PROJECT 10 – ORANGE LABS SENSORS API

Group Members
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Overview
This biweekly details work carried out for the project as of March 27th. It includes further plans for progress and highlights issues encountered along with the current status of each.

Timeline/Summary of progress

- 18th Mar - Testing of one sensor unit and zone controller successful
  [Issue, discovered on 21st Mar: unable to erase/re-write to existing unit once code had been uploaded. Reset button not working either.]
  [Issue solved, 27th Mar: Code received to rectify this reset and updating problem]
- 19th Mar - Email sent to confirm sensor is in working order, requested help assembling remaining three units of prototype.
- 20th Mar - Meeting with supervisor to catch up on progress.
- 20th Mar - Began building the HTML/CSS backbone of maintenance website GUI
- 22st Mar - Begun research into displaying api's sensor information visually on front-end, maintenance website
  [Issue as of 25th Mar: attempted to use Handlebars framework, outcome unsuccessful.]
  [Pending: As of 26th, renewed attempts with ejs framework]
- 24th Mar - Began building second project website features
- 24th Mar - Tried to set up GSM module and installing to zone controller. Unsuccessful.
  [Issue: Unable to register Sim Card that came attached to the GSM module. Sim number provided by Telefonia/Movilforum invalid.]
  [Pending: Email sent to company regarding this issue. Awaiting response.]
- 27th March - All code related to connecting sensor unit to zone controller completed. Remaining 3 pending IR sensor units completed.
  [Pending: GSM module / Sim Card issue to be fixed to send data across UDP connection to VM (which then uploads to the database)]

Summary of meetings [13/03/15 – 27/03/15]

Friday 20th March - Discussion of current progress **[Supervisor meeting]**
Location MPEB 6th Floor
Time: 1.30pm - 2pm
Attendees/ Absentees: Johan, Gulliver, Victoria, Leslie Kanthan / None

This meeting was a short catch up primarily focused on updating Leslie on our process. We informed him that our infrared and zigbee devices were working and he felt that we were on track to completing on time. He informed us that we should update Orange Labs on our process so far, which we later did on the 27th March in an email. A following meeting has tentatively been scheduled for the first week of April.

Monday 23rd March – Re-evaluations I **[Team meeting]**
Location: MPEB 4.03 (relocated 4th floor lobby)
Time: 2.30pm – 3.30pm
Attendees/ Absentees: Johan, Gulliver, Victoria / None

Three items of interest were discussed in this meeting. These being, 1. how to visually display the data retrieved from the basic node.js api about the sensors, 2. a re-evaluation of how replacing or adding new sensors in a running network would work: and how MAC addresses could be reassigned to deal with the issue of replacement/ addition instead of having to re-write/ re-upload code on the closest sensor unit and zone controller, 3. undecided: whether switching back to a relational SQL database at this stage would be worth the risk - given the lack of documentation currently existing for managing a NoSQL Cassandra DB.

Friday 27th March - Finalisation of hardware **[Team meeting]**
Location MPEB 4.03
Time: 12.30pm - 3.30pm
Attendees/ Absentees: Johan, Gulliver, Victoria, Graeme McPhillips / None

Today we had on and off meetings with Graeme McPhillips getting our hardware sorted. We got the reset button bug fixed quickly and then went on to discuss the GSM shield for our arduino. Graeme suggested we use the serial ports to send data. One issue we then realized was that the arduino serial ports require 5V signals, while our sensor units only provide 3.3V. Graeme told us to come back next week once a fix has been found to complete it. Since we proved that the infrared sensors were working, Graeme then went on to install the last sensors to the rest of our sensor units.
In between all of this, we had team meetings discussing our website implementations and we tried to get the provided sim card to work. We found out that the sim card number was not working and thus contacted the service providers to ask for assistance. At this point in time we are still awaiting a reply. If we do not find a fix however, we have spare sim cards that should work. Gulliver showed us his process on the documentation website and Victoria showed her process on one of the two demonstration websites.

Next Actions:

GULLIVER

Recently I decided to reassess the overall goals and intended outcomes of the project, and shifted focus toward the process of building the system software. Having faced issues with Cassandra drivers and the lack of documentation, we'll have to quickly decide whether to switch to using a relational SQL database for prototyping purposes, in order to speed up development. If this is the case, I would need to carry out some basic restructuring and establish a MySQL server on our allocated virtual machine. My immediate focus will be on experimenting with the current Cassandra database, and aiding Victoria in building the web API, in order to ascertain whether it is a viable solution for this initial PoC. Following from that, with the hardware now completed and the architecture decided, the core Java backend can be written. My other responsibilities between now and the close of the project will be to ensure the reliability and scalability of the backend, assist with the construction of the demonstration websites, and look in to how to ensure secure usage of the system. The documentation demands will be evenly spread, though I specifically will co-write the system manual with Johan and produce the final showcase website.

VICTORIA

My focus so far in the past two weeks involved building on the basic node.js API designed previously which accesses the NoSQL database. Firstly, given the expansion of the NoSQL database with more column families in the key space, the API has since been updated to retrieve data from these too. Secondly, I have also been looking into how express can be used to generate dynamic content/ display data retrieved from the API visually on the front-end. This has mostly been met with mixed success. Handlebars and EJS are the two template engines experimented with. At present, usage of EJS has been more successful. Of course, the API itself depends greatly on the kind of database we are using and so, if this indeed changes back to a relational SQL database for prototyping purposes - it will also be subject to change. As it was decided that the particular demonstration website I was working on held a lower priority compared to the other parking one, this may be put on hold for awhile to prioritise other, more important sections of the project of which I will carry out in co-operation with Gulliver, such as helping in the construction of the core Java backend. In the coming weeks, documentation demands and attending to the new project website are two other things I will also be looking into.

JOHAN

Over the past two weeks, I have succeeded in getting the zigbee and the infrared components of our sensor units to work. This means that the only hardware that still needs assembling and coding is the GSM shield for the arduino. So far I have code that will work for the GSM, sending a simple string, however since we have not yet connected the arduino to one of our sensor units, we have not been able to write code to send the IR readings. The next few days will be spent making a final version of our code for the sensor units, so that once we attach the GSM Shield and arduino, we will be able to show it working immediately after. The rest of

the next few weeks will then be spent helping my team members make the websites for the front end and write documentation for our product website.