



ICEIS 2006

Matthias Jarke

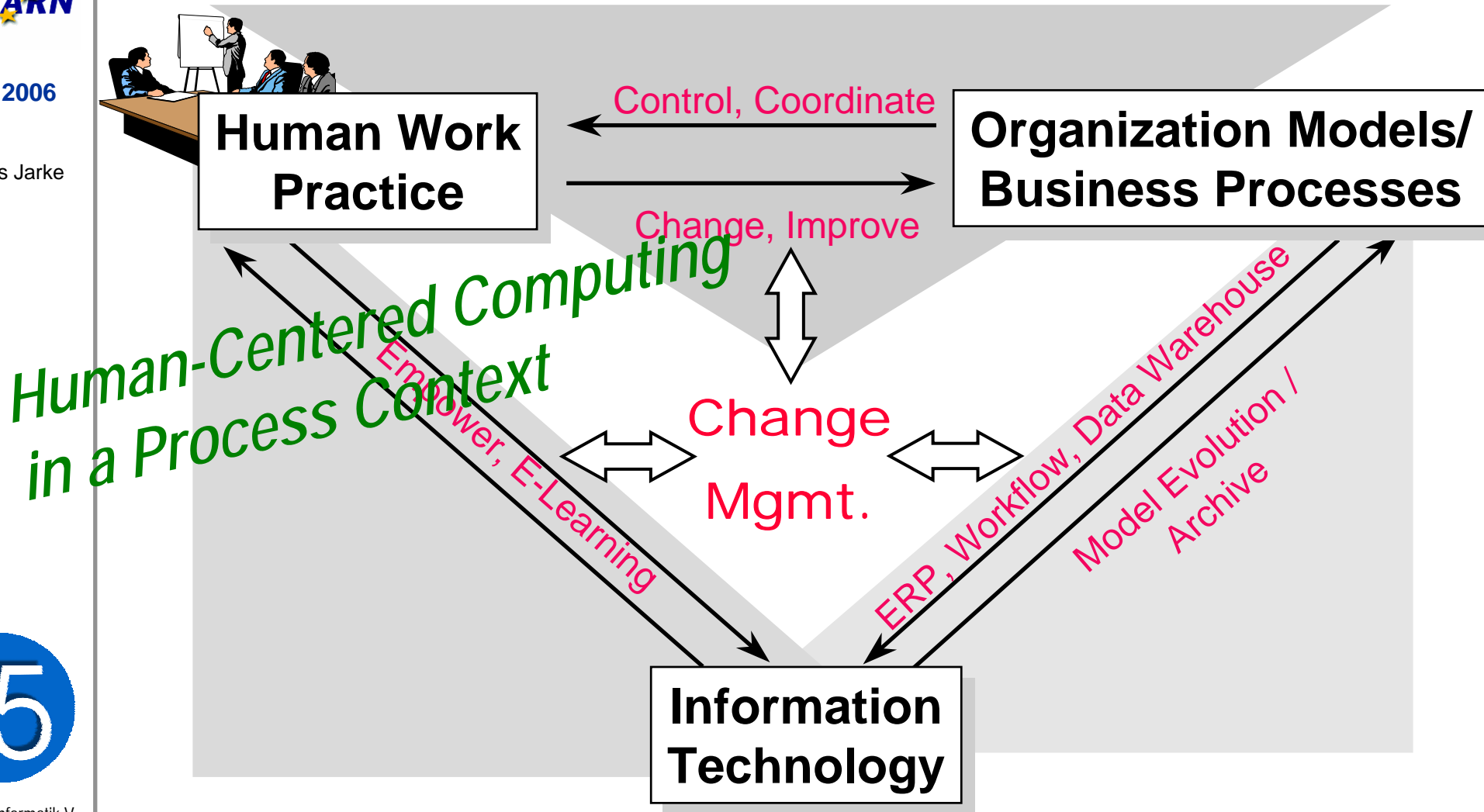
Reflexive Community Information Systems

Matthias Jarke

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Three Facets of Enterprise Information Systems



Research Question

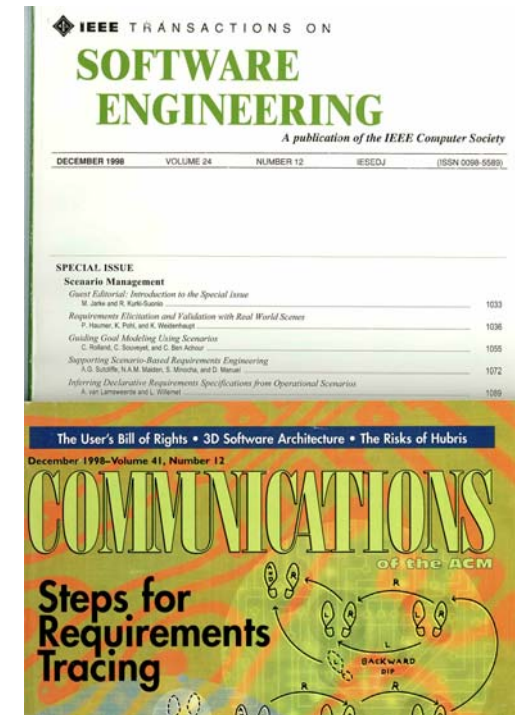
- “Communities of Practice” (Wenger) are social groupings with some shared practice, mutual learning and reflection
- Internet-based communities
 - span organizations and countries
 - have become an important source of social identity and (inter-) corporate memory
 - but are also known to prolong conflicts, including some of the major civil wars of today
 - create their own cultures which are highly volatile, hard to predict and control
- **Can we provide assistance for self-organization and reflection without too much complexity?**

Talk Outline

- Background on Requirements Engineering
- Community Information Systems
 - Multimedia IS + “Social Software”
 - (self-)organized via Metadata
- A Case Study: Afghan Cultural heritage recovery Information System (ACIS)
- Reflecting on IT-Supported Social Networks
- Summary and Outlook

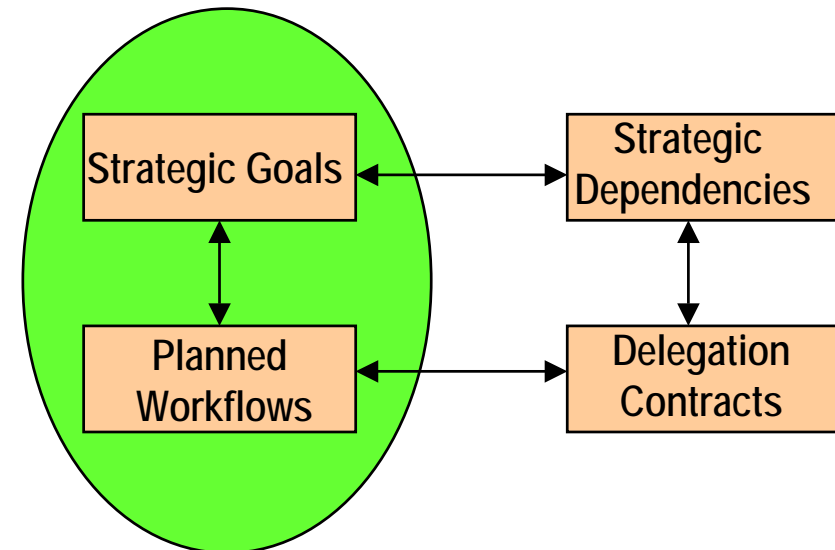
(Biased) Background on Requirements Engineering

- Early 1990's: RE defined as the *traceable* process of establishing a vision in a three-dimensional context (EU project NATURE)
 - **domain** (e.g. ontologies, patterns)
 - **formalism** / technology (e.g. UML, formal specs., tool environments)
 - **social environment** (stakeholders, organizations, impacts)
- Late 1990's: requirements knowledge cannot be made fully explicit (EU CREWS)
 - circumscribed by **use cases**, misuse cases
 - (textual or multimedia) **scenarios** linked to **goals** to allow **viewpoint resolution**
 - linked to Nonaka/Takeuchi theory of **knowledge management**



Background on Requirements Engineering (2)

- Since 2000: systems seen as embedded in **social networks**, and can themselves be viewed as **agent networks** (TROPOS initiative)
 - i* formalism for strategic goals and dependencies
 - speech-act based contract nets in workflows
 - TCD dynamic trust model
 - Trust in people
 - Confidence
 - Distrust by monitoring
- **Logical next step:**
 - End user development



“Social Software”

- Facilitates construction of relationships between individuals or groups = facilitate construction of **social networks**
- Support for conversational interaction between individuals or groups = **Support individual publishing** and dissemination of information within these social networks

(cf. Hippner & Wilde, 2005;
Wikipedia, 2006; Boyd, 2003)

