

# PARROT

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Study Report

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## PREFACE

The source code for this report is attached on the CD-Rom at the last page of the report. A PDF version of the report is also included at the CD-Rom.

### **Partisipators of the project:**

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# INDHOLD

<b>Indhold</b>	<b>V</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Motivation . . . . .	1
1.2 Target Group . . . . .	1
1.2.1 Working with Children with ASD . . . . .	2
1.3 Target Platform . . . . .	2
1.4 Development Method . . . . .	2
1.5 Problem Definition . . . . .	3
1.6 System Description . . . . .	3
1.7 Architecture . . . . .	4
1.8 Usability Test . . . . .	4
1.8.1 Approach . . . . .	4
.1 Notes from Interview . . . . .	9
<b>Litteratur</b>	<b>11</b>

# INTRODUCTION

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. 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[?]. 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 [?], 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[?]. The firmware on the tablets is version 3.2 [?]. 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) [?], and Scrum [?].

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 [?]. 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. 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 years architecture to make it easier to work with. We have simplified the design because we feel it is unnecessarily complex.

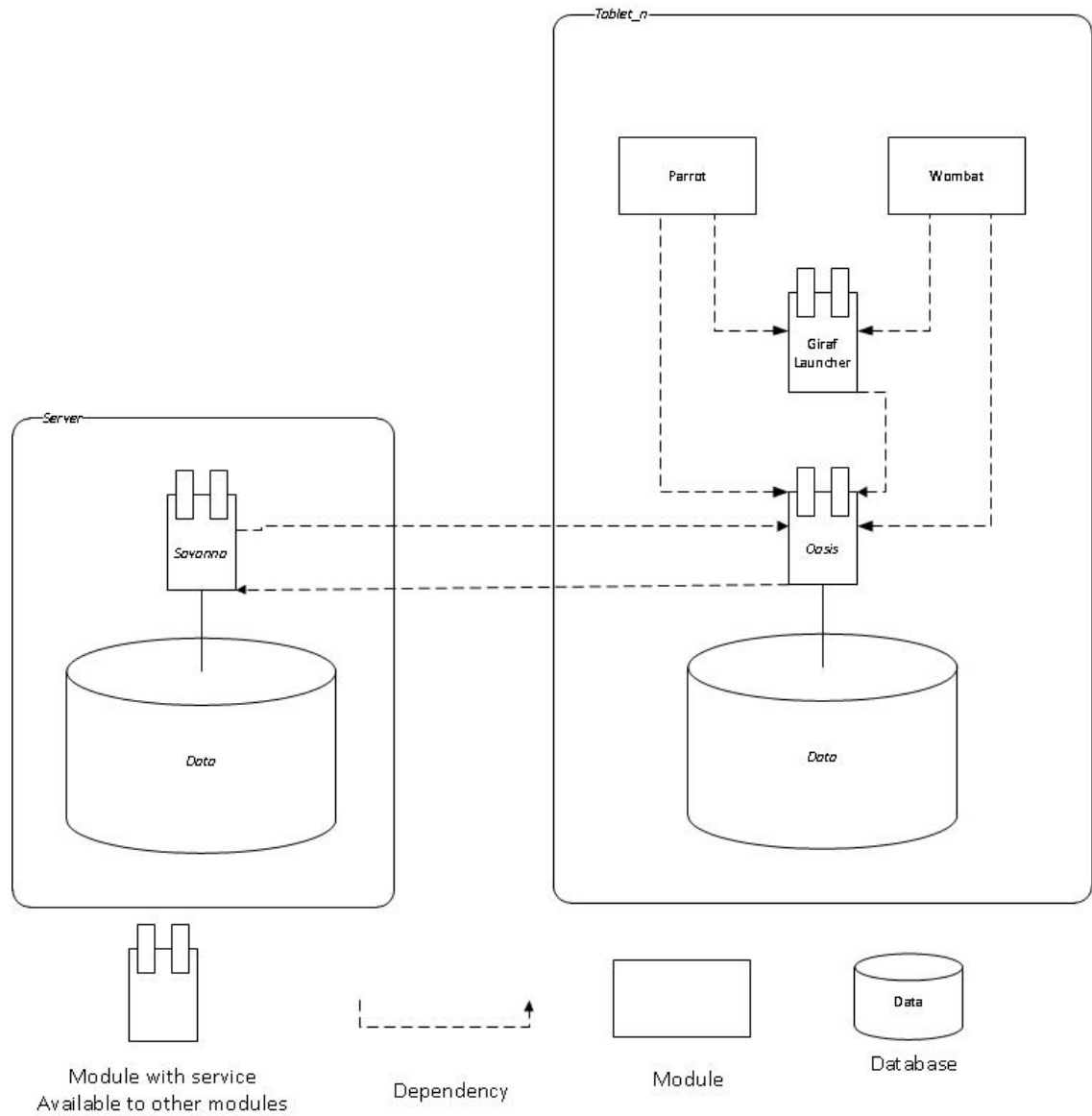
### 1.8 Usability Test

The usability of GIRAF is important because GIRAF is supposed to be a tool the guardians can use on a daily basis in interaction with children. GIRAF is built as an alternative to the tools guardians already use when working with children. Therefore is it important that the guardians want to pick GIRAF instead of the tools they already have. This requires GIRAF to be a system the guardians can learn to use quickly and a tool the guardians feel comfortable with.

The usability test is also a good indicator of how the individual applications are integrated with each other. As a developer in a development environment the applications you make, may seem like they are integrated very well. But when introduced to the real world, the user might find that the applications aren't working together at all.

#### 1.8.1 Approach

The most obvious test group was the persons already involved with the project as contacts. The invitation sent to the test persons can be found in the appendix .3.

