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Chapter 3.

Towards managed structuration: Exploring bridging mechanisms for IS-enabled change in multi-site implementation projects

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Abstract

This chapter aims to enhance our understanding of the bridging mechanisms that underlie IS-enabled change in multi-site implementation projects, and explore opportunities for intentionally shaping such change. To achieve this, we develop and empirically demonstrate the added value of a multi-site practice perspective. The perspective conceptualizes IS-enabled change as a product of the interactions between processes in two related social systems: the project and local implementation sites. We introduce the term bridging mechanisms to indicate three interaction types between the project and local sites that contribute to IS-enabled change: practice alignment, shifting actors, and shared action. Guided by the multi-site practice perspective, we analyze the implementation process of a project implementing IS at three local sites. We make three contributions to the literature. First, by introducing the term bridging mechanisms, the proposed multi-site practice perspective provides a better understanding of how multiple socio-technical sites interact during multi-site IS implementation. Second, the empirical demonstration of the perspective highlights that we should make a distinction between social and technological change, in addition to change at both the project and local sites. Social and technological changes made at the project site help facilitate desired local change outcomes. Third and finally, the empirical demonstration yields three illustrative, practical applications of each of the bridging mechanisms, i.e., bridging tactics, that allow for managed structuration during multi-site IS implementation. These bridging tactics are: 1) applying

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* A shortened version of this chapter has been included in the European Conference on Information Systems 2015 Proceedings and can be retrieved from: http://aisel.aisnet.org/ecis2015_cr/67/.
a modular implementation process; 2) investing time and feedback in order to integrate shifting actors within project and local systems; and 3) facilitating project sustainability by involving local actors through joint activities.

3.1. Introduction

Multi-site IS implementation projects are those that develop (semi) standardized IS and implement these IS at local sites. They thus include a project site in addition to multiple local sites. These projects are increasingly common in IS implementation (Sia & Soh, 2007) and customary to, for example, enterprise software (Van Fenema, Koppius, & Van Baalen, 2007; Markus, Tanis, & Van Fenema, 2000; Pollock & Hyysalo, 2014) and telecare implementation (Barlow, Bayer, & Curry, 2006; Boonstra & Van Offenbeek, 2010).

Many multi-site IS implementation projects face the understudied challenge of generating local change through IS implementation. Such IS-enabled local change can be defined as those re-configurations of the relative distribution of resources between local actors that are the consequence of the implementation of new (understandings of) IS actors. Previous research has highlighted that in order to achieve the desired local IS-enabled change, it is important to explicitly manage the implementation process with careful consideration of the local social context (Elbanna, 2007; Zack & McKenney, 1995). However, in multi-site implementation projects, IS is developed through an interactive process between project actors and multiple local sites (Pollock & Hyysalo, 2014). Then, the particularly difficult part is managing the local integration of IS implementation at multiple sites (Leonardi & Barley, 2008; Lucas, Walton, & Ginzberg, 1988; Sia & Soh, 2007; Wagner et al., 2010b), and by doing so, generate the desired local IS-enabled change.

In order to better understand how multi-site implementation projects enable local change, and to take steps towards intentionally shaping such change, we pose the following research question: When, i.e., through which mechanisms, do multi-site implementation projects contribute to IS-enabled local change? To answer this question, we must go beyond “the local and immediate circumstance surrounding [IS] adoption and use” (Williams & Pollock, 2012, p. 1). Therefore, we extend our analysis to in-
clude IS implementation (with development) in addition to adoption. We propose a 
multi-site practice perspective on IS implementation that considers both the process 
of IS development and its embedding within existing local practices, enabling (or 
constraining) change at local sites.

This study contributes to the literature in three ways. First, it develops a theoretically 
grounded multi-site practice perspective. This perspective explains how multiple 
sites interact during IS implementation, and enables a better theoretical under-
standing of these interaction processes that recognizes the important material as-
pects of IS implementation (Greenhalgh & Stones, 2010; Johnston, 2001; Pentland & 
Feldman, 2007; Stones, 2001). We introduce the term bridging mechanisms to de-
scribe the mechanisms that underlie different forms of interaction between project 
and local sites. We identify three such mechanisms: practice alignment, shifting ac-
tors, and shared action. They provide a theoretical underpinning for change man-
agement strategies previously indicated in the literature. Second, the empirical 
demonstration of our model highlights that both project and local sites are changed 
during the implementation process. Social and technological changes (Leonardi, 
2009; Leonardi & Barley, 2010; Williams & Pollock, 2012) made at the project site 
facilitate the desired local change outcomes. Thus, in addition to social and techno-
logical implementation, scholars need to consider project and local change. Finally, 
the empirical demonstration provides examples of practical applications of each of 
the bridging mechanisms, i.e., bridging tactics. We propose three theoretically 
grounded bridging tactics that managers can apply to manage the local change out-
comes of IS implementation. By doing so, we open the way for managed structu-
ration.

The rest of the chapter is organized as follows. We draw on the IS structuration lit-
erature to develop a multi-site practice perspective and introduce bridging mecha-
nisms. We explain how bridging mechanisms differ from those mechanisms identi-
ified within single site implementation studies, such as action alignment (Barley, 
1986; Black, Carlile, & Repenning, 2004) and technology-in-practice (Orlikowski, 
2000). In an embedded case study, we examine how bridging mechanisms are enact-
ed in practice through the analysis of a multi-site IS implementation project. In the 
discussion, we highlight the theoretical contributions of including bridging mecha-
nisms in multi-site implementation research, and argue how they can be used to inform managerial bridging tactics to generate IS-enabled local change.

3.2. Theorizing on change in multi-site implementation projects

To enhance our theoretical understanding of IS-enabled change in multi-site implementation projects, we develop a multi-site practice perspective. This perspective allows us to identify three mechanisms for IS-enabled change between project and local sites that we call bridging mechanisms. In the following section, we investigate recent calls within the multi-site IS implementation literature to adopt a more holistic view of the multi-site implementation process. Then, we discuss the theoretical grounding and key elements of the perspective. Finally, we introduce the term bridging mechanisms to refer to the interactions between project and local sites proposed by the multi-site practice perspective.

