Department of Computer Science

Tender

Project: PowerCloudv2

Client: Buhler

Team: CodeBlox

Tshepo Malesela (Bsc: Computer Science)

Lethabo Mogase (Bsc: Computer Science)

Lorenzo Spazzoli (Bsc: Computer Science)

Bilal Muhammad (BIS: Multimedia)

Dirk de Klerk (BIS: Multimedia)

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1 The Team

Each team member possesses a wide variety of skill sets and characteristics that will ultimately contribute to the success of this project. All of our members work well together and are diligent in their work. We as a team take deadlines rather seriously and strive to deliver high quality work well before final submission dates.

1.1 Tshepo Malesela

1.1.1 Interests

As a computer science student, my interests have changed over the past three years. Ive always had a profound deep interest in computing, I had no one to introduce me to programming as there was no one at home who worked in such an industry or knew anything about it. A lot of interests have changed over the past three years but my love for discovery and knowledge hasn't.

1.1.2 Technical Skills

I only started my computer learning properly in my first year, it was difficult to adjust to so much information being thrown at me but over some time I began enjoying it, I gained skills in Object Oriented languages such as as C++, C, Java, scripting languages such as javascript and php, and lastly some special-purpose languages such as php. I understand these languages well, studying computer science mens you also need to do more than just school work, so I started reading books and writing programs in my spare time.

1.1.3 Past Experiences

For one of our courses (Software Engineering), we where introduced to so many technologies and also had to use them to complete a project. I believe the knowledge we were introduced to will aid me in adding valuable input to this project.

1.1.4 Non-technical Strengths

I am open to new things, I love experiencing things I'm not familiar with as well. I'm also a very fair person. I am also disciplined. I communicate well with others and this

wil hep because I am working in a group.

1.1.5   My motivation for wanting to do this project

I have a very strong and passionate interest for technology. I really enjoy finding out how different technologies works and picture how I can use it or how it is used in the real world. I also enjoy making things work better. I know that I will be fully dedicated to this project because I interests me in the deepest way, I really believe that my group and I will enjoy developing this for you and I have no doubt that it will be done to the greatest of our abilities.

1.2   Lethabo Mogase

1.2.1   Interests

I have been interested in computers and how they work from when I was very young. I had no knowledge of what programing was until my first year in university (2014). I have come to love programing and creating new software to make life a pleasure. I enjoy challenges and coming up with the most efficient way of solving them

1.2.2   Technical Skills

I have a good knowledge of C based languages, namely C, C++ and Java. I also have good experience in the following scripting languages: JavaScript and PHP, which externs to my knowledge of web development using HTML 5, CSS, JSON and SQL. On the other hand I have a general understanding of Intel 64 bit Assembly Language for Linux.

1.2.3   Past Experiences

I have gained some experience during the Mini-project (Software Engineering). I have learnt how to follow client requirements in terms of functional and architectural and building a system according to the service contacts.

1.2.4   Non-technical Strengths

I work very well in teams and I have the ability to keep people focused on the task at hand.

1.2.5 My motivation for wanting to do this project

Creating technology to make life easier is my biggest interest and this is exactly what this project is.

1.3 Lorenzo Daniele Spazzoli

1.3.1 Interests

I started learning to program in 2010 at the school I attended.I love to program and I love the feeling of creating something from nothing and seeing how hard work can pay off to create the most beautiful programs.I have had an interest in hardware since 2007 and have created many small systems using raspberry pi's. When im not at my computer I can be found with my guitars.

1.3.2 Technical Skills

I have been working with raspberry pi's and arduinos for a few years now. Currently I teach arduino training at the university of Pretoria maker-space.As a Computer Scientist in training I know many programing languages. As a hardware enthusiast I can debug and fix almost all hardware problems that we may experience

1.3.3 Past Experiences

In December 2014 I was an intern at a South African start up known as LEPSTA, there I learned many aspects of software engineering and how to work in a team to create a working scalable project

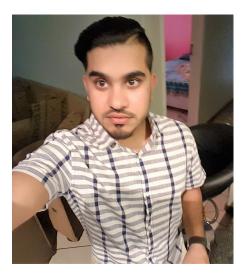### 1.3.4 Non-technical Strengths

I am good at Motivating others,a Good Leader, a Hard Worker, good at Public Speaking and willing to learn

1.3.5 My motivation for wanting to do this project

I have found that my biggest interests in computers is where hardware and software meet and this projects combines the two in a way I have dreamed of since I got my first

raspberry pi in 2011.This project contains a lot of potential and with the correct team working on it much of that potential will be achieved.

