

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

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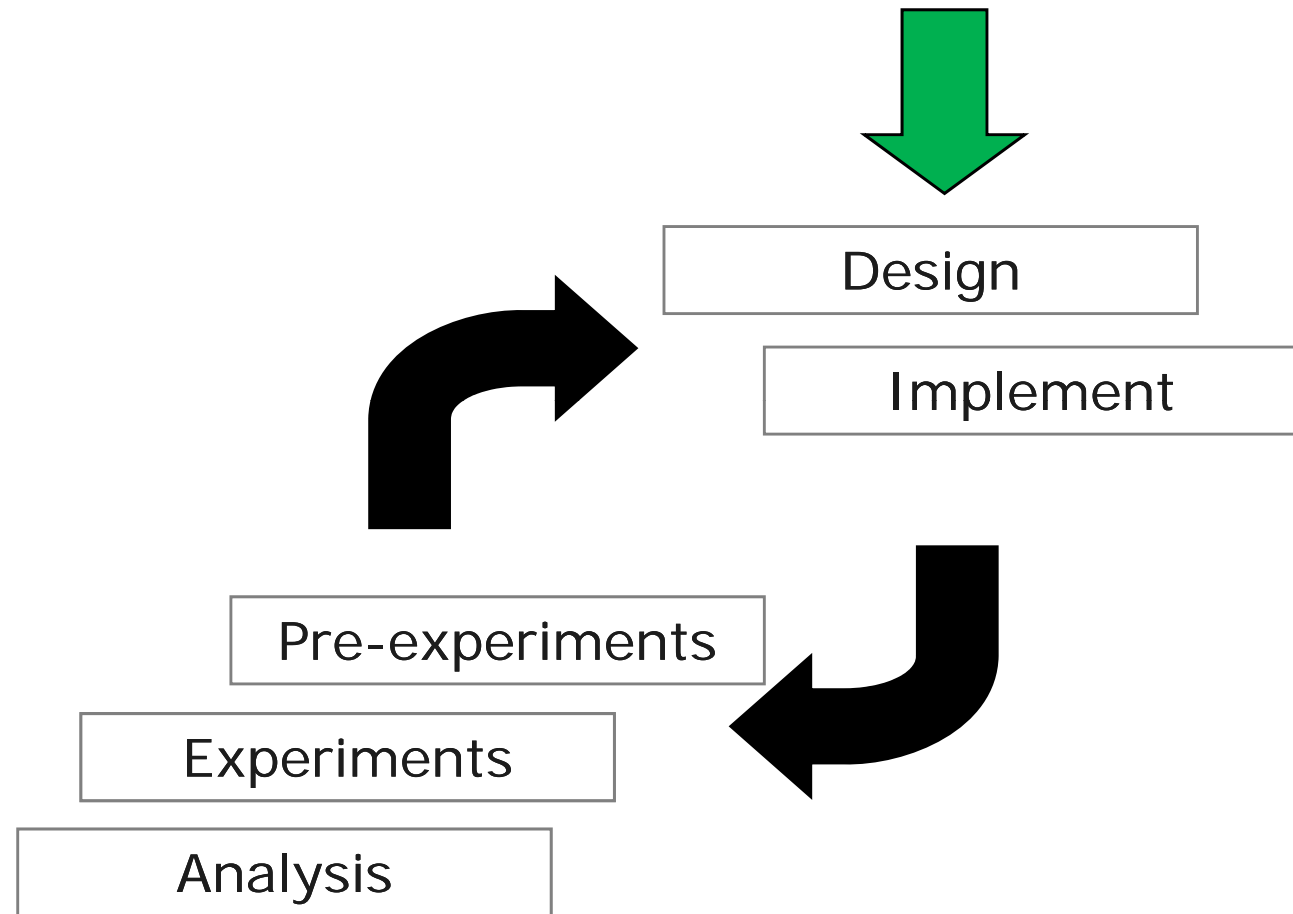
Participants

