

Project Assigning System

KPMG

Tender

May

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UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

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Albert
Prime

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Why Albert Prime?

Project Overview

With the growing demand in today's world for shorter development cycles (in more than just the field of programming), lower project costs, and the minimizing of downtime between projects, a clear need is present for the improvement of the administrative tools used to oversee the assignment of employees to projects. With this project we see an opportunity to build a tool that can become integral to the management of employees by taking advantage of the multiple synchronized services offered by Google for example. A tool that can be integrated to work with and manage an employee based on personal details, such as their calendar and skills, holds immense promise in improving any industry that it is deployed into.

For the creation of such a tool, we have given initial thoughts to how we would go about implementing it and what technologies we would use to address the needs of the project.

Technologies To Address Project Needs

Web Application

Based on our initial analysis we would recommend moving forward with a web application. The reasons for this are that it allows for a high level of portability, scalability, and accessibility. It allows the application to be accessed from any computer with a web browser, and can even be programmed to be accessible from mobile devices without the need for a dedicated mobile application.

Node.js Server

For our server back-end, we would elect to implement a Node.js server. This is the primary technology that allows us to maintain high levels of scalability, while also allowing us to keep high cohesion and low coupling among any modules that we add to the system. It also has a lot of support from the programming community at large currently, in terms of community assistance and documentation.

MongoDB

For our database, we would elect to implement a MongoDB database. Due to it being a No-SQL database, it has huge benefits in being able to scale for any requirements in terms of server clusters, performance, and data. It is also built towards supporting the use of agile methodologies for programming by supporting sprints and frequent iterations.

Front-end Framework

For the front-end design of the application we would look at making use of any CSS framework such as Bootstrap, Materialize, or Material.io. This helps greatly in implementing a design which is both user-friendly and visually appealing, as well as being well tested and less prone to errors. All of these tools will help greatly in building an interface for the app which is up-to-date with modern standards and which can be easily ported to any browser configuration or mobile device.

External APIs

We fully agree on maximizing the usage of external APIs to improve the capabilities of the app. The foremost of these is the Google API, which would allow users to sync up their email accounts (if they make use of gmail's services), their calendars, and their usage of google maps. The usage of Google accounts and OAuth can also be used as an additional layer of security for the application. The synchronous nature of the Google API is inherently a large advantage to what we hope to achieve with this project, and should be fully exploited for it.

Additional Suggestions

Our foremost suggestion is the inclusion of a time-card system which would function similarly to Github's Issues Board, in that once users were assigned to projects, they could register on the application the task or issue that they were working on. This can allow for integrated timekeeping which can be used for the recoverability assessment mentioned in the project specification.

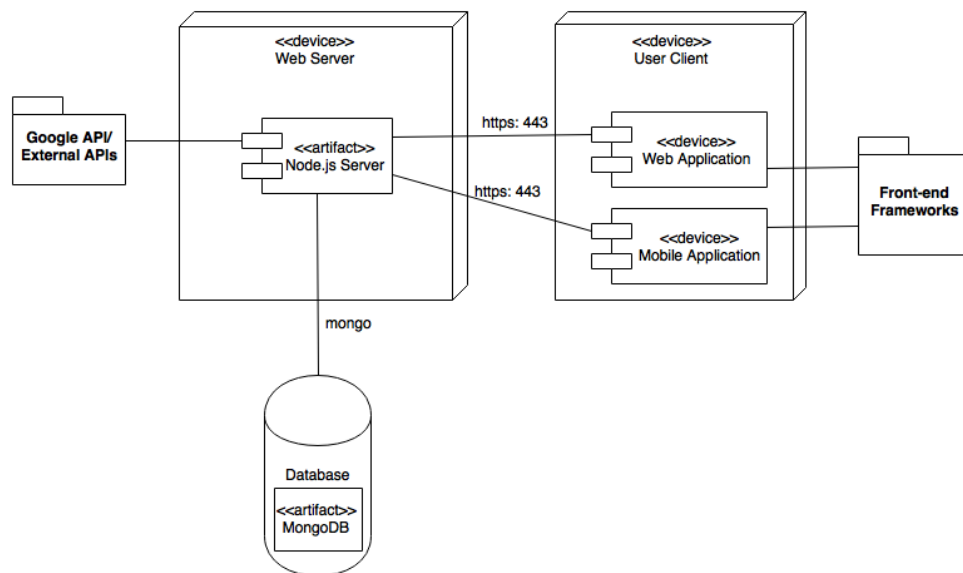


Figure 1: Deployment Diagram

Proposed Methodology

We value the relationship formed between the client and our team and the importance of having a good relationship. So much so that we want to include you throughout the whole process of building your project by presenting demos and working with your feedback; as well as keeping you up-to-date on our progress.

