Improving Healthcare Processes through Small-scale Innovations

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Abstract

Business Process (BP) Improvement remains one of the core activities of Business Process Management (BPM) today. It is often expected to result in cost reductions and process efficiency, typically achieved through automation. Research described in this paper focuses on ongoing improvement of healthcare BPs involving knowledge work.

Through an exploratory case study, conducted in a real life organization named “SuperClinic”, this research challenges the underlying assumptions behind process improvement, showing that in the explored case, their “to-be” customer-facing knowledge-intensive processes were made slower and more expensive, yet considered and confirmed to be significantly improved. As these knowledge-centered BP improvement initiatives were implemented through small-scale innovations, by process participants (knowledge workers) themselves this research critically analyses the role of process analysts in this context and offers new opportunities for BPM-related research.

1. Introduction

Business Process Management (BPM), in particular Business Process (BP) Improvement, continue to dominate the most influential business priority lists, as confirmed by Gartner [1]. Even more, the BPM field is rapidly evolving into “the dominant management paradigm of the 21st century” [2].

While BP Improvement efforts may focus on different aspects of the target (“as-is”) BPs, more often than not they are expected to result in cost reduction and improved efficiency i.e. cheaper and faster processes. “A surprising number of firms simply do not get beyond the phase of deploying Six Sigma for cost containment and never reach its true potential…In other words, while the rhetoric may emphasize customer centricity, the action is focused on cost reduction” ([3], pg. 230). This was especially the case during a recent global financial crisis, with more organizations taking up BPM initiatives to reduce operational costs [4].

Regardless of the methodology used, the improved efficiency has been achieved through process and/or task automation, standardization, elimination of non-value adding tasks, automated coordination, task reorganization, role reassignments and so on. The outcomes of these initiatives are then measured by quantifiable measures such as “process throughput”, time spent on each task, reduced waiting time, number of units produced etc. Put together these improvement initiatives are expected to translate into lower operating costs, which in turn drive improved enterprise performance [5].

Consequently, organizations focused on “process efficiency” are likely to perceive the outcomes such as slower or more expensive “to-be” BPs as negative and their improvement project as a failure. Given the fact that BP Improvement is still the main domain of BPM consultants [6], these negative outcomes would be very hard to justify. “In many instances, Black Belts receive bonuses for bringing in the targeted cost savings. This naturally leads to a narrower definition of projects, as that tends to improve the likelihood of completing projects on time and reaching the targeted goals” ([3], pg. 230).

Furthermore, BP improvement projects typically target transactional processes at the operational level. “In the first instance, organizations will address business processes that are routinized, using software solutions for workflow automation” [7]. Due to their highly structured and repetitive nature these processes can be captured by very detailed conceptual models. This in turn, makes the above described cost-cutting improvement initiatives possible to perform in a project-like manner by well-trained process analysts, even with very little contextual knowledge.

However, the last two decades of BPM have resulted in a very high level of BP automation across all industry sectors. Even more, BP automation of transactional processes is becoming ubiquitous with organizations gradually achieving a similar level of efficiency of their routine BPs [7]. Most simple tasks are already automated or soon will be [8]. “The main area of benefit is BPM’s ability to increase the efficiency of a core business process. However, in reality, most processes have already been made efficient over time” ([9], pg. 445).

Consequently, the BPM community is starting to shift their collective attention to more complex processes, especially those that involve knowledge work. “Sometimes the assumption is made that the concepts of process and process management only apply to highly structured, transactional work…Nothing could be further from the truth. The virtues of process also adhere to developmental processes, which center on highly creative tasks, such as product development, demand creation and so on. Process should not be misinterpreted as a synonym for routinization and automation, reducing creative work to simplistic procedures” ([5], pg 11).
The BPs that involve human judgment, either at the task or process level, and require complex unstructured and semi-structured situational decisions are now termed knowledge-intensive. They are increasingly recognized as the most important for organizations today [10]. In fact, “human-driven processes constitute the larger portion of organizational activity, especially in customer services” ([9], pg. 445).

Yet, these processes are not typically the first one to be targeted for possible improvements. “Process improvement has mostly been for other workers: transactional workers, manufacturing workers, people in call centers. All serious approaches to improving work have largely escaped knowledge work” [7]. While in the past knowledge-intensive processes “haven’t really been the focus of most organizations – improving administrative and operational processes has been easier – but they must be in the future” [11].

