Challenges in Multimedia Communication

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CONTENT 2010
Lisbon, Nov. 21-26 2010

User generated content

- User as consumer, creator, and distributor of media content (YouTube).
- What are the most promising applications?
- What are the limitations of the existing technologies (editing tools, compression, networks, etc.)?
- Can these limitations be addressed?

Context

- How can context be exploited for improved media delivery (personalisation)?
- What are the most promising applications (mobile phones)?
- What are the main technological challenges?
- Are there any risks?

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The Second International Conferences on
Pervasive Patterns and Applications
PATTERNS 2010
November 21-26, 2010 - Lisbon, Portugal

Patterns and Learning Objects

PANEL on Content, Patterns and Cognitive Technologies

Luis Alberto Álvarez-González

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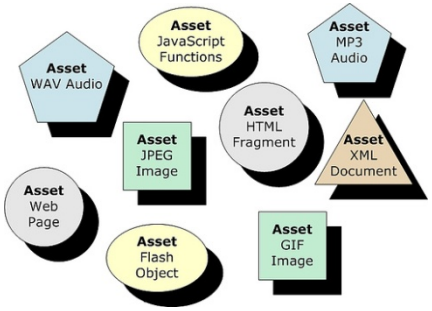
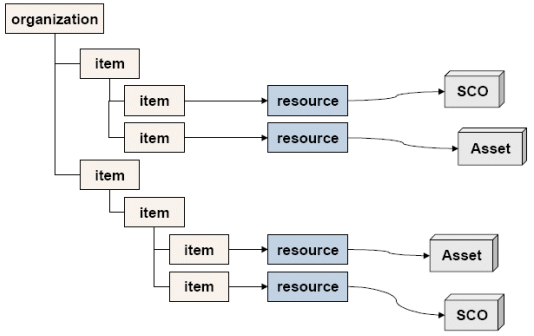
LOs are like an "Educational MicroUnit". The Lego metafore is used.

To build a course, several LOs are required





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The main charateristics are:

R Reusability
A Accesibility
I Interoperatibility
D Durability

For reusability, every LO has a Metadata

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There are several repositories with several millions LOs.

There are several thousand LMS with several thousand LOs.

Are the lecturers using repositories ?

Are the lecturers using LOs from other lectures in the same LMS ?

Do the lecturers re-use their own LOs?

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The reusability is very low.

Why?

Some reason could be
Language. Most of LOs are in a different languages or same language but differentes dialects (Portugues in Portugal is a litle diferent that in Brazil)

The LOs in general don't follow a "pattern" and one LO is so different to another one, and very often is necessary to learn how to use the other one.

One LO was develop for another context (geographical, time, etc.)

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In others words the reusability is not met.

¡ Most of the lecturers wants to build their own pedagogical material !

Then,

For lecturers is very important to have tools to build LO.

In others words, patterns to do that.

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¡¡ The students need LOs !!

¡ The lecturers need patterns to build LO !

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Semantic-Content, Learning Objects and Beyond: Where Do We Go?

Michal Žemlička

Charles University in Prague

Czech Republic

Content: Quantity & Tools

We have many tools able to handle our content: databases, clusters, grids, clouds, …

… we have so many resources of the content (how many pages are on the web?) …

…. but … do we have the content interesting and valuable for us?

Content for Us

- Do we know which content (what kind of information/knowledge) we need?
- Do we know how to get this content?
- Are we allowed to generate such content?

Issues

- The needs tend to be individual
- Quality is subjective (ISO)
- Moreover … Even the same data may be a source for different content – they can be viewed within different environments (compare e.g. evaluation of scientific publications and activities in different countries)

Sidestep:

- The reason of most software project failures is in last years in the early stages of development (Gartner)

