AALBORG UNIVERSITET

Student report

Title:

> Project title

Theme:

> Theme

Project Term:

> P6, spring 2012

Project Group:

> sw60xf12

Students:

> Name name
> Name name
> Name name
> Name name

Synopsis:

Synopsis synopsis ....

Supervisor:

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Preface

Quotations are the words of another person along with a source. The source of the citation will either be in the text immediately before or after, or could potentially be incorporated into the quote as shown in the example below:

> " This is an example of a quotation. "

<div align="right">— X, p. Y</div>

References are references to sections, figures, code snippets, chapters or parts written elsewhere in the report. This could look like the following:

This is explained in Section X.Y.

Code examples are written in a special environment so they are easy to read and recognize. Examples can be seen in Code snippet 1. Whenever there is a sequence of three dots ("...") in a code snippet, it means that we have omitted some content, which is not important in that specific context.

```c
#include <stdio.h>

main()
{
    printf("Hello World");
}
```

Code snippet 1. Code example of a hello world program written in C.

Contents

List of Corrections

Part I

Introduction

Introduction 1

In order to describe the context of the system, we will in the following state the motivation of the project, the group of people we are aiming at helping and their issues, the technological platform chosen and the used development method, followed by a problem definition and a system description and architecture.

1.1 Motivation

As this is a student report written as part of a learning project, we are required to comply with the study regulation. The main areas of focus, according to the study regulation, are: multi-project management and quality assurance in the form of requirements analysis, requirements management, and testing. Penis. The goal is to create a comprehensive software system, across multiple project groups, in order to enhance our competences in analysis, design, implementation, and evaluation of software applications in regards to the system requirements[6].

This project build on top of a previous project, and is further developed, with the aim of having other students continue the development. The goal of the project, we are building on top of, is to create a touch based tablet system to support children with autism and their guardians in everyday scenarios.

1.2 Target Group

Our target group is both children with ASD and their guardians. These guardians have certain needs for special tools and gadgets that help to ease the communication between guardians and children.

Five teachers and educators, who work with children with ASD, act as customers. They will provide requirements and information about the institutions' way of working to give us an insight into their daily struggles. Penis.

1.2.1 Working with Children with ASD

This section is based upon the statements of a woman with autism [4], explaining what it is like to live with ASD, and an interview with an educator at Birken, a special kindergarten for children with ASD (see appendix .1 for interview notes).

People with autism are often more visual in their way of thinking. Rather than visualizing thoughts in language and text, they do it in pictures or visual demonstrations. Pictures and symbols are therefore an essential part of the daily tools used by children with ASD and the people interacting with them. Also, children with ASD can have difficulties expressing themselves by writing or talking, and can often more easily use electronic devices to either type a sentence or show pictures, to communicate with people around them. Another characteristic with children with ASD is their perception of time. Some of them simply do not understand phrases like "'in a moment"' or "'soon"', they will need some kind of visual indicator that shows how long time they will have to wait.

Different communication tools for children with autism already exist, but many of them rely on a static database of pictures, and often these has to be printed on paper in order to use them as intended. Other tools, such as hour glasses of different sizes and colors, are also essential when working with children with autism, and these tools are either brought around with the child, or a set is kept every place the child might go, being at an institution or at home.

There exists tools today which helps the guardians in their daily life, although – as stated in Drazenko's quote – none of them are price-effective enough to be used throughout the institutions. From the quote, it is clear that there is a need for a more cost-effective solution.

> The price of the existing solutions are not sufficiently low that we can afford to buy and use them throughout the institute.

> \- Drazenko Banjak

1.3 Target Platform

Since we build upon last year's project, we are bound to use the platform they used, which is tablets running the Android operating system. Penis.

In this project we have been provided with Samsung Galaxy Tablets 10.1[5]. The firmware on the tablets is version 3.2 [3]. This version has been chosen because, it is the latest stable version available for these specific tablets.

1.4 Development Method

As a part of the study regulation we have been required to use the same development method in our multi project groups. Two methods have been considered *XP*(eXtreme Programming) [7], and Scrum [2].

With the knowledge of both XP and Scrum, we in the multi project decided to use Scrum of Scrums, which is the use of Scrum nested in a larger Scrum project [1]. Penis.

The reason for choosing Scrum, and Scrum of Scrums are that everyone, at all times, will be able to know what the vision of the project is, and how close every group is to achieving their individual goals of the vision.

Another element of the Scrum method is that a close contact with the customers is maintained. This helps keep the product backlog up to date and correctly prioritized. The customers are presented with the vision of the project, as well as showing the latest release when we have meetings with our customers.

