Personalisation versus Adaptation?

A User-centred Model Approach and its Application

Victor Manuel García-Barrios (Speaker)
Felix Mödritscher
Christian Gütl

Institute for Information Systems and Computer Media, Faculty of Computer Science, Graz University of Technology, Austria

Agenda

1. AdeLE
2. Adaptation Systems
3. The Personalisation Model
4. Examples in Context
5. Personalisation in AdeLE
6. Conclusions and Future Work

What is AdeLE?

- *Adaptive e-Learning with Eye-Tracking*

- Research project by
  - Institute for Information Systems and Computer Media (IICM) at Graz University of Technology
  - Information Design at FH Joanneum, Graz

- Main aim: development of an innovative framework for personalised adaptive e-learning

Expected Results (AdeLE start: 2003)

- Improved knowledge about users' behaviour
- Identification of possible user problems and development of correction and adaptation mechanisms
- Detailed course-progress tracking, recording of consumed content, recording of cognitive processes
- Improved and personalised media and content presentation
- Identification of problematic areas in the content flow and / or content structuring
- Identification of the need for detailed additional information related to the learning content

2003: ‚AdeLE is born‘

- Facts at the turn of the century:
  - Almost all users of (adaptive & personalisation) systems are conscious of the increasing amount of well-tailored information they may access for particular needs.
  - Users know that (in most cases) they have to deliver personal data to ensure those services.
  - According to surveys (e.g. [ChoiceStream 2004]) most of them are willing to do so!

- AdeLE: how?
  - 2003: beginning of research confusion
  - Adaptive & personalisation systems→ terminological problem!

Learning from other Research Fields

Why?

- Description of characteristics of systems that are pertinent to adaptation and thus, facilitate the identification of participatory components and interaction processes.

Where?

- Biology, Climatology, Cybernetics, Evolutionary Research, Information Theory, Systems Theory, Control Systems, Signal Processing, ..

The Findings

- A lot of components.
- A lot of interactions and interaction modalities.
- A lot of characteristics.
- A lot types.

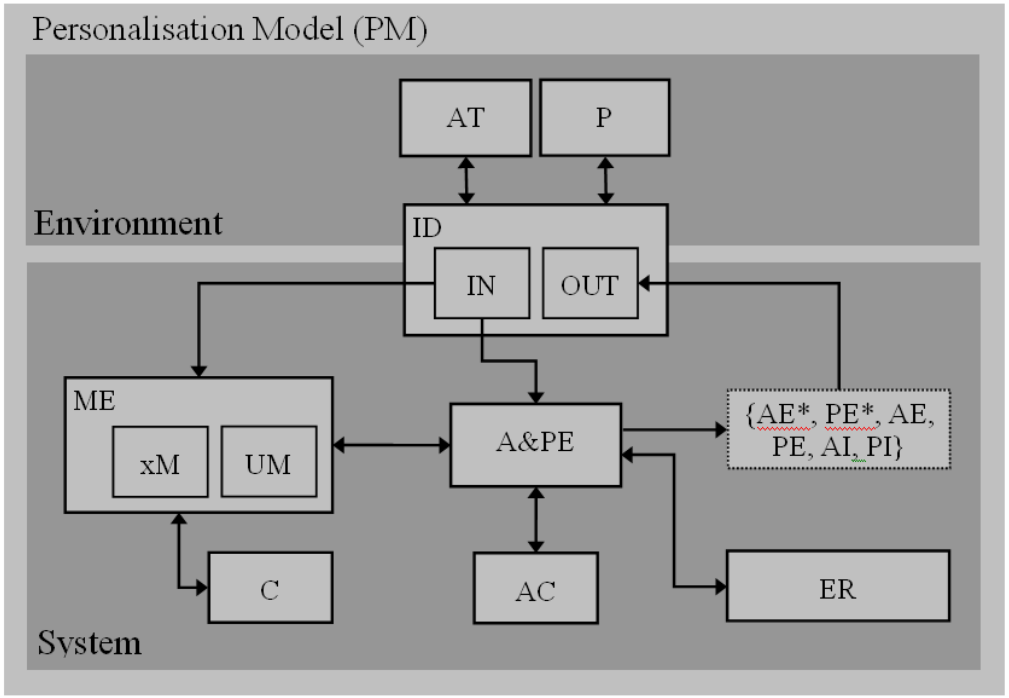
- Characteristics:
  Sensitivity (Bio.), Stability (Control Sys.), Adaptability (Cyber.), Vulnerability (Climat.), Resistance (Evol. Res.), Adaptive Capacity (Climat.), ..
- Components(?):
  Feedback (Cyber.), Population (Bio.), Success (Evol. Res.), Stimuli (Sys. Th.), Demonstration (Info. Th.), Autonomy (Signal Proc.), ..
- Types:
  autonomous / planned, anticipatory / responsive, generic / selective, short / long term, ..