3.2.1. Social and technological elements of multi-site IS implementation

In response to technology-deterministic perspectives on multi-site IS implementation projects (Adam & O’Doherty, 2000; Parr & Shanks, 2000; Sumner, 2000), recent discussions have highlighted the need to better understand the interactions between project and local actors (Howcroft & Light, 2006; Keil & Carmel, 1995; Pollock & Hyysalo, 2014). Such studies have shown that misfits between technological features and organizational structures and needs (Lucas et al., 1988; Ragowsky & Somers, 2002; Soh, Kien, & Tay-Yap, 2000) have important organizational implications. For example, Boudreau and Robey (2005) showed that users may resist the use of implemented IS, or reinvent the way the technology is used, thus leading to unanticipated change outcomes. Resolving misfits is no easy task because the list of factors that can influence misfits is long (Fraiha, 2014; Hong & Kim, 2002; Markus et al., 2000; Hirt & Swanson, 1999). Moreover, misfits that occur at one organizational level can resolve misfits at other levels, and over time, fits can become misfits, and vice versa (Maurer, Berente, & Goodhue, 2012).

To better understand the mechanisms that create and resolve misfits, scholars have focused on the social dynamics that underlie IS implementation. These studies highlighted the importance of organizational learning (Van Fenema et al., 2007; Lyyt-
ennen, Newman, & Al-Muharfi, 2009), organizational identity (Pollock & Cornford, 2004), institutional logic (Berente & Yoo, 2012), interpretation of mandates (Chae & Poole, 2005), power issues (Howcroft & Light, 2006), and negotiation processes (Scott & Wagner, 2003; Wagner & Newell, 2006). Sabherwal (2003) analyzed coordination mechanisms, i.e., standards, plans, formal mutual adjustment, and informal mutual adjustment, that may be applied to resolve misfits, the relative importance of which may shift over time (Nurmi, Hallikainen, & Rossi, 2005). Studies focused on the social dynamics that underlie multi-site IS implementation make a valuable contribution by bringing to the fore power relationships, routines, and identity issues, and explaining how these social aspects shape the implementation process. However, these studies also tend to neglect the (socially constructed) role of IS (Shepherd, Clegg, & Stride, 2009), and thus provide a partial explanation for IS-enabled local change.

In order to further enhance understanding of IS-enabled change in multi-site IS implementation projects, it has been suggested to acknowledge both social and technological elements of the implementation process (Elbanna, 2007; Lytyinen & Newman, 2015), and highlight the role of the technological artifact (Orlikowski & Iacono, 2001). Williams and Pollock (2012) provided two suggestions for such research within the multi-site implementation literature. First, they argued that analyzing the role of technology in multi-site IS implementation projects requires to “follow technologies through space and time” (p. 15). That is, first, to trace “the long-term development of packaged systems both prior to and after their […] implementation” (p. 15). Second, in order to understand social dynamics during the implementation process, the evolution of an IS needs to be studied in relation to the multiple actors involved (Williams & Pollock, 2012). In line with Leonardi (2009) and Leonardi and Barley, (2010), Williams and Pollock suggested that technological and social change are linked and should not be analyzed in isolation. Adopting a holistic, process-oriented approach to multi-site IS implementation by following the interactive socio-technical process through which IS is developed and implemented, allows a better understanding of the underlying power structures (Leonardi & Barley, 2010) as well as IS-enabled local change.

Empirical studies that adopt such a holistic perspective are rare. To the best of our knowledge, only Pollock and Hyysalo (2014) adopted such perspective to analyze how
a software vendor enrolled key customers in selling a given product, and by doing so, shaped a new reference user role. Whereas studies do often suggest that technological and social changes are linked, they have rarely made these linkages explicit, and a thorough investigation of the role of the technological artifact is often lacking (except for Leonardi, 2009; Pollock & Hyysalo, 2014; Williams & Pollock, 2012). We believe that such an analysis can extend our knowledge of interactions between multiple actors (i.e., project and local actors) throughout the full implementation process because it helps us identify bridging mechanisms for change in interactions between project and local actors. In the next section, we provide a theoretical grounding for such a perspective.

3.2.2. Theoretical grounding: locating the material in IS structuration

What is missing in the multi-site implementation literature is a process-oriented perspective, including both social and technological elements, on what allows for local IS-enabled change. We draw on Greenhalgh and Stones (2010), Johnston (2001), Pentland and Feldman (2007), and Stones (2001) to fill this gap and develop a multi-site practice perspective. These authors combined the process-oriented IS structuration literature (Barley, 1986; Giddens, 1984; Orlikowski, 2000) with insights from socio-material literature. The theoretical foundations and insights of studies within each of these literature streams are in themselves valuable to IS literature. Structuration theory unravels what happens in the “translation” (Callon, 1986) between virtual structures and the physical world through the analysis of situated actions and practices. In addition, the socio-material literature analyzes social and technological interrelationships. This literature is particularly insightful when conceptualizing humans in relation to the objects that exist within the physical world, by ascribing agency to both. The theoretical foundations of the IS structuration and socio-material literature streams share important common elements and have the potential to enrich each other’s insights (Greenhalgh & Stones, 2010; Johnston, 2001; Pentland & Feldman, 2007; Stones, 2001). Combining key elements from the IS structuration literature with understandings from IS socio-material studies requires us to centralize 1) action, 2) interaction between actions and practices, and 3) the contingent nature of these processes (Pentland & Feldman, 2007). Doing so allows a detailed account of the relative contributions of both human and IS actors within
project and local practices that change local structures. Moreover, it allows an assessment of what allows for IS-enabled change within multi-site implementation projects. IS-enabled change is then defined as those re-configurations of the relative distribution of resources between local actors (both human and technological) that are the consequence of the implementation of new (understandings of) IS actors.

3.2.3. A multi-site practice perspective

We now introduce the multi-site practice perspective and elaborate on its key elements and the connections between these elements (see Figure 3.1; Appendix B provides a list of definitions). The perspective includes two site types. First, the project site, i.e., the change agent site, is the site where the development and implementation of IS is executed and managed. Second, the local site, i.e., the change recipient site, concerns the site where IS is implemented (based on Armenakis & Harris, 2009). Moreover, both sites consist of three levels: structural, physical, and practice. First, the structural level includes the socio-technical structures drawn upon by project and local actors. These structures are defined as rules and resources (Giddens, 1984), i.e., actors’ shared understandings about the relative distribution of resources among actors. Actors at each of the sites may draw upon distinctly diverse social structures, and thus perform and understand their actions through diverse combinations of reflections, rules, and resources. This is referred to as social multidimensionality (Boonstra & Van Offenbeek, 2010).

