The Importance of Process Knowledge For Cross Project Learning: Evidence From a UK Hospital

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Abstract

A core prescription from the knowledge management movement is that the successful management of organizational knowledge will prevent firms from “reinventing the wheel.” Information and Communication Technologies (ICTs) are seen as a key enabler of this process. Our findings challenge this logic. They suggest instead that knowledge is embedded within organizational processes and it is through the continual enactment of these processes that knowledge is created, renewed and transferred. Evidence from a cataract project underway at a Midlands Hospital substantiates our findings. We suggest therefore that attention should be directed at the development and use of ICTs to support the relational aspects of project working and the production of process knowledge facilitating processes of knowledge exploration.

1. Introduction

Logic suggests that firms can improve their efficiency, and therefore their overall performance, if they utilize the organizational knowledge already embodied in their existing systems, processes and people. This logic is endorsed in the current literature on knowledge management that suggests that firms can improve their time to market, their start-up time for new ventures, and cut their internal costs if they more effectively manage their organizational knowledge [1].

Thus, one of the fundamental tenets of the knowledge management movement is that the successful management of organizational knowledge will prevent firms from “reinventing the wheel.” As Wah states: “the central theme of knowledge management is to leverage and reuse resources that already exist in the organization so that people seek out best practices rather than reinvent the wheel” [2]. The exploitation of organizational knowledge is therefore a central concern for those interested in knowledge management [3]. Maula uses the term ‘intelligence ecology’ to capture the idea that it is important not to waste organizational knowledge [4].

This improved exploitation of organizational knowledge is especially relevant within project-based organizations. Project-based forms of organizing are increasingly common across a range of industrial sectors because they are seen to be more flexible and responsive than other forms of organizing [5]. However, a key problem identified in relation to project-based organizations is the transfer of knowledge from one project to another [6]. This is because there is a tendency for each newly formed project to start anew rather than learn from what has been done previously. Szulanski uses the notion of internal stickiness to denote this difficulty of transferring knowledge of best practice within a firm [7]. Nevertheless, despite this acknowledged stickiness, increasingly writers are arguing that such reinvention can and should be avoided by improved knowledge...
management practices. For example, Hogberg and Edvinsson state “To survive in the future, corporations will need a knowledge network that captures and stores all the knowledge, innovations and new ideas that are created, and distributes that knowledge to the right people, so that it can be reused and create more value”[8]. Information and Communication Technologies (ICTs), such as intranets, databases and enterprise systems, are seen as important medium through which such knowledge networks can be created and through which knowledge can be transferred and shared [9].

The underlying assumption, then, is that organizational knowledge can be captured and transferred to other groups within the firm through the use of ICTs. In this paper, we question the notion that the knowledge outcomes from projects can be transferred through ICTs from project to project in a relatively unproblematic manner. In particular, we argue that the processes of knowledge generation and transfer are mutually dependent. Therefore, we argue that current approaches to knowledge management, which are underpinned by linear notions of knowledge generation and transfer, are fundamentally flawed. In order to overcome these problems we suggest that more emphasis should be placed on the development of project documentation which includes process knowledge i.e. the way in which knowledge has been generated within projects as well as product knowledge – the outcomes from the project. ICTs therefore only have an important role to play in knowledge transfer and cross project learning if they can support both the relational aspects of organizational learning within and across projects. We substantiate this claim with evidence from an ongoing cataract treatment project currently underway at a Midlands Hospital in the United Kingdom.

The paper begins with an examination of existing literature on the management of organizational knowledge. The next section describes the methodology used in the reported study. A case description and analysis follows in the subsequent sections. In the final discussion and conclusion section, the theoretical and practical implications of the analysis are drawn together.

2. Managing Organizational Knowledge

In this paper, we adopt a social constructivist view of knowledge seeing organizational knowledge as embedded within firm processes [10]. From this perspective, all human “knowledge” is developed, transmitted and maintained in social situations [11]. Organizational knowledge needs therefore to be seen as an integral aspect of the overall activity system of the firm [12]. Therefore, when firm members participate in organizational activities, they have the potential simultaneously to create and extend the firm’s knowledge [13].

