Innovativa mobila applikationer för att stödja samarbete och lärande

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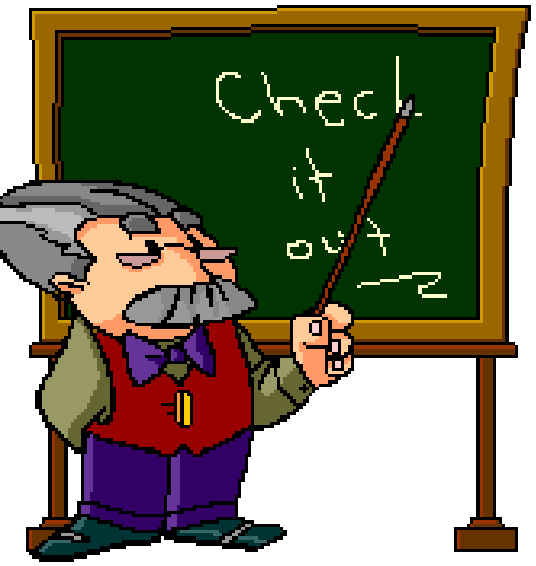
November 6, 2007

eLeKT Center for Learning and Knowledge Technologies

Växjö University

Agenda



- Background
- Current Efforts
- Examples
- Reflections and Conclusions
- Questions

The New Mobile Landscape

This is how mobile computers look like today

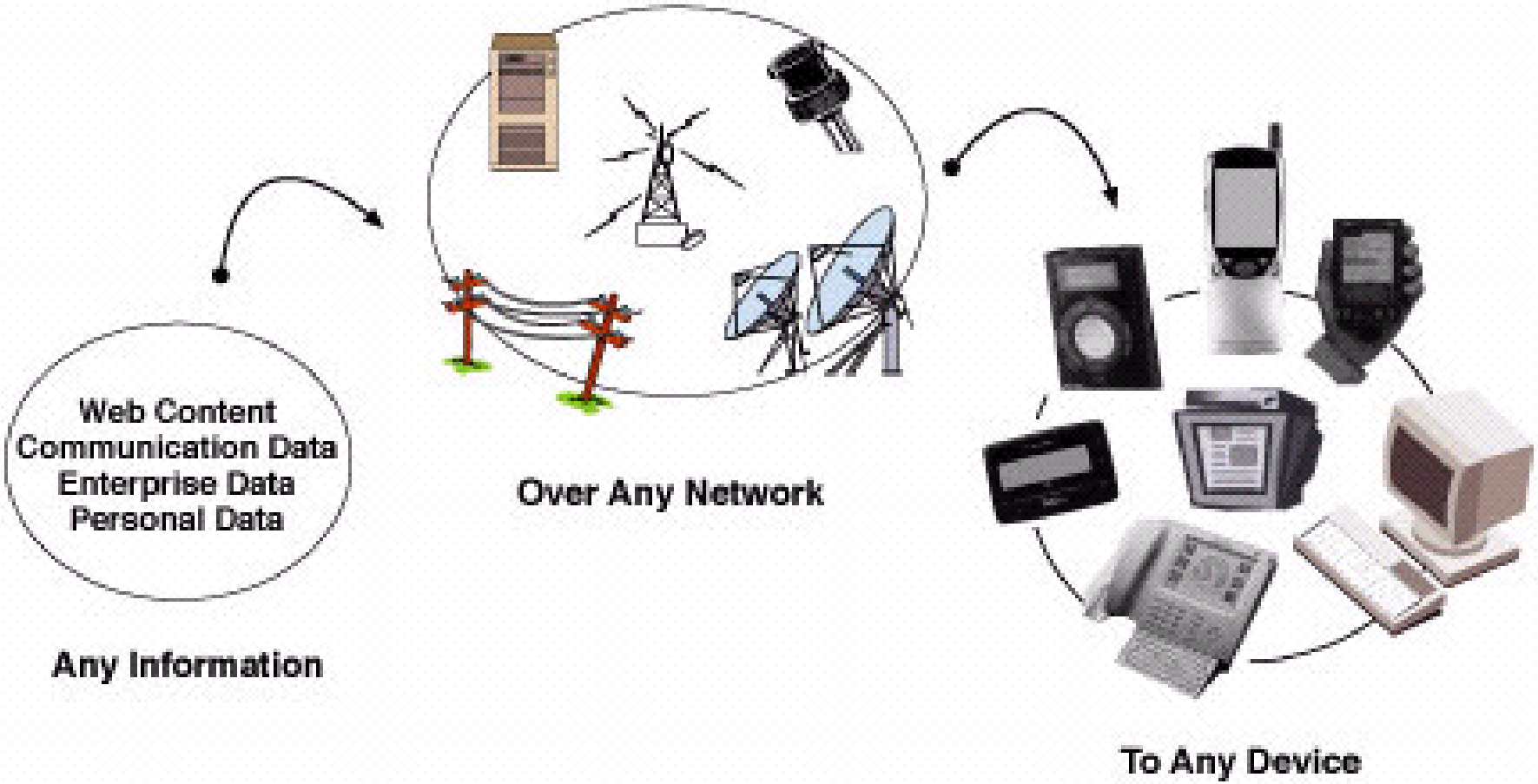
Global Connectivity

Mobile phone subscribers in the world
2005 - 33%
2010 - 47%

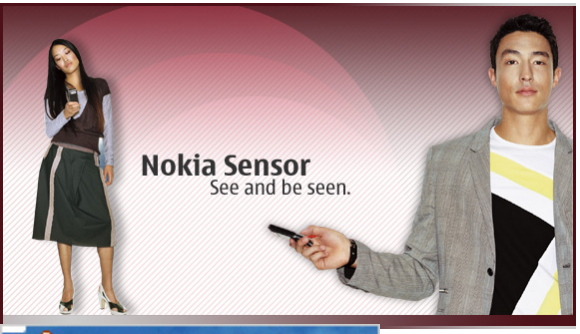
Internet users in the world
2005 - 13 %
2010 - (slow growth)

