Too Much or Not Enough: Information Systems Integration in Post-merger Context - A Sociomaterial Practice Perspective

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Abstract

During the post-merger integration phase (PMI), new information systems (IS) that span the boundaries of the previously independent organizations need to be implemented to enable a specific level of integration. Although the literature emphasizes the important role played by ISs in support of the amalgamated organizations, there is a lack of studies on the issue of boundary management at the information technology (IT) level in a PMI context. We draw on a sociomaterial practice perspective to analyze two IS implementation projects in a healthcare organization resulting from a merger of previously independent hospitals. The results suggest there is a dilemma of post-merger IT integration versus autonomy, which is reflected by the unpredictability of the implementation’s outcomes for the ISs designed to enable planned practices. The model also suggests that post-merger practices reflect the outcomes of dialectic processes of resistance to, and negotiation of, the IS configuration during its implementation.

1. Introduction

Despite introducing major organizational changes and the consequences that come along, mergers are an important strategic tool for achieving business growth and repositioning [1, 2]. At the end of 2011, global mergers investment represented approximately $1,000 billion (a 32% increase over 2010) [3]. Given the sums involved in mergers, it is critical for organizations to actually attain the expected synergies – i.e., the actual net benefits in terms of reduced cost per unit and increased income – sought from this effort [4].

The literature defines post-merger integration (PMI) as being a phase in which the merging organizations try to create the value identified in the pre-merger financial and strategic analyses [1]. This transition period is often beset with emerging problems, such as high levels of stress, job dissatisfaction, and resistance to the merger among employees [4]. Research on PMI reveals that when organizations try to manage differences among the merging parties, they face the dilemma of integration versus autonomy also called the issue of boundary management [1]. This refers to how much integration of, and autonomy among, the merging organizations is needed to achieve the potential identified synergies. A number of researchers have addressed this dilemma by proposing four ideal-types of integration approaches based on strategic and organizational dimensions [5]. Absorption occurs when one party requires the other parties to adopt its practices, norms and culture. Preservation occurs when status quo is preserved in each organization. The approach is symbiotic when the merging parties are gradually combined while encouraging operational interdependence and a common culture. Finally, transformation occurs when an organizational structure and work practices (best practices) new to all parties are implemented.

The literature suggests that information technology (IT) is a decisive enabler in helping organizations achieve merger expected synergies [6]. A recent McKinsey study suggests that 50-60% of the expected value from a merger is dependent on post-merger IT integration [7], defined as the process of change of five distinct but complementary IT resources: IT infrastructures, IT applications and data, IT human resource management practices, IT vendor management, and IT strategy-making practices [6]. The integration of IT applications and data often entails the implementation of new ISs to span the boundaries of the previously independent organizations [2]. These systems in turn enable the implementation of new practices, i.e. the coordinated activities of individuals or groups within their work context [8]. Practices are usually embedded in configurable information systems (CIS) [9], a set of software modules in which default data parameters, provided by the software manufacturer, must be adapted to satisfy local requirements.

Organizations often realize the practice logics embedded in their CIS are incompatible only once the system is implemented and users begin to resist, as they can no longer carry out their legacy practices. This forces some organizations to engage into a lengthy
process of negotiation and may result in substantial customizations of the system [10]. The professional literature on PMI suggests that when significant post-merger IS-enabled changes in practices are envisioned, it is more difficult for users to adopt the new ISs, which increases the integration challenge. For instance, when Nokia merged with Siemens in 2007, it realized that reaching post-merger synergies was dependent on implementing a common set of IT applications [11]. The new ISs needed to support a new set of organizational practices with one common backbone and one value chain system, which was a transformation PMI approach. At the time of the merger the two companies used non-standard systems. Facing dramatic changes in practices, organizational members built up resistance at the outset of the PMI phase. The management was able to successfully implement the new ISs only after employees were encouraged to take initiatives during the PMI process. Although this and other practitioners’ reports identify the challenges of implementing ISs to support post-merger business processes, the academic IS literature on PMI does not mention the existence of a dilemma of integration versus autonomy at the IT level. Instead, research focuses either on identifying strategies for integrating the merging entities’ IT resources [12, 13] or on analyzing the alignment of the post-merger IT resources with the business needs [6, 14].

