Human Centered Design and Evaluation (IP2 of IM2 Phase 3)

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Participants

- New IM2 partners
  - Prof. Pierre Dillenbourg, CRAFT / EPFL
  - Prof. Jürgen Sauer, University of Fribourg

- Partners from Phases I and II
  - to ensure smooth integration of new partners and sharing of technology between IP1 and IP2
  - Dr. Denis Lalanne, U. of Fribourg (IP head)
  - Dr. Andrei Popescu-Belis, IDIAP (deputy)
Objectives of IP2

1. Develop new “light” applications, mainly oriented towards teamwork spaces and learning
   - increase collaboration support aspects
   - target lightweight technologies
     - not necessarily as “intelligent” as the IM2 SMR vision

2. Develop and apply formal user-centered evaluation methods
   - for meeting browsers and assistants
   - for the new applications
Application development lifecycle and entry point in IM2 Phase 2
Human-centered application lifecycle and entry points in IM2 Phase 3
New competencies for IM2 Phase 3

- Fully user-centered design approach
  - take into consideration full usability engineering lifecycle
  - including “mid-tech” prototyping, closer to the applications

- Novel user evaluation methodologies
  - group perspective: for human-human interaction mediated by technology
    - distributed cognition and CSCL (*P. Dillenbourg*)
  - individual perspective: for human-machine interaction
    - cognitive ergonomics (*J. Sauer*)
Envisioned Applications

IP2 in IM2 Phase 3
Two envisioned families of applications

1. Enhancing teamwork with unobstructive devices
   ~ with EPFL, P. Dillenbourg (Teaching Technology)

2. Document-based retrieval of multimedia content
   ~ with UniFr, J. Sauer (Cognitive Ergonomics)

• Both families intend to re-use IM2 Phase 1-2 technology and to put it to work in new, user-oriented settings
New contexts at EPFL and UniFr

• EPFL Rolex Learning Center
  – open public spaces vs.
  – smaller meeting rooms (“Bubbles”)

• Evaluation
  – real-world operational context: EPFL RLC and other sites
  – laboratory context: UniFr Cognitive Ergonomics
1- Enhancing teamwork with unobstructive devices

- **RLC Bubbles**
  - 10 closed spaces, 4-6 people doing teamwork

- **Teamwork support applications**
  - should be modular: “humble widgets”

- **Activities to be supported**
  - project work, revise, solve, etc.

- **Ideas for IM2 Phase III applications**
  - group mirror, word catcher, agenda monitor, summarizer, automatic content linking
2- Document-based retrieval of multimedia content

- **RLC Open Spaces**
  - desks for ~800 students doing individual work

- **Devices**
  - for the RLC: should be quite cheap
  - can be replicated at other participating sites

- **Evaluation**
  - series of specification/test studies
  - user-oriented, Cognitive Ergonomics approach
  - lab-based usability tests + field studies at RLC
2- Document-based retrieval of multimedia content

• Design applications to enhance individual work
  - e.g. in RLC open spaces

• Ideas for IM2 Phase III
  - augmented book, e.g. through document recognition or visual markers, projecting multimedia content (e.g. A/V lecture)
  - image-based information retrieval (e.g. with Kooaba)
3- Other directions of interest (at UniFr)

- In connection with previous applications, could fit into RLC, UniFr & IDIAP

- *The Augmented Clearboard*: discuss remotely with a professor or student and manipulate documents on a shared surface [image from Ishii 98]

- *iWall*: leave, watch, hear multimodal messages on a collective wall
Milestones

1. Target application and users [M6]
   – specification of novel educational applications for teamwork through formative studies

2. Low-fidelity prototypes and evaluation [M12]
   – lab-based usability evaluation at an early design stage

3. High-fidelity prototypes & evaluation [M24]
   – lab-based usability tests with multiple task scenarios

4. Field testing of fully operational application [M36]
   – educational applications installed in smart learning and meeting environments + tested in the field with real users
Other ideas?

- Participate in either of the two workshops tomorrow → brainstorming on how to apply existing IM2 technologies to new settings

1. Enhancing teamwork with unobstructive devices (P. Dillenbourg, with A. Popescu-Belis)

2. Document-based retrieval of multimedia content (J. Sauer, with D. Lalanne)
   - Applications to be evaluated using Cognitive Ergonomics, in the lab and on the field
   - The Augmented ClearBoard and other applications