Factors Making Software “Social”

- Support for **conversational interaction** between individuals or groups (not centred around technology or communication channel)
- Self organisation, shifting locus of control
- Support for social feedback
- Voluntariness (no enforcements like groupware)
- Shifting role of individual from information consumer to information producer
- Focus less on individual contributions but on emerging structure (emerging from connections)
- Reputation is earned by winning trust of others

Potentials for Enterprises

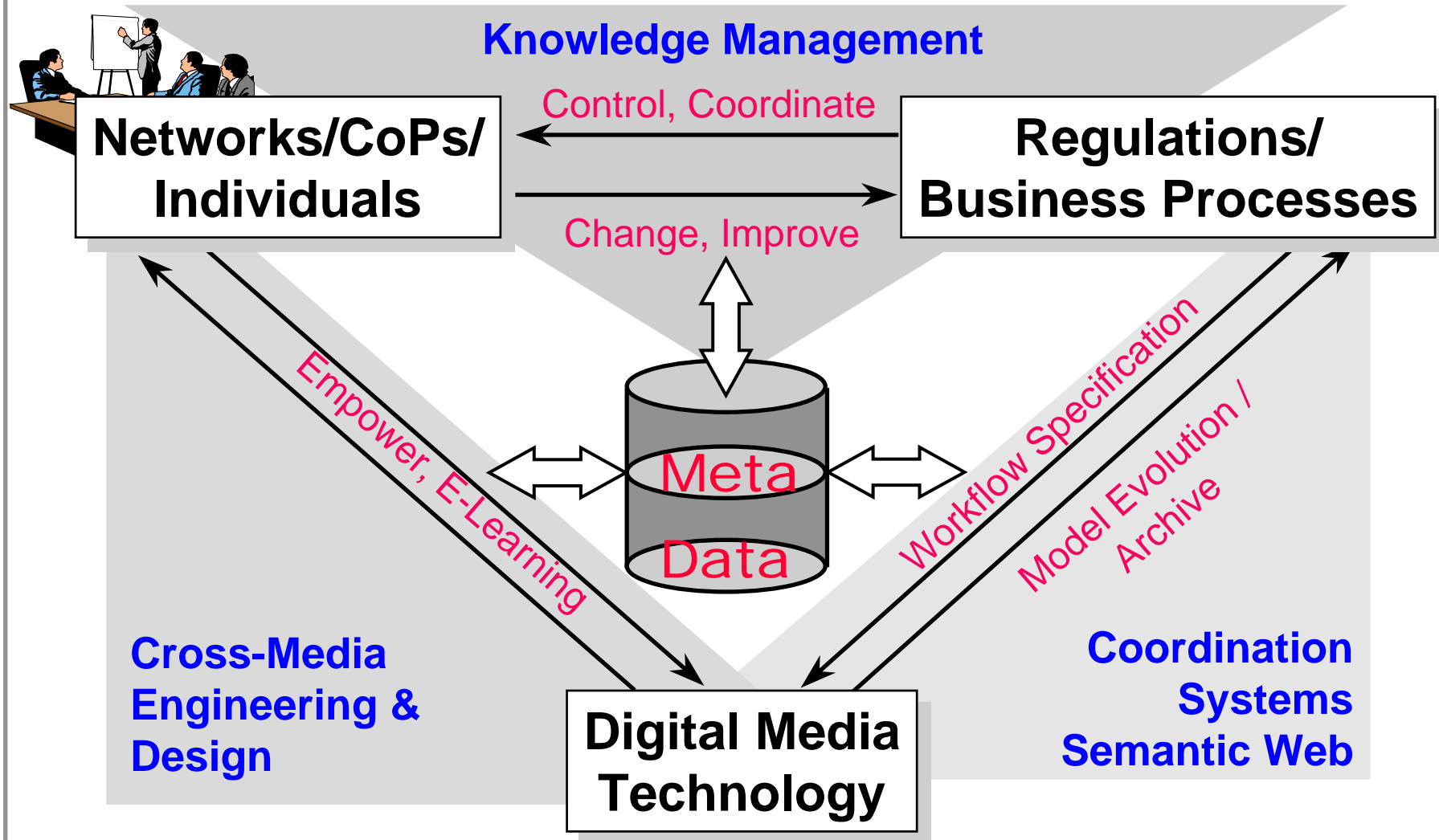
- **Blogging for Business**
 - For knowledge management, project management, communities of practice, PR
 - Substituting traditional CMS, bottom-up tagging
 - Low costs, high flexibility, easy to use, reputation
- **Web 2.0 - eLearning 2.0**
 - Networks of interaction – The web as a platform
 - An attitude not a technology
 - From blogging to podcasting
 - New businesses, increased productivity
 - ePortfolios
 - Self-monitoring tools for learning communities

A Plethora of Media and Artefacts

Artefacts \ Medium	Email	Newsletter	Discussion Group	Blog	Transaction-based Web Site	Wiki	Chat Room	URL
Message	+	+	+	-	-	-	-	-
Burst	+	-	+	+	+	+	-	-
Blog Entry	-	-	-	+	-	-	-	-
Thread	+	-	+	-	-	+	+	-
Web Page	-	-	-	-	-	+	-	+
Comment	-	-	-	+	+	+	-	-
Transaction	-	-	-	-	+	-	-	-
Conversation	-	-	-	-	-	+	-	-
Feedback	-	-	-	-	+	-	-	-

+ rapidly increasing usage of multimedia (speech, photos, videos, ...)

