



# 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/>]



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# Knowledge management and learning in virtual teams

- Need to find, extract, share and re-use knowledge in development processes



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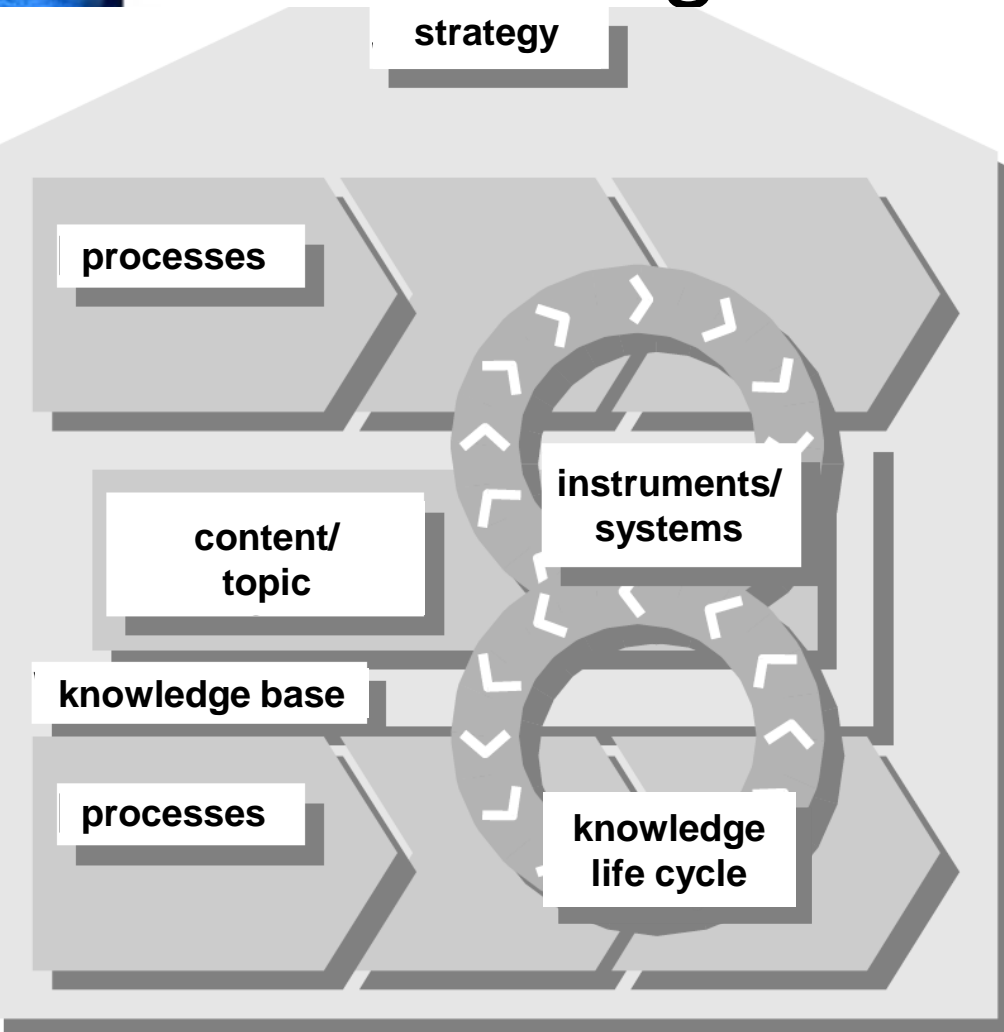
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# Knowledge management