- 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*)

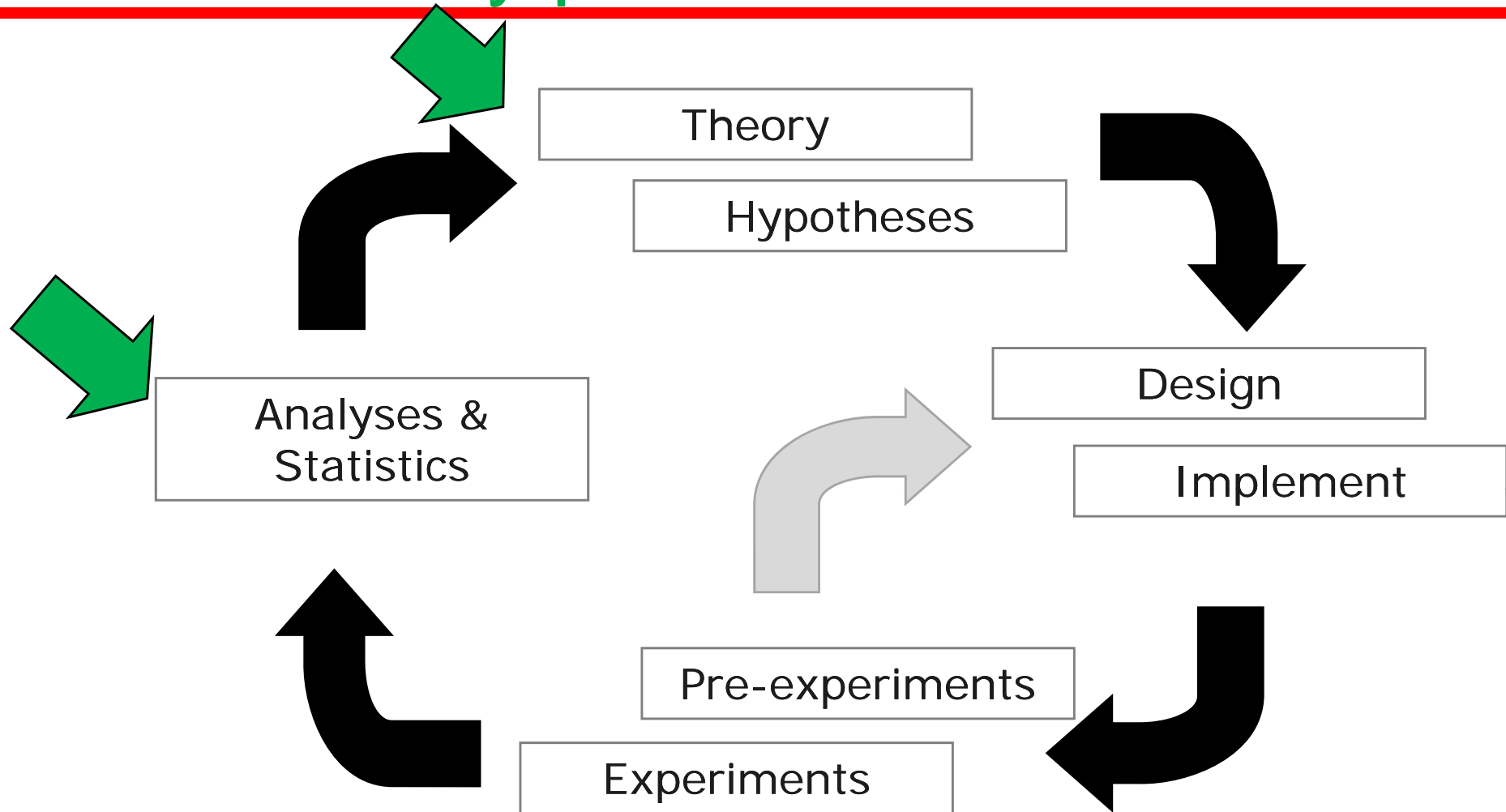
Objectives of IP2

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 CSCCL (*P. Dillenbourg*)
 - individual perspective: for human-machine interaction
 - cognitive ergonomics (*J. Sauer*)

