Becoming a Member of a Community: The Role of Strategies of Practice-Based Learning

Abstract

Oil and gas production involve potential danger to human lives, environment and economy. Everyday decisions and actions can lead to catastrophe. Production engineers are a group of people responsible for getting oil and gas from the subsurface reservoir to a processing plant. In order to this in an efficient and safe manner the engineers require a set of skills that we argue they cannot get for education alone. In order to become proper production engineers, they have to become members of a community of practice. A knowledgeable production engineers must acquire a contextual understanding of the world of oil and gas production. However, this world changes from oil field to oil field. Hence, it is important that new engineers are initiated into the existing practices of the organization. Our primary question is, how are new members introduced to the community practices in order to become a knowledgeable engineer? We contribute by characterizing strategies and mechanisms for helping newcomers become knowledgeable members of a community.

1. Introduction

The disaster with the BP operated drilling rig Deepwater Horizon in the Gulf of Mexico in April 2010 clearly illustrated how oil and gas production can be a potentially dangerous undertaking with risks to human lives, the environment and the economy. Oil and gas production are extremely information intensive operations, and faulty or unreliable information can lead to severe consequences. Engineers working with oil and gas production rely on a vast amount of information, ranging from theoretical models, simulations, logs, intervention reports and production measurements. In order to make good decisions the engineers should ideally consider all this information. However, this information is not readily available to them. The information is dispersed across a huge number of databases, applications and platforms in a fragmented, redundant and inconsistent maze of systems. To make decisions, the engineers must first retrieve the available information, filtrate the information before they can begin to render the data in order to build knowledge necessary for sound decision making. When a new engineer is introduced to these tasks, he/she has to be introduced to the practices used by the rest of the group in order to do the job.

How to organize or mobilize for problem solving and learning across geographically distributed settings and communities have long been an important issue for both research and practice. Within the oil industry this is commonly referred to as integrated operation (IO). Given today's situation in many companies, knowledge is increasingly more distributed across technological systems, people and organisational boundaries, IO denotes the commitment towards creating radically new and more effective ways of working and learning. A fundamental issue in this respect is how to collaborate across different boundaries [1] or Communities of Practice [2] and what kinds of technical and social arrangements provide a better context for learning and working to take place. Our perspective on learning addresses how a network of people and tools (i.e. material entities) may change as a co-construction. This perspective from Science and Technology studies [3], is combined with a pragmatic view on knowledge. Learning and working in this perspective emphasise the network of actors; human and non human from where knowledge is created and shared rather than on individuals, methods, or particular systems. Efforts of establishing new arenas for sharing knowledge and solving problems have to foster a process which is iterative and continuously evolving where members interact with each other, share experiences and take action.

The key question in our study is how are new members introduced to the community practices in order to become a knowledgeable engineer? We illustrate how sosio-technical strategies in combination with organizational learning are used in such settings.

The empirical setting for this paper is a group of highly specialized engineers working with oil and gas production within a large international oil and gas company (dubbed OGC for anonymity).

The rest of the paper is organized as follows: Section 2 reviews the challenges of knowledge sharing within groups of highly specialized experts. Section 3 describes our research method and approach. Section 4 introduces the case. In section 5 we present our analysis centered around strategies for initiating someone into a community in order to provide them with the foundation for creating context specific knowledge. In section 6 we discuss our findings, while section 7 offers our concluding remarks.

2. Knowledge Work in Specialized Communities

On the one hand, we are becoming increasingly aware of the important role knowledge plays in everyday work [4- 5]. On the other hand new technologies are opening for increased codification and physical fragmentation and the potential of distributing the overall knowledge of work on several ((Hutchins 1995 [6- 7- 8- 9]. A fundamental question then is what mechanisms are established to enable the sharing of knowledge when existing work practices are facing new technologies.

From a technological point of view, sharing knowledge is a question about capturing and codifying the content of knowledge. Only then can it be made usable across contexts. Typically knowledge management tools such as experience factories, semantic web systems and organizational intranets have been applied to enable knowledge sharing. Such a perspective, often underlying the design and development of 'new technologies', have however been vastly criticized as it neglects the interactive and narrative side of knowledge (See e.g. [4- 10- 11] [12- 13]).

