Global Information Systems: Tools

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The Open Unified Process – Disciplines

- Architecture
  - Architecture Notebook
- Configuration and Change Management
- Development
  - Design
  - Build
  - Developer Test
  - Implementation
- Project Management
  - Iteration Plan
  - Project Plan
  - Work Items List
  - Risk List

- Requirements
  - Supporting Requirements Specification
  - Vision
  - Use Case
  - Glossary
  - Use-Case Model
- Test
  - Test Case
  - Test Log
  - Test Script

- Roles
- Artefacts / Support

[Source: http://www.epfwiki.net/wikis/openup/]
Knowledge management and learning in virtual teams

- Need to find, extract, share and re-use knowledge in development processes
<table>
<thead>
<tr>
<th>Knowledge management approaches</th>
<th>human-oriented</th>
<th>technology-oriented</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>knowledge management strategy</strong></td>
<td>personalization</td>
<td>codification</td>
</tr>
<tr>
<td><strong>comprehension of knowledge</strong></td>
<td>knowledge is contained in peoples head</td>
<td>documented knowledge; detached from employees</td>
</tr>
<tr>
<td><strong>actors/roles</strong></td>
<td>knowledge worker, networks, and communities of interest</td>
<td>authors, experts, knowledge broker</td>
</tr>
<tr>
<td><strong>knowledge managements systems (KMS)</strong></td>
<td>interactive knowledge managements systems</td>
<td>integrative knowledge management systems</td>
</tr>
<tr>
<td><strong>prior knowledge management system functions</strong></td>
<td>communication and cooperation, locating of experts, community-support</td>
<td>publication, structuring and integration, search, presentation and visualization of knowledge elements</td>
</tr>
</tbody>
</table>
Knowledge management process

- Knowledge Identification
- Knowledge Acquisition
- Knowledge Use
- Knowledge Preservation
- Knowledge Development
- Knowledge Distribution

[Remus, 2002] [Probst, 1997]
Knowledge management: success factors

- Organizational culture
- Management support
- Common vision and understanding
- Holistic, integrated approach
- Continuous participation
- Multiple communication channels
- Technical and organizational infrastructure
- Motivational factors
Knowledge management in a global context: known issues

- General barriers: lack of time, lack of infrastructure, fears
- Communication
- Culture
- …
Global Knowledge Management Framework

Context

Stakeholders
- Society
- Organization
- Individual

Processes
- Intervention A
- Intervention B
- Intervention N

External Processes
- Business Processes
- Knowledge Processes

Validation, Feedback, Improvement

Strategies
- Resources

Knowledge
- Problems

Results
- Performance
- Knowledge
- ...

Culture

Instruments
- Human-based instruments
- Technologies and tools

Infrastructures
Knowledge management in a global context: ideas for solutions

- Knowledge communities
  - Based on a regional / local approach
  - Trust building in smaller groups
- Context awareness
  - Getting to know norms, values, …
  - Contextualized knowledge
- Multilingual infrastructure, communication support
- Time allocation, Rewards, reputation
- User involvement
- Knowledge facilitators
- User generated content (Web 2.0 applications)
Tools

- Process Design
- Coordination Tools
- Awareness Tools
- Specific Tools (Translation)
- Simple support mechanisms!
  - Culture Clouds
Collaboration tools

- Collaborative tools
  - Development environment
  - Administration tools
  - Workflow tools
  - …

- Virtual management tools
  - Document library
  - Shared calendar
  - Online meetings (video- / phone conferencing)
  - Online scheduling and planning
  - Discussion forum
  - Awareness tools (IM, location-based tools)

- Knowledge management tools
Coordination Tools (World View, Sarma, 2008)

Source: http://www.cse.unl.edu/~asarma/research.html
Coordination Tools (Tessaract, Sarma, 2009)

Source: http://www.cse.unl.edu/~asarma/research.html
Social Software

“Social Software enables an interactive way of collaboration, managing content and connecting to online networks with other people. It supports the desire of users to be pulled into groups in order to achieve their personal goals”

(Wever, Mechant, Veevaete & Hauttekeete 2007)
Social Software in global settings

- Collaboration
- Awareness
- Documentation
- Customer engagement
- Interaction with stakeholders
- ...

But what does really improve our work and global operations?
## Global IS barriers

<table>
<thead>
<tr>
<th>Barrier</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cultural and language distance</strong></td>
<td>Do the collaborators share the same language, skills as well as cultural norms, corporate culture, interpretations etc. Most occurred barrier in Noll et al, (2010) analysis on collaboration barriers in GSD.</td>
</tr>
<tr>
<td><strong>Geographical distance</strong></td>
<td>Distributed collaboration (within a country or cross-border). Third most occurred barrier in Noll et al, (2010) analysis on collaboration barriers in GSD.</td>
</tr>
<tr>
<td><strong>Temporal distance</strong></td>
<td>Distributed collaboration (Time-zone differences). Second most occurred barrier in Noll et al, (2010) analysis on collaboration barriers in GSD.</td>
</tr>
<tr>
<td><strong>Lack of trust</strong></td>
<td>Geographic, temporal, and cultural distance have a significant impact on trust among globally distributed team members (Noll et al, 2010)</td>
</tr>
<tr>
<td><strong>Infrastructure</strong></td>
<td>In distributed collaboration teams and employees must rely on technology to support the communication (Noll et al, 2010)</td>
</tr>
</tbody>
</table>
Social Media

Social media employ mobile and web-based technologies to create highly interactive platforms via which individuals and communities share, co-create, discuss, and modify user-generated content.