Second, the object level consists of human and IS actors. We follow the suggestions of Greenhalgh and Stones (2010) and Pentland and Feldman (2007) to argue that humans and IS can both be considered actors (Law, 1992; Latour, 2005). An actor is an entity capable of performing action (e.g., humans can build connections with others, a computer screen lights up by the push of a button). This is a departure from earlier conceptualizations of technology as a structure (Orlikowski, 1992), or as mediator for the enactment of structures (Orlikowski, 2000).

Although human and IS actors can both be defined as actors, this does not mean that they are the same. To begin, although human and IS actors both consist of particular combinations of material and non-material parts, the nature of these parts is fundamentally different. Whereas IS actors consist of hardware (material) and codes, for example, software or files (non-material) (Faulkner & Runde, 2013; Leonardi, 2010),
human actors are composed of living bodies (material) with thoughts and emotions (non-material). Moreover, whereas the particular organization of the material and non-material parts allows both human and IS actors to access a range of resources (e.g., knowledge and abilities), the type of resources available to them is again different. On one hand, IS actors draw on performative resources for their actions. Performative resources determine how and when an action is conducted (based on Feldman & Pentland, 2003; Pentland & Feldman, 2005; 2007), and the action based on these resources is reactive. On the other hand, human actors can draw not only on performative, but also on ostensive resources. Ostensive resources refer to situated understanding of the rules, i.e., the why behind the how and when of an action (Feldman & Pentland, 2003; Pentland & Feldman, 2005; 2007). Thus, action based on ostensive resources is reflective, an ability unique to human action. Conceptualizing the differences between human and IS actors in this way helps us better understand the relative roles of both types of actors during the implementation process.

With respect to the relationship between human and IS actors and socio-technical structures, we follow Faulkner and Runde (2013), who argued that human actors collectively assign a function to an IS actor. This function is therefore “community-relative.” However, in order for an assigned function to be sustained, the particular organization of the material and non-material parts of the IS actor need to allow the performance of that function. For example, for 26 years, 3.5-inch floppy disks were used to transfer data from one computer to another. However, as file sizes increased, they became less suitable for performing this function (Fletcher, 2007) and were replaced by CDs, USB-sticks, and more recently, the cloud. Faulkner and Runde (2013) considered a collectively assigned function as a type of social rule, and therefore, part of the social structure. The question remains how human actors assign a function to an IS actor. The answers can be found within the practice level elaborated on next.

Third, between the structural and object level, linking them, is the practice level, which comprises situated practices (Orlikowski, 1996; 2000). Situated practices are the recurrent “embodied [resource] mediated arrays of […] activity centrally organized around shared practical understandings” (Schatzki 2001, p. 2). Therefore, we understand situated practices as those that consist of related, socially meaningful actions. Here, actions entail the enactment of resources by an actor. The mutual relationships between these actions are established through interactions between them.
(Barley, 1986; Leonardi & Barley, 2010) (e.g., there is a relationship between pressing a key on the keyboard and a character appearing on the screen). Practices constitute the link between the structural and object levels within sites (Orlikowski, 2000). The structural level allows and constrains practices similar to the way a particular distribution of resources among actors allows for a range of optional actions and excludes others (Giddens, 1984; Stones, 2001). Depending on the situation, an actor can thus choose to perform, or embody (Schatzki, 2001), different actions. In turn, these actions can reinforce or change pre-existing structures, while producing actors simultaneously. With the production of actors, we refer to the production of resources available to an actor (e.g., a person’s actions downloading an application can affect the set of resources available to that person’s phone: in this example, an application is added, thus allowing it to perform a new range of activities), which may or may not affect actors’ material features (e.g., hardware development). This briefly summarizes how practices link structures and physical actors.

In summary, we have outlined the key elements of the multi-practice perspective. We defined multi-site IS implementation as consisting of two types of sites, i.e., the project and multiple local sites. Each of these sites has a socio-technical structure that enables and constrains action. At each site, human and IS actors perform related, socially meaningful actions enabled by the structure. Taken together, we label these actions and their mutual relationships as “practices.” In the next section, we go one step further and explore the possibilities for interaction between sites.

3.2.4. Bridging mechanisms

When project (e.g., the project manager or developed software) and local actors (intended user groups, pre-existing hardware) jointly engage in the IS implementation process, interactions also occur between project and local sites. Whereas the current multi-site IS implementation literature underlines the relevance of the interaction between project and local actors to generate IS-enabled change (Howcroft & Light, 2006; Wagner et al., 2010b), it remains relatively silent on the mechanisms for the IS-enabled change that underlay these interactions. Even when mechanisms have been considered (e.g., Sabherwal, 2003), it remains unclear where to position these mechanisms within the wider implementation process, and how these mechanisms relate to social and technological elements. To fill this gap, we introduce bridging
mechanisms. In the next sections, we theoretically deduce three such mechanisms: practice alignment, shifting actors, and shared action. Bridging mechanisms allow a more systematic understanding of when IS implementation enables local change, and thus the possibilities for intentionally shaping such change, i.e., managed structuration.

First, practice alignment relates to the negotiation process (Wagner et al., 2010b) that shapes meaningful relationships and boundaries between the practices (Mørk, Hoholm, Maaninen-Olsson, & Aanestad, 2012) of project and local actors through recurrent interactions between those practices. The alignment between project and local practices is different from the alignment of actions within a single practice (e.g., action alignment [Barley, 1986; Black et al., 2004]) because it includes the possibility that practices at one site, e.g., the project site, enable a new enactment of resources at another site, e.g., the local site. Moreover, how the local actors make sense of the practices they observe at the practice site differs from the way the project actors that

Figure 3.1. A multi-site practice perspective on IS-enabled change (with the bridging mechanisms in bold italic)
enact the practice make sense of it because both actors draw on different sets of ostensive resources.

Second, **shifting** actors refers to human or IS actors that participate in both local and project practices, and thus shift between actor groups. Pollock and Hyysalo’s (2014) conceptualization of a reference actor seems to refer to a local actor that shifts to the project site. Indeed, Pollock and Hyysalo (2014) showed that such shifts enable change as reference actors 1) build tradable knowledge; 2) help construct the IS as an object of consumption for others; and 3) construct close affiliations with vendors and others.

