SPE 112196

Learnings From the Deployment of Advanced Collaborative Environments at Scale in BP North Sea Operations

S. Goodwin and C. Critchley, BP, and P. Shaw and N. Da Costa, Deloitte MCS Limited

This paper was prepared for presentation at the 2008 SPE Intelligent Energy Conference and Exhibition held in Amsterdam, The Netherlands, 25–27 February 2008.

Abstract

This paper reports on key learnings acquired over the last two years from of the implementation of five Advanced Collaborative Environments (ACE) projects, as part of BP's global FIELD OF THE FUTURE programme in the North Sea. ACE transforms the way onshore and offshore staff interact and collaborate, with the objective of improving operating uptime and plant efficiency.

The paper will describe:

- How the behaviours of onshore and offshore teams have changed, and the subsequent impact on business performance.
- The benefits realised during the early months of ACE operation, including both tangible and non-tangible value recognised.
- The impact of ACE projects on both the onshore and offshore population.
- Plans to continue the ACE journey by deploying and exploiting new and existing technologies to:
  - Further improve the efficiency of the offshore/onshore interface.
  - Change the working relationship between BP and some of its third party suppliers.
  - Deliver global expertise more effectively to the point of need.

What is ACE?

ACE is defined as a physical and/or virtual environment in which people collaborate using shared information It can include a permanent place of work, a "go-to" place, or even a group of geographically disparate desks digitally linked together to create a virtual environment. It can be offshore, onshore or span the two.

The style and type of ACE appropriate to a particular team is determined by the need to balance collaborative versus solitary work and between real-time and longer-term collaboration.

However, while understanding that ACE can be both physical and virtual is conceptually important, for the sake of clarity, this paper will refer to ACE only as onshore or offshore physical environments.

Status

In January 2007, BP North Sea's ACE project moved from the detailed design and piloting phase into the implementation phase. This meant:

- The initial pilots used their new environments as part of business-as-usual and benefits could be accrued and measured.
- The standard solution could be rolled out to those teams not involved with the intial pilots.

There are currently five live ACE pilots, four of which have high bandwidth communications between the office and platform, while one remains constrained. Two of the four high-bandwidth pilots maintain an almost-always-on high definition (HD) video connection, while a third uses their HD connection for key interactions during the working day. The fourth is awaiting offshore installation work to allow a meaningful link to be established. A further four ACE projects have been developed in BP's new North Sea headquarters, and are due for occupation during first half of 2008.

Implemenation of further pilots has been complicated due to a move of BP's North Sea headquarters into a new building. In this new location all asset teams will have access to an ACE, but this has meant that no further ACE projects have been built in the current building. Teams not involved in ACE pilots will only experience working with ACE capability in their new place of work in early 2008 and as a result, initial implementation has focused on engagement and changing ways of working in advance of the move.

The ACE projects have, with one exception, been developed to support a single asset, given that the occupants of each ACE have in-depth knowledge of the asset they support. The exception has been the Everest-Lomond ACE, where one team supports two assets. This has also been the case historically, as the two platforms are of virtually identical design. It has, however, proved to be an equally effective model, but would be more challenging to implement across two very different assets.

Behavioural Change Achieved

Anecdotal evidence suggests that the greater the degree of connectivity, the greater the sense of there being a single (albeit physically dispersed) team focussed on the safe and efficient operations of an offshore asset. Where the importance and value of 'always on' connectivity has been recognised and genuinely extablished, it appears to be self sutaining and constant. To the contrary a lack of engagement and understanding can lead to connectivity being minimal.

Engagement and buy-in of both the onshore and offshore teams has been critical to the success of the pilots, requiring multiple trips offshore. There has been varying levels of enthusiasm amongst onshore and offshore teams, with both enthusiasts and cynics in fairly equal numbers amongst both populations. Strong guidance and establishing ground rules, with regards to the use of always-on video conferencing, was important early on in the programme. Particular emphasis was placed on the onshore team to recognise when an intervention might be valued and when it might be an unwelcome distraction.

