Project change stakeholder communication

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Abstract

This action-based qualitative case study explores how the project communication routines affect stakeholder engagement during change management process and evolve project culture. With an inductive design, this research studies change communication practices in two different case contexts. The results underline the fact that an effective communication ensures stakeholder participation in the change management processes through teamwork and empowerment, whereas lacking communication routines lead to a rational and straightforward project culture where task performance and efficiency are preferred over stakeholder involvement. Theoretical results suggest that project communication planning requires more attention on the know-how of stakeholders than the current stakeholder evaluation models instruct.

Keywords: Project management; Change management; Communication management; Stakeholders; Action research; Project culture; Stakeholder know-how

1. Introduction

During past two decades the infrastructure projects constituted 3.8% of world GDP, and this contribution is estimated to increase up to 4.1% by 2030 (McKinsey Global Institute, 2013). Meanwhile, changes are experienced in almost every infrastructure construction project (Ibbs \textit{et al.}, 2007). These changes are among the major reasons for project time delays and over budget (Hwang \textit{et al.}, 2009). The rate of project change increase also the complexity (Zhang, 2013). Most of the complex projects involve a large number of stakeholders (Muller and Turner, 2007). Ignoring stakeholders may become the main reason for a complex project failure (Kangas, 2011; PMI, 2013b). It is widely accepted that the stakeholder consensus and satisfaction is achieved through communication (PMI, 2013b). Realistic stakeholder expectations can be spotted through effective communication routines (Mok \textit{et al.}, 2015). Insufficient communication and lack of stakeholder integration are among the most common drivers for unattended change causes and un-controlled change impacts in a project (Zhao \textit{et al.}, 2010). The development of effective communication routines between stakeholders requires considerable attention and efforts during the project development and planning phase. The stakeholders may have different national and organizational cultures (Prajogo and McDermott, 2005), which affect the project communications. Loo (2002) identified that the project cultures are not stable as they change during time (Loo, 2002). The effective communication routines (Bakens \textit{et al.}, 2005; Kerzner, 2009) help to maintain stakeholder trust (Turner, 2009) and to keep track on the project culture changes (Marrewijk, 2007) in order to prevent the development of dysfunctional culture (Bate, 1994).

Researchers have found that organizational culture types can influence positively or negatively on knowledge sharing, depending on the culture type: clan, adhocracy, market, and hierarchy (Suppiah and Sandhu, 2011) or innovative, competitive, bureaucratic, and community (Cavaliere and Lombardi, 2015). In this paper, we have focused on five different types of culture...
(compare Suppiah and Sandhu, 2011; Bate, 1994; Prajogo and McDermott, 2005; Zuo et al., 2009):

- developmental/ innovation culture where the organization focuses on developing the task and pursues to find new solutions to the challenges
- group culture where decisions are reached at lower level
- hierarchal project cultures where communication routines are restrained
- rational culture focuses on reaching the goal as efficiently as possible
- dysfunctional culture where some of the signs are visible: the internal competition is harder than outside competition; change resistance is hard; people depart from organization; strategies change based on management or culture fad; bureaucracy reigns supreme, innovation is not valued

According to our literature review, most of the proposed change management models do not adequately focus on the role of knowledge of stakeholders, although many (e.g., Kotter, 2007) recognized the importance of change communication. Change management systems, with lacking communication routines, are practical, however bureaucratic top level decision-making systems. The objective of this paper is to explore the role of effective communication and stakeholder engagement in project change management process. Engagement of stakeholders necessitates their participation and involvement (Deegan and Parkin, 2011). The research questions of this paper are as follows:

Q1: How do the different project communication routines affect stakeholder engagement during the change management process?

Q2: How do the different communication routines and cultures facilitate stakeholder engagement in the change management process?

By answering these questions, this research aims to clarify the role of communication routines during project change management processes. The two action-based case studies demonstrate how effective communication routines specifically designed during the project planning phase effect on stakeholder engagement during change management processes throughout the project life cycle.

This paper begins with a brief overview of change management, communication, and culture, as well as the role of stakeholders in changes. This is followed by the description of research method and case study. Communication routines and stakeholder culture are described for both the cases. Then the role of case-specific communication and culture in the change process is discussed. The paper concludes with discussion for further research and contribution of this paper.

2. Literature review

2.1. Change management in projects

Projects, although temporary endeavors, undergo changes during the life cycle. Most of the time, project changes are caused due to imperfect planning, lacking stakeholder involvement and improper integration of project work packages (Zhang, 2013). Still, almost all the construction projects undergo planned or unplanned changes (Ibbs et al., 2007), which is a major reason for their cost and time overrun (Hwang et al., 2009). Such changes are considered as variation or modification from the original scope, cost, time schedule, and agreed quality (Hao et al., 2008). Typically, a project may undergo change due to various factors. Examples of these causes include but are not limited to the following factors: wrong interpretation of scope; conflicting stakeholder expectations or understanding about project functionality; change in regulations, laws, and standards; wrong project assumptions; financial uncertainties; political uncertainties; technology improvements; human behavior-related uncertainties; omissions during engineering; mistakes during construction; value engineering; delayed deliveries from the subcontractors and vendors; non-conforming components and equipment; inclement weather and other force majeure condition; and incomplete or conflicting contract clauses (Love et al., 2002; Zhang, 2013; Hao et al., 2008). Concurrent occurrence of any two or more of the mentioned cause factors increase the importance of change in complex project setups (Zhang, 2013) and hence the change impacts. However, the earlier the change cause factor is identified during project life cycle, the easier it would be to manage its impact (PMI, 2013c).

Changes have direct and indirect impacts on the project outcome (Moghaddam, 2012). Direct impacts of a change may include additional work, deletion of work, demolition of work already done, re-work, specification change, time lost in stopping and restarting current task, revision in project reports, drawings and documents, reschedule to make up for the lost time, etc. Meanwhile, indirect impacts of a change can include the following: stringent stakeholder relationships, decrease in the interest and engagement of resources, loss of productivity during construction, increased risks related to coordination and scope interfacing, change in the cash flows, and increased critical tasks in project time schedule. However, identifying change causes and minimizing their negative impacts require considerable efforts. Lack of effective communication and lack of stakeholder integration are among the most common drivers for unattended change causes and un-controlled change impacts in a project (Zhao et al., 2010). Therefore, project stakeholders should be keen to understand the need for the changes and so to minimize their negative impact. This can be achieved by establishing change management communication routines from the project planning phase.

A list of identified project change cause factors and change impacts are included in Table 1.

Project change causes and effects are known already; however, referring to the Engineering and Physical Sciences Research Council, Moghaddam (2012) mentioned that there are no widely accepted standard and comprehensive change management methods in construction projects. Likewise, the authors of this paper believe that project management literature offers several methods and systems for the change management (PMI, 2013c: Zhao et al., 2010; Park and Pena-Mora, 2003; Moghaddam, 2012; Hao et al., 2008; Ibbs et al., 2001). For example, Hao et al.’s
Table 1
Project change causes and impacts.

