**Assessment 2**

**Group 25**

5 Squared

**Members**  
Christopher Crawford  
Mathew Ormay  
William Stevenson  
Wayne Zoutenbier

**Website**https://5squared.github.io/  
  
**GitHub Repository**  
https://github.com/5Squared/Assessment2

**Wayne Zoutenbier -** Tools

To complete out assessment as a team we used the free to access, GitHub repository. On GitHub two repositories were used, one to host the team profile website and one to host the documents we would ultimately use to collaborate out final report.

As we team, we used GitHub effectively to share our progress made in our individually assigned tasks, once we completed a task, we would upload the document to the repository. At the end of the assessment these documents were then combined into one major report, with all formatting unified to create one flowing document.

Updates were done periodically over the time we spent on the project and the log of committed changes show this over the timeline.

**William Stevenson** - Industry data

5-Squared have a range of career outlooks. This next few paragraphs will analyse the relevance of the chosen career paths and what skills an employer is likely to look for in an employee.

The jobs that 5-squared members are aiming for consist of:

* Full stack developer
* Network and systems administrator
* Cyber security engineer
* Financial planner

When industry data taken from burning glass is used to gauge the demand for such roles within the industry it is good to see that all the IT related careers that 5-squared are seeking, have healthy demand. Both Chris and Mathew as systems administrators rank at 8th in the list and Wayne at 17th as a Full stack developer. As Will is looking for a career in the financial industry the data is not relatable to him.

The data collected also goes into detail about how the IT specific skills within the careers of choice are ranked in terms of demand from employers. In terms of a group set of skills that are IT related it would be seen that all members would require a sound understanding of software engineering, Microsoft office and windows packages, and basic scripts such as python, java. As we look deeper at the different directions of the chosen careers it is seen that skill sets will vary with Wayne requiring a wide array of competencies in different programming languages than what Chris and Mathew would.

Wayne will use his knowledge to develop new projects while Chris and Mathew will use their knowledge of systems to make sure they can ensure their assigned systems are functioning correctly and without drama. Wayne’s skillset being so broad, it is likely that some of the skills such as SQL, Javascript, Microsoft Windows which he will be required to possess will be in high demand whilst some of the other systems python, GIT and Oracle are not as commonly required, either way a full stack developer needs to have this broad skillset so they can interact with developers on different projects that have a more concentrated stack skillset. Chris and Mathew’s skillset are also quite broad but in different areas. Their skillsets are based with the sound knowledge of Microsoft windows, and technical support which are both quite high on the demand list.

General skills are quite prominent in the ideal careers of the 5-squared group. When the ideal Careers are broken down into skills and referenced against the burning glass data it is seen that many skills such as communication skills, Problem solving, organisational skills and team work are in demand by all of the chosen careers. Wayne and Will require a general skillset with more Management and interpersonal skills as they will generally be spearheading a team and interacting with higher management or a client directly, so communication and leadership skills are imperative. Chris and Mathew require a wide array of different skills relating to completing tasks in a timely manner within a team environment, they need to work to a high standard and be detail orientated, they need good analytical skills and excel with their troubleshooting abilities to keep their systems running optimally. Overall the careers that 5 squared are aiming for all require broad skillset, general interpersonal skills and teamwork are imperative and the rest of the skills are all in good demand.

The three highest ranked IT related skill that are not required in our group skillset are

* SAP
* Microsoft C#
* Scrum

Due to the broadness of skills required by Wayne, Chris and Mathew these are the few skills that were left being un-utilised.

The three highest ranked general skills that are not required in our group are:

* Writing
* Creativity
* Mentoring

Due to most of the careers utilising online systems the need for writing is not needed, creativity is generally not needed as there is generally a framework in which to work with in development of software, maintenance and implementation. Also, the knowledge of the members will be built up over their education and mentoring skills in these roles is just not needed.

The 5-squared group after reviewing the burning glass data are still committed to their ideal careers. They feel the skillsets required and demanded by the industry are tangible and within reach within the near future once they further their education and gain further experience within the industry.

**Wayne Zoutenbier -** An interview with an IT Professional

For this interview, I interviewed a long-time friend of mine that has been in his industry for 9 years now. He started in the Australian Defence Force and eventually went on to work for a company that contracts support through to the Australian Defence Force.

**Name:** Matthew

**What do you do for work?**

Applications Analyst

I support a whole range of different software products, the main system is SharePoint which is a document collaboration tool. Which companies can use to collaborate on documents, similar to Nextcloud. I support the programs use within the company and help with development or customised solutions.

