How to get most value out of an integrated operation center initiative

Planning and Delivering Improved Operational Performance Through IOCs

By Alex Clark and Jan-Erik Nordtvedt, Epsis
Synopsis

There is a massive interest in the E&P industry on digitalization and on operational excellence. Combining these interests, a series of oil and gas companies have demonstrated huge value cases from implementing Integrated Operations Centers. In this paper, we discuss three key factors that are important for the success of an IOC initiative. We also address eight elements that one need to pay attention to for an IOC initiative to deliver value over time.
About the authors

Alex Clark, Principal Consultant

Alex is a UK based consultant who has been with Epsis since 2009 and has a wide range of experience in many industries, with most focus on oil and gas. Over the last 10 years he has built up considerable experience within Integrated Operations environments. Much of his time has been within Chevron’s digital oilfield program, initially on projects in Aberdeen but later helping Chevron develop their global capability to deploy and sustain Integrated Operations.

Prior to working at Epsis, Alex has worked within internet providers/services, local/national government, defense, education and healthcare sectors. Within Oil and Gas, Alex has also worked on the digital oilfield programs within BP, Maersk and Shell.

ac@epsis.com

Jan-Erik Nordtvedt, CEO

Jan-Erik is one of Epsis’ founders and have been with the company since the very beginning. Jan-Erik is passionate about how modern ways of working can improve operations across all industries. He has worked closely with Chevron for more than a decade and assisted their i-field initiative within integrated operations. Chevron has indeed been one of the key clients for Epsis – helping to shape Epsis’ technology platform and ensuring its usability in a demanding environment.

Jan-Erik holds a PhD in physics for University of Bergen. He has a broad experience prior to starting Epsis – and has worked in oil and gas companies, for technology companies as well as within research.

jen@epsis.com
Motivations for an Operations Center Initiative

The recent years’ volatile commodity price is forcing the entire industry to focus on costs within their operation. The increased spotlight on Health, Safety and Environmental issues is also pushing operators towards new ways of working to satisfy more demanding requirements. Continuous performance improvement is key to sustained success within oil and gas companies; to increase production, reduce OPEX and utilize resources in the most effective manner.

One initiative proven successful in addressing these needs, is to establish Integrated Operation Centers (IOCs). This paper summarizes some of the success factors to accomplish these ambitions within reasonable time and cost.

A number of companies have published value statements of IOC effectiveness. Chevron, for example, has a world-wide IOC initiative, and the corresponding value from asset implementation has been quoted in SPE con ferences. In the UK, successful implementation of an IOC for production, operations and maintenance, led to improved production efficiency of 4%, a reduction in equipment failure of 9 MUSD and an NPV of 51 MUSD over a period of 18 months (Alba asset manager in key note at SPE Intelligent Energy 2016, see also Reed, 2015 and Gilman et. al, 2016).

Equinor has recently opened two operations centers in Norway – one within production, operations and maintenance, and one within geo operations. The Geo Operations Centre (GOC), will ensure more efficient and better geoscience control of drilling operations as well as higher cost saving and personnel safety. Equinor expects the GOC to save them NOK 270 million per year. Kjetil Hove, Equinor’s Head of Operations Technology on the Norwegian Continental Shelf says: “This is a completely new way of working and represents one of the biggest changes we have made in petroleum technology and geology during the last 20 years. The GOC will utilize new technology and help form a digital future, where tasks are carried out and experience gained and shared in smart ways.”

Tengizchevron, a Kazakh-Chevron joint venture, have recently published a paper concerning two of the world’s deepest supergiant oilfields; Tengiz and Korolev. They have developed an IOC for both plant and field operations to improve planning, to support short and long-term field activities, to improve communication and increase production efficiency. They quote improved production of more than 15,000 bbl of oil per day (see Svytov et al., 2018). This corresponds to yearly added value of more than 300 MUSD.

From this, one may think that developing IOCs can be termed a “no-brainer” and that oil and gas companies will be deploying them everywhere. Even though a number of companies already have or are launching their IOC initiatives, there are also a number of stories quoted where deployments have not been as successful as reported here. Centers have been built that not lived up to their initial expectations – and screens have gone “black”, indicating little use. The center then becomes a very visible display of failure. One problem is that beyond the initial “wave” of technology implementation, centers can fall short of delivering sustained value, and the use of the technologies initially implemented can decrease over time.

In this short paper, we will therefore highlight some success factors that projects that have been successful have been paying close attention to. The paper also offers some key elements that need to be established within an IOC program to ensure sustained success. Finally, we provide guidance to setting up successful IOC programs.
“The Integrated Operations Center value comes from the sum over many incremental performance improvements”

Alba Asset Manager, Chevron
(@ SPE IE in Aberdeen, Sept. 2016)
Planning for success - 3 pillars

We believe that an IOC initiative needs to be looked upon as a journey as opposed to a destination. In our experience unsuccessful programs have to a to large extent thought that the cutting the ribbon on the opening day was the finish line – we believe it represents the starting pistol being fired. And not for a 100 meters sprint – but rather for long journey to transformed operations managed, driven and implemented by the people working within the center.