Our Methodology

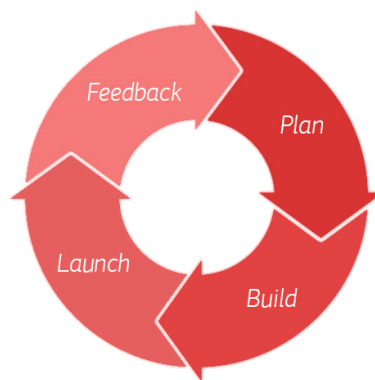
This all forms just one part of the methodology we've chosen to development your project. The agile method. Specifically, feature driven development. One of the biggest advantages about this is that we can quickly and easily incorporate feedback into the system.

Procedure

We will begin by developing an overall model of the system. The model will represent our solution and how we intend to develop it. Once we have agreed upon the system model we can begin working on the feature list. This list will contain all the features you wish your project to have. We will ranks each as either a major or minor feature and begin working through such accordingly. For each feature we intend to develop a plan to construct the feature.

Development

Lastly, develop the features. As we go through we'll go through each feature on the feature list we'll create the plan, develop the feature and move to the next feature. We believe this will provide the best experience for communication and producing the product.



Timeline



We would like to meet our clients as soon as possible to begin discussing your vision for the project and to clarify as much as possible before we begin work. Currently there are 3 demos assigned for this project:

- Demo 1: 26th May
- Demo 2: 28th July
- Demo 3: 1st September

During these demos we will show you the progress we have made and get feedback from you about what you like and what you would want changed. Our current plan for the demo meetings are as follows:

- Demo 1: Discuss requirement documentation that we have produced, as well as demo a mock front-end that we have produced to demonstrate how these requirements can be met.
- Demo 2: Discuss design documentation that we have produced, as well as demo the progress we have made with the various subsystems of the project.
- Demo 3: Demo the various subsystems of the project, and potentially have a working, integrated prototype of the full system, as well as present some user documentation.

During each of these demo sessions, we would appreciate any feedback that you may have. Any criticisms or advice that you may have for us will be greatly appreciated, as we greatly value your input and believe that it is important in order to deliver the product that you require. During the final evaluation phase, which begins on the 13th October, our client will receive all of documentation as well as a fully integrated system.

Please note that, as the client, you are more than welcome to adjust this timetable as you see fit. Additionally if you would like to have any additional meetings to check our progress, or make an adjustment to the specification, we would be more than happy to arrange it. We believe the more input we get from you as a client, then more refined the final product will be.

The Team

Dimpho Mahoko



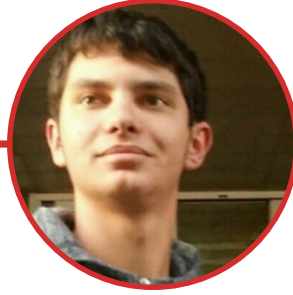
Software Developer

I am an aspiring software developer looking to gain new skills and develop those I already have. Notable skills include web development, Java, C++, JavaScript, PHP, HTML.

Below are my accomplishments worth mentioning in no particular order.

- Second place in the Standard Bank IT challenge finals in 2016.
- Webmaster at Tuks FM from September 2016 till present. Responsibilities include maintaining the website and keeping it up to date.
- Mentor at The University of Pretoria EBIT Week for EBIT Marketing.
Responsibilities include database administration, website maintenance and all other admin related responsibilities like communication with parents whose children wish to attend EBIT Week.
- 2016 Retro Rabbit Rabbiteer program attendee
The program was focused mainly on giving programming students an idea of how work in the industry is actually done. Notable technologies learnt include GitHub integration with team work and cloud computing and hosting.

Jason van Hattum



Team Leader | Android Developer

I am a motivated developer and student with a passion for application and web-app development, currently studying a BSc(Computer Science). Technologies that I am fluent in include full-stack MEAN and LAMP development, Java, C++, Android, Python and Django. I have experience in project management, web-app development and Android application development.

I enjoy experimenting in my free time, especially working on side projects on my Raspberry Pi and building Android applications. I also enjoy making graphical programs in WebGL. My hobbies also include reading, playing games, and fishing.

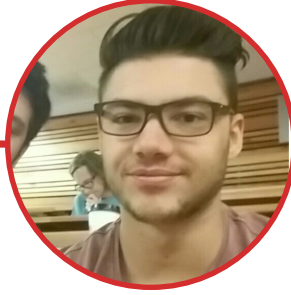
Projects that I have worked on include:

- A web application for the University of Pretoria used for peer-review and team evaluation within major projects (Can be found [here](#)). Skills that I developed here include front-end languages such as HTML, CSS, and Javascript; Python and Django.
- A variety of Android applications as a freelancing developer, both front-end and back-end. Skills developed here include Android development, Google Firebase, interface design and NodeJS.

