KNOWLEDGE ISSUES AND KM TRENDS IN SCIENTIFIC, ENGINEERING, AND TECHNICAL SETTINGS

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WHY KNOWLEDGE MANAGEMENT (KM) EXISTS

Problems need experts and experience.

- Knowledge is walking out the door.
- Not transferring best practices
- Not using lessons learned

Silos: We don’t know what we know.
KM DESIGN PRINCIPLES

1. Start your efforts with focus on the knowledge that matters to the business.
2. Don’t reinvent knowledge management (KM) best practices.
3. Embed knowledge sharing approaches in the flow of work.
4. “People” approaches make “system” approaches work.
5. Balance “connect” and “collect”.
6. Demonstrate tangible value.
7. Think enterprise-wide.
It used to look like this...
Now it looks like this.
Pressure to Accelerate

➢ “Be more like Google.”
➢ "Be more like Facebook.”
➢ Reduce time to competency.
➢ Don’t pull employees away from their job.
➢ Use less face to face knowledge transfer.

Image Credit: NASA
The Rise of the Mobile Device
What are the most important external forces affecting knowledge management at NASA?
WHY ARE TECHNICAL AREAS SPECIAL?

- The Nature of the Knowledge
- The Nature of the Work
- The Nature of Technical Teams
“How Smart Leaders Leverage Their Experts”
www2.apqc.org/STEMresearch
How can scientific, technical, and engineering leaders leverage existing experts to meet the knowledge needs of today and tomorrow?
OUR RESEARCH APPROACH

- Interviewed 14 organizations with a large technical workforce

- Collected data from 757 people in a dozen sectors
  - 69% were from organizations with global operations
  - A quarter of the respondents were technical and engineers
  - 85% said the issue was urgent and on the agenda

- Alcoa
- Baker Hughes
- Chief Oil and Gas
- Deere & Company
- Devon Energy
- Ecopetrol
- Merck
- MITRE
- MWH Global
- Nalco
- NASA
- Pfizer
- Rockwell Collins
- Schlumberger
- U.S. Army ARDEC
Driving factors to leverage and grow experts

- Rapid Changes in Knowledge/Technology Domains Important to the Organization: 54% significant, 30% moderate, 16% minimal, total 100%
- Retirement of long-tenured Experts: 54% significant, 19% moderate, 28% minimal, total 100%
- Changing Product/Project Mix Requires New Expertise: 38% significant, 37% moderate, 25% minimal, total 100%
- Changing Career Expectations of New Hires/Recent Grads: 29% significant, 25% moderate, 46% minimal, total 100%
- Growth has Outstripped Supply of Experts: 26% significant, 34% moderate, 40% minimal, total 100%
- Globalization of the Work Force: 18% significant, 12% moderate, 71% minimal, total 100%

n= 70
In which areas is accelerating the rate of learning most critical? (Select all that apply)

- Program/project management: 53%
- Tech. or Eng. Mngt/ leadership: 49%
- Tech./Eng./R&D (not management): 43%
- IT: 39%
- Innovation: 34%
- Field operations: 33%
- Other: 7%

N=737
THERE ARE THREE KNOWLEDGE GAPS

Getting novices up to speed more quickly.

Growing Nex’perts

Novice → Nex’pert → Expert

Building Expertise in New Domains
People approaches make system approaches work.
Knowledge Management in Schlumberger
People at the center

Connect people to solutions

Connect people to people

Connect people to information

Connect people to communities

People

Communities
• Started in 1998
• 50 self-governing groups of individuals with common interests that engage in:
  ▪ Knowledge sharing
  ▪ Problem solving
• Leading a Eureka COP is a coveted professional development opportunity
• Required to receive a technical promotion
• KM Leader also leads Technical Talent Management
BUILDING EXPERTISE IN NEW DOMAINS

- Convene diverse groups of experts and expertise to address new knowledge needs
  - This is not the classic reuse of known expert knowledge.
  - This is the creation of new knowledge by people with the expertise and readiness to do it.
  - The magic is orchestrating their knowledge into something completely new: “New Use”
- Example: Ecopetrol
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SENSE-MAKING: SENTIMENT ANALYSIS
FURTHER RESOURCES
WHO WE ARE

- APQCC is a member-based, 501(c)3 nonprofit specializing in benchmarking, knowledge management, metrics and measures, process improvement, frameworks and maturity models.
- Leveraging benchmarks and best practices obtained from more than 7,000 projects, APQC helps organizations to rapidly define and prioritize improvement efforts.
- NASA is an APQC Member with full access.
APQC’S WORK IN KM

- 1995- 1st global conference on KM
- Annual KM conference – 18 years
- 30 major research consortia with over 400 organizations and thousands of best practices
- Worked with over 500 organizations on their KM initiatives
- Huge collection of best practices, tools, cases, and presentations in APQC’s Member Knowledge Base
- APQC’s Levels of Knowledge Management Maturity℠
- Return on investment research and model
- Global winner of the Most Admired Knowledge Enterprise (MAKE) Award (2008-2012)
APQC’S LEVELS OF KM MATURETY℠

Level 1: Initiate
- Growing awareness

Level 2: Develop
- Localized and repeatable practices

Level 3: Standardize
- Common processes and approaches

Level 4: Optimize
- Measured and adaptive

Level 5: Innovate
- Continuously improving practices

Knowledge Levels:
- Ad Hoc Knowledge
- Applied Knowledge
- Leveraged Knowledge
- Dynamic Knowledge
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2x Better Financial Performance with Higher Knowledge Management Maturity

Yokell, M. R. (2010). A Quantitative Correlational Study of the Relationship Between Knowledge Management Maturity (APQC) and Firm Performance