Architecture Requirements Specification

Smart Door

CSIR
ZEBRA-V
Eduan Bekker (12214834)
Albert Volschenk (12054519)
Zühnja Riekert(12040593)

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Access channel requirements

The system's services are to be accessed through an Android application on a tablet, mounted to a door. A twitter feed must be displayed on the home screen. Each Smart Door application should have its own Twitter account.

Integration requirements

Cmore is an existing system that tracks the location of users. Integration with the Cmore system is seen as a bonus feature which may or may not be implemented at a later stage. The integration can be done by making HTTP requests to Cmore's web-based RESTful API.

Although this is not part of the project requirements, the Smart Door app must allow easy expansion and integration with Cmore.

Quality requirements

Performance

The user interface should have a response time of less than 2 seconds. Facial recognition should not take longer than 7 seconds. Waking the system by passing users should be instantaneous and should not take longer than 1 second.

Reliability

The system should always be available otherwise users might be locked in/out.

Scalability

Each instance of the application should only be able to handle one user at a time.

Integrability

This system should be easily integratable with the current Cmore system and a future hardware project that will do the locking and unlocking of the door. These integrations will all be done with RESTful calls.

Security

No user should be granted any access without authentication.

Flexibility

The system should always have the option of a conventional pin login system, if the facial and voice recognition fails.

Maintainability
The system should be easily maintainable by future developers who would like to add functionality and integrate with more systems. A developers guide on how to build the project will be included.

Auditability
Audit logs of all the actions will be recorded.

Usability
The system should have a user friendly interface corresponding with the colour schemes of the CSIR and Cmore.

Accuracy
The system should have a 90% accuracy on facial recognition, i.e. a person should be correctly recognised 90% of the time. Voice recognition should have a 99% accuracy for a valid recognition and it should achieve this accuracy 80% of the time. If the system could not recognise a user then there should be infinite amount of retries.

Architecture requirements and constraints
The client specifically specified that the Smart Door application must not be an HTML5 or cross-platform solution, but be written in Java with the Android SDK. Android 4.4 is the target version to implement the app for, but it also needs to be backwards-compatible to Android version 4.0.3.

3rd party libraries are allowed to be used for the text-to-speech, speech-to-text, motion detection and the facial recognition functionalities.

This app is to be written while keeping in mind that it is to be used on a Tablet.