Third, **shared action** refers to a particular action that is part of two or more practices, thus creating an overlap between those practices. Shared action is different from multiple actors performing the same action within a single practice (e.g., technology-in-practice [Orlikowski, 2000]). Although the action is performed jointly by project and local actors, how human actors at both sites make sense of the action in relation to the wider practice to which they belong might differ. For example, in the context of a multi-site implementation project, project and local human actors might jointly formulate the IS requirements. However, whereas project actors might understand this action as a way of increasing the likelihood of project success, local actors involved might want to better understand and influence the implications of IS implementation on existing work practices. Over time, project and local human actors might develop a shared understanding of the action relative to other actions. This is the basis for shared practices and the emergence of hybrid structures that connect the previously separate project and local structures.

Having outlined the multi-site practice perspective and suggested the theoretical possibility of bridging mechanisms, we now explore how these bridging mechanisms are enacted empirically through an embedded case study. The method and result sections elaborate on this analysis.

### 3.3. Methods

#### 3.3.1. Case selection

To explore how bridging mechanisms are enacted empirically, we conducted an embedded case study. The selected case is a government funded project implementing
IS within a societal context, targeting older adults at three villages (population <600) in the Netherlands, i.e., three local sites. For the analysis of bridging mechanisms the societal context is particularly appropriate because the villages are relatively autonomous. Such decentralized control tends to problematize the implementation process (Lyytinen and Newman, 2015) and thus increases the necessity of creating bridging mechanisms in order to establish local change. Moreover, the absence of managerial pressure and sanctions to participate in IS implementation at the local sites eliminates some alternative mechanisms to establish change. From a societal perspective, considering the rapid world population aging (United Nations, 2013), and the frequent calls to develop IS to support this aging population (e.g., Ambient Assisted Living Joint Programme, 2012) studying IS implementation among older populations is increasingly relevant.

The selected case met all four criteria for the joint analysis of practice and alignment processes within multi-site projects (Leonardi & Barley, 2010). First, we analyzed both IS development and local adoption in order to consider how pre-existing power structures shape the IS implementation process, including the available IS. When we started data collection in the beginning of 2011, the project interventions, including the selection of IS applications, were still rather vaguely defined. There was a formal project proposal and planning, but also the realization that this proposal had to be adjusted to fit local realities. This setting provided us with an excellent case to assess both the development of IS and its local adoption, thus enabling local change. Moreover, Wagner et al. (2010b) argued that the less focused on an ideal solution sites are, the more likely it is that they will negotiate a successful way of implementation.

Second, by including both the project and local sites in the analysis, we were able to assess the relative contribution of multiple actors to the implementation process that brought about IS-enabled change. In our case, the actors involved were distinguishable at the project or local sites. At the project site, organizations had adopted a formal role in the project team, board, or advisory council. Formal partners included: representatives of the three municipalities in which the project occurred, the joint association of municipalities in that region, the provincial rural community association, an IS provider, a patients' interest group, an older adults' interest group, and the regional university and university hospital. At the local sites, and on a more i-
formal notice, the boards of the community centers, community political interest groups (dorpsbelangen), a 55+ association for older adults, and the villages’ older adults (roughly defined as aged 65 and above) became actively involved in the project.

Third, we adopted a longitudinal approach, which is necessary for observing subsequent and interrelated practice and alignment processes at and between multiple implementation sites.

Finally, we compared the three villages targeted by the project as multiple local sites. The villages were selected by the three participating municipalities, and were comparable in the sense that they had a population of less than 600 people; limited service availability; and were located within 15 kilometers of the same commercial center that provided a wide range of facilities. Variations in the local project’s implementation process at the embedded sites highlighted the role of contextual factors. The combination of these methodological characteristics made our case study particularly well suited for demonstrating multi-site practice perspective (Leonardi & Barley, 2010).

3.3.2. Operationalization

An overview of all key elements in the multi-site practice perspective and their conceptual and operational definitions are provided in Appendix B. We distinguish between human and IS actors at both the project and local site by considering human actors at the project site to be people either employed by the project or an official member of one of its bodies. At the local sites, village members were involved with the project, for example, members of the target population or a community leader. IS actors included all IS involved in the project and/or local practices, as well as the IS developed during the implementation project, i.e., a care management tool “Online-Contact,” local support tool “Noaberschap,” library service, and online bread delivery service.

We operationalized the bridging mechanisms, practice alignment, shifting actors, and shared action, as follows. Shared action occurred when multiple people involved at both the project and local sites performed the same social behavior together. Practice alignment occurred through interactions between project and local actors doing
different activities. Finally, shifting human actors is conceptualized as project managers hiring local people, not only to device user requirements, but to shift between local and project practices while organizing and managing local IS implementation. Shifting IS actors is operationalized as the implementation of an IS at a local site, during which ownership over the (part of the) technology shifts between local and project actors.

3.3.3. Data collection and analysis

We collected multiple types of data. The first author attended nearly all official meetings within the project between January 2011 and June 2014. These included project team meetings, board meetings, advisory council meetings, and local sounding board meetings in each of the three participating villages (an overview of the attended meetings is included in Appendix C). During these meetings, research notes were made to complement the meeting minutes. When appropriate, the meetings were audiotaped. In addition, we participated in project activities at each of the local sites, went through email communication between the project actors, and collected newspaper articles regarding the project published in local newspapers.

We analyzed the data by selecting the key events and interventions per local site, and placing these events and interventions within multi-site practice perspective. We explored the bridging mechanisms that could be identified per site. Doing so provided us with a comparable overview of how the IS implementation process developed at each of the local sites. Finally, we compared the local sites in a cross-case analysis.

