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Content

Abstract

Purpose: The purpose of our study is to investigate the factors that have been prominent in driving or restraining the implementation of Integrated Operations within the Norwegian oil industry.

Design/methodology/approach: Cross-sectional case study based on interviews with 15 respondents and the use of relevant documents. Findings are presented in a modified version of Lewin's Force Field Analysis.

Findings: We have found multiple forces that have affected the implementation of Integrated Operations to various extents. Our findings are categorized into nine different sections: *Understanding the rationale of IO; Vision and goal setting; Establishing support for change; Coping with uncertainty and fear; Experimentation and local creativity; Stakeholder involvement; Technology; Collaboration rooms; Training; and Communication*.

Research limitations: This study has limitations related to the operationalization of concepts, breadth of scope implying reduced degree of detail, time perspective and generalizability.

Practical implications: Findings based on data gathered across multiple organizations in the Norwegian oil industry should yield a great potential for improving the future development of Integrated Operations.

Originality/Value: A study focusing on trends in implementing Integrated Operations across companies on the Norwegian Continental Shelf has not previously been conducted.

Key words: Change Management, Integrated Operations, Resistance to Change, Employee Commitment

Paper type: Student Master Thesis

There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things

Niccolo Machiavelli, The Prince, 1532

1 Introduction

Since oil first was found and extracted on the Norwegian continental shelf (NCS) in the early 1970s, this industry has served as the main contributor to the rise of Norwegian economy and welfare. Numbers presented by Statistics Norway in 2009 stated that 47 000 persons were employed in the Norwegian oil and gas industry (SSB.no a). In addition, in 2010 the industry was attributed 22 % of Norway's total GDP, demonstrating its central position in the Norwegian economy (SSB.no b).

As companies in any other industry, the operators on the NCS compete for profits and competitive advantage. By the turn of the millennium a new way of organizing work, heavily based on utilization of new technology, was introduced in the industry. By taking advantage of real time data, multidisciplinary teams and increased decision accuracy, *Integrated Operations* (IO) has been expected to enhance the effectiveness and efficiency of work processes in the sector (OLF 2007). However, as this is a new way of organizing work, there is a certain risk that issues will arise in relation to the implementation of change.

1.1 Research Question

The purpose of our study is to investigate how IO and its work processes have been implemented within organizations operating on the NCS. Different IO-related initiatives have been introduced to the industry over the past ten years, and as a consequence we wish to assess the implementation during this period of time. In order to do so we want to map out the different driving and restraining forces affecting change. We will look into the major IO initiatives that have been undertaken within the industry, what their intended effects have been, and to what extent the overall implementation has been successful. The aim of this study is thus to answer the following research question:

How has Integrated Operations been implemented within the Norwegian oil industry, and what factors have been prominent in driving or restraining the implementation?

In order to answer this question, we will utilize a modified version of Kurt Lewin's Force field analysis (Buchanan & Huczynski 2010; Burns 2009; Cummings & Worley 2009; Green 2007). By combining this tool with the central aspects of IO implementation we wish to get an overview of how change has been managed. Further, by mapping out these forces we will attempt to gain a deeper understanding of how IO-related initiatives have been implemented in regards to employee commitment and potential resistance to change, as these concepts have been shown to have a

significant influence on the outcome of change (Buchanan & Huczynski 2010; Ford, Ford & D'Amelio 2008; Beer & Nohira 2000; Piderit 2000).

The oil industry's great significance for Norwegian economy underlines the need for a study that assesses potential success criteria for the IO implementation (SSB.no a; b). Our research is unique in that it evaluates the implementation across company boundaries, and we hope that our findings might yield some value for the Norwegian oil industry as a whole. In a more general perspective, we also hope that this study can be of some contribution to the large base of change management literature as it involves research on employee commitment and resistance to change.

1.2 Thesis Structure

We will first introduce and define IO, and explain the different components of the new technology and work processes. Thereafter follows a comprehensive literature review focusing on relevant issues from change management theory. We will here elaborate on employee commitment, organizational culture and employee resistance to change, and try to see these concepts in relation to IO. A review of Kotter's 8-stage model of change and Lewin's Force field analysis will be presented at the end of this section (Buchanan & Huczynski 2010; Burns 2009; Cummings & Worley 2009; Green 2007; Kotter 1996). Following, we will carefully go through the methodology employed, before we present our findings in our analysis. Our main findings will then form the basis for a discussion. Finally we will present the practical implications of our study after which the thesis is summed up with some concluding remarks.

1.3 Deciding for one name

Integrated Operations is only one of multiple terms referring to the technology and work processes within the industry. Some related initiatives among suppliers and operators are referred to as Smart Operations (Petoro), eOperations (Hydro), Smart Fields (Shell), Field of the future (BP), Real Time Operations (Halliburton), Smart Wells (Schlumberger) and i-fields (Chevron) (Henriquez 2008). The term Integrated Operations has primarily been used in Statoil and OLF, but today it seems to be a shared understanding of what this particular term includes within the industry. Thus, we will consequently use the term Integrated Operations (IO) when we refer to the new technology and related work processes throughout this thesis.

2 Integrated operations

Within the petroleum industry the term Integrated Operations (IO) basically refers to work processes that allow for a tighter integration of offshore and onshore personnel, operator companies, and service companies (Skarholt et al. 2009). This integration is made possible by modern

information and communications technology (ICT), and high bandwidth fiber optic network that allows for real time data sharing between remote locations (Gulbrandsøy et al. 2004). Experts from different disciplines can collaborate more closely, which facilitates for more rapid response and decision making (Rosendahl & Egir 2008). The Norwegian Ministry of Petroleum and Energy (St.meld no. 38) defines IO as: "Use of information technology to change work processes to achieve improved decisions, remote control of processes and equipment, and to relocate functions and personnel to a remote installation or an onshore facility".

2.1 The fundament from which IO has developed

The first outline of IO was developed by the space industry (Rosendahl & Egir 2008). It was fundamentally based on multidisciplinary teams sharing information in a concurrent manner, using high-tech instruments to ensure a sufficient flow of information. This way of working was anticipated to increase the cooperation between different fields of expertise and thus improving decision accuracy, in addition to cutting costs. In the oil industry the idea of enhancing rig site support from an onshore location was first implemented in the early 1980s. The first attempts were performed by Superior Oil (Booth & Hebert 1989) which established drilling data centers, providing real time log and "measurement while drilling" data to shore based teams (Wahlen et al. 2002). These early attempts of improving the procedures of critical drilling projects lay the path for the future development of IO within the industry.

In relation to the Norwegian oil industry, the first implementation of IO took place around the turn of the millennium. In 1997 Baker Hughes INTEQ started planning for a project, in cooperation with Norsk Hydro and BP, which was supposed to facilitate the relocation of people from offshore installations to an Operations Service Center onshore. In 2000 the project launched with a centre capable of supporting five offshore rigs simultaneously (Wahlen et al. 2002). ConocoPhillips went in the same direction, and developed an onshore drilling centre established in Tananger in 1999 (Herbert, Pedersen & Pedersen 2003).

2.2 Components of Integrated Operations

Today most major companies in the Norwegian oil industry utilize what we refer to as IO initiatives, and the NCS is by many regarded as the world's most advanced basin in terms of developing such initiatives (Henriquez et al. 2008). The new work processes of IO represent a parallel way of cooperating, which contrast the traditional sequential way of performing work (OLF 2007). Various professionals with multidisciplinary backgrounds are now able to analyze real time data in collaboration, making decisions and corrective actions to optimize rig site production. In

addition such collaborations are no longer dependent on one physical location as the new technology allows for onshore assembling of people with the needed competencies (Rosendahl & Egir 2008; OLF 2007).

One of the key components related to IO is the establishment of onshore support centers which has enabled companies to move work tasks from offshore platforms to land. As employees are moved onshore, the need for virtual communication and collaboration between sea and land emerges. Virtuality can be defined as activities between parties that are in different geographical locations (Gulbrandsøy et al. 2004). Accordingly, a virtual organization consists of people working towards a shared goal across space, time and organizational boundaries made possible by webs of communication technologies (Buchanan & Huczynski 2010; Hepsø 2002, in Gulbrandsøy et al. 2004). The technological capabilities are realized in so-called *collaboration rooms*. Such rooms facilitate for cooperation by utilizing videoconferencing, sharing of large data sets and remote control and monitoring (Hepsø 2009; Henriquez et al. 2008; Rosendahl & Egir 2008; Herbert, Pedersen & Pedersen 2003; Ursem et al. 2003). These rooms contain large screens for sharing of data and possibilities for real-time data transmission between land and sea, vendors and suppliers, and other departments deemed important. The potential effect of such virtual communication can be illustrated by the following success story which one of our respondents shared:

> *"There was a situation offshore where a drilling device got stuck, and expert assistance was required. Two experts were sent out by helicopter – a trip that takes about two and a half hour – while a third expert was summoned to the onshore operation room. When the helicopter finally arrived at the platform, the two experts were told that they could go back immediately – the problem had already been solved! The third of the experts had seen what the problem was virtually and could based on this information explain how the drilling device should be released. That is pretty amazing."*
>
> - Respondent

2.3 Why implement IO?

In general the rationale behind implementing IO is based on the belief that this way of organizing work will streamline operations and increase effectiveness, thus leading to competitive advantage and increased profits (OLF 2007). Based on the definition of IO which was offered initially it is anticipated that the organization by integrating its operations will improve its decisions, both in relation to time and accuracy. Further, the fact that technology provides the opportunity to control offshore processes and equipment from onshore locations should imply more effective operations.

The ability to assemble important functions on an onshore location will also include reduced need for offshore personnel. Already in 2003 a study by OLF on a drilling pilot project found that on some platforms, a reduction of up to 70 percent in personnel had been carried out without reduction in security (OLF 2003, in Gulbrandsøy et al. 2004).

In addition to the positive implications for effectiveness, implementation of IO is expected to have beneficial effects on Health, Safety and Environmental issues (HSE) in the industry (OLF 2007). Greater continuity and integration of activities will enhance the integration of management offshore and onshore, and potentially improve HSE issues. Offshore management can focus more of its attention to operational issues and less on administrative tasks, while performing the planning and work preparation onshore will increase the long-term focus on each asset, increase safety and reduce the risk of environmental hazards (Grøtan & Albrechtsen 2008; Henriquez et al 2008; Ringstad & Andersen 2006).

In a report from 2007 the Norwegian Oil Industry Association (OLF) estimated that if the oil and gas companies in the Norwegian shelf were to quickly integrate their operations, revenues from the shelf could be increased by approximately 300 billion NOK (OLF 2008). Such an estimate provides a good incentive for companies within the industry to rapidly implement IO in their organizations. It also displays some of the belief that IO represents the future for the oil industry, and that the companies who first adapt to this way of working will gain an advantage. In response to this, the different operators in the Norwegian oil industry have undertaken various initiatives to integrate their operations. For example, Statoil has shown great belief in that IO will be a part of its future, something that Chief executive of Statoil Helge Lund emphasized at the Intelligent Energy conference in Amsterdam late February 2008: "Statoil(Hydro) aims to be a global leader within integrated operations. This is one of three selected focus areas across the organization. Real time competence sharing is necessary in a complex and demanding industry. It is all about integrated operations and people in seamless collaboration, independent of organization, time and place" (OLF 2008).

2.4 Issues in implementing IO

IO as a concept tap into technological issues in the oil industry, as well as issues related to the organization, its people, and its work processes (Rosendahl & Egir 2008; Ringstad & Andersen 2006; Herbert, Pedersen & Pedersen 2003; Ursem et al. 2003). To capture these different aspects of the organization, literature has proposed the concept of Man-Technology-Organization (MTO) (Andersson & Rollenhagen 2002). If IO-related work processes are to be successfully implemented

it will require considering all three aspects of this system perspective. Although it appears in retrospect as if the implementation of IO on the NCS is relatively successful, severe challenges have been faced regarding the development of new work practices and the management of change – the integration of people, processes and technology all together (Rosendahl & Egir 2008; Hepsø 2006; Ringstad & Andersen 2006).

According to Hepsø (2006) there was an overoptimistic belief in IO at the turn of the millennium, as to how easy it would be to implement and gain results from it. To explain the challenges faced in relation to people and processes in the implementation of IO, we will in the following make use of the field of change management theory. The implementation of IO involves restructuring of work processes and management of employees, and these are undoubtedly two of the cornerstones of change. Different factors can drive the change forwards, while at the same time, other factors may hinder the change, and as a consequence, being able to successfully manage change is of utmost importance.

3 Change Management Theory

In a constantly evolving world the need for organizations to anticipate change and reconfigure themselves is more predominant than ever (Lawler & Worley 2009). Buchanan & Huczynski (2010) propose that the evolving circle of repeated change can be explained by three basic factors. First is the intense competition and stock market turbulence in the private sector along with consumerism and government pressure in the public sector. Second, the pace of technological innovations plays a major part, and third, increased knowledge-intensity, as organization design affects information flows. Beer and Nohria (2000) estimate that about two-thirds of change projects fail, a concern that is shared by Whittington and Mayer's (2002) research claiming that outcomes of major organizational change often is disappointing. Evidently, in order to achieve successful change in an organization there will be a fundamental need to devote sufficient attention to the management of change. We will in the following go through what we consider to be some of the most important literature in regards to the implementation of IO within organizations operating on the NCS.

3.1 Commitment to change

One of the most essential aspects related to successful change is the establishment of employee commitment (Buchanan & Huczynski 2010; Cummings & Worley 2009; Beer & Nohira 2000). Commitment is often described as an employee's attachment to an organization, but this association might also have other referents such as an organizational subunit, a supervisor, or even a particular program or event, as for example a change occurring within the organization (Herscovitch & Meyer 2002). For example, Fedor, Caldwell & Herold (2006) found evidence to suggest that the

favorableness of an organizational change is positively related to perceptions of both change- and organizational commitment. In other words it might be useful to distinguish between commitment towards the organization as a whole, and the change process itself.

Establishing commitment towards the change process is imperative for an organization in order to harness the expected benefits of a change initiative. Such commitment can in many ways be defined as the willingness to exert effort on behalf of the change (Fedor, Caldwell, & Herold 2006). In addition, it is vital to separate commitment to change from mere compliance, since the long term benefits occur when employees actively work to support the change and maintain or enhance their alignment with the organization's values and goals (Fedor, Caldwell & Herold 2006; Beer & Nohira 2000). Thus, when employees act on compliance and simply do as they are commanded, there will be a lack of motivation over time that might impair the effects of change.

Reichers (1985) distinguish between two different types of commitment; attitudinal and behavioral. Attitudinal commitment is concerned with the employee's identification with the values and goals of the organization, and their willingness to work towards them. Behavioral commitment, on the other hand, is based on the binding of individuals to behavioral acts, and can be termed as an attributional approach to commitment. It is important to be aware of the cyclic nature of these concepts, since attitudes can affect behavior, which again can affect the attitudes (Reichers 1985). Further, since people have multiple commitments towards the organization, be it their colleagues, superiors, work units or customers etc, it is important to recognize these different commitments in order to know more exactly how an employee can be influenced to support change. Related to this is the research by Kegan & Lahey (2001) in which evidence was found to support their theory on *competing commitment*, which is a subconscious hidden goal that conflict with an employee's stated commitment. The authors explain how competing commitments can cause valued employees to behave in ways that seem irrational, and thus cause concern both for themselves and the company (Kegan & Lahey 2001).

Employee commitment is an important aspect for organizations to take into account in order to manage change effectively. But how is such commitment established? In the following we will review some theoretical concepts that are central in ensuring dedication and effort towards the implementation of change initiatives.

3.1.1 Employee involvement

According to Cummings & Worley (2009) employee involvement generally seeks to "increase members' input into decisions that affect organization performance and employee well-being"

(p.351). In a change-related context, Buchanan & Huczynski (2010) suggest that those who are being affected by the change should be involved in the planning and implementation of new initiatives in order to reduce opposition and ignite commitment. To gain and maintain such involvement is a continuous process that stretches over the lifetime of the change project. Beer, Eisenstat & Spector (1990) underline that even though top management often understand that there is a need for establishing employee commitment and involvement, they seldom realize that changing employee behavior takes more than introducing new formal structures and systems in the organization. In their study they found that the greatest obstacle of organizational revitalization is that it comes about through companywide change programs. In order to achieve successful change, they claim that initiatives must develop from lower levels of the organization through the active involvement of employees focusing on how to solve actual work-related problems (Beer, Eisenstat & Spector 1990).