Our study aims at providing an in-depth examination of the dilemma of integration versus autonomy that can have an impact on post-implementation configurable IS adoption in PMI settings. With this in mind, we focus on two research questions: (1) Is there a boundary management issue of how much integration ISs need in PMI settings? and (2) How are post-merger practices embedded in configurable ISs? To this end, we draw on a sociomaterial practice perspective [15] to explain the outcomes of two CIS implementation projects in a healthcare organization resulting from the merger of three previously independent hospitals. We focus on the CIS functionality by examining the practices that these ISs were supposed to enable after their implementation.

2. Theoretical background

2.1. Post-merger Dilemma of Integration versus Autonomy

Researchers have addressed the issue of boundary management in PMI by proposing integration approaches based on the extent of change in the merging parties’ business processes and structures [1, 16]. While most of the extant empirical studies on the PMI phase provide interesting insights into post-merger success factors, they tend to offer “either/or” solutions: that is, for one given pre-merger type of combination, there is only one type of integration approach [5]. However, other researchers have observed that in some mergers, the combined organization adopts multiple types of integration approaches [17, 18]. This line of research emphasizes the fact that PMI is a complex and delicate process that cannot be fully understood by considering single integration approaches in isolation. These studies promote two main ideas. The first is that the issue of boundary management should be dealt with by simultaneously providing different multi-level integration approaches that will ensure a certain degree of organizational autonomy for some business units, yet provide an environment that enables the sharing of work practices and knowledge with other business units, if required [18]. The second is that the boundaries to be managed should be defined not only in terms of the differences between organizational structures, but also in terms of the differences in information systems [19] or work practices [17, 18].

2.2. Sociomaterial practice perspective on post-implementation IS adoption

As mentioned earlier, PMI must be supported by ISs to enable a specific level of integration. However, implementing ISs is not a straightforward task and it tends to be even more difficult in a merger context, considering the different objectives and cultural identities of the combined organizations. While initial use is an important indicator of IS success, the desired managerial outcome is not attained unless usage continues [20]. In the literature, this phenomenon has been termed post-adoption usage, IT usage, IS continuance, or post-implementation IS adoption, to name a few. To complicate things further, not all usage are created equal and it has been said that IT, even when suited for the task at hand, can be used as to circumvent the initial objectives of the implementation [21] and in non-conformity to the original spirit of the project [22].

Research on post-implementation presents it as part of a stage maturity model (e.g., [23]), studies the critical factors that lead to its success (e.g., [24, 25]), the way to maximize benefits from, and continuous improvement of implemented ISs [26, 27], and the effects of post-implementation behaviours [28, 29]. This research has been mainly concerned with large and complex systems such as enterprise resource planning (ERP) systems and, according to Kim and Son [30], has been mainly conducted in intra-organizational settings.
In recent years, post-implementation studies have mainly adopted an organizational imperative perspective, focusing on human agency, viewing technology as a social production and overseeing its material element [15]. This is possibly a sign of the time as many organizations are now going through system upgrade or replacement [26] and academics and practitioners are now aware ISs are in no way silver bullets [15]. Whether they are using causal models, case studies or contingency models, most articles consider the actions and decisions of stakeholders within organizations as mainly responsible for the observed effects, a perspective also known as organizational determinism [31].

A number of researchers have recently been calling for a new perspective in which the material and the social intermingle to form IT-enabled practices [32, 33], described as sociomaterial. Following this line of reasoning, in this study we adopt the view that the IT (material) and the social (human agency) can be reconciled by conceptualizing them together instead of separately [34].