3.4. Results

3.4.1. Description of the implementation project

The project selected for this case study aimed to facilitate the implementation of IS applications that provide wellbeing services as well as other services. This implementation should enable older adults to live independently, increase social cohesion within the participating villages, i.e., local sites, and include the most vulnerable. Implementation was supposed to be realized by appointing a project leader and local project employee. After three years local adoption should be independent from project support.
The project ran from early 2011 to December 2013, in three local sites each with a population below 600 (Statistics Netherlands, 2014). The formal project planning (see also Appendix D) dictated six sub-aims of the main project aim. The project needed to establish a local organizational structure, which included 1) involving village members in the project by setting up local sounding boards, and 2) hiring project employees. In addition, 3) a need investigation had to be conducted to determine the IS services to implement. Then, the IS service had to be developed and implemented. This implementation was supposed to include three more parts: 4) hardware to be implemented at the community center, possibly equipped with newly developed software; 5) newly developed software to fulfill local needs; and 6) ten tablets per site as personal technology. Although hardware implementation was successful at local sites 1 and 2 (but not at local site 3), software development was considerably delayed. Moreover, way the project aim was operationalized changed after the needs investigation revealed that older village members desired a place and occasion to meet. Therefore, in addition to IS implementation, the notion of “meeting each other” became a central project theme. In addition, the needs investigation showed that the elders and lowest educated subgroups in the older population were more likely to be non-adopters. IS illiteracy was widespread among these groups. To ensure that the project would not exclude these older adults, it decided to provide tablet courses. The project aimed to make the project induced changes sustainable. This program planning required interaction between the project and various local actors, ranging from older adults as the intended users, to community leaders.

Whereas the project ran relatively smooth at local site 1, it encountered significant problems at local sites 2 and 3. In the next sections, we describe the interactions we observed between project and local processes during the implementation process. Then, we analyze and compare how the interactions between local and project actors at each of the three local sites relate to the three bridging mechanisms: practice alignment, shifting actors, and shared action.

3.4.2. Description implementation process at local site 1

After a first project presentation, the village members from local site 1 were not convinced of the feasibility of the IS implementation project (1)\(^7\). This initial misalign-

\(^7\) In brackets, the local events and interventions numbered in Figure 3.2
ment between project and local understanding began to resolve after the village developed a community vision in May 2010 that prioritized organizing activities for older adults (2). The formulation of this goal, the changed project focus (7) resulting from the needs investigation (3) and the project support to refurbish a room in the community center (4) increased the willingness among the community center board and the local interest group to cooperate with the implementation project. The project appointed a local project employee, who had lived in the village most of her life and was well known by many of its members (5). The project employee organized several activities as a form of practice alignment, thus creating regular interactions between project and local practices. These activities included weekly informal gatherings, monthly informative gatherings (8) and a tablet course (9a). The informal gatherings attracted approximately 10-15 people each week (of the 82 people aged 65 or above living in the village), and the turn up at information gatherings was usually higher. In addition, two tablet courses were organized for older adults without computer experience. The older course participants received a tablet from the project for a small compensation (9b). After the tablet course ended, a local village member volunteered to set up a monthly “ICT helpdesk” during the informal gatherings (10). In the summer of 2012, a personal computer (PC) and beamer, co-funded by the project and community center (11a), were installed in the community center (11b). As the projects’ software development was considerable delayed in all three villages (6), the project manager encouraged local software development initiatives. During the next year, three locally developed software applications were introduced (12) and abandoned (13), i.e., a library application in cooperation with the library, a bread delivery service in cooperation with a bakery, and a local IS developer from local site 3 developed “Noaberschap,” a web-based application for offering and requesting neighborly help. These software implementation initiatives developed from shared actions between project and local actors, whereby local actors were initiating and feeling responsible for the development and implementation of software. None of these applications were used frequently, though the process did lead to closer cooperation with the local school (14). At the end of the project, project management and local stakeholders organized a brainstorm session (15), and the continuation of the projects’ activities was discussed. After the brainstorm, volunteers took over the
Figure 3.2. The implementation process at local site 1

Change outcomes
- Continuation of informal and informative gatherings
- Continued involvement of sounding board and local project employee
- Locally developed software was abandoned
- Project software was not implemented
- Continued use of PC and beamer in community center
- Continued use of tablets

Initiated by
1. Project presentation
2. Village vision

Locally developed software was abandoned

Continued use of tablets
Continued use of PC and beamer in community center
Continuation of informal and informative gatherings
Continued involvement of sounding board and local project employee

Time
2009 2011 2012 2013 2014

Event
Intervention
Practice alignment
Shifting actors
Shared action
Action alignment

= Event
= Intervention
= Practice alignment
= Shifting actors
= Shared action
= Action alignment
organization of the informal and informative gatherings (16), and the ICT helpdesk was continued (10). From a technological perspective, though, only some of the formal project objectives were met.

3.4.3. Description implementation process at local site 2

Similar to local site 1, there was an initial lack of enthusiasm for the project at local site 2 (1). In particular, the active members of a local foundation of older adults felt threatened by the project because it targeted the same population of older adults catered by the foundation. This feeling was expressed during a meeting with the later-appointed project manager in April 2011 (2). Ironically, the changed project focus “meeting each other” (3, 5) strengthened the perception that the project would compete with the local older adult community because the proposed project activities showed considerable overlap with the community’s activities, at least in the eyes of its members. Because of the community member concerns, the informal and informative gatherings were not implemented by the project. Because of health problems and job shifts, the project had considerable problems appointing a project employee at local site 2 (6-8). Eventually, a social worker was appointed who started organizing tablet courses for older adults without computer experience (9), much similar to local site 1. A local computer expert and active organizer of local computer (i.e., PC-based) courses for older adults offered to provide the classes along with the project employee (10). This was one of the first active local contributions to the implementation process, i.e., local attempts to practice alignment. Moreover, the local computer club started advanced-level tablet courses (12). The project employee brought key local actors together in a task force to jointly implement “Noorderschap” (13a, 13b). Because the personnel changes delayed the implementation process, the project actors decided to extend the project at local site 2 by six months until June 2014 (11). This allowed the software developed by the project, i.e., OnlineContact, to be tested at local site 2 (14). The application is an agenda that patients and (in)formal caregivers can share to coordinate care activities. The test showed multiple technological difficulties with the software.

