



UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

PROJECT TENDER

PROJECT

PROPERTYINVESTMENTOPTIMIZER

CLIENT(S)

ALEX TERLUNEN - ATERLUNEN@CSIR.CO.ZA
PIETER BOTHA PBOETHA2@CSIR.CO.ZA

TEAM: TERABITES

TEAM MEMBERS

Christiaan Nel
Dzilafho Mulugisi
Eltom Tom
Gershom Maluleke

DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF
PRETORIA
May 2, 2016

GROUP BACKGROUND

- Our team is made up of individuals that are all studying towards different computer degrees. We bring a unique perspective as we are able to give individual ideas on how to solve a problem, and at the same time incorporate other members ideas to form an ideal solution to any problem. Our group understands each other and each person brings something different to the team.
- As individuals we are strong in specific situations, together we are stronger in every situation that will come our way. For this project we have discussed that instead of using a divide and conquer method, we will unite in completing each phase of this project as quickly as possible. This allows us to ensure that we do not forget to implement a point that might have been overlooked as this often occurs when a member works alone. It also guarantees that once a phase is completed we do not move backwards only forward.
- We are all excited and prepared to work hard and well on this project and we believe that you will be satisfied with the outcome. We are more than prepared to research and learn about the fields we currently lack. We would like to do this project because it is a unique and interesting project that would allow us to expand our skill set and challenge us in a way that has not been done before.

TEAM MEMBERS



Name: Christiaan Nel

Email: u14029368@tuks.co.za

Phone: 0728359073

Field: BSc IT

INTERESTS

- Solving problems through programming
- Gaming

TECHNICAL SKILLS

- Programming: C, C++, C#, Java
- Web development: JavaScript, PHP, SQL, HTML, CSS
- Good at mathematics

PAST EXPERIENCE WHICH MIGHT BE RELEVANT FOR THE PROJECT

- COS 301 Mini project which gave me some experience in how version control systems and automated build systems work, as well as how different teams working on different components can collaborate to work on a single project.

NON-TECHNICAL STRENGTHS

- Fast learner
- I can work hard on solving a problem

WHAT MAKES YOU WANT TO DO THE PROJECT

- Interesting idea
- I enjoy mathematics
- Will be useful to learn more about investing



Name: Dzilafho Mulugisi

Email: u13071603@tuks.co.za

Phone: 0798056530

Field: BSc Computer Science

INTERESTS

- Automotive Journalism
- Web Technology
- Building Computers
- Self learning
- Socializing

TECHNICAL SKILLS

- Fixing Computers
- Java, C++, C, Intel Assembly and Web Programming
- Fault Detection
- Operating Systems
- Databases

PAST EXPERIENCE WHICH MIGHT BE RELEVANT FOR THE PROJECT

- The UP Department of Computer Science recently prepared us for effective team work. I worked in a mini project where we had to deal with various constraints in groups. The challenges included differences in level of knowledge, interest, personalities and different types of pressures including time amongst others. From this I learnt how to work when under pressure and stepping out of my comfort zone and work with people whom I did not know.
- I have attended numerous workshops by Studietrust in which we were exposed to challenges and had to work in groups to resolve the provided problems. In order to solve the problems we had to combine the best of each group member. I can now effectively work well in groups even when the personalities of the group members are opposites.

NON-TECHNICAL STRENGTHS

- Team Work
- Quick learning
- Leadership and Planning
- Effective listening and discussion
- Future Visualization

WHAT MAKES YOU WANT TO DO THE PROJECT

- As a young adult I am soon to be exposed to the world of properties. I will have to find a place of my own soon when I begin working and have to be fully responsible for myself. In order to effectively spend and manage money I need to know about risks and returns of property investment.
- The project is very interesting because property investment is something I have no experience with but I am very interested in. The project arouses my curiosity and I find it intriguing to learn about it.



Name: Elton Tom

Email: u13325095@tuks.co.za

Phone: 074 902 1879

Field: BSc Computer Science

INTERESTS

- Solving problems
- Web programming
- App development
- Business process management

TECHNICAL SKILLS

- C++ and Java skills
- Mathematical literacy and Solving problems
- Front-end (HTML, CSS, JavaScript/JQuery) and back-end (PHP, MySql) development skills

PAST EXPERIENCE WHICH MIGHT BE RELEVANT FOR THE PROJECT

- I studied a first year course in business management, statistics, and mathematics. And I feel with that with all these skills and knowledge that I have acquired from these courses, I can transfer all that knowledge into this project, with also all the programming skills.
- I recently worked in a project at the university which introduced me to some extensive software development, which included working in teams, and working on different stages of software development (gathering and documenting requirements, designing, testing and so on).

NON-TECHNICAL STRENGTHS

- Working under pressure
- Working within a group
- Clear and concise communication
- Intellectual curiosity

WHAT MAKES YOU WANT TO DO THE PROJECT

- With the skills that I have acquired throughout my tertiary years, I am confident that this project suits my skill set, but also it is the challenge of this project that I look forward to as it will bring a lot of experience on a personal level. With this being said, I am also confident that the project itself will be a success of the highest quality.