<table>
<thead>
<tr>
<th>Project change cause factors</th>
<th>Direct impacts of a project change</th>
<th>In-direct impacts of a project change</th>
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<tbody>
<tr>
<td>- Wrong scope interpretations</td>
<td>- Additional work</td>
<td>- Stringent stakeholder relationship</td>
</tr>
<tr>
<td>- Conflicting stakeholder about project functionality</td>
<td>- Deletion of work</td>
<td>- Lacking interest and engagement of resources</td>
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<tr>
<td>- Changing regulations, laws, and standards</td>
<td>- Demolition of executed work</td>
<td>- Loss of productivity</td>
</tr>
<tr>
<td>- Wrong project assumptions</td>
<td>- Re-work to meet specification</td>
<td>- Increased risks related to scope interfacing and coordination</td>
</tr>
<tr>
<td>- Technological improvements</td>
<td>- Change in work specifications</td>
<td>- Project cash flow changes</td>
</tr>
<tr>
<td>- Omissions/mistakes during engineering and constructions</td>
<td>- Time pressure to complete the work</td>
<td>- Altering critical path and increasing critical path tasks</td>
</tr>
<tr>
<td>- Wrong estimations (e.g., resourcing, raw materials, time)</td>
<td>- Revisions in engineering documents, drawings, and reports</td>
<td>- Consequential losses or gains for the future business.</td>
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<tr>
<td>- Delayed or non-conforming equipment deliveries</td>
<td>- Rescheduling of the works</td>
<td>- Stringent clauses for new agreements</td>
</tr>
<tr>
<td>- Conflicting contract clauses</td>
<td>- Updated testing procedures</td>
<td>- Re-evaluation of suppliers, vendors, and contractors.</td>
</tr>
<tr>
<td>- Financial, social, and political uncertainties</td>
<td>- Additional/reduced criteria for acceptance</td>
<td>- Updating of standard specifications of future use.</td>
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<tr>
<td>- Human behavior-related uncertainties</td>
<td>- Inclusion of new definition in the contract</td>
<td>- etc.</td>
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<tr>
<td>- Force Majeure conditions (e.g., inclement weather)</td>
<td>- Extension of contract clauses</td>
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<tr>
<td>- Value engineering</td>
<td>- Demands for extra features or warranties</td>
<td></td>
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<tr>
<td>- Additional features demanded by the owner</td>
<td>- etc.</td>
<td></td>
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<tr>
<td>- Identification and involvement of a new stakeholder</td>
<td></td>
<td></td>
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<tr>
<td>- Project management in effectiveness</td>
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<tr>
<td>- Scope interfacing decision making</td>
<td></td>
<td></td>
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<tr>
<td>- etc.</td>
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</tbody>
</table>

(A. Butt et al. / International Journal of Project Management 34 (2016) 1579–1595) proposed a comprehensive change management system for tracking project change causes and effects. Our further observation is that such models demand an intensive stakeholder engagement without providing detailed guidance about the implementation. Consequently, an intensive stakeholder engagement implies that the decision-making process should be prolonged, especially in hierarchical project cultures where communication routines are restrained. The underlying problem is that change management models fall short to amplify the significance of engaged project stakeholders once the actual problems are occurring concurrently.

Unfortunately, involving stakeholder with appropriate communication routines is missing in such change management models. What is the best way out? Is it to characterize the level and/or type of change with its possible impacts? Then involve the key stakeholders (Freeman, 1999) (Wang and Huang, 2006), for example, the core teams, into the change management processes? The answer lies in an evolving practice to organize resources in a project! For example, Kähkönen et al. (2012) have delineated the role of core teams for focused coordination on the arising issues in a project. Developing core teams and establishing their communication routines facilitate decision making rather at lower project hierarchy. This is one possible way for stakeholders to understand expectations, responsibility, and power of individual resources during communication. Therefore, disputes arising from the conflict of interest, lacking authority and contractual limitations are likely to be escalated to higher project hierarchy.

From project management literature, one can identify that most of the proposed change management systems are extended from a generic change management model comprising the following five sequential processes: identify change → evaluate and propose change → approve change → implement change → review change. Henceforth, for the generalization of our findings, we will use this five-step change management model to analyze the stakeholder communication routines in our two case projects. In the following two sub-sections, we aim to further establish our argument about the need for stakeholder engagement through appropriate communication routines. The first sub-section describes the project change implementation during construction. The second sub-section seeks guidance about project stakeholder communication from the organizational change management literature.

2.1.1. Implementation of project changes during construction

Practically, the changes once known during construction lead to two possible solutions, either (i) re-work or (ii) in situ managerial decisions (Park and Pena-Mora, 2003). Re-work is a process of re-doing those of the already performed work that does not fulfill the agreed quality or functionality criteria for project acceptance (Sun and Meng, 2009). Vice versa, the construction teams also practice in situ decisions (referred as managerial decisions) to deviate from original deliverable plan. Either of these two solutions is selected (Re-work or in situ decision), the project may suffer from additional costs, time delays, low quality, and functionality compromises. Park and Pena-Mora (2003) have observed that the construction teams tend to avoid re-work. It is because re-work necessitates additional resources resulting in higher time and cost impact on the project completion. Re-work also accumulates time pressure on the contractors who then compromise on the work quality, and consequently this may result in more re-works. Therefore, with delayed construction the tendency to adopt in situ managerial decision increases (Park and Pena-Mora, 2003). Alternatively, in situ managerial decision making is although preferred to avoid the schedule and cost pressures during construction, however it is not either free from consequences.

Construction process is a logical and efficient sequence of work deliverables. However, an in situ managerial decision necessitates alteration in the sequence of consequential works. Such alteration may further require (i) re-work or otherwise
followed by many other consequential *in situ* managerial decisions. This dilemma of choosing between *re-work* and implementing *in situ* decision may continue over the construction period. Park and Pena-Mora (2003) further observed that the reduced response time, resulting from informed stakeholders, should increase the probability of preferring *re-work* over *in situ* managerial decision.

2.1.2. Change management as an inquiry

Organizations endeavor to transform their capabilities (Barney et al., 2011) through change management guided by wise leadership (Kotter, 2007), flexible change project structures, and agile processes (Kerzner, 2009; Turner, 2009; PMI, 2013a). These organizational change management processes, consisting planning, preparing, implementing, benefit realizing, and sustaining change, entail an active stakeholder engagement (Kotter, 2007). The change leaders and agents in an organization engage the stakeholders through effective communication routines (Crawford and Nahmias, 2010). Further, a study on managing complex projects directed leadership and communication skills as most significant traits in managing project changes and uncertainties (PMI, 2013b). Kazmi and Naranoja (2013) observed the important role of the stakeholder communication in a significant organizational change. In Kotter’s eight-step change management model, the first four steps are focusing on the strength of leader’s communication for embracing change (Kotter, 2007). The change leaders and agents in an organization engage the stakeholders through effective communication routines (Crawford and Nahmias, 2010). Further, a study on managing complex projects directed leadership and communication skills as most significant traits in managing project changes and uncertainties (PMI, 2013b).