* In brackets, the local events and interventions numbered in Figure 3.3
Figure 3.3. Implementation process at local site 2
3.4.4. Description implementation process at local site 3

Unlike the other sites, local leaders at local site 3 were relatively positive about the technological solutions initially suggested by the project (1), and slightly disappointed when they realized at kickoff that the initial project ideas and the IS supplier had changed considerably over the course of time (2). During a workshop in October 2011, actors at local site 3 were fed back the initial results of the needs investigation (3), and invited to brainstorm with the project management regarding potential technological and non-technological solutions (4). Although project actors intended to engage in shared action with local actors, local actors were reluctant to take on the role of active participants. It was believed that decisions regarding the project focus and planning were the responsibility of the project experts. This reluctant attitude forced the project actors to take initiative and develop an adjusted project focus and planning based on their own interpretation of the need investigation results (5). The adjusted focus and planning were presented (6). A local project employee was appointed in September (8) who had lived in the village her entire life. The project employee started organizing informal and informative gatherings (9). However, the finalization of the project employee’s contract proved problematic because it was unclear which organization involved in the project would be the official employer. By the time the contract was finalized, the relationship was damaged and the project employee abandoned her role as project actor (10). An external conflict manager was appointed by the project to assess the situation and propose ways forward during Summer 2012 (11). This did not stop a local IS developer from designing and developing a local web-based application, i.e., “Noaberschap” (12). The community hardware presented by the IS supplier during kickoff was not used, and thus removed (13). Eventually, although the conditions of the project employee to continue her job were not met, she decided to continue her work for the project organizing gatherings and implementing “Noaberschap” (14). However, the relationship between the project employee and the project remained problematic (15). When the project ended, along with her employment status, the former project employee continued to organize the informal and informative meetings, albeit under a different name and not before she publicly distanced herself from the project (16).

* In brackets, the local events and interventions numbered in Figure 3.4
Figure 3.4. Implementation process at local site 3
3.4.5. Case analysis: bridging mechanisms and change outcomes

In the descriptive part of the results section, we observed diverse interactions between project and local actors. In Figures 3.2-3.4 we conceptualize these interactions as bridging mechanisms, including practice alignment, shifting actors, and shared action. Table 3.1 explains how the interactions were categorized as particular bridging mechanisms and compares them per site. With this, we empirically demonstrate the relevance of bridging mechanisms. In addition, we found that the extent to which these mechanisms are present differs among the local sites, affecting change outcomes (see also Appendix D).

We found four instances of practice alignment. First, at all three local sites the project conducted a needs investigation to better understand how the project aims matched local needs and current practices. Second, based on the results of the needs investigation the project decided to organize a number of social activities, i.e., informal and informative gatherings, and a tablet course, which were not originally incorporated in the project planning. Only at local site 1 all social activities were implemented. At the other two sites implementation was hindered by pre-existing local structures (local site 2) and a problematic relationship between the project and the local project employee (local site 3). Third, the project organized local meetings at each local site to inform local actors about the project progress. Finally, at local site 1 the project made arrangements with local institutions such as the community center and the local school to enable the embedding of the project within local structures.

Furthermore, we observed four types of shifting actors. First, at both local site 1 and 3 a local project employee was appointed, i.e., a human shifting actor. Although the local project employee at local site 1 continuously shifted between local and project roles, the local employee appointed at local site 3 eventually distanced herself from the project after considerable misalignment in project actions, e.g., a delayed contract. In addition, three types of IS shifting actors were introduced: community hardware, personal hardware, and project and locally developed software. Although the community hardware at local site 1 and the tablets at local sites 1 and 2 were successfully implemented, local actors abandoned the project and locally developed software. This meant that both some human and IS actors stopped shifting and restricted themselves to the local and project domain respectively.
### Table 3.1 Bridging mechanisms per local site (in brackets, the associated local events and interventions numbered in Figures 3.2-3.4.)

<table>
<thead>
<tr>
<th>Practice alignment</th>
<th>Local site 1</th>
<th>Local site 2</th>
<th>Local site 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understanding local practices</td>
<td>Need investigation is carried out, resulting project changes are well received (3)</td>
<td>Need investigation is carried out, resulting project are perceived as a threat (3)</td>
<td>Need investigation is carried out, resulting project changes are well received (3)</td>
</tr>
<tr>
<td>Organizing suitable activities for local actors</td>
<td>Informal &amp; informative gatherings (8,10) Tablet course (9a)</td>
<td>Tablet course (9a,10)</td>
<td>Informal &amp; informative gatherings (9,14)</td>
</tr>
<tr>
<td>Local project presentations</td>
<td>Although the pre-presentation is not received well (1), later presentations are well attended</td>
<td>Although the pre-presentation is not received well (1), later presentations are well attended</td>
<td>The pre-presentation (1) is well received, making it at times difficult for the project to legitimize changes (6)</td>
</tr>
<tr>
<td>Making agreements with local institutions</td>
<td>Project provides budget to refurbish the room used by the project (4) Project involves local school in activities (14)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shifting actors</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project employee</td>
<td>Local project employee is appointed (5)</td>
<td>Local project employee is appointed (8,10,11,15)</td>
<td>Local project employee is appointed (8,10,11,15)</td>
</tr>
<tr>
<td>Community hardware</td>
<td>PC and beamer are installed (11b)</td>
<td>Specialized hardware are implemented and later removed (2,13)</td>
<td></td>
</tr>
<tr>
<td>Personal hardware</td>
<td>Tablet course participants buy tablet (9b)</td>
<td>Tablet course participants buy tablet (9b)</td>
<td>Locally developed software is implemented (12b)</td>
</tr>
<tr>
<td>Software</td>
<td>Locally developed software is implemented (13)</td>
<td>Project and locally developed software is implemented (13a,14)</td>
<td>Locally developed software is implemented (12b)</td>
</tr>
<tr>
<td>Shared action</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared responsibility in formal structures</td>
<td>Sounding board is established (not numbered) Library and bread delivery service are developed (12) Joint hardware selection (11a) Joint brainstorm on project continuation (15)</td>
<td>Sounding board is established (not numbered)</td>
<td>Local actors are not willing to invest (4) &quot;Noaberschap&quot; is developed (12a)</td>
</tr>
<tr>
<td>Joint software development</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint activities</td>
<td>Joint implementation of &quot;Noaberschap&quot; (13b)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Joint hardware selection (11a) Joint brainstorm on project continuation (15)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Local change</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social change</td>
<td>Continued involvement of sounding board and local project employee Continuation of implemented social interventions</td>
<td>Continued involvement of local project employee Continuation of implemented social interventions</td>
<td></td>
</tr>
<tr>
<td>Technological change</td>
<td>10 tablet course participants complete tablet course Continued use of implemented community and personal hardware</td>
<td>10 tablet course participants complete tablet course Continued use of implemented personal hardware</td>
<td></td>
</tr>
</tbody>
</table>
Moreover, we found occasions where project and local actors engaged in new forms of shared action. In these cases, shared action was legitimate from both project and local perspectives, although the meaning assigned to it might have differed between project and local actors. For example, at the start of the project, local actors at sites 1 and 2 engaged in sounding board meetings, where project and local actors worked together in a formal structure. At local site 3, these meetings were soon discontinued. Next, at local site 1 and 3 local actors closely collaborated with project actors to develop software, i.e., a library application, a bread delivery service, and “Noaberschap”. In other occasions, project and local actors joined forces to organize activities. At local site 2, for example, local and project actors set up a local taskforce to organize an event with the goal of drawing attention to the new “Noaberschap” application, and the wider socio-political context that inspired the application’s development. The brainstorm meeting at local site 1 is another example of a shared action.