This quest for achieving successful change through employee involvement can be traced back to a more fundamental issue within change management theory. Should change be implemented from top-down, or should it evolve from the bottom and up? In Beer & Nohria's book "Breaking the Code of Change" (2000), these two seemingly contrasting perspectives are discussed. Conger (2000) speaks for a top-down approach to change, since senior managers are in the best position to plan and coordinate organizational change. After all, top management possesses the advantage of having breadth of perspective of the organization. However, Bennis (2000) claims that successful change only can occur by having willing and committed employees. As top management has a limited ability for understanding the complexity of operational tasks in the different units, organizational change is not possible without the inclusion, initiative, and cooperation of the employees. Beer & Nohria (2000) concludes that both approaches must be taken into account in order to achieve change successfully. Employee involvement and participation are required both to assist in the planning of change, as well as in the execution (Beer & Nohria 2000; Dunphy 2000).

3.1.2 Sense-making

During a change process people will go through stages with uncertainty and phases where there are a lot of questions of what is going on. There will be a need for sense-making, which basically is about trying to understand what is happening around us (Weick 1995). Sense-making can be seen as the process of linking together symbols and activity (Taylor and Van Every 2000) and is a fundamental part of dealing with the unknown (Prus 1996). Weick et al. (2005; cited in Maitlis & Sonenshein 2010) explain that an increased need for sense-making occurs when discrepant cues challenge people's ongoing activity, and involves the retrospective development of plausible

meanings that rationalize what people are doing. Central to this development is the perception of cues from the environment, and the interpretation of those cues based on existing mental frames. Sense-making is thus about connecting cues and frames to comprehend what is going on (Maitlis & Sonenshein 2010).

Both Matilis & Sonensheim (2010) and Weick (1995) highlight the importance of the social process through which sense is made, as well as the shared meanings that can emerge from it. The extent to which shared sense-making across employees will lead to collective action is much debated, and research has suggested that the impact of certain kinds of shared meanings might be helpful as well as harmful to change (Matilis & Sonensheim 2010). Three types of shared meanings are mentioned – *commitment, identity* and *expectations* – which all might facilitate or inhibit sense-making during times of organizational change. Employee commitment to change serves as a foundation for sense-making since people often generate explanations to justify the actions they have committed to (Weick 1995). At the same time, people will not commit to something they cannot comprehend, and there is thus a need for establishing sense to change before it is implemented. Evidently, sense-making is an important aspect of raising commitment towards a change process.

3.2 Organizational culture

Organizational culture can be defined as "the shared norms, values and beliefs which influence the way employees think, feel and act towards others inside and outside the organization" (Buchanan & Huczynski 2010, p.100). More specifically, we can say that organizational culture is something that guides or influence employee behavior by setting the norms for appropriate behavior in different situations. According to Bate, Kahn & Pye (2000) organizational cultures are continuously constructed and reconstructed at the everyday level through interaction and intervention.

Changes related to the implementation of IO bring about quite drastic transformations in parts of the organization (Henriquez et al. 2008; Hepsø 2006; Brochure Integrated Operations; TU.no a). New and complicated tools and equipment, new ways of organizing work processes and situations together with new working environments and requirements for the employees, establish the need for employees to be prepared for a different future. Schein (1999) argues that organizations fail to implement change due to their inability to effectively create a readiness for change, before attempting the change induction. As a consequence, it is essential that a company contemplating change needs to take readiness for change into consideration.

3.2.1 Readiness for change

Prior to the change process, the concept of readiness for change is arguably one of the most important factors involved in establishing initial employee support for the change initiatives (Holt et al. 2007 a; Armenakis, Harris & Field 1999; Armenakis, Harris & Mossholder 1993). Readiness for change is reflected in "organizational members' beliefs, attitudes and intentions regarding the extent to which changes are needed and the organizations' capacity to successfully make those changes. Readiness is "the cognitive precursor to the behaviors of either resistance to, or support for, a change effort" (Armenakis Harris & Mossholder 1993, p.681-2). Accordingly, organizational readiness for change occurs when the environment, structure and employees' attitudes reflect receptiveness to a coming change. Organization members' adaption occurs as they gradually alter their attitudes and behaviors to conform to the expectations of the change, and the readiness is institutionalized as the change becomes a stable part of their behavior (Holt et al. 2007 b). We would assume that establishing a high level of organizational readiness for change is of great importance for the companies operating on the NCS, especially since the implementation of IO is a continuous process with multiple episodic initiatives. Thus, there will be a constant need for being receptive to new technology and work processes.

In order to create readiness for change an organization must instill a sense of dissatisfaction with the status quo, so that the employees are motivated to try new work processes, technologies, or ways of behaving (Cummings and Worley 2009). Holt et al. (2007 a) found that the most influential readiness factors, were *discrepancy*, the belief that a change is necessary; *efficacy*, the belief that the change can be implemented; *organizational valence*, the belief that the change will be organizationally beneficial; *management support*, the belief that the organizational leaders are committed to the change; and *personal valence*, the belief that the change would be personally beneficial. However, the creation of readiness is not necessarily a pre-change concern only. Readiness must be maintained throughout the process of large-scale change initiatives, particularly since such change is composed of smaller continuously ongoing changes.

3.3 Resistance to change

The human side of implementing the different aspects of IO can be a major challenge, since it affects the work situation of many of the employees in the organization. When confronted with a change, humans normally react in one of three possible ways regarding how to comprehend the change; by *acceptance*, by *ambiguity* or by *resistance* (Ford, Ford & D'Amelio 2008). Therefore, when a company is going through changes it must be aware of the fact that some employees might resist the change. In fact, employee resistance has been cited as the main factor that derails change

initiatives (Regar et al. 1994; Kotter 1995). Kurt Lewin defines resistance to change as "a restraining force moving in the direction of status quo" (Lewin 1952, cited in; Piderit 2000, p.784) and it might be conceptualized as a cognitive state, an emotional state or as a behavior. We believe this might be an area that could potentially cause the implementation of IO to be slower and more difficult than first proposed by the OLF, and as a consequence, an important restraining force to change.

3.3.1 Reasons for resistance

Since resistance to change can have such a detrimental effect, we will try to shed some light on what can be the source of this resistance. As the concept is complex, it can be observed in various ways. Yukl (2010) describes some important, not mutually exclusive, reasons for resistance, and we will include four of these that we perceive to be most applicable for the case in the Norwegian oil industry:

1) Belief that change is unnecessary. If the organization has been successful, and there is no visible trouble on the horizon, resistance is more likely to occur when change is introduced. Even when a problem is recognized, people usually confront it by trying to adjust previous strategies or to do more of the existing routines, instead of changing. The belief that change is unnecessary might be an issue in an industry – like the oil and gas industry – where profits are high and business is generally going well (SSB.no c).

2) Economic threats. Employees might fear that they will suffer personal loss of income, benefits and job security as a consequence of organizational change. Thus, economic threats might increase resistance, especially in situations where employees have painful experiences of downsizing and layoffs in the past. As IO brings about rationalization within the organizations, leading to a reduced need for off-shore staff, this source of resistance might be particularly relevant in our case.

3) Loss of status and power. Since changes often imply a shift in power and status for some teams or individuals, employees holding positions that most likely will be affected negatively might possibly be more prone to oppose the change. In relation to IO, experts working in multidisciplinary teams might experience an increase in status and power, while those who stay put in their ordinary positions might experience a similar decrease.

4) Resentment of interference. Some employees simply do not like to feel controlled by others, and attempts in changing their job situation are likely to cause resistance. IO will for some involve severe changes in their everyday work processes, and this might provoke a feeling of being interfered.

3.3.2 Overcoming resistance to change

Cummings and Worley (2009) describe three major strategies for dealing with resistance to change. First is the notion of empathy and support. By being able to see the situation from another perspective and thus learn why people are resisting the changes, it is possible to convince employees of the usefulness of the change. Second, it is very important to have a high focus on effective communication, and always keep the employees informed about forthcoming changes and the likely result. Because of the vast amount of information already coming through existing channels it is vital that the information regarding change is delivered through new or different channels than previous information. The third and maybe the strongest strategy are using participation and involvement of the employees in the planning and implementation of change. This increases the likelihood that the employees interests and needs will be accounted for, which will help raise commitment, because doing so will suit their interest and meet their needs (Cummings and Worley 2009).

3.3.3 Resistance to change – an asset?

While resistance to change can have damaging effects on the outcome of change, some research is challenging the idea that resistance merely should be regarded as an obstacle that needs to be eliminated. Piderit (2000) suggest that researchers have ignored the potential positive intentions that may motivate negative responses to change, and that a strategy of fostering ambivalence and resistance in the early stages of a change initiative actually can be fruitful in order to see the change process from different angles. The problem is, however, that managers often perceive resistance as purely negative, and that employees who resist change are seen as disobedient (Piderit 2000).

Ford, Ford & D'Amelio (2008) are concerned with the same issue in their study on alternative ways on perceiving resistance to change. They point to the fact that resistance to organizational change seldom is presented as a product of rational coherent objectives and strategies, even though resistance to persuasion has been found to come as a result of thoughtful consideration (Ford, Ford & D'Amelio 2008). In addition, resistance to change is almost never portrayed as a potential contributor to effective change, even though authentic dissent has been shown to be useful in other areas of management. Thus, the authors propose that resistance to change actually might be utilized as an asset for organizations going through change (Ford, Ford & D'Amelio 2008). Since what is referred to as resistance to change is very common, and perhaps even inevitable, there is a need for organizations to address this issue the right way. Knowles & Linn (2004) support the arguments above and propose that if an organization can use resistance in a productive way, it might create

value for the existence, engagement and strength of the change, and thus act as a resource instead of a restraint to change.

Now, how should organizations go about utilizing resistance as a resource for achieving successful change? First of all, Ford, Ford & D'Amelio (2008) propose that resistance might be utilized in keeping the conversation about change in existence, since it ignites debate and creates awareness. In this way the idea of change will gradually root within the organization. Second, resistance might be valuable in that it represents on possible form of engagement (Piderit 2000). Thus, in some cases, resistance may reflect a higher level of commitment than mere acceptance will. Third, since resistance is a form of conflict, and conflicts have been shown to improve quality of decisions (Amason 1996, in Ford, Ford & D'Amelio 2008), it is possible that resistance will improve the quality of change. By involving conflicting thoughts and ideas in the planning of change, different perspectives will be shed light on which might bring about a better final outcome. Further, Piderit (2000) suggests that managers and change agents should utilize a new conceptualization of employee ambivalence to change, focusing on at least three multidimensional attitudes (emotional, cognitive and intentional). This will break down the traditional, simplified perception of resistance, and provide for a better understanding of employees' feelings, thoughts and intentions towards change.

3.4 Kotter's 8-stage model of change

According to Harvard Professor John P. Kotter (1996) the increasing global focus of many organizations creates a more competitive atmosphere for companies, and as a result, they have to increase productivity, reduce costs, improve the quality of products and services, and find new opportunities for growth. As a consequence companies need to be able and ready to implement changes. Historically, many companies have failed to do this in a satisfactory way, leading to wasted resources and tired and frustrated employees (Kotter 1996; Kotter & Cohen 2002). In order to avoid potential pit-falls related to the implementation of change, Kotter describes an eight-stage process intended to enhance the likelihood of successfully managing major change. Step one to four help refreeze a hardened status quo, making the organization ready to implement the proposed change. Stage five to seven are concerned with instigating new activities and routines. Kotter (1996) explains that a major problem for today's companies is that they only devote their full focus on these three stages. Stage eight is perhaps the most difficult to complete and is a stage that requires protracted sufficient attention. It ensures that the change sticks, and becomes the new way of doing things. Kotter (1996) suggests the following eight stages:

1) *Establishing a sense of urgency*. The first stage is about establishing a shared understanding and acceptance for the need for change, and a realization that change will have to happen immediately. The pull of the status quo is strong enough to derail transformation initiatives if urgency is not clear. This can be done by investigating the potential future if change is not implemented, and sufficiently communicating this information to all stakeholders of the organization. This stage relates to the previous discussion of the importance of sense-making.

2) *Creating the guiding coalition*. The second stage involves establishing a group with the needed knowledge and power to lead the change. It is essential that the team is composed of individuals with positional power and expertise, together with high credibility and great leadership and management skills. The team will need to develop a common goal, which is both understandable and appealing to the employees.

3) *Developing a vision and strategy*. It is imperative for successful change that a vision is created in order to direct the change process, and a strategy to accomplish that vision. A good vision can encourage people to make sacrifices, while a strategy will present a logical and comprehendible description as to how the vision is to be accomplished.

4) *Communicating the change vision*. It is decisive to use every possibility and relevant medium to communicate the new vision and strategy. A critical mass of people must understand the vision and strategy if the change is to be successful. If employees do not perceive the benefits of the change as attractive, they will not change their behavior even though they are unsatisfied with the present situation.

5) *Empowering broad-based action*. It will be vital to get rid of obstacles, in order to change systems and structures that undermine the change vision. In addition, risk taking and nontraditional ideas should be encouraged for establishing commitment to the change. If a company achieves this, they will be able to tap into an enormous source of power to improve organizational performance.

6) *Generating short-term wins.* A company must plan for visible improvements in performance, reach the goals that are set along the way, and visibly recognize and reward people who made it possible to reach these targets. Short-term wins should be clearly visualized in order for everyone to see for themselves that results are actually achieved. The short-term wins should be linked unambiguously to the change effort in order to build further support.

7) *Consolidating gains and producing more change*. The seventh stage is about keeping up the momentum towards change and can be achieved by continuously changing systems, structures, and policies that do not fit the transformation vision. By hiring, promoting and educating people who are capable to implement the change vision, an organization can reinvigorate the process with new projects, themes and change agents – thus making sure that change progresses towards the desired state.

8) *Anchoring new approaches in the culture*. The last stage is about making the changes a permanent part of the organization and its culture. In order to make change stick it is important to articulate the links between the change initiatives and organizational success. In addition, it is vital that management continues to identify with the change – regardless of retirements and successions.

3.4.1 Sequencing

It should be emphasized that even though Kotter's model is depicting change over time, the stages do not necessarily unfold in a linear sequence (Bolman & Deal 2003). In reality stages will often overlap, and for change agents this will imply a need for sometimes returning to earlier phases. Kotter's 8-stage model of change was first proposed in an article published in 1995, which later become the most reprinted article among all the articles in Harvard Business Review (Burns 2009). His theory is widely used and often referred to in change management literature, much because of its overall applicability (Buchanan & Huczynski 2010; Burns 2009; Cummings & Worley 2009). According to Bolman & Deal (2003) much of its value lies in that the model incorporates different dimensions vital for successful change, namely structural, human, political as well as symbolic elements.

3.5 The Force Field Analysis

As brought up earlier, Kurt Lewin defined resistance to change as "a restraining force moving in the direction of status quo" (Lewin 1952, cited in; Piderit 2000, p.784). According to Lewin, the nature and pace of change are depending on the balance between the driving and restraining forces within a field. A field's progression is never static, Lewin claimed, but always in a continuous state of adaption (Burnes 2009). Therefore he used the term *quasi-stationary equilibrium* to indicate that "whilst there might be a rhythm and pattern to the behavior and processes of a group, these tended to fluctuate constantly owing to changes in the forces or circumstances that impinge on the group" (Burnes 2004, p.981). A technique for assessing the balance of the mentioned factors that push or hold back movement towards the desired target situation was developed and named the Force field analysis (Buchanan & Huczynski 2010; Burns 2009; Cummings & Worley 2009; Green 2007). The

rationale behind this tool is basically to identify all forces within a field (organization or group) that will affect change to some extent.

As part of the analysis in this thesis we will utilize a slightly modified version of the Force field analysis, where we - based on the empirical evidence gathered – will map out the most important factors that drive or restrain the implementation of IO within the Norwegian oil industry. In order to do so we will in the following make some clarifications about the assumptions this analytical tool is based on.