A sociomaterial perspective provides a way to understand how meanings and materialities are indistinctly associated and have an impact on practices [32]. The concept of sociomaterial assemblage [34] illustrates this constant agency shift between the material (IS) and the social (practices performed by the organizational members). In this view, an IS represents a sociomaterial assemblage or arrangement that “emerges from practice and defines how to practice” [33: p. 279].

The introduction of a configurable IS (CIS) designed to cut across pre-merger boundaries between merging entities alters the existing sociomaterial arrangements within those entities. A CIS is developed based on the belief that a collection of functionalities can be extrapolated from general to particular settings. In this sense, configurable software is often seen as providing universal or global solutions and embedding best practices [35]. However in PMI context, the business rules underlying CISs cannot take into consideration all of the local practice idiosyncrasies. In terms of the sociomaterial practice perspective, the dynamic relationship between organizational actors and ISs is reflected in practices and is referred to as performativity. This is a dialectic process of resistance and accommodation that produces unpredictable reconfigurations of the sociomaterial assemblage [33]. Despite the fact that professional-based communities are usually considered global, they tend to promote practices that have a local character based on an organizational context [36]. This is to emphasize the fact that there are always differences even when organizational members are supposedly engaging in the same practices. Thus, by focusing on performativity, we are able to examine how CISs are reconfigured to create agreed upon post-merger material and social arrangements.

3. Methodology

We adopted a theory building from case studies approach [37] with theoretical replication logic [38, 39]. We chose two retrospective cases representing two successfully implemented CISs within one organization that was engaged in the process of post-merger integration. The selected organization was the MQ Health Centre (MQHC), a large Canadian hospital. The cases were compared and contrasted on three dimensions: type of business process enabled by the implemented CIS, initial integration approach, and final integration approach. Consistent with a sociomaterial practice perspective, we analyzed practices over time to identify how material and social assemblages were produced and reproduced during the implementation of the systems. To this end, we interviewed 23 key stakeholders, mainly project implementation committee members (i.e. department managers, IS professionals, project managers, clinicians) who participated in the implementation of the two ISs. The identification of the interviewees followed a snowball sampling procedure. The semi-structured interviews were supplemented by archival documents, which offered a source of triangulation for the themes that emerged from the interview data. Interview questions focused on understanding, from the participant’s standpoint, the history of the two IS implementation projects, episodes of resistance, negotiations, and practice accommodations and differences in IS’ functionalities between the initial and the post-implementation phases of the project. When no new information was revealed during interviews, data collection was terminated. Archival sources included post-mortem project documentation (system support documents, final reports, and team members’ emails) and other organization documents (strategic planning presentations).

The interview data were analyzed in an iterative process [37] by cycling between data, emerging themes, and relevant literature. We used the case narratives for within-case and cross-case analyses. During within-case analysis, themes emerged from the data. During cross-case analysis, cases were compared to identify similarities and differences between them. Coding was a two-phase process. In Phase 1 we built a provisional list of codes prior to the interviews. Most of the initial coding categories were based on the three theoretical constructs introduced in the previous section: practice, performativity, and reconfiguration.
In Phase 2, the interview transcripts were introduced into a database, read carefully and relevant portions were marked as evidence. This allowed us to identify episodes of resistance, followed by negotiations from which CISs were reconfigured to accommodate practices at MQHC. The final configuration reflected a mix of industry standards and local idiosyncrasies.

4. Findings

The MQHC is the result of a ‘merger of equals’ of three large independent teaching hospitals: two Adult hospitals, the Downtown and the Midtown, and the Paediatric hospital. While the term ‘acquisition’ refers to the purchase of a target organization for absorption into the acquiring organization, in a ‘merger of equals’, merging parties are considered full partners and when PMI approaches do not reflect the pre-merger promises, the result may be dissatisfaction and distrust [16]. The MQHC merger was initiated in 1998 with the clear goal of creating a mega-hospital that would provide 21st century health care by implementing a business model for care management based on best practices. Because of the expected magnitude of the business process redesign, keeping legacy systems was considered to be an ineffective cost option. The implementation of new work practices could only be accomplished with a single set of IS. Thus, in 1999 the management identified a list of prioritized integration projects among which were an enterprise solution for the ambulatory care patient scheduling, and a laboratory system that would integrate the services across the three hospital sites. According to archival strategic documentation, the planned MQHC approach at the outset of the PMI phase was consistent with a transformation approach.