Finally, we observed that IS-enabled local change emerged through bridging mechanisms. Whereby the presence of bridging mechanisms is a necessary, but not a sufficient condition to establish local change. Moreover, social and technological changes at the project site enabled new bridging mechanisms between project and local sites, which resulted in additional local change. This is illustrated in Appendix D. The appendix shows the project aim and six sub-aims defined in the project proposal. We tracked what happened to each of the sub-aims at the local sites and found that bridging mechanisms were necessary to enable and sustain IS enabled local change. For example, at local site 1, the brainstorm session (shared action) led to a list of tasks that needed to be taken over and a list of local actors willing to take on these responsibilities. This assisted local volunteers to become organized and start managing the former project interventions (e.g., informal and informative gatherings). Moreover, the brainstorm session helped to sustain previous initiatives enabled through practice alignment, such as the locally initiated ICT helpdesk. In addition, the joint selection of the PC and beamer at local site 1 (shared action) ensured that the implementation was sustainable, i.e., the shifting IS actor became an integrated part of the local context. In contrast, a lack of bridging mechanisms seemed to obstruct implementation. For example, at local site 2, the lack of practice alignment hindered the implementation of the project’s social interventions (i.e., informal and
informative gatherings), and restricted activities to a tablet course and software implementation. At local site 3, the problematic relationship between the project actors and local project employee, i.e., shifting local actor, limited the project’s technological interventions to the “Noaberschap” software implementation, which was largely abandoned. Clearly, this was not the local change initially envisioned by the project actors.

Moreover, Appendix D shows that the project underwent considerable social and technological change. For example, two new project sub-aims emerged over time as a result of practice alignment enabling social and technological changes within the project. The emerging sub-aims related to the inclusion of informal and informative gatherings and tablet courses. These activities, in turn, became additional examples of practice alignment and induced considerable social change at the local sites. Moreover, initial sub-aims were occasionally reinterpreted by project actors to better match the local contexts. Especially, the prioritizing of personalized hardware over community hardware enabled shifting of IS actors and led to local technological change at local sites 1 and 2. Older adults who participated in the tablet course took their tablets home and continued to use them (see table 3.2). Thus, social and technological change at the project site enabled new bridging mechanisms between project and local sites, which resulted in further local change.

Table 3.2. Changes at the project site

<table>
<thead>
<tr>
<th>Domain</th>
<th>Changing from:</th>
<th>To:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technological</td>
<td>• Community hardware</td>
<td>• Increased relative importance of personal tablet technology, which is then complemented with community hardware if appropriate</td>
</tr>
<tr>
<td></td>
<td>• Software focus is on external service delivery</td>
<td>• Software focus is on local service and information exchange</td>
</tr>
<tr>
<td></td>
<td>• IS supplier A</td>
<td>• New IS supplier B, in addition to formalized local IS development initiatives</td>
</tr>
<tr>
<td>Social</td>
<td>• Focus on (predominantly) technological interventions</td>
<td>• Including (predominantly) social interventions in addition to (predominantly) technological interventions to establish IS-enabled local change</td>
</tr>
</tbody>
</table>

3.4.6. Case analysis: towards managed structuration

Taken together, the three bridging mechanisms, practice alignment, shifting actors and shared action, enabled social and technological changes both at the project and local sites. In turn, occasionally these changes affected subsequent interactions between project and local actors, and eventually enabled local change. We observed
project actors attempting to actively and intentionally build structural patterns of interaction with local actors in order to establish sustainable change through bridging mechanisms. For example, the brainstorm session at local site 1 is an intentional action undertaken by project actors to enable local change. It is also a shared action. These reflective attempts of project actors to engage with local actors in order to make implementation successful are the first steps towards managed structuration.

However, the process towards managed structuration is demanding for project actors. We observed that it involved considerable social and technological change at the project site (Table 3.2 and Appendix D). For example, the role of IS within the project changed considerably. While the initial project idea centered around community hard- and software making external services locally accessible, over time, increased attention was given to personal technologies, i.e., tablets, service, and information exchange between local actors, and IS literacy. In addition, the project switched IS suppliers and involved local software developers. Related to social change at the project site, we observed that the aim of locals meeting each other became an integral part of the project's interventions, signaled by the inclusion of social interventions such as the informal and informative gatherings and the tablet course. Because the project sub-aims and practices changed to adjust to the local sites, social change is accompanied by technological change and vice versa.

Nevertheless, tension remained between incorporating the general needs of older adults and adjusting project interventions to the specific circumstances at each local site. This meant that not all initial misalignments could be resolved. Moreover, a particular change within the project site might smoothen the implementation process at one site, yet disrupt it at another. For example, whereas organizing local gatherings was extremely effective at local site 1, it made local actors at local site 2 more defensive against the project. By considering these new understandings and unforeseen circumstances, project actors aimed to increase the effectiveness of their more or less standardized interventions within the particular local context. Although the initial misalignment with the local site practices were not resolved completely, the project actors managed local concerns during local sounding board meetings (shared action) through selective implementation of social and technological interventions (practice alignment), and introducing more advanced technology (i.e.,
OnlineContact, shifting IS actor) at local site 2 that did not require social intervention.

