

Collaborative Networks and Virtual Support Enterprises

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INTRODUCTION

Owing to complexity and dynamism of the industrial settings, the business environment today is more prepared to adapt different competitive strategies to retain profitability and growth (see for instance, Click & Duening, 2005; Tidd, 2000; Wang, Heng, & Chau, 2007). Smart use of cooperative technologies and establishment of prudent business-to-business (B2B) partnerships are very central to manage risk when business activities are exposed to a much wider range of uncertainties (Shaw, 2006; Wang et al., 2007; Wroblewski, 2002). This is particularly so for high-risk businesses such as oil and gas (O&G) exploration and production (E&P), which is far more sensitive in socio-economical and political terms. This chapter presents such an emerging collaborative and dynamic network environment within the O&G industry on the Norwegian continental shelf (NCS) through a case study. It provides a background of the industry, describes the organization of the network, its structure, and the active strategic components. At the end it also highlights some of the major challenges that need to be addressed in the establishment of a fully-integrated and fail-safe network and an operational enterprise to manage complex assets. This is based on an ongoing industry-wide new development process termed *integrated operations (IO)* commenced very recently in 2004-2005 dedicated to establish smart offshore asset management practices on NCS by 2015 or so (OLF, 2003).

Conventionally, O&G exploration and production business often pays much attention on the technological capabilities and economical excellence as the criteria to lay the strategic road maps for asset development. Application of hardcore technologies often targets production enhancement for instance in use of multi-lateral drilling, down hole separation, condition monitoring, and so on. The progress in the data management solu-

tions has also been relatively slow for a long-time without much attention on implementing a major change, and mostly is limited to various off-the-shelf and/or ad-hoc solutions. The organizational environment has been pretty conservative with a classical division into core disciplines and departments. The nature and scale of interactions with third parties followed such an industrial practice that is purely based on a *price tag* to a given contractual package. Such settings have mostly been subjected to criticisms and constantly been challenged by various stakeholders since the underlying bases of B2B transactions are not seen adequately incentive-driven or contributing in its full potential to the value-adding process.

Changes in business settings occur as the environmental conditions for commercially successful business transactions change. Such changes can be internally or externally driven (Davenport, Prusak, & Wilson, 2003; Mintzberg, Ahlstarnd, & Lampel, 1998; Peppard & Rowland, 1995; Porter, 1998). The current situation in North Sea O&G exploration and production environment is a good example of such a change where a strategic combination between internal and external factors has triggered a major re-engineering process across the entire industry. Interestingly, this major reengineering process has significant organizational ramifications with a rapid advancement towards *collaborative dynamic networks (CDN)* and *virtual support enterprises (VSE)* to manage offshore assets in North Sea (Liyanage, Herbert, & Harestad, 2007; Liyanage & Langeland, 2007).

BACKGROUND

The report no. 38 (2003-2004) to the Norwegian Parliament on the petroleum activities of the Norwegian continental shelf (NCS) directly addressed and underlined

the critical need for a long-term development scenario to reduce commercial risks and to enhance value-added by existing reserves and offshore production portfolio. The main highlights of the report refers to the maturing assets, discovery of marginal fields, remaining value creation potential, and thus on the timely need for a new development path to extend production towards 2050 or so.

In fact the principal concerns of the majority over the last two years in particular have been on operating costs and production efficiency (OLF, 2003). At the same time, leading socio-political organizations, O&G producers, and the expert service providers have been reiterating the commercial benefits of industry restructuring. Subsequently, Norwegian O&G industry, with the fullest support from political leadership and authorities, began to develop dedicated plans and launched specific programs commencing from 2004-2005 to establish an operational environment challenging the conventional practice. The new development scenario, termed *integrated operations (IO)*, was launched introducing a complex and dynamic new socio-technical environment in North Sea, with dedicated programs to re-engineer offshore asset management practices by 2015 or so targeting major commercial benefits.

INTEGRATED OPERATIONS (IO) AND ITS KEY SOCIO-TECHNICAL CHARACTERISTICS

With the launch of the new IO scenario, Norwegian O&G industry stepped into its so-called 3rd *efficiency leap*. It is a dedicated national program focussing on

all aspects of technologies, techniques, commercial transactions, and so forth to establish what are termed *smart assets*. The offshore assets became embedded within dynamic networks with enhanced process-to-process (P2P) and business-to-business (B2B) data exchange and communication routes allowing active integration of various business sectors and competence groups physically and/or virtually.

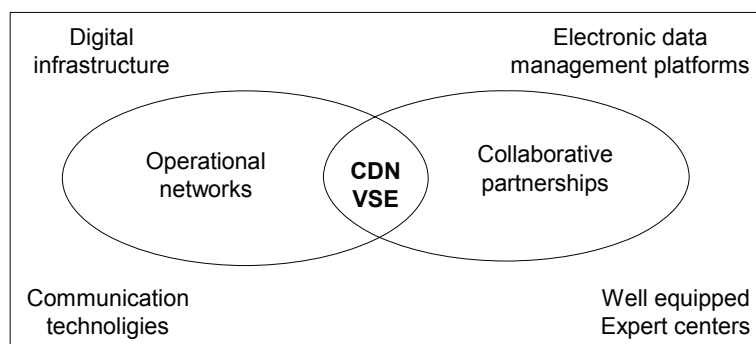
The new practice redefines and re-engineers the conventional setting by establishing tightly integrated offshore-onshore environment so that remote expertise can be made use of regardless of the geographical location. This is made possible by advanced information and communication platforms and high reliable information and knowledge based operative networks.

In brief, current developments aim at building up dedicated and reliable network of discipline experts and organizations that are actively involved in dynamic sharing of information and knowledge and online real-time communication for fast yet effective decisions and actions on a 24/7 interactive basis.

CDN-VSE ENVIRONMENT OF EKOFISK OFFSHORE PRODUCTION COMPLEX

The great Ekofisk asset was discovered in 1969 and today it has become the landmark in Norwegian O&G history. It has been in production since 1971 and as of today the production area consists of 29 platforms with 18 of them still in operation. Ekofisk is still one of Norway’s biggest oil-producing fields, and ConocoPhillips is the holder of the operating license. The

Figure 1. Establishment of CDN-VSE environment in North Sea O&G exploration and production business require a combination of elements to work in synergy. (© 2007, Jayantha P. Liyanage. Used with permission.)



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