3.5.1 Modifications

Like Ford, Ford & D'Amelio (2008) we believe that resistance to change is a natural human reaction that does not necessarily impair the progression of planned change in an organization. Rather, resistance should be seen as a phenomenon that refines the organization's new way of doing things. Accordingly it seems necessary for us to make some modifications to Lewin's original Force field analysis. First, we would like to clarify that we do not expect forces to exclusively drive or restrain overall change. A force might be multidimensional in that it affects an organization in different ways; it can for example drive change in terms of speed/time and at the same time restrain change in terms of lack in quality. Second, in order to make our analysis more comprehensible we will divide the force field into three sub-dimensions based on the concept of Man-Technology-Organization (MTO) as presented by Andersson & Rollenhagen (2002). In this way we will be able to consider the different aspects of change in relation to the driving and restraining forces. Third, Lewin originally developed this analysis for use in individual-, group- or organizational settings (Cummings & Worley 2009). In our research we will apply the tool when we investigate multiple organizations within the Norwegian oil industry. Our complete force field analysis, with explanations of all factors, is attached in appendix 4 and 5.

4 Methodology

The purpose of our study is to investigate how IO and its work processes have been implemented within organizations operating on the NCS. As previously mentioned, the different IO-related initiatives have occurred gradually over the past ten years, and as a consequence we wish to assess the implementation during this period of time. In order to do so we want to map out the different driving and restraining forces affecting change. We will look into the specific IO initiatives that have been undertaken within the industry, what their intended effects have been, and to what extent the implementation has been successful. The aim of this study is to answer the following research question:

How has Integrated Operations been implemented within the Norwegian oil industry, and what factors have been prominent in driving or restraining the implementation?

Further, by mapping out these forces we will attempt to gain a deeper understanding of how IO-related initiatives have been implemented in regards to employee commitment and potential resistance to change. In order to investigate the phenomena of IO implementation and change management we will utilize a *qualitative* methodological approach, as it allows for assessing "the meanings, concepts, definitions, characteristics, metaphors, symbols and descriptions of things" (Berg 2009, p.3).

4.1 Research design: Case study

A research design can basically be defined as a plan that aids the researcher in the process of collecting, analyzing, and interpreting observations. It is "the logical sequence that connects the empirical data to a study's initial research questions and, ultimately, to its conclusions" (Yin 2009, p.24). The approach taken to investigate and answer the problem formulation in this thesis can be defined as a *case study*. According to Yin (2009) the case study method can be applied when the question seek to explain some present circumstance, "how" or "why" certain social phenomena works, and when it requires an in-depth review of the phenomena. Since our objective is to investigate how IO—related work processes have been implemented within the Norwegian oil industry, and to map out the different factors that drive and restrain change within the organizations, we find it useful to utilize the case study method.

4.1.1 Cross-sectional design

In our study we have utilized a *single-case design* which basically means that one single case is going to be used to address the research question (Yin 2009). In order to strengthen our findings we have gathered data from multiple organizations operating on the NCS. This is referred to as a *cross-sectional design* (or *embedded* case study), implying that our focus is on a sample of events rather than on one individual situation (Yin 2009; Bryman & Bell 2011). The fact that we have conducted our study in multiple organizations allows us to compare and contrast the findings across different organizations. This provides us with the opportunity to map out trends and consider those factors that are common for the entire industry (Berg 2009).

4.2 Sources of evidence

Yin (2009) provides a good structure for conducting a case study analysis, and according to him three aspects are important to focus on; 1) using several sources of evidence, in order to enhance the credibility of our findings; 2) create a case study database, in which evidence is gathered that is distinct from the final case study report; 3) maintain a chain of evidence, meaning that there should be a clear connection between the questions asked, the data gathered, and the conclusions drawn. Moreover, Yin (2009) lists some important sources of evidence of which we will focus on the three we find most applicable - namely interviews, archival records and documentation. It is important to bear in mind that each of these sources have their strengths and weaknesses, and they should be viewed as being complementary to the investigation. Yin (2009) also suggests that direct observation, participative observation and physical artifacts are potential sources of evidence, but due to geographical distance and limited access we are not able to utilize these approaches. Using more than one source of evidence is referred to as *triangulation* (Bryman & Bell 2011). Triangulation strengthens the confidence in our research and findings, as it combines the different sources of data and counteracts the threat to validity associated with each.

4.2.1 Pilot: In-depth interview

In order to ensure the appropriateness and quality of our interview we decided to conduct a pilot. This was done with one of our original respondents who were willing to give us feedback on the interview and assist us with our project. The respondent had extensive experience with implementation of IO as he had both been working and conducted research in this field. By performing a pilot test we got an opportunity to refine the structure and content of our interview guide. In addition, it provided us with some experience in conducting the interview. According to Bryman & Bell (2011), conducting a pilot interview helps ensuring that the interview questions operate well and that the research instrument as a whole functions properly.

4.2.2 In-depth expert interviews

Several theorists claim that in a case study, when it comes to gathering data, it is the interview which is most significant because this method is perceived as particularly helpful in the generation of an intensive, detailed examination of a case (Yin 2009, Bryman & Bell 2011). In addition, Rubin & Rubin (2005) explain that in-depth interviews are particularly useful in explaining how and why social processes occur. Moreover, the goal of our interviews is to be able to extract a coherent explanation, by adding together what different persons have said, and at the same time, acknowledging that each of the participants might have their own way of understanding the

phenomenon, and hence their own explanation (Rubin & Rubin 2005). Here, it is important that we as researchers are aware of potential response biases (Yin 2009, Bryman & Bell 2011).

4.2.2.1 Telephone Interviews

Due to the geographically far distance between us and our respondents, conducting the interviews face-to-face would be very costly and time consuming. Thus, we decided to conduct our interviews over telephone. During a face-to-face interview visual cues might be helpful in order to interpret and understand the respondents (Berg 2009). Without being able to pick up on such visual cues during our interviews, we might potentially face problems with regards to probing and elaborating on important issues. However, according to Berg (2009) limitations can be reduced if the researcher has fairly specific questions in mind, like when a semi-structured interview guide is prepared beforehand. Berg (2009) also explains that the greatest strength of utilizing telephone interviews is that they are cost effective, which makes it a practical tool in a student master thesis.

In order to accomplish a qualitative telephone interview there are certain aspects that need to be taken into account (Berg 2009). First of all, there is a need to establish legitimacy for the study. Second, it is essential to convince the potential respondents that their participation is important. Finally, it is important that the information gathered is detailed enough to give some meaning to the study. We conducted all of our interviews during normal working hours and started each conversation with a friendly tone, introducing ourselves and our project, informed about how we would use the data, asked for permission to use a recorder, and gained an overall consent for the interview. An outline of how we presented our research for the respondents can be found in the introduction of interview guide (appendix 2).

4.2.3 Recording, transcribing and coding

By using a tape-recorder we were able to focus more thoroughly on the answers and plan follow-up questions (Bryman & Bell 2011, Rubin & Rubin 2005). Further, Bryman & Bell (2011) propose various advantages of recording and transcribing the interviews, for example that it reduces the need for remembering everything the respondents say, it allows for a more thorough examination of what people have responded, and that it allows the interviewer to repeat the examination. Transcribing the tape recordings will in other words give us the possibility to get a more systematic understanding of the data. Also, by not having to take notes frantically we are able to pay closer attention to the answer given, and thus being able to conduct the interview in a more satisfactory manner.

According to Bryman & Bell (2011) coding is the starting point for most types of qualitative data analysis. In order to examine the data in a structured and detailed manner, coding is used to divide data in a way so that all data that concerns the same category can be stored and analyzed together. The coding categories we have used in our analysis are in addition based on research literature, previous studies, and topics in our interview guide. As proposed in Strauss & Corbin's *grounded theory approach* (1990; in Bryman & Bell 2011), we have attempted to utilize *open coding*, an approach focusing on "breaking down, examining, comparing, conceptualizing and categorizing data" (p.586). This process includes the creation of concepts that are to be grouped in categories (Bryman & Bell 2011).

4.2.4 Documents

Yin (2009) claims that the strength of the use of documents is their broad coverage, their stability, that they can be reviewed repeatedly, and that it will cover a long time-period with many events and settings. The documents we have used as sources of evidence have been provided to us by three experts in our area of study: Vidar Hepsø at Statoil/NTNU, Adolfo Henriquez at Petoro, and our external supervisor Asbjørn Egir at Capgemini. The documents we have received are of different types, from internal records on work processes and policies, to studies conducted within different companies, to papers presented at industry conferences. The different documents were particularly important when we constructed our research question, the interview guide and the interview questions. However, since these documents came from people representing companies within the industry, we have to be aware of possible biases.

4.3 Structuring the interview

In order to facilitate for quality and accuracy during our interviews, we find it appropriate to utilize what is called a semi-structured interview. Bryman and Bell (2011) explains that in a semi-structured interview the interviewer has a list of questions on fairly specific topics to be covered - called the interview guide. Berg (2009) suggests that it is important to construct an interview guide in order to specify the nature of our investigation and the objectives of our research. When constructing an interview guide Bryman & Bell (2011) point out some essential aspects to consider: it is important to create a certain degree of order in the sequencing of questions in order to have the interview flow reasonably well; one must formulate questions in such a way that they will help answer the research question, while yet not making them to specific; use a language appropriate for the subjects; as well as not asking leading questions.

To have open-ended question in the interview guide allows the interviewees to answer the questions in the manner they feel is appropriate. This way, the respondents can choose to focus on what they consider to be most important related to the question. In addition, the questions do not have to follow the proposed structure, and follow-up questions might be added in order to capture the entire picture (Bryman & Bell 2011). This means that we can probe for answers far beyond the initial question, whenever we find it important.

4.3.1 Use of Kotter

In order to capture different dimensions of the IO implementation we choose to use Kotter's 8-stage model as assistance in structuring our interview questions. As previously mentioned, the model is widely recognized for explaining crucial aspects of large-scale change (Buchanan & Huczynski 2010; Burns 2009; Cummings & Worley 2009). These questions are marked with K1 – 8 in our interview guide (appendix 2), symbolizing which of Kotter's eight stages it represents. It should be mentioned that there are potential short-comings related to Kotter's model of change. Critique centralizes around the oversimplification such step-by-step recipes might represent (Langley & Denis 2006) as well as the neglect of organizational cultures' importance (Bate, Kahn & Pye 2000). In addition, we personally perceive Kotter's model to be based on a somewhat mechanical foundation, assuming that employee behavior can be altered by managers through organizational design. However, we will use the model in structuring our interview as it propose crucial aspects that are related to successful change (Buchanan & Huczynski 2010; Burns 2009; Cummings & Worley 2009).

4.4 Sample

The rationale behind using a sample of respondents is to make inferences about some larger population from a smaller one (Berg 2009). In quantitative research the investigator is concerned with the notion that the sample should be selected mathematically to represent a subgroup of the larger population – a concept referred to as probability sampling. In qualitative research, however, the research situation often demands other approaches to sampling that go beyond those used in large-scale surveys. Here, investigators rely on *nonprobability samples* – offering the ability to access otherwise highly difficult-to-research populations. In this approach the investigator attempts to establish a quasi-random sample with a clear idea of what larger group the sample may reflect (Berg 2009).

In order to conduct our in-depth, expert interviews we required contact with people who had extensive experience with IO and its implementation. It was important for us to gain insight in both

the leader/change agent perspective, as well as the employee perceptions. Thus, we made sure that both viewpoints were embraced in the organizations we included in our study. Respondents were mainly recruited through *purposive sampling*, which means that we in collaboration with our supervisor used our knowledge about IO to select candidates to be interviewed (Berg 2009). Further, respondents were recruited through *snowball sampling* – that our initial interview objects give us suggestions for other appropriate respondents; and through *convenience sampling* – that the category of our sample to some extent was determined by availability of the respondents (Berg 2009).

A complete list of all respondents and their positions is presented in appendix 3. We have chosen to present this list in order to demonstrate the competence and appropriateness of our respondents and consent has been gain by all in order to include their names in the thesis. We have conducted our research in some of the largest companies within the Norwegian oil industry, namely Statoil, ConocoPhillips, British Petroleum, Shell and Halliburton. We have also interviewed people representing OLF, Petoro and different labor unions. Our respondents represent various levels of the oil and gas organizations. This has allowed us to gain a deeper insight of different layers within each organization. The reason for investigating such perspectives is that we imagine that perceptions might differ among top management and lower level employees.

4.5 Scientific Value

When conducting research it is important to establish a degree of quality. In order to be able to ensure the scientific value of a study, certain criteria have been developed. In the following we will focus on how to establish construct validity, external validity and reliability. We will not be assessing the internal validity, since for case studies the concern for internal validity generally extends to the broader problem of making inferences (Yin 2009).

4.5.1 Construct validity

When establishing construct validity the important aspect is to identify correct operational measures for the involved concepts, which according to Yin (2009) is especially challenging in case study research. Critique vented towards case study research is often based on the fact that it is difficult for the investigator to develop a sufficiently operational set of measures, and that subjective judgments too often are being used in collecting data (Yin 2009). Yin provides three tactics in order to increase construct validity. First, by using several sources of evidence, the goal is to encourage convergent lines of inquiry. As explained earlier, we use this tactic in conducting our interviews, constructing

archival records, and examining documents. This tactic is obviously relevant during the collection of data.

Second, the construct validity can be strengthened by establishing a chain of evidence. In much the same way as with forensic investigation, the idea is to present to an external observer the derivation of evidence form initial research questions to the ultimate case study conclusions. It should be possible for the external observer to trace every step of the research progression from start to end, and vice versa. We have tried to do this by carefully structuring our thesis in such a way that it is based on logical progression. Third, it is recommended to have a key informant reviewing the case study report. As previously explained we have used our supervisors' feedback to ensure that our method is appropriate and we have drawn on their expertise when necessary.

4.5.2 External validity

A common concern when conducting case studies is in regard to the method's ability to provide a basis for scientific generalization (Yin 2009). By assessing the external validity of a study the aim is to understand the generalizability of the findings. In other words, to decide whether the findings are applicable beyond the immediate context in which the study took place (Yin 2009). In order to ensure external validity in our study we have attempted to interview experts from a wide selection of the most important operators within the industry. The rationale is that a broad and equal inclusion will allow our findings to say something about the industry as a whole. As the respondent list indicates, one of the organizations, Statoil, has been devoted more attention since it is the responsible operator for about 60 per cent of the total production on the Norwegian Continental Shelf (Henriquez 2008).

4.5.3 Reliability

According to Yin (2009) reliability is basically about minimizing the errors and biases associated with a study. More specific, if a researcher decides to investigate the same case and follow the same procedures used by an earlier researcher, the same findings and conclusions should be drawn (Yin 2009). The most important aspect of being able to do this is to keep a close record of the procedures that have been followed (Yin 2009). Yin also describes two approaches that entail using a case study protocol to deal with the documentation problem in detail, and a case study database. We have taken the reliability aspect into consideration as we have kept close records of our own progression, documenting when, how and from whom data has been gathered. In addition, we have recorded and stored all of our interviews, and kept the data files so that we at any time could go back if something were to be unclear.

5 Analysis

The following analysis is based on about 50 000 words of transcribed interviews distributed among 15 respondents, as well as relevant documents gathered from within the industry. The analysis' structure is founded in the driving and restraining forces we have discovered in our force field analysis, which is found in appendix 4. Separate explanations of the different force are presented in appendix 5. In the following analysis, the different forces we have mapped out are recognized by *italic* letters.

5.1 Understanding the rationale of IO

As described earlier in this paper, the Norwegian oil industry can in many ways be described as a lucrative and profitable industry (SSB.no c). The implementation of IO-related initiatives has had the purpose of ensuring this profitability by increasing the effectiveness, production and safety in the industry (OLF 2008). Intuitively, we would assume that organizations operating on the NCS might face challenges in establishing an understanding for the implementation of new work processes – after all the previous ways of performing work was apparently working well. So, has there been a particular need for establishing a sense for urgency and convincing employees to embrace IO? Our respondents unanimously reported that that the vast majority of employees in the different organizations understood the need for IO and accepted the rationale behind change. First of all we found that there seemed to be *a common understanding of the purpose/rationale* for change. The fact that IO-related work processes actually help make the involved people's working day less complicated has created a desire to take part in the development. Perceiving the implementation of IO as a "win-win" situation has seemed to motivate employees toward commitment and even enthusiasm.

Second, we found that organizations that was perceived by our respondents to be permeated by a "there is always room for improvement" –mentality experienced less employee resistance in the implementation of IO. When the organizational culture was characterized by a high degree of openness to change, new initiatives were met with less negativity and skepticism. This is what Holt et al. (2007 a) refer to as "readiness for organizational change" – where readiness arguably is considered one of the most important factors involved in employees' initial support for change initiatives. Based on the data gathered in our interviews we found an *organizational culture embracing change* to be an important driver for large scale implementation of IO within the Norwegian oil industry.