For example, we might have a customer that needs to complete a specific task. So, I will work with the customer and develop a custom solution. Afterwards I would then run in it an enclosed environment to see if it works on our system and the implement it assuming all has gone well.

**What type of tasks to you complete each day?**

We work on a rotation, so one day we will look at the call stack. This is where our clients will raise tickets, you’ll check the queue and assign some tickets to yourself. You’ll work through those tickets and liaise with the customers to ensure everything is functioning as it’s meant to be. Once you resolve a ticket you move onto the next in the queue.

If not on call stack then we do some project work, this might include updating servers, or other tasks that are directly related to servicing the clients. Maintenance and software upgrades for example. At the moment we are upgrading to a newer version of SharePoint so we are going through and doing an analysis against the current SharePoint system to see what we need to change to make it compatible with the new version.

**How did you get into your position?**

I entered the Australian Defence Force through the army, I was specialising in the communications field. Eventually I became involved in a defence project which was related to SharePoint, I was deployed overseas to work on the software and hardware on site. While I was doing this, I ended up working with the company that was contracted to help support the system we were using. They approached me and when my service with the ADF finished I eventually went on to work directly for that company which still contracts support to the defence force.

**What kind of people do you interact with? Clients, customers etc**

I work with all stake-holders, we have a meeting each day with my peers and workout the direction for each day. We will talk with the product owner and work with the team that uses the share-point software. I also may have to deal with Microsoft or other vendors of software that we use.

**Where do you spend most of your time?**

I work from home these days and log into a system using a VPN that allows me to work as though I’m at the office. My role is support and software maintenance so everything can be done from the laptop provided by the company. Occasionally I will need to make a trip to the office as I am on call.

**What aspect of your position do you find most challenging?**

Probably dealing with old products that are no longer actively developed by vendors. We may have some old software that is still needed for a business function, but it’s no longer actively developed so it becomes difficult if we ever need to troubleshoot it or integrate it into to new hardware and software. In some cases, we may even need to investigate the code and try patch things ourselves to create a custom solution. The software may have been discontinued, or the company has paid a lot of money for it and they aren’t ready to upgrade it. This can happen as soon as 4 or 5 years into its lifecycle, so it can become a common problem.

**Would you change your career path if you could or are you happy with where you are?**

I would have always liked to move more in to a software development path. My career has taken me to a point where its more software support than development. Having said that I am happy with where I am as I still get to work with some development. I have learnt where my strengths are taking this path though, I’ve learned that I can pick up new products and software packages very quickly.

I’ve just accepted a new role in which I will work as a stack technology consultant, this allows me to look at an entire system of software as opposed to specific software. I’ve learnt many skills which have shaped and refined over my career so far. I wouldn’t really change anything, but I’ve learned where I want to slowly move my career over time.

**Do you do anything outside of your daily job to further your skills into your chosen career path?**

One thing I’ve done is setup a lab in my home using enterprise grade gear. I use this to learn the hardware we use at my job, I also setup virtual environments to install software and test out functions and modifications before implementing them at work.

As a side project I use this hardware, to practice skills in other areas that aren’t related to my job such as other programming tasks and hosting gaming servers.

**Conclusion**

Interviewing Matthew was quite insightful, and a good indication of what it will be like to work in the IT industry. His work with the ADF has allowed him to gain a lot of skills over the years and helped him to narrow in on what he really has a passion for. While the field he works within may not be something I myself or the rest of the group may find themselves in, being that its within the defence force, the context of his work is quite relatable in the broad field. The way Matthew works within a team, handles his day to day tasks by sharing a workload and dealing directly with those who use the software he supports is the way most companies operate, civilian or military.

**It Technologies**

**Christopher Crawford:** *Clouds, services, servers*

I work as Level 2 support engineer for a private medical company. The company’s IT infrastructure works on a client-server architecture. I provide extensive support for both client software/machines and servers. Servers provide many different functions in a workplace and certainly mine. Our company has medical clinics all over Australia and this means servers all over Australia.

Servers provide many different functions within our company and are essential to the running of the company. My company hosts domain controller, email, print, file, SQL, application, web, media and back-up servers. In each clinic there is only 2 actual physical servers with multiple hard disks in each server. These are virtual hosts with the appropriate Operating System for the role of the virtual server. There are also servers that are centrally hosted which are used to host virtual machines/desktops. These virtual machines are then assigned to users and the machines appears as normal desktops to the user without expensive hardware.