Simple Personalisation Model

'Personalisation is adaptation towards a specific user'

Components (logical units!):

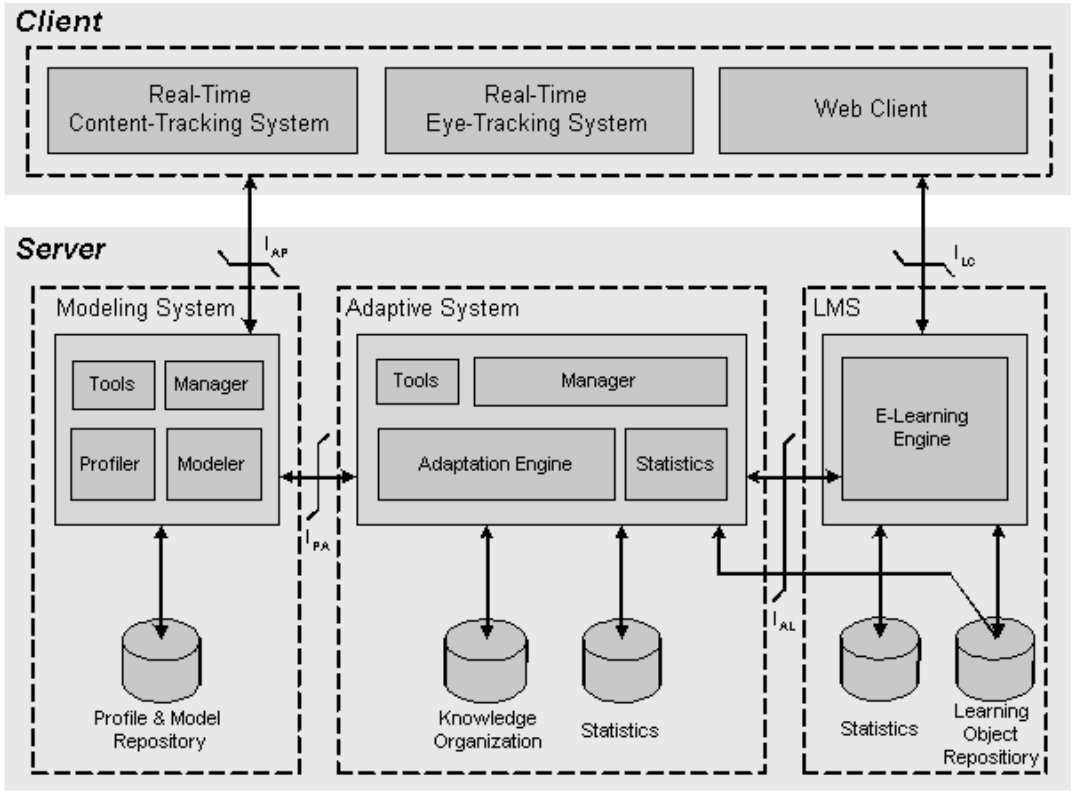
Adaptation Targets (AT)
Persons (P)
Interaction Interfaces (ID)
Input & Output Interfaces (IN, OUT)
Modelling Engine (ME)
User Model (UM)
Other Models (xM)
Collector (C)
Adapt. & Pers. Engine (A&PE).
Adaptation Configuration (AC)
Entities Repository (ER),
Adaptable/Personalisable Entities (AE/PE)
Adapted/Personalised Entities (AE*/PE*)



(Some simple) Examples in Context

- adapt brightness of user's screen {environmental illumination} ↔ personalise layout colours on screen {user suffers from colour blindness}
- adapt level of detail of information {didactical method} ↔ personalise presentation of content {cognitive style}
- adapt presentation of search results {semantic notions} ↔ personalise results by means of additional recommendations {stereotypical rules}
- adapt size of document {connection speed} ↔ personalise language of document {preferred language settings}
- adapt resolution of images {screen settings} ↔ personalise image type {preferred media type}

Personalisation in AdeLE



Different Types of Personalisation in AdeLE

- *Explicit - implicit*
  towards user profile/model - towards certain context (situation or environment)
- *Perceivable - hidden*
  user recognises the result – e.g. updating the user model for optimisation
- *Predictive - deterministic*
  some ‘work in advance’ - adaptation result ‘right now’
- *Controlled - uncontrolled*
  scrutable system and user may take control of adaptation processes at any time - do not allow the user to influence adaptation decisions
- *Individual - stereotyped*
  towards ‘one specific person’ - towards groups or anonymous users

Conclusions

- We all can - in fact – learn from other research fields.
- ‘The difficulty of the concept adaptation is best documented by the incessant efforts of authors to analyse it, describe it and define it.’ [Reeves & Sherman 1993]
- Terminological ‘order’ may lead to logical order.

Problems and Future Work

- We only intended to bring some semantic order in ’our’ minds ☺
- Evaluation of model, assumptions(!) and findings.
- User Profiling/Modeling: privacy, dynamic traits, sensor rich data, functionlets, initialisation, ..
- Adaptation System: design patterns, adapters, ..
- Eye-Tracking: user behaviour and system assumptions, integration, ..

Our Stand at IKNOW 2005

The 1st AdeLE prototype implementation
can be inspected and experienced!

Next presentation: Friday, 10:45-11:15

THANK YOU FOR YOUR ATTENTION!