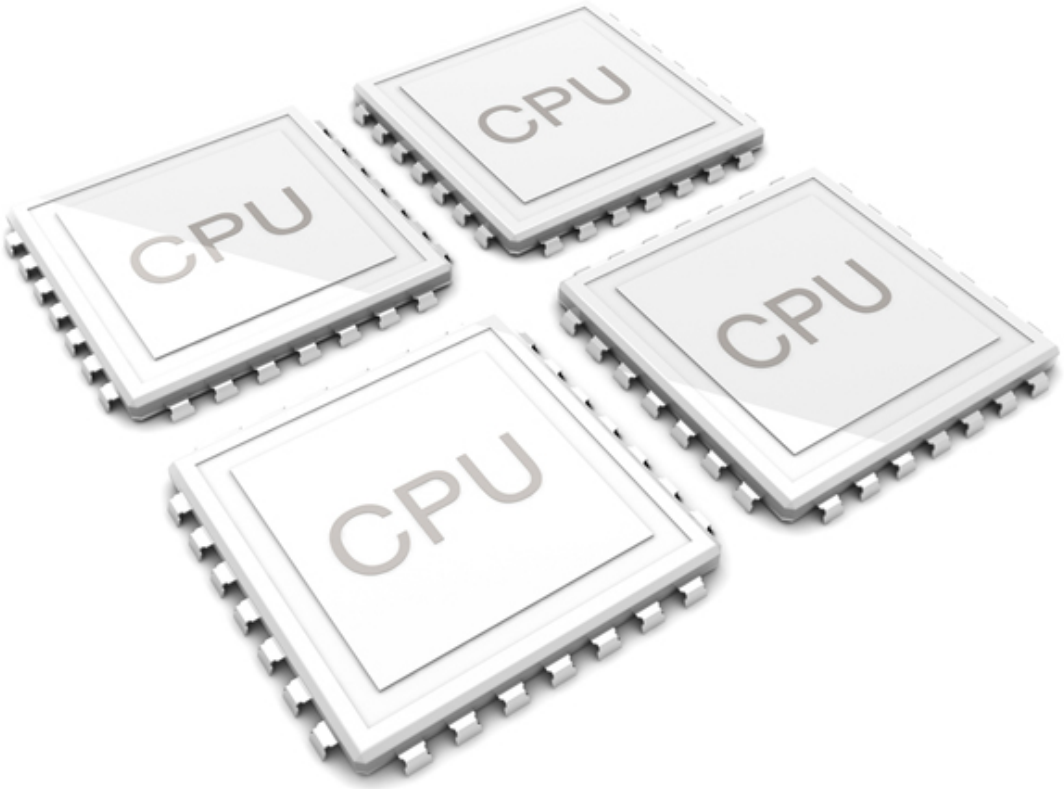
Project: Power Cloud

Client: Hanrich Potgieter
Team: Quadcore Productions

Themba Mbhele 14007950
Moses Mayimela 14019702
Hlengekile Jita 14077893
Mpho Baloyi 14133670
Department of Computer Science, University of Pretoria

01 May 2016



1 The Team

1.1 Moses Mayimela

1.2 Hlengekile Jita

1.3 Mpho Baloyi

1.3.1 Interests

- Keeping abreast with new technologies
- Learning and using new technologies to solve problems
- Reading up and doing research on new and old concepts in computer science
- Solving riddles and puzzles
- Helping people through ICT

1.3.2 Technical Skills

- Solid programming skills in java,c++ and python
- Fair amount of knowlegde in assembly programming
- Web development with HTML,JAVASCRIPT,JQUERY,CSS,PHP,AJAX,ANGULARJS
- Interaction Design
- Database design with MySQL
- Understanding of process development
- Unit testing,mocking and dependency Injection

1.3.3 Non-technical Skills

- Exellent Communication skills
- Patient
- Creative approach to problem solving
- Pay attention to detail
- Excellent planning skills
- Ability to grasp concepts quickly
- Willness to learn new things
- Ability to interpret and follow technical plans

- Ability to collaborate and work efficiently with other people
- Ability to work under pressure

1.3.4 What makes you want to do the project

My interest and deep passion for Internet of Things,helping people and more importantly providing people with means to take care of the enviroment through careful power consumption are the main reasons why I want to do this project. I also want to do this project because it is an opportunity to learn and see how software and hardware work togther which has always been one of my many interests.The project presents an opportunity to learn new things,acquire new skills and refine my skills and I believe this is the headstart i need for my career in Computer Science.

1.4 Themba Mbhele

2 Project Execution

2.1 Development Methodology

2.2 Communication With Client

To keep the clients informed we are going to use the following means of communication

2.2.1 email

- To inform the client of our progress
- To address any issues or concerns that they client may have
- To acquire information from the client
- To require any resources that the client has to offer for their project,..

2.2.2 Phone calls

This will only be used to address very urgent matters if they arise during the course of the project development however this will only be done with permission from the client and during business hours.

2.2.3 Regular Meetings

These will take place depending on the clients availiability and willness. We may discuss the progress of the project,to address any concerns,etc.

2.2.4 GIT

Access to our git repository will be provided to the client,so the client can be able to monitor our progress and have access to the project material.

We are also open to any means of communicatiuon that the client may prefer or suggest.

2.3 Technical Challenges

2.3.1 Collecting the readings

The sensors or hardware that will be used to collect the physical readings have not been outlined and thus the challenge is how these values will be captured from the operating machinery.

The solution:
Since the boards (photon and electron) have GPIOs, these can be used to interface with the various sensors that will capture the readings such as voltage and current. To measure current, a Current transformer, for example can be used to capture the operating current of a machine.

To measure voltage, a step down transformer can be used to step down the voltage of the line connected in parallel to the operating machine. once the voltage has been stepped down to a level that the boards can tolerate i.e the max voltage would be 3.3V logic since the boards can operate at 3.3V VCC, then the signal can be fed to the analog pins of either the photon or the electron board.

These values, voltage and current are essential for the computation of other values such as power, e.g P=VI.

2.3.2 Connecting the photon to a local router

The electron has a direct connection to the internet through the SARA-U260 module. The photon board, however needs a mobile device to get internet connection and thus thus the challenge will be to eliminate the need for a cellphone for the internet connection.

The solution:
The approach to follow is to use a device that can connect more than one device to the internet e.g a wifi router. The router can provide all the photon boards with a connection to the internet.

2.4 Technologies

This section will list the technologies that will be used to implement the system.
To implement the back-end of the system, the following technologies will be used:

- NodeJS will be used to implement the server.
- MongoDB will be used to store the data that will be collected.
- C++ will be used to program the hardware

To implement the front-end of the system, the following technologies will be used:

- AngularJS will be used for the web front-end.