4.1 Case 1 - Patient Scheduling Information System (PSIS)

Designed for management of a wide array of ambulatory care information, including appointments, registrations, attendances and waiting lists, a PSIS is a configurable IS. Prior to the merger, the three ambulatory services were using three different legacy systems that were not able to provide adequate patient-related statistics. The development of the new system started in 1998 and was the result of a collaborative effort between an MQHC project team and Delta, the company that was chosen to develop the PSIS. Members of the project team were the three managers from the ambulatory services (Downtown, Midtown and Paediatric), each using a different set of ambulatory practices based on pre-merger hospital-based norms. In early 1999, the system was implemented at the Paediatric site to be evaluated by the end of the year. During this period, the Paediatric manager insisted to have the new system configured to become compatible with the old Paediatric site’s work norms.

In early 2000, the upper management realized that after two years of PMI, while the main administrative functions were fully integrated, the clinic-administrative services were integrated only on paper. The Paediatric site had kept their clinical independence and within the Adult sites, some departments were preserving their old practices. At the Downtown site, where patient appointment scheduling reservation practices in clinics were based on several DOS-based systems, users found the change to PSIS very difficult since the new system was a Windows- and mouse-based application. Also, the organizational structure at the Downtown site was very different from the one at the Midtown site. Departments within the hospital pursued different practices; many of them were using their own charts and viewed switching to PSIS – with its ‘corporate feel’ – as an obstacle to delivering efficient patient care. Department heads at both hospitals felt resentment at being ‘forced’ to change departmental practices. In this context, upper management was expecting the implementation of the PSIS at the Adult sites to be a huge challenge.

In 2003, the implementation of the PSIS at the Adult sites was completed. While the planned PMI transformation approach involved the implementation of a new set of administrative practices, at the end of the PSIS project, the ambulatory services were presenting two different sets of practice: one that preserved its old norms (Paediatric) and another, at the Adult sites, reflecting a mix of industry-based practices and local idiosyncrasies. Thus, the resulted PSIS functionality revealed a blend of preservation and transformation and was different from the planned configuration (transformation).

4.1.1. Within-case analysis. Theme 1: Planned PMI practices and the project context. At the outset of the project, there were three site-based set of practices: Midtown, Downtown and Paediatric.

“We discovered that the way the clinics work at one hospital versus another was very, very different [...]” (Midtown-manager)

On the one hand, the management’s imposition of new practices was justified:

“We had a bunch of ‘rinky dinky’ little systems that were often DOS-based. It was clear that this was a requirement that we had to have some kind of a common system” (Midtown-manager)

On the other hand, the upper management did not communicate to the user community within the
ambulatory clinics that the new system would be a unique IS for the ambulatory services at the MQHC. This is illustrated by the following comments:

“The message was not given appropriately that this is an enterprise-wide, mandatory activity”
(Downtown-manager)

At the outset of the project, the ambulatory services managers were aware that the outpatient clinics’ staff was not ready for change and that the upper management did not try to ‘sell’ the potential benefits of the new system. The evidence confirms that this had created a negative impression, especially on the physicians:

“At the adult sites certain doctors didn’t want to have the system, they have a different kind of environment, it wasn’t like you take one system and you replace with another because they didn’t have a system.” (Paediatric-manager)

In these conditions, project team members realized that the initial configuration for the new system imposed a sociomaterial assemblage that was different from the pre-merger social and material arrangements:

“So if you work in Clinic A on Monday and I have to stamp this paper, two labels and a Medicare. Tomorrow they shove me in another clinic, I have no idea because that doctor, he wants three labels, the Medicare instead of putting it like this, it should be like this. Everyone wants their own way”
(Downtown-manager)

Theme 2: Resistance and Accommodations.
Resistance at the outset of the CIS implementation indicated that negotiation might be necessary if the PSIS were to be adopted across the boundaries of the MQHC sites. This is reflected in the Paediatric-manager’s remarks:

“There’s nothing worse than implementing a new system and losing functionality of the things you had before. How do you sell it?”