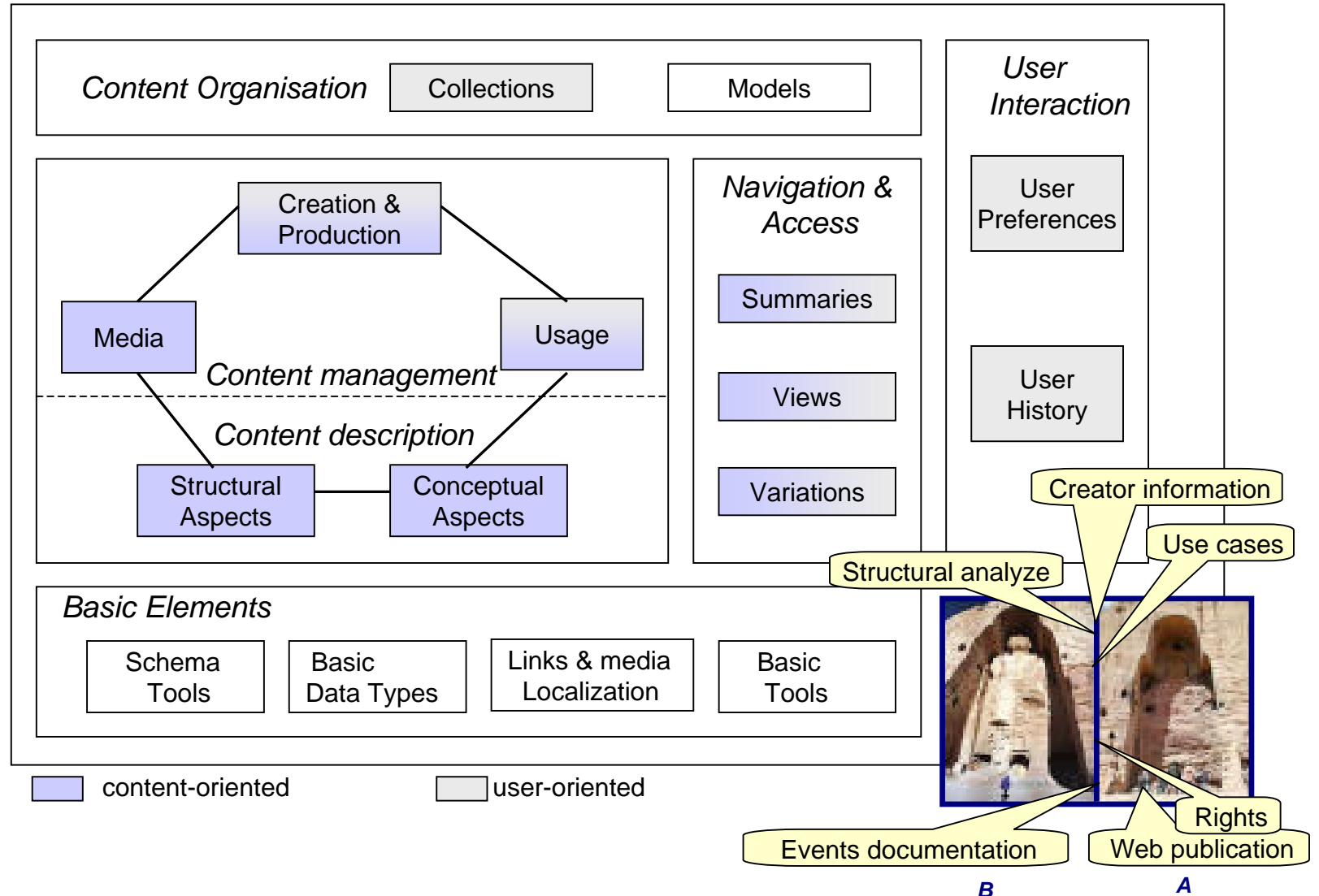
Community Information Systems



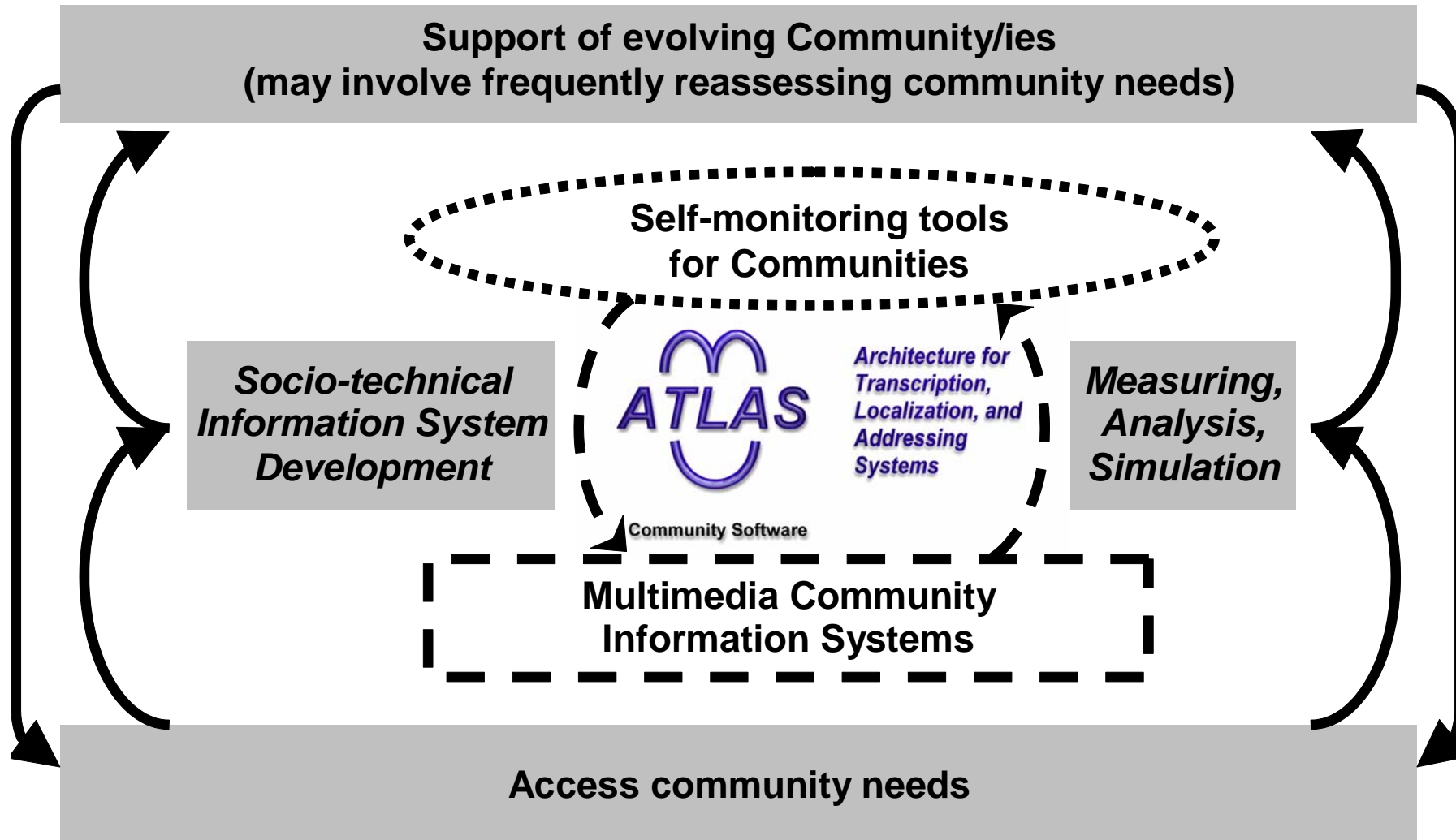
Metadata in Community Systems

- **Scalable and interoperable repositories** for communities by technologies for creating, maintaining, and utilizing metadata
- Metadata are based on **international standards** in different application domains
- Repositories are based on state-of-the-art **database technologies**
- Community middleware is realized as **service oriented architecture**
- **Functions:**
 - Search and Retrieval, Browsing,
 - Matching, Interoperability, Harmonization
 - Data Mining, ...

MPEG-7 Metadata Standard



Reflective Community Information Systems



Lightweight Application Server (LAS)