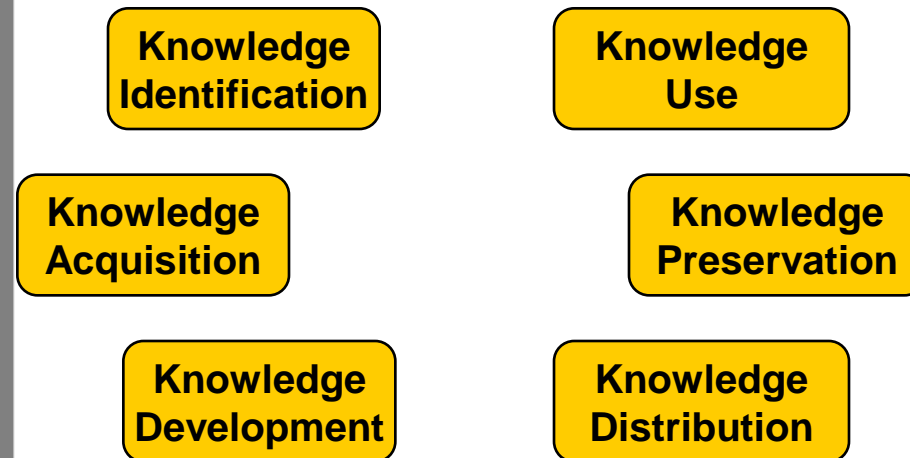
|  | human-oriented  | technology-oriented  |
|--|---|--|
| <b>knowledge management strategy</b>               | personalization   | codification   |
| <b>comprehension of knowledge</b>                  | knowledge is contained in peoples head                                | documented knowledge; detached from employees  |
| <b>actors/roles</b>                                | knowledge worker, networks, and communities of interest               | authors, experts, knowledge broker   |
| <b>knowledge managements systems (KMS)</b>         | interactive knowledge managements systems                             | integrative knowledge management systems   |
| <b>prior knowledge management system functions</b> | communication and cooperation, locating of experts, community-support | publication, structuring and integration, search, presentation and visualization of knowledge elements |



# Knowledge management process



[Remus, 2002]



[Probst, 1997]



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# 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



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# Knowledge management in a global context: known issues

- General barriers: lack of time, lack of infrastructure, fears
- Communication
- Culture
- ...