5.2 Vision and goal setting

The implementation of IO within the Norwegian oil industry can be defined as a continuous change process which has been evolving over the past 10 years (Beer & Nohria 2000). The initial visions for IO have been somewhat "hairy" as no organizations knew precisely where the development was headed. In retrospect, our respondents inform that the path has appeared as they have walked it, and to steer the development of IO after specific long term goals has been perceived as impractical. Thus, *developing a vision for IO* that made sure the organization moved in one direction and allowed for gradual adjustments has been an important driver for implementing IO. A clear vision will also assist in establishing a shared understanding of purpose, as described in the section above.

Even though the implementation of IO as a whole can be seen as a continuous change process, it does consist of multiple cycles of episodic initiatives. We found that for each and every IO initiative there was a profound need for the *development of specific short-term goals*. In our interviews it was revealed that such specific goal setting had only been completed to a varying extent within the industry, depending on the organization. While some had a huge emphasis on achieving specific ends with their initiatives, others applied a more loosely planned approach. It was however a shared understanding among our respondents that establishing tangible goals and having a thorough evaluation of the initiatives was of great importance. In order to evaluate the effect there is a need to *measure the effect of IO initiatives*. Such measurement can be performed in relation to a vast array of parameters, the most usual being significant KPIs (Key Performance Indicators), operational uptime offshore, production volume, as well as financial results. In addition, IO has to some extent been used as part of the criteria of which leaders are being evaluated. The measurement of different initiatives can function as a driver for change as it documents the (potential) effectiveness of IO activities. Such results can be used in convincing various stakeholders of the value IO holds and convince them of its worth.

When short term goals have been reached and visualized we found a coherent focus among our respondents on the driving effect of celebrating the *short-term wins*. Collecting the "low-hanging fruits" along the way has contributed to keeping the momentum up during the implementation, signaling to employees that the change is headed in the right direction, and increasing the likelihood for eventually reaching the overall vision.

5.3 Establishing support for change

The respondents were pretty clear on the importance of *establishing a guiding team or coalition*. These teams could consist of leaders on different levels, hired professional change agents and coaches, experts in the areas involved and other key personnel deemed important to the change. The main responsibility of the team would be to guide and support the implementation process and make sure the changes were supported and carried out by employees. In order for the IO initiatives to be implemented successfully, comprehensive *support from the senior management* has been absolutely indispensable. By wholeheartedly showing its belief in change, providing the required resources and being active participants in the process, senior management can demonstrate the importance of the change initiatives (Burns 2009; Kotter & Cohen 2002; Kotter 1996). In this manner employees might get the feeling of the actual worth and significance the organization places in IO, and as a consequence being more inclined in committing to change.

Further, some of our respondents highlighted the importance of mapping out individuals who strongly support or object change, and *utilizing positive key personnel* in driving change. When employees were presented with co-workers who strongly supported the IO initiatives, and got to understand the motivation behind their support, it functioned as a strong driver for overall change. On the other hand, in cases with *lack of enthusiastic key personnel*, overall enthusiasm and engagement could often be weakened and the IO implementation restrained. In these situations the guiding coalition could attempt to *find and change the skeptics*. Our respondents reported that skeptics that were given attention and persuaded often become some of the most positive supporters of change, encouraging their co-workers to follow them. The fact that the skeptics had been convinced after been provided with informational evidence, sent a powerful message to others that the change initiatives should be embraced by everyone.

5.4 Coping with uncertainty and fear

Most of our respondents brought up the general mechanisms residing in human nature, explaining why change could harvest restraining effects due to an increased state of *uncertainty and fear* among employees. Employees going through work-related changes might develop a fear of changes in routines/status, or even becoming excess and losing their jobs (Buchanan & Huczynski 2010; Burns 2009; Cummings & Worley 2009). We found that some of the offshore personnel have felt, and some still do feel, that IO-related changes might threaten their job situation. The fact that the offshore installations to an increasing extent can be remotely operated and controlled by people onshore may create perceptions that positions offshore belong to the past rather than the future.

As some employees have been moved from offshore installations to onshore working environments, some of the remaining employees offshore have started worrying. As with their colleagues, a lot of decision making responsibilities have also been reorganized, to some extent creating a feeling of insignificance among the remaining personnel due to the *reduction in decision making* power offshore. In many instances this has meant that prior to making a decision, an offshore worker would need to consult with the operations center onshore. We found that this increased level of bureaucracy might have created negative feelings among the offshore employees affecting both their motivation to partake in the changes, as well as their general job satisfaction. Related to this comes the negative effects that emerge together with loss of status. Since more and more decisions are being made onshore, some of our respondents reported a drop in perceived job importance, and maybe even status, among offshore personnel. Without proper management and focus these negative aspects can potentially have a damaging effect on the IO implementation process - as well as on the day-to-day operations.

5. 5 Experimentation and local creativity

In particularly one of the organizations we found extensive local experimentation prior to the era when IO was launched as a corporate initiative. Some of the local platform activities that were already taking place would later be included under the umbrella of IO-activities. These platforms, and its personnel, were used as examples in visualizing to other employees how the IO-initiatives could be executed. When employees on other platforms in the company saw the involvement from their peers in the development and utilization of IO, it had a positive effect on commitment and motivation. Moreover, this initial local development of IO has possibly had positive side-effects in that employees see that ideas from lower levels of the organization are being valued and actually used. This might facilitate for a positive cycle, as it can lead to further generation of new and improved ideas.

Based on the above, several respondents were clear on the fact that it was important to *allow for initial experimenting and piloting of initiatives*, and that this could act as a strong driver for the implementation process. After the first steps were taken in the direction of implementing IO, some of the organizations allowed their employees to experiment and develop the initiatives as best they could. Statoil, for example, had different experiments going on in Trondheim, Stjørdal, Bergen and Stavanger, driven by highly enthusiastic employees. When some of this experimenting showed signs of usefulness, the initiative would be included as a corporate initiative. As with the previous point, when employees saw their own and co-workers' ideas being implemented, their commitment and support rose. Related to this is the importance to *allow for local creativity.* Since there is great

diversity in the different departments with regards to location, personnel, work activities and responsibilities, there has been a need for local creativity and experimentation to prevent a sense of authoritarianism. As mentioned, this can possibly also lead to a heightened level of motivation because the employees will feel more important when they get to participate.

5.6 Stakeholder involvement

Employee involvement in planning is generally shown to have positive effects on employee commitment (Buchanan & Huczynski 2010; Burnes 2009; Beer & Nohira 2000). In conducting our research we uncovered a shared concern among our respondents towards the necessity of *involvement of employees in planning, execution and evaluation* of the IO implementation. This shared concern was based on different experiences of varying degrees of employee involvement in the respective organizations. In organizations with low degrees of employee involvement we learned that commitment to change was replaced by mere compliance, and motivation was reported to be low. In the large bureaucratic organizations IO activities functioned as standardized corporate initiatives. In accordance with change management theory, respondents informed that when employees perceived the decision making and planning to be too much top-down they felt they were no part of the change process, and that their competence and know-how were not utilized in the optimal way. This could create a sense of carelessness which might have negative effects on the implementation outcome. In organizations with high degrees of employee involvement, on the other hand, we found that commitment and motivation was high. Another interesting finding was that some of our respondents claimed better quality in the actual implementation process in cases where employees had been involved in the planning. In other words, the inclusion of employees might function as a valuable source of input in the development of new IO-solutions.

Further, according to our respondents the organizations have had positive experiences in *including different relevant stakeholder instances* in the planning, the most important being OLF, the respective employee unions, Petroleum Safety Authority Norway (PTIL), Norwegian Petroleum Directorate (OD) and Data Protection Agency (DT). OLF and the unions have important objectives in representing the respective interests of the oil companies and the employees. The prior has also been utilized as an *external strategic support* for the Norwegian oil industry as a whole, presenting a vision of the future generations of IO (Brochure Integrated Operations). PTIL, OD and DT are important sources of input in relation to laws and regulations, HSE-aspects, employee privacy policies etc. It seems like such a broad inclusion increases the quality of decisions as well as reducing skepticism among other stakeholders. However, such broad involvement might also function as a restraining force on the implementation, as it apparently is very time consuming and

somewhat bureaucratic. It is worth mentioning that during the recent years also the vendor companies have been included in the planning of IO initiatives to a larger extent, as a part of facilitating for what OLF refers to as the second generation of IO (Brochure Integrated Operations).

5.7 Technology

As is quite evident from the description of what IO is and how it affects the working environment for the employees, the technological aspect is important. *Well developed network capabilities* are provided by fiber-optic cables on the seabed, allowing for continuous streaming of data between the offshore and onshore installations. By studying what IO really constitutes, it is not difficult to understand that these network capabilities form the foundation IO is built upon and our respondents recognized this fact. Real-time transmission of data, remote controlling of installations and *communication across locations* would not be possible without these technological capabilities. Communicating across locations in a IO manner also demands the use of cameras, projectors, high definition television screens and screen sharing – all facilitating for enabling people to work and cooperate without even having to be at the same location.

Moreover, a *comprehensible user interface on the technical solutions* is essential in facilitating the transition for employees to use IO technology in day-to-day working activities. Our respondents describe that too complicated solutions to some extent have confused the less experienced users. *Technological complexity* has on a similar note acted as a potential restrainer in the implementation process. In addition, *technological dependence* – the fact that one is dependent on technology in order to perform ones work - has yielded a potential restraining force to the implementation. Whenever there is a breakdown or technical malfunction it might generate a lot of resentment and anger since there are no other ways to perform the tasks. The respondents pointed to the significance of proper support and maintenance mechanisms in order to make sure the technology works as it is supposed to.

Some of our respondents also brought up an *initial overconfidence in new technology* that particularly had been existing among engineers in the initial phases of IO development. The planning and visions of IO might have gotten somewhat caught up focusing on the technological possibilities, and to a certain extent perhaps neglected - or at least did not pay enough attention to - the human aspect of implementing new work processes. Some thought that this overconfidence might have had a restraining effect on the implementation process.

5.8 Collaboration rooms

The collaboration rooms play a central role in the IO-related work processes (Hepsø 2009; Henriquez et al. 2008; Rosendahl & Egir 2008). In these rooms experts from all relevant disciplines gather to make decisions and communicate with people in geographically distant locations. A continuous flow of incoming real time data is being displayed and analyzed, and the rooms are equipped with state of the art ICT systems. This constellation between competence and technological possibilities yield a massive source for performing work more effective (OLF 2008). However, we found various sources of potentially restraining forces related to the use of the collaboration rooms. First, based on our findings we were made aware that it is of outmost importance for senior management to delegate the necessary decision-making power to the rooms – even though this might imply a reorganization of the power structure within the organization. To ensure a sufficient *empowerment of the collaboration rooms* is decisive for optimal functioning, as the rooms need the ability to make significant decisions. Second, management has a responsibility of ensuring the needed multidisciplinary team composition within the collaboration rooms – that is the perfect mix of competence from all relevant disciplines. Such a composition is essential for understanding all aspects of emerging problems, and for enhancing the quality of problem solving and decision making.

Third, by interviewing people who had been directly involved in the use of the collaboration rooms we found that even though the rooms represent fantastic opportunities, there are still challenges related to how they function. The work environment inside these rooms have apparently been characterized by loud discussions, parallel work processes and an environment many find it hard to concentrate in. Thus, to focus on *good work environment within the collaboration rooms* seem to be an important driving force for implementing IO successfully. There are a number of ways the different organizations have met these work environmental issues. By focusing on the design of the rooms (placement of participants, noise barrier walls, decoration etc.) a lot have been done in order to establish a work-friendly environment. Further, there have been established rules on how to behave in such environments, in relation to noise levels and engagement in discussions. In addition, the rooms have to a large extent been installed with chairs, keyboards and computer mice with ergonometric design, screen and desk adjustment opportunities and other work-friendly specifications.

Finally, as a fourth potential restraining force related to the use of the collaboration rooms, we discovered certain unease among parts of the employees with working in rooms installed with video conference opportunities. The discomfort has been linked to a *feeling of being watched* and

monitored, even in situations where the cameras have been turned off. This feeling of being monitored might to some extent restrain the implementation of IO, and is therefore an issue that must be attended to. We found that in some organizations this skepticism has been countered with better information and training in how the cameras function. Signs have been put up in and around the collaboration rooms, clearly signaling that users are entering an offshore environment with cameras. In addition, to make sure that employees' privacy policies are being maintained to the fullest some organizations have included DT in the planning process of new collaboration rooms.

5.8 Training

IO includes an array of technical possibilities. As mentioned, employees are placed in collaboration rooms equipped with the latest of innovations in video conference technology, real time transmission of data, high definition monitors and three-dimensional presentations. The IO technology represents fantastic possibilities, but with it follows challenges related to the use of the different specifications. From our interviews we learned that technical experience varies among employees in the organizations. Thus, it is of great importance for the organizations to provide the *proper training in the use of new technology*. Lack of such necessary training will potentially restrain the implementation and use of IO-related technology, and have a negative effect on the desired outcome. We found that a wide range of training initiatives have been undertaken within the organizations, including the establishment of own training centers, workshops, practical training courses and seminars, and even final exams in order to verify the gain of competence. When employees have been provided with this kind of training in how to use the collaboration rooms and related technology, it has functioned as a driver for change. Knowledge of how IO systems function is demanded for effectively communicating across distant locations as well as across disciplines. However, several respondents informed that there had been lack of sufficient training, making this a restraining force slowing down the implementation.

5.9 Communication

The fact that the offshore personnel are working on a shift basis are one of the important restrainers when it comes to the offshore implementation processes since it creates a *lack of continuity among offshore personnel*. More specific, the fact that a large amount of these employees are working 2 weeks on, and then have 4 weeks off, creates a sizeable issue in relation to knowledge transfer and establishing stability. As new employees arrive on the platform they must allocate some time to understand and comprehend the process in change that have developed since the last time they were on duty. Most of the time, this is an issue the organizations are able to comprehend with. However,

when large scale initiatives have been implemented and the work-related changes are significant, it can be problematic both in terms of operational effectiveness as well as safety. The way to tackle this issue has been by facilitating for proper communication. The organizations have to *establish routines for internal communication* to ensure a satisfactory knowledge transfer. Based on our interviews sufficient communication was in fact one of the absolute most important drivers for the implementation of IO-related processes. By developing proper routines for communication the employees could be provided with relevant IO information and being updated on the implementation process. Throughout this analysis the development of good routines for communication seem to have been a reoccurring topic that most of our respondents perceive as extremely important for achieving a successful implementation of IO.

Communication is central for being able to establish a common understanding of the rationale behind IO, and in the work of creating an organization embracing change. Several of our respondents also talked about the importance of celebrating goals as they were achieved, and here communication is an inevitable factor in spreading the news. In order to manage and contain uncertainty and fear, communication is important to be able to convince the employees about the future and that they still are valuable to the company. These are just examples of the important role communication plays in facilitating the implementation process. Accordingly, sufficient communication can in many ways be seen as the backbone of a successful implementation of IO.

6 Discussion

In the following we will present a discussion where we elaborate on our main findings in relation to theoretical aspects. We start off by discussing two of the most essential issues of this thesis, namely resistance to change and employee commitment. Further, a shared understanding of the need for change and the maintenance of the different aspects of the MTO framework will be reviewed. The discussion ends with an outlook on the future development of IO.

6.1 Resistance to change?

Resistance is a natural part of change, and when change occurs it is in our human nature to stick to the past and preserve the status quo (Buchanan & Huczynski 2010; Burns 2009; Cummings & Worley 2009). As a consequence, employee resistance to change should be a vital issue for managers and change agents presenting a new order of things. According to Ford, Ford & D'Amelio (2008) change agents have traditionally seen resistance as an obstacle that must be eliminated in order to achieve change successfully. By removing resistance, or the sources of resistance, the implementation of new programs, structures, systems etc. is often assumed to

progress more seamlessly (Ford, Ford & D'Amelio 2008). However, is it necessarily so that eliminating contrasting views will lead to the best result in a change process? By reviewing theory as well as the data gathered in this study, it seems evident to us that instead of merely removing resistance to change it should be utilized in all stages of implementation (Ford, Ford & D'Amelio 2008; Knowles & Linn 2004; Piderit 2000).

