



Information Technology

2018 Projects



Well connected. Right Here.

 **WeITec**
Te Whare Wānanga o te Awakairangi

Information Technology Undergraduate and Graduate Projects



Introduction

Welcome to the compilation of Final Project synopses. These projects are undertaken by Graduate Diploma in Information Technology students and students in their final year of the Bachelor of Information Technology (BIT), from the School of Information Technology at the Wellington Institute of Technology.

The synopses briefly capture the compulsory 450-hour capstone projects component that is available in both of these programmes. By working with the IT industry and various research and development specialists, students have been able to execute projects at no cost.

The Qualifications

The School of Information Technology offers a Masters in IT, Graduate Diplomas and a Bachelor of Information Technology degree, with majors in five specialised areas (and an unendorsed option allowing students to design their own degree).

The four specialised areas of the degree are:

- Programming
- Networking
- Software Engineering
- Information Security

Students also have the option to further specialise in their study by undertaking a Masters and double-majors in three areas:

- Software Engineering and Programming
- Networking and Information Security
- Programming and Information Assurance and Security

From 2020 students will be completing our new degree, with 5 majors in the areas of Software Development, Networking and Infrastructure, Cyber Security, Data Science and Interaction Design. This is developed and delivered in partnership with Whitireia Community Polytechnic.

The Post Graduate Certificate, Diploma and Masters, along with the two Graduate Diploma programmes give a range of courses to choose from for a final project.

- Graduate Diploma in Information Technology (Level 7) has further options for students to gain a comprehensive understanding of specialist areas within IT and apply that knowledge by working on an IT project.
- Bachelor of IT students can dip extensively into the Graduate Diploma in Information Assurance and Security (Level 7) courses, and are offered experience in how to integrate security policy, practices and technologies into operational structures and explore the principles of survivability and information assurance, and students are able to use knowledge gained from some of the courses in this programme towards their final Project.

Students have the option of an alignment with many international industry certifications like Cisco, Microsoft, ISTQB, etc., and can utilise some credits from this towards their degree affording further depth and a wider scope in developing their Project.

What these projects are really about

A capstone project, such as this, is intended to allow the student to refine the qualities that make them eminently employable. Our students select their own small teams and projects, and then work in independent teams, setting their own goals and pace in line with the project client needs. Students choose their own technologies, methodologies, and management practices in addressing both Client needs and best industry practices. These projects represent: Adaptability, responsibility, and perseverance.

With this in mind, and the arbitrary limits of 450 work hours we impose, many encounter 'expert overconfidence' – and must negotiate and manage new goals as the project progresses. This is a real learning curve for all project students, as in most of their studies our lab exercises are designed to work cleanly, but reality is never that tidy. They face real problems, and develop real solutions.

The other skill the students develop in this project is teamwork. Until this project the bulk of their studies have been individual efforts, now they must form a team, utilise their diverse skillsets, maintain relationships, and rely on others for essential parts of the puzzle – just like in industry!

For most students this project will be the last time they undertake a project from beginning to end – but they do get to experience the many facets of the project lifecycle, and hopefully make better career choices because of it. As the IT industry runs mainly on projects, and has many specialisations within it, this project will help students find their best place in the industry.

Supporting the students

This year the project coordinators were Robert Sutcliffe and Glenda Shaw. Their task was to find and evolve the projects, thoroughly brief the students, set standards, and support them through the rough patches. They also audited the projects to get projects managerially back on track, co-ordinate all the assessments, and develop this presentation booklet.

The students also had regular access to an academic staff member for advice and guidance on matters ranging from technical, administrative, to relationship management.

Highlights of the Year

The spread of projects this year are quite different to previous years – the defining characteristic this time is business diversity. We had a game developed to aid student orientation, a detailed business analysis based software selection, an application based on Blockchain for validating issued certifications, a revamp of a disaster recovery plan for a bank, development of automated software testing for a local developer, and a slew of app and website developments for small businesses.

Enjoy the show, but please be gentle with them – many of them have had a hard time!

If you have a project idea you'd like considered by the students for a future trimester, please let us know:

Email: Robert.sutcliffe@weltec.ac.nz or Glenda.shaw@weltec.ac.nz

2018 IT Projects

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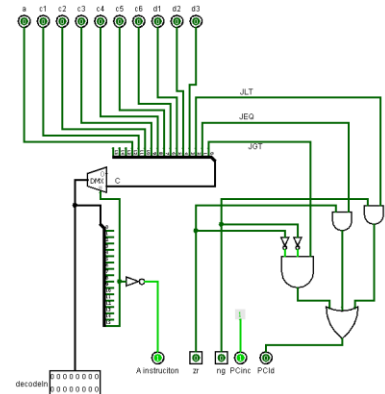
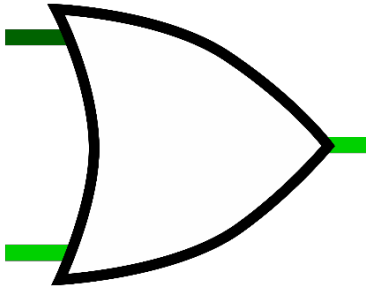
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Abstraction Exposed

By: Matt Ball, Louise Carpinter and Dylan Fenn

Advisor: John Gould

Client: Paul Bryant



INTRODUCTION

Abstraction Exposed focuses on an in depth look into the hardware components that make up all modern computers. Using an open source program called Logisim, each circuit and chip of the computer can be built from the ground up and simulated in real time so the user can watch the logic progress around the circuit.

The team wanted to repurpose a course for implementation into the current Bachelor of Information Technology taught at Weltec. This gives students the opportunity to develop a deeper and more insightful understanding of how the various elements of computer science work. The concepts learnt in this serve as the foundation for ALL computing.

DEVELOPMENT

The course was repurposed from five chapters outlined in the nand2tetris book, each focussing on a different element of the computer. The elements were:

- Boolean Logic
- Combinational Logic
- Sequential Logic
- Computer Architecture
- Machine Language

The team followed a Scrumban approach which is a combination of Scrum and Kanban. This follows the Scrum approach, but incorporates the Kanban

method that allows for constant adaptation and improvement of work.

We worked through each chapter to produce PowerPoint slides, lab work, marking schedules, and a software manual for visually creating the hack computer in Logisim.

The work was tested internally within the project team. Each chapter went through a development stage, and then would be passed to other members of the team to test for problems.

Due to time constraints, we were unable to conduct external testing for improved results, but we have created documentation for the testing to be conducted in the future.

CONCLUSION

The team were successful in their development of the five chapters of content. We are proud of the work that we have done, and we've become closer from working together for a long period of time.

This project has the potential to be developed further by continuing to work through later chapters. These take on a software approach and eventually tie everything together. The content we have already produced can be improved further through external testing with students.

ANZ Disaster Recovery Application (Project-X)

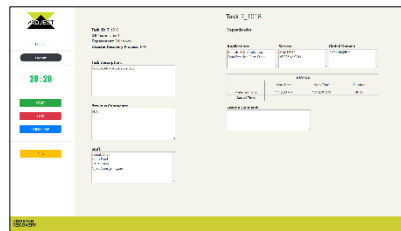
By: Danak Chea, Kiran Patel, Phuc Hong Pham and Vijay Amargalinggam

Advisor: Chalinor Baliuag

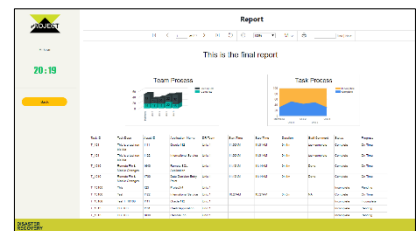
Client: ANZ Disaster Recovery Team (*James Braid – Representative*)



Login Page of Disaster Recovery App



Begin Task Page



Report Generation Page

INTRODUCTION

The Disaster Recovery Application is a web application, aimed to assist the organisation in recovering their systems in the event of a disaster. The application contains and provides crucial system information, live-updating dashboards, notification systems, task management, user authentication and report generation. This application is cloud-based to ensure that multiple users can access the system at any given time, and that data remains unharmed and secured.

This web application was created to further improve the current disaster recovery processes and to aid the organisation when it comes to efficiency of executing tasks, save resources, and reduce room for human errors. The application's goal is to help users identify the tasks, complete tasks, and provide the crucial information necessary to get their systems up and running again.

DEVELOPMENT

The team started by gathering the project requirements and what was actually needed by the client. By understanding what was required, the team was able to create a plan of action to follow and execute such as a work breakdown structure and Gantt chart.

After the information was gathered, the team analysed what the system would be and how the infrastructure of the application would be created in regard to the functionalities, database, and back-end development.

Once the system analysis and design process were completed, the team started designing the wireframes and prototypes. This was an important step as it helped to visualise the application and ensured that the client and team were on the same page.

When the design of the application was approved, the team started researching the different development techniques that would be used. Various database options were also considered; an SQL Relational Database was the suitable option for this application. The research helped determine that the ASP.NET Framework was the best fit option for an application with consideration to the requirements.

The team approached the development by prioritising the main requirements of the application, by using a SCRUM to organise the development sprints and tasks. The team began developing the application. The first half of the team developed the User Interface, while the other half developed the database. Then the back-end was developed. Lastly when a milestone was reached in development the team would merge all of the code together and progress to the next functionality.

While the development was completed, the testing was also done in parallel to keep a consistent work flow, with different testing methods used such as, manual and integration testing. Stress testing was also completed to ensure the application could handle the large amount of traffic.

Once development was completed, the final accompanying documents were finished, such as the training manual and technical documents. After client handover the team prepared for the academic handover by completing the necessary documentation.

CONCLUSION

Overall, the project was completed on time and met all of the requirements. This project outlines the time, research, development, and effort necessary to complete a project of such size. The client was impressed with the outcome as it was exactly what they had pictured. The team was gratified with the outcome and were content with the new skills and experiences gained from this project.

Automated Class Register

By: Rohit Jaswal, Khozema Rampurwala and Nino Noel Tolentino

Advisor: Steve McKinlay

Client: Robert Sutcliffe



INTRODUCTION

The Project is about the Automated Class Register where the tutors can maintain the student attendance easily. Nowadays tutors take the attendance by distributing and updating the sheets in the class and then update it on the system which is time consuming work. With this system tutors can easily upload the attendance on the system through CSV.

The main motive was to save time and error while uploading the attendance on APlus+. As the automated attendance is prominent around the world so it was a good experience to get the ideas from that type of project. Tutors can easily maintain the attendance and check anyone's attendance. Overall as a team we worked hard and for the future aspects fingerprints and facial recognition can be used to upload to the database.

DEVELOPMENT

The main aim of the project was to upload the attendance of the student through CSV. As a team we decided to work in our fields so I was working as Project Manager, Khozema Rampurwala was working as a developer and Nino Noel was working as a developer and tester.