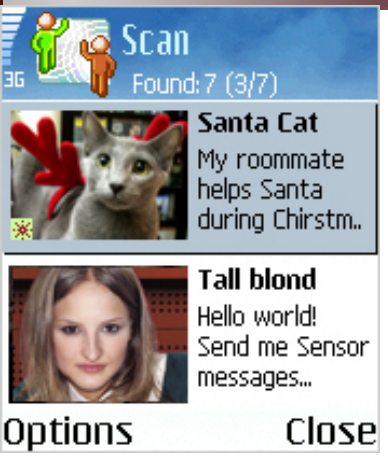
The Evolution of the Web

Any Information, Any Network Any Device



Current Mobile Services



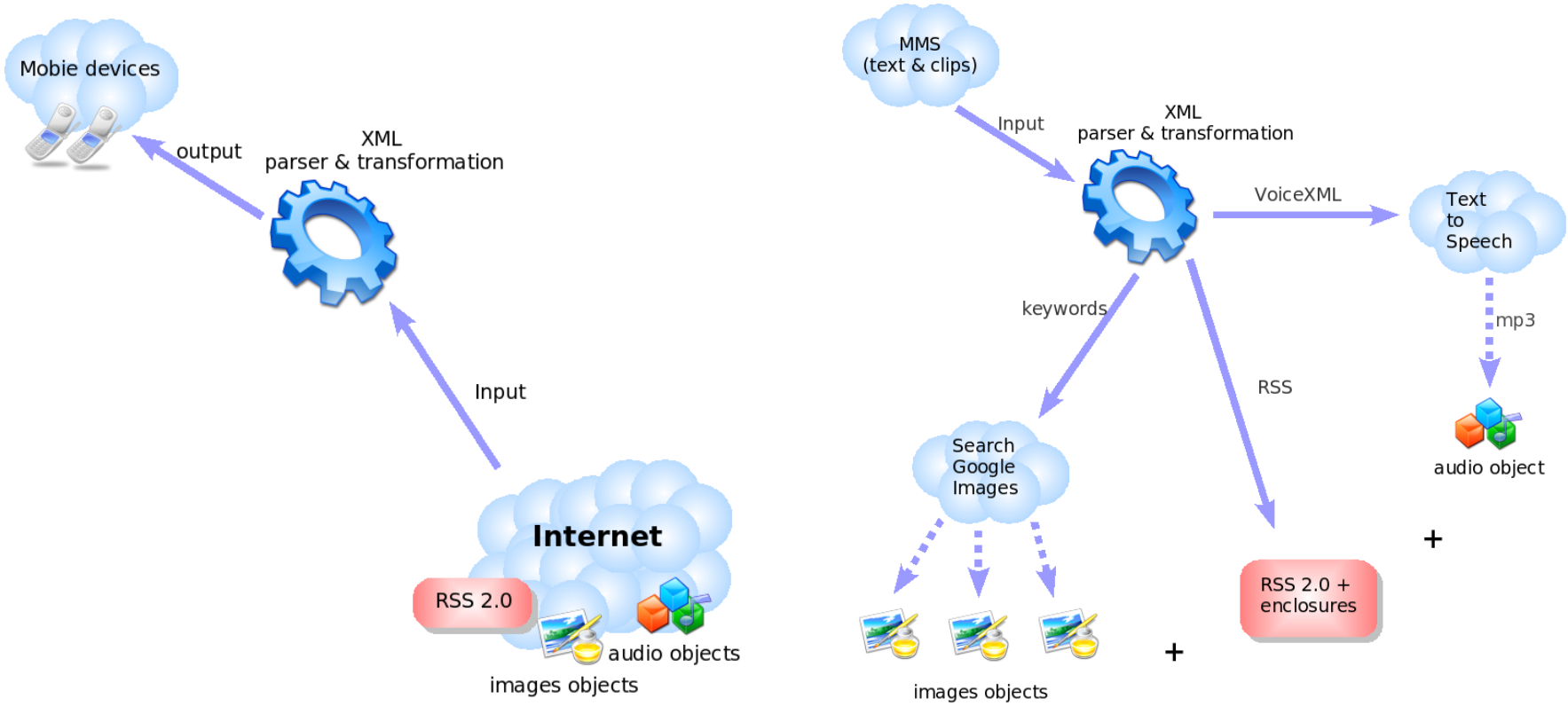


http://www.dodgeball.com/

Telia Navigator

http://www.imahima.com/ihcorpv3/

System Design Challenges



Our Research Focus

Our research activities focused on:

- The development of mobile and wireless applications and systems to support collaborative learning
- Connecting Learning Theories and Technological Design

Technological Approach

We base our work upon the following:

- **XML Technologies**
- **Web programming techniques (PHP; JSP, .NET, APIs, etc)**
- **Web Services**
- **Rich Media Repositories (contextual metadata), developing tools for media reuse and media migration**