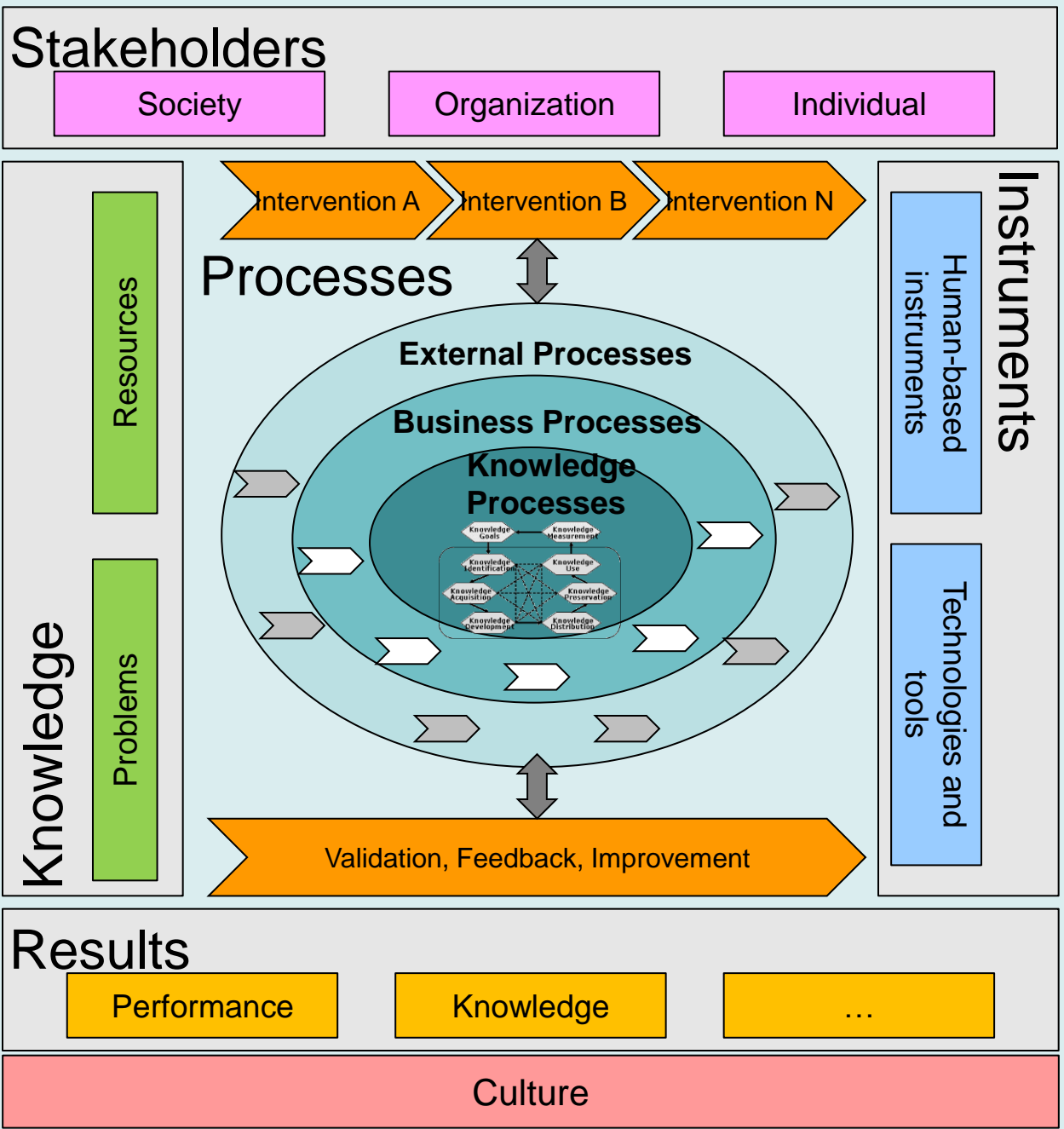


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# Global Knowledge Management Framework

## Context





# 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)



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# Tools

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

korea culture professional japan china relation to my  
boss teaching style germany finland giving  
feedback



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# 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)



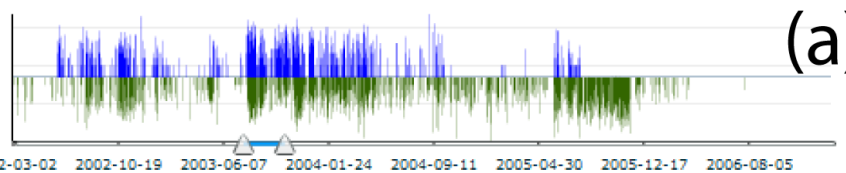
Source: <http://www.cse.unl.edu/~asarma/research.html>

# Coordination Tools (Tesseract, Sarma, 2009)

**Project**

gnome/rhythmbox  DoubleClick node to drill down upon all selected.

Search

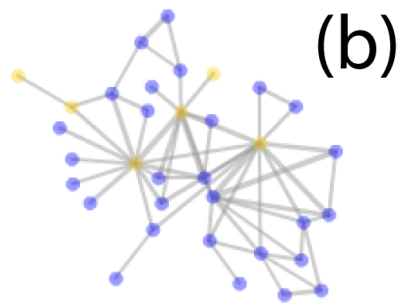


(a)

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**Files** Show Settings

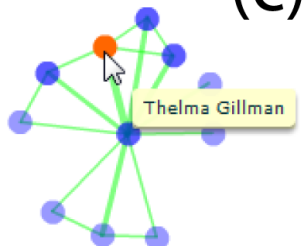
| File name                          |
|------------------------------------|
| data/node-views/rb-node-view-iradi |
| data/node-views/rb-node-view-song  |
| data/node-views/rb-node-view-iradi |
| po/ml.po                           |
| data/glade/buffering-dialog.glade  |
| data/ui/Makefile.am                |
| data/node-views/rb-node-view-artis |
| po/pl.po                           |



(b)

**Developers** Show Settings

| Name              |
|-------------------|
| Jose Osteen       |
| Vivian Johns      |
| Earl Haber        |
| Katrina Bolt      |
| Joshua Boughton   |
| Velma Morehead    |
| Marvin Montelongo |
| Sandra Wakefield  |

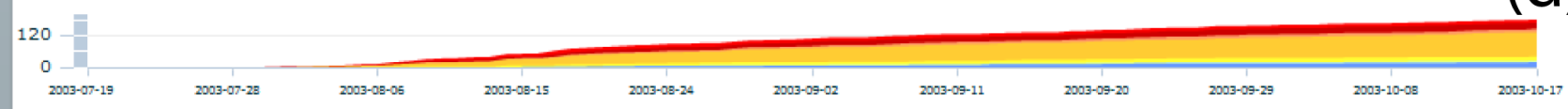


(c)

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**Issues**

Severity:  Enhancement  Trivial  Minor  Normal  Major  Critical  Blocker



| Bug ID | Start      | End        | Severity | Priority | Status   | Resolution | Description          |
|--------|------------|------------|----------|----------|----------|------------|----------------------|
| 7641   | 2003-08-25 | 2004-12-21 | trivial  | Normal   | RESOLVED | FIXED      | Minor language fixes |
| 7793   | 2003-09-17 | 2004-12-21 | normal   | Normal   | RESOLVED | FIXED      | Error on track end   |
| 7794   | 2003-09-17 | 2004-12-21 | critical | Normal   | CLOSED   | INCOMPLETE | Rhythmbox crashes w  |