The problem with the technological perspective mentioned above is that it downplays to the level of non-existence the contextual side of knowledge (See e.g. [14- 15]). In the same way the human interaction perspective tends to disregard the role of codified representations of knowledge [16]). In this paper we do not engage ourselves in a debate about one or the other, but appreciate both as important to the knowledge sharing discourse [17- 18- 19])). We take a pragmatic approach and conceptualize knowledge as the ability to act (See e.g. [11- 20])), and explore how 'heterogeneous' representations of knowledge (i.e. both codified and narrative forms) are brought together in specific practices.

2.1. Communities of practice

There is a deviation between the way people conduct their actual, everyday work and the way the organization describes the same work in training, formal descriptions, organizational charts and job descriptions [17]. The concept of Communities of Practice [2] is an often used approach to increase understanding of the activities and processes taking place in work, as well as putting focus on the kinds of social engagements required.

The concept of Communities of Practice was based on the fundamental belief that separating theory from practice is unfortunate [21]. Instead it is argued "that learning should be contextualized, by acknowledging its presence and allowing it to continue to an integrated part of work" [22].

According to [23], "Communities of practice are groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly.", i.e. a group of engineers working together within an business organization to get the optimal quantity gas and oil from a reservoir below the seabed to a platform would constitute a CoP – given that the three crucial characteristics of a CoP is met:

1. *The Domain*: A CoP is not just any group of people. The group must have an identity through a common domain of interest, or goal. That is, the members of the community must be committed to this goal.
2. *The Community*: In order to achieve their goals the members of the community must interact with each other; they must engage in joint activities and discussions, in addition to help each other and share information. Their interpersonal relationships enable them to learn from each other. It is, however, important to note that the community members do not have to work together on a daily basis, but that their interactions are vital in making them a community of practice.
3. *The Practice*: To constitute a community of practice the members must be practitioners. Through their interactions; their experiences, tools and views, the members of the community develop a shared practice over time. This is an ongoing and continuous process. If the group stops interacting, their practices will in time deteriorate.

Developing this shared practice is done through a series of activities like solving problems, sharing information, utilizing expertise, reusing resources, coordinating, discussing and documenting.

A community of practice relies heavily upon each individual member's understanding of who the members of the community is, what kind of behaviour that is acceptable within the community, what kind of role the various members have and what kind of convention is applicable. Each member's understanding of the community is an ongoing process that evolves as the community evolves through collaboration and experience. Through mediation the community settles on a shared understanding based on accumulated knowledge and experience.

2.2. A practice based perspective on knowledge sharing and learning

Practice implies doing and is the situatedness of all human action [24]. It is fundamentally different from the way organizations describe that work in manuals, organizational charts, and job descriptions [17]. Emphasis is on Communities of Practice [2] were knowledge sharing takes place, rather than on individuals, methods, particular systems or single projects. According to [15] strategies to supporting knowledge sharing, even in large scale communities cannot discount for the interactional human-to-human processes through which it is nurtured. For instance, in practice information from the electronic patient record, clinical specific systems and other systems are often copied and printed out on paper to become usable in the everyday work [25].

In this paper we apply a practical and contextual perspective on knowledge [13], highlighting the active and productive processes of knowledge as in "sense-making, in which the unique thought worlds of different communities of knowing are made visible and accessible to others" [10]. By this we do not imply that technologies to embed knowledge entities are misplaced. Rather our argument is that these are always dematerialized knowledge entities. Peoples' ability to make sense of them is thus intrinsically tied to the specific socio-technical setting through which they are recorded and actually used. As argued by [26]:

"Medical technologies and artefacts are located ethnographically and historically in the practice of designing or using the technology. Distinct from other related theories, where technology is considered to be a passive mediator of human action"

We lend ourselves to a socio-technical perspective and consider knowledge as a network of interdependent entities where "individual pieces [of knowledge] are linked together into complex structures in various ways" [27]. Knowledge sharing then is a collective, heterogeneous and ongoing accomplishment, distributed, delegated and coordinated across time and space (see e.g. [28- 29]). Making knowledge sensible across contexts requires work, articulation work. As argued by [30]:

"(…) disentangling the data from their primary contexts is possible; however, this involves a translation from one context to another, and this translation requires active work".