■ Basic Elements

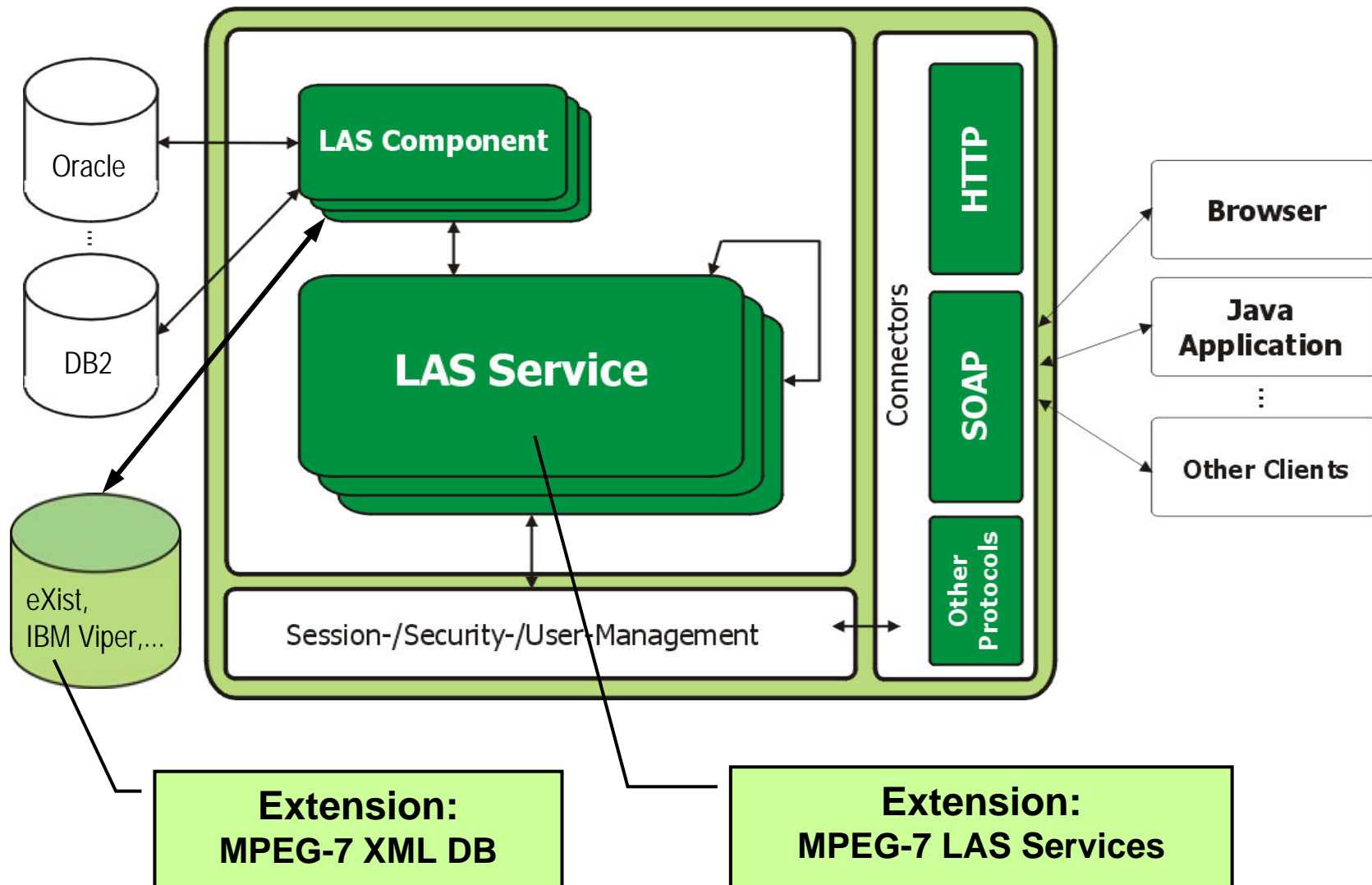
- Connectors
- Components
- Services

■ Service Methods Call

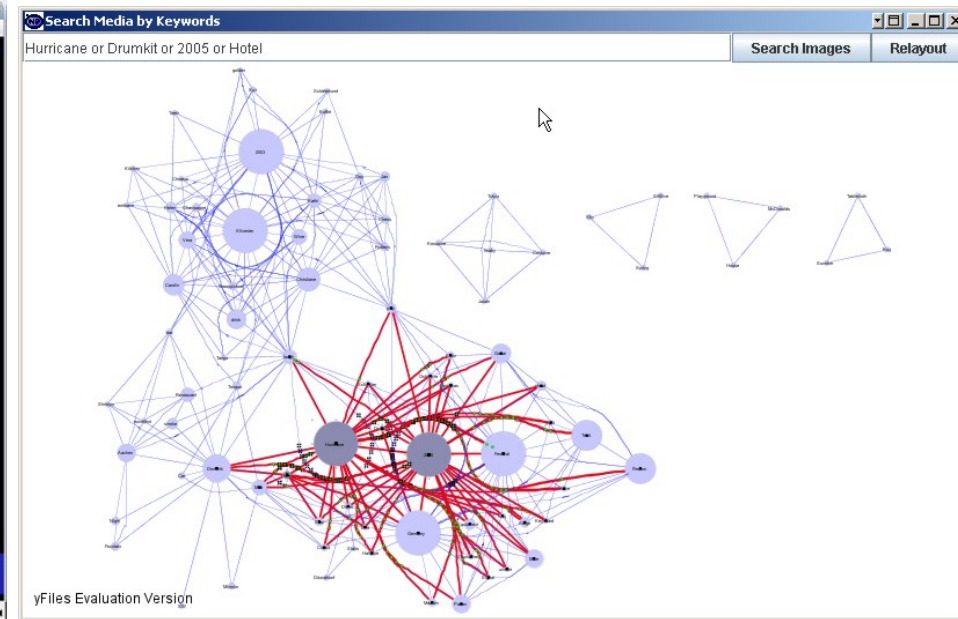
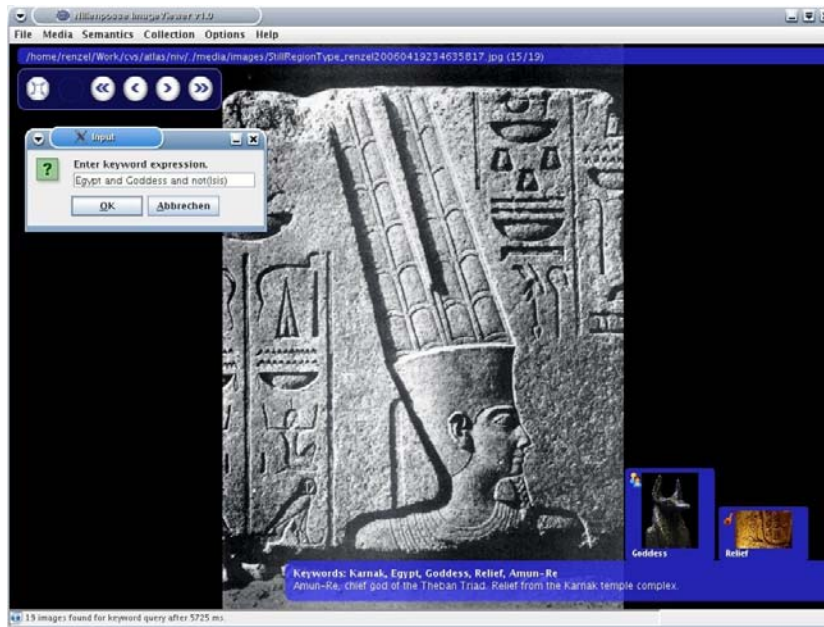
- SOAP Connector
- HTTP Connector

■ Extension & Reload at Runtime

LAS MPEG-7 Service Extension



Semantic Image Tagging



■ MPEG-7 Image Tagger:

- Powered by MPEG-7 Services and LAS
- Keyword Tagging & Search
- Semantic Basetype Tagging & Search
- Keyword Graph Analysis (yFiles)

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Afghan Cultural heritage recovery Information System (ACIS)

■ Motivation

- Use of IT technologies to reconstruct the scientific infrastructures in post-war Afghanistan by young professionals

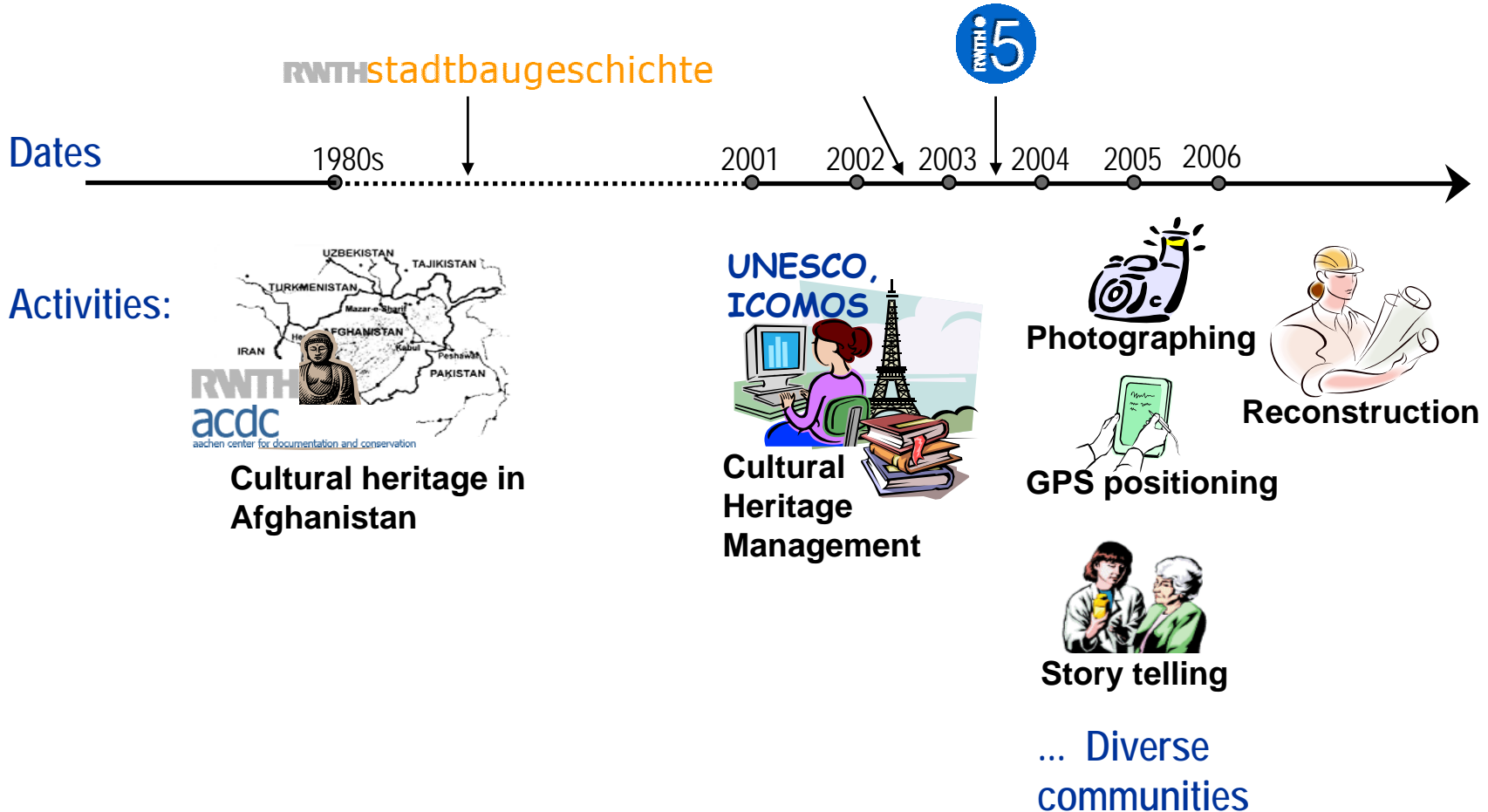
■ Approach with information systems

- Foundation, design, and implementation
- ACIS community hosting with community tools & social software