At the starting phase the team was excited as well as a little confused as we were doing the project for the first time. But we overcame and got the things done. Our project client and advisor helped us a lot and gave us the ideas.

At the technical phase Khozema Rampurwala and Nino Noel Tolentino worked hard and was very stressed and we asked the help of our Advisor.

As a Project Manager I managed the team and whenever the team needed me I supported them. We got stuck sometimes but we managed to overcome. There was some conflict between the team sometimes.

At the end phase of the project we started our final documentation preparation and we were also working on technical things. At last we submitted our client handover report and project to our client.

As a team we did our work and we learned lot of things from each other.

CONCLUSION

With this project we tried to help the tutors to update the attendance through CSV and it will be easy in the future to upload the attendance easily and it will reduce the time and error.

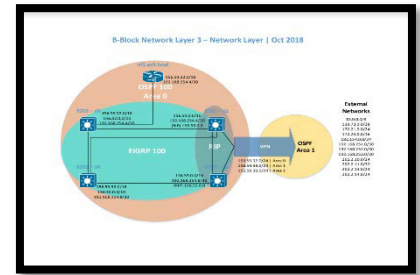
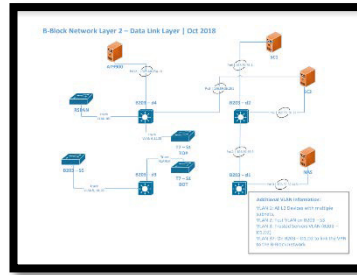
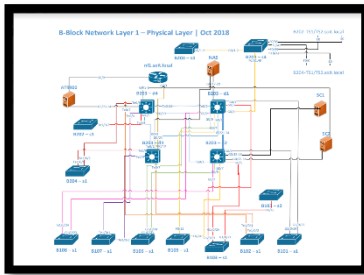
The purpose was to establish a system which will allow the tutors to upload the attendance directly.

B-Block Infrastructure and Software Audit

By: Stuart Bayne, Patrick Peters and Isabelle Thomas

Advisor: Jeff Echano

Client: Mary-Claire Proctor



INTRODUCTION

Having a complete and up-to-date catalogue allows a business to make accurate decisions. It also allows for security vulnerabilities to be identified.

The B-Block infrastructure and software audit's primary goal was to complete an audit of a live environment. This entailed cataloguing the hardware, software and settings on the B-block network.

DEVELOPMENT

The project leaned towards a hybrid approach; management giving structure through the waterfall approach, while utilizing an agile approach to allow for movement throughout the project life cycle.

After the Proposal was accepted, the project group planned all the details for the execution phase to ensure project security was held securely as the project entailed dealing with sensitive information. The project team decided that an Excel-based spreadsheet was the best way to present the catalogues.

During the Planning and Discovery phase the project group found that to increase the quality of the end product, an addition of a testing phase for network monitoring applications was valuable. Through the application testing phase the group discovered that Spiceworks was the best application to fit the project's needs for monitoring

and network discovery. The project group found that the Spiceworks tool allowed for application and hardware discovery.

After the Testing phase of the project the information was gathered in such a way as to not interfere with the live network to ensure that there was no downtime. The project team ensured that confidentiality was upheld at all times. For the Network side of the discovery our Network analysis utilised command line interface to extract information. The project's security specialist worked in tandem to also present a list of live connected hardware.

For added value to this project the group did a group policy object catalogue and a security analysis of the B-Block Network and infrastructure.

CONCLUSION

The successful operation of this project was measured by the deliverable completion, the handover to the client and the academic handover.

Through this project the team has learnt a great many things surrounding the successful undertaking of an Information Technology Audit. The project has prepared the group members to work in industry conditions successfully with the ability to undertake an audit of a network and projects.

Certifying Students using Blockchain Concept – DigiCert

By: Kartik Patel, Prabhakaran Ganesan and Maria Sagayaraj

Advisor: Paul Bryant

Client: Glenda Shaw



Outline of Certifying students using Blockchain

INTRODUCTION

The Wellington Institute of Technology (WelTec) is one of New Zealand's oldest tertiary education institutions and offers a range of industry-led qualifications from trades through to degrees and postgraduate programs. 'Certifying Students using Blockchain' will be the first capstone project at WelTec that will develop a distributed application (DApp) for deployment on a blockchain. Three students currently studying the Graduate Diploma in IT at WelTec have undertaken this project. The Project Team worked together with different skill sets and the aim was not only implementing the Certifying Students project using blockchain technology, but also to enhance our own skills and knowledge that will help in our future endeavours in the trending blockchain technology.

DEVELOPMENT

- Digitally certifying the students of WelTec using Ethereum Blockchain.

- Proving the study ownership using the blockchain technology because the data is immutable and cannot be altered once entered.
- Proving the WelTec qualifications are true and accurate.
- Proving that blockchain technology can be used for such certification processes.
- The contributions from all team members were put together as a team project to make the process smooth and effective.
- The team members used the essential skills of Project Management to maintain the relationship with the client and to carry out the process within the team.

CONCLUSION

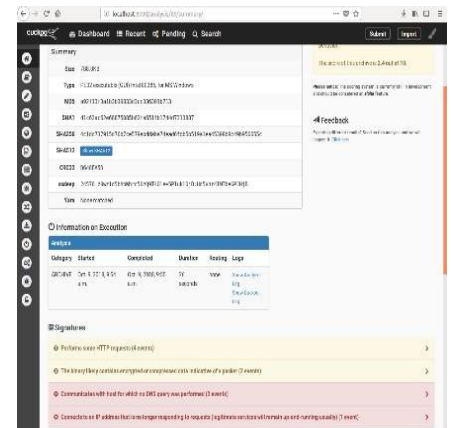
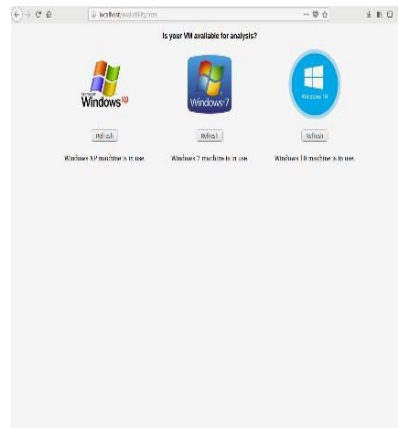
The outcome of the project is enabling WelTec's certification to be viewed on the Blockchain Decentralised Ledger so that anyone in the world can get assessed on any time using the Blockchain technology.

Cuckoo Sandbox Malware Analysis

By: Sam Hardley, Jonathan Lee, Brighton Muchemwa and Fortune Tauro

Advisor: John Gould

Client: Masood Mansoori



The basic web UI for file upload/analysis

Web page for viewing available VMs

A report generated of a file that was run

INTRODUCTION

Cuckoo Sandbox is a virtual file analysis system where users can upload a file and select a virtual machine that will analyse the file and produce a report.

The system consists of a backend server which hosts a virtual environment for file analysis, and a frontend website where users can upload files and fine-tune their analysis options.

Users who have received files they are suspicious of can use the website to run the file without harming their own system. The report that is generated will allow the user to see what impact the file has had on their VM of choice.

DEVELOPMENT

The backend of the project required a server that hosted a virtual environment designed to be as vulnerable as possible to malware.

The frontend of the project was developed with languages such as PHP, Python, and HTML. This frontend was built with the intention to interact with the backend virtual environment.

Agile methodology was implemented due to the amount of flexibility that would be required during the life of the project. This methodology also suited the requirements as many features needed to be developed one by one.

Once the backend was stable and completed, work began on coding the frontend webpage.

The easiest features to deliver were identified early on and given priority before attempting to deliver more complex features that the project team were unfamiliar with.

Prioritization of features to develop meant that the system could be developed in iterations, and each iteration would improve upon the last.

The project required coding, scripting, server administration and networking tasks to produce the final system.

CONCLUSION

The Cuckoo Sandbox Malware Analysis system can be hugely helpful for users of all technology experience levels, as it is simple to use and can be used in a “set and forget” way.

There are file analysis websites that already exist on the internet, and this project has the potential to compete with them due to the extra features it can provide.

Although not all client requested features were completed due to time constraints, the project is in a good state to be continued.

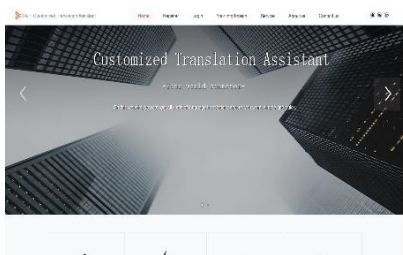
The project team compiled all recommendations and heavily documented the source code to make sure any party who may continue development have a good knowledge base to work with.

Customised Translation Assistant (CTA)

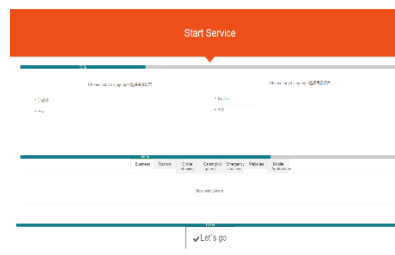
By: Dingyi Cai and Junwei Liu

Advisors: Robert Sutcliffe & Glenda Shaw

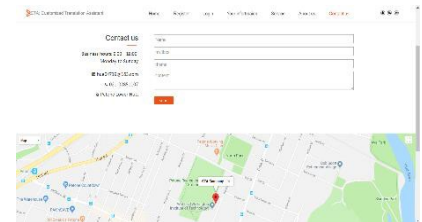
Client: Project Team



Website Homepage



Service page



Contact us

INTRODUCTION

Customised Translation Assistant (CTA) is an online platform that provides accurate customised translation services according to the needs of customers.

Nowadays, shopping and travel abroad are very popular, but many people lose the opportunity of shopping and tourism because they cannot speak a foreign language. Our platform wants to make a connector. 'Connect the world.'

The next step was to improve functionality, including login, registration, service flow, and so on, as well as developing the navigation. In the service process, we added communication tools, paid methods and feedback functions.

Finally, we completed the introduction of basic information of the website, including service characteristics, company address, working time, contact number, working email and so on.

DEVELOPMENT

First, we chose the server. We chose Alibaba Cloud, which is free and fast.

Then there was the choice of domain name, and we chose a random domain name, because it costs money to customise a domain name. This was difficult for us because random domain names are hard to remember.

Next came the design of the page. Our design requirements were concise and fashionable.

CONCLUSION

We replaced the development platform, and in the end we finished the website construction, although we did not achieve the desired outcome, but the basic function of the website is complete. We will constantly update and repair site in the future.

We also studied the process of project production/management. We believe that with this experience, we can better finish projects in the future.

Direct Trading System

By: Dibesh Gurung, Danny Philp and Navdeep Singh

Advisor: Robert Sutcliffe



Embroidered design



Wood craft



Traditional window

INTRODUCTION

The main idea behind this project is the elimination of middlemen who profit from the trade and helping the producers get the best value for their product. This project is a proof of concept where we have chosen the producers as the craftsmen of Nepal who will sell products to the distributors of New Zealand. The distributors could be any firm or business who works for a fair trade like Trade Aid.