1.4 Bilal Muhammad

1.4.1 Interests

I have always been passionate about programming and creating innovative technology that has not been seen before. I enjoy playing cricket, singing and cooking. But most of all I like experimenting with different viruses and finding ways to break code.

1.4.2 Technical Skills

I am equipped with the knowledge of the following languages and technologies - C++, Java (EE), PHP, JavaScript, HTML and CSS, Assembly x64 and MySql/PostGres.

1.4.3 Past Experiences

I am currently working for the CS department as a tutor for a C++ module, where I create assignments and memos. I was also part of the Integration(High level) team for the Mini Project that we successfully completed this year. I am also currently doing a networking course which I think will be helpful for this project

1.4.4 Non-technical Strengths

I have always been a strong candidate for leadership positions, mainly because I am understanding and can find reasonable solutions easily. My communication skills are solid which makes me a strong team player.

1.4.5 My motivation for wanting to do this project

This is my passion - creating innovative technology. "The difference between the impossible and the possible lies in a person's determination."

1.5   Dirk de Klerk

1.5.1   Interests

I have a great fondness for music and practice the electric guitar when I get the chance. I also enjoy exercise, cooking, and spending time with family and friends.

1.5.2   Technical Skills

I consider myself to be a descent programmer, I also have an eye for aesthetic design. Languages include: Java, C++, Javascript, PHP, Assembler64, XML, SQL, and HTML.

1.5.3   Past Experiences

I gained some experience during the mini-project of Software Engineering, where I was part of the integration team. This gave me good exposure to the Java ecosystem as well as a basic understanding of how layered systems work.

1.5.4   Non-technical Strengths

I am a very ambitious person, that works very diligently, paying close attention to details. I also consider myself to be a natural leader and work well in teams.

1.5.5   My motivation for wanting to do this project

My main interest in this particular project, is the technologies that I will get to work with. I am always looking to challenge myself and discover new ideas.

2 Project Execution

2.1 Development Methodology

The Methodology that will be used in this project is the Agile Development Process. We as a group feel like this methodology will be the most failure and fault proof way to go. In this methodology, we intend to follow the Spiral process because in this way we can adopt elements from other process models such as waterfall, incremental and evolutionary prototyping.

As a group we decided on the spiral process model because in this project decisions will be made on how to implement the functionality and architecture. With the spiral process model we will choose the safest options that will yield the best results. There is high risk analysis with this process model, and it is the preferred choice for many large and mission critical projects, therefore it will suit our project well.

The spiral process model also has great features such as the ability to add extra functionality at a later stage in the project. This will probably be the case as the project progresses.

2.2 Developer/Client Communication

Project tracking will be done as Buhler has specified (i.e github) with the addition of slack for formal communication.

2.3 Technical Challenges

One possible problem that we as a team might face is the concurrency, as the client requires 10000 devices to communicate at a time. Another problem might be the server that will be able to handle such loads as well as the availability of a back up server in case the main one fails.

We however, have done a course on concurrent systems that will help us overcome any such problems. We also are aware of RAID which is a technology used to overcome challenges if servers fail.

2.4 Technology Stack

Our skill set allows us to use Java EE for the entire project, using JPA to persist. We will also use Maven as a build tool and make use of its built in features for unit testing. If the client wants we can use PHP and JavaScript as well. We have experience with both MySql and PostGres databases. However, we are willing to learn any technologies preferred by Buhler.

2.5 Deliverables

We will adhere to the deliverables as specified by retroRabbit. More specifically we aim to deliver the following in a timely manner:

- Documented source code

- Test code and scripts

- Architectural design

- User manual

- Build and development scripts

3 Conclusion

Should you require any further information, feel free to contact our team lead, Bilal Muhammad on:

- Cell: 072 878 7807

- Email: bilibongers@gmail.com

We are extremely excited to be working on this project and also look forward to be working with you.