MUSIS

MUlticast Services and Information in Sweden

http://www.musis.se/resources/movies/MUSIS_TV4.mov

Smart Phones and Services

Technical Features:

- Video
- Sound
- Connectivity

More at http://www.nokia.com/6630

Services: Channels

Channel	VXU	Daily Menu	SMP Radio	SMP News	Enter-tainment	TV4 Weather	Music	DW news
Content Provider	3 courses from Växjö university	Local restau-rants	Daily news	head-lines	SMP, TT spectra, Movie Trailers	TV4 Sydost	Musik-huset	Deutsche Welle
Media Type	Multimedia	Text	Sound	Text	Video	Video	Sound	Video
Format Type	Html, real media and 3gp.	Html	Real media	Html	3gp	3gp	Real media	3gp
Delivery time	anytime	10:30	12:30 17:00	09:00	15:00	09:30	17:00	17:00
Frequency	Daily	Daily	Daily	Daily	Daily	Daily	Twice a week	Twice a week

Detailed Educational Services

Educational Services:

3. Teacher as Content Provider: small ”micro lectures” video films and voice based course information

2. Integrations with existing CM System (First Class), Calendar (Ical), etc. New distribution channels via RSS

3. Support for group communication

Students generate content to be sent to other students

Example 1:

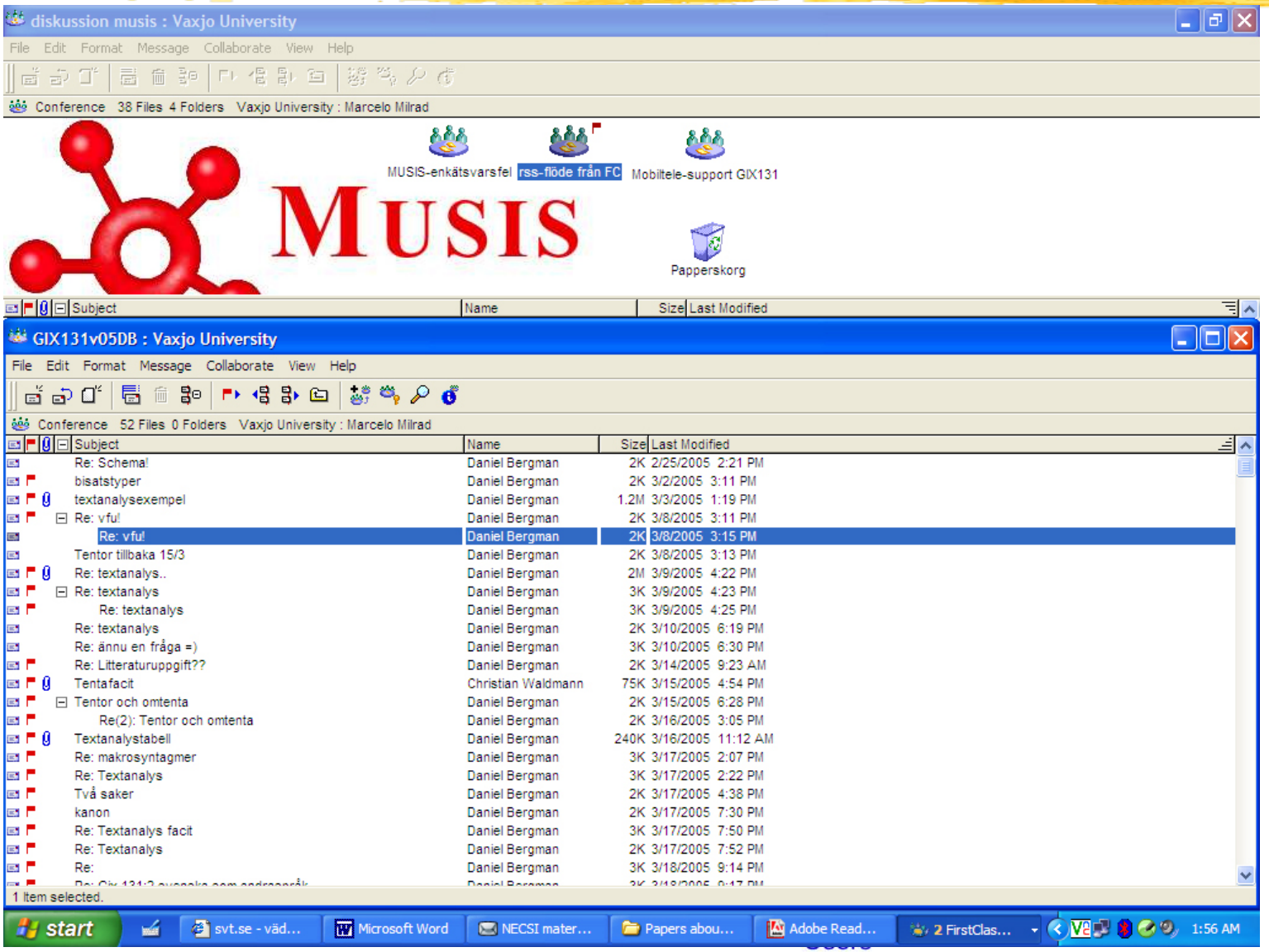

NOKIA
Musis
Recent
GIX131 Kalend..
06-09-2005 17:38
Radionyheter
06-09-2005 17:27
Video Film
06-09-2005 12:38
Options
Back