Adopting this perspective allows us to explore collective knowledge, which is situated and context-specific. Thus, our perspective shares much in common with Brown and Duguid’s idea of a community of practice. In a community of practice, knowledge is constructed as individuals share ideas through collaborative mechanisms such as narration and joint work. Within such communities shared means for interpreting complex activity are thus constructed, often out of conflicting and confusing data. It is this process of constructing meaning, which provides organizational members with identity and cohesiveness. Similar to Spender, who argues that knowledge is embedded within the context in which it is created, in a community of practice, the context facilitates the development of shared meanings [14].

To link organizational knowledge and communities of practice, we draw on the work of Nelson and Tsoukas [15]. Both of these scholars see firms as hierarchies of routines, where most organizational knowledge is tacit and resides not in the heads of individuals, but in teams sharing common experiences. Each individual has only a partial view of what constitutes a particular organizational routine. In other words, “cognition, observed in everyday practice is distributed – stretched over, not divided among – mind, body, activity and culturally organized settings” [16]. Knowledge of a particular routine, here considered in terms of the diagnosis and treatment of cataracts, does not therefore form a complete and coherent body of knowledge that can be precisely documented or even articulated by a single individual. Rather, it is a form of knowing held in a process by the interaction among various collective actors [17].

Importantly, this suggests that to change a particular routine, collective knowledge of that routine has first to be generated through interaction and communication. Cook and Brown (1999) describes the process of collective knowledge generation, as a ‘generative dance’ since communication within a group does not simply add knowledge to each individual’s knowledge [18]. More importantly, communication and exchange within a group or a team can also evoke novel associations, connections and hunches such that new meanings and insights are generated. In other words, communication not only affords the exchange of
knowledge but also the generation of collective knowledge and new ways of using knowledge.

In this paper, we explore this process of knowledge generation within a particular project team that was attempting to reengineer the process of diagnosing and treating cataracts within the UK’s National Health Service (NHS). We argue however, that knowledge of this newly designed process i.e. the outcomes of the project cannot be successfully transferred through ICTs as a single ‘best practice’ to other contexts even though it may be potentially relevant and useful in them. Rather, we suggest that the focus needs to be on examining how the essentially ‘situated’ dimension of knowledge and knowing - process knowledge - can be generated and transferred to, other groups or organizations.

3. Methods

This research is part of a larger project that examined project-based learning in five different industrial/technology sectors within the United Kingdom. For this study, qualitative methods were deemed to be the most suitable method of investigation. Qualitative methods, such as case studies, allow the researcher to explore the phenomenon of interest in its natural setting and are particularly appropriate when the boundaries between the phenomenon and its context are not clearly evident [19]. Given the closely coupled relationship between replication and firm processes, case studies are ideally suited to examine the linkage between knowledge transfers and context in which the transfers occur [20].

We began our investigation with an introductory meeting with a senior hospital administrator. It was quickly determined that the fast-track cataract project would be the most suitable project for us to investigate in that it was an established project with some already identifiable outcomes. In addition, the outcomes of the cataract project had the potential to be replicated in other NHS Trusts within the UK.

We met next with the cataract project manager. It was at this meeting that we learned the details of the project as well as the names and contact information of the project members. We also collected archival project documentation, to include project process charts as well as sets of minutes from previous project meetings. Subsequent to this meeting, we met with numerous members of the project team. In total, we interviewed nine individuals, over a four-month period, eight members of the cataract project team and one project manager who was working on a project that was similar to the focal cataract project.

Respondents were asked to initially describe their role in the overall cataract project, then to discuss the process of knowledge creation and transfers, first within the project team, and then between other teams and other organizations, if applicable. The role of ICTs as an aid to transfer was also specifically examined.

As is typical in inductive studies, writing the case study was an iterative process in which the data were constantly revisited to explore emerging themes. From this process three themes emerged, and these are discussed below - bringing together key individuals, social networks and templates. Within each category any inconsistency among the data collected from different sources was clarified by consultation with third parties. Triangulation across the different sources of primary and archival data revealed a high level of data consistency.