Kazmi and Naranoja (2013) observed the important role of the stakeholder communication in a significant organizational change. In Kotter’s eight-step change management model, the first four steps are focusing on the strength of leader’s communication for embracing change (Kotter, 2007). Likewise, we have learned that for embracing a change and controlling its outcomes the stakeholder engagement through efficient communication routines are crucial. However, Pettigrew (2001) cautioned that change management processes and deliberate actions undertaken by the change agents is under-researched in literature. Such shortcomings in the project management literature became obvious during our literature review as well.

2.2. Project communication and culture

Since projects are unique, temporary, giving discontinuous work contents to personnel, and short-term oriented, they require different ways of communicating (Prencipe and Tell, 2001). Multidisciplinary projects require a massive amount of information exchange and communication to enhance the needed contribution for project success. Especially, in complex and demanding projects, the enormous amount of information exchange is very typical. Nevertheless, it is practically impossible for each project participant to know everything. It should be reassured that all stakeholders are timely communicated with the correct and relevant information. For this purpose, stakeholders deploy three-mode communication: push communication, pull communication, and interactive communication (PMI, 2013c). Push communication aims to send the specific information to the targeted stakeholder groups, for example, through letters, memos, and e-mails. Through pull communication, stakeholders extract the needed information, for example, from project information repository or intranet. Push and pull communication is the result of individual stakeholder actions; however, interactive communication requires multidirectional information exchange between project stakeholders. Apparently, interactive communication is the most efficient way to seek stakeholder common understanding (PMI, 2013c). Essentially, the project-specific combination of these three modes establishes the effective communication routines.

An effective communication is about availability of correct information to the right stakeholders at the “right time and in a cost-effective manner” (Kerzner, 2009, p. 232), and it aims to keep reinstating stakeholders’ understanding about the project deliverables (Bakens et al., 2005; Davis, 2016). This paper uses “project communication” as the overall term for all aspects of communication (Fig. 1) in a project (Kerzner, 2009; Ramsing, 2009):

- Project communication is the overall term for all aspects of communication in projects.
- External project communication deals with project stakeholders.
- Internal project communication covers all aspects of both written and interpersonal communication in a project.
- Documented project communication defines the use of documentation, data, information, design and planning documentation (drawings, photos, models, simulations, etc.), and project management systems.
- Interpersonal project communication defines the personal interaction in a project between project managers, management, project team members, project stakeholders and other individuals who may, formally or informally, be of an importance to the project. E-mail is seen as a form of interpersonal communication due to its character of frequent formal and informal ways of communicating.
- Scheduled project-related communication meetings either face to face or virtually as well as project documents sent as planned.
- Non-scheduled project-related communication is both face-to-face or virtual meetings and e-mails.
- Professional/formal communication, scheduled and unscheduled, as seen necessary to furnish the project deliverables.
- Personal/informal communication, scheduled and unscheduled, as seen necessary to build trust, rapport and to resolve any situation leading to potential conflict.

Kerzner (2009) cautioned that although a rich exchange of project information takes place, still the stakeholders make conflicting interpretations. These conflicting interpretations diminish away the trust among stakeholders and hence their commitment towards project success erodes. The communication crux is to gain stakeholder commitment for the project success (Turner, 2009). Hence, communication routines should facilitate stakeholder knowledge sharing in order to learn about the others’ perspectives, their expectations and interest in the project, and their power to shape the project outcomes. Karlsen et al. (2008) pointed out that there is a need to communicate by using both professional and personal channels (Karlsen et al., 2008). Professional, more formal, communication channel can be official meetings and discussions. Personal channels are the informal ways of communication like chatting in corridors or
during dinner. Berkun (2005) demonstrated that through informal channel of communication it is easier to gain trust in relationship building. Misztal (1996) described trust as the particular vital element for the stable relationship and cooperation building that is needed in daily interaction in projects. Likewise, an open mind-set is also required because through communication stakeholders will question each other’s work routines, assumptions and believes; if not aligned or outdated, then already established understandings should be changed (Baker and Sinkula, 1999).

Our understanding is that project culture has an important role when developing communication routines for change management processes (Ibbs et al., 2001). Therefore, the following sub-section is dedicated to review the importance of project culture types and components and the role of communication routines.

### 2.2.1. Project culture and communication

The academic literature on organizational culture in project management has focused on shared cultural values and pursue to solve problems (Henrie, 2005; Wang, 2001; Anderssen, 2003; Quinn and Cameron, 1988). Kendra and Taplin (2004) noted that a project culture consists of multiple fragmented subcultures. Zuo et al. (2009) have deduced a project culture framework consisting of major components: integrative, cooperative, goal oriented, flexible, and people oriented. The dominating characteristics of these components in mentioned in Table 2:

<table>
<thead>
<tr>
<th>Project cultural components</th>
<th>Cultural characteristics</th>
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<tbody>
<tr>
<td>Integrative</td>
<td>Input of many parties is integrated into the project during the early phase of project.</td>
</tr>
<tr>
<td>Cooperative</td>
<td>Though there are conflicts during the projects they are seen as a normal for the process. The objectives of project participants are aligned together. Teamwork is popular.</td>
</tr>
<tr>
<td>Goal oriented</td>
<td>Results are always given the highest priority while the means to obtain goals can be allowed. Risk taking is acceptable.</td>
</tr>
<tr>
<td>Flexible</td>
<td>The way a project is processed is very flexible and easy to change in the projects within flexible culture. Innovative approaches are encouraged and rewarded in the project process. Failure is viewed as an opportunity for learning and improvement.</td>
</tr>
<tr>
<td>People oriented</td>
<td>Decision making may be passed down. Opportunities are given to develop capabilities during the project process.</td>
</tr>
</tbody>
</table>

Project stakeholders from varying national and/or organizational cultures jointly constitute the project culture. Comparable projects, however, involving different stakeholder nationalities may exhibit different cultural characteristics. For example, in a big European construction project, the culture included the components of innovativeness, creativeness, non-traditionalism, and independency (Marrewijk, 2007). Contrarily, Chinese construction projects’ culture has dominated by goal-oriented approach (Zuo et al., 2009). Project stakeholders’ organizational cultures also affect the communication. One of the stakeholders might be working in hierarchical culture and other in an organization with development culture (Fig. 2). The project participant from development culture will have limited understanding about why the other company representatives just stick to the contractual documents and are not willing to find other solutions or delaying the process. Further, inter-organizational project participants have different backgrounds (education and career paths) that may also lead to contradicting interpretations. The other stakeholder can be under pressure and not able to listen or read the message properly and thus the message is misunderstood. Hence, in order to communicate effectively, we need to learn to ask for feedback that will enable us to understand how our message is received (Shannon, 1948).

