out in order to explore the aspects as mentioned earlier and develop future implications for project complexity and stakeholder management.

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