Creating Knowledge Services for Modern Technical Project Organizations: The REAL Knowledge Approach

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June 2015
I. Key Stakeholders Identified an Issue

**GAO, 2002:** “...fundamental weaknesses in the collection and sharing of lessons learned agency-wide.”

**Aerospace Safety Advisory Panel, 2011:** “...recommends NASA establish a single focal point (a Chief Knowledge Officer) within the Agency to develop the policy and requirements necessary to integrate knowledge capture...”
II. Organizing for Project Knowledge

- Strategy
- Community
- Governance
- Roles and Responsibilities
- Tools
**Goal:** Where does the NASA technical workforce go to find and use the critical knowledge required now and in the future to achieve mission success in a highly complex and unforgiving environment?

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<th>Pillars</th>
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<td>Enable accessibility, findability, searchability, &amp; visualization of data, information, and systems.</td>
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<td>Facilitate opportunities through better communications and processes for sharing and networking.</td>
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<td>Establish best practices for capturing &amp; retaining, sharing &amp; applying, discovering &amp; creating knowledge.</td>
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<td>Establish maturity model for knowledge effectiveness to measure and validate.</td>
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**Philosophy:** A federated approach. Respect local customs & enhance organizational norms.
Knowledge Community: CKOs / POCs

NASA now has an agency CKO as well as local CKOs at 10 centers, 4 mission directorates, and several cross-agency support organizations (e.g., Acquisition).

This community meets twice a year and has quarterly teleconferences to work together on shared challenges.
Expanded Knowledge Networks

- Agency CKO
- Local CKOs/POCs
- Communities of practice

NASA

Government

Industry / professional associations

- PMI
- APQC
- International Astronautical Federation

- Federal KM Working Group
Policy and Governance

NASA adopted a new knowledge policy in November 2013. Key features:

- Federated approach to governance
- Roles and responsibilities
- Six activity categories – a common vocabulary
Roles: CKO at NASA

Given the complex nature of knowledge at NASA, the agency has adopted a *federated model* for coordination of knowledge activities.

The NASA CKO functions as a *facilitator* and *champion* for knowledge.
Knowledge Map

• Online resource at km.nasa.gov
• Information hyperlinked and sortable by:
  – Organizations
  – CKOs/points of contact
  – Knowledge categories (see next slide)
Knowledge Categories

- Case Studies / Publications
- Face-to-Face Knowledge Services
- Online Tools
- Knowledge Networks
- Lessons Learned / Knowledge Processes
- Search / Tag / Taxonomy Tools
Knowledge Categories in Context

- Tacit
  - search for documents / multimedia
  - digital learning
  - mentoring
  - networks
  - workshops / forums
  - hands-on opportunities

- Explicit
  - training courses
  - communities of practice
  - coaching
NESC Academy Announces the Release of New Online Lessons

February 12, 2014 // No Comment

The NESC Academy recently announced the release of new online lessons in the Electrical Power TDT, Loads and Dynamics TDT and Materials TDT areas.

Full story
III. Building on the Foundation
Robust Engagement through Active Lessons (REAL) Knowledge Flow
Knowledge Effectiveness = People + Systems

PEOPLE

Culture of openness and sharing

Networks, alliances, and communities of practice

SYSTEMS

Infusion of lessons learned, mishaps, and best practices

Accessible information, user-friendly services
NASA’s Existing Capabilities and Gaps

**Capture**

*Mature capability:*
- Case studies
- Lessons Learned Info. System
- Videos
- Shuttle Knowledge Console
- Knowledge-based risk records

**Discover**

*Inadequate capability:*
- Search – enhanced ability to discover
- Culture – expectation to discover
- “Nudges” – reminders to discover

**Share**

*Mature capability:*
- Online tools and portals
- Face-to-face events
- Communities of practice
Critical Knowledge Base Elements

1) **People**: Do people with decision-making authority enable the flow of knowledge or constrict it?

2) **Processes**: Do processes utilize a risk-based approach to program/project control that enables flexibility and innovation?

3) **Technical excellence**: Does the organization have the expertise it needs?

4) **Knowledge services**: Is knowledge shared through activities ranging from document and video libraries to face-to-face events?
Top Priorities for Knowledge at NASA

• Executing identification of critical knowledge across NASA
• Digital strategy
  – Improved search capability top practitioner priority
• Learning materials for knowledge expertise
• Measures of knowledge maturity
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