Even when knowledge-intensive BPs are considered the main focus of the improvement efforts, they often remain on their coordination aspects and process efficiency, as illustrated later in the paper. Tasks involving knowledge and expert work are typically treated as “black-boxes” with improvement efforts structured around them. “Management of production processes focuses on efficiency – reducing time and cost. It is human work that delivers effectiveness, resulting in higher customer satisfaction and (for private companies) market leadership.” ([9], pg. 445).

It is important to acknowledge that any type of BP, even if it involves knowledge work, is expected to benefit from improved coordination and if possible, task automation. However, when it comes to knowledge-intensive BPs, these improvement aspects are still very limited, as they do not leverage the experiential knowledge of process participants. Therefore, any improvement achieved through possible automation of coordination could be considered only as the first but often necessary stage of improvement. This observation leads to an important yet very challenging question for BPM research and practice – What does come next for the knowledge-intensive BPs, after their aspects that should be, are being automated? Even more importantly - How do organizations leverage the knowledge and experience of the process participants to improve their knowledge-intensive BPs?

The research described in this paper focuses on these challenging questions. It sets to explore an interesting case of a customer-facing BP and its ongoing improvement in a healthcare organization that has already reached a very high level of process automation. Through an exploratory case study conducted in a real-life organization here named “SuperClinic”, this research challenges the underlying assumptions behind process improvement, showing that in the explored case, the “to-be” customer-facing knowledge-intensive BPs were made slower and more expensive, yet confirmed to be significantly improved.

As these knowledge-centered BP improvement initiatives came from “within organization”, this research critically analyses the role of process analysts in this context and identifies new opportunities for BPM research.

2. Related work

The healthcare domain has been a very prominent area of BPM research and practice due to its very complex BPs. Providers of healthcare services face very unique challenges as they are required to combine aspects of two very different types of organizations – one run by medical staff and the other by administrators [12]. This in turn creates conflicting requirements for BPM practice in this domain, as process efficiency needs to be balanced with the provision of high-quality patient care.

Healthcare provision involves a whole range of BPs including simple procedural processes as well as complex knowledge-intensive BPs. For example, Lenz and Reichert [13] distinguish between generic process patterns and medical treatment processes. The former type helps to coordinate healthcare processes among different people within and across organizational units. The later are the actual healthcare processes involving domain expertise and complex decisions that need to be made case-by-case [14] on the basis of situational information and expert knowledge. They could be best described by a number of iterative diagnostic-therapeutic cycles [13] consisting of observation, reasoning and action.

Furthermore, these BPs also need to be flexible and human-driven. A human-driven approach differs from human-centric BPs. “Human-centric processes require people to get work done by relying on and interacting extensively with business applications, databases, documents, and in limited ways with other people (such as to obtain approval for a document). Human-centric processes require human intuition or judgment for decision making only as part of individual steps in a routine business process” ([9], pg. 445). On the other hand, human-driven processes, involve collaboration and innovation, and as such, cannot be captured by detailed BP models.

There are many exemplary projects that focus on various aspects of BPs in this domain, including coordination support, collaboration within and across functional units, risk management, emergency care processes and so on. However, even when dealing with knowledge-intensive BPs, the improvement projects reported in the BPM literature tend to follow the traditional BP Lifecycle and focus on process automation and improved coordination, see for example [13], [14], [15] and [16]. Similarly, very recent healthcare literature confirms that more and more providers are now applying the mainstream BP improvement methodologies, some even borrowing
practices from the manufacturing domain, including the well-known “Toyota principles” [17].

In summary, based on a very extensive literature review both in BPM and healthcare, it is possible to confirm that healthcare process improvement efforts are still predominantly focused on cost cutting and improved coordination. In this respect, they are quite similar to the other industry domains, both in services and manufacturing.

Without any doubt, process efficiency, especially improved coordination, is yet to be achieved for many healthcare BPs. However, some organizations are tapping into the knowledge and experience of their employees, creating a new type of BP improvement approaches that cannot be captured by the mainstream BP lifecycle. These approaches could be best described as human-driven and centered around experiential knowledge of process participants.

