

Integrating Expert Knowledge into Context Reasoning in Context-Aware Environment

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ASWN 2007, 25th May 2007

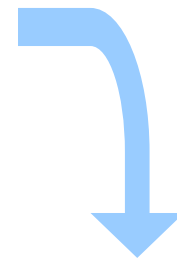
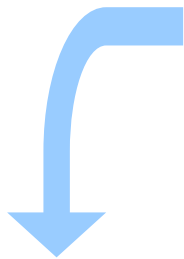
Outline

- **Personalization in the context-aware environment**
- **Shortcomings of current recommendation systems in the context-aware environment**
- **Our approach: integrating expert knowledge and learnt knowledge**
- **Conclusion**

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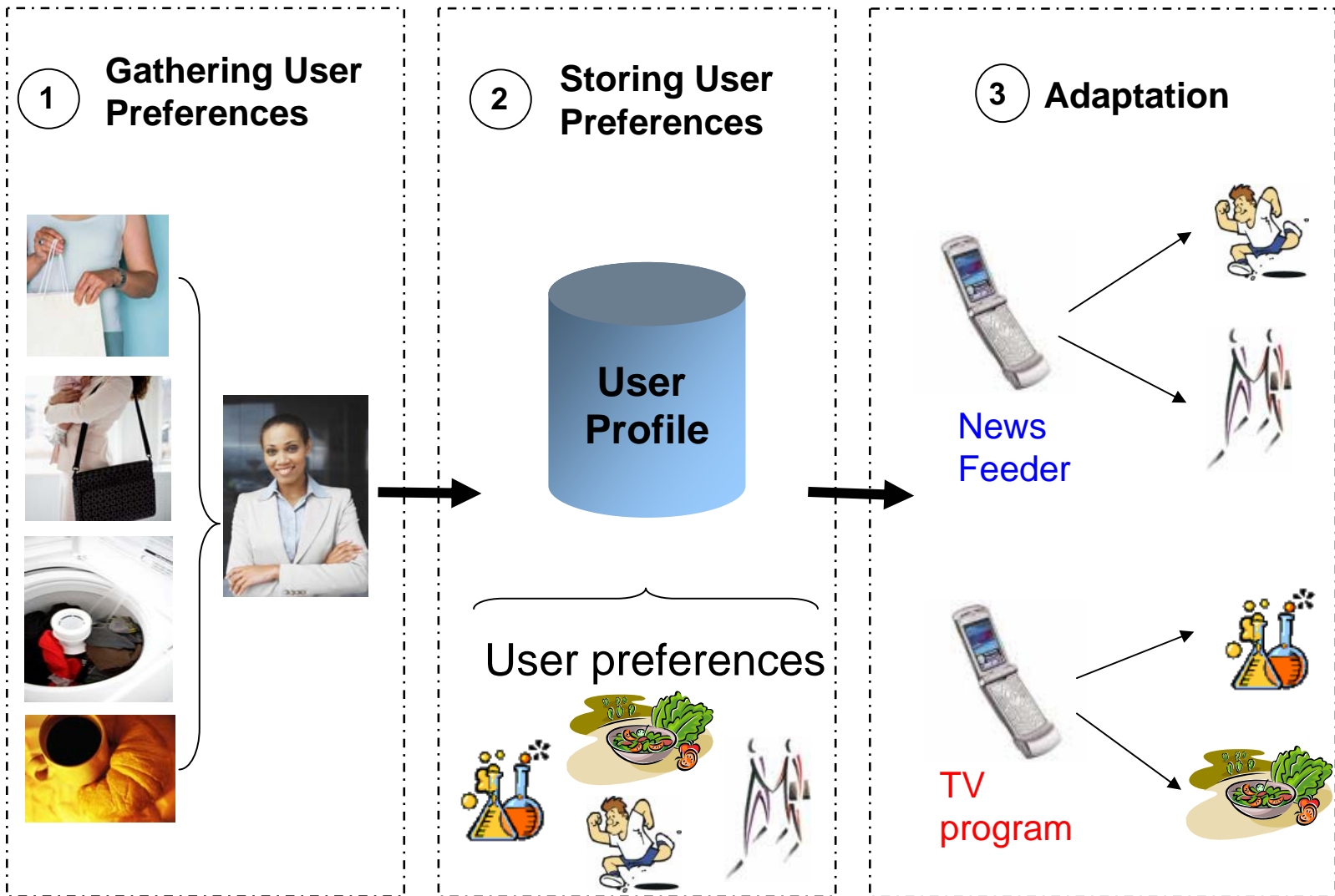
Personalization: Scenario



Personalization in the context-aware environment

- **Personalization**
 - Adapting services to user's preferences
 - Recommender Systems – used to obtain adaptation proposal
- **Advantages**
 - Assists the user when interacting with the service
 - Provides accurate information and service behavior to the user
- **Future types of service personalization**
 - Adaptation to user's situations and environments
 - Context-awareness
 - User's preferences changing in different contexts
 - Location, activity, time,