The current business system is based on the involvement of middlemen for a trade to happen. Hence we are providing a platform, which is a website, which will help the distributors to directly contact the producers. This website will certainly help to eliminate the middlemen.

DEVELOPMENT

We are the *Middlemen* and we chose the name as an irony to eliminate the middlemen. Our first task started with a development plan where we chose a hybrid methodology having spiral methodology in a more agile manner by borrowing some parts of scrum.

In our project we had three iterations with multiple sprints within each iteration. The first iteration was building a database. The second iteration was designing a website. The third iteration was the development of the website.

In the first phase we did a lot of analysis on Entity Relationship Diagram. We gathered information that should be included in the website and made a table for it and set up relationship between them.

We used MySQL to build our database. Second phase was the designing of the website. We used HTML, CSS and integrated with bootstrap to make it user-friendly on different platforms.

Third phase was the development of the website. We chose to use Laravel. It is a PHP framework. It made the development part easier than we had thought.

It was easy to make models, views, controllers and routes using Laravel. The migration system in the Laravel has also helped us in connecting with the database.

CONCLUSION

This project was run by *Middlemen*. This project is just a Proof of Concept. We had wanted to do lots of work for this project. We wanted secure connections between producers and distributors, a platform that could be a reliable option for the end users. Yet due to the time constraint we had on our project we were limited on various aspects of the project.

Yet the idea behind the project has flourished from what we had thought at the beginning. There were many obstacles during the project life cycle and we were able to overcome some of them. This project has an idea, the strength to challenge the modern trading system.

Dynamic Honeynet

By: Charlotte McLean, Dion van Rensburg and Sean Guerin-Jones

Advisor: John Gould

Client: Masood Mansoori

```
=====
Welcome to NetSpyManager 2.0
Fingerprinting and HoneyPot Deployment
=====

Network: 192.168.37.0/24
Network interface: ens33

Honeyd status: Not running
Number of Production Network clients up: 0

****Fingerprinting Options****
1. Scan current network for running hosts
2. Get OS and Services of running hosts
3. Fingerprint a remote network subnet

****Honeyd Management****
4. Generate Honeyd pots to blend into current network
5. Start Honeyd
6. Shutdown Honeyd
7. Exit

Enter choice [ 1 - 7 ] █
```

System Menu

```
=====Scan Production Network For Open Ports and Operating Systems=====

Hosts that are currently up the 192.168.37.0/24
=====
192.168.37.138
192.168.37.139
192.168.37.227

Running an OS detection scan on the running hosts
Please be patient, this may take a while

Here is a list of the running hosts, open ports, and Operating Systems
In the format IP | Open Ports | Operating Systems
192.168.37.138|21,22,139,445|Linux 3.2 - 4.0
192.168.37.139|135,139,445,554,2869,5357,10243|Windows Server 2008 R2
192.168.37.227|22,80|Linux 3.2 - 4.0

These values will be saved to a file called
runningHostsServices.txt

Press [Enter] key to continue...█
```

Fingerprinting Hosts

```
=====Deploying HoneyPots based on Running Hosts=====

Honeyd pots will now be created
to blend into the production network
192.168.37.0/24
Running clients: 3

A honeyd config file will be automatically created called dyn-honeyd.conf

Free IP found for honeypot: 192.168.37.189
Honeyd will be created to be similar to Linux 3.2 - 4.0
Personality chosen for the honeyd: Linux 2.4.7 (X86)
Honeyd name will be linux-189

Free IP found for honeypot: 192.168.37.86
Honeyd will be created to be similar to Windows Server 2008 R2
Personality chosen for the honeyd: Windows_7
Honeyd name will be windows-86

Free IP found for honeypot: 192.168.37.222
Honeyd will be created to be similar to Linux 3.2 - 4.0
Personality chosen for the honeyd: Linux 2.4.7 (X86)
Honeyd name will be linux-222
```

Automated Deployment

INTRODUCTION

The Dynamic Honeynet project consists of system analysis, system design, system development and system testing for a smart honeypot deployment application. The system allows users with no prior honeypot configuration experience to deploy, monitor and modify dynamic honeypot deployments.

The Information Technology (IT) security industry can highly benefit from this project as the system has the potential to assist with vulnerability analysis, penetration testing, ethical hacking and full scope security testing.

DEVELOPMENT

The team behind the Dynamic Honeynet project are Charlotte McLean (Project Manager), Dion van Rensburg (Team Lead) and Sean Guerin-Jones (Technical Lead).

Each team member was assigned a fixed management-based role. With the added agile flexibility, the team was also able to take on a different set of tasks if needed. This meant that each team member was able to apply their technical skills.

The methodologies used for the project were PRINCE2 Agile, Crystal Clear, Lean Six Sigma and the SDLC Lifecycle (Incrementive Model). These methodologies were useful once applied to the project as they allowed for structure and standardisation, adaptability and flexibility, as well as responsibility and accountability. The project was to be completed in incremental phases to keep track of the project's progression and

current developmental phase. Each phase was to be approved by the project advisor and project client before commencing the next phase.

With the methodologies set-in-stone and the client's requirements gathered, the team set about developing the system with the aid of advice and quality assurance from the project advisor.

During system development, the prototype was housed within a virtual machine environment. The system modules were developed using a combination of Bash Shell Script, PHP and Python. The interface automated the complex functionality that NMap and Honeyd provided. Initially it was agreed that all three team members would contribute to the technical development phases of the system, each showing their technical ability and prowess. Unfortunately, as the project progressed, miscommunication was becoming a common occurrence and the team gradually began to break down and so did the project.

CONCLUSION

Priorities changed within the project as deliverables were missing and deadlines were not being met. The basic prototype for phase one was delivered to the client, which utilised NMap fingerprinting, as well as Honeyd system and service emulation. An installation guide and user manual were also delivered to support the basic prototype.

IT Infrastructure – Documentation & Cloud Migration

By: Jonathan Wootton

Advisor: Glenda Shaw



INTRODUCTION

Many modern businesses face the challenge of ensuring their IT systems remain up-to-date and secure as more advanced technologies enter the marketplace. One technology which has taken the industry by storm is Cloud infrastructure, which removes the need for businesses to own and operate physical server hardware leading to cost savings. With many New Zealand businesses and government departments adopting cloud services this project aimed to design a cloud solution that would replace traditional IT systems for a small organisation. As part of ensuring all IT resources were clearly accounted for, this project also documented an up-to-date view of the current IT systems in play.

DEVELOPMENT

With the rapid advances in modern technology businesses are having to review their IT systems to ensure they can remain connected, supported, and secure. The client involved in this project foresaw the limitations of its current systems and decided to engage the project team to reevaluate these and bring them in line with current technology and best practice, whilst maintaining the strictest compliance and security practices.

The project team's proposal was to develop an overarching solution that encompassed all the client's IT infrastructure requirements with the goal of leveraging cloud services as the main platform. As the client had offices and remote workers throughout New Zealand, ensuring this system could work anywhere and at any time was a primary objective.

The team began by documenting the IT systems the client had in place. This was an in-depth process that resulted in a 134-page report covering inter-site connectivity, server, PC device, and network device configurations. As the client

required a complete analysis of data sovereignty issues before deciding if they would go ahead with adopting cloud services, the project team's next task was to document the information assets and classify these against the New Zealand National Security Framework. This process involved a discovery of all the client's information assets/data sets that their current server housed and determining if this data contained personally identifiable information or information classified above RESTRICTED. A cloud risk assessment process was also conducted to ensure risk mitigation controls were identified so that they could be developed if and when the cloud services were used.

With confidence that the client could leverage cloud services if they applied the appropriate security controls the project team next looked at cloud applications that could replace the current Document Management System. An in-depth analysis of the available feature sets measured up against the current and the cloud system was undertaken. The analysis task is still being completed as the client has expanded the scope of the solution they wish to employ.

The team used a simple waterfall approach for the project as infrastructure installs generally follow a thoroughly thought-out design and testing stage before any implementation is undertaken.

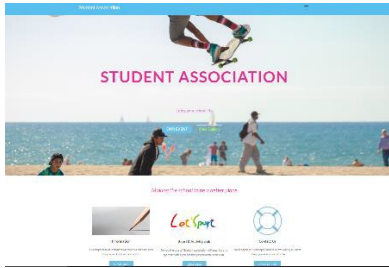
CONCLUSION

This project will be continued by the client's internal staff who will further develop and recommend the best cloud applications and infrastructure services for the client. Once the design stage is complete a full testing and implementation phase will commence.

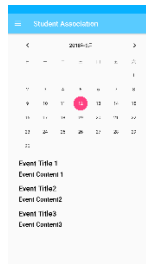
LINK Student Connection

By: Kelvin Lai, Jacky Tsui, Zaira Washbourne and Bowen Zheng

Advisor: Chalinor Baliuag



Web Home page



App Event page



Web Contact us page

INTRODUCTION

The concept of Link project was originally from our teammate, who wanted to help the Student Connection to make a mobile application and a website, so they can have better contact with the students, provide help for students and let them have the best experience in the school.

Some of the student associations from other schools have a website for their students as a way of asking for assistance they need or to give some feedback about what can be improved.

Therefore, we decided to create a mobile application and the website, which will allow students to have a better school life experience and enable them to get the latest information from school.

DEVELOPMENT

Before the Link android application and the website, we started with a brainstorm session, about what features or functions we needed to include in the website and the application. We investigated some other schools' student association websites and asked some advice from our school's student association, our advisor and our client. After that we had a basic concept about what features and functions we would need on the android application and the website.

We then assigned a job for each of us. We assigned a website developer, an android application developer and a project manager.

After that we used paper work to draft our design, and after some discussion and changes, we found the one that fitted our need for the android application and the website, so we started the development stage.

Since the development stage for the android application and the website could start at the same time, we split up into two small teams and started developing the home page first, then the information page, event page, etc.

CONCLUSION

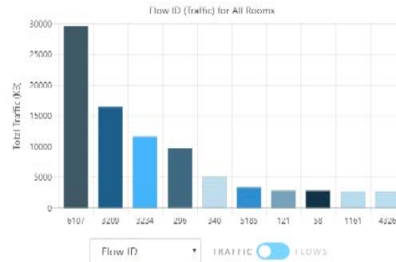
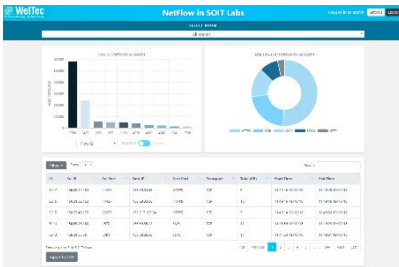
Providing this project for the student association to support the students to have a better experience in school, they will have better contact with the students and a better way to assist or communicate with the students; for the students, they will have a more convenient way to receive the latest news and much easier for them to advise and give feedback about the school. We are glad to have had this great opportunity to share knowledge and skills to the school and the students.