For example, in order to improve their clinical processes, some healthcare organizations are developing systematic routines for creating, capturing, and disseminating knowledge related to everyday care [17]. Others are training their nursing staff in principles and practices of design thinking, thus giving them tools for ongoing innovation and improvement of their everyday knowledge-intensive processes [18].

These examples support a very strong argument that ongoing improvement of BPs that involve knowledge work needs to come from “within organization” [17] as they are shaped by many factors beyond consideration of the traditional BPM – including the experiential contextual knowledge held by process participants. The research described in this paper adds one more case in support of this argument.

3. Foundation theories

This research adopts a model of process/knowledge continuum described by Harmon [19] as a starting point for an in-depth analysis of participants’ knowledge and its role in knowledge-intensive BPs. This framework, depicted by Figure 1, was originally introduced by Crandall, Klein, and Hoffman [20] but was later adopted by the BPM community to categorize three different types of BPs, on the basis of their knowledge perspective. The framework also distinguishes among three categories of workers (“ordinary” “knowledge workers” and “experts”), based on the complexity of their work and the type of knowledge required.

This framework makes it possible to position knowledge-intensive processes along the continuum as those performed by knowledge and/or expert workers. It is also important to observe a strong co-relation between process complexity and types of decisions involved. While simple procedural processes involve highly structured decisions guided by the organizational policies, at the other end of the scale are highly complex decisions with the decision parameters and possible outputs impossible to capture and turn into detailed process models, due to the tacit knowledge involved [21]. “These are the processes that – given current technologies – are impossible to automate in a cost effective manner. In other words, complex processes challenge our ability to define the specific procedures involved” [19]. Between these two categories are complex processes involving decisions that still require human experiential knowledge.

Harmon also pointed out that the line between what can and cannot be analyzed and automated is dynamic and expected to change in the future towards more automation. “The successful process practitioner will want to stay abreast of where the line is at any point of time to assure that the process he or she chooses to analyze and automate are within the means available at that point in time” [19]. Given the fact that one of the core activities of a process practitioner’s work is indeed process improvement the previous statement implies that their focus should remain, to a large extent, on process automation. However, “unless there is a way to embed a computer into the middle of the work process, experts will be a challenge from the standpoint of structuring work… It is unlikely that expert workers will pay much attention to detailed process anyway.”([10], pg.19).

Previous research shows that rather than automation, knowledge-intensive BPs require different types of improvement that also needs to be knowledge-based (e.g. knowledge-intensive) rather than focused on models [22]. This in turn, leads us to posit that the same process/knowledge continuum could be also used to position/express the improvement efforts at the meta-level to better describe its knowledge perspective.

![Figure 1- A process/knowledge continuum [19]](image-url)
4. Research aims and objectives

Taking a process/knowledge continuum as theoretical lenses, this research focuses on a complex example of customer-facing knowledge-intensive BP and aims to investigate research issues related to its ongoing improvement, beyond automation.

The main research question, used to guide this exploratory research could be stated as follows:

How do organizations leverage employees’ experiential knowledge to improve their knowledge intensive processes?

While the overall project involved a number of research sub-questions designed to explore the main research question from different perspectives, this paper will focus on the following subset:
- Who is involved in process improvement?
- What improvement methodology do they use?
- How do they measure the effectiveness of their improvement efforts?
- Are these improvement efforts also knowledge-intensive by nature?

5. The Case organization

The case organization, here named “SuperClinic” has been one of the leading providers of breast cancer screening and diagnostic services in Australia for more than 30 years. Through its ongoing commitment to excellence in patient care, this clinic has been at the forefront of innovation, in terms of their diagnostic services, medical equipment as well as organizational structure and innovative approaches to patient care.

SuperClinic is a day clinic, currently offering three different types of services called “Clinics”, as follows:
- Screening Clinic offers routine screening to women without any suspicious symptoms.
- Risk Assessment Clinic offers more specialized screening to women with a potentially increased risk of developing breast cancer, due to their family history or other medical factors known to increase the risk.
- Diagnostic Clinic offers a diagnostic assessment to determine the cause of a suspicious change that may be diagnosed as breast cancer.

All incoming patients are streamlined into the most appropriate Clinic, based on referrals provided by their general practitioners. However, their allocation is flexible, because, if required a patient may be “reallocated” to a different Clinic on the basis of their progressive results (e.g. from Screening to Diagnostic Clinic).