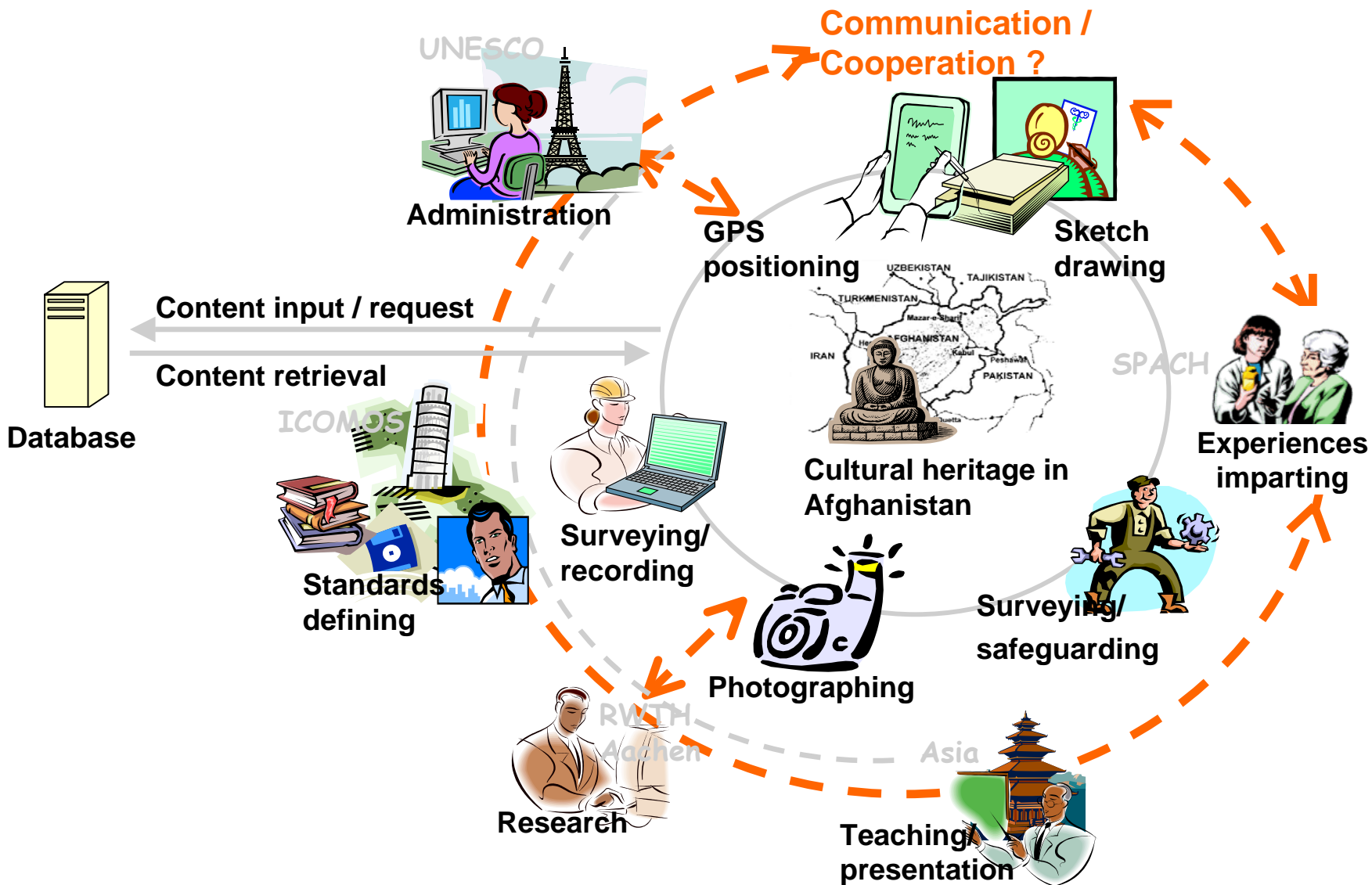
Foundation of a Scientific Community

■ Pre-War Afghanistan

■ Post-War Afghanistan



International Community



Concepts of ACIS

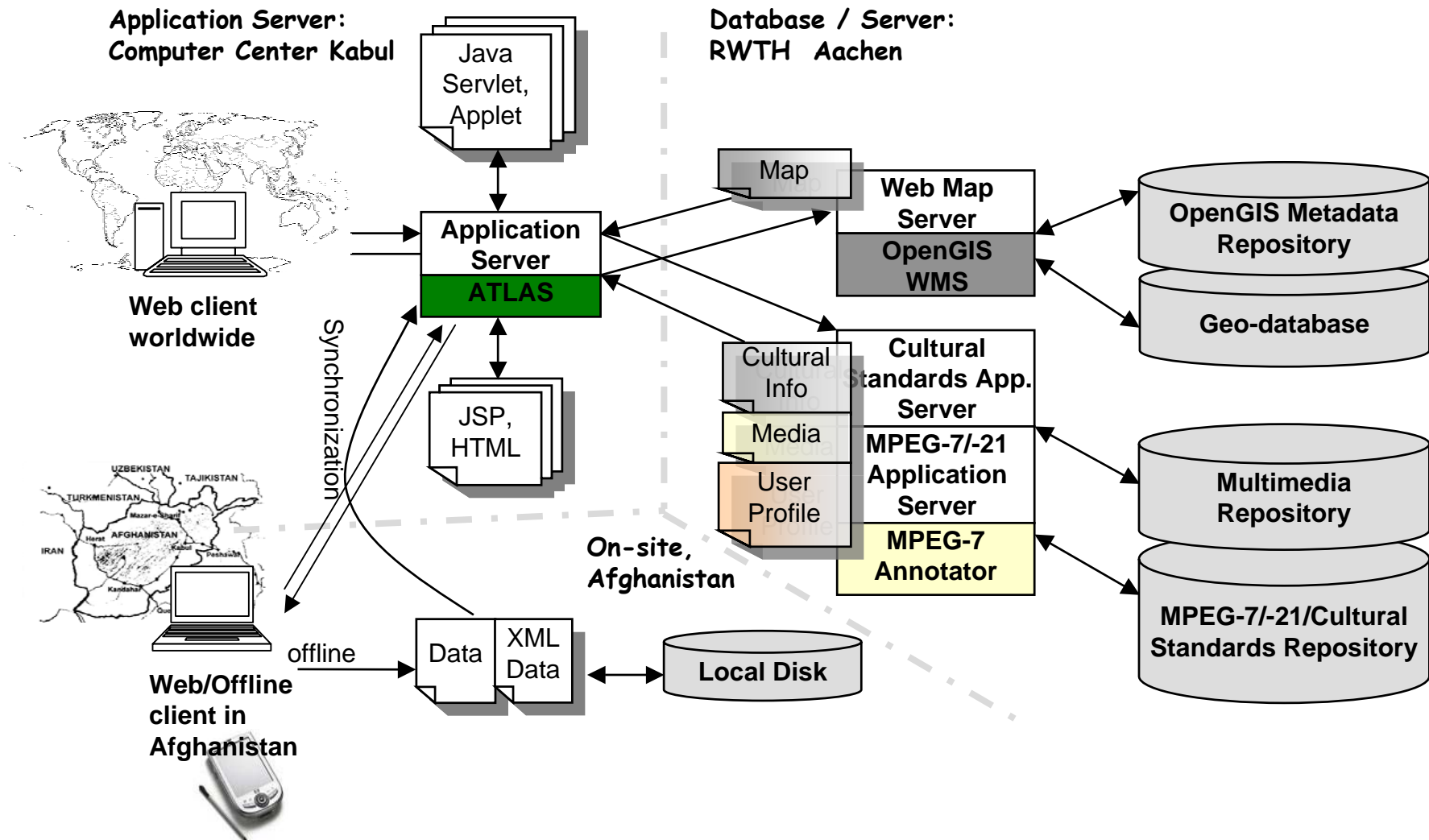
- **Cultural heritage management**
 - Open cultural standards
 - Data source management
- **Hypermedia GIS** (Stefanakis et al., Springer Verlag, 2006)
 - GIS standards and spatiotemporal database
 - Open multimedia standards, e.g. MPEG-7
 - Multimedia database
- **Web community** (Klamma et al., ICALT 2005)
 - Knowledge sharing among diverse user communities
 - Distributed client/server web architecture
 - User profile management

System Design: 3-Tier Web Architecture



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System Services: Hypermedia GIS

ACIS - Afghan Community Information System for Cultural Heritage Management

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Location Search Themes/Maps Selection Nearest Neighbors

Province:

Acis Map Legend

- Search in District Location
- Search in Rectangle Location
- Search in Province Location
- Nearest Neighbors(in distance) Location
- N-Nearest Neighbors Location
- Monument
- Map Center
- Site Selection Location
- Mouse Click Location

Current Action: Site Selection

Site Name(s)	Province / District	Site Description	Location Description	Site Multimedia in Thumbnail	More...
GULDARRA / MŪSA-I LOGAR. MŪSA-I LOGAR. MŪSA-I LOGAR.	KABUL / Musayi	A large stupa-monastery complex, probably the best preserved in Afghanistan. The main stupa consists of a	Kābul Province. In the MŪsa-i Logar Valley, 22 km southeast of Kābul.	 pic 1 of 26	more info...
<u>GUMBAD</u>	BAMYAN / Shibar	no data for this site	no data for this site	no image for this site	more info...