Misalignments between the initial design of the CIS and daily practices were observed in all three sites. One of the team members remembers when she started visiting the clinics she would hear all the time that:

“You are implementing the system at the Midtown… you’re implementing at the Downtown… Paediatric… well, we do things differently at the hospitals… you can’t apply anything that you’ve applied anywhere else here. We need to be distinct.”
(IS-specialist)

Our data analysis suggests that different perspectives of what constitute post-merger new practices between upper management, the Paediatric-manager and the two managers for the Adult sites necessitated negotiations and eventual accommodations. Being the representative of the Paediatric’s clinics and based on clinics’ staff comments, Paediatric-manager started the negotiation on how to reconfigure the system’s functionality to accommodate pre-merger specific procedures. For instance, she gives the example of a divorced mother:

“You have convictions about the way certain things should function or not such as confidentiality of information. For example, ‘I’m calling, I’m in the middle of a divorce, and I don’t want my husband to know my phone number’. So how do you block that information? Should you put it confidential? So for us it’s a huge issue. On the Adult side, not so much.”
(Paediatric-manager)

During the negotiation between the Paediatric-manager and the two Adult sites managers, tensions emerged.

“[Downtown-manager] wouldn’t let go. She couldn’t understand why we needed that, and at one point it was like, look, I’m going to get it for the [Paediatric], whether you understand or not”
(Paediatric-manager).

Thus, to remedy Paediatric-manager resistance, the other managers accepted that the PSIS at the Paediatric site be configured to accommodate most of the pre-merger practices. The system was successfully deployed at the Paediatric site, but mostly reflecting practices of clinics in a standalone healthcare institution. The upper management realized that they needed to implement the PSIS at the Adult sites with a different configuration that would reflect the planned PMI approach. This involved some accommodations that would appease the users’ resistance to the new PSIS. During the implementation at the Adult sites, the team members (now without the Paediatric-manager) negotiated with the clinics’ staff by proposing changes based on ad-hoc improvisations to the existing system configuration that would enable some local contingencies.

“I was definitively a salesman. We chose clinics where we would end up with more champions and power users who then would be able to network with their people. We had to meet with the doctors, convince them, then their secretaries. What we did was we started finding ways of tweaking the system to do things that it had not originally been intended to do.”
(Midtown-manager)

Theme 3: System Reconfiguration and Resulted Practices. The reconfigurations involved the introduction of functionality that was not initially included in the CIS package. However, the system was flexible enough to allow these modifications/additions.

“It was just you could take the system and you could just have people do with it what it was designed to do. Or you can get creative, work the system and morph it to give people more than what the system was designed to do”
(IS-specialist)

These accommodations resulted in practices reflected by a sociomaterial assemblage that was workable.
within the Adult sites. However, the PSIS was configurable up to a certain point.

“We got a very good basic appointment booking tool, but you know it’s still not what we wanted.” (Manager-Midtown); “We have to make everybody understand that we can’t build the system that responds to every clinic… there’s only so much flexibility you can put in a system” (Downtown-manager)

4.2. Case 2: Laboratory information system (LIS)

In 2002, upper management decided to acquire a configurable system to provide common best practices for its unified Laboratory departments. The system, developed by company Kappa, was based on industry standards and provided flexibility to accommodate, to a certain degree, idiosyncratic practices. The role of an LIS in a hospital is to automate laboratory clinical, financial and managerial processes and to enable lab staff to maintain accurate tracking, processing and result recording, while avoiding lost and misplaced specimens. In order to better supervise the implementation work of the project team, a Clinical Advisory Committee (CAC) was set up. Its role was to make key decisions regarding the project scope and direction. The CAC included representatives from the upper management and lab physicians. Prior to the start of the system implementation, the three lab services were asked to standardize their practices (lab request workflow). Even though the typical lab workflow (scanning barcodes that include laboratory number, patient identification and test destination – hospital department/physician) seems to be forthright, each of the three lab services was using different sequence steps and different legacy ISs.