Looking from the BPM perspective, the Clinics could be best understood as three different versions (types) of a high-level customer-facing BP, here called “Provision of Screening and Diagnostic Service”. To some extent, all three versions follow the same coordination pattern, with the diagnostic and risk assessment being more complex than the routine screening processes, in term of tasks and people involved. For example, a “Fine needle biopsy” task may be performed in both diagnostic and risk assessment clinics and may involve different roles depending on its complexity (e.g. it may or may not involve a sonographer).

Furthermore, typical high-level “pathways” for three different Clinics are known in advance to a very large extent, based on many years of the accumulated experience in treating different types of patients. These pathways are used for the initial scheduling of staff and patients to ensure that the patient flow is as smooth as possible, medical equipment and specialists’ time are best used - all while keeping the waiting time between tasks as short as possible. However, the initial schedule is flexible and could be easily changed, as required.

Furthermore, regardless of its type, the main objective of each instance of a knowledge-intensive process is to assess each patient and if present, detect and diagnose breast cancer within a single day – all while the patient is still at the clinic. The average time to complete this process ranges from two to five hours.

The whole end-to-end process involves a multidisciplinary team of co-located medical experts that may include: a Radiologist, a Breast Physician and/or Surgeon, Radiographer(s), Sonographer(s) and a Clinic Nurse. Obviously, the size and composition of this team will be different for different types and, if required, it may change as each individual case progresses. After all necessary tests and steps are completed, the multidisciplinary team then correlates all the findings and communicates the result directly to the patient and their referring doctor.

From the patient perspective, this team-based approach is confirmed to significantly reduce very stressful waiting time between appointments, eliminating the need for multiple return visits to various specialists. As all team members are co-located and working together on each instance of the process while accessing a shared repository of electronic records stored for each patient, they all share the same context. This eliminates the need for “hand-overs” from one specialist to another with each having to rely on information provided by another specialist or communicated by their patient, often in great distress. This also eliminates possible errors due to the inaccurate information.

When this team-based approach was first introduced, it represented a significant innovation in health-care processes as coordination, communication and collaboration patterns among all team members and their patients were significantly improved. However, these days this approach is no longer considered to be as innovative, as there are many other providers of co-located health-care services.

Also looking from the patient perspective, another past process-related innovation included a very simple description of all three Clinics posted on their web site and also communicated to the patient at the point of
their admission. The main objective was to help their current and future patients to understand what different Clinics involve in terms of the main tasks and medical procedures. At the time of its introduction, this example was also considered to be very innovative and, as intended, very helpful to their patients, as confirmed by the collected feedback.

6. Research method

In line with the exploratory nature of this research, a case study method was adopted to capture the contextual richness and complexity of the chosen processes [23]. Interpretive research offers an opportunity to understand the phenomena through the meanings that people assign to them [24] in the particular context.

The case organization was selected on the basis of its complex knowledge-intensive BPs, advanced level of process automation, as well as their leadership position in this specialized healthcare domain in this region.

The exploratory case study [25] combined several data collection methods used to gain insights into the chosen BPs from several different perspectives: organization’s and customers’ as well as operational (i.e. process participants’) and strategic (i.e. management).

The primary data collection involved semi-structured interviews with different types of process participants in charge of different types of tasks, both administrative and knowledge intensive. Their management was also interviewed, in order to gain an understanding of the same process form the strategic perspective, especially in terms of their competitive advantage. All interview questions were exploratory, retrospective in nature and designed by the researcher, around the stated research questions. Additional data was collected from their public web site as well as process-related documents given to patients at the time of admission.

Due to the highly sensitive nature of these processes, patients were not approached nor interviewed. The patient data held by Clinic were not accessed and used in any way.

However, the researcher also sought to understand patient perspective as this was very important to fully appreciate the effects of process innovation on patient care. This perspective was captured in two different ways. The first one included collection and analysis of the secondary data including publicly available customer feedback posted on the company’s web site. Even though this feedback was primarily posted for marketing purposes, it was still very useful as it enabled the researcher to better understand and confirm different aspects of “BP-related value-add”, as perceived by the previous patients.