Our approach thus holds that i) knowledge sharing as a process of translation because knowledge entities will always undergo a change when being used in different contexts. These are ii) heterogeneous processes and consequently, iii) the boundary between computer-based and paper-based technologies are blurred.

3. Method

This paper reports from a longitudinal research project that began in the beginning of 2007. Our research can be classified as an interpretive case study [31] as we "attempt to understand phenomena through the meanings that people assign to them" [32]).

We began our data collection activities in early 2007 seeking to explore the changes introduced into OGC by the implementation of a new collaboration solution based on the Microsoft SharePoint platform. Through semi-structured interviews, observations and document analysis we gained insights into and understanding of the technological complexity, as well as the overwhelming size, of OGC's collaboration infrastructure. In this phase of our research our main informants were IT managers, administrators and developers. The majority of this research was conducted at one of OGC's three research centers where we were granted access, both to the building were we got an office space, and to the people working there. We got to interview people within such disciplines as technology managers, human resources and researchers – both within technology and organizational development.

In March 2009 we got introduced to a group of production engineers working at a nearby operations centre through a workshop at OGC's research centre. Shortly after we got access to this operations centre. We were given the opportunity to visit the operations centre and observe the production engineers in their daily work. During the next 15 months we visited the operations centre about 110 days. We were allowed to sit in during meetings, both internal meeting within the group and with external partners. In total, more than 375 meetings, ranging from 3 minute long status updates to day-long work sessions, were observed. Table 1 summarizes the types of meetings observed.

When not in meetings we were given access to work stations in the engineers' open plan office where we could work while still being able to be a part of the surroundings. This way we got the opportunity to observe how the engineers worked in their everyday work.

During observations handwritten notes were taken down. Either after the meetings or at the end of the day the notes were then written out. Thoughts and reflections made during the observations have been written down in a separate column in our notes. Questions were asked to clarify and elaborate findings, which is very important [32]. In order not to disturb meetings, these questions were most often asked while walking to or from meetings, or during lunch or breaks.

[Table 1 placeholder]

During these meetings our role was only to observe. With one exception: The bi-weekly reservoir meetings. This meeting is a forum that was established during our period of observation and the group leaders wanted our input in order to make the forum as good as possible. So, at the end of each meeting, we spent a few minutes commenting on the meeting structure, organization, flow, etc.

The second method of data collection has been semi-structured interviews. The initial interviews were quite open-ended and targeted, while the latter interviews have been more targeted at specific situations and challenges.

In total we have conducted 26 interviews lasting from 1 to 3 hours. Only 8 of the interviews have been recorded, but as we in most interviews have been more than one researcher present, we have divided the task so that one is only focusing on writing down what is being said, and thus we have to some extent compensated for the lack of recordings. Upon completion of the non-recorded interviews we immediately after the interview went through the notes together in order to clarify uncertainties.

The third data collection method has been document analysis. We carried out an extensive study of presentations, formal descriptions of work processes, plans and strategies, both related to the collaboration infrastructure and to oil and gas production. This analysis gave us a good understanding of the information infrastructure; and the possibilities and limitations set by this.

When it comes to data analysis, this is a newer-ending, continuous process. Being able to discuss findings with researchers working on similar topics has been very useful as to challenge each other with regards to our understanding of the situation at hand. Having different backgrounds, we naturally have different points of view and thoughts about what we see and experience. Also, having established a close relationship with several of OGC's researchers has given us another arena to discuss our findings.

Our data was initially classified into quite broad containers, for instance "technological aspects", "common misunderstandings", "communications" and "numbers". On the next iteration new containers would appear as we had gotten a better understanding of the data and the context. This classification is not able to cover all possible details, nor is it a clear divider between the different containers, but to us – with our qualitative approach – it did the job.