Example 1:


NOKIA
Musis
Recent
MEB 724 Kalen...
01-06-2005 19:01
1 new message.
Play now?
Yes
No

Example 1:

Example 2:


diskussion musis : Vaxjo University
File Edit Format Message Collaborate View Help
Conference 38 Files 4 Folders Vaxjo University : Marcelo Milrad
MUSIS-enkätsvarsfel
rss-flöde från FC
Mobiltele-support GIX131
MUSIS
Papperskorg
Subject Name Size Last Modified
GIX131v05DB : Vaxjo University
File Edit Format Message Collaborate View Help
Conference 52 Files 0 Folders Vaxjo University : Marcelo Milrad
Subject Name Size Last Modified
Re: Schema! Daniel Bergman 2K 2/25/2005 2:21 PM
bisatstyper Daniel Bergman 2K 3/2/2005 3:11 PM
textanalysexempel Daniel Bergman 1.2M 3/3/2005 1:19 PM
Re: vfu! Daniel Bergman 2K 3/8/2005 3:11 PM
Re: vfu! Daniel Bergman 2K 3/8/2005 3:15 PM
Tentor tillbaka 15/3 Daniel Bergman 2K 3/8/2005 3:13 PM
Re: textanalys.. Daniel Bergman 2M 3/9/2005 4:22 PM
Re: textanalys Daniel Bergman 3K 3/9/2005 4:23 PM
Re: textanalys Daniel Bergman 3K 3/9/2005 4:25 PM
Re: textanalys Daniel Bergman 2K 3/10/2005 6:19 PM
Re: ännu en fråga =) Daniel Bergman 3K 3/10/2005 6:30 PM
Re: Litteraturuppgift?? Daniel Bergman 2K 3/14/2005 9:23 AM
Tentafacit Christian Waldmann 75K 3/15/2005 4:54 PM
Tentor och omtenta Daniel Bergman 2K 3/15/2005 6:28 PM
Re(2): Tentor och omtenta Daniel Bergman 2K 3/16/2005 3:05 PM
Textanalystabell Daniel Bergman 240K 3/16/2005 11:12 AM
Re: makrosyntagmer Daniel Bergman 3K 3/17/2005 2:07 PM
Re: Textanalys Daniel Bergman 3K 3/17/2005 2:22 PM
Två saker Daniel Bergman 2K 3/17/2005 4:38 PM
kanon Daniel Bergman 2K 3/17/2005 7:30 PM
Re: Textanalys facit Daniel Bergman 3K 3/17/2005 7:50 PM
Re: Textanalys Daniel Bergman 2K 3/17/2005 7:52 PM
Re: Daniel Bergman 3K 3/18/2005 9:14 PM
1 Item selected.
start
svt.se - väd...
Microsoft Word
NECSI mater...
Papers abou...
Adobe Read...
2 FirstClas...
1:56 AM

Example 2:

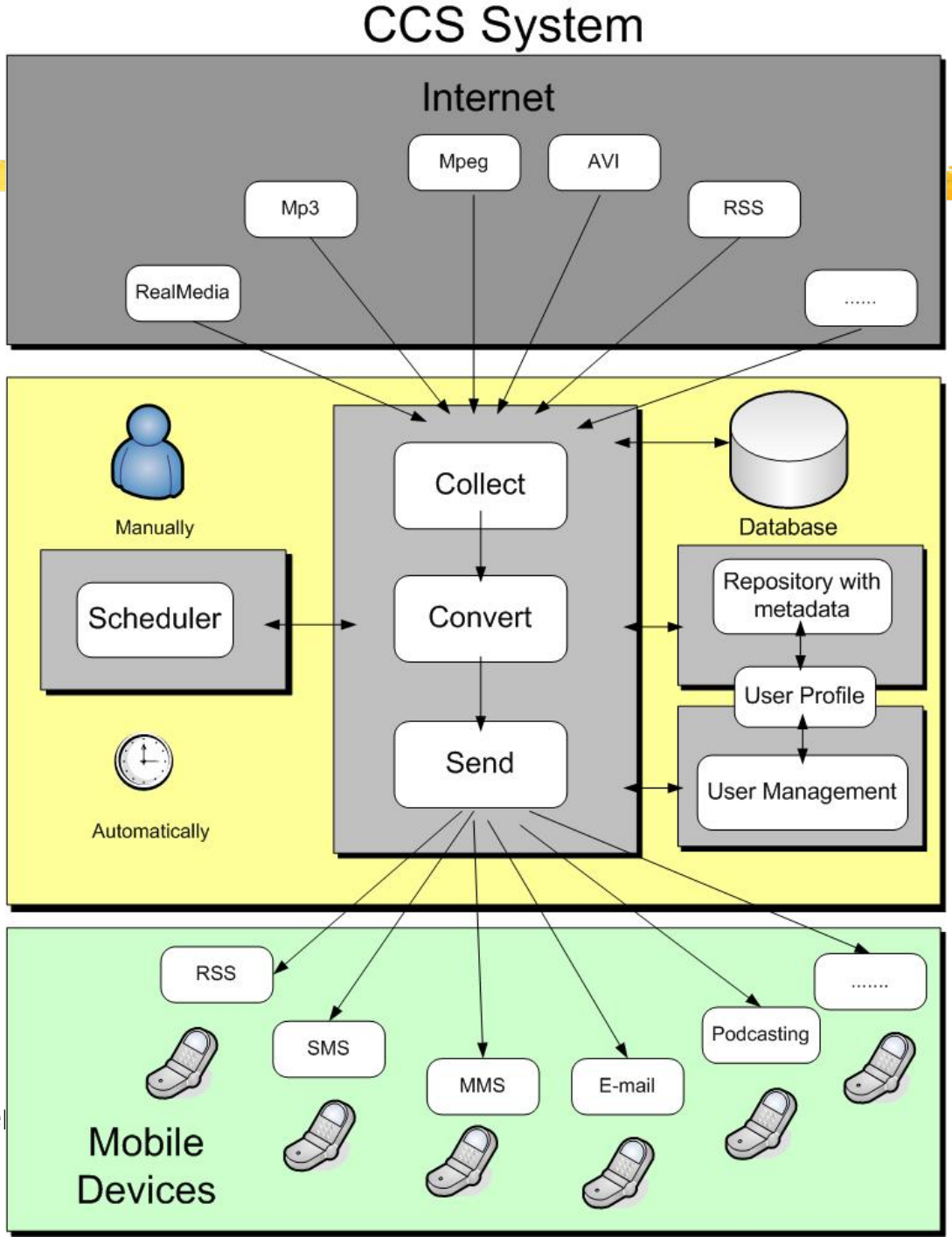

NOKIA
Daniel Bergman
Hej! OK, då får vi sluta oss till det.
//Daniel
Patrik Gustavsson skrev den 19 september 2005 klockan 18:33 +0100:
Ulf sa att texten skulle vara äldre än 1910 och eftersom
Options
Back

Example 3:


NOKIA
Musis
Recent
MEB 724 Kalen..
01-06-2005 19:01
1 new message.
Play now?
Yes
No

Example 3:


NOKIA
?
Options
Back
1
2 abc
def 3
4 ghi
5 jkl
mno 6
7 pqrs
8 tuv
wxyz 9
*
0
#
C



Automated Conte

Data Collection

- Exploratory study; multiple methods to collect data.
- Participants completed web based questionnaires in weeks 1, 5, and 10 of the project.
- Four focus group interviews with 15 participants
- Finally, a 90 minutes workshop with the students was held at the end of the term

Results and Discussion

- General use and attitudes: Students perceived MUSIS' services as something useful, dynamic and integrated in their every day life.
- Did students find mobile phones and services useful for supporting their learning?
- Participants were more likely to see the mobile services as useful the more it was integrated into their course content.
- *How useful did you experience the course related information sent to the educational channel ?*

Perceived usefulness

Perceived usefulness of the educational mobile services after 5 weeks (n=41) and 10 weeks (n=41).

Course	Week	Very useful	Useful	Fairly Useful	Not Useful
GIX131	5	27.3%	45.5%	18.2%	9 %
MEA708	5	10.5%	52.6%	21.1%	15.8 %
GIX131	10	40 %	26.7%	20%	13.3%
MEA708	10	5.9%	35.3%	41.2%	17.6%

The importance of integrating the service into the pedagogy or instructional style of the course.

Results continued..

- Easy access to the instructor and to course materials was particularly important to GIX131 students, because they were off campus 4-5 weeks each semester, on site in schools.

- The pedagogical style of the instructor fit well with the values of communication and mobility offered by the phones.

- The tension between users as “students” and users as “consumers.” By mixing different kinds of services and different kinds of information, the phones are not just educational technology, and they are not just media devices. They are both.

- Ownership of the technology is clearly important. As long as the phones are loaned, students are reluctant to invest time and money in personalization and extension.

Conclusions

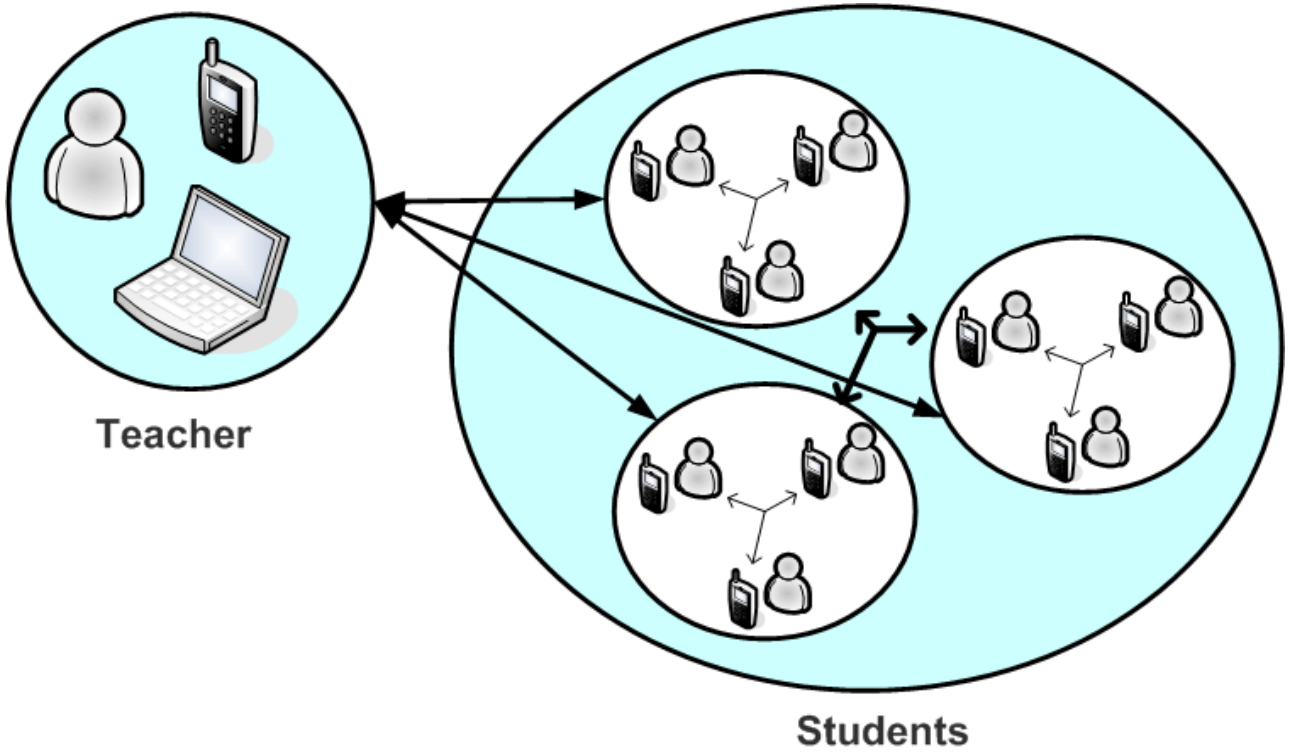
- **The importance of user centered design.** MUSIS services were constantly tested in order to assess their functionality and usability, and users were involved in the design process.