ACIS Community Platforms

- **ACIS TikiWiki**
- **<http://magritte.informatik.rwth-aachen.de:3333/ACIS/tiki-index.php>**

HomePage
Welcome to the ACIS wiki

English

Community Page of the ACIS Working Group

ACIS: Afghan Community Information System for Cultural Heritage Management

ACIS community

Welcome to ACIS Community! The community theme is cultural heritage mangament in Afghanistan. Here you can post discussion messages in Forums, share your pictures and other files in Image and File Galleries and so on.

Collections in this field can be added [here](#).

ACIS Project

ACIS is developed as a community information system for cultural heritage management in Afghanistan. Based on an MS Access database developed by Department of Urban History at RWTH Aachen University, ACIS employs open web architecture and standards and Oracle technologies to present its diverse user communities a GIS-based multimedia community system integrating the existing data migrated from the Access database. Please go to [ACIS development](#) for more detail.

Try it out!

An online demo is available at <http://bosch.informatik.rwth-aachen.de>

Current members

Yiwei Cao (cao@is.informatik.rwth-aachen.de)
Iliyana Ivanova (ivanova@is.informatik.rwth-aachen.de)
Ralf Klamma (klamma@informatik.rwth-aachen.de)
Evanela Lapi (lapi@is.informatik.rwth-aachen.de)
Sandra Leythaeuser
Marc Spaniol (mspaniol@informatik.rwth-aachen.de)
Georgios Toubekis (toubekis@sbg.rwth-aachen.de)

Organizations

- Department of Information Systems, RWTH Aachen
- Department of Urban History, RWTH Aachen University
- Department of Historic Monuments Afghanistan

Links to Afghanistan

[Links](#)

Kleiner text normaler text größer text

startseite nachrichten mitglieder

yiwei mein ordner meine einstellungen rückgängig plone konfiguration ausloggen

sie sind hier: startseite » welcome to the acis community

navigation

- Startseite
- Members

aktuelle artikel

Es wurden keine Artikel seit Ihrem letzten Login veröffentlicht.

Mehr ...

inhalte anzeigen bearbeiten eigenschaften zugriffsrechte

neuen artikel hinzufügen status: veröffentlicht

Veränderungen am Dokument gespeichert.

Welcome to the ACIS Community

This welcome page is used to introduce you to the ACIS Community.

Welcome to the ACIS Community! ACIS is developed as a community information system for cultural heritage management in Afghanistan. Based on an MS Access database developed by Department of Urban History at RWTH Aachen University, ACIS employs open web architecture and standards and Oracle technologies to present its diverse user communities a GIS-based multimedia community system integrating the existing data migrated from the Access database. Here you can post discussion messages in Forums, share your pictures and other files in Image and File Galleries and so on.

Please contribute your experiences here. Thanks for your visit.

Erstellt von: zope-admin
Zuletzt verändert: 2006-02-13 15:33

termine

Workshop on IS for Science, Cultural Heritage Management & e-Government 2006 Information Systems (Informatik V), RWTH Aachen, 2006-02-17

« Februar 2006 »

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Hosted by Informatik 5, RWTH Aachen University, 2005-2006

Disclaimer

POWERED BY PLONE

Diese Seite erfüllt die folgenden Standards:

- **Zope & Plone**
- **http://monet.informatik.rwth-aachen.de:9999/ACIS/index_html/**

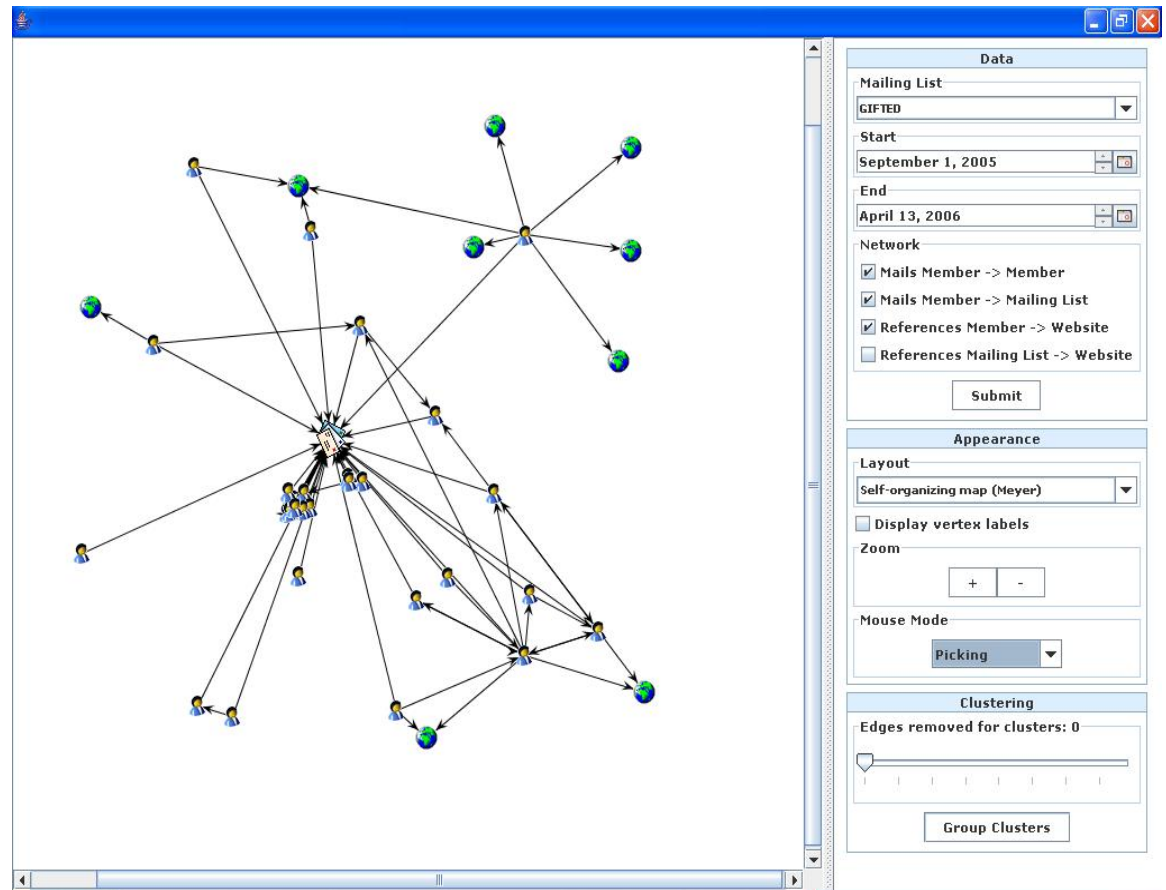


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Basis of Reflection (1)

- **media base**
 - automatic crawling
- **measure**
 - Social network Analysis Tools
 - Cross Media
- **community web interface**



Basis of Reflection (2)

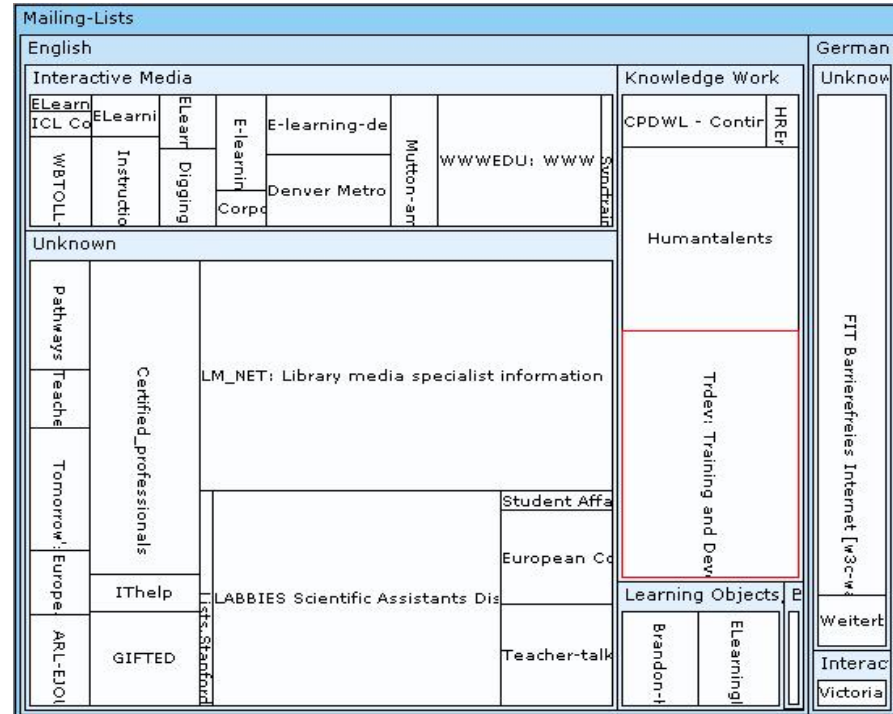
▪ Cross Media Analysis

- Mailing Lists
- Newsletter
- Web Sites
- RSS Feeds
- Blogs

▪ Interactive Social Cluster Analysis

▪ Visualisation Strategies

- Graphs
- Treemaps
- Self organizing Maps



How to use the treemap

If you want to zoom into a category, double-click on its corresponding rectangle. By clicking the right mouse-button, you can zoom out again.