4. Case Description: Midlands NHS Trust Hospital

Midlands NHS Trust Hospital is one of a large number of Trusts that together make up the UK’s NHS. Developed in the post-war period as a means of providing affordable, quality healthcare to all UK residents, the NHS has, in recent years, been plagued with a series of shortages with respect to staff, theaters and beds, as well as untenably long lead-times for non-life threatening procedures. This has lead to a public backlash against the system and the formation of a dual system of public and private health care to which many, more affluent UK residents subscribe.

One of the areas targeted by the government as in need of change is the cataract diagnosis and treatment procedure. Cataract surgery, which is a 20-minute procedure, represents 96% of the ophthalmology workload. Traditionally, cataract diagnosis and treatment took a number of visits to various specialists. For example, the patient would begin at the optometrist who would diagnose the existence of cataracts, and then refer that patient to his or her general practitioner (GP) for further treatment. After a visit to the local GP who, not being an eye specialist would generally rely on the diagnosis of the optometrist, the patient was referred onto the hospital for further examination. At that time, the patient would meet briefly with the consultant and, in a separate appointment, meet with the hospital nurse for a physical examination. Only when all of these visits were complete would the patient join the queue for the cataract surgery. In many
Trusts, lead-time for cataract surgery was over 12 months. Post-surgery, another visit to the consultant would be scheduled to check on the patient, following which the patient would be referred back to the optometrist for a new pair of glasses. As a result, it would take at least six visits and often well over a year to have a routine, 20-minute, outpatient, surgical procedure.

Given the complexity and long-drawn out nature of this existing process, a new reengineered cataract diagnostic and treatment process was seen as potentially beneficial. To facilitate that change, a designated member of the hospital’s transformation team was assigned to the project. The transformation team member gathered a team of eye experts from both the hospital and the community to discuss ways of cutting surgery lead times and improving patient satisfaction. Members of the cataract team included the head nurse in the eye unit, a hospital administrator, general practitioners, a set of optometrists from the local community, and a surgical consultant who was instrumental in championing the need for change and in leading the change process. Team meetings were held in the evening to facilitate attendance, and were led by the transformation team member. Minutes, flow charts and other necessary documentation for the process, were produced by the transformation team member, and distributed to all team members after each meeting. In total, approximately five project-team meetings were held over a six-month period.

A number of changes to the existing process were made. Non-essential visits to the general practitioner, the consultant and the nurse were eliminated. Instead, optometrists were empowered to decide if a patient needed cataract surgery. In doing so, they are required to fill out a detailed form that provides the consultant with specific information about the nature and severity of the cataract, and to call the hospital and book a time for the patient’s surgery. For this additional responsibility, the optometrists are given some extra training and receive a small amount of additional compensation from the Trust.

The preliminary pre-operation physical was replaced with a self-diagnostic questionnaire that each patient is required to fill out and return to the hospital before surgery. Nurses telephone each patient before surgery to check the patient’s details and answer any questions. Post-operation consultant appointments were also replaced with follow-up telephone calls. One indication of how much the process has changed is the traditional post-operation meal. Under the traditional method, before discharge, each patient was treated to a plate of hospital food; now, under the new system, they are given a cup of tea and a biscuit and are then sent home.

The new cataract procedure has resulted in a number of efficiency gains. Lead times have been radically reduced from over 12 months down to six to eight weeks. In addition, theaters utilization rates have improved due to the addition of an administrator whose sole responsibility is scheduling theaters. Finally, and most importantly, according to follow-up phone conversations with cataract project patients, patient satisfaction has improved dramatically.