Importantly, project cultures are not static but constantly evolve during the project life cycle (Loo, 2002). Meanwhile, changing project culture lead to a dysfunctional stage (Bate, ...
In dysfunctional stage, the project is caught in an unpleasant circle of growing frustration, increasing isolation, losing innovativeness, and decreasing ability to adapt to the changes in the wider environment (Marrewijk, 2007). Therefore, to maintain the stakeholder trust and their participation (Turner, 2009) during change management processes, the project practitioners should communicate effectively to avoid dysfunctional project culture (Weaver, 2007; Ibbs et al., 2001).

2.3. Project changes and stakeholders communication

Project stakeholder is an individual or group “who can affect or is affected by” the outcome of project (Freeman, 1984). Stakeholders are influential players and their role is comprehensive, however complicated as well (Littau et al., 2010). Therefore, the management of stakeholders’ expectations is important in every project (Kangas, 2011; Cleland, 1986; Olander and Landin, 2005; Davis, 2016) and so in the change management processes (Bourne and Walker, 2005). Stakeholder communication is critical (PMI, 2013c, b), but it is not sufficient to only inform project changes to the stakeholders (Hao et al., 2008; Davis, 2016). Herein, the position of the authors is that stakeholder participation should be facilitated (and encouraged) throughout the change management process, beginning from the change identification. It should be make sure that the messages are timely distributed and expectations are learned; however, it is merely possible with ineffective communication routines. This in return necessities focusing on integrative and people-oriented components of project culture (Zuo et al., 2009). An effective communication triggers stakeholder coordination to integrate their expectations within high quality work deliveries (Villagarcia and Cardoso, 1999) and managing project changes (Griffith-Cooper and King, 2007) at optimum cost and schedule. Practically, it means that effective communication routines should lead to just-in-time stakeholder agreement on the identified/proposed/required changes.

It is a known fact that major chunk of project manager’s time is consumed in communicating with stakeholders. For example, from a stakeholder collaboration study in construction business success, Ahuja et al. (2009) believed that communication accounts for 75–90% of project managers work time. Communicating relevant and irrelevant information to all the stakeholders is not a wise choice (PMI, 2013c), but it is prudent to seek a differentiated communication approach for various stakeholder groups (Ramsing, 2009). Accordingly, the project management practitioners and leaders are taught (Thomas and Mengel, 2008) to tailor their communication routines ( Muller and Turner, 2010). Accordingly, project communication routines are ramified through the various stakeholder analysis techniques. For example, project stakeholders based on their power and interest are grouped into four categories to design customized communication routines for each group (Olander and Landin, 2005). Stakeholder grouping through salient model (Mitchell et al., 1997) for stakeholder identification is also a prominent tool used for designing project communication (Yang et al., 2011; Mok et al., 2015). The communication routines based on these models are developed, but only at once, for the stakeholder engagement throughout project life cycle (Yang et al., 2011). However, our observation is that project change communication routines need more considerations than the project stakeholder analysis, and should be updated during project life cycle.

Technological advancements offer several ICT applications for projects (Charoenngam et al., 2003; Naaranoja, 2014). These applications (and tools) offer certain capacity to enhance the effectiveness in stakeholder communication (Ahuja et al., 2009). However, from an ICT implementation study, Wong (2007) observed that despite its known benefits, the implementation of ICT in construction industry has faced several challenges. It is because the project-specific customized ICT application is neglected (Charoenngam et al., 2003). On top of that, an over emphasis on ICT also make communication routines very formal (Bagozzi, 2011; Gorse and Emmitt, 2003) and restrained during the change management process.

3. Methods

Our paper deploys action-based qualitative case study research. Denzin and Lincoln (2011) elucidated that the word “qualitative” entails processes and meanings that are not meticulously gauged and examined in terms of “quantifiable intensity or frequency” (Denzin and Lincoln, 1998, 2011). Meanwhile, one of case study research strengths is its ability to investigate a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and its context are not distinguishable (Yin, 2003). Accordingly, to study construction projects as research cases, pragmatism is considered to be the most favorable paradigm (Naaranoja et al., 2014a). It is because that pragmatism is a problem centered action-based research approach where researchers deploy various data collection methodologies in real-world settings (Naaranoja, 2014), which help in elucidating the context-phenomena relationship. With pragmatic approach to reality, action researchers bring evidence-based models from their fieldwork (Denzin and Lincoln, 2011). Therefore, pragmatists, the action researchers, have capacity to address organizational issues as well...
as to fulfill the criteria of academic research (Badham and Sense, 2006).

Empirical data for this research were gained through authors’ contribution in the delivery of two demonstration projects (Naaranoja et al., 2014a), the research cases. They facilitated, designed, implemented, and updated the way of working, including communication routines, in the case projects. Therefore, the data collection is result of their observation, participation, contribution, and reflection on the project deliverables. It is important to mention that during this process, the authors could only influence the outcome of the projects to the extent of their limited (and specific) responsibilities. Henceforth, the analyzed data for this paper were collected during these contributions to the case projects, the authors’ attendance in project stakeholder meetings, accessing minutes of meetings (and other related document repositories), preparing and/or otherwise reviewing various stakeholder reports, exchanging e-mails, phone calls, participating in brainstorming sessions, and also through actively discussing day-to-day issues with the project team members and other stakeholders.

The two demonstration projects were both mainly construction projects but purposefully selected to be different when it comes to the size: a very small project and a mega size project. The mega project had enough resources to invest on communication routines, and the second case although small is an important project for the owner and end users. These different kinds of cases enabled the comparison of stakeholder communication routines and their impact on change management processes. Table 3 gives an overview of our demonstration projects. The following two sub-sections provide the contextual details of the cases.

3.1. Case 1: energy infrastructure project

The first case is an engineering procurement and construction (EPC) energy infrastructure project in Asia. The project being crucial for the country’s energy policy and economic development involved several stakeholders. A multinational joint venture constituted the project owner. Project owner also involved its consulting engineer, plant operator, lending banks and their engineers, fuel and water suppliers, local communities, and various experts from the national authorities. The EPC contractor also constituted from the consortium of two multinational contracting companies. The contract agreement between owner and contractor was impliedly based on FIDIC Silver Book structure and its guiding principles. It means that changes required to fulfill “any” of the intended functionality of project was not commercially compensated by the project owner, but only by contract variations and value engineering. Hence, the contractor had to ensure that uncompensated changes should be avoided. Otherwise, an inevitable change should be identified in the earliest possible stage of project. Thus, the complexity in this project was due to the geopolitical significance of project, the involvement of multiple project stakeholders, the challenging contractual clauses, and the scope interfaces.