Envisioned Applications

IP2 in IM2 Phase 3



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Two envisioned families of applications

1. Enhancing teamwork with unobstructive devices

~ with EPFL, P. Dillenbourg (*Teaching Technology*)

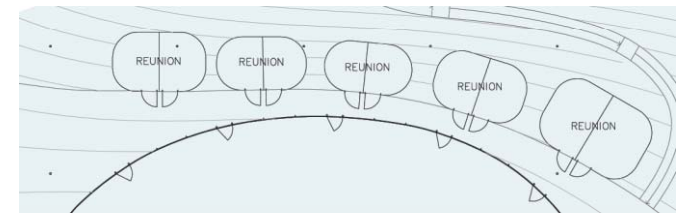
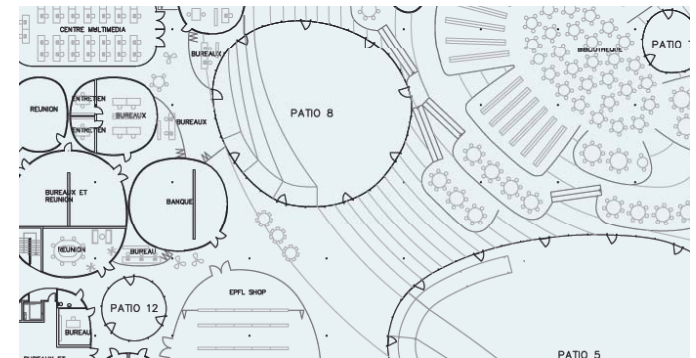
2. Document-based retrieval of multimedia content

~ 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

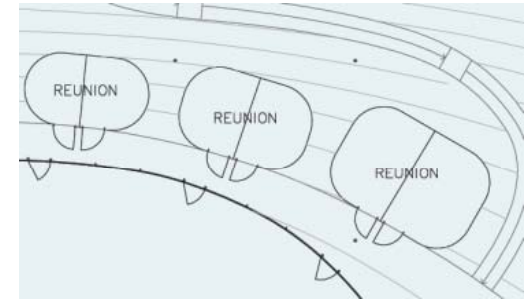
New contexts at EPFL and UniFr

- 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

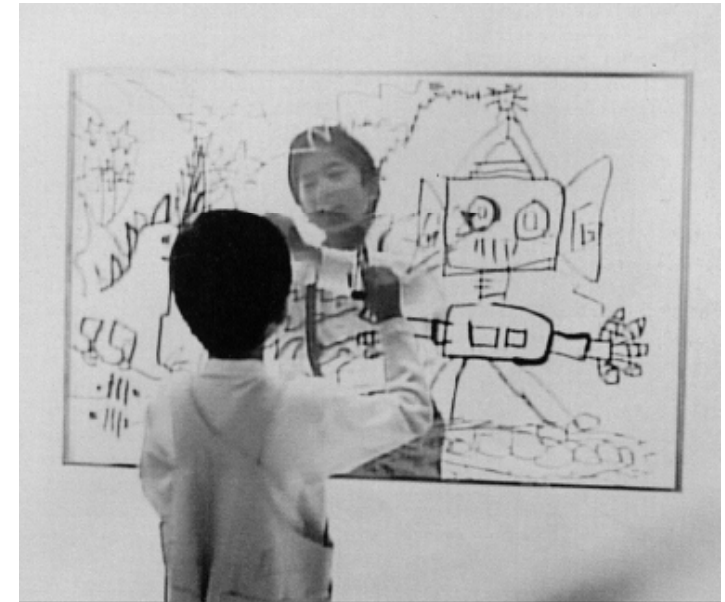
2- Document-based retrieval of multimedia content

- 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