There have been no changes in lines of authority, and the absolute authority of the offshore installation manager (OIM) remains firmly in place. What has changed, however, is the quality of decision making. The onshore team is becoming an extension of the offshore team, and the two halves of that team are able to collaborate more effectively and come to better decisions in reduced cycle time. This has been noted in both normal operations and shutdowns/turnaround situations. What is also apparent is that the onshore end of the ACE is becoming the natural nerve centre for the onshore asset organization, and as a result, the ACEs have become attractive places to work. There are no current plans to extend the ACE hours beyond normal office hours, but this has not been completely ruled out.

Approach to Benefits Realization

A number of potential benefits were identified and formed the business case for ACE implementation. These were:-

- Improvements to operating efficiency (OE).
- More efficient deployment of people's time.
- Logistical savings.

Operating efficiency benefits are the hardest to analyse and reconcile with complete certainty, but they are also the most significant source of value.

The approach taken to benefits has been both top down and bottom-up. This has meant incident-by-incident reconciliation and valuation, as well as drawing conclusions from statistical trends (such as overall improvements in OE, reductions in back-logs of critical work, increased run-times, etc.).

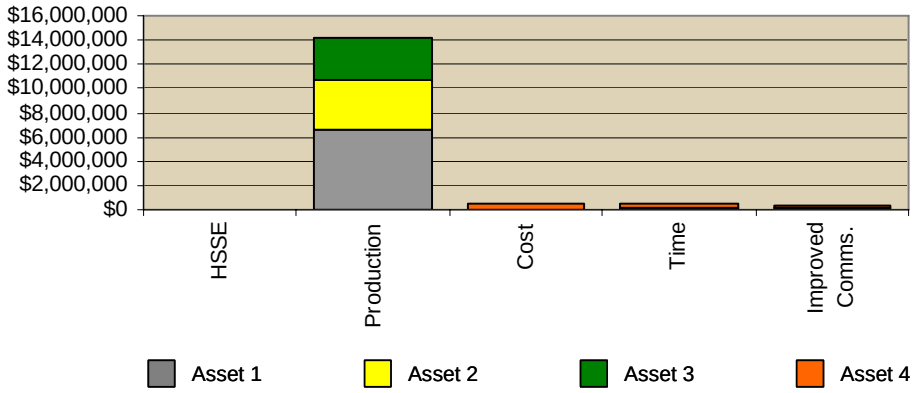
Each benefit has been reconciled and agreed upon with the operations team involved. While it is challenging to pinpoint with 100% certainty which benefit should be attributed to ACE, sufficient data points have been collected and adequately conservative assumptions made to ensure the "leap of faith" is relatively small. This has allowed us to build a rigorous picture of the benefits being delivered.

Benefits have been categorised by:

- Top level improvement area (HSSE, production, cost, time & improved communications).
- Improvement type (opportunity identification, problem avoidance, problem resolution, decision support, meeting effectiveness, team relationships).

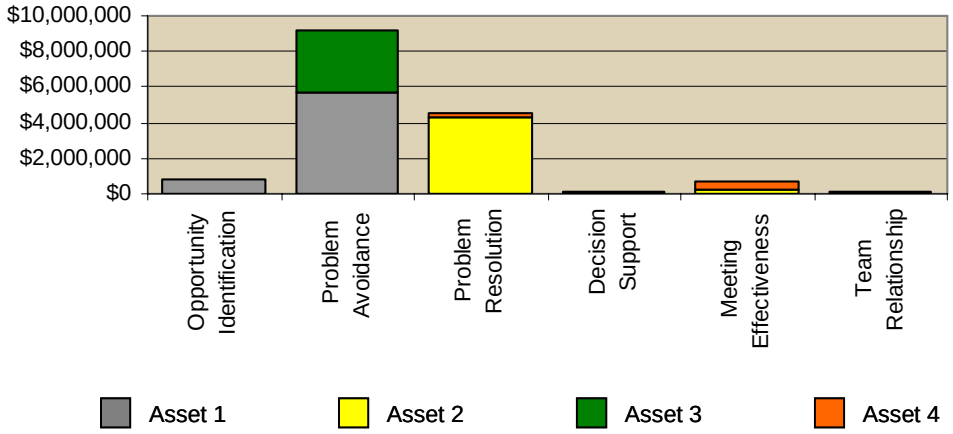
The graphs below show only those benefits that have been ratified by the asset teams, and have been calculated to represent a relatively conservative viewpoint.