We believe that there are three pillars to a successful initiative that are worth paying attention to from the onset.

You are not building a facility

Stating that an IOC in not a facility may seem like a contradiction of terms. After all, very often there will be a facility associated with the IOC. As much as that is true – we often find that the room lay-out and everything associated with building the facility, is a distraction from the real problem at hand; providing the vehicle for positive operational transformation. This aim is little to do with a physical facility; it is all in the way that we work and get to the right operational decisions in a timely manner. Still, we see again and again that companies embark on huge projects to change the building and physical environment first and think about the operations taking place within them second. Then, when the operation is considered, one may well find that the space designed does not meet the needs of the business.

Alternatively; if you start at the other end, that rarely helps either. Mapping out where everyone should sit and the “As-Is” workflows conducted by the target groups for the IOC, would give you a snapshot in time – and probably be quite close to what you would like to move away from.

This then seems like an unsolvable situation that can’t lead to success. However, here are two factors to consider. Firstly, focus on building a capability, not a facility. A capability to perform the work needed in the facility, not the facility itself. Secondly, any physical facility needs to be flexible – as you embrace change, it is expected that it changes over time – that flexibility needs to be designed in from the beginning as a key requirement.

Think big - act small

The E&P industry is good at buying big “things” – it is well set up to buy offshore platforms or drill wells, commission seismic surveys or have large modifications projects for equipment. An IOC may seem like a similar buying proposition – it is a physical thing that can built, and once it is finished one is done and the results can be harvested. Unfortunately, that is not the case for an IOC initiative – the IOC itself is a physical representation of a change project and allows for several improvements to be instigated and realized over time. Thus, the true value is typically not from a single big value component, but the ability to capitalize on a large number of incremental improvements. When establishing an IOC program, this needs to be considered; we have found that programs that are able to assess and quantify the small improvements (via “value capture”) are better at getting sustained value than those that don’t. Governance and management focus are essential ingredients for this to happen.
“This is a completely new way of working and represents one of the biggest changes we have made in petroleum technology and geology during the last 20 years. The GOC will utilize new technology and help form a digital future, where tasks are carried out and experience gained and shared in smart ways.”

Kjetil Hove, Equinor
(Head of Operations Technology)
Change is the only constant

A consequence of the “journey” thinking is that change is inevitable – little by little and piece by piece the operation is transformed through a focused effort by everybody involved. This puts an emphasis on the management of the company and operations to put the people involved front and center. And to empower them to steer their own improvement. It is of utmost importance that the key stakeholders are involved, onboard and remain advocates for the changes over time. Thus, a focused change management effort is essential for success.

Whereas consultants and technology companies will have a key role in establishing the IOC and the initial deliveries of how to work in the center, the IOC itself needs to become a self-learning environment with a structure in place to evolve the activities within the center after initial delivery. A consequence of this is that a management strategy needs to be in place to make changes to the facility, its scope, how people work in the center, who works in the center, the technologies in the center and so on. This should be established and documented within a Life-Cycle Management process for the IOC.

Based on the above success factors, we find that there are some key elements that need to be in place for sustained success of an IOC initiative. We discuss these in the next section.

Sustained Success – 8 Key Elements

Based on our experience the IOC initiative is a journey to transform operations managed. Working globally on IOC programs we find that there are 8 key elements that needs to be in place to gain success, and in this section, we offer some thoughts on how to put them together into an executable program.
Focus on how work is performed (“Ways of Working”)

In our experience we find it useful to separate between what people in the IOC are doing and how they do it; their Ways of Working. Work carried out in an IOC will typically involve activities like preparation for morning meetings, well-test analysis and surveillance of specific pieces of equipment. How they perform these activities, constitute the Ways of Working which defines what information and applications are used, who is consulted, who is collaborating, and so on. Whereas governing documents often describes to an engineer or operator at a high level what to do, and what the outcome should be, we find the real detail on how to execute it is frequently not specified as they tend to be knowledge-based processes that can be executed in many different ways.

The consequence is that two engineers may work the exact same work in very different ways. It may lead to the same result, but there are no guarantees. Thus, the consistency in the operation is lacking, which in worst case scenarios can lead to diverging recommendations. Data is another challenge when activities are performed differently. Do people get data from the same source? Do they store local copies? And where can the latest updated version be found? Our experience is that this challenge is often over-looked and that searching for data is a time-consuming part of an engineer’s daily work.

Properly defined Ways of Working typically lead to activities being performed in a more efficient way with increased consistency as well as quality. An IOC initiative is a very good way to implement standardized Ways of Working. Letting the users participate in creating their team’s ways of working causes engagement and ensures that their knowledge about operations are included in the center.