After almost three years of reconfiguration, testing and implementation, the new LIS was put into production at Downtown in 2005, followed by Midtown and Paediatric at the beginning of 2006. While the initial design was based on best practice standards, the final system configuration revealed a blend of industry standards and local contingencies. Therefore, the resulted LIS functionality reflected a mix of transformation and preservation PMI approaches.

4.2.1. Within-case analysis. Theme 1: Planned PMI practices and the project context. At the outset of the project were the same three site-based set of practices: Midtown, Downtown and Paediatric.

“There were three different databases for each site, Paediatric, Midtown and Downtown. There were just so totally different, you know, order entry, the way they process, even in the way that they did the basic workflow.” (Lab Tech-Midtown)

The need for a unique set of lab practices was clearly conveyed by the upper management to the laboratory clinicians:

“Not only do they [management] count they’re going to start using the same system, but the system will work the same way for all of them. Suppliers are not going to develop a specific need for a specific site.” (IS-manager)

The evidence suggests that resistance emerged right from the project outset due to the new CIS imposing a new sociomaterial assemblage upon the lab clinicians. This set up a need for negotiations and adaptations if the new LIS were to be adopted and used by the labs user community.

Theme 2: Resistance and Accommodations. At the start of the project, the mindset of the clinicians reflected site-related work norms as a result of the existence of the three sets of practices for each laboratory unit. This situation is described by an interviewee:

“There was very little cooperation from the physicians that were on that committee [CAC]. So you would have physicians from the Midtown and Downtown coming to visit us and try to get their feet in the system and put their mark.” (Lab tech-Downtown); “I knew that there was going to be some resistance from the various departments. Just like you know the people that are in the department, and who want to be the ‘top dog’ and who wants to have the last say.” (Paediatrics-physician)

The evidence shows that after a slow start in which clinicians tried to preserve their pre-merger practices, the upper management started to put a constant pressure on the lab physicians that the system configuration process needed to speed up. Thus, the CAC members realized they had to agree on common standard procedures. A process of negotiations followed and compromises ensued.

“There would be some shouting matches and sometimes we would have to say let’s try it for six months and then see what happens […]. So there’s been times when you’re trying to get a site to change and there were heated discussions, and sometimes we decided to leave it alone, depending on how important it was to change.” (Midtown-physician)

Our data analysis suggests that the negotiation process resulted in accommodations that enabled emergent sociomaterial assemblages. While trying to advance the project, the physicians from the Clinical Advisory Committee were showing commitment to the lab user community:
“We do syphilis tests, about 100 a day. So this is just one test in a typical day a microbiologist has to sign out. So at the beginning, I’m laughing because they would have to click each individual syphilis results. I was getting calls, ‘this is impossible!’ because you could be here until eight o’clock at night doing the results. Finally I called one of the IS specialists who figured it out that we could verify it without doing a hundred clicks. So what normally would have taken about two hours of signing, it took ten minutes now.” (Downtown-physician)

Theme 3: System Reconfiguration and Resulted Practices. While neither the upper management nor the lab user community reached their goals - the former to impose new practices and the latter to keep its pre-merger workflows - the new sociomaterial arrangement gained enough support from both sides to reach a stable environment:

“What we did is that there are some different clinical practices we allowed, but we tried not to make too many because it’s too difficult to keep on with quality.” (Midtown-physician)

However, in a CAC post-implementation report it was mentioned that every task performed with the new LIS was taking more steps and time to complete than before with the old system. Workload had increased, secretaries and technicians were working a maximum amount of overtime, and doctors were not receiving reports in a timely fashion. Some were doing workarounds to get their job done.

