Quality attributes/Requirements

1. Performance

(a) First load must be fast on slow networks (including 3G)

- Use Lighthouse on a Nexus 5 (or similar) to verify time to interactive less than 10 seconds for first visit on a simulated 3G network.

(b) The Geyser server system must be able to handle large amounts of traffic without slowing down

- Tools like Website Grader and Web Page Test will be used to analyze the performance of the system

2. Efficiency

(a) The Geyser server system must efficiently make use of available bandwidth to ensure performance on slow connections to the server. This will be tested by throttling the network to simulate a slow connection.

(b) The Geyser server system's mobile application must be implemented as a PWA to ensure that it is multiplatform making the system efficient on Android mobile operating systems.

3. Reliability

(a) The Geyser server system must be fast loading and work offline. This will be accomplished using service workers to cache data, and will be tested using software tests.

(b) The Geyser server system must use an OwnCloud backup online software for integration with 3rd-party cloud storage providers and supports data backup and restore for Windows, or Linux. Synchronisation will occur hourly.

(c) The Geyser server system must support a CDMA (Code-division multiple access) channel as data communication protocol to ensure reliability and quality of data.

4. Security

(a) Each subsystem must be thoroughly checked and tested to ensure security and error handling

- Before the system is published it will be stress tested which will also include several ethical hackers attempting to hack into the system and retrieve confidential information.

(b) The system must use a user name password pair authentication for logging in.

- Check that the user is authorized by the app

(c) Mobile app must be immune to malicious code injection

(d) Prevent Brute Force Attacks

- Three incorrect attempts in logging in will result in a timed block which will increase exponentially for each consecutive incorrect attempt after the first three.

(f) The system must notify the correct people, via email, once a logging of details has been performed.

(g) Communication between server and mobile app must use end-toend encryption

5. Monitorability

(a) The system must use Log4j to log information such as errors encountered by users while they are using the app

(b) The system must use a Datadog to monitor service for cloud-scale applications, servers, database, tools and services

(c) The system shall use SPSS software for editing and analyzing all sorts of data.

6. Integrability

(a) The system must effectively use all necessary subsystems in a logging.

- Git must be used to make branches, track changes and integrate (merge) branches with the master system. Git flow will be utilised to ensure stability.
- Ionic must be used as a platform where modules can be developed and integrated into one system

(b) The system must integrate with the functionality offered by smartphones

- The system must use authentication methods provided by the smartphone to unlock the application
- The system must use hardware like a camera provided by some smartphones

7. Cost

(a) The system must use existing technologies and open source libraries to keep costs to a minimum

(b) The device must run off of low-end, low-power hardware such as a cheap Android phone.

8. Usability

(a) The system must be responsive. This will be tested using ionic developer tools to record interaction time.

(b) The system must be user friendly and accessible. This will be record using Chrome developer tools contrast checking and Google's Mobile Usability Report.

- The system will be tested by a group of first time users varying in age and preferably from a plumbing background to ensure that it can be easily used by anyone

9. Availability

(a) System server failure must not affect the whole system. Redundancy should be implemented as a fallback for the server.

(b) The system should continue to operate even during maintenance.

(c) Mobile app functionality must be available as long as the cell phone is on.

10. Portability

(a) The Geyser app system will run on a mobile device to make it fully portable