- **Keep it simple!** MUSIS services were delivered in a simple, user friendly way and were accessible almost everywhere.

- **Designing applications and services for learners that are easy to use "on the road".** This is one way to support what Brodersen, et al (2005). call "nomadic learners,"

- **WMT as a facilitator.** It is possible to develop effective software solutions (using software components) that bridge the wired internet information landscape with the mobile one. It is important to delegate this task to software solutions and not to the educators.

MUSIS2 – BTH: Reflective Multicast
Technology Enhanced Learning Environment (TEL)



Multicast:

Peer to Peer

Peer to Group

Peer to All

Group to Teacher

Teacher to Group

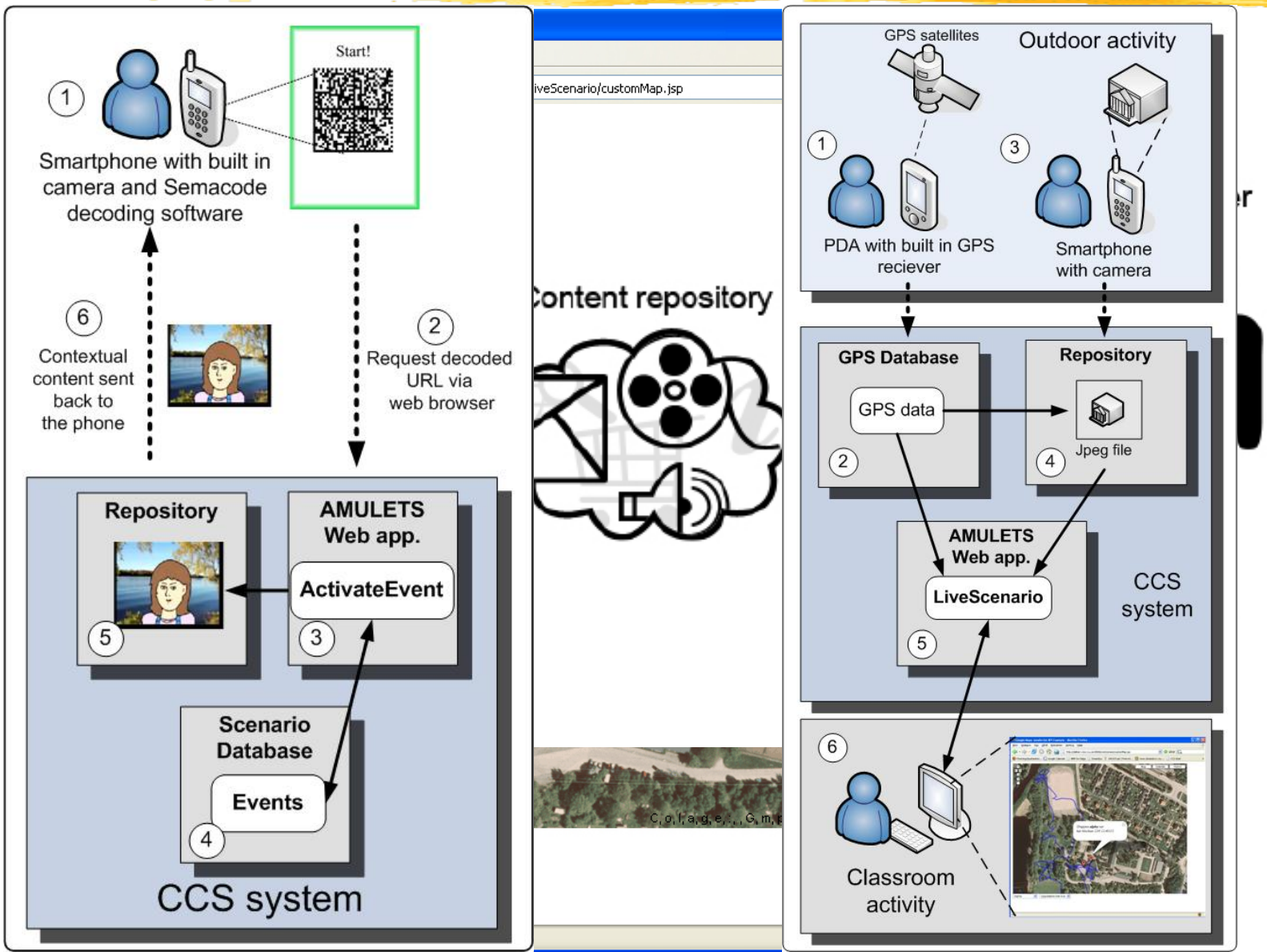
Teacher to All

Mobile Collaboration and Outdoors-Indoors Learning

- AMULETS stands for ”**A**dvanced **M**obile and **U**biquitous **L**earning **E**nvironments for **T**eachers and **S**tudents”.
- Supporting new ways to integrate outdoors learning in the classroom using mobile and positioning technologies
- Collaboration between teachers, children, students and researchers
- Integration with the actual curriculum
- Mobile Content and Digital maps as spaces for reflection