Figure 1. The honeycomb of social media

Kietzmann et al. 2011
Social Software in KM activities and tasks

Not all tools are meant to support all knowledge steps/tasks

Identifying

Collection, modification, collaboration

Annotation

Sharing, awareness

Knowledge Management Tasks

- creation, building, anticipation or generation
- acquisition, appropriation or adoption
- identification, capture, articulation or extraction
- collection, gathering or accumulation
- (legally) securing
- conversion
- organization, linking and embedding
- formalization
- storage
- refinement or development
- distribution, diffusion, transfer or sharing
- presentation or formatting
- application, deploying or exploiting
- review, revision or evolution of knowledge

Source: (Maier, 2004)
Some simple steps to match barriers, activities/processes and social software tools…

Design KM Process: Map Social Software Applications to Barriers and Knowledge Processes

Identify Knowledge Activities and Barriers

Validate, Improve

Awareness Creation Implementation Change Management
Knowledge Activities and Tools

Create
- Shared info spaces
- IM
- Wiki
- Social networking
- Blogs
- Forum

Evolve
- Wiki
- Micro-blogging
- Brainstorming
- Shared info spaces
- Conferencing
- Social bookmarking
- Social networking
- Forum
- Blogs

Organize
- Wiki
- Time management
- Social bookmarking
- Collaborative writing
- Shared info spaces

Identify
- Blogs
- Social networking
- Wiki

Distribute
- Wiki
- Micro-blogging
- Shared info spaces
- Social bookmarking
- Social networking
- Forum
- Blogs
- (IM)
### From barriers to tools...

<table>
<thead>
<tr>
<th>Tool category</th>
<th>Purpose</th>
<th>Key End user Functionality</th>
<th>KM Activities &amp; processes</th>
<th>Main Barriers</th>
</tr>
</thead>
</table>
| Blogging tools        | Communication          | - Post writings  
- Comment on writings  
- Share writing  
(external/internal)  
- Evaluate writings  
- Extend with plugins / integrate to other systems  
- RSS (alerts)       | - Active & passive exchange of professional information (Fiedler & Welpe 2011)  
- Acquire / capture / create, Apply/share/transfer. Incentive for (Reuse/innovate/evolve/transform), alerting (Avram 2006)  
- Knowledge Evolution (Zheng & Zheng 2010)  
- Idea-generation and problem-solving (Zhang 2010)  
- Externalization, combination (Chatti et al, 2007)  
- Creation, codification, sharing, collaboration, organization (Razmerita 2009) | Organizational, Cultural, Social |
| Micro-blogging tools  | Connection / awareness. | - Post micro writings  
- Comment / share / evaluate micro writings  
- Share material / Information via micro writings  
- Manage profile (notifications (RSS), privacy)  
- Follow other users  
- Send direct messages | - Retrieve knowledge for use (Zheng & Zheng 2010),  
- Enhancing information sharing (easy to identify information updates), building common ground, sustaining connectedness among colleagues, supporting informal communication (Zhao & Rosson 2009)  
- Alerting, informing users of changes (Levy 2009; Avram 2006)  
- Socialization, combination (Chatti et al, 2007) | Organizational, Social |

Fitness to task (Thom-Santelli 2010), Social (trust) (Zhao & Rosson 2009)
| Social bookmarking tools | Identification, collaboration, sharing | -Save links / bookmarks for personal/ community use / sharing (social tagging)  
-Comment on pages / bookmarks / links  
-Include saving options for browser or to mobile device  
-Follow users activities  
-Include feeds (RSS) / notifications | -Scan/Map, Acquire/capture/create (Avram 2006),  
-Collaborative building of a knowledge structure (Cayzer 2004)  
-Alerting, informing users of changes (Levy 2009; Avram 2006)  
-Combination (Chatti et al, 2007)  
-Sharing, collaboration, organization (Razmerita 2009) | Organizational, Social  
Conceptual / fitness to task / knowledge sharing (why to use, what are the benefits) (Millen et al, 2006) |
| --- | --- | --- | --- |
| Wiki | Collaboration, sharing, identification, communication | -Collaborative page writing / editing  
-Cross-linking pages/ concepts/information  
-Managing page versioning  
-Commenting on pages  
-Notifications (RSS)  
-Wide extension and integration possibilities | -Active & passive exchange of professional information (Fiedler & Welpe 2011)  
-Scan/Map, Package / codification / representation, Apply / share / transfer, Reuse / innovate / evolve / transform, alert (Avram 2006)  
-Idea-generation and problem-solving (Zhang 2010)  
-Externalization, combination (Chatti et al, 2007)  
-Creation, codification, sharing, collaboration, organization (Razmerita 2009) | Technical, Social  
Social (Cowan et al, 2009),  
Cognitive (Cowan et al, 2009),  
Skills, Usability (Kear et al, 2010; Cowan et al, 2009) |
Summary

- Many tools for different purposes
- Clearly defined process
  - Start from barriers and activities
  - Select tool candidates for each barrier / activity
  - Evaluate whether all project members can / would use those
  - Make a clear selection (e.g. maximum of 3-5 tools) towards the process goals
  - Validate and monitor the use
- First step towards better understand of social software in global settings
- Further development towards a decision support model
Questions

- Which competencies / skills do virtual managers and remote workers need?
- Which cultural influence factors affect communication?
- How do you assess the stage of the group process?
- Which tools should be available for virtual communication?
- Develop a communication plan including communication rules for a small virtual team in the US and Finland.
- Which main barriers of KM can be identified, propose potential solutions.
References

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