The process of verifying the validity of our data has been continuous as well. The nature of our interviews, i.e. semi-structured and open-ended, has opened up to more of a two-way conversation, rather than a pure question-answer session. If something has been uncertain we have rephrased our question or asked the interviewee if he/she could explain further. In addition, our rather unique access to the organization with work space within their offices has, as mentioned, opened up for informal chats and discussions. Bringing up something that we have found interesting during for instance lunch enables us to get other people's opinions and meanings, thus strengthening or weakening our understanding of the topic at hand.

4. Case

4.1. Context and history

OGC was established in the early 1970s and has since grown from being a small regional operator in Northern Europe to become a large Fortune 500 company with about 20000 employees and operations in 34 countries across 4 continents. The growth of the company has been both organic and through mergers and acquisitions. Due to the limited growth potential in the home market, OGC are currently expanding internationally.

As the company has grown in size, so has the need for a good information infrastructure, good tools and good collaboration solutions. A number of corporate-wide initiatives to improve communication and collaboration have been undertaken. In the early 1990s the information infrastructure had become decentralized and fragmented to such a degree that a project to improve the situation was implemented (Monteiro and Hepsø 2002). This implementation was based on a Lotus Notes collaboration solution.

The Lotus Notes solution was widely used within OGC – and especially the Lotus Notes Arena databases were successful in order to facilitate collaboration within projects. However, one major challenge with the Lotus Notes infrastructure was the communication across different projects. The Arena databases had no centralized indexing functionality, meaning it was impossible to retrieve a document by searching if one did not know exactly what database to search. Internal estimates suggested that at within 10 years of operations OGC had more than 5000 Arena databases within their Lotus Notes infrastructure. OGC also produced more than 300 000 new documents each month. In such an environment, finding a piece of information was definitely non-trivial.

In 2001 a new strategy to improve collaboration and communication was introduced to combat the limitations of Lotus Notes. In 2003 a decision to implement a new collaboration solution based on Microsoft SharePoint technologies was made. During the next 2 years the new solution was implemented throughout the company.

Initially, OGC wanted an out-of-the-box solution that would require little or no user training. However, they quickly realized that an out-of-the-box implementation would not fit their needs. They chose to make it as generic as possible in order for it to fit most contexts, but also introduced a custom classification schema in order to facilitate future information retrieval.

The core element of the new infrastructure was a team site, i.e. a virtual arena for collaboration. This is where people would store their documents, relevant emails and other information relevant to the various tasks and projects. In many ways, a team site would equal an Arena database in the old system. A built-in search engine would help people retrieve information within the SharePoint architecture. In addition, a search engine based on FAST technologies was introduced. This search engine would, in addition to the SharePoint infrastructure, also cover old Arena databases, the corporate intranet, archive, disk drives and other sources, making information retrieval even more efficient.

4.2. Production engineers at work

In 2003, OGC discovered a new oil and gas field in the North Sea. A new unit was established within OGC to be responsible for running this new field. Within this unit, a number of engineers with different petroleum technological background was put together to form a division responsible for getting the oil and gas from the reservoir below the sea bottom and to the processing plant on the platform. This division consisted of about 35 people from a number of disciplines: Production engineers, reservoir engineers, petro physicists, geophysicists and geologists.

When our research began, there were 5 production engineers within this division. Their experience ranged from just graduated with less than 6 months on the job to people working within OGC 6 – 8 years. Only one of the engineers had an educational background as a production engineer, while the others had different petroleum technological backgrounds. During our research period a total of 9 production engineers has been part of the group for longer or shorter periods of time. At the time of writing they are 7 production engineers with this group.

The production engineers' main task is to get the optimal amount of oil and gas from the reservoir to the platform at any given time. To achieve this, the engineers have to run the 12 individual wells at an optimum. In the long run, they want to get as much of the oil and gas out of the reservoir, but in their daily work there are limitations and restrictions preventing them from just running the individual wells at maximum rate. For instance, the total production from the 12 wells might be higher than the capacity of the pipelines connecting the wells to the platform. If that is the case, the production engineers have to limit the production from one or more wells in order not to exceed this limitation.