NetFlow in SOIT Labs

By: Alex Nguyen and Mason White

Advisor: Drew Duncan

Client: Jeff Echano



ID	Src IP	Src Port	Dest IP	Dest Port	Protocol	Total KBs	Start Time	End Time
1000	192.168.1.1	8080	192.168.1.1	8080	TCP	2	2020-01-01 00:00:00	2020-01-01 00:00:00
1001	192.168.1.1	8080	192.168.1.1	8080	TCP	2	2020-01-01 00:00:00	2020-01-01 00:00:00
1002	192.168.1.1	8080	192.168.1.1	8080	TCP	2	2020-01-01 00:00:00	2020-01-01 00:00:00
1003	192.168.1.1	8080	192.168.1.1	8080	TCP	2	2020-01-01 00:00:00	2020-01-01 00:00:00
1004	192.168.1.1	8080	192.168.1.1	8080	TCP	2	2020-01-01 00:00:00	2020-01-01 00:00:00

The admin view of the webpage

Network statistics displayed in a bar graph

Network statistics displayed in a table

INTRODUCTION

NetFlow in SOIT Labs is a system that monitors network statistics generated by the several computer labs or rooms in the SOIT network at WelTec's Petone campus. Using NetFlow, traffic is collected from these rooms and sent to a cloud hosted server which will store the statistics in a database. This information is then displayed in graphs (one bar and one pie graph) and a table on a web interface (or website). Several options exist on the page to customize the information that the user sees.

Within the website, the user will be able to see what kind of traffic is being sent and received in the SOIT network. Admins can use an alert system so they are warned by email if too much traffic is being sent and/or received through the NetFlow system. Data from the tables can be exported to a CSV file so that the information can be used elsewhere.

DEVELOPMENT

The project was developed by using a Feature-Driven Development (FDD) methodology. This allowed the team to separate the project into separate features based on the client's requirements. Adding additional features was also easy to implement with this methodology.

The team used an Amazon Web Services (AWS) EC2 instance to host the webserver and database.

Once the features were identified, the team worked on the core system. The core feature would be the basic or main functionality of the website to make sure everything is working. During development of the core feature, the team was able to complete a lot of the functionalities that were originally separate features, such as the table searching feature. This allowed the team to expand the scope of the project and add an alert system to the feature list.

Once the core feature was implemented, the team worked on and finished additional features which included exporting table data (exporting to CSV), a customizable graph, an alert system and viewing traffic information by each individual room.

CONCLUSION

The team was able to successfully complete all of the milestones set in the original project proposal and implement several additional features. The project was a success.

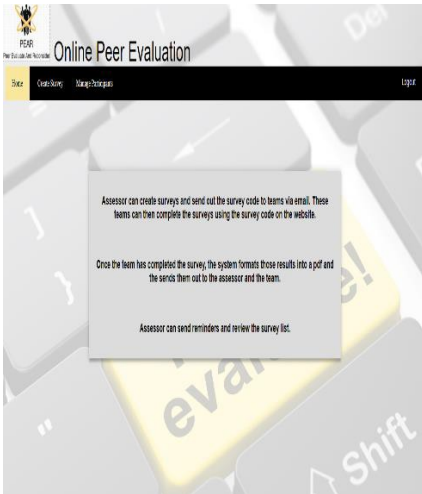
The system solution is fully functional and ready for WelTec staff to use it or expand on it.

Online PEAR Evaluation

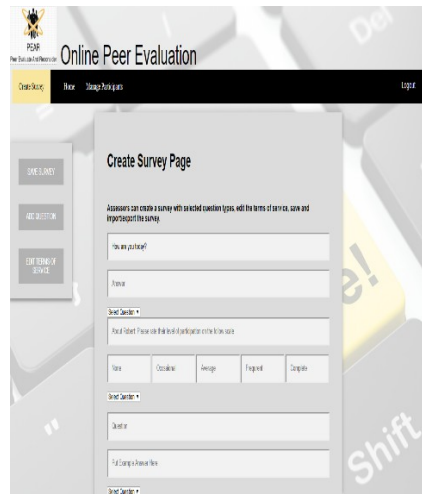
By: Shanitha Mohammedrafi; Nilani Guruge and Anthony Sirvid

Advisor: Reza Moosa

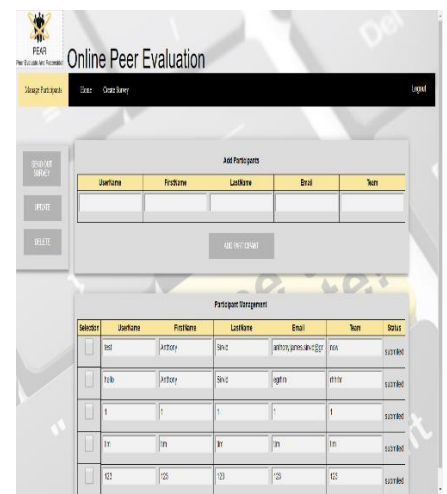
Client: Robert Sutcliffe



Home Page



Create Survey Page



Manage Participant Page

INTRODUCTION

PEAR - Peer Evaluate and Reconsider - is a system which allows the team members to evaluate themselves within the team. Teams are becoming the permanent way of doing things and are increasingly virtualized nowadays where the team members can be from different organizations, places and times. Each team member can have a huge impact on the other team members. Often there is no way for them to find out their impact. With the increasing responsibilities and undertakings among team members of different teams, there is a need for evaluating the contribution by each team member to the team. Peer evaluation has become an inevitable part to evaluate the peer members of a team and know their impact.

DEVELOPMENT

The project consisted of four phases developed from Extreme programming methodology. Extreme programming (XP) is an agile project management methodology that involves frequent releases and allows team members to quickly adapt to changes.

All the phases included planning, systems analysis design, coding and testing. PEAR has two different users: assessors and participants.

The project was divided into four phases which were: creating a survey, taking a survey, ease of

use and iterations version 2 which was a refined version of all the iterations.

PEAR allows the assessor to create a survey and send out the survey to a participant. The participant will receive a participant code and a username through an email. This will allow the participant to access and do the survey.

The system was fully developed using HTML, JavaScript, PHP and MySQL, used for database development.

The system was tested manually. Xampp was used as the testing environment.

The project was not completely developed within the timeframe. The functionalities that have not been achieved are clearly stated so that it will be beneficial for future developers.

CONCLUSION

Even though we were unable to complete the project fully, we have developed the main functionalities and they are working fine.

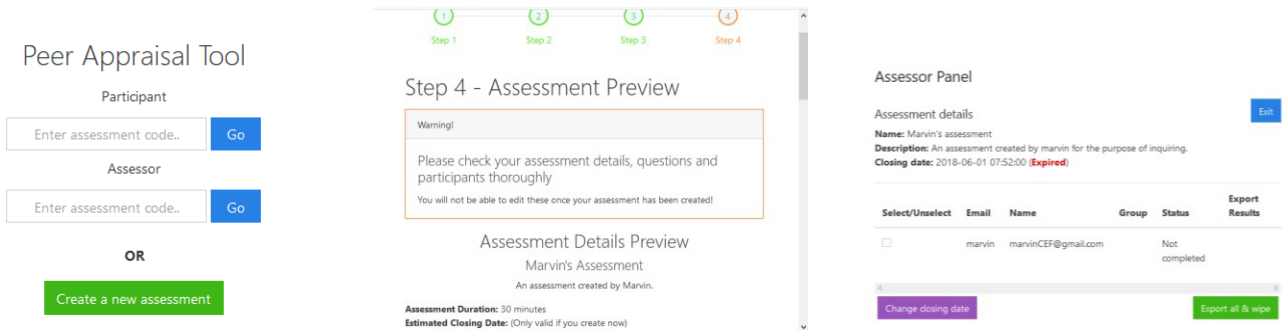
Finally we can say that we have performed adequately in order to complete the project. We hope that if we had more time, then we could have been able to complete all the phases. From this project, we gained a good learning experience and the skills we gained will be useful for our future.

Peer Appraisal Tool

By: Marvin Jay G. Muyargas, Nhan Truong and Yuhan Wang

Advisor: Reza Moosaei

Client: Robert Sutcliffe



Create assessment preview

Assessment management control panel

Homepage

INTRODUCTION

The Peer Appraisal Tool is a website application aiming to formalise the process of creating and answering peer assessments. Peer assessors can create their own assessments with their own question sets and invite peers into groups during the assessment creation stage.

Once an assessment has been created, participants of the assessment are sent invitation codes which they can use to enter in the system and participate in the assessment. Assessors can also use the system to manage their assessments by closing it early, exporting answers, or changing the expiration date.

The client wanted a website to formalise the process which is usually done by hand which is error-prone. Our digital solution aims to solve this.

DEVELOPMENT

The skills taught from WelTec, System Analysis and Design and Programming were vital to us for understanding the system, what the client wants and how to put it together.

We used the Scrum methodology to split the development of our product into four 2-week iterations. The first iteration was about analysing and designing the system. The second and third were implementing the solution, and the fourth was writing the documentation.

We learned a lot about how to develop a website and use PHP libraries to speed up development. For instance, the PHP Mailer library was used to send the assessment access codes to the participants and assessor, and the "fpdf" library to

compile a participant's answers into a single PDF file.

BitBucket was used to host our git repository so that we could work on the project's outcome and Google Drive and Google Docs to share and work on documents.

Bootstrap was used to make the user interface of the website look better and speed up development of the user interface.

Lastly, WAMP was used to develop and run our program, which was useful because we didn't need to install individual packages to get a web server working. Also, MySQL was included, which we used to query our database with the PHP programming language.

CONCLUSION

The website solution achieved several requirements of the client such as the ability to invite participants to an assessment and manage it. Unfortunately, the assessment participation/answering pages were not implemented due to development time constraints.

Although not all the client's requirements for the website were achieved, we managed to create a solution that future development teams can continue developing.

We learned a massive amount by participating in the project course and its activities. But most importantly, we learned how to work together which was one of the biggest challenges in creating the website solution.

Project Bid Automation

By: Jaskaran Singh and Jitendra Swamy

Advisor: Terry Jeon

Client: Robert Sutcliffe

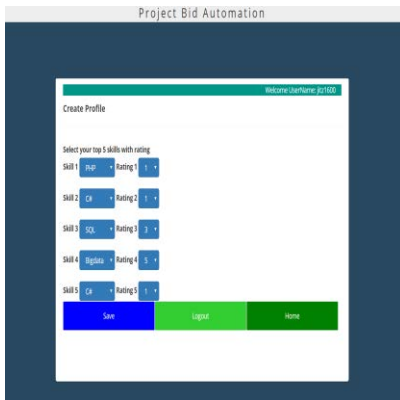


Fig. 1 students can add their skills which can be viewed by others.