By including different perspectives and listening to different voices, we believe that the quality of the change process can be enhanced. In much the same way as the idea of giving someone the role of the devil's advocate in team working (Nemeth 1986) or actively searching for disconfirmatory evidence in decision making (Kray & Galinsky 2003), we propose that utilizing resistance to change is a way to get multiple sources of input to the change process. Further, Ford, Ford & D'Amelio (2008) emphasize the danger of labelling resistance as something negative, since such negative connotations might give employees the feeling of being perceived as disobedient by management. If employees feel their behaviour is undesirable and is expected to be negative for change, it might function as a self-fulfilling prophecy (Ford, Ford & D'Amelio 2008). By addressing these issues it might be possible to ensure a better and more thorough understanding of the entire process, and this will have the potential to improve the final result of the change initiative.

The question is; how can managers in the Norwegian oil industry go about utilizing resistance to change as something positive? We believe that the involvement of employees in both planning and execution of IO-related initiatives is the best way to capitalize on potential resistance. Not only should employees be allowed to participate, their thoughts and opinions should be taken into consideration. Burnes (2009) suggest two main activities that help establish and maintain a high degree of employee involvement to change - *communication* and the process of *getting people involved*. Regular and effective communication processes are suggested to reduce change-related uncertainty among employees, and ensure sufficient information about the change. Burnes (2009) further proposes that organizations should involve their members and make them responsible for the process, instead of approaching them as objects, or even obstacles, to change. There are of course practical limitations as to what extent employees can be involved in planning and execution, and thus it is important to identify and engage those whose assistance is necessary and those who are crucial in making the change happen.

Considering our case, organizations operating on the NCS, it is difficult to say to what extent employees have been involved in the planning and execution of IO-related initiatives. More specifically, it seems that even though there has been a high degree of involvement, we question to

what extent employee contributions *actually* have been taken into account. Among the change managers and agents there has been a shared perception that employees have been involved from day one. Among the union representatives, on the other hand, we learned that lower level employees to various extents have felt a lack of participation in that their thoughts and ideas have not been heard. In general, when employees are involved sufficiently this will facilitate for high degrees of commitment to change (Buchanan & Huczynski 2010; Burnes 2009; Beer & Nohira 2000). This does not mean that change is impossible without employee involvement, but commitment might in these cases be replaced by mere compliance – creating an unenthusiastic "do as you are told" -state of mind.

6.2 Understanding the need for change

As presented initially in this thesis, the companies operating on the NCS are positioned in a lucrative industry where profits are high and operations have been successful (SSB.no c). Thus, prior to our research we intuitively assumed that the organizations would have faced problems in establishing a sense of urgency – a shared understanding of the need for change – among the employees. After all, why change a winning formula? As we interviewed our respondents we found that there seemed to be a mutual understanding, both among managers as well as employees, of the necessity for implementing IO-related initiatives. There are multiple factors we believe can explain this widespread acceptance for change.

First, visualizing and explaining that IO brings about a more effective way of performing work for the employees have created a broad acceptance. Second, there has been a focus on providing sufficient information about the specifics of IO and its implementation. Such information flow has been enabled by good routines for communication. Third, we believe a high degree of organizational readiness for change has moderated the need for establishing a sense of urgency, since such a culture is characterized by openness to new ideas. Fourth, we found that a lot of the managers have utilized theoretical change management concepts, as for example the theories of John P. Kotter (1996). Finally, the implementation of IO is a continuous change process consisting of multiple episodic change initiatives. This gradual development helps establishing a common understanding of the rationale behind change.

6.3 Man – Technology – Organization

Despite the fact that there has not been set specific long-term goals in the implementation of IO, our respondents reported that they would have expected the IO-development to come further than it has per today. Also OLF has had more optimistic expectations than what has been realized (OLF 2007).

The question is then; why has the implementation been progressing slower than expected? To answer this question we will have to look at the initial aspirations that were proposed for IO. The new ICT systems introduced in the industry at the turn of the millennium yielded enormous opportunities, and the engineers that were involved in the initial planning of IO might have displayed overconfidence in the effects of the technological possibilities (OLF 2007). This created a focus on the T-aspect that might have come at the expense of the "softer" M- and O-perspectives. If it is so that the human and organizational dimensions have not been given sufficient attention, this might be one of the reasons for an implementation slower than expected.

The high level of change management-focus within the industry today might be seen as evidence of that the M- and O-aspects were to some extent undermined in the initial phase of implementation. This is supported by both our respondents as well as industry-related documents. Successful implementation of IO is seemingly related to an equal interplay between all three dimensions of MTO (Rosendahl & Egir 2008; OLF 2007; Hepsø 2006; Ringstad & Andersen 2006).

6.4 Future development of IO

As OLF started working on issues related to IO they divided the progress into two different stages, or "generations". Generation one included an integration between onshore and offshore installations and was expected to take place between 2005 and 2010 (Brochure Integrated Operations). This was facilitated by development of operation centers onshore with possibilities to interact with the offshore installations. As a consequence, the organizations would become more efficient by the raised competence and improved decision-making accuracy. The second generation of implementation is somewhat vaguely defined in terms of time perspective, starting 2010 but with no specific end. This stage of IO-implementation will be more of an ongoing process that involves the integration of operators and supplier/vendor companies, using automation to transform the offshore installations into more intelligent facilities. Including so-called third parties in the work process of daily operations will allow for more competency and faster decision making, as more relevant stakeholders are involved. Within the Norwegian oil industry the integration of suppliers has already begun, and the trend will continue throughout the following years. A graphical model of this development has been developed by OLF and is attached in appendix 6.

Further, as the NCS to an increasing extent is characterized by the use of technology and automation, the second generation of IO will have to involve a better integration of data from different systems (OLF 2008). Operation centers are monitoring a vast array of sensors and parameters on the offshore platforms, and different installations are using different it-systems from

different manufacturers and time periods (TU.no b). This creates a great concern with regards to interpreting all the diverse data. Thus, there is a need for systems that are able to converting all the different data into understandable information. This is a challenge which will require considerable effort.

6.4.1 Automation

OLF focuses on the inclusion of vendor companies and better integration of data as two of the most important characteristics of the second generation of IO (Brochure Integrated Operations). The last decade has yielded an increasing automation of systems offshore, allowing for remote controlling of operations. Today there are even some platforms that are completely automated, further reducing the need for offshore personnel. When asked about the future development of IO, the majority of the respondents in our study answered that the industry would see a further increase in automation as the technological advance continues. What kind of implications will this development have for the industry?

A reduced need for offshore personnel implies a relocation of employees from platforms to the main land. It might also imply a reduction in the total number of positions, and that excess personnel face potential layoffs. In both cases there will be a critical need for good change management practice that attends to the uncertainty and fear employees might have. The increasing amount of automation, and reduced need for offshore personnel, has ignited debate within the different labour unions that assist the offshore workers. One of the strongest arguments the unions lay forward is in regard to the HSE-aspect. How safe is it for just a few employees to be alone out on the platform in case of an emergency, and how can these be expected to solve major accidents if they occur? This argument is visualized through the metaphor of entering a plane without pilots. As with the oil platforms, it is possible to control an airplane full of passengers from the ground, but for most people it just does not feel safe to go onboard a plane knowing that it is controlled by someone who are somewhere else.

Not surprisingly, the OLF counter this critique. They do not argue only that increased automation and larger onshore operation centres are completely safe, but it will also make operations safer. First of all, a reduced number of offshore personnel will increase the overall safety for employees, since less risk is related to working onshore. Second, a decrease in offshore manpower does not necessarily mean that there will be a larger risk related to the day-to-day operations. On the contrary, OLF believe that by further automating systems potential accidents will be discovered in a much earlier stage, providing the time needed to fix problems before they occur. The operation

centres on the main land will function as an "all-encompassing eye" and thus improve the HSE-aspect on NCS installations.

7 Practical Implications

The findings we have presented in this thesis should have various practical implications for managers, change agents and organizations – not only within the oil industry, but also for the implementation of large-scale change in other industries. First, the specific forces we have discovered through our analysis should be of particular interest to companies operating on the NCS. Since data was gathered across multiple organizations in the industry, there should be a great potential for gaining valuable learning by reviewing the experiences the industry have had as a whole. Second, companies within the Norwegian oil industry are leading in the development of IO on world basis (Henriquez et al. 2008). Thus, the driving and restraining forces that have affected the change here should be very useful for other oil industries where the implementation of IO is in an earlier stage.

Further, we believe our findings have implications for large-scale change in other industries as well. An increasing globalization in the business world of today has lead to more and more organizations being structured with departmental units in different geographical locations in order to gain competitive advantage (Buchanan & Huczynski 2010). As the different units of an organization are being positioned in distant locations, a new and somewhat different demand for communication emerges that for example might include a more virtual structuring (Buchanan & Huczynski 2010). Thus, we assume that many companies will benefit greatly from making use of high-tech ICT-systems in order to collaborate effectively across physical boundaries. The findings we have presented related to communication and the use of information technology should here be particularly relevant in overcoming potential challenges related to such an implementation.

Finally, many of our findings speak to change management practices on a more general level. Overcoming what have been referred to as resistance to change has been shown to be a more complex process than many might intuitively think, and there is a need for organizations to define and approach resistance in a sophisticated manner. Also the establishment of employee commitment to change is indeed a multifaceted process that organizations will have to pay close attention to – regardless of type of industry.

8 Concluding Remarks

8.1 Limitations

We acknowledge that there are different limitations associated with our study that should be noted. First and foremost, as with most qualitative case studies there are challenges related to the operationalization of the specific concepts (Yin 2009). The challenge of developing an operational set of measures might easily lead to subjective judgements, impairing the construct validity of the study (Yin 2009). Second, the wide scope of this study might be seen as a limitation since not all of the specific concepts are defined and investigated in a sufficiently thorough manner. However, it has been the aim of this study from the beginning to map out the different driving and restraining forces in the implementation of IO, and this task will necessarily demand a certain breadth of perspective. We still acknowledge that the width of our scope have come at the expense of detail.

Third, the fact that IO-related initiatives have been implemented over a longer period of time speaks for the appropriateness of performing a longitudinal study. To measure a continuous change process based on interviews conducted at one specific moment in time might have limitations in regards to the respondents' ability to correctly reflect the past. The documents we have utilized as an additional source of evidence have to some extent assisted us in decreasing this weakness, as they are written over different time periods. Finally, questions can be asked to what extent the findings of our research are applicable for the larger population – which in our case is the organizations operating on the NCS. We have attempted to ensure the generalizability by including respondents from different organizations, which we believe have increased the external validity of this study. However, research on change management has a general lack of consistency in explaining why so many change efforts fail, and thus we are cautious in claiming validity and generalizability in our findings.

8.2 Conclusion

As Niccolo Machiavelli's initial quote suggests, there is nothing more uncertain in its success than introducing change. Throughout this study we have made an attempt at investigating how change has been managed in terms of implementing Integrated Operations within organizations operating on the Norwegian Continental Shelf. In doing so, we have mapped out what we have found to be important factors driving and restraining the implementation of change. Our findings suggest some specific areas of change management that applies for the Norwegian oil industry in particular, elaborating on previous, current and future issues related to the implementation of IO-initiatives.

We would like to note that even though it seems to have been an initial overconfidence in the effects of IO, we acknowledge that the overall implementation today is relatively successful. As time has gone by, and lessons have been learned, an increasing emphasis on the "softer" aspects of change has come into play. However, this does not mean that the oil companies can allow themselves to rest on their laurels. The success of the future development of IO demands a strong emphasis on different change management issues in order for the Norwegian oil industry to gain competitive advantage and stay ahead. The findings of this study might illuminate some of the concerns that will have to be taken into account.

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Appendix

Appendix 1: List of Abbrevations

IO	Integrated Operations
OLF	Norwegian Oil Industry Association (Oljeindustriens Landsforening)
OD	Norwegian Petroleum Directorate (Oljedirektoratet)
DT	Data Protection Agency (Datatilsynet)
PTIL	Petroleum Safety Authority Norway (Petroleumstilsynet)
NCS	Norwegian Continental Shelf
ICT	Information and Communication Technologies
MTO	Man-Technology-Organization

Appendix 2: Interview Guide

Introduction

- Present our self and the thesis project
- Explain why we wish to interview the respondent
- Clarify the method of our interview and tools utilized : Digital recording and taking notes
- Gain consent for the interview
- Making clear that there is no right or wrong answers to the questions. Rather, the respondents' reflections regarding change is desired
- Explain that the interview will last for approximately 30-60 minutes

Introduction to our project: We are studying a master program in Leadership and Organizational Psychology at BI Norwegian Business School. This interview will be part of our Master Thesis regarding change management within the Norwegian Oil sector. Our goal, more specifically, is to investigate how the implementation of Integrated Operations has been conducted. We especially want to focus on the human side of the implementation, and map out the factors which are driving or restraining change.

The reason we have contacted you is that we have got an understanding that you have extensive knowledge regarding IO, and how IO have been implemented in your company. As a consequence, we would like to conduct an expert-interview with you. From a practical view, we would like to record this interview, would that be okay?

(START TAPE RECORDER)

As previously mentioned, we assume this interview will take somewhere between 30 and 60 min. If something is to come up, you are of course free to abort the interview! We would also like to make it clear that there is no right or wrong answers; we are just interested in your thoughts and reflections. Okay?

Initiating questions

1. What is your current position, and what are your main responsibilities?
2. How long have you been working with IO, and what are your experiences with this?

IO: Rationale

3. Can you describe what IO is for your company?
4. What is your strategy for IO, and what is your vision? (K3)
5. What do you aim to achieve by implementing IO?
6. What are your time perspective regarding the implementation of IO?
    - Is it seen as an episodic change, or a continuous process?

IO: Initiatives

7. What specific actions have been taken in regards to implement IO in your company? Explain!
8. How has these actions influenced your day-to-day operations?
9. How are the effects of IO being measured?
10. How have the changes been organized internally – are there any specific persons or groups who have been leading the change? (K2)

Resistance towards change

11. Generally speaking, how do you feel changes, like IO, are being accommodated by the employees in your company? Examples?
12. Have your organization met any kind of barriers in relation to the human side of implementing IO? (K5)
13. How have these barriers influenced the day-to-day operations?
14. What has been done in order to overcome these barriers?

Commitment towards change

15. Are there any specific factors driving the implementation of IO in your company? In relation to the employees.
16. Generally, the Norwegian oil industry has been seen as lucrative with high profits, and operations have been successful. What has been done to show (or convince) employees in your company that further improvements are needed? (K1)
17. What has been done internally to make the employees understand and accept the purpose of implementing IO? (K4)
18. Have any actions been undertaken in order to form a culture, among the employees, to embrace IO? (K8)
19. How has your organizational culture influenced day-to-day operations?
20. Have any incentives been given to help motivate the employees to embrace the changes related to IO? Explain!
21. Have there been set any short term goals in the implementation process of IO? Explain! (K6)

IO: The effect of the implementation

22. How has the implementation progressed in relation to your initial goals?
23. Are you where you planned to be today?
24. Have you adjusted your initial goals during the change process? (K7)
25. Are there different perceptions of success between the management and employees? If so, explain the differences.

Summing up

26. How do you think the future development of IO look?
27. Is there anything you would like to add, which could be of relevance to us, regarding the topics we have now spoken about?

