Integrating knowledge management into the enterprise: Making knowledge flow through knowledge connections

- Facilitating knowledge flow obtain the most value from KM programs: why the upstream oil and gas industry needs this more than any other
- Managing an information governance framework on a global scale: maximizing business benefit, minimizing risk
- Identifying the IT tools that permit companies to “learn” what they already know and promote knowledge flow
- Identifying opportunities to improve productivity, enable high-quality decisions and mitigate risk
- Attacking on multiple fronts: policies, roles & responsibilities, processes, technology

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Knowledge is often gained only through experience and resides only in individual heads. For knowledge to have power it must flow through knowledge connections. Knowledge flow must be facilitated for companies to obtain the most value, especially in industries that must rely on individuals to rapidly assess and solve problems. Upstream Oil and Gas is just such an industry. Fortunately solutions exist, enabled by IT tools, which permit companies to “learn” what they already know and promote knowledge flow. This presentation covers some of the solutions, in varying stages of maturity, being used by Upstream Oil and Gas companies.
I think that some information about Marathon will help to put the work we have been doing in context. Marathon was established in 1887.

For comparison,
• 2008 Proved Oil & Gas Reserves: 1.2 billion barrels
• 2008 Proved Bitumen Reserves: 388 million barrels
Exploration & Production
Oil Sands Mining: 20% interest in the Athabasca Oil Sands Project
Integrated Gas: Transform gas into products like LNG, methanol, ...
RMT: US – Midwest, Upper Great Plains, Gulf Coast & Southeast. Refining, Terminals & Transportation, Pipe line and retail.
Global operations

Operations in 10 countries
Fluid Flow
Fluid flow in porous media (e.g., petroleum reservoirs) is governed by Darcy’s Law.
• Fluid flows faster through a permeable structure
• Viscous fluid does not flow easily
• Fluid flow is improved by applying pressure (e.g., increasing inlet pressure or decreasing outlet pressure)

Knowledge Flow
The keys to knowledge flow are captured in this 2002 quote from Carla O’Dell of APQC.
• Tacit knowledge does not flow as easily as explicit knowledge
• Knowledge flow is improved by applying pressure (e.g., competitive pressure, compliance requirements, managerial leadership, peer pressure)

Knowledge is sticky. Without a systematic process and enablers, it won't flow.

—Carla O’Dell
Context for the presentation

• Goals
  • Construct the work platform for the next generation – a new foundation for collaboration and knowledge sharing
  • Enable easy-to-use and consistent access to the relevant, up-to-date and trusted information needed to monitor performance, to pre-empt potential problems and to take decisions
  • Implement consistent records management to ensure we preserve the information required for legal and regulatory compliance
  • Make a step change in knowledge sharing

• Foci
  • Organizational plumbing
  • Communities of practice

Our knowledge flow work is embedded in an enterprise program to make a step change in the way information is managed across the company. From these goals you can identify the different types of pressure our company is sensing around information governance, sharing and protection.
Success demands a multi-dimensional campaign: updating policies; defining roles & responsibilities; streamlining processes; installing up-to-date, commercial technology; and providing ongoing support.

**Business** (i.e., **Operations** in this context): Relevant, up-to-date and trusted information
**Law:** Consistent information management processes
**HR:** Management of personal information
**Internal Audit:** Following policies & standards
**Public Affairs:** Responsible for the front page news
**IT:** performance, reliability, scalability ... and speed

... **More detail on Law concerns:** Compliance: Consistent Records Management, Policy Framework, Hold Order Management, eDiscovery, Cleanup & Migration: Legal & operational concerns. Law and HR concerns overlap when it comes to country laws for managing personal information

http://en.wikipedia.org/wiki/Information_privacy
http://en.wikipedia.org/wiki/Information_lifecycle_management
http://en.wikipedia.org/wiki/Enterprise_content_management
http://en.wikipedia.org/wiki/Personally_identifiable_information
http://en.wikipedia.org/wiki/Sensitive_personal_information

Standards: ISO 15489, DoD 5015, MoReq, ...

Optional: Show the video.
Just to give the idea of the variety of information we are concerned with.

On the left you see the variety of channels via which information is shared.

On the right you see a sampling of information types ... many of which have been stored traditionally on shared drives.
MaraView front page is Marathon’s intranet home page. It includes corporate and industry news and information, as well as real-time stock, crude oil and crack spread feeds. What every Marathoner needs to know today.

