Driving operational efficiency upstream in oil and gas

A large independent Oil and Gas Producer faces the challenges of growth and uses Business Process Re-engineering to increase productivity, remove stressors from the workplace and increase the reliability of its plans and forecasts. A major re-engineering of the 'Concept to Tie-in' process was undertaken with dramatic impacts.

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Context

The company had just completed a major acquisition, which effectively doubled its annual drilling program. Both predecessor companies had effective drilling programs at the level of activity pre-merger, but the process of getting an opportunity drilled and onto production varied between the companies and even from area to area. Each asset management area remained responsible for the identification of opportunities and shepherding them through to production and had established processes and procedures peculiar to their area.

The shared service departments (e.g. surface land, drilling, facilities) had been consolidated and were faced with a bewildering array of inputs from the various asset management teams. They were faced with a heavy co-ordination load, difficulties in scheduling, and redundant work practices to deal with the variations in inputs.

While the first 'merged' drilling season had been a success, it came at a heavy toll on the workforce—heroic efforts, many workarounds and lots of extra hours. It was clearly not a sustainable condition. To exacerbate the problem, the company was finding that the amount of gas found per well was declining with time. To maintain production, it was necessary to drill more wells each year. And since increased annual production was the desirable goal, there became a double stretch to a process that was already in difficulty.

The Initiative

The senior management of the company was dealing with many issues surrounding the merger (financial systems and controls in the forefront); and the internal resources available for integration, process development and IT were fully engaged.

The company asked Dynawise Inc. to enter into a consulting engagement to begin to converge the practices of the various groups in order to smooth the way for the shared service departments and ease the stain on the workforce while coping with the growth anticipated. Simply hiring more and more people was unlikely to be a viable strategy in terms of cost and error rates in the work flow. The idea was to find the best practice and get everyone to use it.

There was, however, a caution: the company had investigated a commercial software package to assist in this workflow area, but had determined that the internal resistance to the rigid procedures required to implement such a package were sure to produce more workarounds and opportunities for error than current practices.

During the initial stages of the engagement it was discovered that there was no one right way (or single path) for each of the things necessary in Concept to Tie-in (C-T). It was clear that each of the asset areas had optimized their processes to recognize the substantial differences that geology, geography and regulation induced in their workflow. Some areas were dominated by opportunities that were sweet gas, on crown land and largely unoccupied by permanent residences. Other areas were dominated by sour gas, and privately held land with significant resident populations. Some areas were limited to winter drilling, others were all-season, some had rich infrastructure, while others were in sparse infrastructure in difficult terrain. Some areas were dominated by company-controlled infrastructure; still others were dependant on other companies' facilities. These, and other real differences, made a 'railroad process' rather problematical.

The approach taken was to recognise anchor points in the processes, which were places where sufficient information had been accumulated so that other groups could begin their work steps in a predictable manner. It did

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…there was no one right way…

not matter how one arrived at the anchor point, only that sufficient information had been assembled, and key uncertainties resolved so that others (e.g. the surface access group) could begin their work with confidence, based on appropriate and timely information. It was also clear that these anchor points had to be visible and accessible to all participants in the process. It was also clear that the company could not easily survive another drilling season with the stresses currently existing, so something needed to be done quickly that would show real progress towards alleviating the stresses on the folks doing the work. There was no time for a large analysis project followed by a lengthy process and IT implementation phase.

With these thoughts in mind, a strategy was developed. An incremental approach to the process, starting upstream (in this case with the Geological Prognosis), was adopted, based on the idea that common anchor points early in the process would have the most immediate 'smoothing' effects.