Address the “Operation Rhythm” – how activities are related & managed

With activities being performed in a consistent way, we can focus on how they are related. What are done on a daily, weekly and monthly basis in the IOC, and how do these activities dependent on each other and how these can be manipulated at management level to fulfil changing strategy and current business needs & KPIs. Understanding these interactions, dependencies and controls, enables the IOC to “stitch” together a complete picture of work within an IOC. We call this the Operating Rhythm of the center. This will give the heartbeat of the IOC and be instrumental in continuous improvement, adaptability and relevance. Embedding this capability in the organization is important as the focus of any asset will change over time.

Build flexibility into the physical environment – it will need to be continuously adaptable

The Ways of Working & Operating Rhythm of the IOC will evolve and change. To cater for this, flexibility must be built into the physical side of the center. The goal is to facilitate changes without having to include large adjustments to the building or infrastructure. It is important to think about this from the onset – and not develop a center that one expects to look exactly like the one planned and built. Our experience is that it never will. Change is inevitable! Embrace it with a simple modular design that can quickly accommodate changing roles and varying teams.

Start small - Let the staff evolve their own Ways of Working

An IOC initiative can start small – and be driven from changing Ways of Working. It is our experience that projects that are using traditional approaches for this – such as mapping of “As-Is” and “To-Be” work processes in a theoretical way often struggle to deliver value in a timely manner. Our advice is therefore to adopt a more practical and agile approach involving the users of the center from the outset. They are after all the experts, and those that would own the Activities and Ways of Working post implementation.

We have found that using a “Mini IOC” – often in the form of a small meeting room – as a Design Lab for Ways of Working – is a very effective means to help establish how the IOC should operate. Such a Lab can also be used for training, a staging environment for new capability and used for technology testing, familiarization and deployment for the wider IOC. We have observed significant reduction in deployment time and uptake of technology by adopting this approach. Once Ways of Working have been defined in the lab they can be used right away in the normal work environment whilst the wider IOC is still being developed.
Include those outside facility in most of the thinking

The above thinking on how to develop an IOC demonstrates that an IOC is not a static facility, and it does not exist in isolation. It should be regarded as a central element in the development of the strategy for operating the asset and key component in any operating model. Thus, even if one chooses to focus on one component of the operations (for example “production and operations”), other supporting functions (such as logistics and maintenance) are integrated into the Ways of Working and Operating Rhythm where it makes sense.

Therefore, it is wise to include also what can be regarded to be “outside of the IOC” in most of the thinking of the initial design. This also supports good change and stakeholder management, allows for additional ideas to be included in the thinking and pave the way for including other functions into the IOC as it develops or as the focus of the asset changes.

Establish a Lifecycle for Ways of Working

A key shortfall of many IOCs is that the longevity of the solution is not secured – or is thought of too late in the deployment cycle. It is therefore crucial for sustained success that a Governance Model is established early on in the life of the IOC, with clear roles in the organization to sustain the deployed capabilities – both the functional ones (the business side) as well as the non-functional ones (IT and audio/visual). Also, processes need to be put in place to manage the lifecycle of the activities making up the Ways of Working. This needs to be accompanied by a clear, simple support model for all aspects of the IOC. The lifecycle management process will be very closely aligned with the Operating Rhythm as this will be the strategy that steers direction; the lifecycle model effectively being the implementation method.

Measure – Address value capture in the center

Measuring the effect of a change is important, so also for an IOC deployment. It is the only way to verify that the changes we make are worth doing. Proper measurements are the best way to verify value, but also the best way to cut loose change projects that don’t deliver as expected. We have seen that IOCs that are developed with a mindset that the impact on the business will be measured from the outset, have a far higher likelihood for sustained success than those that don’t.

Build in a governance framework from day one

In business and life, there will be good days and bad days. For success within an IOC program, there must be a clear plan from getting from the current situation to a defined and accepted “better place”. For this, a clear governance framework and roadmap for an IOC program is essential, with senior management support and active stakeholder engagement. This needs to be established from the onset.

All the above are key elements for establishing and operating a successful IOC. They should be considered collectively when selecting the solution components and IOC design – including choices made within hardware and software.
References


We have worked in the oil and gas industry for the last 15 years, focused on a market niche that has at various times been known as Digital Oilfield / Integrated Operations / Smart Fields / i-field, and now is often is referred to as Digital Transformation. During this time, we have worked with many clients worldwide on numerous projects of this nature and have gathered considerable expertise in how to implement these programs in a practical and sustainable way.

We have visited oil and gas fields in all regions of the world to help our clients increase value from their digitalization projects and transformational change initiatives. If your company is considering embarking on this type of activity, we hope that you will find our thoughts useful. We would be happy to schedule a follow-up discussion if you would like to have additional input to your endeavors.

Please contact us with your comments or questions.

About Epsis