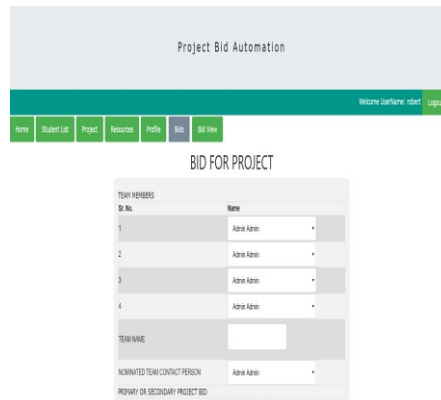


Fig. 2 student can submit bid on the system.

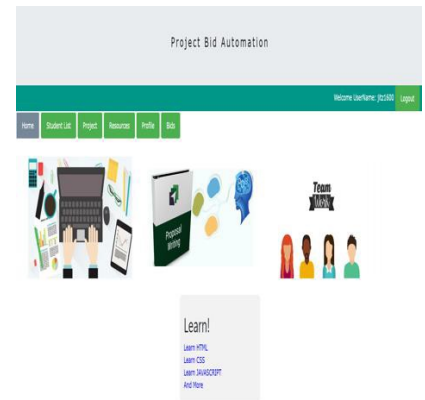


Fig. 3 the main home page where student has access to all the tabs.

INTRODUCTION

The Project Bid Automation is a new version of the form that already exists on Moodle for students to communicate and form groups and to pick a project. The old system is hardly used so the team created a new handy system. The system will allow students to form teams and to pick projects online which is easier as compared to the old form. The system allows the students to enter their skills which can be viewed by everyone. They can then contact the respective person. Students are allowed to add their own projects too. Furthermore, the system allows the students to submit the bid online, which will then be approved or declined by the project leader.

The main aim of the project was to build a new user interface and add some new features to the project in order to get the students to use the form, and make project easier for them in regards to forming teams, selecting a project and submitting bids.

DEVELOPMENT

Project Bid Automation is a web-based project built on Visual studio. The system is built using a number of technologies. These are listed below with how we used them for the completion of the system:

Asp.net – Asp.net is used to build desktop or web-based projects and most of our project was built using it.

MSSQL – MSSQL was used to build the database on MSSQL Management Studio. In order to get the database working with the system we configured the web.config file, which is a connection string and is predefined. We then only needed to add some parameters.

JavaScript – JavaScript was used to handle the validation. i.e. what happens after the user clicks on a button.

HTML, CSS, Bootstrap – These technologies were used to create the interface of the system. HTML was used to create the main page adding the text on the page. CSS used to add colour, layout etc. to the page. The main purpose of using CSS was to separate it from HTML in order to make it easy to maintain the page.

CONCLUSION

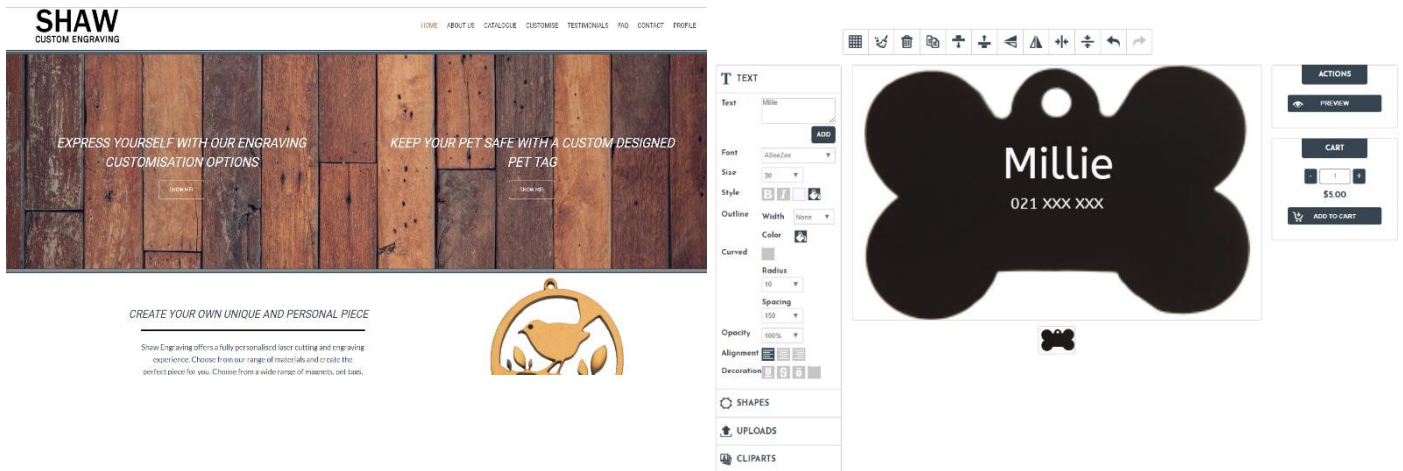
The project was completed and submitted on the 15th of October. Most of the requirements were met, while some weren't. The final documents have been submitted which show in detail what was achieved and what wasn't and the documents also show what additional features could be added in the future to make the system a success. Over all the project was a great learning curve – not just in the building of the system, but also teaching us how to manage and work in a team. The team was happy with the work and so was the client. The team also had a good relation with the Advisor and the Co-ordinator.

Project Laser Engraver

By: Jacob Gardiner, Ray Zorn, Juliette Levien and Chi Cao Dam

Advisor: Abdolreza Hajmoosaei

Client: Glenda Shaw



INTRODUCTION

The Laser Engraver Project aimed to solve their client's business needs by creating an online eCommerce website that allows users to purchase premade products designed and created by the client and to also give users the opportunity to customise their own product for the client to create. The client has not previously had an online presence and the business was limited in its customer outreach.

The Laser Engraver Team took this information and analysed the requirements to produce a fully operational website for the client to run their business from and make their services available for all New Zealand to order from.

DEVELOPMENT

The project team gathered requirements from the client to fully understand their business needs, what the business already looked like and what the website would require in order to broaden their customer base.

As the client was not only readily available but also wanting to be hands on during all stages of the project lifecycle, the project team chose to implement the Agile methodology, Scrum.

Scrum allowed for constant communication and understanding between the client and team, whilst developing the system in incremental sprints.

Development was broken into four sprints:

- front-end development,
- back-end development,
- integration and
- final testing.

Front-end and back-end development involved the creation of the user interface and the appropriate back-end systems in order for the website to function correctly. During the Integration sprint, our eCommerce and business aspects were implemented (e.g. PayPal integration and contact integration).

The final testing phase involved testing the functional and non-functional requirements of the site. Impartial users were asked to complete tasks critical to the business model and rate the site against usability heuristics based on their experience.

CONCLUSION

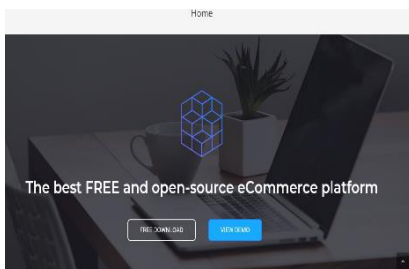
The team managed to complete the desired functional product that meets client requirements, looks professional and both the client and project team are very satisfied with. The client will now be able to use the website to expand and advertise their business in an efficient way.

Retail Web Turnkey System

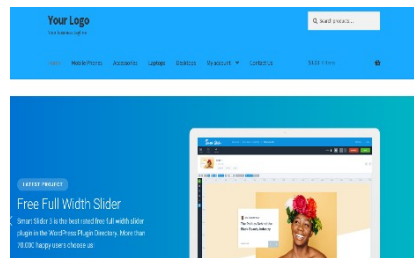
By: Talal Piracha, Mitenkumar Chauhan, Poonamjeet Kaur and Rajveer Kaur;

Advisor: Clement Sudhakar

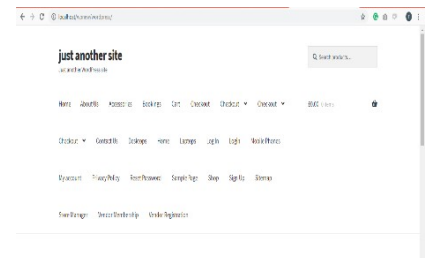
Client: Robert Sutcliffe



Website homepage description



Customer side Home page



A platform where customer adds their modules

INTRODUCTION

The Aim of the project was to develop a turnkey website framework through which small businesses in New Zealand can set up their particular business's website without any technical knowledge. The new-to-business customer will just have to download the platform which is based on Wordpress, and the customer have to then just install Wordpress and run this download folder under their Wordpress folder and can run their website and make changes according to their business needs.

The website can be integrated with a lot of different best of breed modules. The website is preconfigured with New Zealand settings. Eventually this project would primarily be a module selection/customisation project.

At the designing stage we developed the UML diagrams, wireframes, sitemaps and made the first draft of the website which was the website's home page look. After that we developed a demo site for the customer which had login, registration page, shopping cart for their customers and different modules for the staff of the customer.

We chose unit testing and integration testing and the approach was to do the manual testing for the website in which we checked the functionality of each and every page of the website such as links, buttons, field test, navigation, etc.

Client side demo website consisted of page testing such as login and registration page, shopping cart and our website testing based on testing booking page, contact us, etc.

DEVELOPMENT

The methodology we chose for this project was Agile Software Development Life Cycle Model which is a good combination of iterative and incremental processes which focuses on quick adoption. In this methodology there are six stages such as proposal, planning, requirement analysis, designing and coding, testing, final handover.

At the planning stage we were unaware of the requirement from the client and then went on to research about the particular modules of the requirement given by client.

At the stage of requirement analysis we met the client and then took a list of requirements and gathered all the requirements so we downloaded Wamp server and Wordpress to start with the project.

CONCLUSION

We can conclude that this website can be one of the best growing platforms for the future for New Zealand's small businesses to set a website up and running without any knowledge of coding. Customers will have a choice of adding different modules and plugins for their website and can set up the website according to their needs and requirements.

Router Management Interface

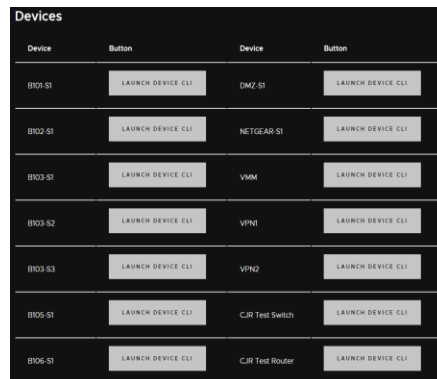
By: Connor McGhie, James Hopgood and Rohan Molloy

Advisor: Paul Bryant

Client: Jeff Echano



Main Site



CLI Launch Page

File Name	File Size	Date
Parent directory/	-	-
156.59.45.199/	-	2018-Oct-08 22:24
156.59.45.53/	-	2018-Sep-17 22:01
B101-S1/	-	2018-Oct-23 01:01
B102-S1/	-	2018-Oct-08 22:35
B103-S1/	-	2018-Oct-23 01:01
B103-S2/	-	2018-Aug-26 22:45
B103-S3/	-	2018-Aug-26 22:45
B105-S1/	-	2018-Oct-23 03:01
B106-S1/	-	2018-Oct-23 01:01
B107-S1/	-	2018-Oct-23 01:01

Backups

INTRODUCTION

The network administrator of WelTec used to do manual backups of all 20-30 Cisco Routers and Switches. This was both time consuming and potentially error prone. Team CJR consisting of Connor, James and Rohan worked together to create a system from scratch with the aim of automatically collecting and storing backups.