Figure 1.0
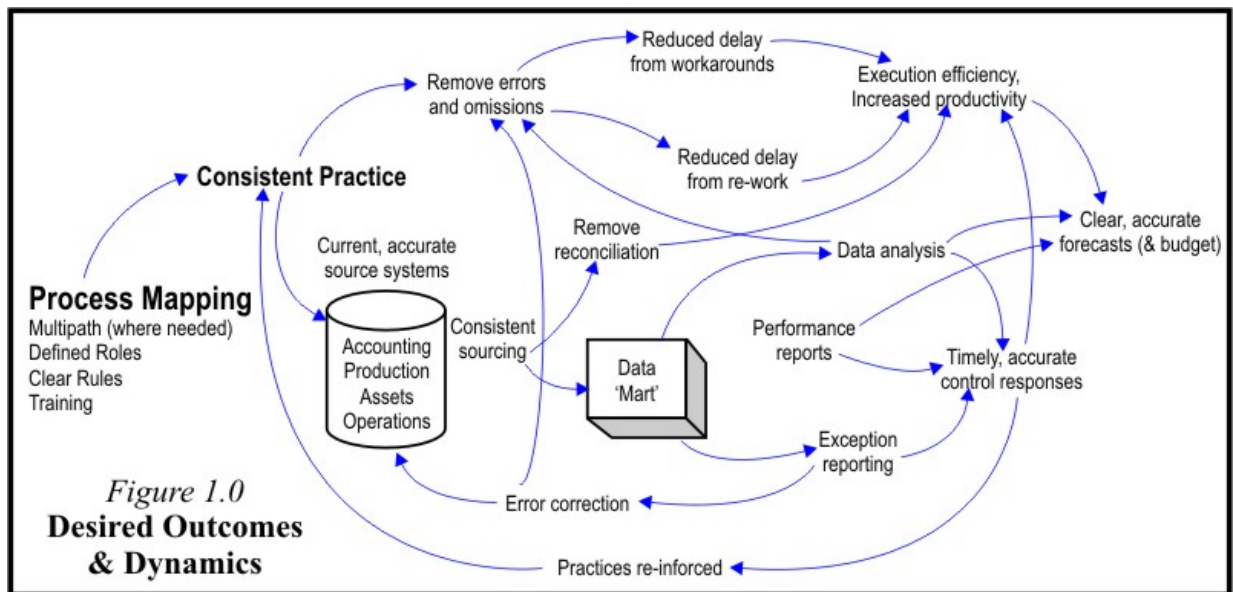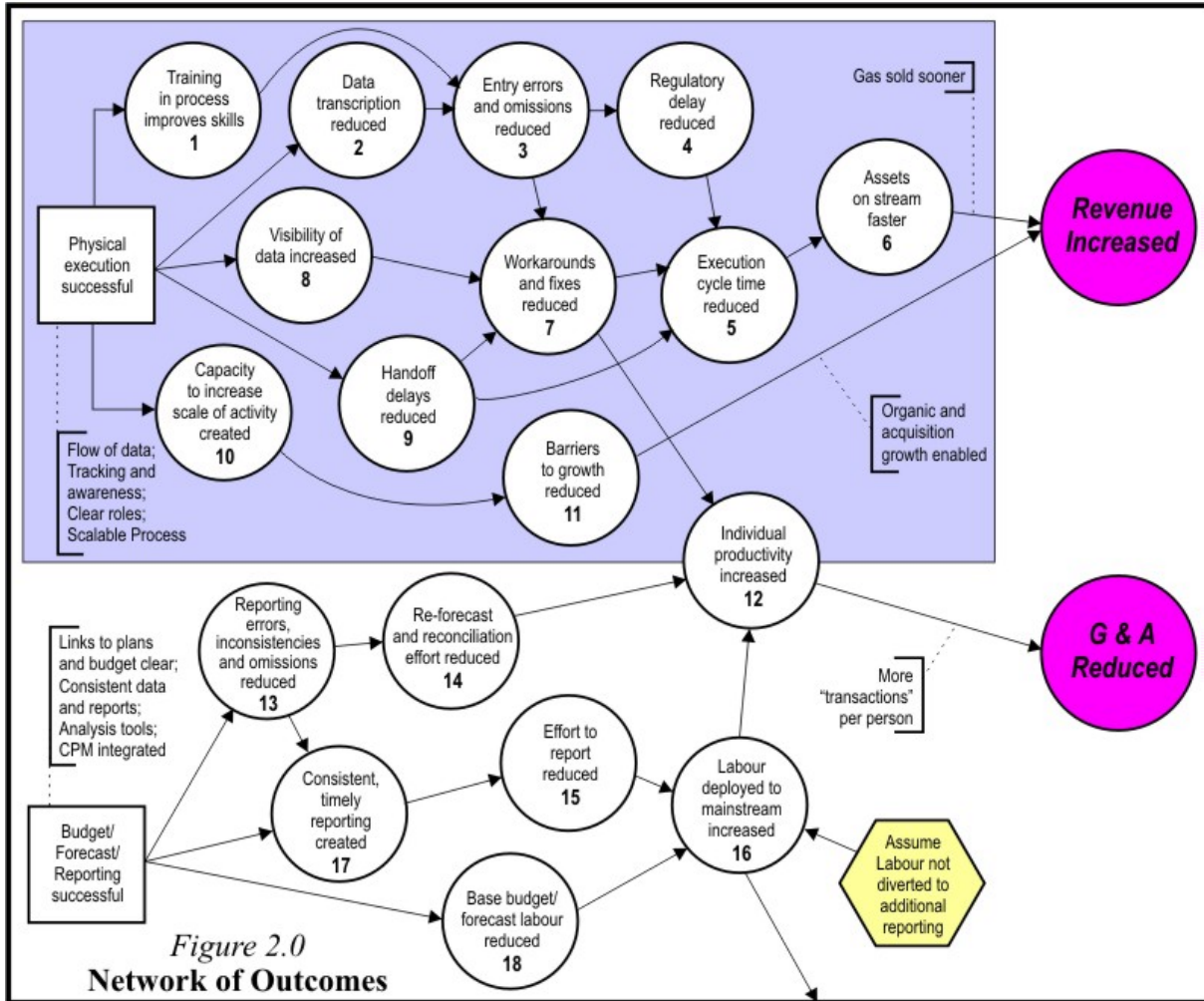**Desired Outcomes & Dynamics**

Figure 1.0 shows a representation of the dynamics hoped for and the outcomes desired.

