"If you don't like something, change it. If you can't change it, change your attitude. Don't complain."
Maya Angelou
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- Goals of the workshop
- Example scenario with some atomic services
- Assignments
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- Analyzing of the solutions
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Goals of the workshop
Goals of the workshop

What does tailoring mean.

Why tailoring is useful for U-Care project

Discussion on service tailoring - preliminary results
- An example scenario
- Assignments
- Solutions

Can we define a ‘generic’ service tailoring process
What do we mean by tailoring

This is Dr. Thompson—He’ll be making you fit into your suit today.
What is tailoring

Problem

• It is economically infeasible to develop personalized home healthcare systems for each individual patient.

Solution: Tailoring

• Home healthcare systems should provide a set of patient-neutral healthcare-related functions which can be configured and composed according to the needs and preferences of each individual patient.
Necessity of service tailoring
Jan and Linda are an old couple who live together in their private home, and have different medical conditions. The following supportive ICT applications can be helpful for them:

- Not to forget taking medicine (reminder function) and to take the right medicine in the right quantity (dispenser function).
- To stimulate activity (monitoring, advisor and reminder functions) or to support social interaction (interactive video/audio communication function).
- To detect hazard situations (monitoring and analysis functions) and to trigger a request for help (alarm function).
Jan and Linda have different requirements and preferences, which occur in different situations and at different times:

Therefore the mentioned applications may have to deliver their functionality in different ways in accordance with individual patients' requirements, preferences and circumstances.
Service tailoring example scenario
A reminder service to send a reminder *(to a static location)* to help them not to forget to take different medicines at regular times.

A dispenser service to help them to take right medicines in the right quantity and detect whether they take the medicine or not.

An alarm service to trigger alarm if they do not take their medicine.
Required atomic services

1. Patient id
2. Date & Time
3. Repetition time out
4. Number of repetition
5. Message
6. Device

Subscription
Where, Who, When, and What

Reminder Service

Send message
To the client

Enable device
To a specific device (e.g., dispenser service)

Trigger Alarm
To the Alarm service

Examples:
1. Mr. Jansen
2. At 10 AM & 8 PM, Everyday, From: 10\textsuperscript{th} May 2009 till: 30\textsuperscript{th} June 2009
3. 5 min
4. 3 times
5. Patient Id, it is time to take your medicine
6. TV (or the URL/IP address of TV)

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Required atomic services cont.

Provide Medicine
- Manual Enable activated by user by pushing button

Enable Dispenser
- Automatic Enable activated by another service/device

Dispenser Service

Medicine Taken
- Notifies that medicine has been taken by the user

Examples:
Required atomic services cont.

1. Who
   - Source of alarm
   - Where?
   - Which message?

2. Patient id
   - Source

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Alarm Service

Configuration: Where to send based on received information

Alarm message: To the caregiver

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Examples:

1. Mr. Jansen
   - Reminder Service
   - Inform Mrs. Maria
   - Mr. Jansen didn't take his medicine

2. Mr. Jansen
   - Reminder service
Composition for our scenario.

Composition of the three atomic services for proposed scenario Using UML use case diagram
Assignments
Assignments

1. Adding default and dynamic location
   - assume there is a predefined default device for receiving the reminder message
   - if there is no reaction on the reminder message within half a minute, a monitoring system should find the current location of the intended recipient of the reminder
   - after another half a minute if there is still no reaction on the reminder message, the system should send an alarm message to the caregiver.

2. Raising alarm when heart rate exceeds a threshold
   - assume that the user is doing exercise and has heart related medical problems; heart-rate should not exceed certain upper limit
   - remind user about high heart-rate and ask them to be calm and rest
   - if the heart-rate is not down within half minute, then suggest user to take medicine x (predescribed) which helps in reducing heart-rate
   - After another half a minute, if the medicine was not taken or the heart rate still has not sufficiently dropped, the system should send an alarm message to the caregiver.
Identify the required basic atomic services for the given scenario

May use, modify or extend the existing three (atomic) services (Reminder, dispenser, and alarm).

If the existing services are not sufficient, may recommend/define new atomic services.

Compose and configure the basic atomic services which fulfill the requirements of the scenario
Solutions
Assignment 1, our solution

Reminder Service

Subscription

Where, Who, When, and What
Disable Repeat (push)

Send message

To the client
Enable device
To a specific device (e.g. dispenser service)
Trigger Alarm
To the Alarm service
Find location
To the location service

Examples:

1. Mr. Jansen
   - At 10 AM & 8 PM, Everyday, From: 10th May 2009 till: 30th June 2009
   - 5 min
   - 3 times
   - Patient id, it is time to take your medicine
   - TV (or the URL/IP address of TV)

2. Mr. Jansen, it is time to take your medicine

3. Mr. Jansen
   - Location
   - Reminder

Location Service

Request

Patient id
Ask for the current location of the user

Response

To the requester

Examples:

1. Mr. Jansen
   - Living room

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Assignment 1, our solution cont.

Diagram:
- Reminder Service
  - (1) Subscription
  - (4a, 4c) Send message
  - (2, 4c) Send message
- Alarm Service
  - (1) Configuration
  - (5a, 6b) Alarm message
- Dispenser Service
  - (2) Enable dispenser
  - (4a, 6a) Disable repeat
- Location Service
  - (3b) Get location
  - (3a, 5b) Provide medicine

Roles:
- Caregiver
- End user

Date: 29 September 2009

Title: Service tailoring
This solution is pretty much similar to the previous solution.

Reminder service: to whom, when and which time the message has to be sent.

Notifier service: to find the destination (where) of the reminder message via location service.

An alarm yes/no parameter added to the reminder subscribe input.

Examples:
- Mr. Jansen
- Mr. Jansen it is time to take your medicine
- TV (or the URL/IP address of TV)
To reuse atomic services, building blocks need to be basic.

Most of the atomic services identified by group 2 have only one input and one output operation.

Generate Message service (GMS): based on the ‘user id’ and rules creates desired message.

Device service (DS): each user may have different devices with him and based on the location, he/she may have different preferences.

Application logic service (ALS): this service store the user agenda in it and based on different events creates an output.
Reminder service: to distinguish different types of reminder messages, a ‘type’ parameter has been added to the subscription operation.
Assignment 2, our solution cont.

Service tailoring
Decision service: user (usually caregiver) may write different rules through this service, and based on that this service can create different outputs.
Lessons learned and conclusions

“You’ve been working too hard. Instead of a heart beat, I’m getting a fax tone.”
Both two groups:

• Identified **similar** atomic services as those identified before the workshop.
• Tried to **decrease** the number of parameters and operations of services.
• Consequence:
  • **more atomic services** are needed for a composition.
  • these atomic services may not useful anymore in a **specific domain** such as homecare.
• Considered services which end users can configure with different **rules**.
• Defined new atomic services
• Some of the predefined atomic services has been modified
• Could solve the assignments as expected, using some of the given atomic services.
For service tailoring:

- U-Care platform should provide a couple of patient-neutral homecare services (atomic services)
- End users can configure and compose these atomic services to adapt them to their requirements, situation and environment.
For the future

What is the granularity and generality of the atomic services?

Which users should be able to tailor? What and how to control this?

Can we define a ‘generic’ service tailoring process?

How can we automatically transfer our model to an executable way?

How can we modify the atomic services?
Tailorability is an important architectural concern:

- End user is allowed to configure and adopt a specific system to his/her requirements (From a technology centric to a user centric approach).

We should define a ‘generic’ service tailoring process.

- (a) Identify and model the required basic atomic services
- (b) Configure and compose these basic atomic services for different patients and environments.
- (c) …