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Dutch Holland

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Doing digital oilfield right

By Dutch Holland Phd,
Chairman, Holland and Davis, Houston

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Dutch Holland, chairman of oil and gas consultancy Holland and Davis of Houston, has helped a number of oil and gas companies with their digital oilfield implementations - using software and data communications tools to make sure employees have the right access to the information they need to make decisions. In this series of articles, originally published in Digital Energy Journal, London, he gives his advice on the best way to go about digital oilfield implementations and avoid making the mistakes which other people made.

The biggest obstacles are usually people - conflicts about who is in charge of IT, resistance to change, and lack of expertise as to what a good digital oilfield implementation should look like. But the biggest winners of a good digital oilfield implementation are also people - with a promise of making their jobs more interesting, the individual's skills and experiences more vital, and provide everyone with opportunities to learn more and make new relationships. So much nicer than the last big industry re-organisation - the slash and burn of re-engineering of the past 2 decades.

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Doing digital oilfield right

Digital oilfield consultant Dutch Holland gives his ideas for how to make the best shot of a digital oilfield project work. This is the first of a planned series of articles.

By Dutch Holland, CEO of Holland & Davis

Concrete strategy

You need a concrete digital oilfield strategy that fits overall business strategy and will be backed by top management.

Simply making strategy pronouncements such as "...by the way, we might be using some digital energy ideas/innovations to improve our upstream operations" will not get the job done.

Instead, digital oilfield strategy statements must fit the overall business strategy and have specific intentions.

For example, "to assist upstream in reservoir location/management as well as enhanced recovery from existing fields by providing higher quality information on a more timely basis for collaborative decision-making by the company's best minds."

Business value

Business value is totally dependent on implementation effectiveness.

Business value only results when business personnel fully utilize the digital oilfield application in day-to-day job performance. And utilization depends on quality of implementation.

You could say, the business value is the quality of digital oilfield application multiplied by the quality of implementation.

If either part of this equation is zero, business value will be zero. This series of articles will be devoted to exploring big ideas critical to successful implementation.

Today's common practice of focusing almost entirely on the quality of the technical app will prevent business value from ever occurring for lack of an effective implementation.

Like any other asset

You should work to ensure that a digital oilfield application is treated like any other corporate asset that we expect to be developed and used to make money for the company.

It is easier said than done for innovations that are flavored with IT. Companies generally do not treat an investment in such digital oilfield apps in the same way.

For example, if a company builds a new process unit costing millions, everyone

automatically assumes the company needs to be fully ready to make money with that process unit when it "goes on line." Not so for an IT investment.

Without a specific message from top management to use the IT asset to make money for the company from the moment it "goes live," expect business users to assume that the IT asset is optional. Go figure.

Innovation and results

Digital oilfield is driven by innovation which produces functionality that must be implemented into the business to produce results. However, the quality of the implementation process must match the complexity and sophistication of both the innovation and operations.

In short, take a complex innovation and turn it into a complex digital oilfield app, use an unsophisticated and invalid implementation process to integrate it into a complex and sophisticated business process at the asset level - and expect failure.

Imagine Boeing building a 787 aircraft, parking it on the ramp and telling the airline to come get it. "We built it, you figure out how to fly and maintain it." P.S. Boeing spends as much money on implementing the aircraft into an airline's fleet as it does building the aircraft.

Portfolio Management

A mature Portfolio Management process is required at an organisation's senior level to ensure selection of the right number or type of digital oilfield projects for development and implementation.

Since a company cannot work on every digital oilfield idea, Portfolio Management is necessary to direct resources to those digital oilfield ideas/projects following the digital oilfield strategy and best fulfilling the company's business vision.

Deployment v adoption

While the word deployment in a general sense may mean getting a digital oilfield application into play, more specific definitions are called for in the digital energy arena.

Deployment more specifically means



"Simply making strategy pronouncements ... will not get the job done" - Dutch Holland, CEO, Holland & Davis

"the required use of the digital oilfield app by all parties by a certain date."

An adoption, on the other hand, means that "users may choose if and when the digital oilfield app will be used" in the business process.

For proper deployment, expect almost all users to be ready to put the application into play at the moment it is available for use.

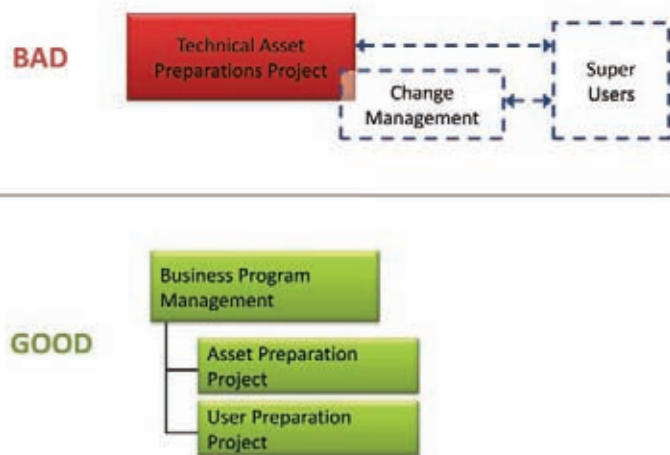
For adoption, expect only a small number of users to volunteer initially to try the application, with most other users opting to try the application over a period of years (and some users electing never to).

Effective implementation of either type requires a firm, explicit decision communicated from top management to either deploy or adopt. If management fails to name one or the other, users will automatically conclude that using the digital oilfield application is optional.

Change management

Two separate but interdependent tasks are required for digital oilfield implementation.

The digital oilfield application or system must be made ready for use in the business and the business organisation must be



Change management: it is too common for people to just expect new projects to work with the help of a few 'super users' (above) - but far better to put together a comprehensive business program, to prepare both the users and the asset for the change (below)

made ready to fully utilize it.

These two tasks require very different skills and competencies and the tasks must be managed in two distinct project organizations.

The common practice shown in the figure above has proven without a doubt to be inferior to the best practice also shown in the figure.

In its most simple form, Change Management literally means "ensuring the business work processes and people are aligned and in sync with the digital oilfield technology being implemented."

Change Management (or Change Engineering) is a formal body of knowledge dealing with the organisational mechanical changes necessary to incorporate a new technology into the business.