One of the authors, being part of contractor’s core team, participated in the development of project execution plans. These plans also included the tools used to manage the complex communication with multiple interfaces. For this particular research, the tools used to manage communication interfaces between owner – contractor – consulting engineers are studied.

3.2. Case 2: dance education facility renovation project

The second demonstration case is a renovation project for an educational facility in Finland. The complexity of this project was related to satisfy the (partially conflicting) needs of many stakeholder groups during the designing and construction stages of the project. The project was crucial for end users since they needed updated facilities to teach, present, and research music. The project owner, the owner of the property, directly involved several stakeholders mainly including project management consultant, design coordination consultant, architect, other designers, and construction company. The construction company then made contracts with suppliers. Other stakeholders were facility users: professors, researchers, lecturers, individual students, student organizations, and even anticipated future students from high

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<th>Table 3</th>
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<tr>
<td>Characteristic comparison between the case projects.</td>
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<tr>
<td>Project characteristics</td>
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<td>Project objective</td>
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<tr>
<td>Scope setup</td>
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<td>Project type</td>
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<td>Capital expenditure</td>
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<td>Project duration</td>
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<td>Site location</td>
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<td>Key stakeholder cultures</td>
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<td>Key stakeholder education and profession</td>
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<td>Contract setup</td>
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<td>Action researcher role in the project</td>
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school, facility management service, and a representative of the Finnish National Board of Antiquities.

Two of the authors had a researcher role in this project and additionally one of them had a small role as consultant in the project. The original aim of the research project was to study the stakeholder involvement during planning and construction stages. This project has been analyzed in several published papers using different perspectives and different sets of authors (Naaranoja et al., 2014a, 2015).

4. Analysis

4.1. Case 1—energy infrastructure project

4.1.1. Explicating communication routines

This large project required planned communication routines for all the key stakeholders. The communication requirements had to be written down in the contractual agreement due to the complex setup. The contract contained information about “what is to be done” and “why it is to be done”. The communication tools and practices were agreed during the planning phase as in every project. These communication tools and practices are meant to delineate “how to be done” and “when to be done.” Ideally, such decisions between the contracted parties should be presented in the project plan. This has been the practice in Case 1, where the preparation of project plan was initiated ever since the (project) development phase. Meanwhile, the communication role of each key stakeholder was also agreed and it included the clarification of interfaces and customized implementation of ICT tools. The selection and development of project customized ICT tools was a worthwhile effort in this case. The success of such a customization requires joint working of IT experts as well as the project core teams. For example, many of the key stakeholders having an understanding about project business (Kerzner, 2009, has detailed the type of organizations for executing a project) had their own document management systems (at individual organization level). Therefore, the key for successful communication was to agree on how these different systems should interact. For an executable project plan, the following accomplishments established the praxes of communication routines:

1. **Contractual documents**: Contract, its appendices, and applicable standards facilitated in establishing the definition of each stakeholder’s interest, their power to influence the project outcomes, and hence their role in communication. This way the rules for communication interfaces were established.
2. **Project core teams**: Project core teams were identified and their participants were nominated from all key stakeholders. For example, the core team for project time schedule, civil, architectural, mechanical, electrical, and construction established. Due to similarity in their professions, each core team participants had shared know-how about the project and its functionality. The development of core teams having members participating from different stakeholders, an increasing practice, facilitated the engagement and coordination (Kähkönen et al., 2012; Naaranoja et al., 2014a) by utilizing effective way of communication. Thus, provided focused coordination on the arising issues and minimized the agreement time.

The establishment of such teams has also been a complex process because of multiple interfaces. Therefore, it is important to nominate communication leader for each core team. Such a nomination was based on the contractual position of a party or its scope superiority or otherwise its expertise knowledge. Profession/experience-based core teams facilitated a group culture where decisions were reached at lower level in the project organizations. However, there had been few exceptional events which required decisions to be made at higher level in project organization.

3. **Project communication matrix**: The communication matrix, started to develop during project planning phase, provided the basis for agreeing communication routines between project stakeholders. Many of the communication routines in this matrix had links to the contractual requirement (as applicable). Consequently, the objective for each communication routine was then defined. Also, the medium of each routine was defined along with its occurrence frequency, including the audience/participants to be invited. Communication routine owner was specified and also the deliverables to be furnished. Worthwhile to mention that although this communication matrix was developed during the planning phase, however with the work progress and materialization of few risks, some new communication routines were also included.

Communication matrix played a significant role to patronize the meeting routines between core teams as well as other stakeholder groups. The face-to-face meetings had been the preference; however, online/live meetings were also practiced whenever required to avoid ambiguities and maintain the trust. To ensure the effectiveness of agreed decisions among the stakeholders, rules for conducting the meetings were developed and followed up. The structure of communication matrix used for this project is shown in Table 4 (Representation of actual communication routines but the text is not exacting the decisions in actual settings.) Tens of such routines were decided, defined, and practiced by the stakeholders.

4. **Project database shared server**: The development of project data server was based on share point platform that proved to be a push and pull communication central point. The communication through the shared server was logged with agreed communication numbering with SharePoint server protocol.

5. **Project directory**: Project directory, a common living document for all the key stakeholders, was developed. Such a document was containing the names, roles, and contact information about each resource.

6. **Design comment sheet**: Based on agreed format these comment sheets helped in gaining consensus between the owner and the contractor. Initially, these comment sheets were also very helpful to identify the changes and then also to verify the impact of implemented changes.

7. **Scope interfacing issue list**: One complexity in the project was scope distribution among the contractors, which
required continuous follow-up and agreement on interfacing between both the contractors. This scope interfacing issue list had been submitted to the owner and owner’s engineer for their information about the possible discrepancies and risks that could have led to the possible project changes.

8. **Risk log register**: Continuous follow-up of project risks are maintained during the life cycle. This risk log was also including the schedule critical path analysis.

9. **Project quality management system**: Project quality management system was developed and followed up properly. Such a system facilitated transparency and developed trust among the stakeholders that the project outcomes would fulfill the defined objectives of its investment.

### 4.1.2. Change communication-culture analysis

Our first case describes how to manage a complex project involving multiple stakeholders from diverse cultures in an orderly way by designing effective communication routines, which also supported change management processes. They had plenty of tools, for example, communication matrix and well-organized routines to ensure efficient flow of project information among the stakeholders. The aim of project communication routines was to support stakeholder participation in order to ensure commitment and trust and to have a successful project. The establishment of project core teams and the effective communication routines developed a “group culture.” In addition, the stakeholders were empowered to participate in decision making. However, conflicts appeared due to unclear contractual definitions. Such contractual conflicts turned project culture more hierarchical and thus decisions could only be reached with cooperation, though at a higher level in project organization. Here again, the communication routines helped to elevate conflicts to the level where contractual issues were resolved.

Learned through our literature review, a generic change process model in construction comprises the following five sequential stages: identify change → evaluate and propose change → approve change → implement change → review change effects. We have used this generic model to delineate our understanding about the stakeholder involvement in managing change through effective communication routines. To facilitate the readers’ understanding, the relationship between change management, stakeholders, and communication routines is presented in Table 5.