The second source of data (in the form of insights and observations) was collected through personal experience of going through the process (Screening Clinic) as a regular customer. This quite unique perspective enabled the researcher to observe different aspects of the process both as a customer and as an experienced BPM professional. However, this experience did not involve any formal research data collection, as this would be highly inappropriate, given the nature of this service.

Insights obtained in this way, were used to fine-tune and confirm research questions, with research interviews being conducted in a separate research visit at the later date. These insights were also valuable during the research interview, as the researcher had a sufficient contextual knowledge, leading to better sharing of process-related experiential knowledge with process participants.

After all qualitative data were collected their analysis was supported by a qualitative analysis tool (NVivo). To ensure that the interpretations made by the researcher were correct for the given context, the researcher sought a feedback and when required the additional information. This in turn enabled the researcher to triangulate different data sources to better understand, what was in essence highly contextual knowledge and would be very hard to capture only by observation.

Like all interpretive studies, this study sought a subjective understanding of the conditions, practices and consequences of social action, as expressed by the stakeholders and facilitators in their particular social context and are expected to reveal complexities and details that are commonly omitted in quantitative studies [26]. However, as data collection and analysis were related to the process rather than the medical aspect of their services, thanks to the insights obtained, the researcher was in the position to understand and interpret the collected data from the BPM perspective, due to her extensive experience in this area, both theoretical and practical.

7. Research Findings

7.1. BPs at SuperClinic – the knowledge perspective

In order to set the foundations for further discussion on ongoing improvement of the chosen customer-facing business processes at SuperClinic, it is necessary to start from their knowledge perspective. Thus, Harmon’s framework [19] has been modified to represent a continuum of tasks (procedural, knowledge and expert) within each process together with the associated roles. As previously discussed, all three Clinics could be seen as three different versions of the same high-level process, each involving a sub-set of tasks. Therefore, all three processes could be depicted by the same Figure 2, as follows.

As shown by the above figure, all three processes include the same procedural tasks: “Appointment Booking”, “Patient Admission” and “Patient Discharge”. These are administrative tasks performed by the receptionists. They are required to collect
relevant data, provide enough information to orient the patient to the process, including its medical and administrative aspects (payment method, scheduled fees and health fund refunds etc.), and answer any initial question they may have at the point of admission. Each patient is then booked into a Clinic on the basis of the provided medical referral from the patient’s general practitioner. The “Initial scheduling” task is more complex with regards to the required knowledge. It is completed by a clinical nurse typically a day ahead, as all bookings need to be completed by that stage. This task is computer-supported but still classified as knowledge task as it its completion takes into account typical pathways for different Clinics, previous experience with different types of patients, (e.g. first time patients may require a longer appointment with a radiographer), doctors’ referrals, patient’s data collected during their previous visits as well as any other information communicated by the patient when booking their appointment.

All other tasks are classified as expert tasks. To acknowledge the fact that they are only initially (loosely) scheduled in advance while the actual schedule emerges during process execution, these tasks are depicted on Figure 2 without any interconnecting control flows. As Davenport [10] pointed out, structured BP models are not suitable and accurate for knowledge workers.

7.2. BP Improvement through Automation

SuperClinic has already reached a very high level of BP automation. Their routine, procedural tasks have long been automated, eliminating unnecessary paperwork and reducing the overall costs for the clinic and its patients.

Furthermore, the coordination aspects of their knowledge-intensive BPs are also automated, but in a flexible way. Thus, once an initial schedule is finalized, its execution is automated by a workflow system, designed to “make the right task, available to the right person, at the right point of time, along with the resources needed for the tasks”, similar to any other workflow automation system. In this case, resources include patient’s progressive record that gets updated with the results of each test/task.

However, unlike many workflow implementations, their scheduling system is simple and designed to allow flexible process instances, including addition of new tasks, flexible duration, reordering of individual tasks and their re-assignment to different/new roles during process execution. Most importantly, the schedule is human- rather than technology-driven, allowing process participants to complete their work in the most effective way.

SuperClinic’s shared data repository enables knowledge and expert workers to access and share the same version of patient records, including digital outputs produced by different medical equipment. This type of integration has improved the overall process efficiency in terms of time and cost involved. For example, some unnecessary tasks, such as development of X-rays films were eliminated along with the need to carry these films around from one person to another.