Far beyond today's street definition of Change Management as "lots of communication and soft stuff," Change Management includes the hard mechanical decisions and alterations necessary for the organization to be more productive business-wise by using the new technology.

How to deploy

Deployment depends on certain mechanical actions being taken by management to ensure the digital oilfield app will be implemented and utilised on target, on-time and on-budget.

The specific mechanical actions required are part of a deployment formula (certain number of steps, all of which are required for implementation to occur).

Failure to follow each step will "spoil the cake" and prevent a successful implementation of the digital oilfield app. Is your company using a proven "formula" for implementation?

How to do adoption

The adoption process as applicable in an optional digital oilfield implementation has been studied for decades in "diffusion of innovation" literature. How an innovation travels through a population of potential adopters has been well-studied and clear, definitive actions have been tested to be a positive influence on adoption speed.

But adoption remains voluntary and depends largely on each user's propensity to adopt very early, very late or any point in between. Managing an adoption is not at all about "high pressure selling" but more about ensuring that early volunteer adopters mix with non-adopters to spread the word and let non-adopters decide for themselves whether they want to try the innovation.

Not surprisingly, spreading of the innovation through an adoption process is relatively slow (years) and somewhat unpredictable.

Project management

Strong project management is an indispensable part of digital oilfield implementation success.

A digital oilfield project manager must have the authority to make virtually all decisions within boundary conditions set by the sponsor's Project Objectives. That is, the project manager should be empowered to define project scope, plan project activities and spend the budget to accomplish the sponsor's objectives.

In this sense, the project manager has been provided the opportunity to be strong. However, this means being a leader not an autocrat, by taking in his team's views and respecting their skills, knowledge and insight. Yet, since a project team is not a democracy, the project manager must make

decisions based on his expertise combined with the combined expertise of his team.

Ultimately, the digital oilfield project manager must have the maneuverability to do his job with upper management providing oversight without micro-managing.

Culture

Whether formalized or not, an organization's culture is "the way we do things around here."

An organization's culture must have certain attributes to enable full value from digital oilfield technology.

For example, a digital oilfield culture might include "high levels of collaboration, data-based analysis, and speedy decision processes."

Companies lacking attributes needed for digital oilfield must act quickly and aggressively to change that situation.

This begins by establishing culture expectations at three levels: executive, senior management and technical professional. Then Action Steps must be taken and rewarded, to achieve the desired digital energy culture.

These are: identify at all levels the desired culture to leverage digital energy potential, tools and applications; identify changes necessary; treat the digital oilfield culture change as a project; and hold managers accountable.

Join us for "high adventure" as we explore Big Ideas in digital oilfield implementation in the months ahead.



Tell us about your experiences

We're always looking for digital oilfield implementation stories, cases (good and bad) and good ideas to feature. Send your input to dutch@hdinc.com Who knows? You may be "in print" (with your permission, of course.)

Dutch Holland, PhD, is CEO of Holland & Davis, LLC., a Houston-based management services company providing digital oilfield implementation advisory services, manpower and methodologies / tools.

Fitting digital energy around your IT department

Your IT department can often be at cross purposes with your digital energy strategy, says Dr Dutch Holland. Here are some ideas how to resolve the problem.

Within any organization a Digital Energy (DE) culture does not magically appear, seamlessly integrating people with technology. Realistically, the organisational wheel must first be reshaped to make it roll more easily.

Why? Every organisation's culture is made up of several subcultures based on the past and ongoing assumptions.

One involves how the people work with and think about information technology (IT). The working relationship with IT dates back many years, or even decades, for most companies. Many assumptions about IT may have been created and reflexively accepted, without ever being challenged as wrong.

The cumulative effect of this unchallenged IT thinking might have been generally benign except for its recent collision with DE.

What happened is that managers have tended to view DE through the same lens as they view IT.

This is somewhat akin to watching a movie with an exciting action hero who unexpectedly meets an unhappy ending.

But, the oil industry has the opportunity of a lifetime because it can write a much more upbeat ending to real-life DE at companies throughout the world.

Overall, the objective is to have DE become more than simply the introduction of new technology into an oilfield company. When done properly, the goal is to use the power of digital technology to transform the way the company does business into one that takes the business to a new level of excellence, accomplishment and profitability.

Just as a farmer must prepare his field for planting, DE advocates must diligently prepare the organisation's "IT culture" before DE's promise can be realised.

People don't want risk

Remember that risks are always associated with introducing new technology within an organisation, as is any new way of doing business.

Typically these risks are absorbed at the top level of management because they usually issue the go-ahead on new technology after the case is made at lower levels.

However, lower level managers, in-

cluding the asset manager, are not equipped to absorb R&D risks. So, placing R&D risks on asset managers will accomplish little more than killing DE innovation on the launching pad.

Disconnect from your current IT

The first step in creating a viable DE culture is to stage a "cultural disconnect" at senior management levels from the current embedded IT culture.

First, bring "incorrect" IT assumptions to the surface by writing them down in explicit language in order to challenge each and explain how the DE culture will work differently. Then create the new DE culture from a blank sheet of paper.

But what about the flip side? What if the organization has actually been working in a positive mode toward a DE culture?

If so, the IT assumptions its management has are that IT will supply the means for advancing productivity; business expectations for IT projects will consistently be met; IT projects will be on-target, on-time and on-budget; IT Implementations will be manageable and doable; and communication between business and IT will be complete and understandable.

Right direction is critical

Properly creating a new DE culture is critical not just to get the right puzzle pieces in the right places. It is also the template for addressing problems and guiding workers in performing their jobs within the new organizational culture.

Yet, many organizational cultures are not necessarily pointed in the right direction in the first place, which is what often makes the collision of IT and DE not unlike a train wreck.

The reason for the wreck is not difficult to ascertain even for laymen.

DE is typically seen by most workers as if it were a television commercial for technology: "Deliver new productivity to your company and solve all your problems with our new software. No special work or skills required."

The truth is that the DE culture will require an engineering mindset especially for implementation and business readiness.



Often the term 'culture' has a negative effect on employees - 'Digital Energy working environment' is better - Dutch Holland, CEO, Holland & Davis

As a result, management typically looks at DE they want to introduce at any given time and invariably concludes the technology will be fully and enthusiastically utilized, after some good psychology-based communication of course, beginning at 8 am the next day.

Imagine the surprise at every company that thinks this way when they discover this mindset is simply inaccurate.

In brief, a company's non-DE culture may work quite well for all manner of tasks and business objectives but, at best, may be an awkward fit for the new DE working environment.

The solution, as for most business problems, is to shift into the proactive mode and proceed forcefully in order to develop and shape the company's new DE culture, one which is a glove-fit for its people and processes.

This solution – for the company's DE future – begins and carries through on a positive, yet challenging, note.

At the outset, management draws up expectations to be met at three different levels within the organization: executive, senior management and technical professional.

Executive level

At the executive level leadership factors are the driving force.

To maximize DE's value in the workplace, new technology should be deployed

by executives communicating explicitly to workers throughout the company.

In a crystal-clear, non-fuzzy way, executives should put forth what is coming through the pipeline – not just floating the new DE out in the workplace and allowing employees to adopt or ignore it.

Simultaneously, as with a coach for a sports team, these same executives must be offering clear direction, while pushing and prodding. Remember, DE is engineered into a company, not sweet talked into it.

And to further help ensure that everyone gets the point, a system must be put in place to align objectives with accountability, stressing that DE's success or lack thereof has real consequences. Failure will be penalized and successful implementation leading to full use of the system will be rewarded.

Senior management

Senior management has its plate full of responsibilities, too, in creating the new DE culture.

The senior management level must insist on a systems engineering to approach to business readiness. In fact, they have to deal with two different stakeholders: business units and corporate.

On an everyday basis, this means when corporate strategy hinges on DE leveraging, senior management cannot set corporate aside just to make the highest current profits for their business units.

They must be on the same track as upper management in the respect of keeping DE implementation momentum alive instead of resorting to the simplistic “out with the old and in with the new.”

Technical professionals

Technical professionals, who comprise the third level, have to begin living in the pres-

ent and the future at the same time.

On the one hand, they have to continue being very exacting and professional in their technically-oriented work.

While this should be expected under any circumstances, these traits are particularly important when the organisation is bringing new DE on board because these qualities validate their input.

On the futuristic side, they must recognize that the days of doing a considerable amount of manual work and functioning on relatively slow time cycles are over.

The environment now, hence the future, is real-time and 24/7 instantaneous decision-making. And, finally, as if these other responsibilities were not enough, they must share knowledge and work collaboratively in helping ensure successful DE implementations.

Specific actions

Now comes what most people look for when presented with a challenge, in this case, creating the new DE culture.

Yes, there is a game plan to achieve the objective, so that guesswork does not have to be brought into play.

Steps required for changing to a DE culture are, most importantly, reward-based. In other words, the new DE culture that is being created must be clearly communicated to workers while explaining that successful implementation will be rewarded in various ways, ranging from bonuses to promotions.

With that in mind, specific actions required for DE culture change are:

Identify the culture or new work environment that everyone will be expected to work toward, so that the organization can optimally leverage all the attributes that DE offers. This must be communicated at all three levels, not just on an arbitrary or spot basis.

Establish the opportunities for employ-

ees to best comprehend how they are aligned within the new DE culture, through means such as benchmarking and essentially having them diagnose their niche within the organization

Help ensure that the transition to a new DE culture is guided by a systems engineering approach. Pinpoint and communicate the specific changes that must be made in how the company presently functions and map the route to implementation of the new DE culture.

Inform employees that the organization's transition to a DE culture is project-based (again removing any broad brush thinking), which will hold managers accountable for how effectively the change is made.

Inject some “extras” into the reward system to let everyone know that, just as real consequences are in place to penalize failure, there are enhanced sweeteners for DE culture implementation success.

Although this analysis has discussed DE in terms of “culture,” it's best to present the change to workers at the organization by using words such as “DE working environment” and “DE workplace.” Often “culture” has a negative effect on employees.



About the author

For more than a decade Dutch Holland has been the pioneer in applying a systems engineering approach to change management in the digital oilfield (Engineering Organizational Change® {patent pending} and Systems Engineering Approach to Business Readiness®). Dutch Holland, PhD, is CEO of Houston, TX-based Holland & Davis LLC (www.hdinc.com)

Lessons from the US Air Force

The oil and gas industry could learn a few lessons from the US Air Force in working out the best way to implement and integrate new technology, says Houston oil and gas consultant Dutch Holland of Holland & Davis.

New technologies can be powerful and mind-bending, especially in digital energy (DE).

Ever stepped into a visualization (“viz”) center and put on the 3D goggles to watch colorful strata spun upside down and inside out? Technologies can fascinate, intrigue and, most importantly, change how the world works in ways often dramatically better than yesterday.

New technology can also be perplexing when being moved from scientists’ hands in research and development to everyday application within an organization, as companies attempt tying new technologies into operations.

Although technology integration was not invented just the other day, the results invariably make it seem as if that were the case. Implementation scenarios still play out adversely at too many companies trying to bridge R&D and operations. Why is the transition still so difficult and what’s the solution?

Apples, oranges and test pilots

When executives attack problems within their companies, the tendency is to draw upon knowledge about their specific industry, their experience within that industry and experiences of colleagues and customers within that same industry.

Looking outside oil and gas, therefore, seems to be comparing apples and oranges. In other words, management is advised to stick to the business they are in when brainstorming for answers.

But the real-world tells a different story: “Look anywhere for solutions and find them in seemingly unlikely places.”

For example, who would guess that a world-class solution for complex technology integration for the oil industry might actually come from the United States Air Force (USAF)?

The USAF invented the box, referred to as an “intelligent interface” (Figure one), between R&D and operations to not only support technology integration but to actively participate in product and mission innovation.

Since its formation in 1947, the USAF’s mission has called for continually improving technology. Therefore, being technically-oriented thinkers and overachievers, they developed an intelligent interface which has been the key to innovating and integrating every new aircraft into operations for more than half

a century.

So, to get inside the world’s most effective integration of new technology, temporarily suspend the whole idea of working at an oil company, don the test pilot gear and get ready to see how excellence is routinely achieved.

Home to the USAF intelligent interface is Edwards Air Force Base, where the Test and Evaluation Squadron and the USAF Test Pilot School are located.

The test squadron ensures that all new technology meets mission requirements and a pivotal part of the process focuses on using operational personnel who have completed test pilot school. In other words, the interface includes people from both operations and R&D sides.

However, not just anybody can be airborne at Edwards AFB; only the best and brightest are selected for this prestigious school, with some applying several times before acceptance.

Ten years of pilot experience is required, of which five years must be in a command position.



“Look anywhere for solutions and find them in seemingly unlikely places” - Dutch Holland, CEO, Holland & Davis

Further, although bravery and flying skills are requirements, much more is demanded. This includes scientific and engineering knowledge, critical and reasoned judgment and managerial skills of the first order.

They must also have an affinity for mechanical systems, an ability to “feel” the airplane, a well-honed sense of what is happening at all times and mature, reasoned judgment. Upon acceptance, applicants undergo a 40-week intensive training program directed at taking day-to-day operational opportunities and turning them into real technology projects that come back as airplanes.

Applying this to digital energy

In the ongoing goal to make new technology “work” for a company’s greater good, simply linking an innovation to operations is not enough.

The use of an intelligent interface helps ensure that the power of DE technology is used to enhance daily business operations, now and in the future.

The technology integration problem stands out when people try to take complex and sophisticated DE innovations and tie them into a complex and sophisticated operations system ... without the use of an intelligent interface.

In place of an intelligent interface, however, is often a very unsophisticated integration approach staffed by transaction-oriented personnel, frequently with little or no operational experience.. A passive, transaction interface just is no substitute for an intelligent interface that can analyze, modify and improve the both operations and the technology.

Depending on one’s perspective that may seem doable or difficult but, whichever applies, the DE/intelligent interface must operate with a set of attributes. If not, once again the necessary integration either will not happen or will be exceptionally bumpy and ultimately unsatisfactory.

One, a DE Intelligent Interface must be a formally chartered function, not a set of informal practices that may or may not have worked in the past.

Two, it must have leadership backing and assigned responsibility to do this interface, backed both by operations and the R&D or IT side.

Three, the Intelligent Interface must

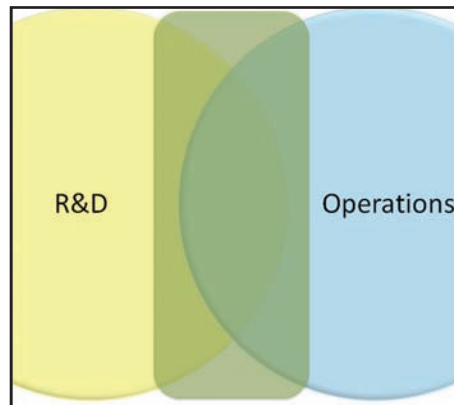


Figure 1 - the US Air Force likes to see research and development well integrated with operations

have a mission focus, not a technology focus.

Four, the interface should have functions shown inside Figure 2.

Essentially, the DE/Intelligent Interface is powered by the disciplines and principles of systems and change engineering.

Staffed by the highly qualified operations personnel, these people should have some of the key attributes as those in the AF test pilot school. That includes ten years in operations, five years with bottom-line responsibility and high credibility with operations personnel.

Additionally, they are marked and designated as “comers” in the organization and known as Operations Stars, or proactive leaders who are “consciously competent.” The latter refers to being able to articulate what operations needs, wants and is doing.

They are anchored in “what we do in operations and the way we do it,” not in the theoretical way it “ought to be done.” More viscerally, these individuals have business operations “in their bones.” They have a general understanding of the IT environment rather than knowing the “nuts & bolts” of DE technology and they must keep conversations focused on the mission first.

Reaping the benefits

The idea of figuring out how to best make DE pay off, using the context of the USAF, is to challenge readers to take some or all the ideas and evaluate their own DE implementation effectiveness, competence, horsepower and future potential.

Even though DE was not unveiled the other day, it is still relatively new and personnel at companies throughout the world are continuing to determine how to best get their collective arms around both DE technology and its integration problems.

How new? Consider that the Society of Petroleum Engineers (SPE) in April is holding its seventh annual conference on DE. In contrast, the USAF would have already held its sixtieth conference.

That means that the entire interfacing process, no matter how far it has come, is still in its infancy compared not only with what it is and could be but with what it should be.

The upside for USAF test pilots is that by completing the school, they get an important career boost; some become astronauts. On the oil and gas side, leaders in the energy business of tomorrow are those who will be able to harness technologies, including DE, for their operations.

And who are the leaders? They are the ones who actively and aggressively find technologies that enhance operations in the first place, then getting these technologies integrated. They will lead technology innovation and insertion, not have “technology done to them.”

On the downside of not getting the potential of technology due to not interacting and innovating around it, again an AF similarity exists.

Not achieving technology integration would be like the AF commissioning Boeing to build an airplane, but never having the opportunity to test it and see if it could fly new and different types of missions.

This causes them to miss out on a huge element of both innovation and integration since many innovations come from the Edwards AFB test environment and go back to Boeing for airplane improvement.

What’s happening right now is that the best and brightest still work very hard to get into test pilot school because they know it is the critical link between R&D and the flying world. This is precisely not where the DE



Figure 2 - the functions of the intelligent interface

world currently is.

In other words, more operations people need to figuratively stand on stage and reach out for the opportunities continually emerging from DE. The DE culture really needs people who want to make things happen.

In order to do this, there must be a formal organization spin, perhaps taking “lessons learned” from the USAF. Not depending on informally touching base across the interface between R&D and flying, the USAF employs a carefully planned DE intelligent interface.

Today, this same kind of interface, while only existing in some oilfield companies, is something to which all companies can realistically aspire and benefit from.



Tell us about your experiences

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IT and the business - common mistakes

Many implementations of new IT fail because they are not integrated well enough into a company's existing business, writes Dutch Holland of Houston consultancy Holland and Davis.

What is not happening yet in the digital energy world is an investment in the interface between the business and technology worlds - because the seemingly unsolvable problem still exists - how to get people to communicate from the operational functions to the innovation function and vice versa.

For example, it is not uncommon for asset managers and digital energy research to work at cross-purposes with each other. Too often, R&D is expected to continually develop innovations and then make them available to the asset managers who take the new technology and figure out what to do with it, if anything.

What is missing in this faulty scenario is that a part of operations must be proactive about getting improvements and receptive to innovation and, conversely, a part of the Innovation side must be implementation-oriented.

What companies must do, and what continues to be missing, is to invest in the quality of that intelligent interface.

Implementing digital technology into an oilfield company's work environment can potentially add substantial value - but technology insertions are repeatedly easier said than done.

IT implementations are even more painful than a root canal in failing to meet management expectations an excruciating eighty percent of the time.

While companies have figured out how to implement new core technology, a lesson learned the hard way is that an intelligent interface - connecting the digital technology innovation with the existing business - is vitally needed.

The issue is not to continue wondering why so many insertions go belly up but how to leverage an intelligent interface and dramatically improve the rate of successful insertions.

The human interface

Essentially, an interface must be a formal function staffed by real and talented people primarily from the business side.

Interfaces are not one-dimensional concepts, but rather concrete connections between innovation and business functions.

These designations refer to people and processes which connect technology and operations.

The intelligent interface must have multi-faceted capabilities that translate business opportunity into technical requirements; innovate, test and evaluate; and seamlessly implement new technology into the business.

A major change is necessary from what is being done today in many parts of the industry that are using a mechanical template-driven interface that "only communicates" between research and development / IT and the business.

Instead, the business side must drive an intelligent interface by coming through with passionate participation and leadership - from initial exploration of possibilities to full implementation and utilisation.

More than lip service is imperative; somebody on the business side must be committed to mining IT's technological value for their business.

Still, many in business management ranks carry negative baggage from failed insertions at a time when they should actually be mobilizing their "best and brightest" and energising them to extract the most value for the business from each piece of new technology ... including digital energy.

In working to improve technology insertions five types of interfaces are in play.

The by-the-book business analyst

Generically, a bright young guy in a suit and tie, working on the "innovation" side, is assigned to interview various individuals on the business side.

Using a checklist to ask questions and record answers, his mission is to provide a completed template to document and develop an understanding of what the business needs from technology.

Theoretically, if this approach works, an applications sourcing expert can interact with both the analyst and template data to select and develop appropriate technology and configure it to meet business needs.

The business-experienced analyst

The idea is that "He comes from the business side so he knows what business wants."

In all aspects, nobody is looking for him to push the envelope in any way, shape or form. From a positive perspective, he brings a wealth of business experience to the table.

On the negative side, he also drags

along decades of biases (both conscious and unconscious). Frequently not an effective or disciplined template developer, he may make decisions about business needs by feel rather than conducting a data-based analysis.



"IT implementations are even more painful than a root canal in failing to meet management expectations an excruciating eighty percent of the time." - Dutch Holland, CEO, Holland & Davis

The businessman CIO

Realistically, this is perhaps the most reactionary one of the five. For example, top management comes to the conclusion that communicating with the company's IT personnel is very difficult if not virtually impossible.

Therefore, they believe that IT is "not under control" and should be commandeered. Management's mission becomes "We'll fix them (IT)" by installing someone from the business side as the new CIO or IT head.

Before anyone quickly applauds, however, be advised that this approach is very tough to execute for fairly obvious reasons. Not surprisingly, the level of communication is indeed improved between the CIO and the business side because the latter is where the new CIO came from.

Unfortunately, the new chief knows no more about IT's nuances than a genuine IT-experienced CIO knows about business-side details.

The IT expert inside the business

Obvious logic here: Why not place one or more experienced IT/R&D people "inside the business," both physically and organizationally?

Once again, if not prompting a "That could work" reaction, it still might strike some as not necessarily a bad idea.

But, hold that thought. Taking an innovator and inserting him into the business side

– attending meetings and picking up daily information and observations – only means having someone hearing the business through IT ears and processing it accordingly.

Regardless of good intentions, without figuratively having business in his bones, no real net gain occurs because the IT expert is typically tuned out at business meetings.

The operations-led interface

Here, the actor is the business side committed to exploiting technology - in this case, digital energy.

The interface is comprised of operations/business experts who are not only passionate about exploiting digital energy, but formally commissioned and made accountable by the business side to penetrate the in-



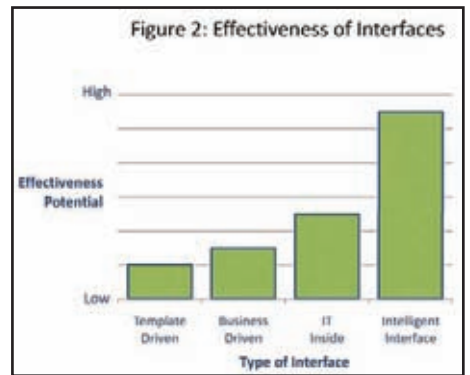
For many companies, the way to make sure new software integrates well with the business is to bring in a business analyst to come into the company, and ask lots of questions by going through a checklist

novation side and make business improvements happen.

Consider the NASA environment to see how an intelligent interface, in the form of an astronaut, examines the flight hardware which will take him into space. These future fliers interact directly with technology providers, which can sometimes be ugly. Usually the ugliest part is when a technology innovator or vendor responds to an astronaut's operational question with jargon or alphabet soup acronyms.

“When trying to connect technology innovation with business, an intelligent interface between the two is required. It must be able to translate business opportunity into technical requirements; innovate, test and evaluate; and seamlessly implement new technology into the business.”

It takes but a few seconds for the intelligent interface to clarify who the customer is, who defines the needs and who has ultimate control of the dollars – then to insist that the conversation continue without the obfuscation. Most likely, the digital energy equivalent is an experienced business person fully committed to putting new digital technology to work to pay off for the business. For this, there is no substitute.



Tell us about your experiences

We're always looking for digital oilfield implementation stories, cases (good and bad) and good ideas to feature. Send your input to dutch at hdinc.com Who knows? You may be "in print" (with your permission, of course).

For more than a decade, Dutch Holland has been the pioneer in applying a systems engineering approach to Change Management in the digital oilfield (Engineering Organizational Change® patent pending) and Systems Engineering Approach to Business Readiness®. Dutch Holland, PhD, is CEO of Houston, TX-based Holland & Davis LLC (www.hdinc.com)

How you implement technology

Companies have got very good at choosing technology – but maybe lose value by their lack of attention to choosing how the technologies will be implemented, and measuring the likelihood of its success, says Dutch Holland.

Of three major criteria used to make the decision about what to do with a digital oilfield (DOF) opportunity, two are tagged ADD because of their additional value that's previously flown under the radar:

Technical Assessment of the DOF technology for proposed utilization in a specific opportunity

ADD - technical assessment of the implementation method that will be utilized

ADD - Assessing implementation probability: Economic Pro Forma (or business case) based on the relevant implementation function (i.e., utilization over time).

The upshot is that when companies prepare to make a decision about a DOF opportunity, leveraging these three criteria will best help them.

Then, once the decision is made, it should be clearly and formally communicated without exception to all affected employees within the organization to ensure success.

Technical assessment of technology

On the first criterion, Technical Assessment of the DOF technology, the salient point is that most companies of any size are not wondering how to make decisions.

They already have a way of making decisions around utilizing new technology; they have specific procedures for bringing new technologies to the table for discussion, evaluation and selection.

Additionally, they have technical experts who are quite accomplished at this entire process. Therefore, no breaking news is occurring about making a Technical Assessment because of companies' continued skill in this facet of the digital oilfield about assessing how the new technologies work and how they may be best used.

ADD: Technical Assessment of Implementation Method

Beyond the first criterion, however, new perspectives have emerged and proven their merit in the oil and gas industry beginning with the second criterion, Technical Assessment of the Implementation Method.

A red flag should pop up for management because this particular technical assessment is not made at a detailed or robust level by most companies' management.

Specifically, implementation is not han-

dled like the rigorous technical assessment conducted on the technology itself although it certainly should be.

Why? One of the problems which happens too often in the field is literally the lack of implementation detail available for decision-making, hence an obstacle to new technology adoption.

Instead, the scenario which unfolds is that the individual describing the new technology is typically unable – in lieu of a detailed implementation methodology – to provide end-users an accurate picture of (a) exactly how the technology will be integrated into day-to-day operations and (b) how all the various risks to business interruption will be addressed in detail.

In these situations, outcomes can be somewhat less successful than anticipated. Sometimes management makes a decision to move forward with a new technology even though the implementation methodology has not been clearly thought through.

Thus, to coin a word, they may make a decision to implement an “unimplementable” technology.

This outcome obviously produces little more than a waste of the company's time and money, with nothing useful having been put into motion.

Airlines

Look at a real-world example. Say a major U.S. airline wants to expand its fleet. Realistically, they only have two supplier alternatives: a major U.S. manufacturer or its European competitor.

When analyzing two competing manufacturers, airline management will likely not find major differences in size, shape, fuel economy or other major aspects of the offered aircraft. Therefore, they usually make their selection not based on the airplane itself but on which of the two manufacturers will best help the airline integrate the airplane into day-to-day operations.

Essentially, airplane selection boils down to conducting a highly detailed examination of the implementation methodology. In some cases that calls for more detail and more calculation than required for the aircraft part of the selection process. At this juncture is an important advisory. As part of the Implementation evaluation, implementation should be simulated so that potential



Frequently, business cases for new technology are built on the faulty premise that when a new technology is “up and running” on desktops and laptops throughout an energy company, “utilization occurs by magic.” - Dutch Holland, CEO Holland & Davis

users can best understand what is required to actually get the new technology on board at the company.

This is no different than what a software salesman does when conducting demos of new releases so that users can see what the software will look like, with all its “bells & whistles,” once it's up and running.

Applying that concept to new DOF technology, management needs to see a demo of the process of implementation of new technology to visualize what the time and resource requirements will be.

To provide some perspective, integration of new technology into day-to-day operations usually takes both months, not days, and FTE (full time employed) man-months, not just number of people involved.

Using the airplane analogy, management needs to be able to see how a technology implementation will be done: how maintenance procedures will be written and implemented to fit new airplanes; what training will be required of pilots, mechanics and other personnel; what adjustments to facilities will be needed ... with all this folded into a simulation.

(This step is happening now: Detroit-based EOS Solutions has constructed several very successful implementation simulations for the oil patch).

Again, the purpose is to best position companies for making optimal decisions about the implementation process for new DOF technology.

ADD: Economic Pro Forma or Business Case

In the third criterion, companies need to have an Economic Pro Forma or Business Case that builds relevant implementation probabilities into it.

Why? Frequently, business cases for new technology are built on the faulty premise that when a new technology is “up and running” on desktops and laptops throughout an energy company, “utilization occurs by magic.” Supposedly, there will be a rapid pick-up of the new technology by all employees whereby they can immediately do as intended by the newly installed tool.

Unfortunately, as demonstrated repeatedly at companies, that is a heroic assumption. The reality is that the utilization rate, or pick-up on the new tool, has been all over the map for most companies.

Pick-up probability is dramatically different for the two most common cases.

Case one occurs when the company makes the formal decision to deploy the technology organization-wide with a date-certain implementation that holds managers accountable. In this case, the result is typically the curve represented in Figure 1. It means that with explicit top management deployment decisions, a high utilization rate (up to 90%) usually occurs at the “Go Live” of the new technology, quickly surging to 100% or full utilization as the final stragglers overcome their individual obstacles and get on board.

The second case occurs when the company does no more than give permission for new technology Adoption at users’ own discretion and timetable.

That approach results in a very different curve, as in Figure 2 showing the typical “Diffusion of Innovation” curve that has been validated for more than a half-century. For voluntary adoption, usage begins at an alarmingly low rate of about 20% of users volunteering to use the new technology as soon as it is available. Gradually other users come online, with the painstakingly slow (2-3 years) pick-up by most of the remaining 80%. With the latter there is even a caveat that in too many instances the likelihood is substantial that a remaining 10-20% will never voluntarily pick up the new technology.

So, the underlying point in this discussion is that when companies are contemplating employing new technology in the field, they need to build those two distributions into the economics of their case for change. In other words:

- What will be the business value of the new technology if management formally makes the decision to implement new technology by date-certain?

- What will the business value be if management opts to allow voluntary adoption of new technology throughout the organization?

Communication

With the three key criteria covered – Technical, Implementation & Economic – the next step should never be underestimated. That is, once management makes the decision to deploy by date certain or to encourage voluntary adoption, this decision must be clearly and explicitly communicated to all potential users and technology providers.

Thereby, the company is stating emphatically that through proven methods they have determined the new technology is good and beneficial for the company and, therefore, will be deployed as the new standard for doing business worldwide by date-certain ... or that the technology has real merit and should be considered for adoption by all users

Conclusion

Many energy companies are unnecessarily re-inventing the Implementation wheel by not connecting the dots in integrating new technology.

For all that may be said, the integration of new DOF technology is not a mysterious UFO but a known process in the world of big technology (as executed for decades by organizations such as Houston-based Holland & Davis LLC, following a specific formula).

Anecdotes abound throughout the oil

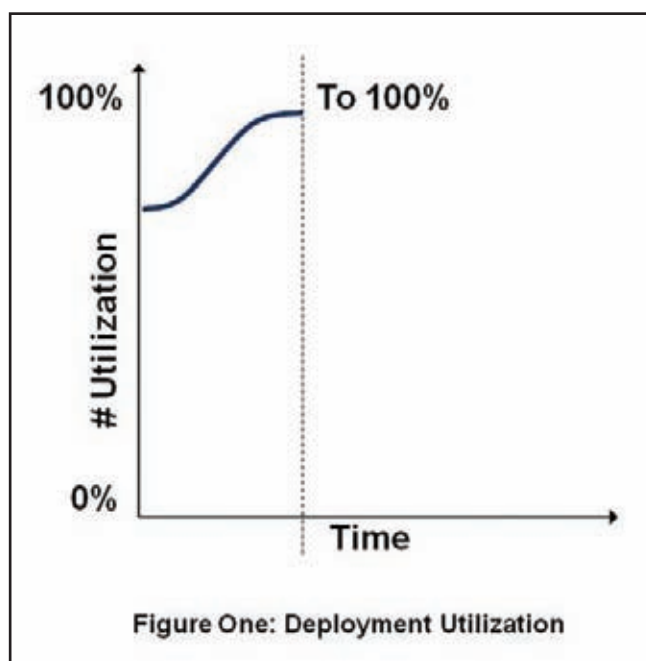


Figure One: Deployment Utilization

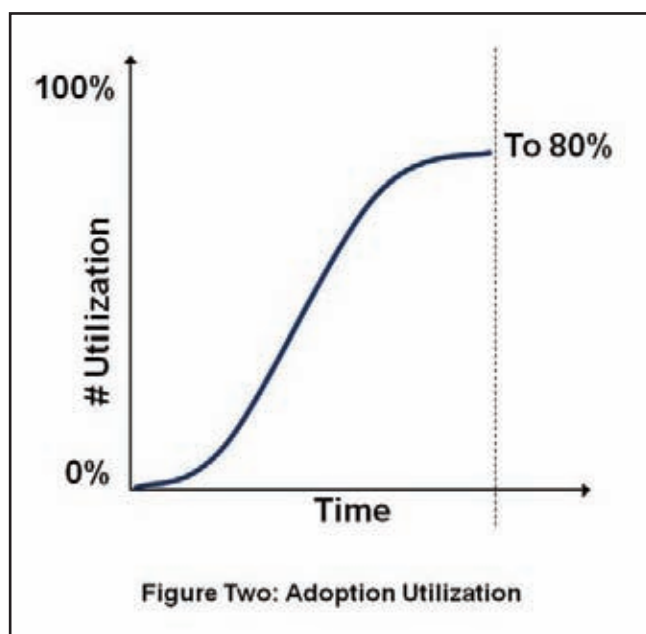


Figure Two: Adoption Utilization

industry about new DOF technology launches that fizzled or outright flopped. While these make colorful cocktail banter, think about the time and money this costs companies globally. When that hard fact hits home, forward-looking company management typically splashes cold water on its collective face and decides to take an Implementation page from the experts for dramatically better results.



Dutch Holland is CEO of Houston-based Holland & Davis LLC management consultants to the oil and gas industry for more than three decades.
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Digital Oilfield 2.0 - it's about the business

We are now moving to phase 2.0 of the Digital Oilfield, where vendors are expected to not just provide technology, but also ensure that their customers achieve business success with it, says Dutch Holland, PhD, Holland & Davis LLC.

Digital energy technology was once known more for being new, exciting and promising than for actually re-shaping how the oil and gas industry works on a daily basis. The Digital Oilfield (DOF) concept, having been in play for awhile, lets companies be more organized, more focused and operate with less waste.

What is new today about DOF is how decision-makers view and manage it.

The new business model is for vendors discovering they need to take their customers all the way to the bank. They must be able to work with a client who is diagnosing a field and determining what digital technology can do, all the way through planning and execution – to ultimately deliver business value.

Practically speaking, providers must move away from extolling and supporting the next “sexy” app and transform themselves to be able to provide complete solutions all the way to client success.

No simple challenge, this means that no longer can an app be “dumped by the door” by solution providers with the comment: “Technically, it does everything it’s supposed to. If your (oil and gas client) engineers can’t use it - well, that’s beyond the scope of our assignment or responsibility.”

A more-timely expression to replace “DOF project” may be a “business transformation project enabled by DOF technology.”

When companies focus primarily (or exclusively) on getting technology up and running in the organization, they are actually steering their people in the wrong direction.

Companies should re-title the box in which they have been working and start re-directing digital technology resources more toward achieving business results.

Another major shift among solution providers (or vendors) is they have expanded their business pitch and, without modesty, are saying they can cover the solutions landscape from A to Z.

Essentially that entails going from diagnostics to design, to development of applications and infrastructure, getting systems ready for the company, getting the company ready for the systems and infrastructure and even, in some cases, managing DOF infrastructure.

That means they are either capable of supporting each oil and gas company all the way from diagnosis to operations ... or they

are not.

Solution providers are making all the “right comments” for DOF 2.0 success but they have to do more than just talk, they have to “walk the talk.” In order to serve their customers from A to Z they must have major new organizational/business competencies put in place.

Unfortunately for some vendors, transforming the way they operate, especially if they are product-oriented, may prove to be a Herculean task which is to say utterly daunting or even impossible.

Why? To “walk the talk,” providers must embrace and become proficient in all three elements of the transformation paradigm: technology, processes, and people.

They must be able to modify customer technologies, help modify their customers’ work processes as well as helping customers align their people and performance systems that oil and gas companies currently utilize to manage them.

Organisational change

A multi-part model, Engineering Organizational Change, already exists for vendors to mature their business to the DOF 2.0 level. Instead of letting customer RFPs slowly drag them into the new era, they can proactively engineer their way to a more mature operation.

First, it is critical to tackle a transformation initiative to mature a provider’s way of working with a “project mindset.” Therefore, providers must begin by forming an internal project to effect the change i.e., turning the initiative into a disciplined project to mature their organization’s services to be able to serve customers from A to Z.

Second, DOF providers must develop and communicate a broader vision to their associates/employees. In one respect, they should let employees see themselves in the near future engaged with the customer in technology, work processes and people alignment. And this is perhaps the biggest change because previously the vision would have only seen solution providers and customer employees working solely with the technology.

Additionally, providers need to develop and communicate how their organization will support customers in the DOF 2.0 era. That support is expansive --from diagnostic to de-

sign, to infrastructure, to system and business readiness, sometimes even to operations, i.e., from A to Z.

Third, the providers’ internal work processes will need to be altered or added. Now they will have to break the mold and add work processes that go beyond software selection, im-

plementation and systems integration to processes and methodologies that focus on preparing customers for the use of the technology to create business value: increased production and maximized recoverable resources.

Fourth, the providers’ internal tools/technology will have to be altered or added to support A to Z work processes, which might include adding models and simulations that detail the business readiness process and collaboration tools that can be used both by customers and other vendors (a sticky situation for most providers).

And fifth, providers must alter their people management systems by setting up new organizational leadership structure with Value Creation (as opposed to “Technical Operations”) as the focus. Additionally, new value-oriented job descriptions must be written, business readiness people must be brought on board, employees must be trained on business value/readiness ... from A to Z. Getting business user feedback will be critical.

For providers willing to invest in transforming their own competencies, three goals can be achieved: longer-lasting customer relationships, they can more likely keep their “seats,” and they can keep the door open to selling the next round of whiz-bang digital technology and services.



“When companies focus primarily (or exclusively) on getting technology up and running in the organization, they are actually steering their people in the wrong direction.” - Dutch Holland, CEO Holland & Davis

People and the digital oilfield

Unlike many “re-engineering,” or “slash and burn” industry initiatives, the digital oilfield promises to empower people and improve their working lives. But it only works if people take people management seriously – not discounting it as ‘soft stuff’ which will take care of itself, writes Dutch Holland.

When the industry last experienced a big push similar to that now occurring with DOF, the “re-engineering” label was frequently attached and referred to re-designing from a clean sheet of paper.

While that phase was neither overwhelmingly positive nor negative, the primary downside is that re-engineering unfortunately became code for “slash and burn” with its hard-edged emphasis on doing more with fewer people.

As DOF flexes its ever-newer capabilities, however, it promises to be quite different – because of its increasingly people-oriented focus. The driving concept is to enrich people’s work experience and teach them new skills rather than bean counter manpower reduction (see Figure 1).

As companies get smarter people involved, manpower actually goes up and not down. The “know and grow” theme results in multiple positives including limitless technical horizons, ample room for everyone, jobs gained and a sense of contribution along with personal control.

People in the upstream sector will thrive on greater opportunities.

DOF’s potential is virtually open-ended as the New Frontier for upstream people with no ceilings and enriching those who play in the new environment which has plenty of room to innovate.

Needs individuals to get excited

It’s up to each individual professional to come and literally get their arms around DOF rather than waiting for it to be pushed onto them.

Sometimes, that enthusiasm is missing in the oil industry regarding the exclamation “Wow, I can hardly wait to put this into operation so we can make better and quicker downhole decisions.”

It’s imperative for each individual to recognize the exceptional opportunity right in front of them and “take it to the max” themselves.

The hard side of “Soft Stuff”

Management often conveniently splits the world into “Hard Stuff” and “Soft Stuff.”

The “Hard Stuff” is the fun technical work of DOF while the “Soft Stuff” has to do with the people side. “Lets get the tech-

nical stuff right and the people will take care of themselves,” they say.

But to make the digital oilfield work, companies – through their executive and senior management, as well as technical professionals – must take care of the hard side of the “Soft Stuff” - those hard concrete actions that must be taken on the people side is DOF is to realize its full potential.

Executive management should deploy DE with clearly and explicitly expressed expectations for its use throughout the company. And that is only the beginning because the executives cannot leave deployment dangling. They must provide implementation direction, exert ongoing pressure and demonstrate clear insistence on implementation.

Senior management must wear both corporate and business hats without favoring one set of objectives or profit goals over the other. They must be highly attuned to directional implementation, with each newly assigned senior manager expected to sustain that implementation.

Technical professionals must adhere to a continuum of highly precise and disciplined work and they must engage in active collaboration in implementing new DE technology.

Here are five “hard” things which individuals need to accept.

One, accept usage of DOF technology integrated into their job description.

Two, agree and accept goals that relate to development and use of DOF.

Three, accept training and education in DOF. The context for thinking about upstream is changing and must be reflected in innovative and intensive ways to help up-

stream personnel know and grow. For example, the University of Southern California’s School of Engineering is re-thinking what the education of tomorrow’s oil industry engineers needs to look like today and how that will translate to field operations.

Four, accept a performance assessment and feedback system oriented to DOF. Managers are key to feedback and must get on the train first or they will not be effectively positioned to literally and figuratively look over young engineers’ shoulders to suggest and coach new idea production.

Five, accept that their financial compensation will include incentives to encourage them to learn and use DOF.

Dangers

It is worth considering what dangers may lurk for companies approaching DOF 2.0.

One is that companies may talk a good game about supporting the troops and appear to be on the right track but if they fail to actually deliver, it may adversely affect business value, expectations and even people’s careers.

Two, dangers are right around the corner when companies incorrectly assume that investing in the Hard Stuff is automatically good and that Soft Stuff will just happen naturally.

Three, on a related point, danger comes to the fore when companies use technology partners that are long on the Hard Stuff but short of services on the Soft Stuff.

Dutch Holland is Founder & Chairman of Houston-based Holland & Davis LLC (www.hdinc.com)



“Digital oilfield” is a much nicer change for people to go through than “re-engineering” - Dutch Holland, CEO Holland & Davis

| Movement | Theme | Perception / Reality |
|----------------------|----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Reengineering | Slash and Burn | <ul style="list-style-type: none"> Some new processes in place Lost jobs Dispirited people Fear and distrust Economic gain at the expense of teams/people Feelings of Dead End |
| Digital Oilfield 2.0 | Know and Grow | <ul style="list-style-type: none"> Limitless technical horizons Premiums on Learning Enough room for everybody Jobs gained Job richness Personal control Feeling of Contribution Career Growth |

Figure 1: Re-engineering & DOF: Perception / Reality