5. Case Analysis

Our findings from this study indicate the overwhelming importance of the social process in generating knowledge, which can lead to the transformation of organizational practices. The process of reengineering the cataract diagnostic and treatment procedure involved building meaning out of often conflicting and confusing data. This was only possible through bringing together a number of individuals with different knowledge and understanding who were willing to share their largely tacit knowledge in order to generate new knowledge. Here, a crucial aspect of this ‘new’ knowledge was an understanding of the existing cataract process as a whole, which could then be reengineered. This holistic knowledge of the cataract process did not exist before the formation of the project team and so had to be generated through interaction and negotiation. Thus, as with communities of practice, the reengineering of the new process was not done in isolation, but instead drew on the critical knowledge of each participating team member, and combined it into a new, meaningful whole. In particular, this case highlights the importance of bringing together key individuals, the use of social networks to bring new ideas into the process and the use of templates, which in this case served as tangible outcomes of the reengineered process. The role of ICTs in the reengineering effort was limited to low level communication, for example, regarding meeting arrangements between team members.

In the final part of the analysis, we consider how far the newly developed diagnosis and treatment process could be transferred to other contexts where it may be applicable and highlight the importance of transferring process knowledge as well as product knowledge if cross project learning is to be successful. Here, the potential role of ICTs is again considered.
5.1. Bringing Together Key Individuals

A range of individuals from the different professional groups involved in cataract treatment was invited to attend the reengineering meetings. Each of these individuals was committed to seeing a new, streamlined cataract diagnostic and treatment procedure implemented. It is quite clear that the change in the cataract diagnostic and treatment procedure would not have occurred if there had not been a significant number from each of the professional groups who were eager to become involved. All those actively involved in the process wanted to enact change.

This involvement was driven by a perception that change would be beneficial to each group involved in the process. The optometrists benefited in that they were provided with an enhanced sense of professionalism and decision-making authority that was commensurate with their training and experience. In addition, they now had the opportunity to build stronger relationships with their customers by providing diagnostic services. The incentive for the general practitioner was a reduction in their already large patient load as well as a reduction in their administrative paperwork. The consultants and the nurses also benefited from a reduced patient load, thereby freeing them up to focus on non-routine cases. Midlands Hospital benefited from increased theatre utilization and increased patient satisfaction. Finally, the patient benefited from obtaining the same quality care with a major reduction in wait-time to surgery.

With all the benefits inherent in this change, it is important to note that there was substantial resistance from some individuals and groups. For example, a transformation team member recounted the story of an optometrist with a large local practice, who refused to participate in the fast-track cataract process.

Bringing together individuals from different professional backgrounds was necessary in order that each group could understand and appreciate the skills and capabilities of other groups. Without this collective activity, the knowledge and understanding of the different groups would have remained unconnected and isolated, and preconceived notions of the limits of the professional competence of others would not have been challenged. By bringing together these different individuals there was an opportunity to challenge and break down many of the existing barriers, at least among those who were willing to get involved. While bringing together individuals from different professional domains was important, wider social networks were also crucial in terms of learning from the experience of others.

5.2. Social Networks

One way in which new knowledge was brought into the project team was through the use of personal contacts. Similar to Granovetter’s weak ties argument, the project team, and in particular the nursing staff, used their knowledge of developments at other local Trusts as a source of information when making decisions about the new cataract diagnostic and treatment project [22]. While there was no prototype for the fast-track cataract project to follow, different Trusts were called on to provide information about components of the proposed change.

For example, one of the most contentious changes in the new cataract process was the change in the role of the consultant’s secretary. Under the old model, each secretary was assigned to one consultant and that secretary was charged with the responsibility for all theater scheduling for that surgeon. Under the new process, all theater scheduling was handled through one administrative assistant, and secretaries were reallocated to more than one consultant.

The secretaries, who insisted that they were far too busy to be assigned to more than one consultant, were extremely resistant to this change. “They saw the waiting list management as a big part of their role. They felt that we were undermining their role by taking this away… taking away their patient contact…we were just turning them into audio typists” (project member).

To address their concerns, one of the nurses on the project used her personal contacts with a manager at another Trust to arrange for the secretaries to go and visit their counterparts who, at this other location, were assigned to more than one consultant. Through this visit, the secretaries were able to see, first hand, how their workloads would be reallocated and this helped to legitimize the new practice. However, it must be stressed that this did not lead automatically to the acceptance of the changed role.