(d)



# 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
- ...



# Enterprise 2.0



**But what does  
really improve our  
work and global  
operations?**

# Global IS barriers

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



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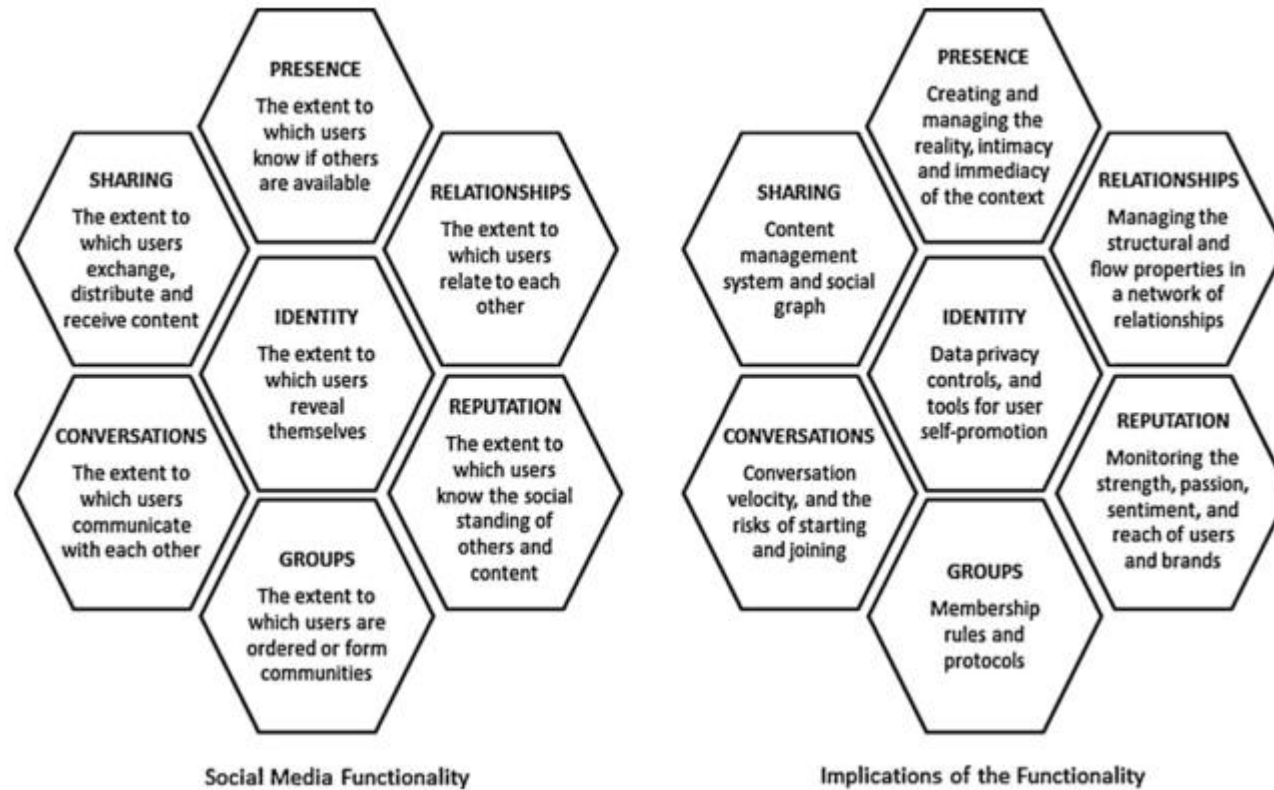
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# Social Media

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



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# Social Software in KM activities and tasks