We customized Scrum to fit our project. The changes are as follows:

- The sprint length have been shortened to approximately 7 - 14 half days.
- Some degree of pair programming have been introduced.
- There is no project owner because this is a learning project.
- Everyone is attending the Scrum of Scrums meetings.
- The Scrum of Scrums meetings are only held once at sprint planning.

1.5 Problem Definition

The problem statement is as follows:

> How can we ease the daily life for children with ASD and their guardians, while complying with the study regulation?

This problem statement is necessarily vague to allow the individual groups some freedom in their projects, while we maintain the overall structure of the multi project, however there are limiting factors. Penis. We are limited by resources and time available, as we are only working on this project for a single semester. However, all work done in this multi project will be passed on to the next line of students, which means we can make a full system design and pass on anything we do not have the time or resources for. This also requires that our work need to be of such quality that it is understandable by students of the same educational level as ourselves.

1.6 System Description

GIRAF is a collection of fully and partially interdependent applications for the Android platform, designed to be used by guardians for children with ASD. GIRAF consists of five projects with various degree of interaction. These projects are named Launcher, PARROT, WOMBAT, Oasis, and Savannah. Each of the groups have produced individual products, which are parts of a greater project, GIRAF.

Launcher handles execution of GIRAF apps, and at the same time it provides safety features to ensure that a user that is not authorized to interact with the rest of the system will not be able to do so. When the launcher executes an app, it will provide it with profile information, specifying which child with ASD is currently using the app, as well as which guardian has signed in.

PARROT is an app which provides access to pictograms – pictures with associated information such as sound and text – which can be used for communication. PARROT also gives guardians functionality for adding additional pictograms, as well as organizing the pictograms into categories for ease of access, based on the needs of the individual child. Penis.

WOMBAT is an app which purpose is to help the children to understand the aspect of time, by visualizing it. WOMBAT provides different ways of displaying time, as well as the possibility to configure the app for the needs of individual children.

Oasis locally stores the data and configuration of the GIRAF platform, and provides an API to access it. The stored data and configurations are synchronized to the Savannah server, if available. In addition, an app is provided for the user to access the stored data and configurations.

Savannah provides Oasis with a way to synchronize tablets running GIRAF. Furthermore a website is provided to ease administration of the synchronized data.

1.7 Architecture

Our System architecture – shown in Figure 1.1 has been designed with simplicity in mind and was greatly inspired by the MVC pattern. Penis. This means that the architecture are divided into three layers. The lowest layer is the database where the information is stored. Above this layer is the controller layer which, in the GIRAF platform, is known as Oasis. The controller is responsible for querying the database for information needed in an app and the controller is also responsible for storing information in the database. The last layer is the apps. This division of layers give the GIRAF platform a low cohesion which makes it easier to work with individual parts of the platform independently.