However, as far as the workflow is concerned, all expert tasks remain “black boxes”. They involve complex decision-making that is human-driven and requires domain expertise, and as such cannot be effectively automated by the existing BPM systems. According to the participants interviewed in this case, any additional level of automation of their internal processes was not perceived as value-adding. “Our patients are not coming to us because we can easily process their payment. These days this is very much expected. They value our expertise and patient care”.

Therefore, with the respect to the traditional BPM, one could ask what else could be done in this context to improve their knowledge intensive BPs. The next section describes their next level of innovation in customer care, fully implemented within their knowledge-intensive processes.

7.3. Knowledge-centered BP Improvement

As the above-described automated environment became more and more ubiquitous to their work, various small-scale human-driven innovations started to occur in the context of their knowledge-intensive BPs. Over time, they have evolved into what could be best described as a paradigm shift in their approach to process improvement, in particular their perception of the desired outcomes, such as cost-reduction.

The pivotal role in this process was taken by a senior clinical nurse (here named “Sue”). While working as one of the team members in charge of her own assigned task, Sue noticed that in addition to the patient care provided within each task, it was important to consider the overall process and, in particular, process-level information for the overall patient experience. In other words, while individual specialists took excellent care of every single patient within their own allocated process tasks, Sue noticed that the time spent waiting between different tasks, regardless of its duration was always stressful for the patient. But at the same time, Sue observed that the inevitable waiting time could also open new opportunities for patient care of a very different kind. So, in addition to her allocated task, she gradually assumed the role of human-interface for each process instance and in this way, gradually changed her role from the task to the process level.

In this newly created role, Sue aims to provide additional information and care to patients at the process level e.g. between or within tasks. She carefully observes and even preempts the type of support, information or even process modification is likely to be needed for each patient currently at the clinic, based on their progressive results, emotional state, needs and preferences for different type of information and in-process support.
“Sometimes, they just need a place to come and take a break from the overall process, away from examinations, doctors, machines or even members of their own family they brought for support. The place to ask different sorts of questions or just take a little bit of time to absorb everything that is going on... For some, these are life-changing moments... This is what my office is for.” [Sue]

“If needed, I go back and speak with the team and let the patient know what is going on in the background e.g. when to expect to be called in for the next task. Sometimes, they interpret a longer wait as a sign that something is wrong – this is when they need information.” [Sue].

Figure 3 depicts the mapping of the resulting (improved) process along the process-knowledge continuum. As shown, Sue has created a new type of role that combines the aspects of knowledge and expert work. Also compared to the other roles in the process that are allocated to individual tasks, her role has changed from task-oriented (depicted by Figure 2) to process-oriented (depicted by Figure 3).

When looking from the BPM perspective, it is possible to argue that this particular role corresponds to a new type of process owner that is very different from the traditional ones. While process ownership is typically delegated, often to a higher-level manager, in this case it is created by a process participant and assumed through “grass-roots” leadership.

Figure 3 also illustrates another important aspect of Sue’s role. Through her process-level work, she has also assumed a role of a boundary spanner [27], making the boundary between the “inside” and “outside” worlds of their customer-facing BPs more fluid. This is shown by the highlighted area now including the customer. Most importantly, looking from the customer perspective, this boundary-spanning role becomes the “human-face” of their allocated process instance, making it more human-centric and humane.

Furthermore, when analyzed from the control-flow perspective, Sue’s process-level role enables her to change the scheduled order of different tasks (in consultation with the allocated specialists), reallocate tasks to different specialists to better meet patient needs and expectations (even taking into account their personality), as well as to create additional tasks, such as counseling, preparation for the next task and so on. Therefore, their automated coordination becomes human-centric rather than workflow-driven.

Most importantly, their BP improvement efforts are very much proactive and guided by their collective ability to understand but also anticipate patients’ needs and turn these insights into small-scale innovations. They are often implemented on “the fly” while the patient is going through their “process instance”. The effectiveness of each small innovation is assessed through very careful observation and feedback from the whole team. If judged to be value adding, these innovations are then gradually incorporated into their daily practice.