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

Identifying

YAHOO! GROUPS

RSSready

friendfeed

Google

Collection, modification, collaboration

Annotation

EtherPad

flickr

Wiki

YouTube  
Broadcast Yourself™

del.icio.us  
social bookmarking

Sharing, awareness

twitter

LinkedIn

facebook

MyBlogLog

## 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

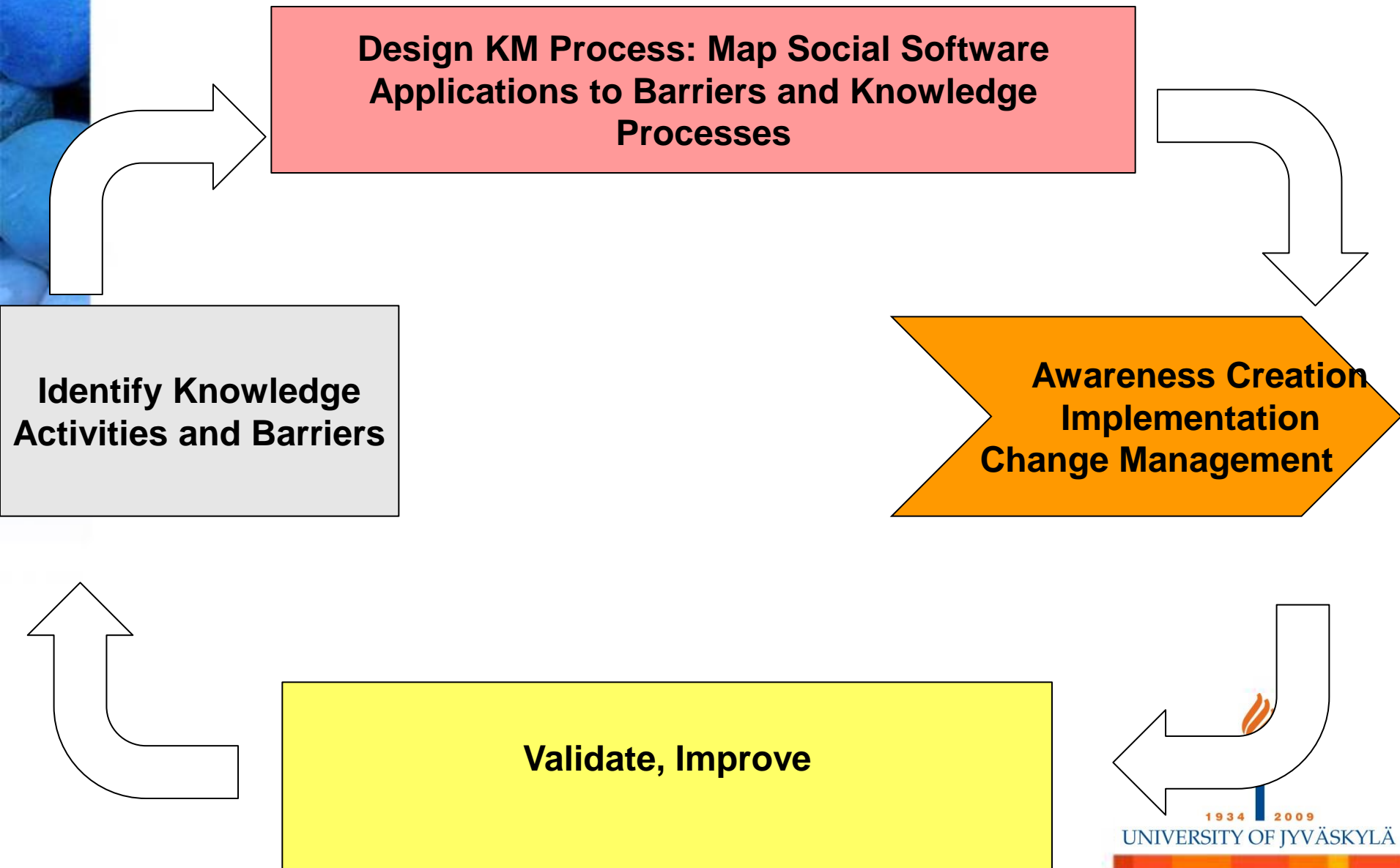
Source: (Maier, 2004)