The system called the Router Management Interface is capable of automatically backing up all Cisco devices either hourly, daily, weekly or monthly.

The system is accessible via a web page front end where the client is able to access backups and even launch command line access for selected devices within the browser.

DEVELOPMENT

1. The team began work on the project in June, beginning with the milestone of completion and acceptance of the project bid.
2. The proposal served as the team's promise of what it would deliver to the client, as well as the business case for the project. This was created after requirement gathering, and allowed the team to progress into the design phase.
3. The design phase involved the initial front and back end system design. The front end being the interactive website and the back end consisting of setting up the webserver and backup server.

4. A prototype of the system was developed and extensively tested. When it was signed off as working by the client, the Team was then able to commit to pushing the system on the B-Block devices.
5. The system was deployed on the B-Block devices and each device was individually tested. All devices which the team were able to access were configured and confirmed to be functioning with both front and back-end of the system.
6. Once all the devices had their configurations being automatically backed up, the Client was satisfied with the fully operational system.

CONCLUSION

Overall the team used and learnt a lot of key skills from technical to management. All three members contributed to designing and implementing a working system which is currently in operation, saving the assigned network devices configuration files onto a server.

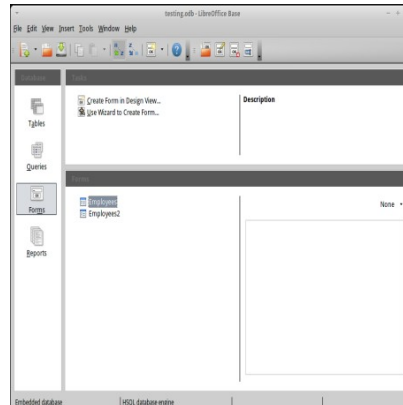
Service Desk Module

By: Sukhdeep Kaur, Vladislav Sokolov and Ravinder Singh

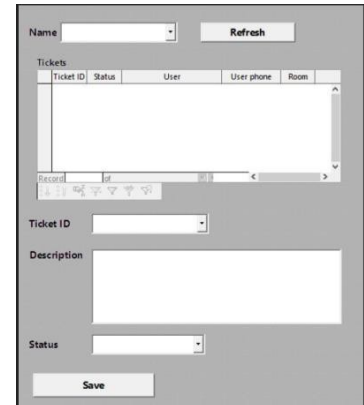
Advisor: Robert Sutcliffe



Use application for service Desk Module



Insert table and frame for application



Add customer tickets

INTRODUCTION

LibreOffice is a powerful, free, open source office suite. LibreOffice is used extensively in less affluent countries, where free software is more desirable than paying Microsoft. The deployment of LibreOffice covers many industries, but it generally supplies the office administration toolset. There are many applications that can also operate alongside this, but these are only loosely integrated through common APIs.

Most support areas need some sort of service or help desk features for managing workflow and communications around issues, faults, and requests. The more tightly integrated they are to the office communications systems, the more productive and effective they can be. This project was to adapt and customise service desk operations into the LibreOffice environment.

This project is to produce the Service Desk Module, which is a ticket management system for organisations. It serves as a single point of contact for all departments within the organisation, as well as for clients/customers. A Service Desk enables a strong and smooth workflow that tracks all requests, provides the current status of the requests and allows all authorised personnel to view the status of the request. The employees of an organisation, clients, and customers would hence converge at the Service Desk for resolution of their issues.

DEVELOPMENT

The process started with the selection of the prevalent open source office suite. Next we undertook some research about how this works and how we can create tables for the Service Desk module application.

Then we created designs for the application, built a testing environment, and successfully developed the Service Desk Module.

Specifically, you can create and manage service requests, manage activities and tasks to describe general work that needs to be done on a ticket record. You can also create a ticket template to hasten ticket data-entry time. Work prioritisation and escalation processes were integrated to implement typical ITIL workflow practices. Customers can choose their ticket, seeing work undertaken, priority and intended completion. The administrator has oversight to check the ticket status and change work allocations as needed.

CONCLUSION

All-in the entire project was successfully completed. The Service Desk Module improves the overall organisation's Customer Services. The ultimate goal of the Service Desk is to resolve end user issues and requests as efficiently and quickly as possible.

SJS Automation Testing System (2)

By: Anastasia Mikhaylova, Dianyi Jiang and Zhantu Wang

Advisor: Chalinor Baliuag

Client: Student Job Search

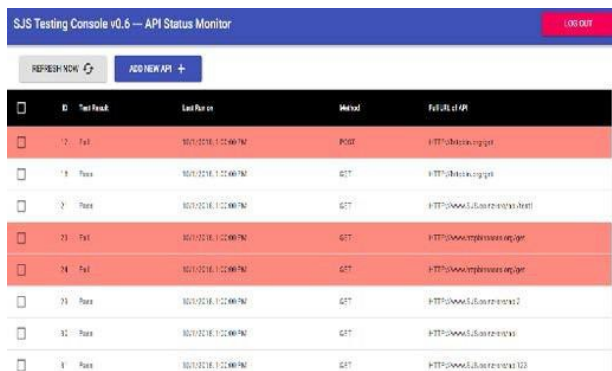


Figure 1: Web application defaults screen

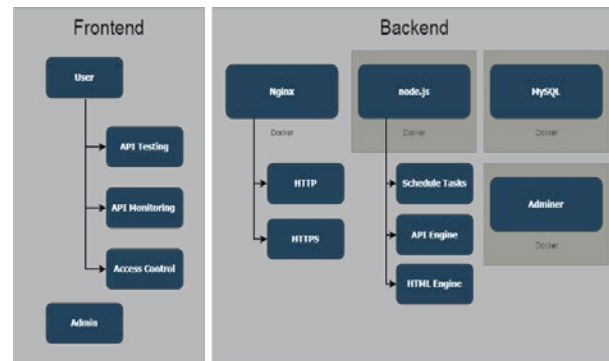


Figure 2: System architecture diagram

INTRODUCTION

Student Job Search (SJS) has an opportunity to develop software in a much more dynamic and responsive way, but is currently limited with existing testing strategies.

In order to implement suitable testing automation for their future development needs, this Project concentrated on Application Programming Interface (API) testing of the whole solution framework or platform in order to be feasible for the limited time and resources allocated for the project.

DEVELOPMENT

The team used Agile methodology to develop the project. The lifecycle of the project was divided into the initial stage and six sprints:

- Initial stage - the team performed the research of the business case and prepared the Project Proposal.
- Sprint 1 - Options Analysis for the client. In this Sprint, the team researched and compared three possible solutions for the client, and offered the team's recommendations on the best option.
- Sprint 2 - System Analysis and Design. In this Sprint the team performed analysis of the chosen solution, in order to ascertain all

system requirements for the system design. The outcome of the system design were system architecture, components, modules, interfaces, and database to satisfy specified requirements.

- Sprint 3 and 4 - system development stage. At the same time the User Acceptance Test was planned and prepared.
- Sprint 5 - system integration and deployment on the server, team also started to prepare client handover documentation, such as Installation and Deployment Guide and User Manual.
- Sprint 6 - final tailoring of the project documentation, project presentation for the client, user acceptance testing, and client handover.

CONCLUSION

This project was able to provide our client with a working solution for their stated needs and also gave the team great opportunities to apply their knowledge and grow as professionals.

The team is satisfied that the solution will allow the client to save time and other resources and improve their testing processes.

Student Alumni

By: Nikhil Kalia, Yurav Singh and Gurminder Singh

Advisor: Clement Sudhakar

Client: Ian Hunter



A healthy mind



...in a healthy body

INTRODUCTION

The Student Alumni Association (SAA) is a website to create strong relations between students. It creates an opportunity for every student to participate in the events held in polytechnics. Due to a good reputation in New Zealand it is imperative to WelTec to have an SAA. For the last few years this project has been under development. Our main objective was to deploy it on the School of Information Technology (SOIT) Network.

However, we could not successfully host this website on the SOIT Network as the SOIT network needed to be updated. We were happy to host it on a third-party domain as well as on the local network of SOIT. This was a great achievement for our team.

DEVELOPMENT

In the beginning our team faced many problems. Our first idea of creating a JOBHUB Android application failed to deliver business requirements. Then our team took another project from the Moodle list (i.e. Student Alumni). We then succeeded to find a Client to work on the project. After that, our progress was smoother. With the guidance of our Project Coordinator, Project Client and Project Advisor we succeeded in completing this project appropriately.

Our team applied SCRUM Methodology. Through this methodology we divided our project into sub-tasks. We divided the whole project into 4 sprints. Our team then moved to another sprint when the previous sprint was complete. We also used Hypertext Markup Language (HTML5) and Cascading style sheet (CSS) to do the designing; Hypertext Preprocessor (PHP) for providing functionality to the website and My SQL as a database for our website.

For preproduction, our team created a Gantt Chart for every task where we gave a specific time to each activity. By applying these tools and techniques we successfully completed our project.

CONCLUSION

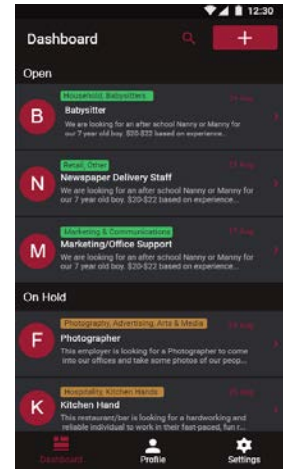
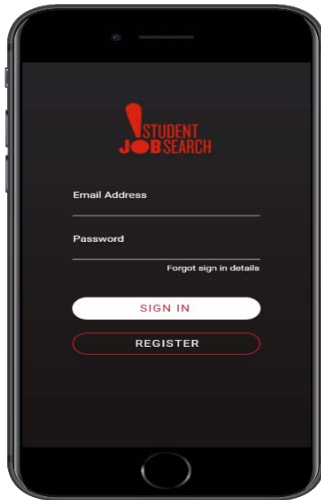
This project improved our skills of PHP, HTML5, CSS and testing website and so on. Apart from that, it helped us to improve our self-confidence, communication skills, preparing professional documents and build leadership qualities in us. From this project, we know how to work in a team and how to make critical decisions.