[Figure 1 placeholder]

At all times, one of the production engineers also has the role of production coordinator. Two of the production engineers alternate having this position every month. The production coordinator is responsible for coordinating the tasks within the petroleum technology group with tasks from other parts of the organization. The production coordinator is also the one making the production plan; a prediction of the production for the upcoming week, every week. The role is also responsible for going to various meetings and bringing relevant information back to the group. In short, the production coordinator is the petroleum technology group's connection point with the rest of the organization.

All the various engineers within the petroleum technology group are co-located in a large open office area. At one end of this area is a separate room, a collaboration room, where some of the production engineers work. In the rest of the area office desks are grouped together into "islands" of three people (See figures 1 and 2). The collaboration room- or "glass cage" as it is sometimes referred to – is separated from the rest of the area by a large, sliding glass door. This collaboration room is, in addition to 4 workstations, equipped with 2 projectors, 1 interactive whiteboard and 1 42" LCD monitor. The content on any of the workstations can be displayed and shared on any of the large screens in the room. The room is also equipped with video conferencing facilities. The group uses this room for internal meetings, as well as in meetings with people from outside the group if the meeting is production related. Except during meetings, the sliding door is most often left open.

[Figure 2 placeholder]

The rationale behind separating the production engineers in their own room is because they to a large extent work on a different time horizon compared to the rest of group; they monitor the daily activities both in the reservoir and on the platform, while the rest of the group have a more long term focus. If something related to production happens to either the reservoir, the wells, the pipelines or the platform, it is the production engineers who have to handle it. The production engineers, and especially the production coordinator, also interact with other parts of the organization on a more frequent basis than the others, and if he/she should do this in an open office area they would more likely interrupt the others.

5. Analysis – Becoming a production engineer

New engineers go through an on-the-job training period shortly after joining OGC or after being transferred to a new unit within the organization. During this phase the engineers are introduced to organization, their future tasks and responsibilities, as well as the tools and systems they will need in their new position.

5.1. The master-apprentice relationship

When a new engineer is joining the group he/she is coupled up with a more experienced, often senior, engineer. This mentor/mentee relationship is positive to the new engineer as he/she through following the senior around on meetings interacting with other parts of OGC the newcomer is introduced to the rest of organization.

> *"[Name 1] and [Name 2] were production coordinators this fall, but I attended all meetings."* – Production engineer

This is in sharp contrast to when one of the other engineers began shortly after the field began production. He had no experience being a production engineer, nor did he have other production engineers to rely on:

> *"I relied on people around me that did not have this type of responsibility. ...[Newly employed engineer] began in a better setting. Fewer problems. Better to sit with the others."* – Production engineer

As the oil and gas field has become more mature, routines for introducing new members into the group has been established as well. From the ad hoc practices in the initial phases there is now a plan behind hiring new engineers.

> *"I got a job offer, began in August with a 6-months plan: Gradual training to become a production coordinator. Good to know what they wanted to use me for."* - Production engineer

5.2. Learning by doing

Another way of embodying new engineers into the community is to get them producing as quickly as possible. New engineers quickly get responsibilities and tasks. In the beginning quite simple, but with time they become more complex.

> *"[I] got some small tasks that soon became bigger."* – Production engineer

As one of the main responsibilities of an production engineer is to monitor the various wells in depth, each engineer has a special responsibility for a handful of specific wells. New production engineers are given the responsibility of wells and have to follow them with regards to production rates, changes in temperature and pressure and sand and/or water production. In order to do this, the engineers have to get to know the wells.

> *"Before Christmas I got the responsibility for the [group of wells]. [I] had to get to know their history from production began, as well as production data. ... I searched through [available] information myself. Documents from Teamsites. [System] has data back to 1. January 2008. [Name] has a different system for older data."* – Production engineer

Retrieving, sorting through and understanding this kind of information is very important to a production engineer. In order to understand how and why a specific well is behaving they need to understand its history.

Knowing the history is paramount in becoming a part of the community of practice that the production engineers constitute.