AMULETS: Field trip

AMULETS: Contextual Metadata



Digital Maps as Spaces for Reflection

Växjo Square Trial:
History of the city through the centuries

- 26 students over 2 days
- 3 groups of divided into 2 subgroups
- Indoor / Outdoor (Field / Museum)
- Context information can be used to explore collaboration between groups

Teacher Students: From mobile users to mobile designers, May 2007

- 17 students over 2 weeks
- 4 groups
- Indoor / Outdoor (Field / Lab)
- Collaborative Problem Solving
- Division of Tasks

AMULETS, Mapping Växjö Skattjakt

http://www.kollegiet.com/templates/StandardPage.aspx?id=5504

Mobile Games & Informal Learning: Children as designers

Learning Aspects

The different scenarios offer a challenging arena for children and adults to learn and to experience a variety Of learning domains in novel ways.

- ***Multidisciplinary learning***
- ***Situated Learning***
- ***Social constructivism***
- ***Multimodal representation***
- ***Content creation and not only content delivery***
- ***Collaborative Knowledge building perspective***

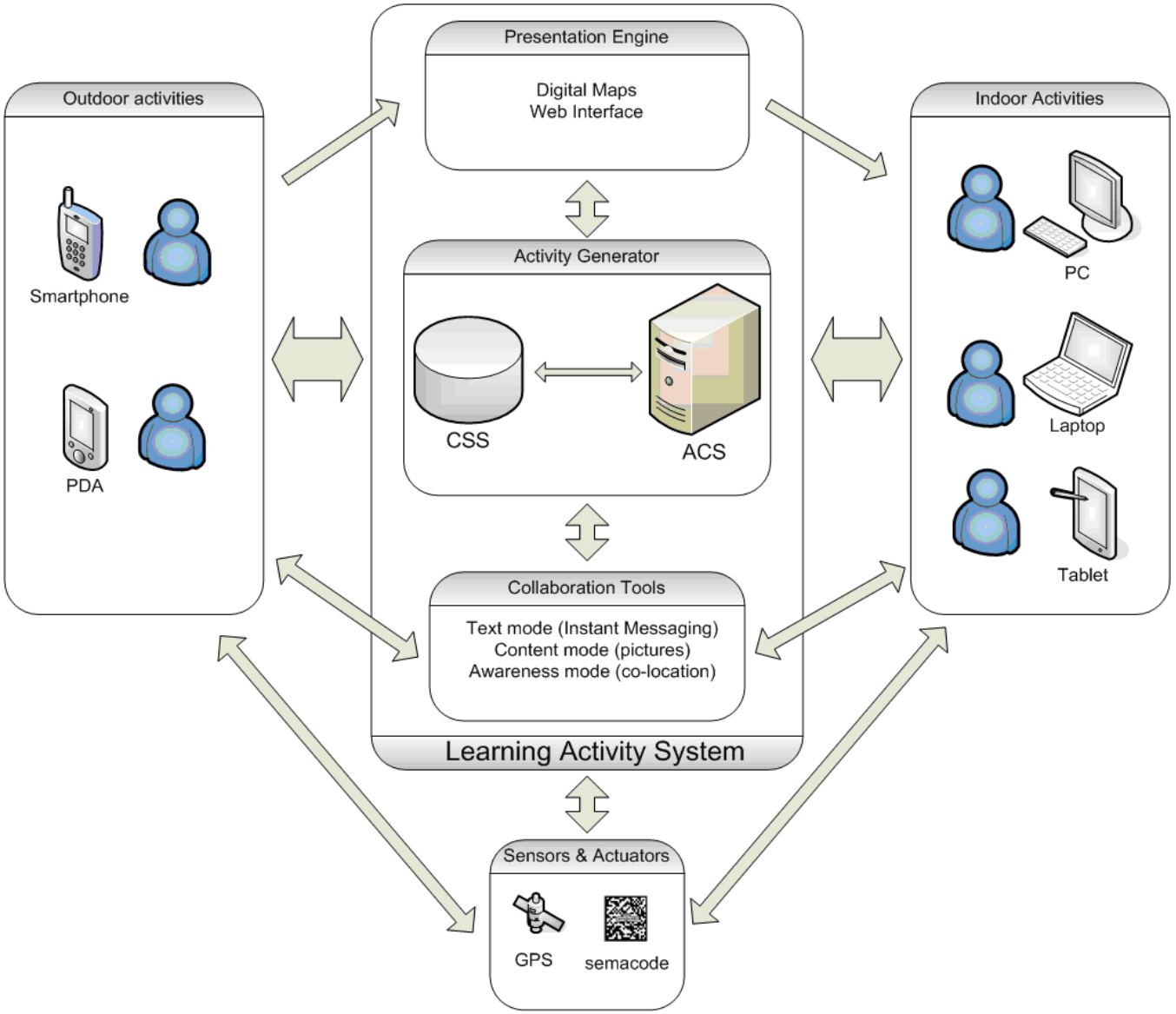
AMULETS: Assessment

- Active observations during the activities
- Video documentation and analysis
- Questionnaires
- Usability Aspects