Choose a color scheme

Blue ▼

Statistics

Name	Trdev: Train
Last Mail	2006-04-12
Mails	1266
Mails (today)	1
Project start	2006-01-10

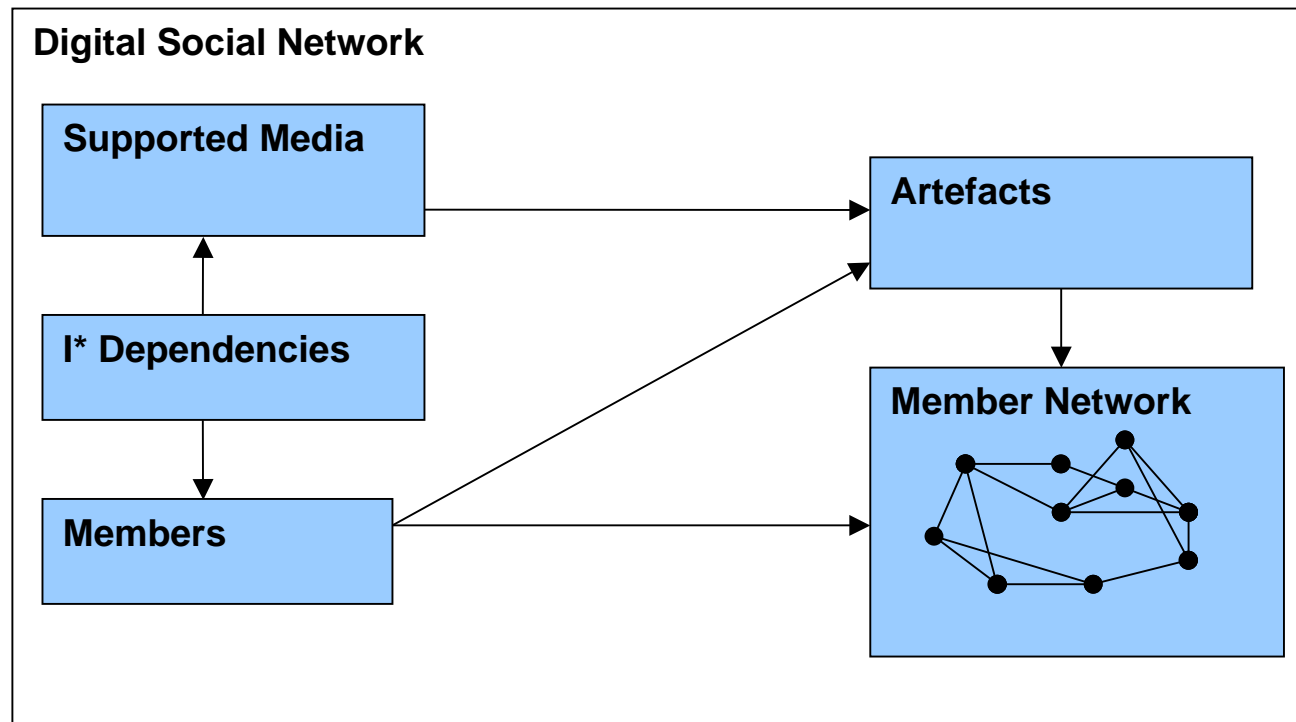
Complexity Reduction Approaches



- **Abstraction - Model for Digital Social Networks**
 - Actor-Network Theory
 - Social Network Analysis
 - i* Framework
- **Pattern Application**
 - XML-based Pattern Language for Multidimensional Disturbances
 - Mechanisms for Automatic Application of the Pattern Language
 - Pattern Repository
- **Visualization**
 - Algorithms for Graph Visualization

ANT Model: Actor-Network Theory

- **Actor** - the basic unit of the model, no difference between technical and social actors.
- **Semantics, given to the actors from the interpretation in the context of digital social networks:**
 - Medium – an object which enables the members to exchange information
 - Artefact – objects created by the members using some medium
 - Member – any person or group, part of the digital social network
- **Relation** – a relation between two actors
- **Network** – set of actors along with their relations

ANT Model: Digital Social Networks

**Legend**

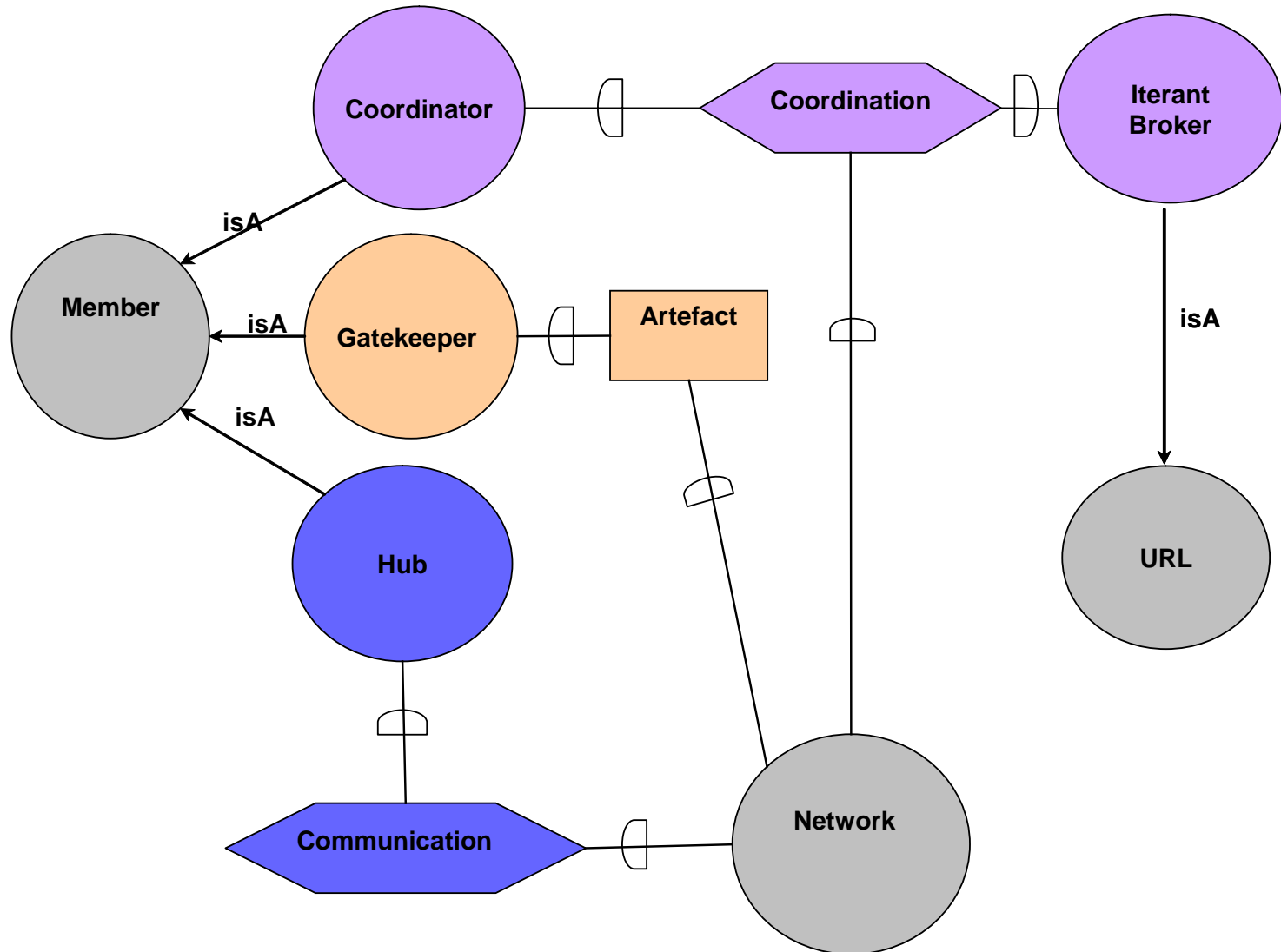
-  Component of the Digital Social Network
-  Relation between components