5.3. Peer-based learning

Production engineering within OGC is versatile. The production engineers, whose primary responsibility is to get oil and gas out of the reservoir and to the process plant, need to know a little about everything due to their coordinating role. For instance, a production engineer needs to have a bit of understanding of reservoir engineering as well the processing plant. Due to this, it is near impossible to learn everything needed before beginning in the position. A consequence of this is that people that do not have a education specifically within production engineering can assume the role. For instance, amongst the initial group of production engineers, only one had an education specifically related to production engineering. One had an educational background within chemistry and experience from processing, while another had previously worked on drilling of wells.

> *"[I've] never worked on production earlier. [I had] no knowledge of production optimization."* – Production engineer

Because of the diverse educational backgrounds of the people working within production engineering, on-the-job training becomes even more important.

> *"I finished my education in '97, everything I need I've learnt after school. Lots of courses – both*

here and at [previous employeer]. The education is just the background." – Production engineers

Production engineering does require specialized and knowledgeable workers. However, being such a multifaceted discipline it is impossible to expect new engineers to possess all the required skills when they begin in the position. Thus, giving them the required knowledge through on-the-job training becomes even more important. A strong community of practice is in that respect paramount.

When a new production engineer is introduced to the community he must be adopted into the group, i.e. the community. Even though he knows a lot about production engineering, and perhaps have years of experience, there are still reservoir and well specific elements he must become taught. Each reservoir and well has specific characteristics with regards to for instance temperature, pressure and the ratio between oil and gas. The wells are also planned and completed differently.

"*There is a lot of documents and history. [I] used a bit of time on [field name] and well [number] regarding completion, initial plans and final well trajectory."* - Production engineer

However, the collaboration room in itself can be seen as a tool assisting the learning process. The room provide more than just co-located work. Through its design it facilitates learning by lowering the threshold to ask for help.

"*No doubt things has improved with the new room. ... Easy to put things on the big screens and check with colleagues."* - Production engineer

The room also plays a role as a place where discussions are held and decisions are made. Even to the engineers that are not directly involved in the discussions the fact that they are witnessing the discussion means that they are aware of what the focus of the discussion has been and what was decided. This is especially important to the production coordinator has he/she at all times need to have a big-picture understanding of what is going on.

But also to new production engineers, being able to witness discussions between senior engineers are valuable in giving them insights into how problems are being solved. In other settings, we can imagine problems being discussed and solved around one single computer monitor – effectively preventing anybody else from being included.

Some of the time, the production engineers work alone with their computer desktop displayed on one of the projectors. At times this is appear to be to signal to others that they are very busy and will not be disturbed, while at other times, for instance while making the production plan, they signal that they would like input from others.

8. Discussion

As our analysis has showed, being a production engineer within oil and gas production is an intricate position. The engineers have a variety of responsibilities and have to interact with multiple disciplines.

Production engineering is a core activity within oil and gas production. The engineers sit with their fingers on huge streams of revenue and can, if doing their job poorly, easily kill a well and cause their company millions in lost revenue. Still, production engineering is to some degree an entry level position within oil and gas production. As our analysis has shown, production engineers do not have a uniform background or education. In fact, most production engineers within this group do not have an education within production engineering.

Our findings suggest that production engineers are the generalists within gas and oil production. As opposed to for instance reservoir engineers or geologists that are more strongly focused on their specific world, the production engineers have to interact with significantly more disciplines. The production engineers need to know a little about everything; they need to know a little about what the reservoir engineers do, they need to know a little about what the processing engineers do, they need to know a little about what the operations engineers do, they need to know a little about what the geologists do, and so on.

Because of this versatility, you don't have to be a production engineer by training/education in order to become a production engineer. You do, however, need an overall understanding of oil and gas production in order to fill the role. You need an overall understanding of how oil and gas behave within a reservoir with given properties. You need to know how oil and gas is being processed at the processing plant. You need to know how a well is constructed and completed, and you need to know how to treat the well in case something happens.

As there are significant differences between the wells on one field compared to wells on other fields; both with regards to production conditions like pressure and temperature, and with regards to how the well is drilled and completed, as well as the tools and systems used, a production engineer cannot easily "just switch fields". Joining a new field requires the new engineer to go through a period of training, no matter how experienced he/she is from other fields, before he/she can become a productive production engineer. Though, on an abstract level, production engineering can be seen as a rather uniform activity, i.e. get oil and gas from the reservoir somewhere under the surface and to some processing plant, in reality it is not.