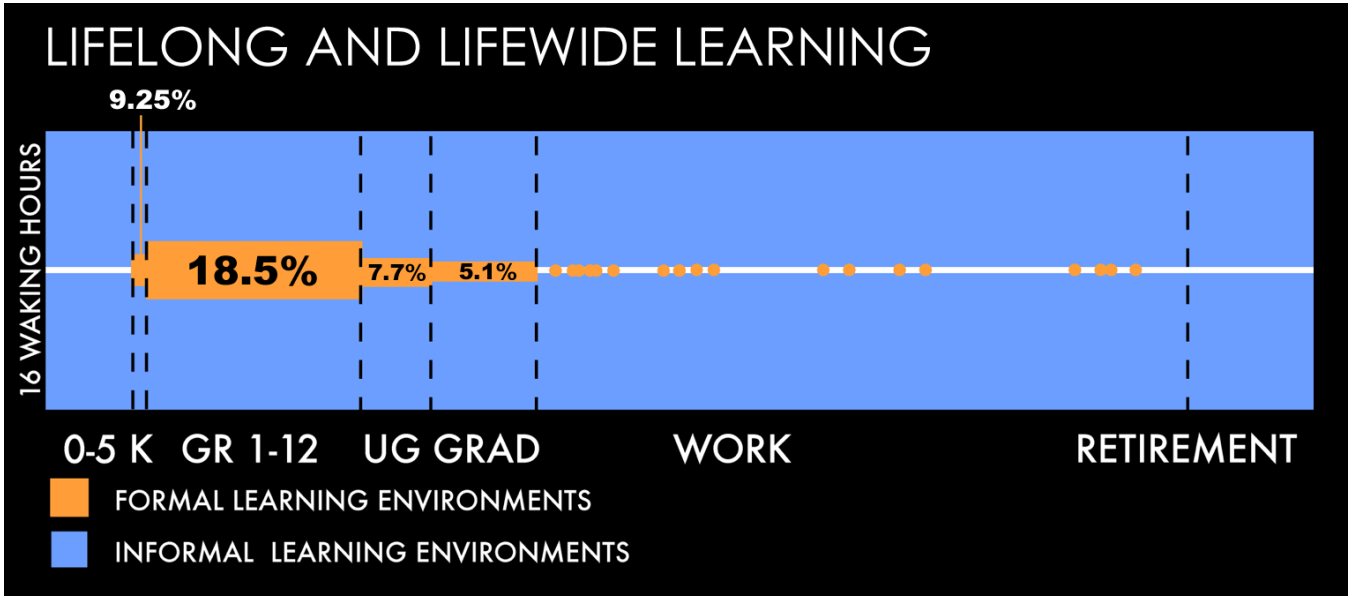
Some of these results were presented at IEEE ICALT 07 in Japan:

http://w3.msi.vxu.se/users/mmilrad/papers/ICALT07.pdf

AMULETS: Generic Architecture



Why are we doing this? Our Rationale



Greater potential than realized for harvesting "funds of knowledge" from people's learning experiences outside of classrooms - and supporting *bridging* across informal and formal learning.

For design - must consider the activities and life experiences of the learner *throughout the day* as our units of learning design.

Pea (2007); Milrad et al,, (2007)

Summing Up

- More than 500 children, young people and adults have been involved in these activities
- Novelty: students seems to be more excited and motivated
- Expanded educational pathways – connecting formal and informal learning
- Transforming and defining new literacies
- Implementation aspects:
  - Early adopters needed
  - Teachers need intuitive, simple systems
  - Technology needs to reach certain maturity before becomes educationally effective

Lankshear and Knoble (2006) claim that school ignores some of these trends and argue that mobile and wireless technologies and new media might be integrated into current school educational activities, as they are bandishing and defining new literacies in teaching and learning.

Challenges & Research Issues

1. Engineering
   - How learning aspects should be considered while designing new mobile solutions?
   - Designing for seamless interaction
   - Design once use many (re usability/interoperability)
   - Automatic Object Classification into Ontologies
   - Smart sensors and mobile tools for simulation and modelling
2. Design and Pedagogical Aspects
   - How can we design learning activities to support innovative educational practices?
   - How shall we design activities that integrate learning in informal and formal settings?
   - Which are the most appropriate methods to assess these activities?

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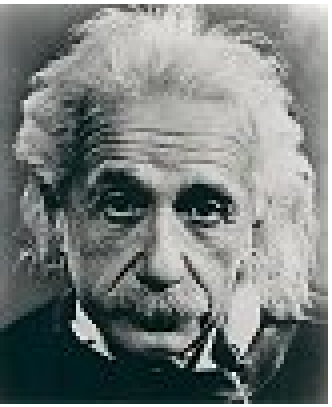

"Make everything as simple as possible, but not simpler."

-- **Albert Einstein**