

System Architecture

This chapter covers the system definition as well as the system architecture of GIRAF. First, the basis of the system definition, the FACTORS criteria, is covered. Secondly, the system definition is specified and finally, the architecture of GIRAF is defined.

3.1 FACTORS

The FACTORS criteria are used to support the preparation of a system definition. In the following, the FACTORS for GIRAF will be covered. The definition of each criterion is based on [MMMNS01].

Functionality *Describes the systems functions that support the application domain tasks. That is, defining what the system is able to do.*

The system should offer installation of new applications and make it possible to administrate common settings by need. The system should take complete control over the operating system and thus mask the normal functionalities of the unit to the user. Further, the system should give the opportunity to control the usage of and access to applications according to the current location of the unit, as well as system- and user profile settings. The system should be delivered with a number of pre-installed applications which is customizable to the user.

Application Domain *Concerns those parts of an organization which administrate, monitor, or control a problem domain.*

Children with limited mental capabilities due to handicap or age, making it hard for them to handle the complexity of a normal smart-phone or tablet operating system. Parents and kindergarten teachers (guardians) will be in charge of administrating the system.

Conditions *Covers conditions under which the system will be developed and used.*

The project is being developed by a number of study groups as a study project, and thus has a hard deadline that cannot be exceeded. The system should be simple and intuitive to use. It should be customizable to the individual child and its disabilities. The system should allow guardians to limit the functionality of the system. The system should be maintainable to allow other application developers to continue to develop the system and further applications after this semester.

Technology *Covers the technology used to develop the system and the technology on which the system will run.*

The system must run on Android touch devices such as smart-phones and tablets. Different hardware should be supported, although it is required that the unit is at least running Android 2.2. The system should mainly be developed using Java and the recent Android Software Development Kit (SDK).

Objects *Describes the main objects in the problem domain.*

A smart-phone or tablet device. The Android platform. Global system- and application specific settings.

Responsibility *Covers the systems overall responsibility in relation to its context. That is, how the system would interact with the tasks to be solved using the system.*

The system should act as a teaching tool and as a toy by providing pre-installed applications developed to aid and entertain the small-aged and disabled children using the system. Further, the system should provide the opportunity to install other third party applications having the same purpose of aiding or entertaining the children. Through a home menu, the system should in accordance with the location, the user profile as well as the global settings of the system control which applications the user is allowed to access.

Sub Systems *The subsystems in the overall system.*

A user capability module must take care of administrating the user's profile. An administration module should provide access to global and specific application and system settings. A home menu must provide access to applications in accordance with the location, the user profile as well as the global settings of the system. Pre-installed applications including a day-planning tool and a Picture Exchange Communication System (PECS) application.

3.2 System Definition

In this section, the system definition of GIRAF is given:

A simple and intuitive module based single user system for Android touch devices, such as smart-phones and tablets. By masking the normal interface of an Android device, the device should offer functionality that is suitable for the intended user.

The system should be responsible for aiding and entertaining children with limited mental capabilities due to mental handicap and/or age, having a difficult time handling the complexity of a normal smart-phone or tablet operating system. Guardians should be able to administrate the system by controlling selected application-, system- and user-specific settings through an administration interface on the phone.

Based on these settings, as well as the location of the unit, a home menu should be responsible for providing access to applications that conforms to the current settings and the state of the system. It should be possible for any third party to develop and provide an aiding and/or entertaining application to the system.

Beyond that, the system must be delivered with a set of pre-installed applications consisting of a visual, day-to-day, planning tool, and a Picture Exchange Communication System (PECS) application. The system should be developed using Java and the recent version of the Android Software Development Kit (SDK). It is expected that the system supports Android 2.2. Further, it is expected that the system is maintainable to such a degree, that is allows other developers to keep developing the system as well as applications to the system after this semester.

3.3 Components