3.5. Discussion

This chapter conceptualized “what goes on inside” IS-enabled change processes (Iveroth, 2011) within multi-site implementation projects. We developed a multi-site practice perspective in order to better understand the bridging mechanisms through which multi-site implementation projects interact with local actors, and by doing so, contribute to IS-enabled local change. The perspective addressed two concerns in the multi-site implementation literature. First, we embedded the multi-site IS implementation process within its wider context by 1) the joint analysis of the practices enacted by project and local actors; and 2) considering practices, actors, and socio-technical structures. Second, we clarified the role of IS by conceptualizing it as an actor, albeit of a different nature than human actors. We demonstrated the added value of our perspective through an embedded case study. Our findings suggest that bridging mechanisms are a necessary condition for IS-enabled local change, and they showed that their enactment was facilitated by project change. Moreover, we observed how bridging mechanisms took shape in managerial practices, i.e., in bridging tactics, which are discussed after the theoretical implications.

3.5.1. Theoretical implications

With the multi-site practice perspective and the introduction of bridging mechanisms, we contributed to the literature by bringing together known change interventions in one perspective of multi-site implementation projects. It addresses calls to embed multi-site implementation projects within the complex socio-technical systems to which they belong (Iveroth, 2011; Winter, Smith, Morris, Cicmil, 2006). The perspective allows the positioning of different interaction types between project and local socio-technical systems through bridging mechanisms. Moreover, the perspective allows a better understanding of the cohesion between these mechanisms. We found that bridging mechanisms are usually a consequence of reflective action, and require changes at the project site to allow change at the local site (in line with Leonardi & Barley, 2010; Lyytinen & Newman, 2015; Williams & Pollock, 2012).
The first bridging mechanism presented in this study entailed the alignment of practices between project and local sites. This practice alignment triggered new patterns of local interaction, for example, through the organization of a range of gatherings. However, the way practices were aligned differed for each local site, which is problematic to multi-site implementation. To overcome the tension between standardization and customization (Larsson & Bowen, 1989) in multi-site IS projects (Gann & Salter, 2000), a modular implementation approach emerged that included not only IS-based interventions, but also social interventions. Depending on the local situation, project and local actors determined the interventions to include and exclude. For example, at local site 1, social gatherings were supplemented with a tablet course and IS implementation; local site 2 included only a tablet course and IS implementation; and local site 3 comprised only social gatherings. This points to the possibility of tailoring a standardized socio-technical approach through service modularization (Voss & Hsuan, 2009).

With regard to the shifting actor mechanism, we argue that local knowledge brought in by shifting actors can be used to develop and implement context sensitive interventions (Pollock & Hyysalo, 2014). Shifting actors resemble existing principles, such as linking pins (Likert, 1961, 1976), circularity in responsibility (Ackoff, 1989), and double-linking (Romme, 1997), because those are also mechanisms for linking organizational groups. Shifting actors have double roles both at the project and local site, e.g., “employee and villager” or “product and service.” Findings show that maintaining these double roles is a complex and challenging process. For shifting human actors, this requires considerable flexibility from both the project practices and the local actor. Moreover, shifting IS actors is often hindered by non-adoption, i.e., lack of integration into local practices. However, when shifting actors can manage their double roles, they are in a unique position to “translate” and “relate” (Iveroth, 2011) actions across sites.

Another way to stimulate IS-enabled local change is through shared action, as happened at local site 2 where a local task force was formed to manage the introduction of a particular IS, including project and local actors. Such shared action is related to user-developer communication, user participation, and user influence (Bano & Zowghi, 2014; McKeen, Guimaraes, & Wetherbe, 1994; Ives & Olson, 1984; Robey & Farrow, 1982), but it is not the same. Such action requires us to conceptualize “us-
ers” not as “those using IS,” but as “local actors” that recognize their embeddedness within a particular socio-technical context (Lamb & Kling, 2003). For example, while jointly organizing events, project and local actors would draw upon different sets of ostensive resources to make sense of these activities. Moreover, in shared action, project and local actors are equals not just in terms of taking initiative, but also in terms of having responsibilities and interests. Thus far, and to the best of our knowledge, such contextualized user involvement perspective was missing (Bano & Zowghi, 2014; He & King, 2008).

Finally, our empirical findings underline that, indeed, social and technological change concur (Leonardi, 2009; Leonardi & Barley, 2010; Williams & Pollock, 2012). However, in the context of multi-site implementation projects, technological change is not limited to the project site, and social change is not restricted to local sites, as sometimes seems to be implied. Instead, we observed project actors making changes to both social and technological elements of their practices in order to better match the local socio-technical context. Likewise, IS-enabled local changes included both social and technological elements. The multi-site practice perspective presented in this chapter considers both social and technological change in multiple systems, and thus combines the social-technical with the project-local dimension.

3.5.2. Managerial implications

The empirical demonstration yielded examples of possible practical applications of each of the bridging mechanisms, which we call bridging tactics. Managers can apply these theoretically grounded bridging tactics to shape the multi-site implementation change process through the informed manipulation of project-local interactions, i.e., managed structuration. We lay out the three possible bridging tactics as practical applications of practice alignment (i.e., modularization), shifting actors (i.e., integration), and shared action (i.e., joint organization). First, in order to align project practices with local practices while minimizing appropriation costs, managers can consider a modular implementation approach. Such an approach allows for both standardization and flexibility. Incorporated modules could include IS-based and social interventions, and should be developed in close consultation with reference users (Pollock & Hyysalo, 2014). Second, managerial attention can be directed at the integration of shifting actors within project and local systems. Such integration is likely
to require investments in time, flexibility, and feedback. Finally, shared action could be established by facilitating joint activities organized by both project and local actors. Such shared activities may help to engage local leaders with the project, which eventually can help to make project outcomes sustainable. Ideally, in these joint activities, project and local actors share not only decision power, but also responsibilities.

3.5.3. Limitations and future research

We acknowledge the following two limitations. Although we argue that bridging mechanisms could be observed in any multi-site implementation project, the specific characteristics of our empirical case may have highlighted particular interactions and downplayed others. Therefore, for future research, we suggest the application of our perspective to other project management contexts. Moreover, where we distinguish between two sets of practices, i.e., project and local practices, previous literature has shown that there might be more than two relevant stakeholder groups, and thus, sets of practices, involved in multi-site IS implementation (Bob-Jones, Newman, & Lytinen, 2008; Boonstra & Van Offenbeek, 2010; Lyytinen & Newman, 2015). We encourage future research to analyze how more complex notions of multi-site IS implementation, i.e., allowing for three or more actor groups, could enhance our insight into dynamic inter-group practice interactions.