TURN OFF THE TAPE RECORDER

28. Is there anything you would like to add now that we have turned the tape recorder off?

Appendix 3: List of Respondents

Name	Position	Company
Ketil Andersen	Project Manager	*Statoil*
Stig Aune	Operations Support Lead	*A/S Norske Shell*

Ivar Berg	ISC Cost and plan engineer	*A/S Norske Shell*
Rolf Bolstad	Leader	*Ekofisk-committee (workers union CP)*
Bjørn O. Bådsvik	Infrastructure Analyst OOC & DDC AV & IT Support & Coordinator Valhall PACE AV & IT Support & Coordinator ACE Team Stavanger	*BP Norway*
Adolfo Henriquez	Consultant (Formerly Leader of the IO Company Initiative)	*Petoro (Statoil)*
Vidar Hepsø	Principal Researcher TNE RD NEH HSE and Water management Statoil ASA Professor II NTNU Center for Integrated Operations in the Oil Industry.	*Statoil, NTNU*
Kurt Høyland	Former union leader	*Statoil*
Nils Kaageson-Loe	Technical Manager Norway	*Halliburton Baroid*
Thore Langeland	Manager IO	*OLF (The Norwegian Oil Industry Association)*
Tor Egil Løvli	Labour Union Representative	*SAFE (union for workers within the energy sector)*
Dag Unnar Mongstad	Vice Chairman	*IE Statoil Sokkel (workers union)*
Kjell-Ivar Nesvåg	Safety Representative	*Statoil, Snorre field*
Arne Røsdal	Operations Supervisor	*A/S Norske Shell*
Brage Sandstad	Leader Norwegian shelf	*ConocoPhillips*

Appendix 4: Force Field Analysis

Man
• Establishing a common understanding of purpose/rational
• Organizational culture embracing change
• Good work environment within collaboration rooms
• Bottom up initiative
• Utilize key personnel
• Find and change sceptics
Technology
• Well developed network capabilities
• Communication across locations
• Comprehensible user interface on all technical solutions
Organization
• Developing a vision of IO
• Develop specific and clear short-term goals as you progress
• Establishing a guiding team
• Support from senior management
• Measure the effect of IO-initiatives
• Involvement of employees in planning, execution and evaluation
• Proper training in the use of new technology
• Establish routines for internal communication
• Allow for initial experimenting and piloting of initiatives
• Short-term wins
• Empowerment of collaboration rooms
• Include relevant instances and unions
• Include relevant instances and unions
DRIVERS
QUASI-STATIONARY EQUILIBRIUM
RESTRAINERS
Man
• Uncertainty and fear
• Reduced decision making onshore
• Feeling of being monitored in video conference rooms
• Lack of concentration in collaboration rooms
• Lack of enthusiastic key persons/supporters of change
Technology
• Technological dependence
• Technological complexity
Organization
• Lack of specifity in IO-related goal setting
• Lack of continuity in the offshore personell
• Initial overconfidence in new technology
• Lack of involvement of employees
• Lack of needed system training

Appendix 5: Explanation to Force Field Analysis

Man:

Driving Forces

(K1) Establishing a common understanding of purpose/rationale:

In order to ensure that all organizational members understand the need for implementing IO, employees should be presented with the opportunities of which the new work processes will make their work easier. No one wants to perform their tasks in complicated manners, and more effective ways of doing things should motivate employees to engage in the implementation. We found that organizations that successfully established a common understanding of IO as a "win-win" situation experienced this to drive overall change.

(K8) An organizational culture embracing change:

A culture among leaders and employees that embraces continuous change has been an essential driving force for implementation of IO. A "there is always room for improvement" –mentality will facilitate for commitment to new ways of working. An organization characterized by a high degree of change readiness will face IO-implementation more effectively.

Good work environment within collaboration rooms:

We found that organizations focusing on the work environment within their collaboration rooms and other landscape offices experienced better results. When many people are gathered to work within a limited space it might create challenges in terms of loudness and lack of concentration concentration. Thus, great care should be taken in the design of the rooms, and rules can be established on how to behave in such environments. In addition the rooms can be installed with ergometric chairs, screen adjustments and other work-friendly specifications.

Bottom-up initiatives:

We found that in organizations that initially developed IO-initiatives from lower levels of the organization experienced high degree of motivation to IO-related change. Explaining to employees that initiatives had been developed by some of their peers have apparently had a positive effect on commitment to the change in some organizations. This might have created a feeling that employees' ideas are being used and valued, which subsequently can generate new and innovative ideas.

Utilize key personnel:

Some of our respondents emphasized that change can be driven by mapping out key persons in the company and utilizing their positive influence in order to build momentum and persuade the skeptics towards change. As employees witness that fellow co-workers strongly recommend to engage in change, there is an increased likelihood that they will accept and become positive themselves.

Find and change skeptics:

Similarly to the point above, we found that mapping out negative people and turn them around has been a driver for change in some of the organizations. If you are successful in turning these people they will very often be the most positive drivers towards change afterwards, and the fact that skeptics have been persuaded will also send a message to the other employees that this is something powerful and worthwhile to adhere to.

Restraining Forces

Uncertainty and fear:

All of our respondents emphasized the restraining effect of the uncertainty and fear of breaking out of the status quo, feelings which reside in the human nature. Employees going through work-related changes might develop a fear of changes in routines/status, or even becoming excess and losing their jobs. These negative feelings are really strong in people and - without the right focus - can be really detrimental for a large scale change as the implementation of IO.

Reduced decision making offshore:

By moving employees and decision making responsibilities onshore, the remaining employees offshore may feel they are not as important anymore, and can start feeling left over, reduced or even less valuable to the organization as a whole. We found this reduced responsibility, and perhaps reduced status, to be a restraining force. These negative feelings must be dealt with and proper information must be given to the employees concerned about their real value to the organization. There is also evidence to support a claim that in some instances there has been an increase in bureaucracy since the workers offshore now often must go through the onshore operation center before they can make a decision.

Feeling of being monitored in video conference rooms:

Resistance to new technology has become evident when video conference opportunities have been introduced in the collaboration rooms. Some employees have reported that they feel monitored and

watched, even in situations where the cameras have been turned off. This feeling of being controlled might to some extent restrain the implementation of IO.

(K5) Lack of concentration in collaboration rooms due to noise and distractions (from discussions):

There have been complaints from employees about noise and loud work environment in the collaboration rooms. Organizations should take these problems seriously and undertake noise-reducing initiatives in the rooms (silence-walls, codes of conduct etc.) Noisy collaboration rooms might be a restraining force in implementing IO – individuals might lack commitment to collaboration rooms if they don't feel they can perform their work properly there.

Lack of enthusiastic key persons/supporters of change

Some of our respondents admit that their change process has lacked individuals that really show optimism, enthusiasm and engagement in the implementation of IO and the utilization of the technical opportunities. Key persons pushing the organizations employees towards change might function as effective drivers for IO-implementation.

Technology:

Driving Forces

Well developed network capabilities:

Through well developed fiber-optic cables real-time data-transmission opportunities arise. Our respondents all praised the value of having such network capabilities, emphasizing that the implementation of IO would not be possible without it. This is the corner stone IO is built upon, and it is easy to understand that without this it would not be possible to work in the way IO facilitates for.

Communication across locations:

As with the point above, the communication across locations that a well-developed network allows for is essential for the implementation of IO. Today's video conferencing opportunities, with projectors, high definition television screens and screen sharing provides the technology which, together with fiber optic cables, gives people the opportunity to communicate despite distant locations.

Comprehensible user interface on all technical solutions:

Too complicated technical solutions confused the less experienced user, and sometimes served as a source of frustration and negative feelings. The technical solutions that employees used in their work should therefore be understandable and facilitate for effectiveness. This will motivate employees to use the technology and make them want to learn more.

Restraining Forces

Technological dependence:

Since all aspects of working related to IO are so dependent on technology, it created anger and resentment towards the change when there was a breakdown or malfunction in the technology. To be able to reduce this problem, support and maintenance mechanisms must be in place to ensure the quality of the technology.

Technological complexity:

Technological opportunities was multiple, complex and hard to utilize for novice users, which sometimes created bad feelings related to IO and the changes which were implemented. These problems were dealt with by extensive use of guiding and training.

Organization:

Driving Forces

Developing a vision for IO:

In order to make sure that the whole organization moved in the same direction, an initial vision of what one wants to achieve with IO was be developed. This is might be a somewhat obvious driver, yet incredible important. A good vision also facilitated for a common understanding of the purpose of change.

Develop specific short-term goals as you progress:

The implementation of IO was very much a continuous process of change with multiple episodic initiatives, and the road very much appeared as the process went along. In order to ensure the successful overall IO development, the short cycles of episodic initiative implementation had very clear and specified goals.

Establishing a guiding team:

A team composed of leaders, change agents, coaches, different experts etc. supporting change was established in order to guide and support implementation in the organization. This has been done in

most of the organizations operating on the Norwegian shelf - with good results. The "guiding coalition" provides confidence and enthusiasm for the new ways of executing work.

Support from senior management:

Wholehearted support from senior management was extremely valuable, and really set the tone for the whole company. By giving their support, the top executives and senior management showed the employees how important the subject was and how much effort they should put into the change process.

Measure the effect of IO-initiatives:

To measure the effects of IO-related initiatives might be useful for visualizing its efficiency and potential success. By measuring criteria like KPIs (Key Performance Indicators), operational uptime, production volume and financial outcome the effect of IO-related activities was documented and used in convincing stakeholders of the value IO holds. In addition IO could become a part of the criteria of which leaders are evaluated.

Involvement of employees in planning, execution and evaluation:

By involving those who will work with IO-related work processes in all stages of the implementation, potential resistance to change was reduced significantly. Such an inclusion not only enhanced commitment and motivation, it also functioned as a valuable source of input in the development of new IO-solutions.

Proper training in the use of new technology:

On the Norwegian shelf a lot of different training initiatives have been established, for example own training centers and practical training courses with final "exams" for the employees. When the employees were provided with this kind of training in how to use the collaboration rooms and related technology it worked as a driver for change. Such training should also focus on collaboration across different fields of expertise, as well as across offshore and onshore locations.

Establish routines for internal communication:

The organizations who establish good routines for communication and information-sharing within the organization were the most successful. It was important for the employees to be provided with relevant IO information, as well as being updated on the implementation process. In addition, it was evident that the leaders of different organizational levels should take on the responsibility of preaching the positive effects of IO in order to increase employee motivation.

Allow for initial experimenting and piloting of initiatives:

In order for IO-initiatives to develop within the organization, it was vital to allow for initial experimentation in the lower levels of the organizations. When some of this experimentation showed signs of useful for the organization, the initiative was integrated as a corporate initiative. The fact that lower levels of the organization stands for the initial development of IO-related initiatives had a positive effect on future support and commitment.

Short term wins:

Closely related to the idea of short term goals, was the importance of celebrating small-scale short term wins. This helped keep the momentum up during the implementation, signaling to the employees that the change is headed in the right direction, and increased the likelihood of the overall goal to be seen as realistic, and eventually reached.

Empowerment of collaboration rooms:

In order to make the collaboration rooms function properly it was of great importance to delegate the necessary decision-making power. This was the only way to ensure that the collaboration rooms functioned as optimally as intended. This resulted in a reorganization of the power structure within the organization, which might affect the status of some employee positions.

(K5) Include relevant instances and unions in planning (OD, PTIL, OLF, DT and respective unions):

It was important to utilize the competence and input from relevant stakeholder instances in the planning and implementation of IO. Unions, OLF, PTIL, OD and DT have to different extents been included in order to ensure a safe and legitimate use of new technology. A broad inclusion increased the quality of decisions as well as reducing skepticism.

External Strategic Support:

In the OLF (The Norwegian Oil Industry Association), the companies had a large industry-encompassing organization which worked to solve common challenges for the members, and strengthen the industry by continuous development and exploration of new ideas. This ensured that all companies had a good support structure with regards to challenges related to the implementation of IO.

Allow for local creativity:

Since there are a great diversity in the different departments with regards to location, personnel, work activities and responsibilities, there was a need for local creativity and experimentation to prevent a sense of authoritarianism. When the different departments were given this freedom, they also witness an increase in motivation due to the fact that the employees felt important cf. employee participation.

Multidisciplinary team composition in collaboration rooms:

To facilitate the success of the collaboration rooms, great consideration was taken in relation to the selection of team members and their needed knowledge, skills and abilities. In addition the members were provided with clearly defined roles and goals, as well as proper system training.

Restraining Forces

Lack of specificity in IO-related goal setting:

Lack of structure in goals related to IO-implementation is common for many of the organizations operating on the Norwegian shelf. Even though there is a consensus that the road very much appears as you go, the lack of clear-cut goals for specific initiatives might have restrained some of the IO development.

Lack of continuity among offshore personnel:

The personnel working offshore are working on shift basis. This means they are working 2 weeks with 4 weeks off. Each time there is a change in shifts, the new employees must use time to learn and understand what has happened since the last time they were offshore. This inevitably creates a lot of delays.

Initial overconfidence in new technology:

The initial belief among many leaders and engineers that multiple and complicated technical solutions would lead their organization to excellence have proven to be somewhat overoptimistic. Treating the social nature of work as a residual factor (Hepsø 2006) in the early phases might have had a restraining effect on the implementation.

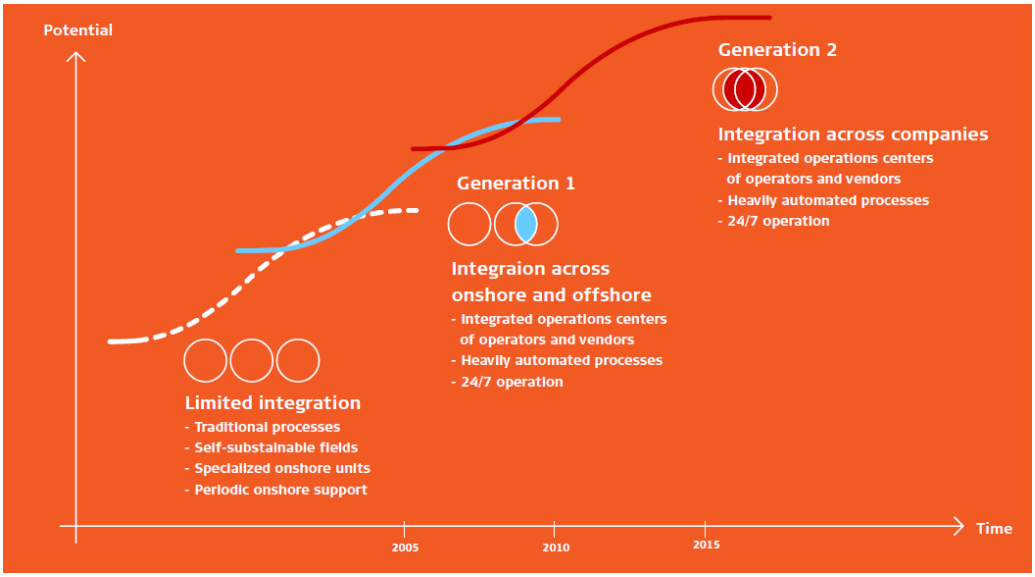
Lack of involvement of employees:

When the employees perceived the decision making and planning to be too much top-down they felt they were no part of the change process, and that their competence and know-how were not utilized in the optimal way. This could create a sense of carelessness which might lead to negative results in the long run.

Lack of needed system training:

People's lack of proper training to utilize the IO technology (i.e. video conference opportunities) had an obvious restraining effect on the implementation.

Appendix 6: IO Generation 1 and Generation 2



(Source: Brochure Integrated Operations)

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Preliminary Thesis Report

- Integrated Operations -

Change Management within the Norwegian oil and gas industry

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Content

Abstract

Throughout this preliminary thesis report we have first introduced the concept of integrated operations (IO) within the Norwegian oil industry. With this new way of organizing work, a need for change in the organizations operation on the Norwegian continental shelf will emerge. As a result we have presented a thorough review of relevant change management theory, and trying to link theories to the specific context. First, we have introduced two fundamental approaches to change, namely theory E and O. Second, we have gone through six aspects of these approaches, linking them to the Norwegian oil industry. Third, we have explored the concept of change resistance and possible restraining forces. Fourth, we have looked at commitment to change, and finally we have presented Kotter's 8-stage model of change. To end with, a methodological part has been developed in order to establish a specific research question, how we will conduct our study, who our respondents will be, and how we plan to analyze the data we obtain. A plan for our progression is found in appendix 1. Based on the situation within the Norwegian oil industry, and the breadth of the theoretical field of change management, we propose the following research question:

How are the changes related to IO being implemented within the organizations operating on the Norwegian continental shelf, and what factors drive or restrain the implementation of organizational change?

Introduction

Since oil first was found and extracted on the Norwegian continental shelf in the early 1970s, the industry has served as the main contributor to the rise of Norwegian economy and welfare. Numbers presented by Statistics Norway (SSB) in 2007 stated that 75 000 persons were employed in some relation to the Norwegian oil and gas industry. In addition, the same year the industry was attributed above 20 % of Norway's total GDP, supporting its central position.

As businesses in any other industry, the operators on the Norwegian shelf compete for profits and competitive advantage. By the turn of the millennium a new way of organizing work, heavily based on utilization of new technology, was introduced in the industry. By taking advantage of real time data, multidisciplinary teams and increased decision accuracy, *integrated operations* has been expected to enhance the effectiveness and efficiency of work processes in the sector. However, as this is a new way of organizing work, there is a certain risk that issues will arise in relation to the implementation of change.

