Group 08 FallPrevention

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Chapter 1

Introduction

Damage from falling is the main cause for hospitalization among the elderly. In addition to the enormous costs incurred to society, falling is also the cause of great personal tragedy. As the use of computational devices becomes more common, it seems natural to examine how such devices can contribute to preventing such accidents.

This project is a cooperation between SINTEF and a group of students at NTNU for the course IT2901. Its goal is to develop a model for risk level of movement based on common sensors found in Android smart phones, and build a API to make the model accessible for third-party developers.

Chapter 2

Requirements

2.1 Initial requirements

According to the project description, the following should be developed:

- A model of physical movements based on common movement sensors found in Android smart phones.
- An Android content provider that stores and makes available the data in this model through an API[1] .
- An example application that can visualize this data.

2.2 Understanding the requirements

The group entered the project with a narrow understanding of what should be done, because the description was very general. Hence the general description, a meeting with the customer was arranged to get a broader explanation of what the project contains.
The meeting served its purpose and filled in a lot of holes that was missing from the official description:

[1] Application Programming Interface

- The development process in question uses a iterative approach. This essentially means that the requirements expands as the time goes, and to define the requirements from the beginning is impossible. This chose was made in collaboration with the customer.
- The team at Sintef got a wide range of experts to help the group with health-specific features, e.g. making the algorithms to recognize movements.
- The customer expected weekly meetings with the whole group present, and that goals had been achieved before each meeting. At each meeting a new goal until next meeting was set.

Chapter 3

Alternative solutions

Here we describe possible solutions to fulfil the requirements.

Chapter 4

Project Management

4.1 Development process

The customer favoured the use of an iterative approach to the development process, where every sprint added a new layer of functionality, either to the application or the underlying model. Each sprint lasted for a period of 1-2 weeks, and the exact content was worked out in collaboration with the customer. Short term plans were favored over longer plans, due to the flexibility provided. While this made formulating definite goals for the final product difficult, the customer and the group were in agreement that due to the research intensive nature of the project, a high degree of flexibility was required.

It was decided by the developers that they would have online meetings twice a week and an offline meeting once a week. The working hours was set to not less than 20 hours a week, but the developers was free to choose when to work themselves.

4.2 Team Roles and Organization

There was not much place for specific roles among the group, as it was a small group, and the project requiring that all the members are capable and willing to work at all the tasks that needed doing. Roles that was set for

the Group was therefore mainly organizers, so that one person was to keep awareness of what work needed to be completed in a particular domain:

Organizer Elias was made organizer, and getting the responsibilities of reminding the group of what to do.

Documenter Johannes was tasked with organizing documentation and distributing the work of writing the report to the group.

Chapter 5

Development Environment

5.1 Code-sharing

It was requested that the group would use the tool Github to share code and perform version control. Github had browser-based interfaces and downloadable clients, meaning all the members of the group could make use of it.
The repository that was to be used for the project was called "Fall_Prevention_2013".
The first content shared in the repository was this report, in form of .tex files and a .pdf. Later this repository would also be used to keep the code in order.

5.2 IDE

The demands from the IDE was as following:

- Could be used with Android programming
- Was sufficiently understood by the team members to be used

To fill these requirements, and because there was plenty of tutorials that could be found, the group decided to use the Eclipse IDE, with add-on's to more easily code and deploy towards Android.

5.3 Prototyping

Graphical prototyping was done with a service called ”proto.io” and with paper scetches. The scetches were subsequently shown to the group and the customer.

Chapter 6

Implementation

6.1 Plans

Nearing the end of every spring, the customer and group agreed upon the content of the following sprint.

Sprint nr.	Date	Summary
Sprint 1:	03.02.13 - 08.02.13	Developing user stories and paper prototypes of the GUI.
Sprint 2:	08.02.13 - 15.02.13	Developing a mock-up application demonstrating the GUI.
Sprint 3:	15.02.13 - 22.02.13	Improving UI and functionality for the prototype, researching medicinal factors.

6.2 Architecture

The application is made in a way that is common for all android applications. This means that

User interface is described in xml layout files that is called in java code. Strings and resources is placed in a separate folder and file, to be accessed by the code as needed. This is to separate content and layout in the UI.

6.2.1

Appendix A

Appendix

Appendix content goes here.

A.1 Mockups

After the second meeting with the customer, the group had a sketch that was to be used as a starting point for the mock-up application.

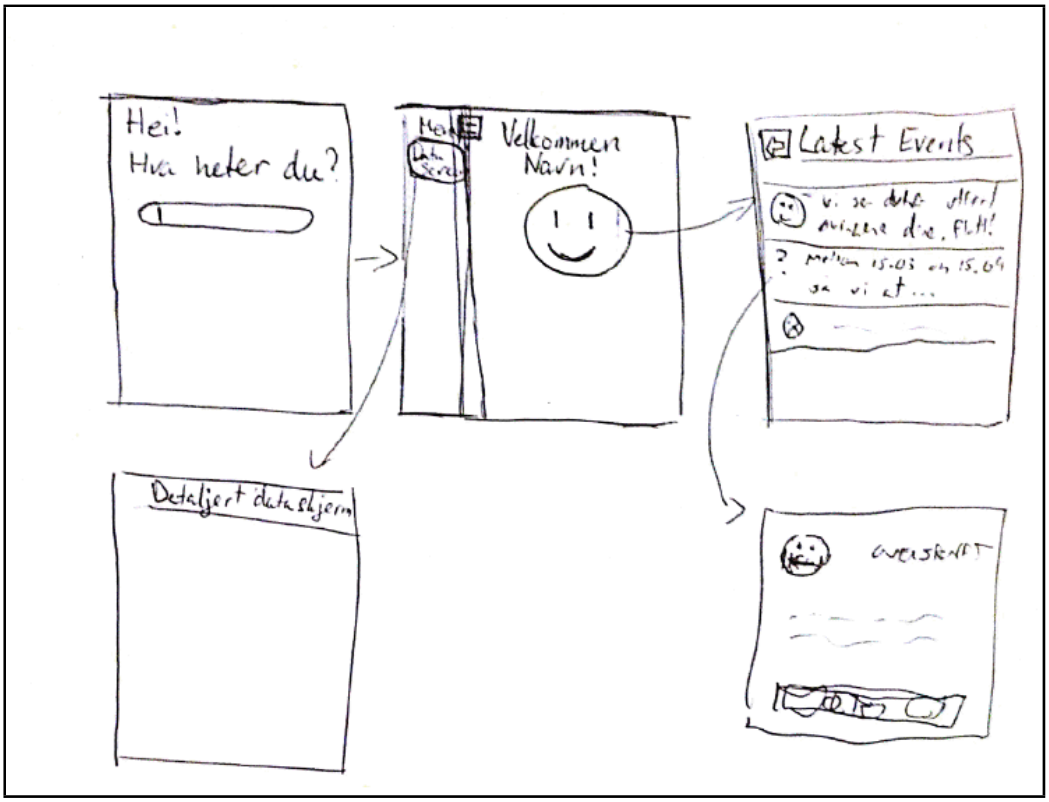

Figure A.1: A mockup of the program flow, text is just scribbling

A.2 Reports