Thus, industry initiatives like Integrated Operations are faced with a number of challenges when they seek to standardize and generalize oil and gas production. How can they succeed in standardizing such a heterogeneous activity as production engineering?

7. Conclusion

Due to the inherent complexity of oil and gas production, in order to become a production engineer newcomers must be initiated into the community of practice through extensive training. Experiences from other oil and gas fields are to some degree of little relevance as there are so large differences between two different oil and gas fields. Engineers with experiences from other oil and gas fields do have some benefits already knowing what to do, they still need to learn how to do it when coming to a new oil and gas field; as different fields use different systems offshore, have different tools – or simply use the tools differently. The different oil and gas reservoirs also often have very different characteristics with regards to temperature, pressure and permeability. There are also differences between how different wells are designed and constructed, as well as the various processing plants. All this suggests that in such complex settings, training are an extremely important in becoming a member of a community of practice.

10. References

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Table 1. Types of meetings observed

Meeting type	Frequency	Duration	Participants	Purpose
Control room meeting	Daily	15-25 minutes	8-12	Production related events last and upcoming 24 hours
Platform meeting	Daily	15 minutes	18-22	Platform related events last and coming 24 hours
Petroleum technology	Daily	3-15 minutes	15-30	Summary of the two previous meetings with focus on petroleum technology
Production meeting	Weekly	1-2 hours	15-20	Planning activities and operations for the coming week
Reservoir meeting	Bi-weekly	2 hours	6-12	Status of fields and well, planning activities for the next period
Various meetings	Occasional	5 minutes – 6 hours	4 – 20	E.g. reservoir drainage strategy workshop

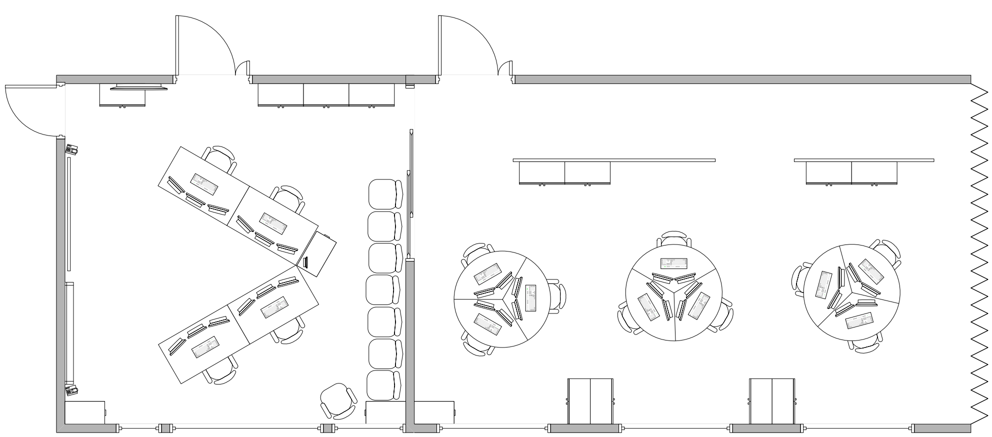

Figure 1. Open plan office layout (The room continues to the right with more “islands”)

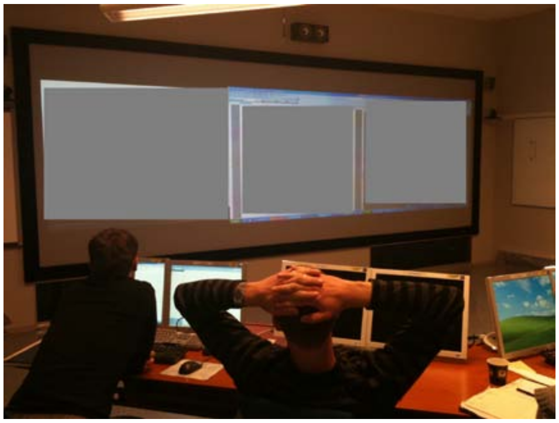

Figure 2 - Working in collaboration room