Change management theory addresses a variety of concerns related to change in organizations. Basically there are two fundamental approaches to change, referred to as theory E and O, emphasizing different aspects of transforming organizations. Resistance to change can evolve in different shapes, and managers are forced to attend to these issues if change is to be implemented successfully. There are both restraining as well as driving forces to change which will have to be taken into consideration. The implementation of integrated operations within the Norwegian oil industry will most likely involve some of these issues.

Integrated operations

Within the petroleum industry the term integrated operations (IO) refers to new work processes that allow for a tighter integration of offshore and onshore personnel, operator companies, and service companies (Skarholt et al. 2009). This integration is made possible by real time data from remote locations, i.e. the offshore installations. Physically gathering experts from all relevant disciplines, in addition to the most important stakeholders, allows for rapid responses and

decision making (Rosendahl & Egir 2008). The Norwegian Ministry of Petroleum and Energy (St.meld no. 38) defines IO as: "Use of information technology to change work processes to achieve improved decisions, remote control of processes and equipment, and to relocate functions and personnel to a remote installation or an onshore facility".

The fundament from which IO has developed

The first outline of integrated operations was developed by the space industry (Rosendahl & Egir 2008). The fundamentals were based on multidisciplinary teams sharing information in a concurrent manner, using high-tech instruments to ensure a sufficient flow of information. This was anticipated to increase cooperation between different fields of expertise and thus improving decision accuracy, in addition to cutting costs. In the oil industry the idea of enhancing rig site support from the office was first implemented in the early 1980s. The first attempts were performed by Superior Oil (Booth & Hebert 1989) which based on advances in electronic communication and personal computer technology established drilling data centers, providing real time log and measurement while drilling (MWD) data to shore based teams (Wahlen et al. 2002). These early attempts of improving the procedures of critical drilling projects lay the path for the future development of integrated operations within the industry.

In the Norwegian oil industry the first implementation of IO took place around the turn of the century. In 1997 Baker Hughes INTEQ started planning for a project, in cooperation with Norsk Hydro and BP, which were supposed to facilitate the relocation of people from offshore to an Operations Service Center onshore. In 2000 the project launched with a centre capable of supporting five offshore rigs simultaneously (Wahlen et al. 2002). ConocoPhillips went in the same direction, and developed an onshore drilling centre established in Tananger in 1999 (Herbert, Pedersen & Pedersen 2003).

Today most major oil companies in the Norwegian oil industry have what might be referred to as e-operations, smart operations, e-field initiatives or integrated operations. Such operations usually share the characteristics of planning and implementation of new work processes which are being enabled by the latest real-

time information and communication technology (Hepsø 2006). The new work processes of IO represent a parallel way of cooperating, which contrast the traditional sequential way of performing work. Various professionals with multidisciplinary backgrounds are now able to analyze real time data in collaboration, making decisions and corrective actions to optimize rig site production. In addition such collaborations are no longer dependent on one physical location as the new technology allows for onshore assembling of people with the needed competencies (OLF-report 2007).

Why implement IO?

In general the rationale behind implementing IO is based on the belief that this way of organizing work will streamline operations and increase effectiveness, thus leading to competitive advantage and increased profits (OLF-report 2007). Based on the definition of IO which was offered initially it is anticipated that the organization by integrating its operations will improve its decisions, both in relation to time and accuracy. Further, the fact that technology provides the opportunity to control offshore processes and equipment from onshore locations should imply more effective operations. The ability to assemble important functions on an onshore location will also include reduced need for offshore personnel. In addition to have positive implications for effectiveness, implementation of IO is expected to have beneficial effects on Health, Safety and Environmental issues (HSE) in the industry (OLF-report 2007; Ringstad & Andersen 2006).

In a report from 2007 the Norwegian Oil Industry Association (OLF) estimated that if the oil and gas companies in the Norwegian shelf were to quickly integrate their operations, revenues from the shelf could be increased by approximately 300 billion NOK (OLF-presentation 16.04.08). Similarly, by not integrating their operations the companies will presumably lose out on profit. Such an estimate provides a good incentive for companies within the industry to rapidly implement IO in their organizations. It also displays some of the belief that IO represents the future for the oil industry, and that the companies who first adapts to this way of working will gain an advantage. In response to this, the different operators in the Norwegian oil industry have undertaken many initiatives to integrate their operations. For example, Statoil has shown great belief in that IO represent the

future, something that Chief executive of Statoil Helge Lund emphasized at the Intelligent Energy conference in Amsterdam late February 2008: "Statoil(Hydro) aims to be a global leader within integrated operations. This is one of three selected focus areas across the organization. Real time competence sharing is necessary in a complex and demanding industry. It is all about integrated operations and people in seamless collaboration, independent of organization, time and place" (OLF-presentation 16.04.08).

Issues in implementing IO

IO as a concept tap into technological issues in the oil industry, as well as issues related to the organization, its people, and its work processes (Rosendahl & Egir 2008; Ringstad & Andersen 2006; Herbert, Pedersen & Pedersen 2003; Ursem et al. 2003).To capture these different aspects of the organization literature has utilized the concept of Man-Technology-Organization (MTO) (Andersson & Rollenhagen 2002). If the concept of IO is to be successfully implemented it will require considering all three aspects of the MTO system perspective. Within the companies operating on the Norwegian continental shelf the implementation of new technology seem to be relatively successful. At the same time it appears to be a growing concern regarding the development of new work practices and the management of change – the integration of people, processes and technology all together (Rosendahl & Egir 2008; Hepsø 2006; Ringstad & Andersen 2006).

Today it seems to be different opinions in relation to how effective the implementation of IO has been. According to Hepsø (2006) there was an overoptimistic belief in IO at the turn of the century, as to how easy it would be to implement it. To explain the challenges faced in relation to people and processes in the implementation of IO, we would consider it useful to utilize the large knowledge base within the field of change management theory. The implementation of IO involves restructuring of work practices and management of employees, and these are undoubtedly two of the cornerstones of change. Different factors can drive the change forwards, while at the same time, other factors may hinder the change, and as a consequence, being able to successfully manage change is of utmost importance.

Change management theory

Being such a general term, defining organizational change is indeed no simple task. Thus, literature within this field has not provided a clear cut definition of the concept. Changes are observed in many ways; some include major, long-term changes of whole organizations, other might be less complicated and only affecting some of the employees. The nature of change management evolves as the complexity arises, and the deeper within the organization transformation delves, the more intricate the change process becomes.

In their research Whittington and Mayer (2002) studied the top 50 companies in Britain from 1992 to 2000 and found that during the 90's the companies executed major organizational changes every five years. As we entered the new millennium, the companies actually reorganized, on average, every three years. This evolving cycle of repeated change is basically driven by three factors (Huczynski & Buchanan 2007). First is the intense competition and stock market turbulence in the private sector along with consumerism and government pressure in the public sector. Second, the pace of technological innovations plays a major part, and third, increased knowledge-intensity, as organization design affects information flows. Beer and Nohria (2000) estimate that about two-thirds of change projects fail, and together with Whittington and Mayer's (2002) research that found evidence to claim that the outcomes of major organizational changes often are disappointing, it seems evident that the process of change should be taken very seriously in all organizations.

Fundamental approaches to change

Beer and Nohria (2000) present two fundamentally different approaches for understanding organizational change. With differing assumptions the two theories attempt to account for the underlying drivers of change. The two approaches are useful for understanding how change management usually is being coped with, and together they provide us with different perspectives on the concept of organizational change.

Theory E

In this approach change is seen as a planned and structured process implemented form the top down within the organization (Beer and Nohria 2000). Change is

managed without involvement from employees, and often even managers are omitted from this process. The rationale is that change should be planned in an objective manner, without being biased by political and psychological considerations. Implementing change through planned strategies, structures and systems allow leaders to quickly improve financial results, which is the main target when E-initiatives are undertaken.

Within this approach the maximization of shareholder value is the singular most important objective, and change is implemented in order to increase the economic value of the organization. This focus is in the spirit of economist Milton Friedman who strongly argued that the "sole ethically justifiable contributions of corporations to society is to produce profits and economic value" (Beer and Nohria 2000, p. 6). Further, to generate motivation and commitment to the change process economic incentives are being provided. Managers face a variety of different distractions and considerations as they enter the change process. If provided with the right incentives it is assumed that they will be more able to stay focused on their objective. In this way incentives aligning the interest of management and shareholders are considered crucial for change to occur within this approach.

When leaders take on an E-approach to change it is not unusual that large consulting firms are included in the process, bringing motivation and up-to-date knowledge to the table. As the rest of the organization is considered to be resistant to change, the leader engages external support to turn things around rapidly. This way it is easier to see the organization purely as an economic institution, ignoring its human side (Beer and Nohria 2000).

Theory O

The main purpose of this approach is to develop organizational capabilities, primarily in a way that involves employees in the solving of work-related tasks. By generating emotional commitment among employees it is assumed that effectiveness and efficiency is increased, enhancing economic value of the firm. Theorists of this approach, like Peter Senge, are sceptic in regards to making economic value the singular objective function in managing change (Beer and Nohria 2000). Even though such a focus in itself is considered right and

appropriate, organizations are assumed to be highly complex systems which yield multiple factors that affect its economic performance.

Theory O differs from E's planned, top-down characteristics, as it suggests a more emergent, bottom-up process. Within this approach change strategies focus on the organizational culture, taking employee values, belief systems and behaviour into account. The rationale is based on creating emotional attachment, which is considered critical in developing commitment to change (Beer and Nohria 2000). According to O-theorists, fundamental change cannot be achieved by imposing strategies and systems from the top-down, as these initiatives will not change the existing culture within the organization. Change of culture requires that people are involved and emotionally committed to the change processes. Such involvement will provide employees with motivation to implement change successfully. Within this approach financial incentives, as provided in theory E, are seen as lagging rather than driving change. There is no doubt that money moves people, but that does not necessarily mean that financial incentives motivate them (Beer and Nohria 2000).

The consulting model of the O-approach is usually characterized by the utilization of smaller, more process-oriented consulting firms. The idea is to involve managers and employees in both analyzing the current situation as well as the development of solutions and in this way ensure that change emerges from the bottom of the organization. As opposed to the E-approach, long-held psychological contracts with employees are considered important, and sudden termination of these is seen as a large risk to take (Beer and Nohria 2000).

Six crucial aspects of change

Based on the article by Beer & Nohria (2000) we would like to address change in relation to six specific aspects briefly visited above, namely *purpose*, *leadership*, *focus*, *planning*, *motivation*, and use of *consultants*.

Purpose

When considering organizational change the first and most fundamental issue to address is what the organization wants to achieve. What is the purpose of change? Theory E and O propose two different approaches which both seek define what

overarching goal should be the rationale for transforming the organization. Within the Norwegian oil industry a stated goal is to integrate operations in order to gain competitive advantage and increase revenues. Even though the creation of shareholder value has a significant focus within the companies, attention is also given to the development of organizational competencies, creating sustainability, protecting the environment and so on. Accordingly, both the E and O approach are visible within the industry.

Leadership

The two approaches we have reviewed so far differ in terms of how leadership is to be performed in relation to change. Should change be implemented as a top-down procedure where employees are "forced" to comply, or should change be implemented as a bottom-up process where employees are involved and participating throughout all stages?

Leadership scientist Jay A. Conger (2000) argues strongly that senior leaders are in the best position to plan and coordinate organizational change successfully. Top management possess the advantage of having breadth of perspective, being considered the heroic individuals who shape the future of the organization, and being most able to orchestrate change because of the power of their positions. However, Conger emphasizes that top-led change should not necessarily exclude participation from employees. Managers at the lower levels of the organization are often better suited for making decisions regarding detailed issues in their unit, and should therefore be included to some extent. In addition Conger stresses the importance of creating a feel of ownership and compulsion to change within all layers of the organization.

The top-down view, as presented by Conger, has received a lot of criticism because of its weak initiatives of including employees. Warren Bennis (2000) claims that such an approach is anchored in the myth of the *triumphant individual* and that successful change can only occur by having willing and committed followers. Since organizations today have to operate in a changing environment, they are becoming more complex, technologically sophisticated, and knowledge intensive. As a consequence Bennis argues that the idea of a top-leader, or a small group of leaders, being able to fully understand and have the wisdom to steer the

organization in the right direction, can create pitfalls for the organization. He concludes that organizational change is not possible without the inclusion, initiative, and cooperation of the employees.

In relation to IO and the Norwegian oil industry we assume that change leadership varies among the different organizations. However, as change is primarily related to new technology and working processes, and has a limited time to be implemented, we would assume that most initiatives are top-driven. What is interesting to explore is to what extent the organizations allows for employee participation and involvement in the change processes.

Focus

This aspect of change focuses mainly on whether it is organizational structure and systems or organizational culture that should be devoted most attention during a change process. In 1965 Hal Leavitt proposed that focus should be concentrated around three main issues to create meaningful change (Galbraith 2000). Personal relationships, information systems and structure are three different focus areas that together will provide a solid basis when change is to be implemented.

Jay A. Galbraith (2000) argues that in many circumstances the organizational structure and systems can be the central lever for meaningful organizational change. Especially when substantial shifts in strategic direction are being made in an organization, this focus plays a central role. Structure and systems are the formal organizing of work and processes which people attend to, and these are seen as central both from the standpoint of leverage as well as in terms of the sequence that drive change (Galbraith 2000).

Further, Larry Hirschhorn (2000) argues that organizational structure basically is a social construction and that employees imbue structure with moral meaning. Accordingly, the organizational culture and the feelings of employees should be devoted great consideration in change. Hirschhorn continues by suggesting that crisis creates the preconditions for change, and that the leader should provide a counterstructure under such circumstances. This counterstructure might facilitate aggression among employees as they feel morally obligated to the existing structure. However, the work itself and the leader's ability to combine the

aggression with playfulness will limit the potential damaging psychological consequences of the counterstructure. Following these ideas for implementing change in an organization that does not experience crisis will require the establishment of a virtual crisis, exploiting people's passion for a new idea or product Hirschhorn (2000).

Within the Norwegian oil industry it is our opinion that both systems and structure, as well as the organizational culture, should be considered vital areas of focus in the implementation of IO. As the industry enjoy high profits, and further increasing the effectiveness for some might seem unnecessary, we suspect that Hirschhorn's argument about creating a virtual crisis will be relevant. The idea can also be related to Kotter (1996) and his theory of creating a sense of urgency.

Planning

In terms of planning the change process, theory E proclaims that this should be done in a detailed and programmatic manner. Ghoshal and Bartlett (2000) claim that successful transformation processes almost always follows a carefully phased approach, that focuses on developing particular organizational capabilities. Based on their research they state that there are some general, sequential steps for successful implementation of change that has a broad applicability. This planned approach rests on the assumption that the performance of any company depends on two core capabilities: the strength of its component units and the effectiveness of their integration (Goshal & Bartlett 2000).

The planned approach to change originated with Kurt Lewin in the 1950's (Burns 2004 b). Social scientist Kurt Lewin argued that change aiming for a higher level of group performance often is short lived – after a limited time things go back to the status quo. Therefore, for change to be implemented sufficiently, the organization should go through a process with three main stages. In the first stage the organization will have to *unfreeze* its present level in order to enable transformation. Second, the *transition/change* will have to be made, where the organization moves from its existing level towards the desired level. Finally, the organization must *refreeze* in order for the changes to be sufficiently implemented and lasting (Huczynski & Buchanan 2007). The main critique of Lewin is directed towards the fact that his theory assumes that organizations operate in a stable

state, that it only fits small-scale change projects, that it ignores central aspects of organizational life like politics and power, and that it takes a top-down approach and is management driven (Burns 2004 a). However, there is modern research supporting the unfreeze-change-refreeze approach, suggesting its value when considering change and conflict resolving at the group, organizational and societal level (Burns 2004 a; Elrod & Tippett 2002; Hendry 1996).

