An Intelligent Medicine Cabinet Proposed to Increase Medication Adherence

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Motivation

A complicated task:
• Which medicine when?
• Is a medicine expired?
• Are there incompatibilities between them?
• Etc.

→ An automated solution to support people with medicine taking!
Content

- Motivation
- Objectives of the project
- Basics and used technologies
- The concept of the intelligent medicine cabinet
- Summary and outlook
Goals of the intelligent medicine cabinet:

• Support users with medication at home
• Hints on medicine taking
• Administration of prescriptions
• Warning in case of danger:
  • Incompatibility between medicine
  • Allergies
  • Expired medicine
  • Child safety
  • Hints on medicine that is shortly running out
• Multi language support
• Intuitive and simple usage for everyone
Intuitive and simple usage of automated systems

- Complicated operation
- Hidden functions
- Not user specific
→ Lack of usability!

Approach

- Involve users in the development (User Centered Design)

- Provide user and situation specific interaction

- Consider the users’ mental model
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Overall idea

- User interacts in the conventional manner
- He/She receives auditive and visual instructions
Identification of the user, the medicine and the prescriptions

RFID-Technology

• Consists of an RFID reader and one or more RFID tags
• Tags are paper-like chips, which contains data up to 112 bytes
• RFID reader has an antenna through which tags are detected with radio waves
• A tag consists of ID and data fields
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Concept
From conventional to intelligent

Prescription

Intelligent Medicine Cabinet

User

Medicine

- e.g. correct schedule
- instructions
- e.g. compatible and non-allergic
- information on prescription
- information on user
- information on medicine
- e.g. Correct medicine and dose
Concept
Analysis of information

• User’s name
• Medicines to be taken
• Duration of treatment
• Frequency of takings

Prescription

• Quantity to take
• Delay action
• Acceptable delay

User

Medicine

• Name
• Age group
• Language
• Allergies

Mutual verification
e.g. prescription for this user? Correct time?

Mutual verification
e.g. Valid prescription for the medicine?

Mutual verification
e.g. Compatible?
Dose?

→ Mutual verification of all information
→ Rule-based verification
Concept
System Architecture

RFID tags

Speech output
Visual signals
Web Interface

Program logic
Prototype

Film
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• **Summary**
  • Intelligent medicine cabinet
    • Works similar to conventional medicine cabinets
    • Can be used without technical background
    • Provides visual and auditive instructions
    • Administers prescriptions
    • Warns the user against hazards

• **Outlook**
  • Retrieving and updating the information from internet
  • Integration of wireless monitoring and maintenance
Thanks for your interest!

Questions?