Personalization process



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Shortcomings

- **Few recommender systems consider context**
 - Although there are many existing recommender systems available
- **Limitations**
 - **Cold-start, new user problem**
 - Traditional recommender system limitation**=> non-optimal recommendation**
 - **Questionable accuracy of recommendation**
 - accurate algorithm = best adaptation proposal?
 - user does not know whether a recommendation is the most appropriate

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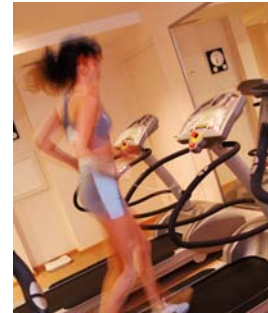
Our approach (1)

- **Provide context-aware recommendation**
 - System can react based on context changes
 - Producing user models based on
 - Users past behaviour
 - Usage records of services
 - User feedback
- **Integration of expert knowledge into recommendation process**
 - Used as complement to the learnt knowledge
 - E.g. based on advice from experts/professionals

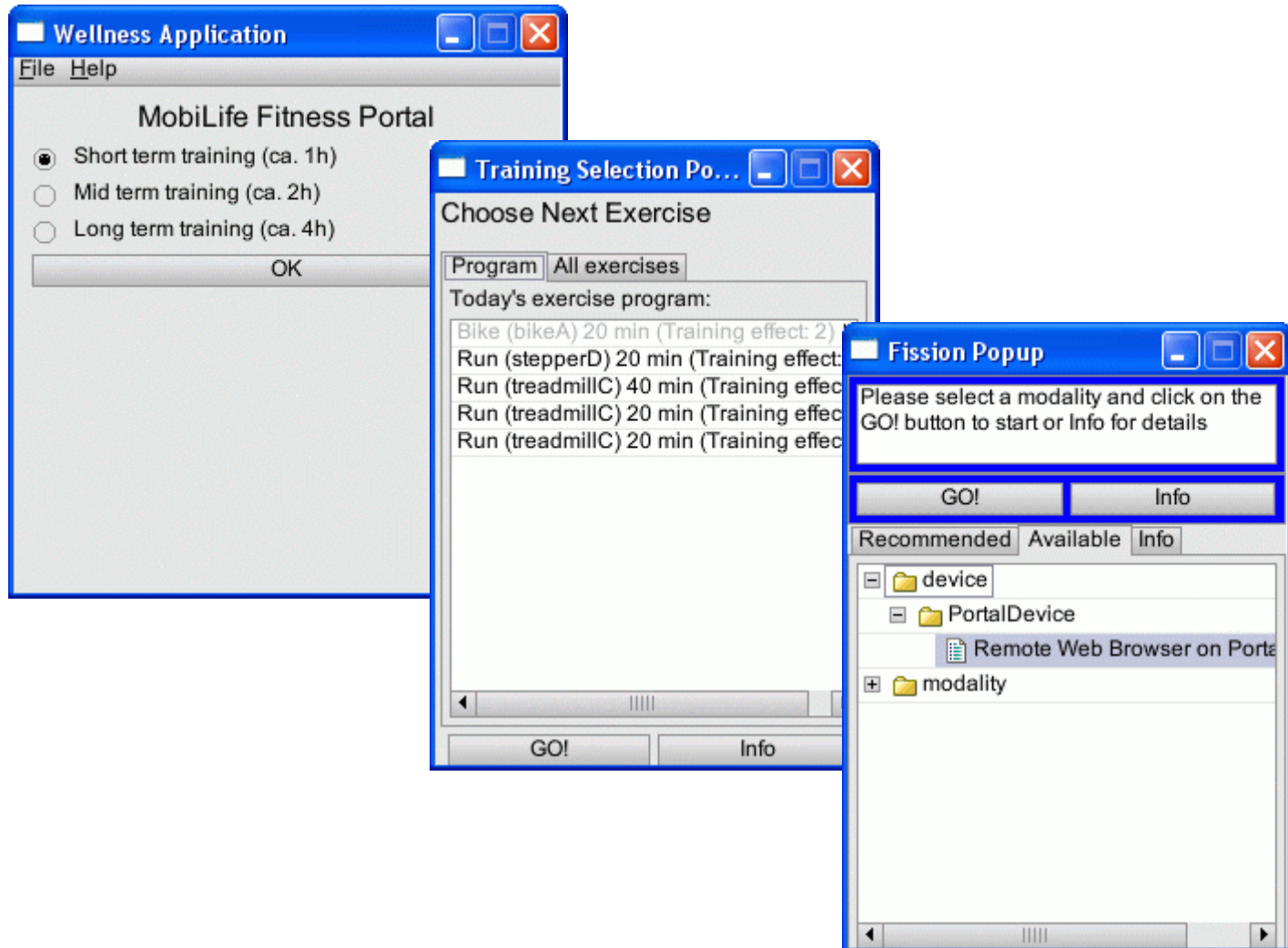
Our approach (2)