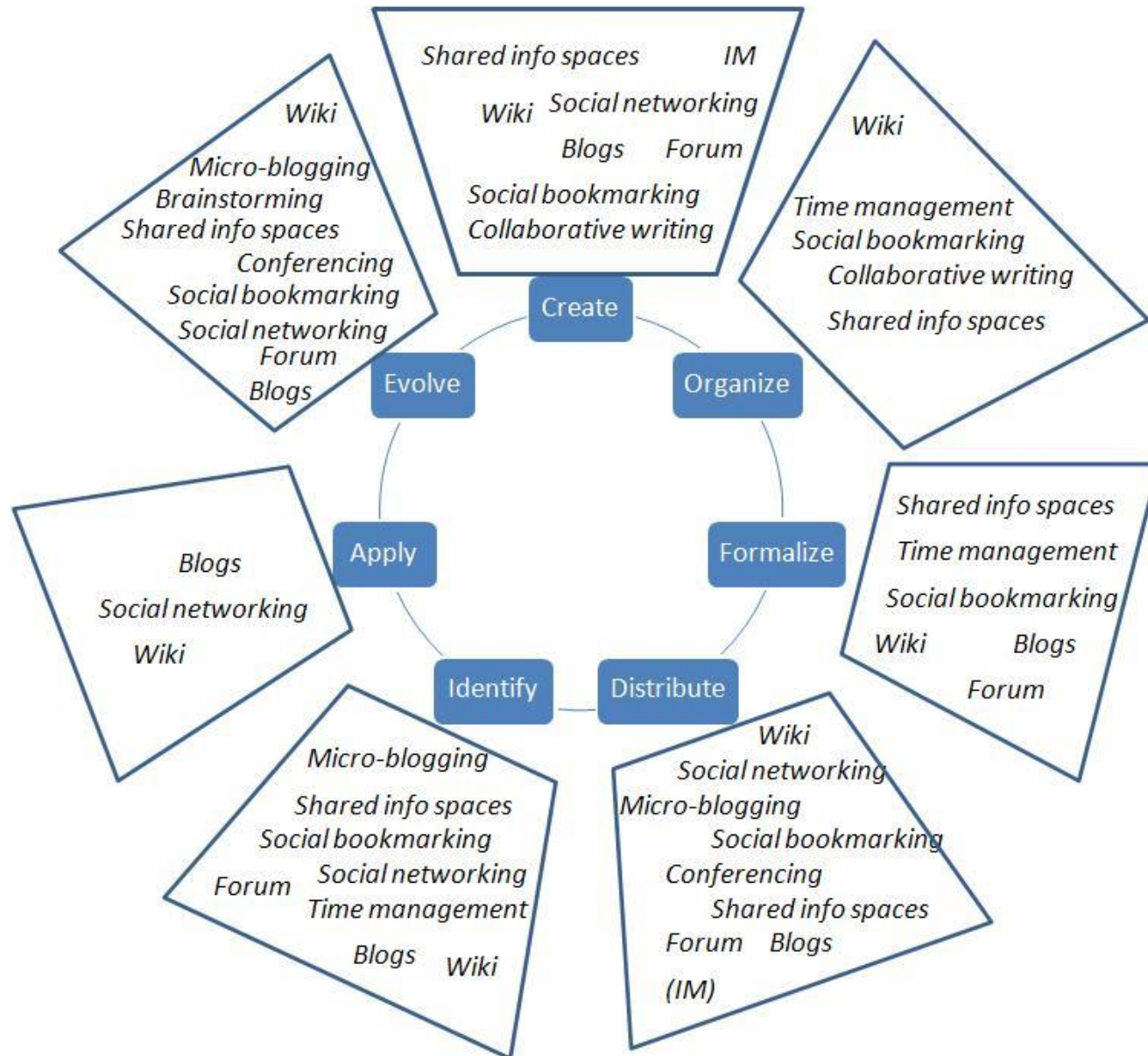
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# Some simple steps to match barriers, activities/processes and social software tools...



# Knowledge Activities and Tools



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# From barriers to tools...