The social network enacted by, in this case, the nurses on the project team was developed before the outset of the project. Other examples of networking during the project involved contacting a particular Trust that was pioneering in another area and was therefore known through various NHS communications. In this case, the pioneering Trust was contacted, and a visit to their facilities was arranged. What is important to stress is that the knowledge...
gained from these social networks was not simply imported into the design of the new cataract process. Rather, it was reinterpreted and blended with the collective knowledge that was developing within the project team.

5.3. Templates

The new knowledge generated through the interactions between the project team members was used to redesign the cataract process. This included the design of some concrete deliverables or templates that were outputs from the project. For example, one of the project deliverables was a detailed diagnostic form that is currently used by participating optometrists, and the health form that is sent to all scheduled fast-track cataract surgery participants. Some components of the health form had been based on an existing health form in use by another hospital project. However, this existing template was not simply reused in this new situation. Rather, each of the forms for the cataract project was developed through a series of iterations in which relevant users were contacted for input. Considerable negotiation and debate took place around the design of these templates and there were several versions developed and tested in the process of finding the form that best met the needs of all individuals involved in the process. The existing templates that were considered from other hospitals were used as examples during this process of template construction. They were not simply reused as-is though, but instead were blended with input from the team members to create new project-specific outputs. The creation of these output documents represented important milestones for the project participants. They provided the team members with a feeling of accomplishment, which helped to sustain their enthusiasm for the change process. In this way the templates were critical to the cataract fast track process.

5.4. Knowledge Transfer?

Once developed, these forms were available to other NHS Trusts looking to improve their cataract diagnosis and treatment process. However, in the one hospital which had looked at Midlands Hospital’s new process, the idea had been rejected, because it was seen as “too radical”: “We had some interest from one of the ophthalmologists (from another region) who wanted to start a similar project, so we sent them our paperwork and documentation. We had some interesting discussion and feedback from people who didn’t like the idea” (project member).

There are a number of reasons why the output from the focal cataract project could not simply be transferred and used in other hospitals. One reason was that making changes to the existing process takes considerable time and effort. Given current workloads this outlay of time may not be feasible: “In many cases consultants are keen to change things but feel that the clinical load is so great that they just get on and work to the best of their ability within the current system. It requires management facilitation to enable them to change. It is very difficult to just change on your own” (project member).

In particular, the project at Midlands Hospital appeared to be successful because of the strong championing and leadership that was provided by the consultant involved. Where such a person does not exist, there is likely to be little impetus for change. All team members recognized the importance of the consultant to the change process.

In addition, the transformation team provided resources and expertise to facilitate the knowledge generation process. They successfully involved the various professional groups of the need for change, so that these individuals were willing and able to learn from each other and realign their roles and responsibilities accordingly. In other contexts, these conditions are likely to be very different. Indeed, the existence of the transformation team in Midlands Hospital was unique, thereby making it a particularly conducive context for organizational change.

These issues of leadership, resources and motivation are important for understanding why those in other contexts may not be willing to learn from the Midlands Hospital cataract project experience, making knowledge transfer problematic. However, more fundamentally, we argue that knowledge of the new cataract diagnosis and treatment process could not readily transfer to other contexts because knowledge transfer does not occur independently of or in sequence to knowledge generation. In other hospitals where the new diagnostic and treatment process could be relevant, the holistic knowledge of the existing process and of the skills and expertise of the various professionals involved would first need to be generated. For example, one of the optometrists who had been involved in the project from the outset explained how his changed role allowed him to diagnose and directly refer patients. He stated that at times he had needed to clarify issues with the consultant in order to ensure that a
particular patient was actually suitable for the cataract operation. With many consultants, this would be very difficult because they undervalued the knowledge of optometrists:

“When patients eventually find their way to hospital any comment that the optometrist has made that is relayed to the hospital staff is usually treated with contempt – ‘what do they know about it’, that sort of attitude” (project member).

