Key Contribution
• Establish the theoretical foundations for using personal goals as foundations for creating understandable interfaces enabling people to manage and control stores of personal data from pervasive computing sensors;
• Design and evaluate a software framework that integrates wellbeing sensors and goals for user control over personal data;
• Design and evaluate the user interface with mechanisms enabling people to efficiently manage and control personal data over long term.

Goals as Foundations for User Control over Personal Lifelong Data in Pervasive Computing

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Fig 1. Integrating personal data and goals in pervasive computing environment.

Why we need user control
• Enable users to decide what personal data to store over long term
• Help users control the management of their long term data
• Ensure users’ right to control external access to their data
• Enable users to view and understand the information stored and inferred by the system
• Ensure users’ right to be forgotten

Personal Wellbeing Goals
Personal goal setting and monitoring can help people achieve behaviour change and achieve a healthy lifestyle. We distinguish lifelong goals as:
• End Goals: Long term goals; the changes occur slowly. For example, losing 5 kilos of weight, reducing LDL cholesterol.
• Means Goals: Short term goals; each goal is intended to serve an End Goal. For example, avoiding inactivity, walking 10,000 steps. Each end goal may have several means goals.

Fig 2. Storage architecture for personal lifelong data in pervasive computing environment. Each storage level is managed in terms of means and end goals and has an associated user control interface.

Mnemonic: User Interfaces for controlling personal data
1. I want the Active Dashboard to show my recent progress on current goals. Yes/No?
2. I want the Long term Dashboard to show my long term progress on all goals. Yes/No?
3. I want to view the trends over months. Yes/No?
4. I want summaries for each. Yes/No?
5. I want to view all deleted data. Yes/No?
6. I want to remove all deleted data. Yes/No?
7. I understand this. Yes/No?
8. I don’t understand this. Yes/No?
9. Continue set-up.

Fig 3. Interface to specify control preferences for selective storage and management of personal sensor data over long term (control preferences for 1-Working store, 2-Long term store, 3-Archive and 4-Trash)

Fig 4. Archive Browser – View and manage fine grain sensor data (e.g., 1-search window, 2-Fitbit 1 minute step count data, 3-showing storage usage by different sensors)

Fig 5. Long term Dashboard – View and manage Long term data for goals (Long term progress on daily step goals)

References