Services/Applications that are hosted on these servers are as varied as the roles of the servers themselves. Some of these services/applications can be like Active Directory (domain controller) which allows for user management and security for user groups, software deployment and other group policies can be managed from this service. Specific business applications hosted on a server for use at client level. For example, there is a medical application that is used by Doctors to log patient data. This application has a simple GUI and is linked to the SQL server. This server is then backed up every 15 minutes to a specific back-up server on-site. This data is also replicated off-site to another cloud-based company who hosts the replicated data. This medical application is also linked to the print server and this allows doctors to print medical data from the application. I am just using this application as an example to show the close relationship between server and application/services.

Working for Medical company means that a lot of services are hosted on-site to protect medical data. However, the company does use Microsoft Office 365 both for software deployment and for cloud-based storage through One drive. This means that software does not have to be hosted onsite and taking up unnecessary space. One Drive also gives the ability to access data from any location without having to VPN into a work network. Cloud-based storage also eases storage issues with on-site servers. I would like to give more insight into cloud-based applications, but I do not support or work with cloud-based applications. I would imagine though that most business in the next 5 years or already have moved to cloud-based services.

I would say that in 3 years virtualisation is going to the replace most business IT hardware. Currently at my workplace there is a huge VDI (Virtual Desktop Infrastructure) project to replace clinics hardware with Thin clients. A Thin Client is a very basic computer optimised for remote connection to a client-server environment. Advantages of VDI are far cheaper hardware, no-onsite servers, greater data protection, better security and less pressure on LAN networks. Disadvantages of VDI reliant on a good and fast internet connection, sometimes hardware can be easier to break, and network outages are very problematic. The current issue for the company is the replacement of hardware and poor internet connection around Australia.

The likely impact of virtualisation for business is the ease and the exchange of data. On-site IT services and hardware will eventually become scarcer due to virtualisation and the difficulty of troubleshooting remote equipment. As a support engineer there is sometimes limitations on remote support and requires on-site support. The issue with on-site support is that it is not easy to co-ordinate with the client and will affect ‘business as usual’ for the company. Virtualisation makes troubleshooting easier as it is far easier to breakdown where the possible source of the problems maybe residing. As everything is hosted centrally it makes communication between IT teams easier for maintenance and incidents.

People most affected are obviously those using the services day-to-day and those that support and implement the technology. In terms of big impact, it changes the dynamic of the IT industry and the way it is supported and delivered. For example, it is far easier to monitor a virtual machine and its health in comparison to a desktop. A desktop/Laptops requires constant updates, hard disk fail, different types of hardware require different types of drivers. These are the drawbacks of desktops/laptops and in my opinion will likely be made redundant or replaced in businesses.

As I am at the beginning of this huge VDI project for my company it does it affect me personally. It means that I will be a part of the implementation and support of this change over. This means in my personal life that I will be studying and trying to understand how the technology functions to provide the best support I can for the technology. As this technology expands within the company this could potential mean I come closer to my dream job System/Engineer Administrator. The major difference in my life will be that I will be part of technology that is setting the way for businesses in the future.

Currently, it affects the time I spend with my wife because I am doing a lot over time to implement the VDI project. It also means that similar technology could be used where my family or friends work, and I hope it something that I will be an expert in the future.

**Mathew Ormay:** *Natural Language Processing*

Natural language recognition is used to recognise what a person says and translate it into something a computer can understand. These systems typically use complex artificial intelligence (A.I.) to determine the meaning of a sentence. The reason artificial intelligence is used is explained well through the example given by Seif (2018). “Steph Curry was on fire last nice. He totally destroyed the other team” how a person and a computer may interpret that statement may be very different. While we as people may understand that the player Steph played very well and probably won against the other team. A computer may take this quite literally and think that Steph was burning and, whilst burning, he destroyed the other team so that they no longer exist. This is the issue that natural language processing aims to fix.

Currently language processing is available in many products, the most common being a smartphone’s assistant. These work in tandem with voice recognition software and typically wait passively in the background for a keyword to be said before a request or question can be asked of the assistant. The A.I. will then attempt to carry out the users request and give them a result. Chatbots are a text-based machines that attempt to have conversations with people and have been around since the 1960’s. Some call centres are replacing people with these systems for basic calls, for example reporting income through Centrelink, saving money on wages in the process.