“We thought that there was one way of working with the system, common to all the sites. But a year after the implementation [2007], we did a follow up. We found out that some people were expressing their concerns about the functionality and we found out that they [lab staff] resolved it. But they didn’t tell anyone about this. So we found out that there were some different practices … workarounds depending on the problem.” (Lab-manager)

4.3. Cross-case analysis

Cases were compared to investigate the similarities and differences between them in terms of themes and then research propositions were offered.

4.3.1 Planned PMI practices, resistance and accommodations – Our cross-case analysis revealed that in both cases the PMI approach adopted by the THC (transformation) involved the imposition of new practices and shaped the context of the IS implementation projects. Even though in Case 1, management did not have an adequate communication plan to explain what the goals of the new PSIS were to the clinics’ staff, in Case 2, upper management made it very clear that a unique LIS was a key technology in helping MQHC to implement new industry-based practices. The evidence shows that in both cases at the outset of the projects there were three different fields of practice, each defined by historical and patent information management-based norms. Therefore, significant differences were between the pre-merger site-based practices on one hand and between these practices and the new planned practices on the other hand. The case data suggest that different pre-merger sociomaterial assemblages based on common interests, organizational values and identities were at stake. This situation triggered in both cases resistance from the user communities that was followed by negotiations with the management. The resulted arrangements: (1) created the bases for new sociomaterial assemblages around IS-enabled negotiated practices; and (2) undermined the planned outcomes of the adopted PMI approach. Taking into consideration the above argumentation we propose a first research proposition:

P1: During a post-merger CIS implementation, new sociomaterial assemblages embedded in pre-merger practices emerge through a process of dialectic of resistance and accommodations.

4.3.2 System Reconfiguration and Resulted Practices – The cross-case analysis revealed one main observation: in both cases the final configuration of the two CISs was different from the initial planned/proposed system configuration. In both cases, the initial design was supposed to reflect practices related to a transformation PMI approach (new practices). In Case 1, the CIS was supposed to reflect new practices based on industry standards. However, the final functionality was different in the two resulting database instances: one at the Paediatric site reflected a preservation of the pre-merger practices (negotiated by the Paediatric-manager) and another one at the Adult sites reflected a mix of new practices (transformation) and local contingencies (preservation). In Case 2, the members of the CAC negotiated common interests with the labs staff by trying to adapt ‘global’ principles to ‘local’ requirements when possible. The LIS was reconfigured to enable workable new practices (mix of transformation and preservation) that were different than the industry standards proposed by the manufacturer in the initial configuration (transformation). Based on the above argumentation, we advance a second research proposition:

P2: During the post-merger implementation of a CIS, system configurability and existing sociomaterial arrangements affect the final IS functionality, thus enabling different ratios of industry-based and local idiosyncratic practices.
5. A process model of CIS implementation in PMI

Our model is based on two premises. First, IS-enabled change of existing organizational sociomaterial arrangements is met with resistance and the new IS will be accepted and used only through negotiations followed by arrangements. Second, ISs, especially configurable systems, do not have pre-defined structures of their own and can only be defined in relation to the practices of prospective users, or to the business processes and institutionalized values of the organization implementing the technology [40]. We posit that major change processes in organizations, such as PMI, can be explained alternatively or complementarily in a processual manner by four different motors of change: life cycle, teleology, dialectic and evolutionary [41]. In this viewpoint, development of an IS can be illustrated as a process that entails a sequence of individual and collective events and activities unfolding over time. The resulting view of the process tells a rich story by explaining how the dynamics of performativity generate new sociomaterial assemblages, which collectively lead to future action.