Patients are observed, asked insightful questions in the context of their case, but never formally interviewed to “collect feedback” while in the process about the effectiveness of their small-scale innovations. “We “read” the patients to understand if our innovations are helpful. Given the context this is possible and highly appropriate. Quite often they send us their unsolicited feedback after the visit.” [a medical specialist]

From the methodological point of view, this approach to process improvement closely resembles Schon’s model [28] of reflective practice. However, in this case, the ongoing cycles of reflection-in-action are collaborative rather than individual.

While this organization and their management acknowledge that it is very hard to translate the immediate effects of these innovations into hard dollars, the overall approach to ongoing improvement through small-scale process-related innovations has been perceived as one of the contributing factors to their sustained leadership.

In fact, on the basis of the received feedback from staff and patients, management decided to formally change Sue’s role to the process-level. Even more, they decided to employ a small team of clinical...
nurses, trained and lead by Sue to continue to provide the process-level support.

At the time of writing Sue has two team members and all three of them are working very closely together, each assuming the ownership of different cases and looking after their allocated patients. Their work continues to be based on the reflection-in-action approach with an added value of collaborative insight and knowledge (idea) sharing. Thus, different observations and possible responses are shared and discussed on-the-fly throughout the day, but also during informal team meetings, typically held at the end of each day. Their approach to sharing of experiential knowledge would be best described as “story telling” and shadowing, especially with new team members.

While it is impossible to predict their future BPM-related initiatives and other innovations in patient care, the whole team has expressed a great interest to learn innovative practices in patient care implemented in other healthcare organizations, as well as across industry sectors, especially in the other areas of human services. This is envisaged to help them to get new ideas, discuss their practices and continue to improve them.

When asked about future BPM-related IT support, including for example support for their own collaborative processes, they did not envisage that any of the widely available collaborative environments would greatly improve their collaboration. This is because their collaboration is, by nature, highly situational, highly dynamic and always face-to-face.

8. Lessons Learned

This research confirms that knowledge intensive processes could be improved beyond automation. But at the same time it challenges the traditional approaches to BP improvement, especially in terms of desirable outcomes and organizational perceptions of “improvement”.

As this case shows, the improved processes could be deliberately made slower by addition of new tasks, that in the traditional BPM could be perceived as non-value adding, such as a “waiting” task. Yet for some patients this task is so critical to enable them to continue with the process instance.

This research also shows that the improved processes could be made more expensive by addition of new roles or in this case even a small team of clinical nurses sharing the same role. Again this is not very likely to be a desirable outcome of a traditional BPM approach aiming for “leaner, faster, more effective processes” that could result in elimination of tasks and the associated roles.

Another important lesson is related to the actual point where a shift from automation to knowledge-centered improvement has occurred in the case organization and the nature of transition from the former to the later. While previous discussion may imply that the second phase (knowledge-centered improvements) started upon the completion of the previous one, this is not correct. The ongoing automation efforts will continue, driven by new technologies and applications, as well as ongoing developments in the external environment. A good example would be the new type of X-Ray machine that streamlined their processes, in terms of data flows.

Therefore, process automation is necessary for the organization to continue to stay up-to-date with industry developments and to continue to provide the environment where other types of innovations are made possible. But at the same time, rather than technology, the interviewees identified “organizational culture that supports innovative thinking” and “shared values resulting in shared commitment to excellence in patient care” as the key enablers for ongoing improvement of their services.

Another important lesson learned in this project is related to the need to break down information silos to facilitate the ongoing improvement of knowledge-intensive processes and the pivotal roles of boundary-crossing individuals in this knowledge sharing process.

As confirmed by the KM field, silos are known to limit organizational learning and knowledge sharing that are all of fundamental importance for knowledge-intensive BPs [29]. Unfortunately, the problem of information silos is also present in the healthcare domain. “There is still a lot of silo mentality in healthcare and what is needed are pit crews and shared responsibility”([26], pg. 60).

In the case organization, information silos were certainly broken down with their co-located, multidisciplinary team, very much acting as a “pit crew”. However, with the help of their “boundary-crossing individual” Sue and her growing team they also broke down a different type of information boundary – the one between the process participants and process-consumers (customers). Very recent industry reports confirm the link between this new type of organisational roles and value creation. “As enterprises drive towards achieving high value and improving customers’ experiences, they look to break down internal boundaries and integrate up, down and across the extended value chain…Boundary-spanning roles become pivotal towards the expression and capture of business value.” [27].