In this case project, the staff was encouraged through structural flexibility and empowerment. Such developmental culture in the contractor’s organization gave enough resources to design sound communication routines. Then the formation of core teams and their communication routines helped to maintain the stakeholders’ consensus during the project change processes. These routines also prevented, to a considerable extent, the overflow of information to stakeholders and project team members. In difficult situations, like when there was no consensus about an expensive change approval, these communication routines expedited (and facilitated) the decision-making process to attain consensus among the stakeholders. Table 6 summarizes the stakeholder communication and

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culture of Case 1 during different project phases and observed change management practices.

4.2. Case 2—dance education facility renovation project

4.2.1. Explicating communication routines

The project communication plan of our second case (education facility renovation) can be divided into the initial co-creation planning phase, technical design phase, and implementation phase (construction phase). The communication method varied during co-creation planning, technical designing, and implementation phase of this project. The architect was selected in the very beginning of the project. The communication during the three phases is described separately. One of the authors was involved in the first two (phases) as cost estimator and design coordination consultant.

4.2.1.1. Co-creation planning phase. During this phase, a collaborative culture was realized. The collaboration process was 5 days long and had five stages. In planning sessions, the aim was to get “as many ideas as possible,” and during this stage, more than 40 persons were present at the working sessions and approximately
100 in whole afternoon sessions where the ideas were further developed and criticized. There were also meetings where the participants were strictly limited to the steering group. The process started with vision workshop, where the focus was on the future activities at the education facility after 20 years. When the vision was clear, the workshop focused on developing alternative concepts that supported future activities. Using these concepts, the plans were developed; these plans were tested with mock-ups and scale models. The last stage was the refining of the plan and decision making related to the planning. The process was well planned, and there was a core team selected who participated in each session. The positive atmosphere also helped to solve conflicting interests. Several professionals were invited to give critics and to further develop the plans after the concepts were developed and drafts of the plans were created. The stakeholders of this process were the facility users (professors, students, and even anticipated future students from high school), owners, architect, other designers, quantity surveyor, and a representative of the Finnish National Board of Antiquities. The collaboration was based on facilitated modified Charrette process (Naaranaja et al., 2015). At the end of this stage, the facility renovation plan was created:

1. The functional and spatial decisions were collected as a result from the charrette process.
2. Architect drafted the first version of the complete layout.
3. The preliminary and very rough cost estimate was created in 2 weeks.
4. In addition, guidelines for technical design stage how to prioritize the objectives if the budget exceeded.

The facility users had not budgeted money for the renovation, and they were forced to make financing decision since the realization of the project was based on agreement that both property owner and facility user would share the costs. The collaborative process ensured facility users the importance of this renovation, and they were able to make the decision. Property owner had already budgeted for this project and the decision making was easy for them.

4.2.1.2. Technical design phase. Architect and technical designers created plans. The building permit required architectural plans as well as significantly changed ventilation plans. The architect took care of museum viewpoint—the requirement to protect the historical building.

During the technical design, a project management consultant/coordinator took care that the end users understood the design documents. This consultant also ensured that improvement proposals of the end users were adequately merged in the final design documents. Coincidentally, the project management consultant/coordinator had to leave the project while the technical design was still in progress. Consequently, the finalized technical design was issued for construction while the end users could not verify that their needs were incorporated.

4.2.1.3. Implementation phase. Contracts specified the role and aims of each partner. There was written a communication plan that described the communication media and the contact person of each stakeholder with addresses.

During construction phase, the construction company made a plan that contained the following communication practices:

1. Contractual documents: Contract, its appendices, and applicable standards facilitate in establishing the definition of each stakeholder’s role in communication. The main function of stating the roles in the contract agreement is that it is necessary to know who has power to order additional work and design changes during the implementation (building) phase.
2. Implementation group: The general foreman (who represents the main contractor), responsible designers, and site work safety organization were nominated in official documents (agreements and building permit documents). The legal obligations were stated in writing. Also, the property owner relations responsibilities were stated in agreements in written.
3. Document delivery: This project delivered documents via e-mails but also a project document database was used. However, in urgent situations the documents were sent by direct e-mails.
4. Project directory: Contact list, as a living document, was developed. Such a list contained the names, roles, and contact information about each person who contributed or would contribute to project.
5. Risks: Risks were discussed in official and in unofficial meetings. A proper risk management plan was considered not to be required because of limited scope of this project. Financial risk was discussed in early phases of the project, but in the later phases, it was stated in the minutes that everybody should “stay within the budget.”
6. Project communication routines: The communication of a small project was rather ad hoc. However, for readers’ understanding, we are presenting these routines in a matrix form to make it comparable with to the Case 1 (Table 7). The text and data in the following figure are only indicative, and it does not represent the actual information about the project. Communication routines were included based on contractual requirement as well as practical requirements for this project. The “communication routine owner” was also specified with deliverables to be furnished.

During implementation phase, face-to-face meetings were organized. If somebody was not able to come in person, virtual participation was organized. These meeting routines were developed to fulfill the needs of construction core team and decision makers of the contractual parties. There were also several official and unofficial meetings. Document exchange happened via e-mails. The aim was to work efficiently in order to hand over the project according to the initial plan “on time.” The initiation stage of contract contained several detailed planning needs that were documented as well. It is important to mention, that the project documentation did not contain change needs or variation.

4.2.2. Change communication-culture analysis

The second case study illustrates how the co-creation planning process might help in the beginning of the project.
During the co-creation planning phase, the culture was developmental where the flexibility, motivation, and creativity were important. However, during the technical planning and implementation phases, the project culture had been very “straightforward.” Through a very straightforward and goal-oriented culture, the project is implemented according to definition of contracts. However, the contact with the end users and project owner was avoided. Consequently, to implement any variation managerial decisions using sense making of the site personnel had chosen. In such a scenario, it appeared that project would be completed within budget and also on time. However, such practices make project stakeholders distrustful while the project functionality lacks.

After the handover meeting the owner and users held an emergency meeting, where they listed all such work and installations that needed to be done before the premises could be handed over to students and teachers. The emergency meeting was needed since the contractor had not understood the special needs of the users due to inadequate communication (Table 8).