At the time a Geological Prognosis has been settled (and the economic decision made to pursue the opportunity it represents) a number of steps can begin. For example, drillers may estimate the time and cost to drill; surface land folks can begin the processes of acquiring access rights; mineral Land can verify ownership of the mineral rights …

and so forth. The key is to have practices that arrive at a consistent anchor point (the "Prog") and then make sure the folks doing the next step(s) are aware of the need to proceed, and have all the pertinent information required to start. If this happy state is consistent and reliable, many extra steps (i.e. searching out missing data, surveying and naming well sites inappropriately, acquiring access rights to inappropriate locations, errors in regulatory filing, etc.), and delays ("I didn't know 7 –32 was ready for survey!") can be removed.

Figure 2.0
Network of Outcomes

If the work is done using underlying systems consistently (and not local excel workarounds) the effort to prepare and use reports will be very substantially reduced, and this time made available to apply to basic productive work.

At this stage an analysis was done to determine the tangible and intangible benefits available to the company. Dynawise searched for measurable impacts that could be attributed to

the initiative—preferably ones that could give early indications of success or failure.

Figure 2.0 shows an extract from a network of outcomes that would lead to the desired bottom line impacts.

In the extract we see the major mechanisms (e.g. removal of workaround and delays caused by practice inconsistencies) leading to increased productivity and eventually to increased revenue and decreased costs.

In practice it is hard to attribute an increase or decrease in revenue to a single factor (a change in the weather allowing an extended season can have big effects, as can price, or regulation change), so it is important to be able to measure intermediate outcomes that one is convinced lead to the impacts desired on the end outcomes. These measurements need to be clear and agreed upon as early as possible.

With a clear idea of what we sought from initiative, a way to measure the results and a strategy to get there, we started to execute. Over the next two years, changes were made to the processes involved in C-T with the assistance of those intimately involved in their daily execution. Incremental approaches were taken in moving along the process from Concept to Tie-in, and also in terms of the breadth of the implementation. Other initiatives (often confined to a particular area), already in progress, were co-opted and incorporated.

As results began to appear we were offered spontaneous improvements and ideas to help with subsequent steps. We were also offered constructive feedback on what did not help!

One interesting twist was the approach taken to providing IT supports to the evolving process. As each incremental change was introduced a quick 'prototype' level of system was introduced to support the new activities, often with temporary bridges to existing systems.

After the process settled, the prototypes were replaced by a 'formal' system—one that was far more robust and sustainable (to the relief of the IT department), and one that fulfilled the business needs exactly (to the relief of the business Departments).

The approach taken was to recognise "anchor points" in the processes.

The Results

The project seemed a great success. The workers in most departments were complimentary and highly receptive to each new step. But what had really happened?

A careful review of the project was conducted to see if real benefits had resulted. The most telling results were in the area of personal productivity. Geological technicians (keeping with our earlier focus on the Prognosis) reported that they were each handling two to three times the number of projects than at the start of the initiative. Engineers reported a 25% increase in the number of projects they could manage (engineering technicians reported a 50% increase). The surface land department reported dealing with twice as many transactions with less people than when we started. In overall terms, while the transaction rate had increased 33% (as measured by well count), the Asset teams had increased headcount by less than 20%, and the shared departments by less than 13%. Much of the improvement was credited to the visibility of the steps and the information developed within each step, and to the consistency of 'inputs' when a new process step was started.

Some of the benefits started to be harvested in the first six weeks of the project, with others developing as the project progressed down the process. Other connected processes (notably those relating to budgeting and forecasting) were added to the project scope over time and there are early indications of similar benefits developing.

Important intangible benefits were also realized. An employee survey, post-project, was compared to the pre-project survey. Employees reported a notable reduction in stress, and the amount of voluntary overtime was much diminished. There was also improved job-satisfaction, as well as support of the way Management was addressing related issues. The general ability of the Asset and Program managers to 'see where they were' was much improved, with a consequent effect of quicker and more accurate 'course changes' when required by weather and other circumstances. One vice president referred to the company as "operating at a higher level". ■

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