TeamView is where individual organizations, project teams and communities of practice share information – with the company and with each other. This slide shows how ECM team members share information with each other.

MyView is a customizable view for each individual. We can subscribe to news feeds, add “favorites” and manage personal information. Here you can see mine.

MyView also includes a personal profile – projects the individual has worked on, expertise, education, and so on. Here you can see what others can find on me.

Consistent search is available on every page. There are a number of Advanced Search options – for narrowing search results. There are also several options for viewing search results, including map integration.

We have also begun to implement enterprise search across technical applications. As a result, one can go to MaraView or to other applications and find the data, documents and people needed to do the job. This example shows how ViewPoint reports can be surfaced via MaraView search. ViewPoint brings together real-time and historical upstream data from sensors and applications in a series of easy-to-understand dashboards. Examples include production data and key performance indicators.

MConnect is the landing page for Marathon’s communities of practice. We are largely using OOTB MOSS functionality to support the CoPs.
The organizational plumbing is in …
On to getting knowledge to flow
The Power of i
Knowledge Premise

- Can we all agree?
  - Knowledge contained in your company adds value to your business
  - Specific knowledge often gives you a competitive edge

- But knowledge is worthless unless it flows
  - Flow $\rightarrow$ re-use
  - No flow $\rightarrow$ useless

- So how do we get knowledge to flow?
  - It’s contained in someone’s head – Tacit
  - It’s contained in a file (paper, digital) – Explicit

“If We Only Knew What We Know”
– Carla O’Dell, APOC
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Our working hypothesis is that knowledge flow and fluid flow obey analogous laws. The analogy suggests a way of thinking for the knowledge manager. To increase knowledge flow, take actions to increase organizational permeability, reduce knowledge viscosity, increase business pressure gradient.
Getting Knowledge Flowing

- Must have the “plumbing” in place to facilitate knowledge flow
- Tools are important, but are not the solution
  - If you build it, they won’t necessarily come
  - Good tools help, bad tools hinder
- Focus on the people (customers)
  - What do they want?
  - Spread tacit knowledge (P2P and P2K)
  - Help tacit knowledge become explicit
  - Convince people of the value of sharing knowledge
    - To the company
    - To themselves
Cultural Legacy

- Upstream was a more decentralized organization prior to 2002
  - More employees of all professions located in regional offices: more F2F
  - Virtually all non-operational professions now in Houston: good and bad

- Very open and collaborative culture – but one-to-one
  - Historically this is how everyone was mentored and how knowledge was shared
  - Decentralized structure worked OK for each region
    - What extra value may have been achieved with cross-region collaboration?
    - Some knowledge sharing occurred simply by moving people

- Visible knowledge sharing and collaboration needed – one-to-many, many-to-many
  - Learning this new trick...
Some KM History

- A few local communities formed in the mid ’90s, focused needs
- Formal efforts began in the late 1990s
  - IT initiative
  - Highly structured, multiple locations, highly governed
  - Established numerous Technical Peer Groups (TPGs)
  - Governance and support waned as people moved
- Remnants of the TPG effort persevered through time by
  - Enthusiastic petrotechs with credibility who wanted to lead and/or
  - One IT Business Analyst who provided continuity and support
- New IT tools gradually adopted to enhance collaboration
Recent Developments

- Addressing Marathon’s *Upstream* business only
  - Fortuitous since company is splitting in two July 1!
- Focus is on petrotechnical professions - ~715 people
- Created a new organization in 2008: Technical Excellence (TecX)
  - Career Development
  - Process Improvement
  - Knowledge Management
- TecX reports to Executive VP
  - Independent of business units, not in IT, out of silos
TecX KM Activities – 1

- Knowledge Management group given goals, funding and support
  - Manager selected for knowing corporate culture first
  - Having KM awareness second (not vice versa)

- Aware of existence of 6 Communities of Practice (CoP)
  - One in the morgue
  - One in intensive care
  - Four in varying degrees of health

- Went to “school” on knowledge sharing
  - KM conferences (especially APQC’s)
  - Industry practices suited to Marathon
  - Met with other companies for BPs and LLs