However, through working together on the project and sharing professional knowledge, respect and trust in the competencies of optometrists had been developed. Moreover, the building of relationships, facilitated by membership in the project, meant that now an optometrist could telephone a consultant working at the hospital and directly ask his/her advice. The consultants were now providing regular feedback to the optometrists, so that the optometrists could continue to learn how to make diagnoses that were acceptable to the consultants. The social knowledge produced as an outcome of the project, in terms of bringing individuals together to form a community, was necessary to enable this beneficial exchange. Essentially, through interactions during the project the landscape of social relations had been changed. In the absence of such a change the templates and the new process are likely to make little sense. In other words, it would not be possible to transfer the templates and knowledge of the new diagnostic and treatment process to other contexts, where this knowledge generation process had not taken place, because barriers between the professional groups involved would still exist.

6. Discussion and Conclusions

While this study contributes to our understanding of the importance of context in knowledge creation and transfer, there are some inherent limitations. It is important to note that our findings are based on a single case study and therefore, by definition, do not meet the criteria of credibility or transferability [23]. Additional research, across multiple case studies, is needed before any attempt can be made to develop a grounded theory of socially constructed knowledge [22]. While not reported in this paper, the research on which this case is based, does however involve multiple cases. These generally support the argument presented in this paper.

Limitations not withstanding, our preliminary investigation does point to some very promising areas of future research. Our analysis suggests that this project team was successful in redesigning the cataract diagnosis and treatment process because, as those involved in the project exchanged ideas and information, new meanings and insights were generated. In particular, through this process of interaction and deliberation a holistic understanding of the diagnostic and treatment process was created whereas before the process, each professional group had only a partial view of what constituted the particular routine [25]. In effect, knowledge of the process of diagnosis and treatment of cataracts was sustained by the interaction of the various collective actors. In the case presented here, the knowledge existed only through their social interaction [26]. As Cook and Brown (1999) observe, groups not individuals, possess the ‘body of knowledge’, and not everybody within a group possesses everything that is in this body of knowledge [27]. Knowledge of the routine had therefore to be generated through interaction and communication within the project team.

What of the role of ICTs in such reengineering projects? In the case presented here, there was in fact very little reliance on ICTs for interaction and communication. ICTs tended only to be used for low level communication such as arranging meetings, etc. Moreover, we contend, that describing the new working practice in the form of project documentation that could exist on an open intranet site, for example, and electronically providing the various templates for reuse in other hospitals would not guarantee that the new procedure is adopted. This is due in part to the pre-existing ideas about normal practice, which in a new context will limit the absorptive capacity of those involved [28]. Absorptive capacity is a path dependent process that is largely a function of the preexisting stock of knowledge. What might improve the prospects of knowledge transfer utilizing ICTs might be project documentation on an open intranet site that highlights the relational aspects of project working – process knowledge. This might enable other hospitals to extend and develop their stock of existing knowledge thus increasing their absorptive capacity. Process knowledge is needed as well as knowledge about the outcomes of the project. Process knowledge about the relational aspects of working on this project could include for example, documenting the way in which the new templates had been designed. Information could be provided that highlighted who had been involved in the design decisions and what their contribution had been. For example, other Trusts had provided information about what might be the components of change. How this information had been used could be documented. Existing templates that had been considered from other hospitals could also be included as project documentation with information regarding how and
why these had been revised in developing the new template. Earlier versions of the template could also be included as project documentation, highlighting the problems that were found with these earlier versions. All of this information potentially increases the absorptive capacity across contexts and can be relatively easily transferred through the use of ICTs. Absorptive capacity was found by Szulanski to be the biggest impediment to the internal transfer of knowledge [29]. Szulanski’s finding highlights our contention that any given work practice is culturally mediated, and therefore is the outcome of a web of knowledge formed through social participation, material working conditions and negotiated interpretations [30].