Student Job Search – Mobile App 2

By: Shubham Julka, Desheng Liu, Alex Nelson and Hank Chou

Advisor: Ian Hunter

Client: Student Job Search



INTRODUCTION

The Student Job Search Mobile Application Project was a bold idea by SJS to expand their employer user base into mobile. This project was aimed at expanding on that idea and making a front end focused native mobile app that would allow employers to create job listings for students on mobile. This will in turn create more jobs for students around New Zealand.

By working on a project like this as students we were also helping ourselves. We were grateful for the opportunity to work on a project like this.

We also got a very good introduction into using the latest in-demand technology and design techniques during development.

DEVELOPMENT

In our design part, Alex utilized the latest design & prototyping software Adobe XD (Experience Design) to create the initial design of the app through many iterations.

Once a solid base design had been created, the development team worked hard on the mobile app using React Native. Considering our background only in JavaScript, and various programming languages such as Java and C#, it was a completely new learning experience and was very difficult to do. React Native wasn't as stable as we thought. Even the mobile app we had faced many issues on installing environment and simulating on iOS and Android emulator.

By using the agile methodology OpenUp, we were able to constantly iterate and improve the project every week.

When we started the project, it was really tricky for us to code JavaScript in a mobile app built by React Native. Unlike the other frameworks we learned before, React Native provided us many files in one package to build a mobile app. It was not easy for a developer who does not have experience in mobile development. There were also some glitches when it came to turning on an iOS simulator with React Native.

However, after a few challenges, we found out that by downgrading the version of React Native and Xcode to a more stable version, it made it much easier to make a mobile app.

After the environment had been set up, we accelerated our pace of developing the mobile app. Finally, we made a three-page mobile app with handy, user friendly navigation for Student Job Search as we promised in the business proposal.

CONCLUSION

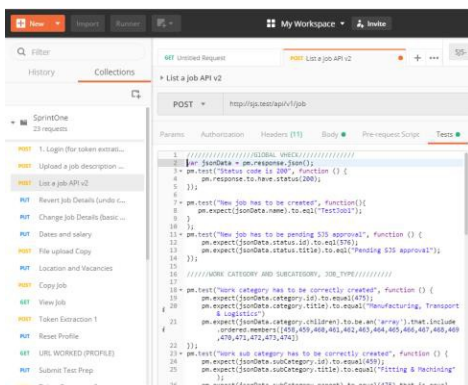
We managed to complete the project to the exact requirements, specifications, and design as we had planned, and we are confident that we produced a great looking working front end design that opened up more possibilities and perspectives for the client in their business goals of having employers create jobs on mobile.

Student Job Search (Website Testing Automation)

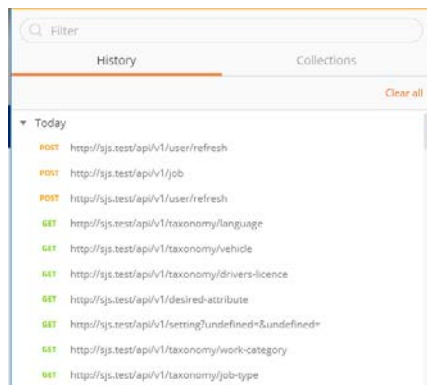
By: Yulia Tekin, Jonathan Power, Hunter Hollows and Dushani Karannagoda

Advisor: Waqar Khan

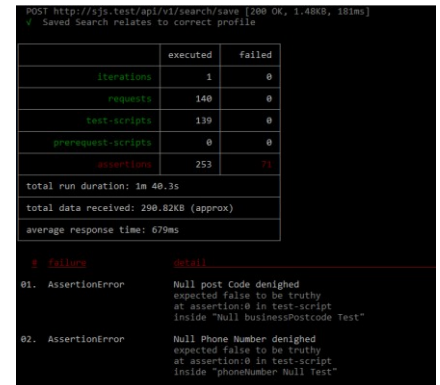
Client: Student Job Search



Writing tests within "Postman"



Obtaining API requests via proxy



Running the suite within "Newman"

INTRODUCTION

Student Job Search is a not-for-profit service which works as an interface between students and potential employers needing a variety of work done. SJS are an SME (small-to-medium enterprise) and have a tight development team who, up until recently, have been doing their own testing.

Our project's goal was to develop an automated testing suite for the Student Job Search website - in particular the "Employer" API, in order to streamline and improve the efficiency of their existing testing processes. From a list of project opportunities provided, the team selected that they would develop the test suite for the back-end of the existing SJS website.

DEVELOPMENT

Our test suite was developed using the Postman API development environment, where we would write and execute test scripts to test the website's various functions and inputs. The team worked in Scrum, with each sprint focusing on a different testing area. These were "Smoke Tests", "Functional Tests" and "Security Tests". By using the VM provided, the team would generate API requests and then write tests for these requests in JavaScript - Postman's supported language.

Sprint 1 - Smoke Tests focused on testing the key functions such as listing a job, viewing a job, or editing the user's profile.

Sprint 2 - Functional Tests focused on boundary analysis and invalid inputs. We tested whether or not fields would accept null, overloaded, or out-of-bounds inputs.

Sprint 3 - Security Tests involved writing tests for SQL injection, data exposure and access control. These were the most in-depth and challenging tests of the 3 sprints.

Once each sprint's tests were complete, we would then be able to export the suite as a JSON file. The client would then be able to import and run this file using the software Newman via command line. The results for each test would then be displayed along with any extra information, descriptions, and reasons for test failures if there were any.

CONCLUSION

Overall, our project was a success. Our client was very pleased with our final deliverable consisting of all our test suites integrated together in an easily configurable format. We had also created a demonstration video to show how it all works.

We believe our testing work will be very useful to them as we may have uncovered a few vulnerable areas of the API.

Student Time Planner

By: Ravita Negi, Ryan Djoenaidi, Toufique Mallick and Prakash Kumar

Advisor: Steve McKinlay

Client: Robert Sutcliffe



Interactive Dashboard



Multiple Courses



Organize Tasks



Share Achievements

INTRODUCTION

“Student Time Planner” (STP) addressed the problem of a student in organizing and managing their time for studies while studying along with their personal tasks to do. Because of improper organizing and managing time for studies which affects students’ marks and grades, the STP came up with a web application solution for students which is responsive with mobile too. It will allow students to become organized, manage their time, do proper weekly planning for studies, focus them and alert them to the upcoming course tasks.

The Interactive Dashboard, multiple course selection, adding their own personal tasks, viewing all course assignments and sharing achievements among all students gives a feeling of better achievement.

STP gives students an interactive scalable Dashboard to check their progress and how many hours of readings, revisions and assignments they are required to do per week. This Dashboard is not only editable (increase or decrease) according to the planning of the student and makes them organized, focused and well-planned, but it also motivates students to achieve better and gives a feeling of satisfaction to achieve set goals and meet the Course’s deadlines on time by publishing their achievements on the all students list.

DEVELOPMENT

The application was divided into two interfaces; Admin Side and Student Side. We used the latest CodeIgniter Framework to develop the application with PHP code. We also utilized Bootstrap to make the interface responsive to the display of both desktop and mobile. Extensive use of frameworks of JavaScript was also used to make the website more fluid.

The development followed the methodology of Rational Unified Process. RUP itself is comprised of Inception, Elaboration, Construction, and Transition Phase. In the elaboration phase, we designed and analysed the system. In the construction phase, we divided it into 3 iterations to finish admin side, student side, and database testing.

CONCLUSION

The developments of our application ran smoothly with the RUP methodology. It also had been tested thoroughly with Unit Testing, Database Testing and User Acceptance Testing. This development was also accompanied by complete and thorough documentation, which is going to be useful for further maintenance and development.

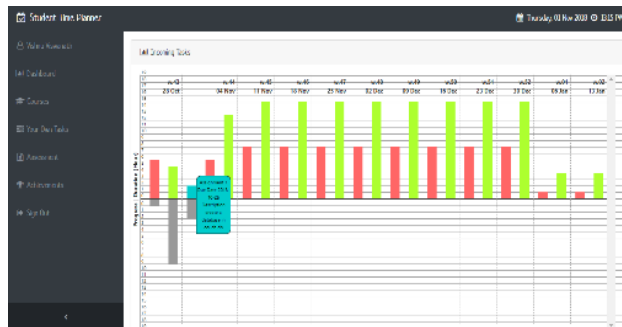
Our final product already met the initial requirements from the client. Due to the limitation of project time, we were not able to polish it to make it public. In the future we hope that the application will provide connection to social media and improve the dashboard to be more interactive and scale dynamically.

Student Time Planner (2)

By: Dawn David, Geno George, Rishipal Manro and Vishnu Vishwanath

Advisor: Ian Hunter

Client: Robert Sutcliffe



Student Time Planner

Achievements List

My Achievements/Future Achievements

Sign Up	1250 EXP	f
Sign In 5 Times	2000 EXP	f
Finish a Task	1000 EXP	f

Cancel

Achievements List

INTRODUCTION

Our client from the school of Information Technology, WelTec, thought of the idea to develop a web-based application “Student Time Planner” for students to organize their timetable systematically for them to achieve better results. It keeps students alerted of current and incoming tasks such as doing revisions, assignments, even part-time work. Also, it helps them with how they are going to cope and schedule their work, study and life in a timely manner. As a group of IT students at WelTec, we got this opportunity for being a part of Student Time Planner.

DEVELOPMENT

In our project, we used WampServer as a cross platform tool running in a Windows 10 Home Edition Operation System to support the development. WampServer contains a complete set of tools to help in development and can be transferred easily to another OS such as Linux if the current OS is not available. Besides WampServer, numerous frameworks were also used for boosting the development speed and quality, such as: Core PHP, JS Framework, CSS Framework, Apache Web server and MySQL 5.6.17 DBMS.

For development, the client needed a set of modifications to the previous version of STP web application by adding certain features into the existing design which will give benefits to both students and administration.

We had five requirements to accomplish the UI design and we finished almost all fields of requirements. The development part was divided into two iterations. The first was STP Admin and the second one was STP Student. The development needed to be done in that order because STP Student would not run without STP Admin. Both parts were done by using Core PHP.

The project’s web programming was done by Dawn, database management by Vishnu, Web testing by Geno and project lead by Rishipal Manro.