ANT Model: I* Dependencies in Digital Social Networks



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Tools for

Digital Social Network Analysis



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	Media	Actors	Relations	Analysis Approach
COMB	Mailing List	Individuals, Mailis, Threads, Genres	Posting in the same thread.	Social Network Analysis, Statistics
Ariadne	Eclipse IDE, CVS Repository	Developers, Software Components	Dependencies derived from the technical dependencies.	Temporal Analysis
Flink	Internet	Individuals	Relations built on the information from Google, FOAF, Mails, Bibliography	Social Network Analysis, Semantic Web
PALADIN	Any Type of Digital Social Network	Media, Members, Artefacts	Depends on the used media in the network	Pattern Repository, Social Network Analysis, Temporal Analysis, Statistics

PALADIN extends ideas from HCI pattern languages such as PSP, PoInter, PLML, ...

Pattern Language Example: Troll

Troll Pattern: This pattern tries to discover the cases when a troll exists in a digital social network. A troll in the network is considered a disturbance.

Disturbance: (EXISTS [medium | medium.affordance = threadArtefact]) & (EXISTS [troll |(EXISTS [thread | (thread.author = troll) & (COUNT [message | (message.author = troll) & (message.posted = thread)]) > minPosts]) & (~EXISTS[thread₁, message₁ | (thread₁.author₁ != troll) & (message₁.author = troll & message₁.posted = thread₁]))]))

Forces: *medium; troll; network; member; thread; message; url*

Force Relations: *neighbour(troll, member); own thread(troll, thread)*

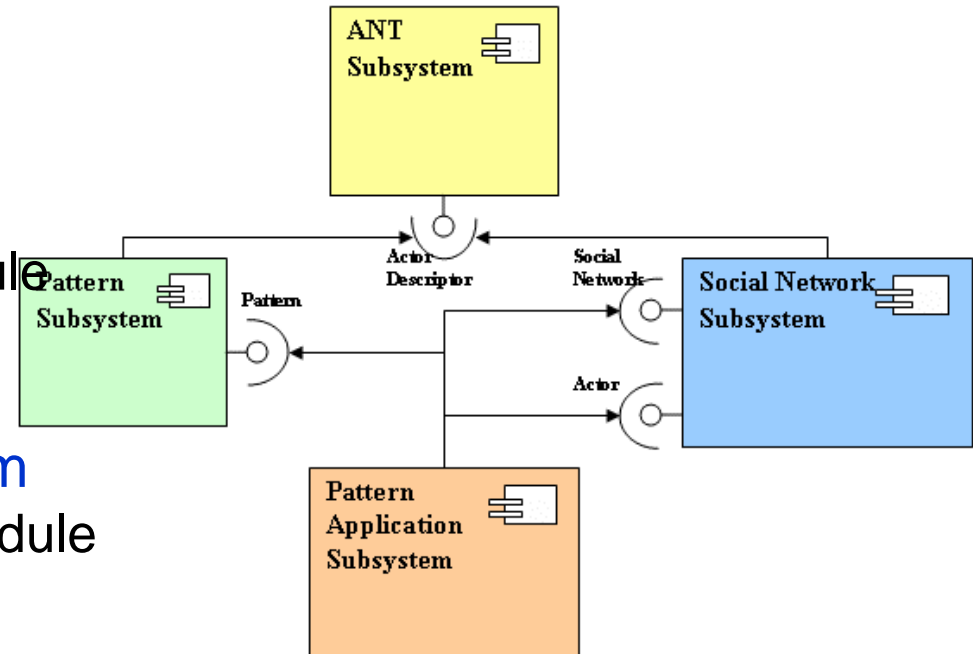
Solution: **No attention must be paid to the discussions started by the troll!**

Rationale: The troll needs attention to continue its activities. If no attention is paid, he/she will stop participating in the discussions.

Pattern Relations: Associates Spammer pattern.

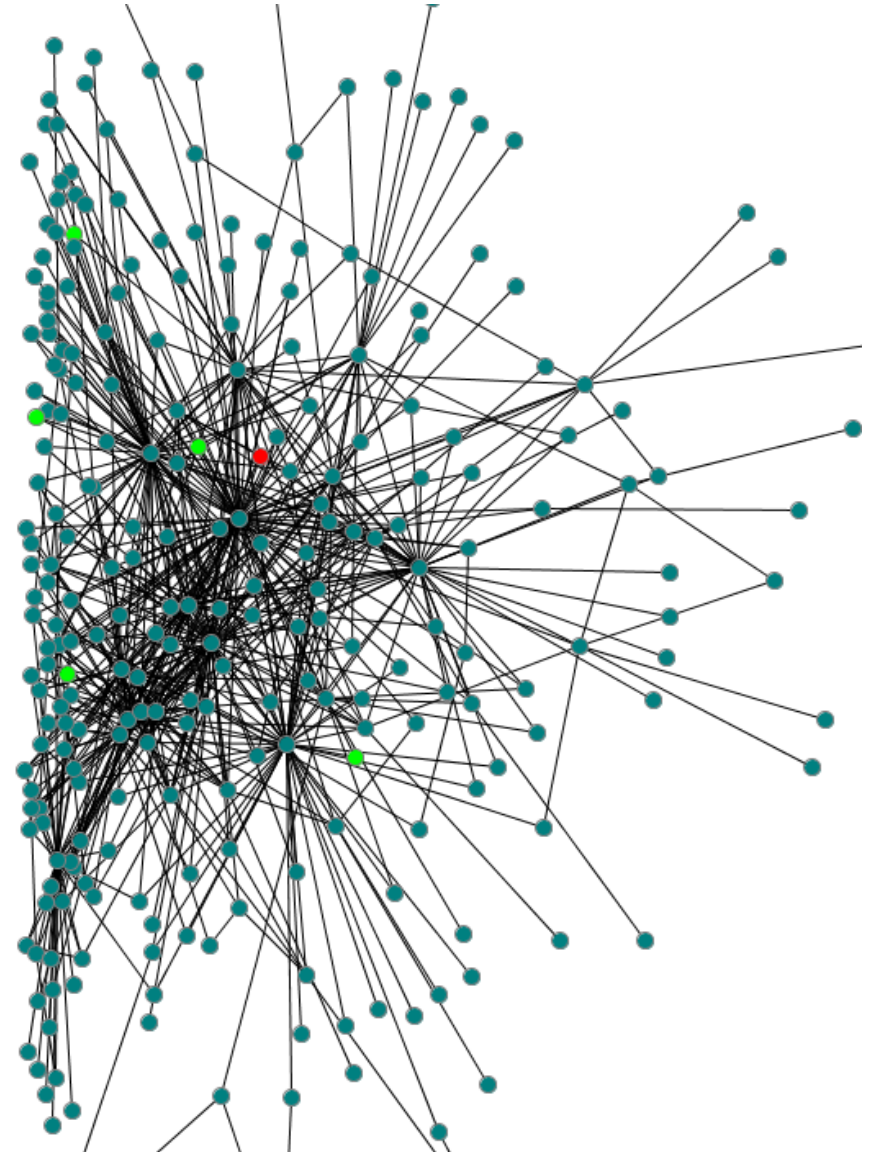
PALADIN: Architecture Implementation

- **ANT Subsystem**
 - Web Interface
 - XML Repository
- **Pattern Subsystem**
 - Formal Expression Module
 - XML Pattern Repository
 - Web Interface
- **Social Network Subsystem**
 - Base Social Network Module
 - JUNG Interface
 - DB2 Database
- **Pattern Application Module**
 - Formal Expression Evaluation
 - Pattern Instance Repository



PALADIN: Community Visualization

- **Troll**
- **Spammers**
- **Members**
- **Size reflects centrality of the member**
- **Members who participate in other disturbances, such as bursts or structural holes can be displayed as well**



Summary and Outlook

- There is a significant potential in embedding “social software” into enterprise information systems to unleash informal knowledge creation and management, but also significant challenges.
 - These challenges will increase further with growing usage of multimedia.
- These challenges need to be addressed
 - at the level of operational architecture (cf. ACIS example) and
 - at the level of continuous requirements engineering.
- Many issues require further research, ranging from media analysis to privacy, security, trust and other management issues (reward structures).