

Person-Centric Service Adaptation

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- What is Person Centric Service Adaptation
- What is needed to do person centric service adaptation
- Approaches:
 - Natural user interaction – inference of intent
 - Community-based constraint of adaptation
- Conclusions and Further Work

What is Person-Centric Service Adaptation?

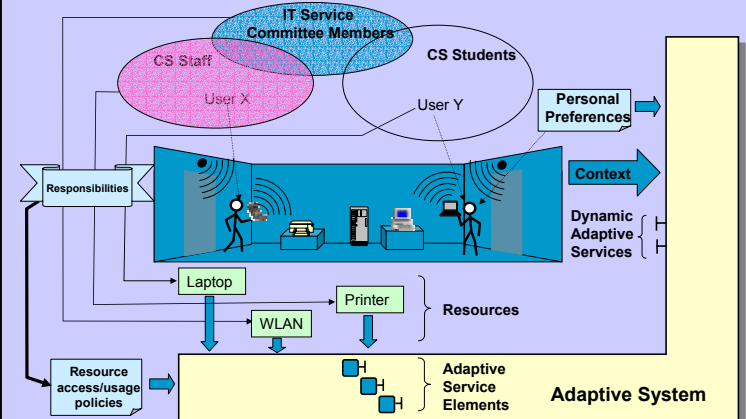
- Service Adaptation: how a service's behaviour adapts to changes in context and resources
- Approaches are often technology centric and fail to fully empower the user
- Adaptation must allow people to:
 - Easily specify what service behaviour they require
 - Exert constraints on adaptive behaviour of services
 - Maintain a sense of control over adaptive behaviour
- Person Centric Service Adaptation:
 - Interpretation of user needs
 - Mapping to adaptive technologies

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Overview

Example: Tutorial Meeting



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Adaptive Systems Technologies

- Service Composition
 - Dynamic assembly of new services from existing services
 - Semantic service mark-up for automated composition
 - Target service specification required
- Policy-based Systems
 - Run time rules specifying reaction to specific events and conditions
 - Applied in system access and network management
 - Must map user level to system level policies
- Adaptive Hypermedia
 - Adapts delivery and navigation based on user models and other context info
 - Increasingly personalised, e.g. learner model in eLearning AH
 - Apply to adaptive services

Requirements on Person-Centric Adaptivity

- Need an accurate understanding of **what** the user wants to do
 - Natural expression of intent
 - Handling imprecision
- Provide **constraints** on adaptation
 - Puts people in ultimate control of adaptive behaviour
 - Express constraint in terms of resource access and usage rules

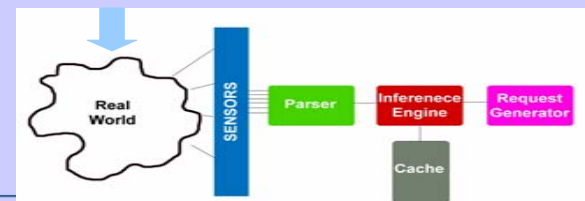
Understanding what users want to do

- Ubicomp Environments:
 - Sensor rich
 - Multiple ways to monitor user action
 - E.g. location, voice and gesture recognition, gaze tracking, schedule monitoring
- Combine multiple context streams to infer user intent, i.e. task goals
- Transform to task description
 - Digestible by the adaptive system – service spec
- Gather user feedback
 - Learn accuracy of task description
 - Improve inference process

Intent Inference: Initial Experiments



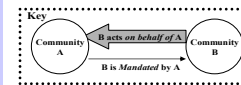
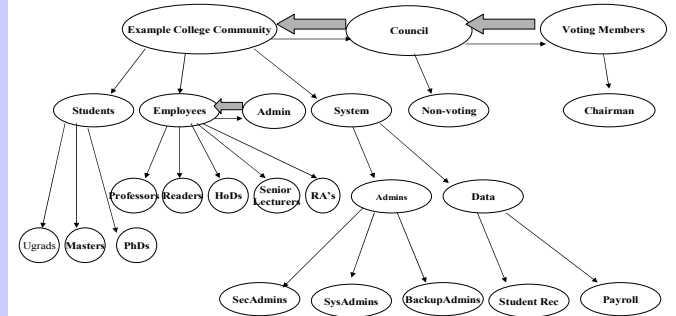
- Two simulated user input streams
 - gaze tracking and voice recognition
- Map to ontological model of real world
- Bayesian networks used for inference



Specifying Constraints on Adaptive Behaviour

- Empowering users means constraining adaptivity
 - For individuals: simple personal preferences
 - For organisations: shared resources result in complex policy rule sets
- Propose community-based policies
 - More flexible than role-based policies
 - Better support for flat organisations
 - Distributes policy authoring over organisation structure
 - Naturally integrates policy conflict resolution with business process improvement

Community based Policies: Initial Results



- Established semantics of community-based policy mechanism
- Implemented community-based overlay onto existing role based policy platform (PONDER)

Conclusions and Further Work

- Examining techniques for more natural interaction with adaptive services mechanisms:
 - For users - by inferring intent from natural communication
 - For communities - by integrating policy authoring into existing decision making structures
- Further Work
 - Integration with adaptive service mechanisms
 - Exploitation of ontology-based semantics
 - Intent Inference
 - User trials
 - Real sensor input, other context sources
 - User feedback and learning
 - Community-based policies
 - Model live Internet communities
 - Community federation
 - Integrate service, resource and policy models