We argue therefore that in each new context a social process of knowledge generation is essential for those involved to understand and appreciate the knowledge, skills and expertise of the other professionals involved. In particular, through the exchange within the project team, all of the professional groups involved in the process started to recognize the value of and under-utilization of the opticians’ skills and expertise. Thus, micro-level shifts in the relative power of different professionals occurred through engaging in the project process itself. The new work practice could not be transferred to other hospital contexts where proposed recipients had not been through this process and therefore had not generated this knowledge. They would not share the new reality about practice that had been generated at Midlands Hospital [31]. Existing professional boundaries and the concomitant distribution of knowing among those involved means that the new practice would be rejected as unworkable. This was indeed the case where those from other hospitals had been passing information about the changed work process. Thus, within each new context the various professionals need to generate the collective knowledge that was the basis of the redesigned process at Midlands Hospital.

This does not mean that the templates produced by Midlands Hospital will not be useful to those in other contexts. It does mean however that the knowledge embedded in the templates must undergo what Czarniawska and Joerges refer to as a process of traveling whereby the knowledge must be legitimated in each new context [32]. This will inevitably be primarily a social process, which depends on the balances of influence implicit in each new context. However, this process of legitimization can also be facilitated by providing crucial process knowledge which can then significantly help to inform decisions in other contexts and legitimize project outcomes. Here ICTs could play a useful role in connecting groups across time and space and providing this vital process knowledge via open intranet sites. It is helpful to see the developed templates as only boundary objects [33]. Knowledge may be embedded in such boundary objects, but they do not simply capture knowledge to be passed on because this knowledge needs to be abstracted and domain knowledge is needed to understand and use the artifact or template. Moreover, some of the soft knowledge will get lost in the process of passing on. In other words, boundary objects have interpretive flexibility [34]. We should expect then that the templates designed at Midlands Hospital will be modified in each new context as those involved attempt to make sense of this explicit knowledge during their interactions. During this process, knowledge will be shared and blended with these existing templates in order to generate new knowledge in each new context.

Thus, the templates and practices developed at Midlands Hospital will be interpreted differently in other contexts. As Dervin states: “reading about a best practice, for example, makes little sense without an understanding of the struggle and gaps it was invented to traverse” [35]. What appears to be needed therefore is the production of project documentation that emphasizes the relational aspects of project working and demonstrates the way in which the situated knowledge produced in the project has been developed. If knowledge is going to be successfully transferred across projects then it is arguably this process knowledge, which is at least as important as the knowledge about project outcomes.

In conclusion, we argue that knowledge transfer does not occur independently of or in sequence to knowledge generation, but instead that the process of knowledge generation and its transfer are inexorably intertwined. In this case, knowledge transfer could only occur in conjunction with the generation of multi-disciplinary/professional knowledge so that there was a more holistic understanding of existing diagnostic and treatment practices among the various expert professionals involved in the particular context. This knowledge generation process allowed the various professionals to reconsider professional boundaries and so reengineer the process. Without this knowledge generation process, the acceptance of the new knowledge, in this case new diagnostic and treatment processes, would be problematic or simply untenable. In other words, project-learning leads to the generation of new knowledge, which is captured in redesigned work practices. However, ‘know-what’ or ‘product’ knowledge cannot simple be transferred to other locations since this ‘product’ knowledge would not fit
by definition with existing practices in these other places. Rather, what can be transferred is knowledge about the processes that will encourage necessary knowledge generation, which in turn will facilitate the development of the ‘know-what’ knowledge in each context of application. This may include process knowledge about how decisions and outcomes were arrived at as well as knowledge about how to select team members, locate skills and interests, and build multidisciplinary groups and communities. Process knowledge can then be used so that the necessary knowledge generation occurs more smoothly in other teams. A conclusion from this inquiry is that it is not possible to completely prevent reinvention. Indeed, reinvention may need to be actively encouraged, especially in contexts where the focus of change involves activities that entail multiple professional groups who each have only a partial understanding of the total activity.

7. References


[23] Credibility is the degree to which the findings across cases fit the data while transferability is the extent to which the findings can be replicated across cases. See Erlandson, D., Harris, E., Skipper, B., and Allen, S. (1993). *Doing Naturalistic Inquiry*, Newbury Park, CA: Sage Publications.