CONCLUSION

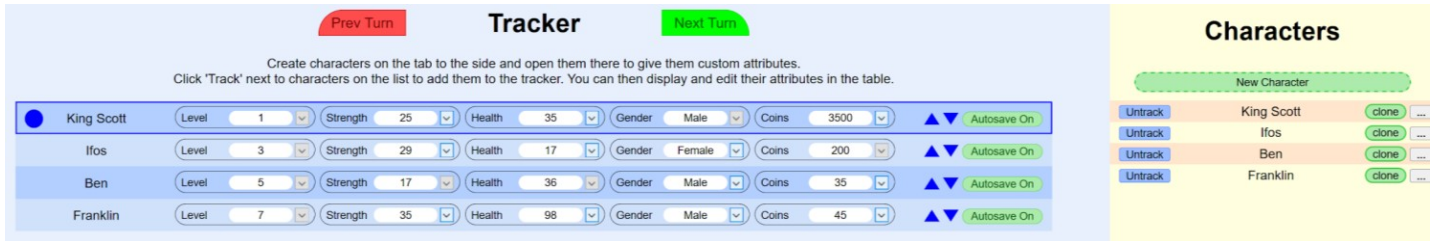
It was a wonderful learning experience for the team to work on this project. The handover and delivery of the project to the client was done successfully. We finished our project by satisfying all the client requirements. We enjoyed every bit of work we had put into this project. The project is further extendable.

Tabletop Companion App

By: Calin Dale, Jonty Johnston and Scott Tyson

Advisor: Simon Park

Client: Developers as clients



Picture shows what a standard tracker looks like.

INTRODUCTION

Many tools aim to improve the hobby of tabletop games, but tend to be designed for only the game the creator is playing. For many other games, there are no specially designed tools; and those tools that are flexible enough to support varying games are so complex that mastering them has a steep learning curve.

Our Tabletop Companion App is a simple to use and intuitive customisable app that can be used for many different kinds of tabletop games.

DEVELOPMENT

There were four phases in our project development:

- 1. Inception:** project scoping and planning, selection of methodology to give a solid base from which to start working. Developed proposal document.
- 2. Elaboration:** confirmed detailed understanding of requirements, established baseline for system architecture, refined scope of project, risk mitigation.
- 3. Construction:** Database creation, character functionality, GUI investigation and implementation, establish user testing, user authentication, leading to Initial Operational Capability Milestone.
- 4. Transition:** Finalising of testing, GUI polishing, deploying live, demonstration video, leading to Product Release Milestone.

We utilised OpenUP as our methodology, finding it ideal for small team collaboration over a short period. It was agile and met our purposes well. The environment we chose to deliver on our project's aim was web-based. To develop this, we used Angular as our framework.

We managed to implement all core requirements as well as adding additional functionality in response to user testing.

We added database functionality to give added value so that users could save characters and return to the app more easily with less set-up.

CONCLUSION

A solid customisable app that is fit for purpose as a tabletop game tool, offering flexibility to users with a fairly small learning curve.

User feedback said that this app showed great promise to become something that could add enjoyment and ease to their tabletop gaming experiences.

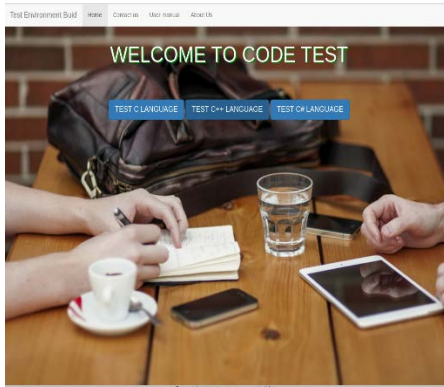
This product could be developed further to deliver even more value to users, but works fully in its release state and meets its base client requirements plus some suggested by users.

Test Environment Build

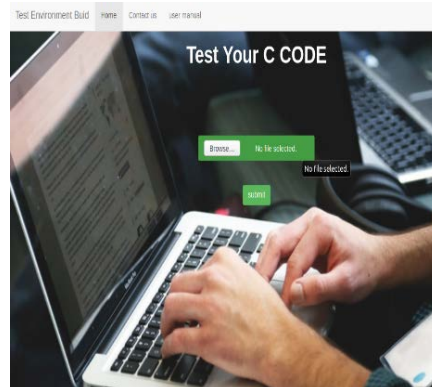
By: Abdhul Wasim, Lovepreet Sohal, Harpreet Singh and Gurpreet Singh

Advisor: Evan Keats

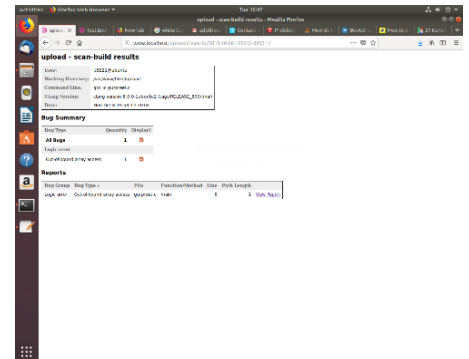
Client: John Gould



[Home Page](#)



[Test Your Code Page](#)



[Bug Summary Page](#)

INTRODUCTION

Our Project, **Test Environment Build**, is to help users to check their source code for errors using an on-line test environment server.

The aim is to provide an easy to use process where the user starts by uploading a source code file. The file is validated, the programming language identified and then it is processed by the correct analysis tool. The analysis tool produces a detailed Test Report with any errors identified and highlighted.

The current user interface is via a website running on the Test Environment Build server. The user loads the source file and, when it has been processed, the Test Report is displayed. The submit-process-view sequence typically takes less than a minute.

DEVELOPMENT

The first tasks for the **Test Environment Build** project were:

- To test and validate the free **Clang Static Analyzer** from **Apple** using code with known syntax and security errors.
- Build, test and validate the website.
- Build, test and validate a Database to record each user history.

The test cases included bugs that can be picked up by Static Analysis e.g. Memory Leak, Race Condition and Buffer Overflow. Both C and C++ examples were tested. The three sub-systems were built, then integrated and tested.

The Clang Analyzer scans the Codes of C and C++ languages for syntax and security errors. It then generates a Test Report which includes a detailed Bug Report section with errors highlighted if required.

CONCLUSION

This Project is designed to help users to verify their code and improve their coding standards which is the key functionality of the test server.

This project was a collective effort, and everyone had a role to play in it to make a satisfying Application which meets the client's business requirement, so if more users can access it then the purpose of making this project has been fulfilled.

Delivering this project is a milestone in our academic careers and a good opportunity to evaluate our self where we fit in our professional careers. This is a new learning curve for us both academically and individually. We have enjoyed our work throughout our project tenure and learned a lot of things besides testing skills and we have improved our coding skills which would help in any future assignments.

We would like to give special thanks to our Client for making this happen and we would like to thank our Advisor and Co-ordinator for allowing us to shape up this project and we can say that they are the front runners of this project.

The Game Project

By: Max McGregor

Advisor: Chalinor Baliuag



Project Manager/Developer

INTRODUCTION

This project is a game designed for new or potential students to play either during orientation or class. It was designed to capture the interest of these students so that they would have a goal to work towards with their studies.

The reason for developing a game is that 67% of New Zealanders are gamers. Therefore, choosing a game targeted a very large percentage of the population.

DEVELOPMENT

The game started with two concepts, either a 3D Virtual Reality adventure game, or a 2D RPG. During the analysis which would decide the better option it was found that doing a 2D RPG would be more beneficial due to the developer's experience and available resources.

The second stage involved planning out the features that would make the 2D RPG. These features had to be refined multiple times until they fitted within the project's scope. After developing a range of different diagrams that showed how the features interacted with each other, it was time to start development.

During development the features were prioritised and broken down into small chunks of work; each of these chunks had a deadline by which to be completed. The priority of the chunks were essential as it allowed any later work that had any dependencies on earlier chunks to be completed first.

CONCLUSION

The conclusion is that this project hit its target audience with 92% of the feedback received being from people with some form of gaming experience, with 100% of those people having played an RPG before. This means that the earlier analysis of the target audience was correct.

61% of the people who played were impressed by the game, 16% were undecided and 23% were unimpressed. (All results concluded from the feedback form)

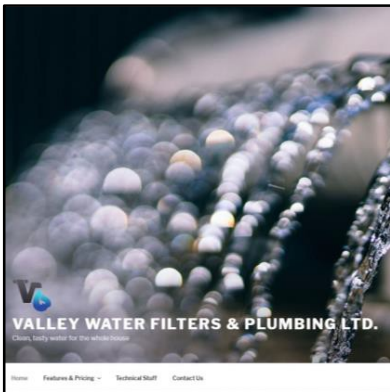
As this is a solo student project, these results are great and show that the project succeeded in impressing new or potential students.

Valley Water Filters & Plumbing Ltd Project

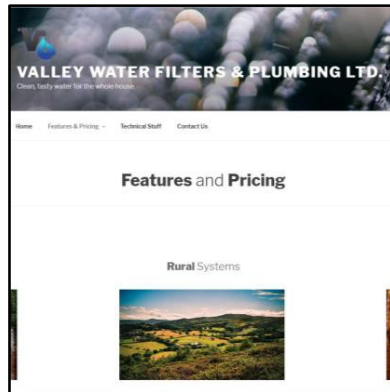
By: Dipak Ranchhod, Mark Omadto and Tom Misikea

Advisor: Reza Moosai

Client: Jo Drower



Valley Water Filters & Plumbing Ltd
Homepage



Valley Water Filters & Plumbing Ltd
Features & Pricing Page



Straight Paths Ministry (2nd Website)
Homepage

INTRODUCTION

Valley Water Filters & Plumbing Ltd is a plumbing firm specializing in water filters, roofing and general plumbing services. The firm is run by husband and wife, Pete and Jo Drower. The challenge is that, despite being an established business with service in the Wellington region spanning over thirty years, the business website is in its infancy and does not promote Valley Water Filters & Plumbing Ltd to the fullest extent. Therefore, the redevelopment of their existing Wordpress website is now completed.

Pete and Jo are involved in a Christian counselling and outreach service called the Straight Paths Ministry. This website had a domain name already; however, it isn't active as it hasn't been developed. Our job as a team was to do research and create an entirely new website from scratch using our technical skills.

DEVELOPMENT

The development of our project was completed according to the Scrum project management methodology. Our project consisted of five 'Scrum sprints' which were the systems analysis and design, wireframe, implementation, testing, and website training sprints.

The systems analysis and design 'sprint' involved brainstorming and development of use cases, use case descriptions, use case diagrams, activity diagrams and sequence diagrams.

The Wireframe 'sprint' consisted of drafting freehand sketch designs, publishing the designs on various software, conducting research and having the published wireframes accepted by our client.

In the implementation 'sprint' we used the existing Wordpress framework for the Valley Water website and have redeveloped the existing website using various development techniques and methods. For The Straight Paths Ministry, we used Themify builder and Wordpress to create a website which ensured our client could administer the website.

The testing 'sprint' involved comprehensive testing of both the Straight Paths Ministry and Valley Water websites. The deliverables of the testing were the 'Test Document Report' and 'Test Summary Report'.

In training we created user and technical manuals for the Valley Water and Straight Paths Ministry websites. We demonstrated to our client how to administer and further develop both websites.

CONCLUSION

We have produced polished and immaculate websites. Valley Water Filters & Plumbing Ltd will benefit greatly from their revamped website. Likewise, when Straight Paths Ministry goes live in 2019, they will be able to reach out to people in need.