Last year in 2018 Google unveiled ‘Duplex’ which can call businesses and make appointments on behalf of a user. What made this demonstration impressive the ability of the A.I. to understand contextual information and ask questions about whether the restaurant would be busy around the booking time, although it did seem to have some trouble in this example. Or if the desired time was not available it would ask what other time an appointment might be able to be made. As evidenced by this presentation this technology is already quite advanced. The future of these systems is further refinement of it’s understanding of people’s speech in given contexts, leading to more human like speech that is indistinguishable from another person.

The earliest systems of natural language processing come in the form of chatbots, one of the earliest of which was called ELIZA. ELIZA worked on the premise that it recognised certain words or phrases from the sentence that was given and responded with a pre-set sentence (Weizenbaum, 1966). These were slowly improved over time and began incorporating learning algorithms, one of the most notable being Jabberwakky beginning in the late 1980s then being superseded by Cleverbot in 2006 (Cleverbot 2019). Large tech companies now have quite a large interest in this technology due to it’s power in delivering effective advertising to users.

Language recognition has been implemented in many areas of our current lives. Each of the major tech companies; Google, Apple, Facebook, Amazon, Samsung and Microsoft (Google assistant, Siri, M, Alexa, Bixby and Cortana respectively), have each created language recognition systems that interact with their platforms. One of the main purposes behind these systems is to deliver more targeted and effective advertising to consumers by knowing more about what that individual wants.

Google and Amazon have begun integrating these systems more into people’s lives with the advent of smart homes. Google home and Amazon Echo are devices that can control elements of a person’s home with just voice commands, from dimming house lights, to making calls to being able to order products online. It is hard to see these products not being integrated into modern homes more often.

Centrelink and the banking sector are two areas that have implemented natural language processing in their call centres to handle the simpler tasks. This removes potential jobs for people as these calls may make up a considerable volume of the call centres traffic. For the people remaining in these positions it may be a good thing as they have to deal with more serious issues from customers and receive a greater compensation for this. Secretaries and Personal assistants’ jobs may be of concern in the future with Google’s assistant making progress. This software is currently able to make appointments, set reminders and help organise a person’s day. With future improvements it may be able to take calls for businesses from people to set appointments, doctor clinics are an example that come to mind.

Currently I try to avoid using the voice functionality of my device and still prefer to type my queries into search engines. I also use an adblocker when online so that I get less disruptions while browsing. It was slightly worrying to discover that the few searches I did do through google assistant had all been recorded. Even snippets from conversations had been captured when someone had said ok in the background. If the reader wants to see their history, they can go to this link: <https://myactivity.google.com/myactivity?product=29>.

I don’t think this technology will have any negative effects on the people I know directly or immediately. I can see receptionist like jobs in the future becoming unavailable as they are replaced in part or wholly by this. Some of my friends have expressed their interest in the smart home devices and I could maybe see myself integrating one if I built a house and the convenience was worth the possibly reduced privacy.

**William Stevenson:** *Autonomous Vehicles*

There has always been a goal within engineering and technology fields to create a ‘driverless vehicle’. As of the 31st January 2018 there were 19.2 million motor vehicles registered in Australia (ABS, 2018) with most of these vehicles having small forms of automation already equipped. The end goal is to create a fully autonomous vehicle. The state of California (2019) defines an Autonomous vehicle as a vehicle that has the ability to be operated via technology without a human having any input into the operation or physical control of said vehicle.

The motivations behind introducing autonomous vehicles into society are due to a varying and broad range of reasons. Mainly autonomous vehicles are favoured to increase the safety of a motor vehicle by reducing the provision for human error. A report into the benefits of autonomous vehicles by Damen, Hillier, Wright. (2015) states that “90% of all motor vehicle accidents have a human contributory factor” it also cites that the National Road Safety Strategy believes that the reduction in seriously injured Australians from road accidents will most likely be due to the implementation of autonomous technologies rather than changing the behaviours of humans.

Environmental and lifestyle impact is also considered to be a massive benefit to the introduction of autonomous vehicles to our society. Supporters of Autonomous vehicles have a vision to reduce the number of vehicles on the road by implementing a “mobility on demand” model whereby there will be autonomous vehicles on the road that will be shared. The Australia & New Zealand Driverless Vehicle initiative (2019) base this on the research results that show on average a car is parked 95% of the time, the implementation of a system very much similar to a taxi or uber where the user summons a driverless vehicle on demand will take the user to their selected destination. The utilization for such a system would also provide independence for many people whom have impairments restrict their ability to drive a piloted vehicle.