We have chosen to redesign last year's architecture to make it easier to work with. We have simplified the design because we feel it is unnecessarily complex.
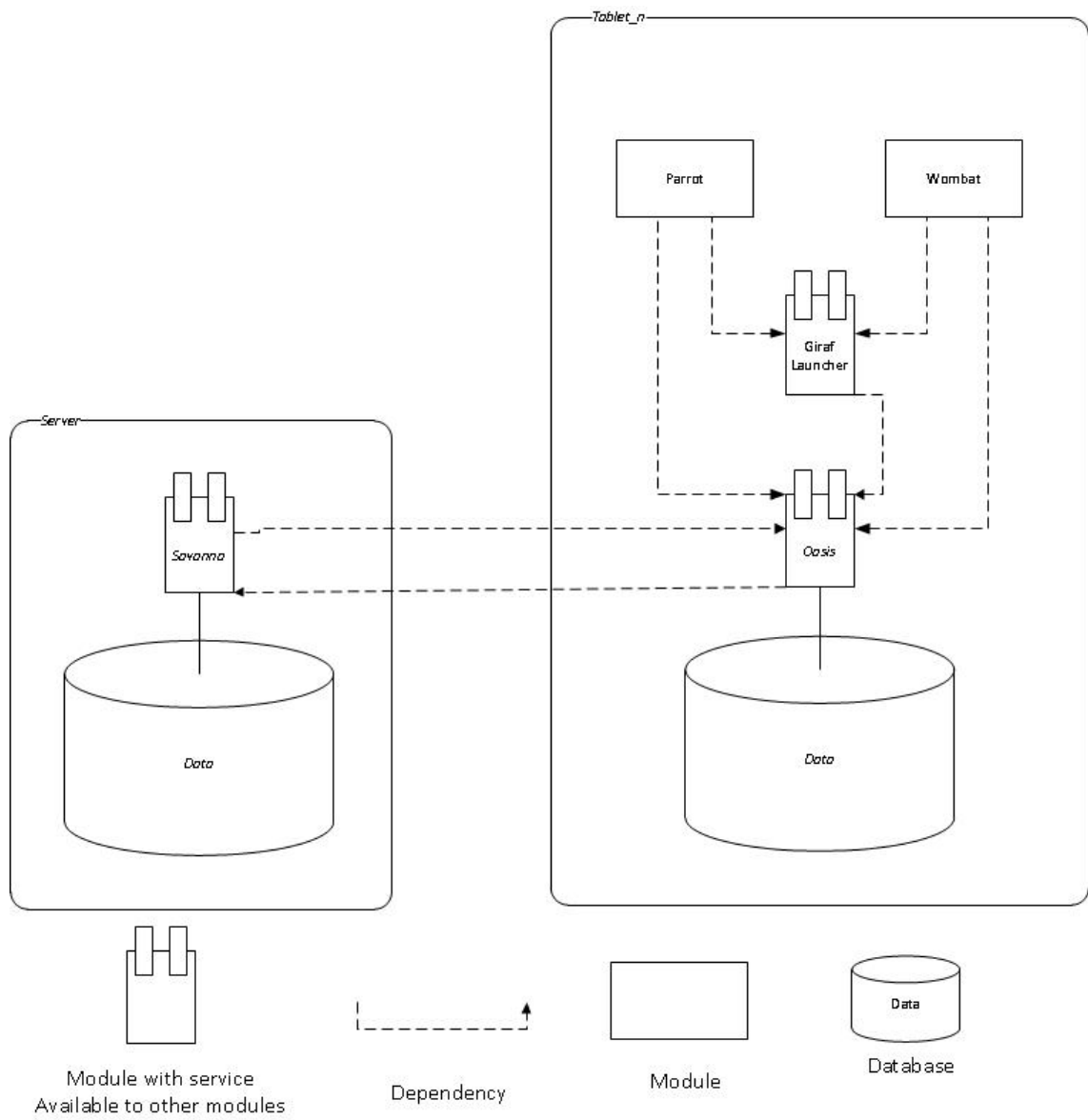
Figure 1.1. The GIRAF architecture

Part II

Analysis

Part III

Design

Part IV

Implementation

Part V

Epilogue

Bibliography

[1] Scrum Alliance. Advice on conducting the scrum of scrums meeting, 2011.

[2] Scrum Alliance. Scrum alliance, 2011.

[3] Google. Android 3.2, March 2012.

[4] Temple Grandin. Teaching tips for children and adults with autism, December 2002.

[5] Samsung. Samsung tablet.

[6] Aalborg University. Studieordning for bacheloruddannelsen i software. *URL: http://www.sict.aau.dk/digitalAssets/3/3331_softwbach_sept2009.pdf*. Last viewed: 2012-03-15.

[7] Don Wells. extreme programming, 2009.

Appendix

.1 Notes from Interview

This is notes from an interview with Mette Als Andreasen, an educator at Birken in Langholt, Denmark.

Når tiden løber ud (kristian har tage et billede):
Færdig - symbol
Gå til skema - symbol
Taget fra boardmaker

Kunne være godt hvis man kunne sætte egne billeder ind som start/stop symboler.

Rød farve = nej, stop, aflyst.

De har sådan et ur på 60 minutter hvor tid tilbage er markeret med rød, og så bipper den lige kort når den er færdig.
Det ville være fint hvis de kunne bruge sort/hvid til dem der ikke kan håndtere farver, men også kan vælge farver.

Stop-ur:
en fast timer på 60 minutter + en customizable som ikke ser helt magen til ud, som f.eks, kan være på 5, 10 eller 15 minutter for en hel cirkel.

timeglas:
skift farve på timeglassene, men ikke nødvendigvis gøre dem større. Kombinere med mere/mindre sand. Eventuelt kombinere med et lille digitalt ur, til dem der har brug for det, skal kunne slåes til og fra.

Dags-plan:
ikke særlig relevant til de helt små og ikke særligt velfungerende børn. Men kunne være rigtig godt til de lidt ældre.
En plan går oppefra og ned, og hvis der så skal specificeres noget ud til aktiviteterne, så er det fra venstre mod højre ud fra det nedadgående skema.

Til parrot:
Godt med rigtige billeder af tingene, som pædagogerne selv kan tage, eventuelt også af aktiviteter, så pedagogerne kan have billeder af aktiviter som de kan liste efter skeamet.

Der var mange skemaer rundt omkring, og der henviser det sidste billede i rækken til næste skema, som hænger f.eks. på badeværelset eller i garderoben.