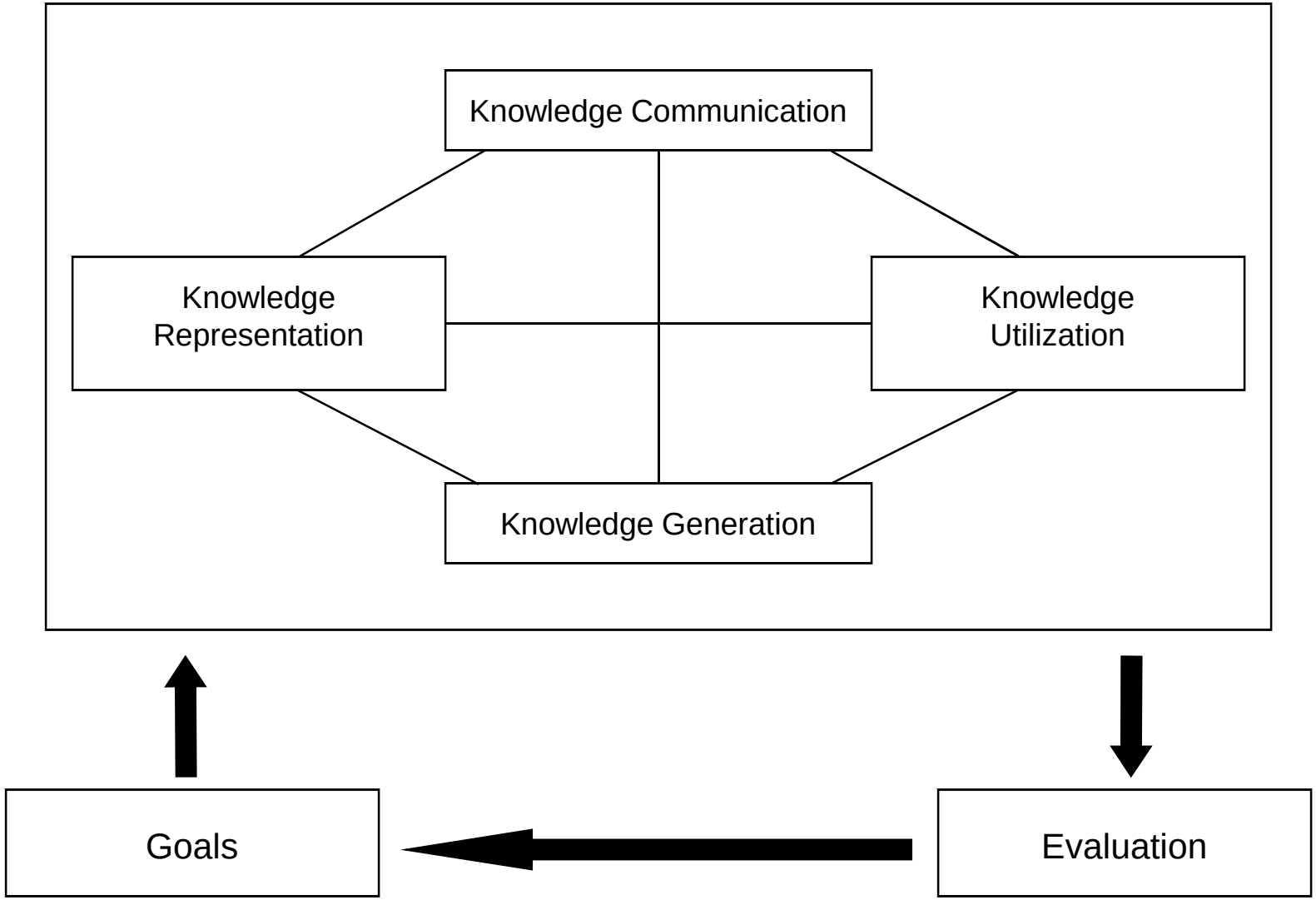
- Do we really make and collect our content with respect to its use?
- Are we able to create/present content according user needs?

Eckhard Ammann

Semantic-Supported Knowledge Management

Topics

- **What is Knowledge Management about ?**
- **Semantic Technologies**
- **Semantics Support of KM**
- **Discussion**



Source: Reinmann-Rothmeier et al.

Eckhard Ammann
Reutlingen University

Ontologies

Representation of Information and Knowledge of a certain Domain

Specification of Conceptualization

(Concepts, Inter-Relationships, Properties, Instances)

Elimination of Ambiguities in Understanding a Notion of Concepts

(Communication means assuring Common Understanding)

OWL as Ontology Language

Reasoning

Definition of Rules, automatic Reasoning

(inducing Relationships among Concepts and Instances)

Technolgies: SWRL, Protegé and JessTab, …

Integration in Applications

General: Supporting Knowledge and Management Processes

E.g. Knowledge Distribution / Communication within and between Organisations

1) General Support

General Ontology (Top Level Ontology)

Knowledge Ontology

Knowledge Development Ontology

2) (Theme -) Specific Support

Enterprise Ontology

Domain Ontology

3) Semantic Knowledge Management

Ontology Management

Knowledge Discovery

Human Language Technologies

- Conception of Knowledge and Knowledge Dynamics ?
- Knowledge always bound to the Human Being ?
- Is it really possible, to (formally) model Knowledge and

  Knowledge Management Processes

  (at least to sufficient Detail) ?
- Modeling of Knowledge-Intensive Business Processes ?
- If so, do currently known Technologies suffice towards this Goal ?

Talking Points on CONTENT + PATTERNS + COGNITIVE

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Algorithms on Strings and Sequences

1. Several basic algorithms for exact and approximate match (allowing mismatch, insert and delete) have been discovered.

2. Generalizations to multiple patterns, patterns with “don’t cares”, patterns expressed by regular expressions

3. Suffix trees or suffix arrays

5. sequence alignments, multiple alignments, scoring matrices, gaps , global and local similarity

6. Practical Algorithms: Boyer-Moore, Baeza-Yates, Unix utilities (agrep, ngrep), BLAST and ClustalW

Future Challenges

1. The approximate and sequence alignment algorithms are relatively slow. Need higher speed.

2. Dynamically changing massive databases. Need parallel construction algorithms for suffix trees and arrays.

3. Compressed domain pattern matching.

4. Domain-specific knowledge to improve precision and coverage.

5. Special-purpose parallel hardware algorithms implemented using FPGA based co-processors

6. Modeling of complex biological processes (pathways) as interconnected network of subsequences of genomic sequences.