...and reiterated this theme
TecX KM Activities – 2

- Began to implement knowledge sharing “no-brainers”
  - Saw value in CoPs as the main KM platform
  - Got CoPs to a healthier state by “pushing” and publicizing activity
  - Identified credible CoP Leaders and got their supervisors’ buy-in (for time)
  - Developed simple CoP “portal” \( k - \text{permeability (increased)} \)
  - Aligned CoP goals with business needs \( p - \text{pressure (increased)} \)

- Working with Marathon’s “plumbing” group (ECM), created a CoP portal

- KM Concepts and language new for most
  - CoP leaders and members
  - Management

- Obtained management support, got some trickle down, ... \( p - \text{pressure (increased)} \)
TecX KM Activities – 3

- Learned of 6 “Advisory Groups” set up in business units
  - Convinced them they were essentially CoPs
  - Provided resources to help them collaborate better

- Had several groups come forward suggesting CoP formation
  - Stress tested whether they should be CoPs
  - Facilitated new CoP formation and existing CoP health

- Introduced “MConnect”
  - Intranet portal for CoPs
  - Share news, Success Stories, all things KS
  - Repository for wiki
  - In one year MConnect generally recognized as the place to go for KS
Sample Success Story

A Reservoir Engineer in Aberdeen posts a question on the Reservoir Site...

...Most Reservoir Engineers are in Houston. No expertise found among Reservoir Engineers...

The Power of We

$k$ – permeability (increased)

Success!!!

...... BUT one re-posts the question on the Production Site...

The engineer found company expertise around the world AND just down the hall, via the network!

...A Chemist in Aberdeen sees the post and has answers too!

...A Chemist in Equatorial Guinea monitoring the Production site has answers, AND re-posts on the Chemical Site...
Continued Progress

- Performed APQC’s self-assessment of KM maturity
  - Some surprises, but mostly confirmed focus areas
  - Get tacit to explicit \( \mu \rightarrow \text{viscosity (reduced)} \)

- Preaching *obsessively* about sharing knowledge *visibly*
  - At CoP meetings
  - Fledgling performance metrics for individuals \( p \rightarrow \text{pressure (increased)} \)
  - Keeping fresh news content on MConnect

- Contracted writing of initial wiki content \( \mu \rightarrow \text{viscosity (reduced)} \)
  - When wiki goes live it will contain magnet content
  - Content based on previous work by internal SMEs
  - Gave wiki a recognizable identity: MWiki
Marathon's Wiki

K.I.S.S.
Current Status

$p$ - pressure (increased)

- Developed CoP award program
  - Rewarding behaviors
  - Coveted year end awards

- Capturing and publishing success stories
  - Quantifying value whenever possible (time saved, $ earned, $ saved, ...)
  - Demonstrates individual and company benefits

- Community of the Year
- Success Story of the Year
- Executive Champion of the Year
- Discussion Post of the Year
- KS Event of the Year
- New Community of the Year
- Leader of the Year
Current Status

- Loading and linking initial wiki content
- All CoPs migrated from old sites, facilitating new CoP startups
- Promoting more KS events and activities

- Taking advantage of new features of the plumbing (e.g., cross talk)

Knowledge Sharing Event of the Year
Organizers

\[ k \text{ -- permeability (increased)} \]

one... ...to many
Going Forward

- More management interaction
- Meaningful metrics
- Add CoPs to new tool as needed
- Encourage use of Mwiki
- Continue to improve plumbing
- Support more KS events (F2F still needed)
- Support more KS between events
- Investigate additional rewards

\[ p \rightarrow \text{pressure (increased)} \]

\[ k \rightarrow \text{permeability (increased)} \]
Increase organizational permeability. First, remind ourselves that porosity is people, knowledge bases and workflows. Focus on connecting them: p2p, p2i, ...

How do you reduce viscosity in oilfield applications: raise temperature (big effect); raise pressure (small effect); gel breakers (used in fracturing ... normally done with enzymes at the lower temperatures and oxidizers at elevated temperatures. The challenge has been adding sufficient breaker to provide a complete break while being able to place the proppant before breaking begins);

Note that in the oilfield, sometimes we want to increase viscosity and sometimes to reduce it.

Remember that in changing the pressure gradient in an organization, you have two variables to work with: pressure and distance. You can reduce organizational distance (e.g., via reorganization).
The Power of

MARATHON