In contrast to the planned approach stated above, *Theory O* describes another strategy on how to plan for change, which involves letting change emerge throughout the organization. Beer and Nohira (2000) explain that if the culture of the organization focus on change, the employees must be involved and emotionally committed to the process. This should be performed by making the employees a central part of the process. Moreover Weick (2000) proposes that emergent change involves a continuing adaptation towards reality, and that it takes place when the employees adjust routines, tackle contingencies and challenges, and realign their everyday work. Emergent change is distinguished by autonomous initiatives occurring internally, steady learning from both failure and success, the appearance of innovations that are unplanned, unforeseen and unexpected, and small actions that have unsurprisingly large repercussions (Weick 2000).

In relation to the implementation of IO, we expect to see a combination of these approaches within the companies of the Norwegian oil industry. Although careful planning might be a good way to initiate the implementation of change, major obstacles are likely to occur if there is not a culture for change within the organization.

Motivation

As is stated above, theory E relies heavily on financial incentives to motivate the employees toward the focus of creating economic value. Motivation is a very important aspect in an organization since it has been found to influence a wide variety of organizational aspects such as organizational commitment (Deery et al. 1995; Morrow 1983) job performance (Jalajas & Bommer 1999; Kuvaas 2008) and turnover and absenteeism (Kuvaas 2008). As for motivation related to financial incentives, Jensen (2000) claims that incentives that align the interest of

management and shareholders are essential if change is to occur. Wruck (2000) argues that getting the incentives right, is the cornerstone to any organizational change, because it will focus the management's attention on the right things, and without the right incentives, managers are to likely to be overtaken by too many distractions.

With regards to *Theory O* on the other hand, there is less emphasis on financial incentives because the underlying assumption is that people are more motivated by the particular way the management involves them in the vital questions facing the organization. Ledford (2000) argues that incentives should be used to reinforce the emergent behavior, not to drive behavior, since it can be quite difficult to know what behavior one should encourage from the start. Thus, intrinsic motivation plays an important role in change as portrayed by theory O. Intrinsic motivation can be defined as motivation driven by an interest or enjoyment in the task at hand. It stresses valued outcomes that come from within the individual, such as feelings of satisfaction, competence, self-esteem and accomplishments (Huzcynski & Buchanan 2007). When the job tasks demand quality, understanding, learning, development and creativity, intrinsic motivation are suggested to bring about the best outcomes (Kuvaas 2008).

However, Vithessonthi & Schwaninger (2008) found that that the level of job motivation is negatively associated with the level of support for change, at least when downsizing is the implications of the change. The authors give a possible explanation in that employees do not like to give support to change which will result in colleagues losing their jobs. Organizations planning for change obviously need to take this issue into consideration, as it brings about implications for the assumption that employees perform better when motivated (Kuvaas 2008).

In relation to IO and the Norwegian oil industry we find it particularly interesting to see how motivation is being facilitated by management. In addition, we expect to find some sort of incentives provided for employees who are affected by the new work processes that evolves from IO.

Use of consultants

Finally we will address the use of consultants in these two different theories. From a theory E perspective, where improvements in economic value are important,

organizations often hire large and knowledge driven consultancy firms to effectively raise the motivation and knowledge the employees are believed to lack (Beer & Nohria 2000). Neill & Mindrum (2000) argue that the huge gap between what organizations knows, and the knowledge resource that exists, is a reason for organizations to hire designated consultants. Because most organizations have a limited view of management research and best practice, they are better of hiring help from big consultancy firms, since these firms have every incentive to accumulate this kind of knowledge.

From a theory O perspective, consultants are utilized to help and support the existing management and employees with analyzing the situation and creating solutions to their challenges. A central aspect here is that consultants base their contribution on a process of discovery and learning. Robert Schaffer (2000) argue that the average organization do not have the capability to effectively put the solutions from large consultancy firms into life, and because of this, he claims that it is better for organizations to try to discover their own solutions, through a process of analysis, redesign and change.

There is no doubt that the companies within the Norwegian oil industry have had an extensive use of consultancy in relation to the implementation of IO. For example, Statoil has utilized the expertise of IBM in order to get ahead its competitors (Article www.tu.no). A question that should be asked is to what extent support from consular services has been used to just implement the technologic aspect of IO. In addition it should be of interest to investigate what role consultants have been engaged to take.

Combining E and O approaches to change

Obviously there are more than one approach to the complex field that is organizational change. Theory E and O represent two distinct sets of change initiatives that tend to cluster together (Beer & Nohria 2000). Even though they might seem somewhat contradictory it is in fact possible to implement change emphasizing both. To do so successfully involves taking a great deal of careful considerations when implementing the change initiatives. In relation to the companies operating on the Norwegian continental shelf, we see it as particularly important to identify a clear purpose for why IO is implemented and provide

managers and employees with clear, overarching main goals. What is wanted to be achieved should be reflected in the way change is lead, in the particular planning of change, how subordinates are involved and motivated, and in what way external consultants are being included in the process.

Resistance to change

Implementing the different aspects of IO with regards to people can be a major obstacle, since it depends on a series of changes in the organization. As a result we believe this might be an area that could potentially cause the implementation of IO do be slower and more difficult than first proposed by the OLF. When confronted with a change, humans normally react in one of three possible ways regarding how to comprehend the change; either by acceptance, ambiguity and resistance (Ford, Ford & D'Amelio 2008). Therefore when a company is going through changes, it must be ready to deal with employees resisting the change. In fact, employee resistance has been cited as the main factor that derails change initiatives (Regar et al. 1994; Kotter 1995). Lewin defines resistance to change as "a restraining force moving in the direction of status quo" (Lewin 1952, cited in; Piderit 2000: 784).

Reasons for resistance

Since resistance to change can have such a detrimental effect, we will try to shed some light on what can be the source of this resistance. As the concept is complex, it can be observed in a various different ways. Yukl (2010) describes nine different, not mutually exclusive, reasons for resistance:

1. *Lack of trust;* with a lack of trust towards the person(s) who propose the change process the employees might doubt the reason for change. Distrust can also magnify the effect of other sources of resistance.

2. *Belief that change is unnecessary;* if the organization has been successful, and there is no visible trouble on the horizon, resistance is more likely to occur. Even when a problem is recognized, the usual way to confront it is to try to adapt, or to do more of the same, instead of changing.

3. *Belief that changes is not feasible;* the employees might doubt whether the proposed change is possible to succeed. Negative experience from previous change processes will increase the likelihood of resistance.

4. *Economic threats;* the employees might suffer personal loss of income, benefits and job security, and this might clearly increase their resistance, especially when the employees have experience of downsizing and layoffs in the past.

5. *Relative high cost;* during a period of change familiar routines must be changed, causing inconvenience and uncertainty, in addition to require more effort on behalf of the employees.

6. *Fear of personal failure;* employees low on self-confidence might be reluctant to change the way they are doing things, because they fear new procedures will be too difficult.

7. *Loss of status and power;* since changes often results in a shift in power and status among teams and individuals, the employees in charge of processes likely to be cut back on, might possibly oppose the change.

8. *Threat to values and ideals;* change inconsistent with strong values and ideals will be resisted. If there is a threat to an individual's values, it is likely to fuel strong emotions that can arouse resistance to change.

9. *Resentment of interference;* some employees simply do not like to feel controlled, and attempts to change their job situation are likely to cause resistance to towards change even though it might be needed.

Intuitively, more than one of these points seem applicable for the implementation of IO within the Norwegian oil industry. Especially the *belief that change is unnecessary* might be an issue in an industry where profits are high and business is generally going well. Also *economic threats* in terms of potentials lay-offs might be particularly relevant, as IO brings about rationalization within the organizations leading to a reduced need of off-shore staff. Further, the implementation of IO will involve restructuring that might evoke feelings of *loss of status and power* for some employees. For example, experts working in the multidisciplinary teams might experience an increase in status and power, while

those who stay put in their regular positions might feel a parallel decrease. The fact that IO for some will involve drastic changes in work processes etc. might also generate *resentment of interference*.

Resistance to change – an asset?

While resistance to change can have a damaging effect on the process, some research is challenging the idea that resistance should merely be eliminated. Ford, Ford & D'Amelio (2008) tackle this very idea when they discuss whether resistance to change is always negative. They point to the fact that resistance to organizational change is never depicted as the product of rationally logical objectives and strategies, even though resistance to persuasion has been found to be the product of thoughtful consideration (Wegener et al 2004.). In addition, resistance to change is never portrayed as a potential contributor to, or resource for, effective change, even though the fact that authentic dissent has been shown to be useful in other areas of management. The authors propose that resistance may, in some cases, reveal a higher level of commitment than acceptance, because some resistance is thoughtful. Thus resistance to change might actually be utilized as an asset for an organization going through change. Since resistance to change is very common, even almost inevitable, there is a need to be able to address this issue the right way. Knowles & Linn (2004) found evidence to support their idea that if a company can use resistance in a productive way, it might create value for the existence, engagement and strength of the change, and thus act as a resource instead of a restraint to change.

The force field analysis

As a "technique for assessing the balance of factors that respectively encourage and resist movement towards a desired target situation" (Huczynski & Buchanan 2007, p. 566) Kurt Lewin developed the *force field analysis*. The basic idea is to identify all forces within a field (organization) that will affect change I some way. By assessing and evaluating the various forces allows a plan for specific change initiatives to be generated. Lewin suggested that the success of a change initiative should be achieved by weakening or overcoming resistant forces, as strengthening the driving forces might actually increase resistance. Technically, the force field analysis allows for scoring or weighting the different forces in order to easily

compare the balance between them. Although lacking scientific validity, the analysis might function as a useful tool when evaluating the change climate in an organization (Huczynski & Buchanan 2007).

Commitment to change

An important aspect related to change is the employee's commitment towards it. Commitment is often described as an employee's attachment to an organization, but this association can also have other referents, such as an organizational subunit, a supervisor, or even a particular program or event, such as a change occurring within the organization (Herscovitch & Meyer 2002). Commitment to a change process is imperative for an organization if they are to harness the expected benefits the change initiative are supposed to give, and such commitment can be defined as willingness to exert effort on behalf of the change (Fedor, Caldwell, & Herold 2006). Moreover, Fedor, Caldwell & Herold (2006) found evidence to suggest that the favorableness of an organizational change was positively related to perceptions of both change- and organizational commitment. This means that it can be important to separate commitment towards the organization as a whole, and the change process itself. In addition it is vital to separate compliance to change and commitment to change, since the long term benefits only occur when the employees actively work to support the change and maintain or enhance their alignment with the organizations values and goals (Fedor, Caldwell & Herold 2006; Beer & Nohira 2000)

Reichers (1985) distinguish between two different levels of commitment, attitudinal and behavioral. Attitudinal commitment will be most important for us, and is concerned with the employee's identification with the values and goals of the organization. It is important to be aware of the cyclic nature of these concepts though, since attitudes can affect behavior, which again can affect the attitudes (Reichers 1985). The literature also explains that since people have multiple commitments towards the organization, be it their colleagues, superiors, work units or customers etc, it is important to recognize these different commitments in order to know more exactly how an employee can be influenced to support the change. Related to this is the research by Kegan & Lahey (2001) in which they found evidence for their theory on *competing commitment*, which is a subconscious hidden goal that conflict with an employee's stated commitment.

The authors explain how competing commitments can cause valued employees to behave in ways that seem incredible irrational, and thus be the cause of concern, both for themselves and the company. As is evident, commitment is an important aspect related to change, and if a company wants to effectively manage change, they need to take into consideration the employee's commitment.

Kotter's 8-stage model of change

According to John P. Kotter (1996) the increasing global focus of many organizations creates a more competitive atmosphere for companies, and as a result, they have to increase productivity, reduce costs, improve the quality of products and services, and find new opportunities for growth. Moreover, these companies have to be able, and ready to, implement change. Historically, many companies have failed to do this in a satisfactory way, leading to wasted resources and tired and frustrated employees. Kotter claims there are eight reasons why change initiatives might fail:

- *Not establishing a great enough sense of urgency:* companies tend to overestimate how much they can change the organization, and how difficult it is to make people change their ways. The companies are often too quick to initiate the change program without enough explanation as to way it is necessary, and the employees often end up soliciting to the status quo.

- *Not creating a powerful enough guiding coalition:* major change is often said to be impossible without the head of the organization on board. Kotter claims the change initiative also has to have a number of other people's support to achieve a successful change outcome.

- *Lacking a vision:* urgency and a strong back-up for change are necessary, but not sufficient for major change alone. Kotter's rule of thumb says that "whenever you cannot describe the vision driving a change initiative in five minutes or less, and get a reaction that signifies both understanding and interest, you are in for trouble" (Kotter 1996; p. 9)

- *Undercommunicating the vision:* the employee's will not change their behavior, even though they are unsatisfied with the present situation, if they don't perceive the benefits of the change as attractive. Communication is of utmost importance in this instance, and the organization should be aware patterns of ineffective communication.

- *Not removing obstacles to the new vision:* sometimes the obstacles are only in people's heads, but mostly, the obstacles are real. Organizational structure, job categories, compensation and appraisal systems etc. has to be managed properly in order for change to occur.

- *Not systematically planning for, and creating, short-term wins:* implementing a transformational change takes time, and introducing short-term goals, which are met and celebrated, are very important in order to keep the employees motivated to reach the long-term goal.

- *Declaring victory too soon:* closely linked to the previous point is the problem of declaring victory with the first major performance improvement. Since it might take years for a change to sink down into the culture, this will jeopardize the change process.

- *Not anchoring changes in the corporation's culture:* according to Kotter a major change has only occurred when the employees use the phrase "that's just the way we do things around here". Until this point, there is always a potential that the change might fail to materialize.

As Kotter explains, these potential fall pits are costly, but luckily, they are not inevitable. With awareness and skill they can be avoided, and the key lies in understanding why organizations resist needed change.

Research Question and Methodology

Research question

In our master thesis we will investigate how far the oil industry on the Norwegian continental shelf has come in the process of integrating their operations. We will focus on the potential sources that can create resistance to change within an organization, how they emerge, and how they should be managed. According to theory, the outcome of change processes depend both on restraining and driving forces of the change. In our master thesis research we hope to identify some forces which we can use to explain the development of the IO-implementation. Based on the literature reviewed in this preliminary master thesis we have developed the following research question:

How are the changes related to IO being implemented within the organizations operating on the Norwegian continental shelf, and what factors drive or restrain the implementation of organizational change?

Method

In our thesis we will utilize the approach of qualitative research, which can be defined as "an umbrella term covering an array of interpretive techniques which seek to describe, decode, translate, and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world" (Van Manen 1979; p, 520).

We will perform a literature review, gathering and examining the relevant theories from the field of change management. The most relevant theories will be used to explain our findings in the analysis of the thesis. In addition, documents regarding IO within the Norwegian oil industry will be reviewed for better explaining the situation within the industry. The literature review will be performed in order to provide the background information so that the reviewers understand the significance of the problem, as well as creating a logical argument leading to your research question (Morse et al. 2004).

Further we will conduct interviews with key persons within the industry to gain insight on what IO is and how it is being implemented. Gillham (2005) argues that semi-structured interviews might be the most important way of conducting a research interview because of its flexibility balanced by structure, and subsequently the quality of the data obtained. Thus we will utilize semi-structured interviews when we conduct our research. To ensure the validity of our study we will first of all use the advices presented by scientific research theory, like Gillham (2005). Further, we will attempt to interview key persons from different companies operation within the Norwegian oil industry as this will increase the generalizability of our findings. Considerations regarding the reliability of the study will be attended as we develop the specific questions of our interview.

Respondents

Our respondents will primarily be key persons within the Norwegian industry that possess relevant information of the development of IO. We will attempt to gather information from some of the most central organizations operation on the Norwegian shelf. Breadth of respondents will hopefully give us a good perspective of how IO is implemented within the industry.

Analysis

Based on theory and models within the field of change management we will analyze the results obtained from our interviews. We will primarily focus on theory explaining why organizations might demonstrate resistance to change. Relevant documents that have emerged from the Norwegian oil industry will provide us with a solid background to understand the industry and to apply change management theory.

Progression plan

A plan for our progression in relation to the thesis work is attached in appendix 1.

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Appendix

***Appendix 1* – Progression Plan**

January
February
March
April
May
June
July
August
Hand in preliminary Thesis
Feedback on Preliminary
Implement adjustments from feedback
Specify direction and purpose of thesis
Reinforce theoretical foundation
Clarify variables
Develop an interview guide
Buffer
Collect data
Transcribe interviews
Data analysis
Proofreading and miscellanous 1
Buffer
Proofreading and miscellaneous 2
Buffer
Printing
Buffer
Hand in thesis report