

DASA: Non-Functional Requirements

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Platform

Since the system will be an all-inclusive product (hardware & software) the platform is quite specific. It will be run on a Raspberry Pi which will be using the most current version of Raspbian Linux (Debian flavor). The Pi must also be connected over a local network to the web application.

The web application will be fully supported in Chrome, Internet Explorer, and Firefox, and will require a responsive design so as to work on all mobile, tablet, and computing devices.

Performance

Since the system is mission critical, performance is key. When using the web application, some lag is to be expected (and cannot be avoided due to connection problems). However, when using just the local microcontroller from the shower (using voice commands) the processing lag should not exceed half a second for any action taken.

Security

Security for the shower system is really only mission critical at the local network level, and even then just regarding authentication for sending commands. The web application will require a login process that will be pre-set per shower system. This login will be the only way to access the web application, and no other accounts may be created. Messages sent from the web application to the shower system will be sent using SSH.

Once inside the web application, the user profiles will require individual authentication that is stored inside the web application's main system. These will not be extremely secure, and require only a password and username per grouping of profiles. New users within the shower system may be created at will and have no capacity limit.

The shower system itself will require no authentication whatsoever. It will accept voice commands from any user that uses it.

Reliability

The shower system itself must be vigorously tested to be sure that it does not include any mission-critical bugs. This is extremely vital as the system will be dealing with incapacitated users on a regular basis and requires extreme precision and reliability. If a serious issue does occur, the shower system must completely turn off and end water flow.

The web application must not have any bugs that would crash the system or send the wrong command (or continuously send the same command) to the shower system. It must be accurate, and if a crash happens it must cease sending commands to the shower and completely shut off the shower system.

User Characteristics

The shower systems main target user is the physically disabled. At this stage, the only user requirement is to be able to speak and somehow get into the shower itself and clean yourself. The shower controls will all be controlled through voice.

However, a second audience of home automation and tech-loving users has been considered.

These users would obviously enjoy the product for it's remote control and absolute automation of system.

Scale

The shower system itself is intended for one user at a time.

The scale of the web application and underlying profiles could be upwards of hundreds of people (such as at a hospital for a single shower location).

Data

The shower system will accept data coming from either the web application (via SSH) or the voice translation system. The system will send out usage statistics and ping responses.

The protocol to be used for all of this is flexible and up for discussion.

Internationalization

At this time, the shower system will be implemented only for english-speaking markets.

Environmental

The shower system will be expected to run in the wet and humid environment of a bathroom or bathhouse.

The web application will run on any mobile, tablet, or computing devices.

Green

An offshoot purpose of this system is to provide users with usage statistics of the shower system as a whole and on a profile-to-profile basis. This will hopefully reduce user water consumption through day-to-day knowledge of consumption.

Expected Changes

Once the system is released, virtually no changes can be made to the software, since the system will not be accessible for updates. Therefore, the system must be very robust and work as expected.

Date

The software portion of this system (including the web app and Pi implementation) as well as a “virtual” shower system, must be completed by the end of Vermont Technical College’s 2016 spring semester.