The way in which vehicle automation is currently used is by incorporating technologies into vehicles as “assistance technologies”. Vehicle manufacturers incorporate ADAS (Advanced Driver Assistance Systems) such as stability control, adaptive cruise control, electronic brake-force distribution, lane keeping technology, self-parking and other technologies that are utilized by autonomous vehicles every day, the main difference is that these technologies currently do not completely override the driver’s input and can be switched off (Weeratunga, Somers, 2015). These ADAS systems use a plethora of technologies such as long-range radar, Light detection and ranging, camera, short-/ medium range radar and ultrasound and that is just the technology involved in reading the environment the vehicle is in. Sophisticated software analyzing all input data then must be processed immediately and synthesized into outputs that will actually execute the driving of the vehicle through the ever-changing environment.

Testing of fully autonomous vehicles has been steadily progressing in controlled environments. In November 2018 Tesla started to introduce a feature known as ‘Navigate on Autopilot’. It gave the driver of the vehicle the ability to surrender control of the vehicle to the autopilot system which keeps the vehicle within its lane and at safe distances from vehicles around it while the driver removes their hand from the steering wheel. The driver must still monitor the system as there are many variables that the technology hasn’t got the ability to interpret currently.

The short-term future of autonomous cars relies not only on technology improving but in the regulation of the technology. There are huge issues within legislation about how a robot is to be regulated in terms of liability for accidents and personal and property liability. An incident in March 2018 involving a Volvo Xc90 where a woman was killed whilst the vehicle was being operated in autonomous mode really shook the industry and made apparent that there is a very real argument about who is liable for the operation of an autonomous vehicle. Improvements in technologies such as GPS, data mapping, Wi-Fi communications to collate environmental data, traffic data, weather and roadwork data are all factors that need huge amounts of man hours to bring more widespread roll out of autonomous vehicles.

The potential impacts of the implementation of autonomous vehicles on the road are mainly eradicating the shortcomings of human input to the operation of a motor vehicle. Factors such as the ability for vehicles to be connected via frequencies and radar to travel in closer proximities and without the need for reaction times are expected to reduce congestion, traffic incidents and improve traffic flow. This technology will impact the way we think of cars. They will essentially become vessels that we board instead of tools that we control. These vessels will be accessible to everyone as there is no longer a set of skills to operate, the disabled, young people and even the elderly will be able to have personal modes of transport and become more independent without reliance on public transport.

Another impact will be the need for greater investment in infrastructure and technology to support their operation on public roads, they will need heavily encrypted technologies to be able to protect the integrity of the overall communication and accuracy of the interpreted data that controls the vehicles. The environments that these vehicles will operate will need to be closely monitored to ensure that the desired safety of passengers and the greater public are actually advantaged by the introduction of this technology.

As far as jobs are concerned there will be a massive amount of people involved in implementation, maintenance, monitoring and improvement of these vehicles, infrastructure and the technology systems utilized by them. By impacting the number of motor vehicle accidents and thus reducing personal injury, other areas of society such as emergency services will become less stressed freeing up resources for other purposes. Autonomous vehicles are only a small progression from what we currently have. The main impact will be upon humans relinquishing total control to an artificial intelligence.

The affect of autonomous vehicles on my daily life will be very similar to many others where my commute to work will be a case of entering a vehicle and relinquishing control to the ai, where I would just be a passenger and keep myself occupied within the constraints of the vehicle. Would this be life changing for myself? … probably not, but if my commute was through dense traffic and longer than the 15 minutes it currently is, then yes. The ability to use your own vehicle to find a way home whilst intoxicated would be a big advantage not just for reasons of convenience but also for the safety of other road users.

If an autonomous fleet was to be rolled out, I wouldn’t always have to have 2 or 3 automobiles parked outside my house and within my garage. It would also mean I wouldn’t have to pay for parking at my workplace which would be a huge positive. By not having to store the cars on my property, I could make better use of my land and increase the size of my living quarters by utilizing the garage as living space which would reduce the need to purchase a bigger property later in life.

By utilizing autonomous vehicles, family and friends would again be able to travel with the same advantages stated above. Another positive to utilizing autonomous vehicles would be the ability to transport dependents without the need to personal drive them somewhere. Daily events such as school drop offs, sport training, medical appointments and other commitments could be carried out without the need for personally taking them saving the time taken to commute to and from the destination.