Graph 1 below shows the benefits accrued over the duration of the pilots (which vary from 3-6 months).



Graph 1 – Top Level Improvement Benefits

Graph 2 below shows the improvement type over the same period.



Graph 2: ACE Benefits Improvement Types

A number of clear conclusions can be drawn from the data collected:

- Improvements in operating efficiency that provide the strongest business case for implementing ACE projects.
- Identifying where ACE has helped solve problems is challenging. Many of the benefits are a result of preventing problems from occuring, which can be difficult to measure.
- There is real and measurable value in deploying onshore expertise more effectively to solve problems.
- The second biggest source of value is opportunity identification – i.e. collaboration between the joint onshore/offshore team over shared data directly leads to the identification of other improvement opportunities.
- The measurable benefits of more effective meetings are relatively low in terms of absolute hours and do not show the value of that time being re-deployed into the other activities described above.
- Given the shortage of skilled front-line resource, the absolute value of time efficiencies do not reflect the value of those efficiencies in terms of the work they can now be redployed to do.

Achieved behavioural changes

The most important behavioural change realised has been the effective merging of two teams, previously isolated by both geography and technology, into one team, that happens to be split geographically by the North Sea. To deliver this, and in support of these changes, the culture of the onshore team has become more service oriented, and more focussed on realtime optimisation and decision making. This has in turn driven changes in organisational structure, roles and responsibilities and performance metrics.

The approach to business transformation

BP's 'five petal' approach to the business transformation associated with ACE is well documented, and has been ratified by the experience in BP's North Sea operation. Diagram 2, below, shows the model and at a high level what the key elements of each 'petal' represent.

People - individuals' knowledge, skills, behaviours and incentives need to be assessed in the context of the planned ACE implementation.

Process - to what extent are activity sequencing, control systems, automation and consistency likely to be impacted by, or influence,the ACE design?

Physical environment - to what extent does the physical space impact the efficiency and effectiveness of ACE, and what sort of physical environment can provide the balance of collaboration and concentration that teams require?

Organization - to what extent does the nature of the organization, both in terms of structure and culture, affect the approach to ACE, and how could ACE change the way we are organised?

Technology - what technology is appropriate and provides added value, in terms of collaboration, process and infrastructure..What impact is the deployment likely to have on both the offshore and onshore support services?

Diagram 2 – the 5 petal model

While the 'five petal' model gives a comprehensive overview of the solution's elements, it does not address implementation. Implementation at scale, as in the case of BP North Sea, has to address the need for standardization as well as the specific strategic and tactical issues being faced by a particular asset.

Therefore, the implementation model has required a two prong approach:

- Centralised support to provide consistency and overall programme management;
- An embedded resource, working directly with the operations teams to help identify how the technology and physical environment can be deployed to address their specific needs, and the changes necessary to people, processes and organization factors to achieve maximum value.

The programme has engaged over 300 people and has had a team of ten BP and external staff working on the programme for two years to ensure effective implementation.