Name: Gershom Maluleke

Email: u13229908@tuks.co.za

Phone: 0728359073

Field: BSc Computer Science

INTERESTS

- Programming(Application, Game and Web development)
- Technology and Gaming
- Travelling, hiking, Soccer, volunteering, Boxing, Cricket

TECHNICAL SKILLS

- Languages: C, C++, Java, Python, Delphi, SQL, HTML, JavaScript, PHP, AJAX, JSON, CSS3 Test Driven Development (TDD), Teamwork
- Tools: JBuilder, Dreamweaver, Rational Rose, UltraEdit, BorlandC++Builder, Oracle SQL*Plus
- Operating systems: Windows, Linux, Mac OS X.
- Graphic design: Adobe Photoshop, Adobe Illustrator, Blender, 3DMAX, MAYA

PAST EXPERIENCE WHICH MIGHT BE RELEVANT FOR THE PROJECT

- We recently did a Mini Project where I was part of the team that was supposed to implement the backend functionality. I learned a lot of technologies that will be useful when doing this project, such as testing frameworks like Spring, building tools like Maven. We mostly used Java to implement and annotate entities for the mini project which were then persisted to the database using PostgreSQL, so I believe I know more than enough technologies to be able to finish this project with ease.

NON-TECHNICAL STRENGTHS

- Willingness to research
- Teamwork mentality
- Ability to handle failure
- Ability to plan
- Problem solving skills

WHAT MAKES YOU WANT TO DO THE PROJECT

- The main reason I want to do the project is because I like to learn new things and this is a totally new experience of development. I am eager to learn and stay up to date with new innovations and IT related products. I am a confident, energetic young person, seeking an opportunity to expand my horizons. I don't mind putting in the extra effort and time, until the problem is solved, which also makes work under pressure well.
- I am able to adapt to different environments, and learn to use new technology, programs, and programming languages well. I prefer to start working earlier than leaving it for last minute; however I can work under pressure as well. I am a hardworking and dedicated student who loves a challenge and works well under pressure.

PROJECT EXECUTION

PropertyInvestmentOptimizer project is a very interesting project with a lot that needs to be done to realize the full potential. Below is our proposed solution and how we plan to implement it.

DEVELOPMENT METHODOLOGY

- We intend to follow the agile software engineering methodology as this minimises risk, promotes adaptive planning, evolutionary development, early delivery, continuous improvement and encourages rapid and flexible response to change. Since the Agile Manifesto doesn't provide concrete steps to follow we will use the scrum methodology. The key concepts that we will be using from the methodology are involving the client in the development process, continuous integration, paired programming, test driven development, design patterns and code refactoring.

KEEPING THE CLIENT INFORMED

- To keep you our client informed about the status of the project we have the following in mind. Since you will be available for consultation twice in a month, we plan to have regular sprints of two to three weeks and then have meetings with you to keep you up to date with our progress and hear if you have any suggestions for us for the next meeting based on your impressions from the meeting.
- We will also grant you access to the Git repository so that you can check at your leisure how far the development is. Also with the Git repository we will also make use of the wiki page in GitHub to make the checking up easy as this will act as our diary in the development process. We are also available via Slack to have a group chat with the client if desired.

INITIAL IDEAS

- Our solution consists of one interfaces (a web interface) and a central server. To begin we will start with the central server which will be the most important part of the project as the web interface will make use of the server. The central server will be implemented to do as much calculations as possible, and try to prevent the client interface from doing any calculations. This central server allows users to upload information online accounts.
- This server will actually calculate the Return of Investment (ROI) between different configurations of property rentals and can be used to optimise what for the best investment strategy depending on the users portfolio. The server will also be responsible for comparisons between different types of investment options with one another using graphs and other visualisations such as ROI over time. Once the implementation for the server is completed and all initial information has been inserted, we move towards the interfaces that will make use of the server calculations.
- The web interface will allow users to enter parameters pertaining to initial costs and capital expenditure required to acquire the rental unit and then projecting the ROI into the futures 20 - 30 years, using provided income and expenditure parameters.
- Our implementation of the system will be expected to run smoothly, efficiently and effectively on both web and mobile interfaces. Due to the creativity of the team we will work towards providing an enjoyable and user-friendly system. The margin of risk for the system will be very small as it will solely rely on our ability to implement our solution. There will be no funding requirements as we do not require any devices or external hardware to be built into the system.
- Using Maven Builds for consistency and effective testing.
- Working together through version control systems (Git).
- Implementation of methods which deal with calculations in Java
- The use of visual imagery to graphically depict results where possible.

TECHNOLOGIES

- Java for Object Orientated Services
- HTML and CSS for the web front-end
- JavaScript

WHAT THE CLIENT WILL RECEIVE AT THE END OF THE PROJECT

- Source code
- Unit Testing
- User manual
- Architecture and design documentation
- Installation manual