The analysis of our case study led us to consider the process of a post-merger CIS implementation project from a single-motor perspective: dialectical. Organizations are complex entities usually comprised of goal-driven individuals whose personal agendas might be incompatible with their organization’s. As opposing individuals interact in an effort to impose their respective goals, organizations may change in response to resolutions of conflicting interests. We therefore infer that the means for driving change is dialectical as change is the outcome of the interaction between opposing forces.

Our model, presented in Figure 1, illustrates the operation of the dialectic motor of change during the process of a post-merger configurable IS implementation. First, we posit that the integration approach decision will reveal existing pre-merger practice-based organizational boundaries. We conjecture that users affected by the IS-enabled changes in practices, will resist system’s implementation. In this context, team members will negotiate and propose accommodations through reconfigurations of the IS during implementation. Thus, the initial functional design of the CIS may be different from the final functionality at the end of the CIS implementation. The resulting dialectic leads to an iterative process of resistance and negotiation of common interests at the boundary, followed by a change of the existing sociomaterial assemblages which reflects a PMI approach different from the planned one.

![Figure 1. A process model of CIS implementation in PMI](image)

In Case 1, management’s decision to implement new practices by imposing a single PSIS, triggered resistance from the clinics’ staff. The ensuing negotiations resulted in new sociomaterial arrangements (preserving practices at the Paediatric site and combining new practices and some pre-merger practices at the Adult sites). In Case 2, management decided to implement a common LIS that caused
resistance from the three lab services clinicians (struggling to come up with a standardized lab workflow). The subsequent negotiations resulted in a workable configurable IS that enabled a common set of lab practices and accommodated some pre-merger practice idiosyncrasies (mix of practice transformation and preservation). Moreover, the lab clinicians were able to use the new LIS in unintended ways which proved to be beneficial to them.

6. Contributions and future research

Our study confirms that there is a dilemma of integration versus autonomy at the IT function level in PMI settings that can be explained by the emergence of unplanned new sociomaterial assemblages during the PMI phase. The MQHC management realized only after the implementation of both CISs that the planned PMI approach did not take into consideration the existing sociomaterial arrangements in the three fields of practice in each of the cases. The literature on PMI suggests that while value creation results from an organization’s ability to integrate practices across the previous organizational boundaries [4], too much integration may render some of those practices useless due to their social and material arrangement context [18]. According to our interpretation of the data, the MQHC management adopted an overall ‘ideal’ integration approach for the new organization by imposing IS-enable new practices. Yet, during the post-merger CISs implementation, it braced itself for a lengthy process of negotiation and trade-offs with the stakeholders of each project, and in time realized that a hybrid integration approach [e.g., 17] might be the appropriate path to take.

Our research makes a number of contributions. First, it introduces the issue of boundary management in the PMI IS literature. Second, it reveals this dilemma through a dialectical motor of change. Third, it contributes to the IS strategy literature in presenting a CIS implementation model that is neither technologically nor organizationally determined, adopting instead a sociomaterial perspective of ISs. Fourth, it demonstrate that negotiated practices are part of a normal course of action in CIS implementation during PMI and that it is therefore preferable not to have a strict ‘ideal’ PMI approach at the outset of a project. This is an important takeaway for practitioners. Finally, the theoretical explanation offered here has the potential for exploring more in depth some of the more complex processes associated with the dynamic relationship between the social and the material in the context of organizational change.

The main limitation of this study might be that it attempts at generalizing only from empirical statements to theoretical statements in developing a process model from case studies [42]. However, it has been shown that statistical, sampling-based generalizability may be an unsuitable goal for qualitative studies [43]. The MQHC cases are built on strong historical foundation and deal with issues of central importance to our research which makes them purposeful [44]. Learning from these cases will now be transferred to other contexts for further refinements.

The dynamic approach of a process model seeks a holistic explanation of an organizational process. We strongly believe that a processual approach is a fruitful choice when viewing IT as an open and dynamic artifact [45] and when drawing on theories such as sociomaterial practice perspective [46].

7. References