Accomplishments and work experience:

- A member of the Golden Key International Honours Society.
- A teaching assistant and tutor for multiple subjects since January 2016.
- Participated in the Standard Bank IT Challenge in 2016 and 2017; and ACM in 2016.

Kyle Erwin



UX Designer | Software Developer

Currently studying a BSc Computer science. I'm a well rounded programmer with many skills in many languages. My passion lies in artificial intelligence and creating applications with an intuitive design. I'm a harder worker that is known to be "on top of things" by my peers.

I've worked in many leader positions and understand the importance of synergy in a team. Most noteworthy, I was apart of the TukVillage residence committee and the graphic designer for all of the events (2015 - 2016). I launched a web development company, unhinged.co.za, with team member Keegan Ferrett. My work has also extended to app development and partnerships with small start-up companies.

In my free time I often find myself programming on personal projects, coming up with new concepts and focusing my time on perfecting my artificial intelligence skills.

More about me and my skills:

- Up-to-date with all the latest design trends.
- Used applications such as Google Analytics, webmaster and Google Trends.
- Written many C++ tutorials for beginner programmers.
- Business skills and working with clients.
- An understanding of scala, a programming language great for AI.

Joshua Cilliers



Graphic Design | Software Developer

I am currently in my final year of studying a BSc Computer Science and hoping to continue on to Honours. I'm an aspiring programmer with a broad set of skills that go beyond programming. I hope to move further into the development of complex systems, on both the front and back end of development. I enjoy broadening my experiences as much as possible and am always eager to attempt new projects and to learn more while doing so.

My programming experience includes being fully fluent in C++, Java, LAMP and MEAN stack development, and Python. I have also worked on projects for iOS and Android and have experience with tools and frameworks such as Ionic.

I offer freelance web development and social media marketing services in my free time when I'm not pursuing my own hobbies and interests.

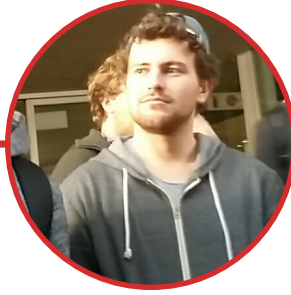
My current personal hobby is attempting to learn about the development process in Unreal Engine 4 so that I can contribute to the open-source Unreal Tournament project.

My other hobbies include photography, photo-editing and film-editing, tinkering with hardware, game development (specifically level and systems design), and reading and writing.

My skill-set and interests include:

- A focus on developing well rounded systems.
- Experience in designing the front-end of websites and a handful of systems.
- Experience in developing for the back-end of systems.
- A willingness to learn new languages and technologies.

Keegan Ferrett



Project Manager | Physical Computing

Currently in my final year of studying BSc Computer Science. I am an aspiring software developer with a love for mathematics and problem solving. I am a passionate programmer who is excited to develop my skills and knowledge. I enjoy taking on leadership roles and pushing myself with exciting and large projects.

I have launched a website designed and development business, unhinged.co.za, with another team mate Kyle Erwin. My role in the business is mostly backend development and running the business's accounting, however our vision is to one day extend into larger, and more complex projects, which we hope with this give up the experience to do.

During my free time I enjoy working on my Android app development skills, experimenting with physical computing (skilled with using Raspberry Pis and Arduinos), as well as competing in various programming and problem solving contests. Some contests that I have completed are: Standard Bank IT Challenge 2016 and 2017, ACM 2016, and HackFu challenge 2016.

Below are some of my passions and interests:

- Android App Development
- Mathematics
- Compiler Design and Construction
- Physical Computing and Electronic Engineering
- Computer Networks and Security

Why Albert Prime?



We believe that our group holds the necessary skills and talents to see this project realized to its fullest extent. All of our group members have a wealth of experience working with the MEAN stack along with talents specific to each of us that make us suited to the development of this project.

Jason is an incredibly skilled developer with experience in both web app development, which he has done for the University of Pretoria, as well as in mobile development which he has pursued in his free time.

Kyle is a developer who prides himself on creating outstanding user interfaces for the websites and mobile applications he has worked on and will no doubt ensure that this application will meet both his and your high standards.

Dimpho is skilled in web development and has a competitive spirit that drives her to always perform at her best. Her experience with database administration will be invaluable in ensuring that the database of this application will be up to a high standard.

Keegan has gained experienced with Node.js, by working on a Node Server which was to serve as the backend of an android application he was working on in his free time.

Joshua has experience in both web and mobile application development which he can lend to any part of the project, which makes him a valuable member of the team.

Overall our team is more than sufficiently equipped with the skills to tackle this project and produce results to your satisfaction.



Figure 2: The Squad