| Tool category        | Purpose                 | Key End user Functionality   | KM Activities & processes   | Main Barriers  |
|----------------------|-------------------------|--|---|--|
| Blogging tools       | Communication           | <ul style="list-style-type: none"> <li>-Post writings</li> <li>-Comment on writings</li> <li>-Share writing</li> </ul> (external/internal) <ul style="list-style-type: none"> <li>-Evaluate writings</li> <li>-Extend with plugins / integrate to other systems</li> <li>-RSS (alerts)</li> </ul>        | <ul style="list-style-type: none"> <li>-Active &amp; passive exchange of professional information (Fiedler &amp; Welpe 2011).</li> <li>-Acquire / capture / create, Apply/share/transfer. Incentive for (Reuse/innovate/evolve/transform), alerting (Avram 2006)</li> <li>-Knowledge Evolution (Zheng &amp; Zheng 2010)</li> <li>-Idea-generation and problem-solving (Zhang 2010)</li> <li>-Externalization, combination (Chatti et al, 2007)</li> <li>-Creation, codification, sharing, collaboration, organization (Razmerita 2009)</li> </ul> | <p><i>Organizational, Cultural, Social</i></p> <p>Organizational (Zhang 2010), Fitness to task (Thom-Santelli 2010)<br/>Cognitive (Kim 2008)</p> |
| Micro-blogging tools | Connection / awareness. | <ul style="list-style-type: none"> <li>-Post micro writings</li> <li>-Comment / share / evaluate micro writings</li> <li>-Share material / Information via micro writings</li> <li>-Manage profile (notifications (RSS), privacy)</li> <li>-Follow other users</li> <li>-Send direct messages</li> </ul> | <ul style="list-style-type: none"> <li>-Retrieve knowledge for use (Zheng &amp; Zheng 2010),</li> <li>-Enhancing information sharing (easy to identify information updates), building common ground, sustaining connectedness among colleagues, supporting informal communication (Zhao &amp; Rosson 2009)</li> <li>-Alerting, informing users of changes (Levy 2009; Avram 2006)</li> <li>-Socialization, combination (Chatti et al, 2007)</li> </ul>  | <p><i>Organizational, Social</i></p> <p>Fitness to task (Thom-Santelli 2010), Social (trust) (Zhao &amp; Rosson 2009)</p>                        |



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# From barriers to tools...

|                                 |   |  |  |   |
|---------------------------------|---|--|--|---|
| <p>Social bookmarking tools</p> | <p>Identification, collaboration, sharing</p>                 | <ul style="list-style-type: none"> <li>-Save links / bookmarks for personal/ community use / sharing (social tagging)</li> <li>-Comment on pages / bookmarks / links</li> <li>-Include saving options for browser or to mobile device</li> <li>-Follow users activities</li> <li>-Include feeds (RSS) / notifications</li> </ul> | <ul style="list-style-type: none"> <li>-Scan/Map, Acquire/capture/create (Avram 2006),</li> <li>-Collaborative building of a knowledge structure (Cayzer 2004)</li> <li>-Alerting, informing users of changes (Levy 2009; Avram 2006)</li> <li>-Combination (Chatti et al, 2007)</li> <li>-Sharing, collaboration, organization (Razmerita 2009)</li> </ul>  | <p><i>Organizational, Social</i></p> <p>Conceptual / fitness to task / knowledge sharing (why to use, what are the benefits) (Millen et al, 2006)</p>     |
| <p>Wiki</p>                     | <p>Collaboration, sharing, identification, communication.</p> | <ul style="list-style-type: none"> <li>-Collaborative page writing / editing</li> <li>-Cross-linking pages/ concepts/ information</li> <li>-Managing page versioning</li> <li>-Commenting on pages</li> <li>-Notifications (RSS)</li> <li>-Wide extension and integration possibilities</li> </ul>                               | <ul style="list-style-type: none"> <li>-Active &amp; passive exchange of professional information (Fiedler &amp; Welpel 2011)</li> <li>-Scan/Map, Package / codification / representation, Apply / share / transfer, Reuse / innovate / evolve / transform, alert (Avram 2006)</li> <li>-Idea-generation and problem-solving (Zhang 2010)</li> <li>-Externalization, combination (Chatti et al, 2007)</li> <li>-Creation, codification, sharing, collaboration, organization (Razmerita 2009)</li> </ul> | <p><i>Technical, Social</i></p> <p>Social (Cowan et al, 2009), Cognitive (Cowan et al, 2009), Skills, Usability (Kear et al, 2010; Cowan et al, 2009)</p> |

# 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

- Dafoulas, G., Macaulay, L.: Investigating Cultural Differences in Virtual Software Teams, The Electronic Journal on Information Systems in Developing Countries EJISDC 7(4), 2001
- Paquette, G. (2007). An Ontology and a Software Framework for Competency Modeling and Management. Educational Technology & Society, 10 (3), pp. 1-21.
- Pawlowski, J.M., Schrader, H., Khatami, P., Adelsberger, H.H. (2008): The Globalization Technology Competency Framework for the Knowledge Worker – an E-Learning Program for Enterprise Resource Planning, European e-skills Conference, Thessaloniki, Oct. 2008. Available at:  
[http://users.jyu.fi/~japawlow/cedefop\\_competencies\\_20081007final\\_citation.pdf](http://users.jyu.fi/~japawlow/cedefop_competencies_20081007final_citation.pdf)



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