Unfortunately, during implementation phase, the work efficiency was preferred over required project functionality. In addition, considering it a normal small construction project, the required changes were not recognized or otherwise were not communicated with the key stakeholders. Therefore, in our second case, the flexibility focused people-oriented culture observed during the co-creation planning was lost in the technical planning and implementation phases. It is because the project culture converted to more straightforward (and goal oriented) decision making where due attention to stakeholders’ communication lacked. We observed that such “straight forward” culture at site does not fit into the Prajogo and

### Table 7
Communication routines in an educational facility renovation project.

<table>
<thead>
<tr>
<th>Sr. no.</th>
<th>Communication routine</th>
<th>Objective</th>
<th>Medium</th>
<th>Frequency</th>
<th>Audience</th>
<th>Routine owner</th>
<th>Timeline</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>Site discussion</td>
<td>To agree on small alteration in order to manage the project completion on time</td>
<td>Unofficial discussion</td>
<td>When necessary</td>
<td>Site manager, Site supervisor</td>
<td>Site manager</td>
<td>–</td>
<td>No deliverables</td>
</tr>
<tr>
<td>1</td>
<td>Site team meetings</td>
<td>To discuss the scope of obstacles, review of progress, discuss the targets, and challenges</td>
<td>At site, Face to face</td>
<td>When necessary</td>
<td>Site manager, site supervisor, architect</td>
<td>Site manager</td>
<td>–</td>
<td>Not necessary if needed the outcome is written into daily construction operation memo Daily progress report and small agreements</td>
</tr>
<tr>
<td>2</td>
<td>Daily construction operation</td>
<td>To show the status of daily activities and small agreements with owners site auditor</td>
<td>Web-based system</td>
<td>Daily</td>
<td>Contractor and site supervisor</td>
<td>Site manager</td>
<td>–</td>
<td>The site diary documentation</td>
</tr>
<tr>
<td>3</td>
<td>Schedule</td>
<td>Weekly the contractor documented a progress report</td>
<td>Schedule visible on wall</td>
<td>Weekly checked but the schedule was not changed</td>
<td>Site manager, site supervisor</td>
<td>Site manager</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>4</td>
<td>Site meetings</td>
<td>The owner representatives invites the meeting and gives each stakeholder an opportunity to talk about whatever they have in mind</td>
<td>At site, face to face</td>
<td>Not regularly</td>
<td>Owner, site supervisor, site team, end users</td>
<td>Owner</td>
<td>–</td>
<td>Agenda, minutes of meetings</td>
</tr>
</tbody>
</table>

During the co-creation planning phase, the culture was developmental where the flexibility, motivation, and creativity were important. However, during the technical planning and implementation phases, the project culture had been very “straightforward.” Through a very straightforward and goal-oriented culture, the project is implemented according to definition of contracts. However, the contact with the end users and project owner was avoided. Consequently, to implement any variation managerial decisions using sense making of the site personnel had chosen. In such a scenario, it appeared that project would be completed within budget and also on time. However, such practices make project stakeholders distrustful while the project functionality lacks.

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### Table 8
Case 2: Change management processes and role of communication routines (according to the observation).

<table>
<thead>
<tr>
<th>Change management process</th>
<th>Actions by project team (and core teams)</th>
<th>Communication tools</th>
<th>Communication type</th>
<th>Decision level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identify change</td>
<td>Hand over meeting the change needs were observed and discussed</td>
<td>Oral communication</td>
<td>Interactive communication</td>
<td>End users</td>
</tr>
<tr>
<td>Evaluate and propose change</td>
<td>Emergency meeting where the change need was discussed</td>
<td>Oral communication</td>
<td>Interactive communication</td>
<td>Property owner and end users</td>
</tr>
<tr>
<td>Approve/reject change</td>
<td>During emergency meeting</td>
<td>Oral communication Issue list</td>
<td>Interactive and push type of communication Pull type of communication Interactive communication</td>
<td>Property owner, end users Site</td>
</tr>
<tr>
<td>Implement Change Review Change effects</td>
<td>Contractor implemented the changes A new hand over meeting was arranged</td>
<td>Report on the site diary Issue list</td>
<td></td>
<td>Project core teams and project team leaders</td>
</tr>
</tbody>
</table>
McDermott (2005) model about organizational cultures. Table 9 summarizes the communication and culture of Case 2 during different project phases and observed change management practices.

### 5. Discussion

This paper attempted to demonstrate the change communication routines and their relevance to the stakeholder engagement and changing project culture. According to Davis (2016), literature offers sufficient guidance about communication between the project core teams and stakeholders. According to our opinion, the available guidance did not sufficiently cover the change management process. In the literature review part, the change management models and systems were introduced to require communication about information flow over time, coordination, trust, balanced culture, common stakeholder understanding, and decision making (Zhao et al., 2010; Park and Pena-Mora, 2003; Hao et al., 2008; Ibbs et al., 2001; PMI, 2013c). Practical guidance and examples of such communication routines focus currently on research projects (Pinnacle, 2012) or give ideas (Harvard University, 2016) or based on experiences of a person (Gill, 2015). This paper described the communication routines in two case projects and then analyzed their implications for the stakeholder engagement and evolving project culture during the change management processes.

Many change management models (Zhao et al., 2010; Hao et al., 2008) focus on change management processes during the execution phase. This paper covered the whole life cycle of two projects because it is known (PMI, 2013c) that if we find the change need early, the change will cause less harm and money. For example, the first case maintained change management tools from the very beginning to the end like the scope interface issue list during the contract development phase and when closing the project.

In the literature review section, we combined in Table 1 various project change causes (Love et al., 2002; Zhang, 2013; Hao et al., 2008; Moghaddam, 2012) and their impacts (Moghaddam, 2012; Hao et al., 2008; PMI, 2013c). By combining the project change causes and impacts, we aim to encourage that change management should not be limited to the implementation/ construction phase of a project (Zhao et al., 2010; Hao et al., 2008). Rather, a change causes is also identifiable in an earlier phase of project, whereas the change impacts may become only apparent after the completion of construction work. This was actually the situation in the second research case of dance education facility renovation project where the impacts of work scope interpretation by the contractor became apparent only at the time of final inspection and acceptance. The cases illustrate that the management of project changes is important from the beginning of project until the acceptance of project deliverables. Project change communication routine plan has to take care of change needs throughout the project life cycle. Effective communication results in the stakeholder engagement into the change management process which was realized in the first case.

During the change management process, effective communication facilitated the development of stakeholder understanding and trust (Bakens et al., 2005). In our first case, the communication routines gave guidelines for teamwork and empowered stakeholders, which in return improved decision-making process within the project core teams even during tough situations. However, communication routines in the second research case were only understood to fulfill contractual obligations during the construction stage, and the change management processes were not in focus when these communication routines were designed. The first case project invested on the development of customized way of working during all project phases. This supports the earlier findings of the need for sufficient resources to implement the change management systems (Hao et al., 2008; Ibbs et al., 2001). It was found important to customize
several communication routines and use all three modes of communication PMI (2013a). As Kähkönen et al. (2012) pointed out, it was also found important that appropriate topics are discussed with correct participant from the relevant/key stakeholders groups.

A very relevant observation in the case projects was the evolving project culture (Zuo et al., 2009; Prajogo and McDermott, 2005). Earlier research (Ibbs et al., 2001) has identified that a balance project culture is required to manage project changes. Therefore, in this research, it was also important to understand how the communication routines were practiced within a dominating project culture components (Tables 6 and 9). The first case about energy infrastructure project demonstrated comprehensive communication routines.