- **Decision – user centric**
 - User makes the final decision
 - Educational purpose – user can learn about what the expert says
- **Recommendation based on both models**
 - Upon context changes
 - Try to overcome the cold-start and non-optimal recommendation problem

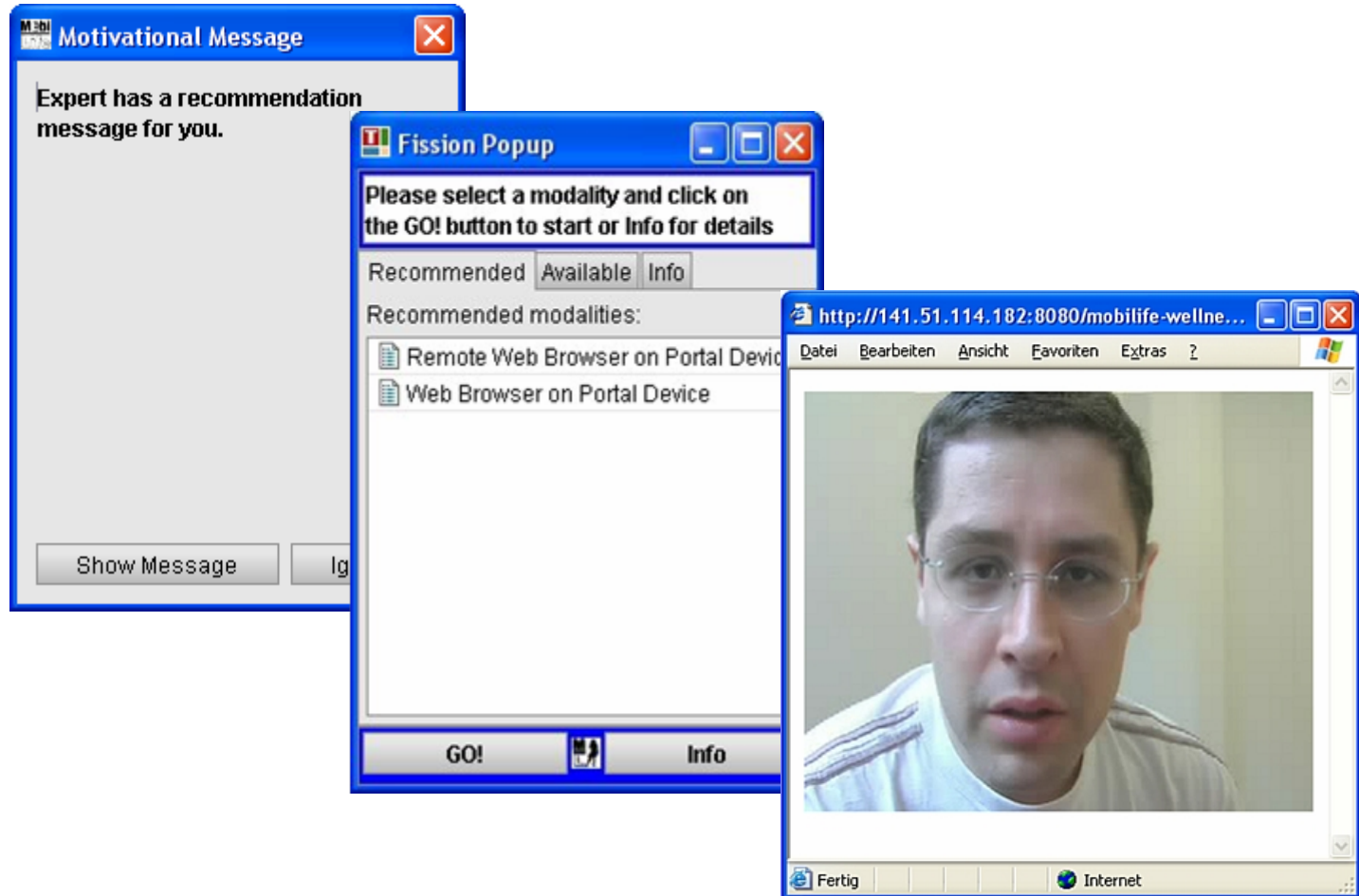
Example scenario: Fitness Training



The Wellness-Aware Multimodal System: User Interface (1)



The Wellness-Aware Multimodal System: User Interface (2)



The Wellness-Aware Multimodal System: Advantages

- **Produces useful recommendations for the following reasons:**
 - Availability of second opinion from experts
 - Context-aware recommendation
 - User-centric decisions
 - Complements learnt knowledge
 - Feedback and comparison with the Expert Knowledge

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Conclusion and Future Work

- **Personalization in the context-aware environment**
 - Devices and services react to their user's needs and requirements according to context changes
- **Current recommender systems**
 - Needs sufficient past user behaviour
 - Can produce non-optimal recommendation
- **Our approach:**
 - Integrating expert knowledge to learnt knowledge
 - Can be (re-)used by services in the context-aware environment
 - Demonstrated in the Wellness-Aware Multimodal System (WAMS)
- **Future work:**
 - User evaluation
 - Other scenarios

Questions ?

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