In conclusion Autonomous vehicles have many advantages but the sheer complexity of the technology, infrastructure, the legislation and the ability to put complete faith in technology to safely transport a living being will take many years to come to fruition.

**Wayne Zoutenbier:** Blockchain and cryptocurrencies

Blockchain started as a decentralised method of confirming and storing transactions. It based off the premise of a triple entry accounting method. It is a ledger that accurately records all information of a transaction as a block which is shared across a decentralised network. This block is confirmed frequently by multiple sources on this network, making it practically impossible to tamper with. While primarily used for the trade of cryptocurrencies, it’s potential use far extends beyond this.

*Where did it start?*

Traditional banking uses a centralised method to confirm and store transactions, because of this it’s prone to certain vulnerabilities and limitations. While unlikely to happen as an everyday occurrence there is possibility of banks manipulating transactions. There have even been proven cases in the United States of America where banks were caught re-ordering transactions to charge higher overdraft fees. With a centralised and private record of transactions the possibility of corruption is present. The other vulnerability is the security of these records, potentially allowing those with the technical knowledge to digitally alter them with malicious intent. Also, as a centralised method, each bank or network of banks is separate from one another, making the process of transferring money around the world a lengthy one as multiple checks on transactions must occur through separate entities as money moves locations.

Though the concept had been around beforehand the blockchain as we know it was created by a person or persons known as Satoshi Nakamoto in 2008. It was created as way of recording, verifying and publicly storing the transactions of the cryptocurrency Bitcoin. Many claim the creation of Bitcoin by Nakamoto was an anti-establishment move in direct retaliation to the corruption involved with the 2008 Global Financial Crisis, that saw the bankruptcy of Lehman Brothers and government bailouts of many other banks totalling over $700b USD.

The difference with Bitcoin as a currency is the blockchain, a decentralised method of processing and recording transactions. As a transaction is made it is stored in a block, a block can store many transactions, each block contains a marker of the previous block thus forming a “blockchain”. These blocks are stored on a decentralised network of nodes, they are then confirmed by checking against other blocks stored on other nodes. Being decentralised, this means no one owns the blockchain and all information is stored publicly.

**So, what is this decentralised network and who is processing these transactions?**

Since there are no central servers in blockchain it relies on many computers around the world to process its transactions. This is done using software loaded onto home computers or server clusters, it is known as mining. The process of transacting Bitcoins requires calculations to be solved before being added to block, these calculations require a certain amount of power from a computer and the time it takes to complete a calculation is measured in a hash rate.

**What’s in it for miners?**

Miners are the backbone of the blockchain, without them there would be no way to store and perform transactions. The more miners there are the more secure the blockchain becomes as it can be verified across even more sources. So, miners are rewarded for completing calculations, each time a calculation is completed a miner receives a fraction of a Bitcoin. This in turn, is what creates more Bitcoins and grows its economy. As the number of miners and currency increase the calculations become harder, thus pushing for more power to complete the task.

Miners compete to process these transactions, it becomes a race for all those involved. This pushes miners to build machines that enable them to have a higher hash rates, allowing them to process calculations quicker, securing a greater income. What first started with multiple CPU configurations quickly turned into multiple GPU setups as the most efficient way to mine. In fact, mining became so lucrative that users from all around the world were moving so fast build machines using upwards of 8 GPUs per setup, that graphics card manufactures increased their prices significantly due to supply and demand, much to the distaste of gamers around the world.

This impact of blockchain will be far reaching for some time to come. Being a decentralised open sourced system, the rise of Bitcoin started an array of many other cryptocurrencies, all adding their own spin on how the blockchain works. The financial sector was rocked hard by the sudden outburst of cryptocurrencies. It changed the way people made transactions online, it created its own economy and made many extremely wealthy. With many countries around the world suffering from devaluing currencies do to inflation, cryptocurrencies have become viable way to safely invest money. It has in fact become so popular that governments around the world have recognised this as a legitimate source of income and begun to tax any gains acquired through its trading.

Financial institutions are also starting to turn to the blockchain technology, embracing is potential and turning away from centralised methods. While these banks are not yet moving completely to a blockchain based system they are implementing it to process smaller transactions, loans or property management. Even in Australia the Commonwealth bank has implemented a trial of a blockchain system known as the Trade-Chain experiment.

