D3.2

Platform prototype tested for individual scenarios (M12)

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Executive Summary

In present, there are many smart devices / sensors (so-called IoT - the Internet of Things) that can transmit real-time data to third parties. Each of these devices can communicate in different ways with a gateway forming a network of objects. This is why SUI HUB platform requires a gateway which can communicate with these sensors either on Bluetooth, Zigbee or Z-Wave. All collected information is channelled to a Druid Engine (which can save real-time data) and to MySQL databases for online and offline use. All software scripts and methods, classes developed and efficient queries to databases are composing SUI CORE SCRIPTS.

SUI HUB platform is combining the most widely used structure for the development of WEB applications LAMP - Linux / Apache / mySQL / PHP, CGI C++ scripting for driver's development and native mobile languages for mobile clients (like Java for Android Application or Objective-C for iOS application).

On the other hand, different solutions were investigated in order to encompass the most of data types. To this end, several parameters were established according to the functionality of the platform. Furthermore, it was decided that the solution should be independent of the number of users, meaning that a high scalability was mandatory. Then, the best ways for data visualization were analysed, deciding to use dashboards, which sum up the information in a desired way.

A first system was defined and developed. This system was based on a Hadoop and HIVE structure with a smartphone application and data transfer system. After compiling all the components together, the system run correctly. However, in some aspects, it required some improvements, like the high demand of processing power. In order to scan and inject the data, the system requires multiple MapReduce, and therefore real-time results were lost due to high latency in processing. Hence, it was decided to change the platform architecture to a more manageable and scalable design: KAFKA + DRUID system.

In this way, API REST calls are supported by Kafka, and therefore, the system becomes highly scalable. Thanks to the changes decided in the platform design, the shortages of the previous design, such as the high processing power demand, are overcome and the final architecture gains speed, scalability and reliability.

Two technology demonstration were made to test and validate the system with real data. The SUI Hub platform was validated using data from the Haarlem case study. And the performance of the big data platform was tested and validated by using smartphones as data collectors. At each stage of development / implementation were performed functional / performance tests and interface fixes and improvements.