**Figur 1.1:** The GIRAF architecture

Since the main focus of the project is not the usability, the purpose of the test is to recognize the most critical usability errors and not to acknowledge all errors of the application. Because of this would a test method which favors that there is no need to spend a lot of time on usability testing, be the best choice. Furthermore is the amount of test persons relatively small, approximately 4-6 persons. Based on the fact that the test should be short and the test group is small, the Instant Data Analysis method for usability testing is perfect for the GIRAF project [?].

### **Setup**

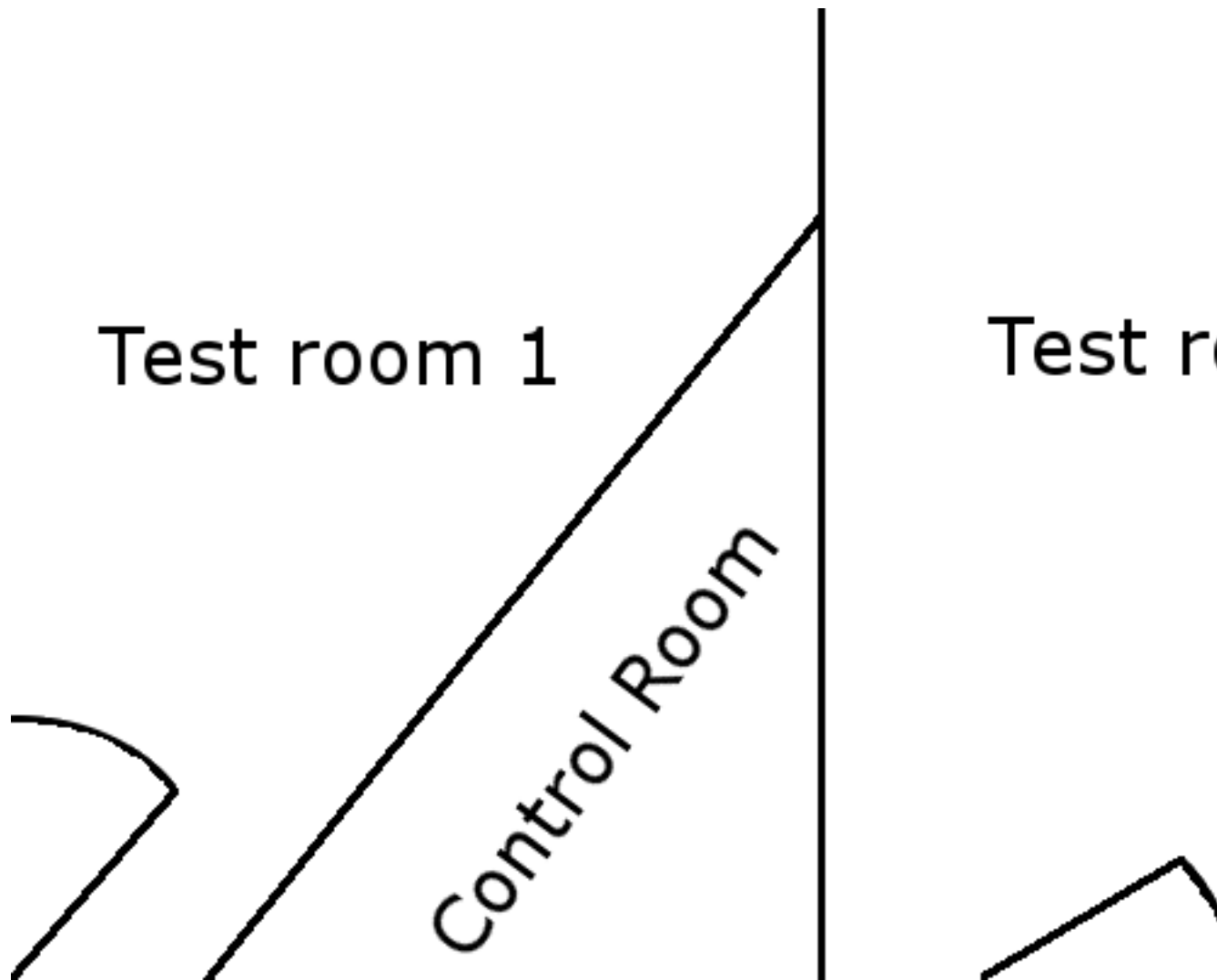
The usability test is divided into two tests, a test of the three applications and a test of the two administrations applications (Android and web). Each test is assigned a team to accommodate the need to run two tests simultaneously. The teams are made with respect to the criteria of the Instant Data Analysis process.

Each team consisting of at least:

- 1 x Test Coordinator
- 1 x Test Monitor
- 1 x Data Logger

To ensure that as many errors has been recognized as possible were the three mandatory persons assisted by two observers.

The usability lab on Aalborg University is designed with two rooms for usability testing and a control room to observe and record the tests. The two test chambers were assigned a test each and the control room were used to observe both tests as seen in figure 1.2.



**Figur 1.2:** An overview of how the usability lab on Aalborg University.

All tests were recorded on video and audio as well as documented for later analysis.

### **Execution**

To ensure an even experience of the test for all users, each test person was introduced in the same manner by the Test Coordinators. The Test Coordinators briefed and interviewed the test persons before each test. Furthermore did the Test Coordinators debrief and interview the test persons along with a questionnaire after each test to get an understanding of their opinion of the system.

The documentation of this can be found in appendice **Ved ikke hvor det er og hvor det skal v?**.

The two test teams used the Instant Data Analysis method to evaluate on the usability tests and give the final result of the tests. The test results can be found in section [Indseference](#) in the individual part of the report.

## LITTERATUR