Blockchain technology can be used for more than just logging financial transactions. Smart Contracts are an area with incredible potential. They can completely do away with traditional paper-based contracts. With the ability to automate payments based on specific conditions being met using compatible cryptocurrencies, such as Ethereum. A contract could be agreed upon by parties and committed to the blockchain, once this happens it cannot be tampered and there is no risk of loss as just like with regular transactions it is verified and stored by all nodes replicating the blockchain. Smart Contracts could be used in all sorts of ways, from supply chain and distribution to housing contracts, banking loans, and insurance claims.

It’s likely your information will make it onto a blockchain at some point, perhaps with your records at medical centre or a customer reference management system. One of the most interesting ideas to come out of the blockchain technology is decentralised applications, potentially creating completely private social media networks or messaging platforms as being stored in a blockchain there is no governing body. There are even groups looking to change the internet as we know it, moving towards a decentralised internet using blockchain. As we all know now, privacy of your information is a hot topic and one that affects each one of us. With mega companies such as Facebook and YouTube constantly monitoring your browsing habits and selling off your information to third parties many consider current internet tainted. Companies such as US based Blockstack are well on the path to making a decentralised internet a reality, with 74,000 domains registered on their platform and over 7000 members in their development community.

Whether you’re into finance or not, blockchain will affect us all eventually. Its potential use far outreaches its beginnings as the backbone of the Bitcoin. It’s ability to securely store and verify data integrity without the need for centralised servers allows this technology to be used for many functions. One day it may even decentralise our whole internet, taking the power away from mega corporations and opening it up to further innovation. With that we’ll all see and feel the effects of blockchain one way or another.

**Mathew Ormay -** Project Ideas

Detecting the passive Wi-Fi pings of a population’s cellular devices 5 Squared hopes to provide statistical data on the movement and location of individuals throughout a city. Using this data would allow a council to more effectively spend funds on projects and ideas, distinguish areas that need improvement and gauge the effectiveness of resources that have been spent. This information could also be made available to emergency services in the case of a disaster to give an idea of how many people may be affected.

Discerning where a council should spend its rates is often a difficult task and can be quite divided. With potentially live data available to it, a council can determine where the populace spends its time and how and where people move around the city. Using this they can predict what the likely usage of a new feature would be with the current amount of people that pass through an area and supply an appropriate amount of funding.

After a project has been completed and some time has passed statistics can be generated to determine its effectiveness. Depending on how the network has been implemented this could show the reduction of congestion of a road expansion and the average time saved by a person commuting along it. If a new landmark was created, it could show how many people pass it each day or if the city’s mall was improved it could show how many more people now visit it. This data upon review could then be used for future decisions within that city, or if it is shared other cities could use it to improve their own.

Determining the number of people affected by a destructive event can be a difficult process, especially immediately after the incident. Providing emergency services with data estimating the number of people in an affected area could be a major boon to how services are dispatched especially if incidents are not contained to just one area of the city.

The method 5 Squared intends to solve these issues is with the distribution of hundreds or thousands of small Wi-Fi detecting modules spaced throughout an urban area that determine how many devices are nearby. The information from all these devices is then collated and processed to show where the population goes and how the city’s citizens use public resources.

Each unit would feature a small processor, some memory and a WIFI module. Power would be provided through a standard RJ45/CAT5 connector. The enclosure for the chipset would be as small of a form factor as possible to not draw attention to itself. Two versions of the case would be available, an indoor variant that is to prevent accidental damage to the unit and an outdoor one that is weather proof and is paintable. Both versions will have mounting options so that they may be affixed to surfaces easily.

5 Squared believes this technology could help save a city a considerable amount of money over a period of time through more responsible spending resources. The ability to determine areas that need improvement could be instrumental in decisions for future planning of the city. And the ability to supply relevant information to emergency services could help save lives.

**Christopher Crawford -** Group Reflection

**What went well?**

The Group 25 introduction went well, and we did initially have 6 members signed up from the deadline. Everyone introduced themselves and left contact details for us to get in touch. The naming of the group and the sharing of ideas was very fluid.

Tasks were split up very quickly and people agreed to the tasks assigned out. The group also set a timeline for task to be completed. The first meeting went excellent and it appeared that we would get this assessment completed in good time without any issues.

**What could have improved?**

As with any groups there will bumps along the road and our group was no different. The biggest issue that we came across was that 2 members of the group did partake in the assignment. However, this was not the groups fault and perhaps as a group we could have contacted the lecturer earlier.