The programme structure adopted is outlined in Diagram 3 below:-

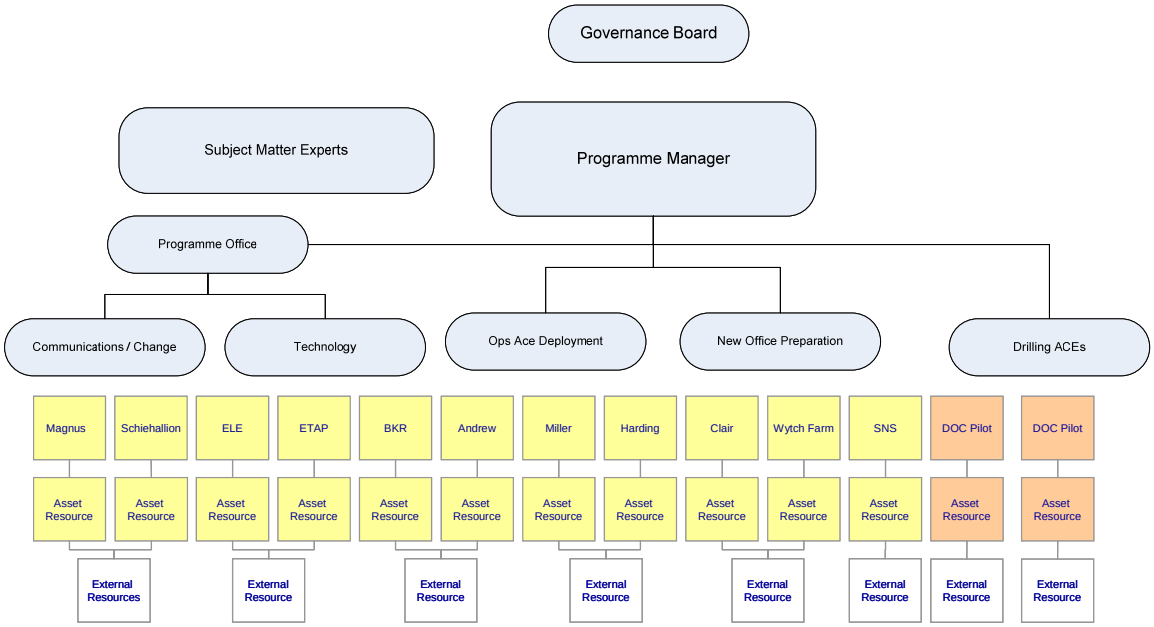


Diagram 3 – Programme Organizational Structure

Plans for 2008

Phase one of the programme is due for completion during mid 2008. At that point, nine productions operations ACE projects will be online in BP's new North Sea headquarters. The work for the remainder of this period can be broadly split into three categories:

- Sustaining and developing existing pilots.
- Transitioning the existing pilots into their new permanent environments.
- Preparing and moving the remaining assets to their ACE locations into the new BP North Sea headquarters..

Sustaining and developing existing pilots

There is clearly much to learn and there will be a great deal of focus on sustainability over the coming months. Ultimately, the ACE projects will need to operate without external support, while incoporating the roles and responsibilities for managing ACE development into the business-as-usual organization.

Transitioning the existing pilots into their new permanent environments

The success of the existing pilots means that the technology and environment has become essential to business-as-usual. A smooth transition into their new environment, and the technology up-lift that is anticipated with that, will be a critical part of BP's move into the new BP North Sea headquarters.

Preparing and moving the remaining assets to their ACE locations into the new BP North Sea headquarters.

An intensive programme of installing offshore technology, defining detailed roles and responsibilities and aligning ACE projects with individual asset priorities will take place over the coming months. In addition, those teams moving into their ACEs in the new office will go through scenario and simulation based training to prepare them for the transition.

Acknowledgement

The authors would like to acknowledge the support and sponsorship provided by BP management, and for their permission to publish this paper. We would also like to thank the large number of individuals in BP's North Sea operations – both onshore and offshore – who have enthusiastically embraced the ACE concept and have unknowingly contributed to this paper.

References

1. Castro, A., Schnellhardt, J. 2007. Advanced Collaboration Environments in Practice in BP's Gulf of Mexico operations. SPE 107035 presented at the 2007 SPE Digital Energy Conference.

2. Edwards, T., Saunders M., Moore-Cernoch, K, 2006. Advanced Collaborative Environments in BP. Paper SPE-100113 presented at the 2006 SPE Intelligent Energy Conference.

3. Phillips, I.C. et al. 2007. Deployment of Advanced Collaborative Environments at scale in the North Sea Operations. Paper 106982 presented at the 2007 SPE Digital Energy Conference.