When it comes to the actual nature of process innovation, this research illustrates that possible improvement of knowledge intensive processes need to be itself, knowledge-intensive and centered around human knowledge. This observation supports the previous argument made by El Sawy [22]. To capture this aspect we proposed the term “knowledge-centered” approach to BP improvement.
Therefore, taken as a meta-process, BP improvement could be also mapped along the process/knowledge continuum, as depicted by the highlighted area on Figure 3. This enabled us to better describe the roles of knowledge and expert workers in the ongoing BP improvement.

It is also important to point out that contrary to the mainstream BP improvement methodologies that are often “problem-based” i.e. designed eliminate various process related problems (e.g. non-value adding tasks), this organization demonstrates the case for opportunity-based improvement through innovation. As such, this approach is not always problem-driven.

The tacit nature of these innovations raises some important questions in relation to the role of process analysts and their involvement in BP improvement of knowledge-intensive processes, such as those described in this case. Many of these gradual improvements are very hard to observe and externalize, as more often than not even the practitioners themselves are not aware of their methods. “We focus on what we can do for patients… we think on our feet” As such, they are very unlikely to be designed by process analysts without sufficient domain and contextual (organizational) knowledge, especially if they remain focused on the process models.

Therefore, in the case of this, and possibly other knowledge-intensive processes, design of these innovations should be left to the practitioners – domain experts. Also, rather than trying to capture these ideas and turn them in a deliberate methodology for BP improvement of knowledge-intensive processes in this and other domains, it is important to shift our future BPM research efforts to discover, analyse and evaluate the new challenges related to human-driven, knowledge-centered BP innovations. They need to be studied in the context and from a multidisciplinary perspective, calling for participative rather than observational research methods.

This case also opens new opportunities for the BPM researchers to identify, analyse and evaluate patterns of innovative practices, such as the one described here and their critical success factors. But most importantly, through our research we need to facilitate knowledge sharing across organizational boundaries and industry sectors to enable innovative practitioners like Sue, to learn from each other and continue to improve their practices.

9. Conclusion

Healthcare providers have always been under a constant pressure to reduce costs while improving the quality of care [31]. “Confronted with the trade-off between improving patient outcomes and maximizing short-term revenue many organizations routinely choose the former” [17].

In the world where traditional BPM approaches and methodologies inherited from manufacturing organizations are still being applied to healthcare processes, in order to make them “leaner”, faster, “standardized” and therefore, less expensive, the presented case organization stands out even more. Very recent reports confirm that they are not alone. “Some players have already begun reconfiguring themselves and making progress despite obstacles such as fee-for-service payment – a system that encourages the performance of procedures regardless of their impact on outcomes” ([17], pg. 69). For example, Dixon argues that “The technology that can revolutionize health care is not high cost or high tech” ([16], pg. 56). They describe a case where a simple phone call made a significant improvement to patient-care. In BPM terms, the same example could be interpreted as another case of a more expensive “to-be” process.

In fact, more anecdotal evidence is starting to emerge in other industry domains (see for example [32]), as customers are encouraged to come and speak with “real people” – all resulting in more expensive BPs.

At the same time, this paradigm shift in the current thinking about process improvement is yet to find its way into the mainstream BPM research and practice. Through an exploratory case study research in the
real-life case organization, this research aims to open new research challenges as well as contribute to further discussion related to new approaches to process improvement.

However, this research is still limited to a single case. Also, research findings are made in the context of an organization that is considered to be the leader of patient care in this domain, in this geographical region (Australia). Therefore, one could argue that the chosen organization is not a typical one, as other healthcare organizations have a long way to go, especially those still struggling to automate their administrative processes.

While readily acknowledging this important limitation, we argue that these exemplary cases are very important for the future BPM-related research and practice for the following reason. While the previous era of process improvement though automation had Toyota and other leaders of process efficiency, the new era of (human) knowledge-centered process improvement needs new examples of the so-called “positive deviants” [33]. They are needed to illustrate new opportunities and inspire new thinking. But above all, rather than offering any “easy-to-replicate” solution, they are needed to help the BPM community to pose new challenging questions about the current BPM research and practice. This was certainly one of the aims of this paper. Further research will involve more case studies of “patterns” of knowledge-centric process innovations of complex knowledge-intensive BPs in different industry sectors.

10. References: