

Governing Energy

The New Knowledge Management Normal

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A recent article lamented the prospect that the upstream oil and gas sector has reduced its workforce so dramatically, that future economic recovery may be difficult.ⁱ Time will tell but there is a contrarian perspective.

As this and other pundits have commented, technology is changing the sector's landscape and rapidly. The often stated, "Do more with less" with enabling technologies has been the staple of industry transformations.ⁱⁱ With a number of case studies across all industries, the statement is hard to rebuke.

A Little History

One suspects that as with the aftermath of multiple sector collapses of the 1980s, 1990s, and early periods in this century, somehow the sector will one more time muddle through. One major similarity between the 1980s and 1990s and today is the explosive growth of technology and the subsequent enabled business process transformations.ⁱⁱⁱ

The 1980s saw the rise of CAD and decline of manual drafting. Interestingly, now CAD is dramatically changing as well.^{iv} A similar transformation began with geophysical and petrophysical stand-alone graphics interactive workstations.^v

Likewise, changes in how data were handle can be traced to this period as well.^{vi} There are many other new information technologies including the conversion of the back office beginning with the introduction of the IBM 360 (Mainframe).^{vii}

Drilling and production technology and processes were changing as well. In the 1990s, the industry experimented with new business models integrating the supply chain more tightly into "risk sharing and profit sharing" relationships.

These were major changes and some worked better than others. This author was briefly the CIO for the Terra Nova project and it was one early example of global collaboration using the Internet, i.e., use of email to exchange information and engineering files as well as video conferencing.^{viii}

Today, the sector has more mature as well as significantly enhanced information tools at its disposal. Yet in some ways this and other sectors have not matured as rapidly as the enabling technology has grown. One example of this shortcoming is Knowledge Management.

Value from Knowledge

The current Knowledge Management (KM) construct is about 25 years old. A definition of that period accredited to the Gartner Group is still in use today, "*Knowledge management is a discipline that*

promotes an integrated approach to identifying, capturing, evaluating, retrieving, and sharing all of an enterprise's information assets. These assets may include databases, documents, policies, procedures, and previously un-captured expertise and experience in individual workers.”^{ix}

Capturing the vast understanding from the departing workforce; Baby Boomers and making it available (*sharing*) to those who will lead the business and engineering challenges over the next 25 years is one of the current charters for Knowledge Management champions. But is a 25-year-old technology model adequate for the next 25 years?

One of the challenges is that technology definitions are often *ambiguous* and in uncertain *context*.^x This lack of a common vocabulary can dramatically weaken an organization/industry Culture.

A strong Knowledge Management Culture is required if the value of KM is to be unleashed. Having a CONJOINT MORPHOLOGY is critical. Previously for a Culture of Safety, we defined, *“This is functional Interdisciplinary Common Vocabulary (ICV) as opposed to traditional interpersonal communications models. Not all members of an organization will speak the same human language, e.g. English, this is process communications from the past. In this new linguistic framework, the syntax, phonology, morphology, and semantics of a common language of safety will bridge traditional dialectal barriers as a functional ICV will be foundational.”^{xi}*

From this cultural perspective, KM as outlined and currently practiced by many is outdated. Additionally, it does not capitalize on technological changes since its inception.

Capturing, retrieving, sharing, etc. are not direct **ACTIONABLE** decision-enabling tasks. To meet the business imperatives a new KM model is needed. One that is based on a functional ICV.

From Motorola's Six Sigma philosophy, the construct of DMAIC can be applied to KM. These five components of the model are:

- **Define**—the Problem Statement process
- **Measure**—Key Performance Indicator (KPI) selection and data collection processes—leading indicators preferred
- **Analyze**—Identify gaps between actual performance and expected or desired behavior. Causal analysis and rank order improvement portfolio development.
- **Improve**—Set of potential solutions identified and tested, i.e., process simulations.
- **Control**—Implementation of a monitoring and update (feedback) plan, including Verification of new process.^{xii}

In other words, this becomes a KM Adaptive Control System similar to those used with Digital Oilfield “Smart” solutions.^{xiii} Incorporating this approach, KM solutions become proactive decision supports processes.

Advanced models may include process simulation. For example, a Drilling Risk Assessment Mental Model Simulation is available.^{xiv} A model like this enables organizations to confirm various scenarios as part of a computer simulation decision-making process.

Operational Excellence (OE) can be defined as a function of six criteria; top asset performance, a stellar reputation, comparative advantage of capabilities, culture of high performance, world class HSSE and best in class processes and systems.^{xv} Firms seeking to attain OE Leadership must effectively address all six criteria.

Traditional Knowledge Management does little to effect OE. Mostly likely this model will underperform best in class firms at most.

However, the KM Adaptive Control System described herein enables knowledge stores to be converted into actionable workflows with feedback so that the workflow can “learn” going forward. Moreover, instead of sharing knowledge, it is imparted on those using the workflow solving field operational and risk management problems.

A Functional *Interdisciplinary Common Vocabulary* is the critical component of KM Adaptive Control Systems. Without, this Lexicon, these multi-variant systems cannot work (communicate) properly.

Organizations capitalizing on knowledge in this manner enable Operational Excellence and the stakeholder value associated with successful OE initiatives. Knowledge Management no longer has the look and feel of an IT activity, but now the Core Competency of the firm!

How does your organization make its Knowledge Actionable?

About the Author

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End Notes

ⁱ <http://oilprice.com/Energy/Energy-General/After-350000-Layoffs-Oil-Companies-Now-Face-Worker-Shortages.html>

ⁱⁱ <http://www.newspapersystems.com/presidents-blog/picking-appropriate-technology-enables-business-transformations>

ⁱⁱⁱ <http://www.wsj.com/articles/back-to-the-future-oil-replays-1980s-bust-1421196361>

^{iv} <http://www.tecnetinc.com/The%20Death%20of%20the%20Draftsman.html>

^v <https://www.landmark.solutions/Our-History>

^{vi} <http://www.osisoft.com/about-osisoft/>

^{vii} http://www-03.ibm.com/ibm/history/exhibits/mainframe/mainframe_intro2.html

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- viii <http://www.offshore-mag.com/articles/print/volume-58/issue-4/news/general-interest/terra-nova-super-alliance-glimpse-of-the-future.html>
- ix <http://www.kmworld.com/Articles/Editorial/What-Is-.../What-is-KM-Knowledge-Management-Explained-82405.aspx>
- x <http://grammar.about.com/od/il/g/ingformterm.htm>
- xi Shemwell Scott M. (2013, November). Process Safety from a Systemic Perspective: Integrated Operations. *Petroleum Africa Magazine*. pp. 24-27.
- xii <http://whatis.techtarget.com/definition/DMAIC>
- xiii Daum, Steve (2003, May 8). *Smart Fields*. POSC Sig. Houston
- xiv <http://www.therrinstitute.com/serious-gaming.html>
- xv https://secure.spee.org/sites/spee.org/files/2014_dec_spee_operational_excellence_caruso.pdf