We observed that in this project, the developmental and group cultures invited stakeholder participation during change management processes. We also observed that during conflict situations, the communication routines turned the project culture more hierarchical. However, in such situation, the irrelevant information was filtered at core team level through already established communication routines, and hence decision making at project management team level became more agile and transparent. This way, their commitment to achieve the required project functionality remained commendable throughout the project life cycle. Our observations were different for the second case where the limited attention and resources could be allocated to the communication routines. These limited communication routines made project culture very rational during the construction stage where focus was mostly on task efficiency. However, in a rational culture, whenever there was a need for change, an in situ ad hoc decision making was preferred. In time pressure situation, the lacking communication routines created a feeling that other stakeholders’ involvement would consume more time and effort. Therefore, the construction team selected not to inform other stakeholders. Hence, the project culture became more straightforward (goal oriented) and meanwhile project needs were sacrificed for work efficiency.

Our data analysis also highlighted the role of project communication leadership. In our first research case of energy infrastructure project, the responsibility of communication was distributed at the core team level. Each core team leader was made accountable to ensure communication effectiveness and was empowered to make decisions. Excluding one, the communication leaders of all other core teams remained unchanged throughout this project life cycle. In our second research case, the responsibility of communication lead remained at higher project hierarchy. Moreover, the responsibility of leading communication also shifted from one project phase to another. We observed that this change in the communication leadership also affected the project communication routines. Our understanding is that variation in the communication leadership affects stakeholder engagement during change management. Further, this variation was noted to have adverse effect in case of lacking change communication routines. This finding is well line, and an extension to the findings of Mayfield and Mayfield (2002) that leaders’ communication strategies affect the commitment and trust of their followers.

According to a recent study (Mok et al., 2015), “stakeholder engagement” has been among the four main researched topics in the stakeholder management literature. The importance of effective communication in ensuring the stakeholder engagement was already found by Bakens et al. (2005). This research extends these arguments (by Mok et al. (2015) and Bakens et al. (2005)) to the change management processes. It was observed that the communication routines in the energy infrastructure project were designed and practiced to maintain the stakeholder engagement throughout the project lifecycle. The lacking focus on communication routines in the dance education facility project resulted in changing stakeholder interest and hence shrinking involvement. Which to our understanding also contributed to the unsupportive project culture and meanwhile neither the change causes and nor their impacts were discussed openly.

Muller and Turner (2010) advised project leaders and practitioners to design the customizable communication routines. Meanwhile, project management literature utilize the stakeholder analysis and identification results to undergird the communication routines. However, this research extends the recommendations of Yang et al. (2011) and Mok et al. (2015) that designing the communication routines through the stakeholder identification and analysis models is not sufficient to ensure stakeholder engagement in the change management process. In this regard, this study supports the findings of Offenbeek and Vos (2016) that stakeholder knowledge is important to establish the stakeholder consensus in difficult situations, for example, arising issues due to conflicting understanding about the change causes and impacts. This study further extends their finding that stakeholder engagement in the difficult situations is more likely if the communication routines are designed by considering their know-how (Teece, 1980) about the project. This is based on the authors’ observations from both the research cases that stakeholder know-how influenced the outcomes of communication routines. The stakeholders with shared experiences were able to maintain the agreed communication routines more consistently and beneficially. Such a shared know-how of stakeholders continued their interest in the project, balanced their power to impact on project decisions, and hence has been a basic element for effective communication routines. Whereas, the varying stakeholder know-how that is often the situation in once in the lifetime projects (like in the dance education facility project) yields a lot of communication with growing misunderstandings about the other stakeholders’ expectations. This varying know-how further leads to lacking stakeholder interest when the project culture is more rational and straightforward. In such project culture, change management processes are influenced by the power of one stakeholder group, whereas the change impacts are barely surfaced (not timely communicated) until their consequences on project functionality are apprehended.

This importance of stakeholder know-how was apparent during project change management in both the research cases. Stakeholders in our first case, energy infrastructure project, had shared know-how, i.e., basic understanding about the
stakeholder engagement (involvement and participation) in the project changes during construction but also to identify change from the project cases will facilitate the practitioners in designing project management practitioners as well. Handful examples management process.

Culture and the stakeholder engagement in the change that if the project leader changes it affects the communication innovative solutions for problems. This study also concludes ment routine and group culture that supported to find communication effectiveness created a clear change manage-
tines and explains their utility through a generic model for demonstration phase. The sub-contractors evidently overlooked the end-user opinions considering their lesser know-how about the construction process. Consequently, one of the authors observed that the project stakeholder meetings became ineffective while the in situ decisions were made, but only outside the meetings. The end users were rarely informed about the project change decisions and could understand the consequences of those informed decisions only inadequately.

6. Conclusion

This research has made notable contributions to the project change management, stakeholder management, and communication management literature. It draws attention to the demand of project change communication that enables getting stake-
holder engagement during project culture changes. This study demonstrates real-world project change communication rou-tines and explains their utility through a generic model for change management learned during the literature review. The two case projects give new insights on how the lack of communication in change situation created later change needs and confusion, and how in a large project the focus on communication effectiveness created a clear change manage-
ment routine and group culture that supported to find innovative solutions for problems. This study also concludes that if the project leader changes it affects the communication culture and the stakeholder engagement in the change management process.

This real-world demonstration is a valuable guidance for the project management practitioners as well. Handful examples from the project cases will facilitate the practitioners in designing their project communication routines not only to implement the project changes during construction but also to identify change causes and their effects throughout the project life cycle. This is possible with a customized but holistic approach towards stakeholder engagement (involvement and participation) in the change management process. Their consideration of stakeholder know-how shall lead to the communication effectiveness during the evolving project cultures.

7. Limitations and future research

We have concluded that this paper contributes the project change management, stakeholder engagement, and communication management literature. However, there are certain limitations of this research that also provide future research opportunities. One such limitation is that real-time empirical data could not be captured for this study but were compiled from the researchers’ retrospective observations and case project repositories. A future research with real-time data recording from few other cases will be very useful to verify and extend the implication of this study. Such a study can also be planned within different case contexts. Such future research can generalize our findings for the project change management and communication management literature.

The lack of research papers that focus on the importance of stakeholder know-how and characteristic of project leader when project communication routines are designed. In this regard, our limitation is related to the retrospective data which could only provide indirect evidences to validate this relationship. We believe that there is a definite need for a dedicated study to understand these relationships and extend its application to the project stakeholder management literature.

Also, we would like to extend the research gap identified by Davis (2016) that there are not only limited examination about “how communication is conducted between the project manager and line management and those at the corporate level,” but the practical demonstration of project communication routines is very rare in the literature. Therefore, literature and practitioners need more contextualized demonstrations of effective communication routines related to the other topics in project management literature for example, uncertainty and risk management.

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