As a group, we discussed that we had lack of communication and unsure if it is the way we chose to communicate. We communicated through Discord and Canvas forums which meant our communication was sporadic at times. As an improvement there could have been a 3rd option for communication and coordination.

Meeting task deadlines and meet up times was probably another improvement the Group 25 could have made. There were deadlines set and it seems that some circumstances made it difficult for individuals to meet those deadlines. The dynamic of online learning will always make this group assessment difficult.

**One thing was surprising?**

Despite our setbacks with the 2 members and our sporadic communication. The group assessment has been smooth in terms of that no one has argued, and people have handed in the relevant pieces for the assignment. It is difficult enough to do an online assignment never mind a group assignment and the current 4 members have done their best.

**At least one thing the group has learned about group work.**

Communication is probably the biggest element we can take away from group work. We have learned that we need to communicate consistently and find better methods to communicate. Meeting deadlines is another important lesson has learned about group work.

**Christopher Crawford -** Group Reflection

**What went well?**

Our initial meet up went very well and quickly agreed to a group name. Wayne and Will took the group lead and established our strengths for the task ahead. We all agreed to the tasks and the deadlines set.

**What could be improved?**

The 2 group members that did not essentially turn up was not something that we could control. Our communication could have been better and the way we communicated. However, I was guilty of not always communicating when needed and being late on task deadlines. Some of this was due to work commitments and this is something I should have communicated to the group more consistently. Personal improvement will be my communication to group members.

**At least one thing that surprising?**

Despite the drawbacks the group pulled together and has submitted the group assignment on time. A lot of the credit must go to Wayne and Will for leading the group to hand in the assignment on time. Wayne skills with Github and Will keeping our group to tasks at hand.

**At least one thing I have learned about groups.**

I have learned that communication is key to any group dynamic and that despite drawbacks people pull together when needed.

**Mathew Ormay -** Group Reflection

After it was determined who the active members of the group were, the work was split evenly amongst the four of us, which we all completed on time. Every member of the group actively participated in the discord server that was set up and had meaningful contributions to the conversations.

Next time I would get started on my work earlier. I left my part to the last minute and I believe it has suffered because of that. Our comments on uploaded work to GitHub could do with some improvements as they lack any description of what was uploaded to the repository.

It was surprising to me to find out how far natural language processing has come in a short time, and that its development was started as early as the 1960’s.

Although I have done previous group work it was nice to be involved in a group where all members contributed proactively.

The activity log while it shows that work was consistently uploaded, the comments that were left when uploading are quite vague as to who uploaded work and what it was. This is something that might need to be worked on for future assignments.

**William Stevenson** – Personal Reflection

I found the group assignment to be quite interesting, I like group environments, the motivation of feeding off others and having that collaboration aspect really motivates me. I enjoy the social context and kept a constant monitor on what was being said through the discord phone app so that I knew of any developments and issues that the team was facing. I felt that this interest wasn’t shared by a few others as there were constant lengthy delays with communication. The inability of some of the members to provide updates and feedback was testing and led to a few periods of anxiety throughout the project when members were absent from conversations around deadlines and didn’t voice opinions or provide reason’s as to why? The thing that surprised me throughout this whole assignment was as to how correct the personality test results portrayed the exact way in which the members interacted with one another.

Overall the group assignment got done and we have all completed our portions of work. However, moving forward I would utilise a more mainstream platform such as Facebook messenger which all members would have on their mobile devices and there is the added function of seeing that a message has been viewed by the other parties so that it could be confirmed if a message has been received and that the other party had been deflecting the communication.

**Wayne Zoutenbier** – Personal Reflection

As a group I think we started out well, I created a message on the Canvas group board inviting everyone to a Discord server that I created. From here we could start our planning by using separate channels for different tasks. We set a date and time to all catch up on the channel, everyone joined up and we got underway, however unfortunately one of our group members that joined the server never said a word. We quickly agreed to get to work without them and started splitting up the work and assigning tasks. Everyone contributed, we agreed on a name, a logo and what direction to take.

I think post this night however things got a little patchy, deadlines were not met and there was a severe lack of communication. We got everything together by the end but as someone that likes to plan and work towards milestones when looking at a project, this style did not sit well with me at all. There was some great communication from some and subpar communication from others. I think going forward a greater commitment must be given to the seriousness of the task at hand, it’s only going to get more in depth as we move forward.

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