

**Submission for Assignment 2
Introduction to Information Technology
at RMIT Online**

A2 Group #22

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Ian McElwaine S3863018
Charles Patterson s3865499
and Jayden Stewart S3863559

Website

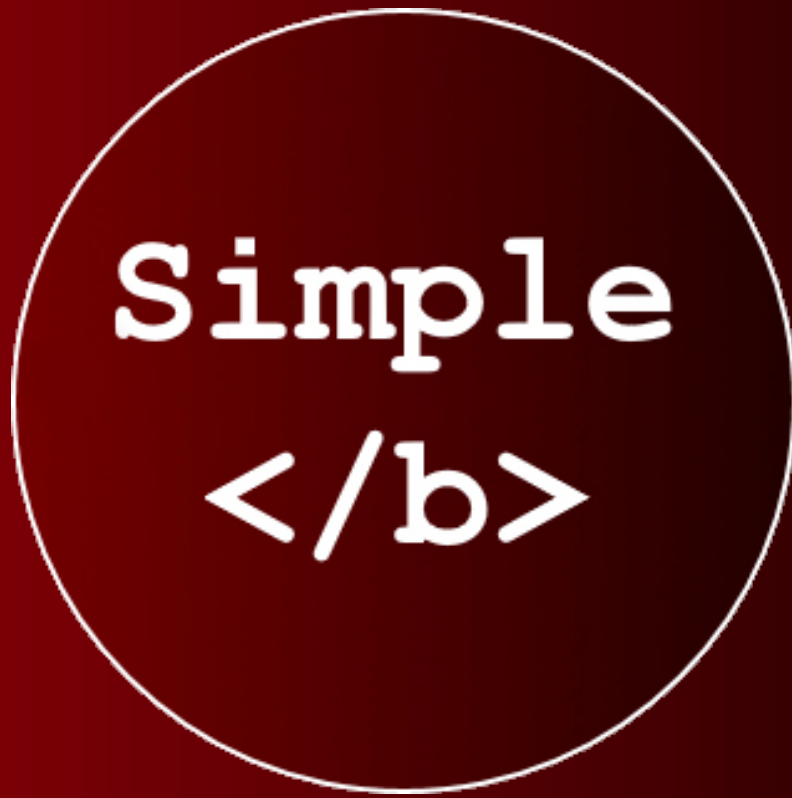
https://a2-simple-b.github.io/A2_Group_22/

Group repository

https://github.com/a2-simple-b/A2_Group_22

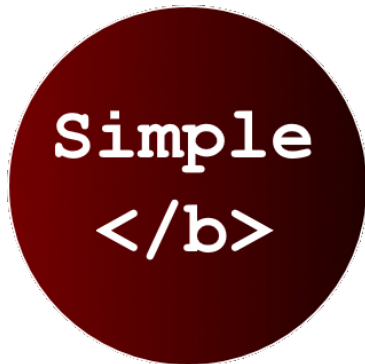
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Team Profile

A2 Group #22 – Team Simple



**Simple ** is pleased to present this report as evidence of our work for Assignment 2 in Introduction to Technology at RMIT Online.

"Our team has people with a diverse range of skills and personality traits. We have found that having diversity in our team has balanced our organisation and provided a well-rounded working environment. We have enjoyed healthy discussions and clarity of purpose.

*Each team member is a different part of the puzzle. By combining our skills together, we have been able to complete this project while physically located in different parts of Australia. With this idea in mind, we combined the initials of our surnames (plus a couple of vowels) to form our team name" – **SiMPLe ***

Personal Information



Jessica Bayly S3766658

Born and raised in Sydney, Australia. **Jessica Bayly** currently finds herself in Adelaide, building a beautiful family. As IT has always played a big part of Jess's upbringing, she is now perusing a degree in IT.

In 1997, Jess discovered a whole new world when she got internet accessibility. She slowly became familiar with mIRC and ICQ in order to communicate with other fans of Hanson.

Working in digital media, Jess decided to go down the path of IT and do what she loves. It is never too late to study and find herself a new passion and soon a new career.

As an introvert, Jess likes to observe a situation and is receptive to new ideas. However, as a natural defender, Jess will stand up for herself when in need.

With the tendency to sit back and analyse situations, Jess is more comfortable to present her thoughts and opinions during the meetings.

With new career path being planned out, Jess is ready to embrace a diverse team with a wide range of personalities. She believes that the best kind of group is to have people with opposite personality traits in order to have a balanced team.

As a graduate, **Chris Lai** is intrigued to see that many finance positions value highly of people with experience in IT. Chris believes that the financial sector is ever more intertwined with technology and to learn the basic of IT will soon be a requirement rather than a bonus point on the resume.

With no prior experience or academic training in the IT field, Chris believes that understanding the fundamentals of the IT Industry will benefit him throughout his career.

As a protagonist person (ENFJ-A) who is passionate at things he does and unafraid to speak up when something needs to be said, Chris will be an excellent value-add to the team working closely with the team while building good relationship among team members.



Chris Lai S3866221

Chris is a visual learner who is best informed with visualised diagrams and notes. As a huge fan of breadcrumb trails, he will appreciate a clear timeline to follow the workflow and deadlines.

Although Chris is forced to change the trajectory of his career path earlier this year, he had since discovered that positions with relationship management and sales would be ideal for him and by being able to pitch ideas, he will be beneficial to the team in future projects.



Ian McElwaine

S3863018

Based in Albury, **Ian McElwaine** developed a keen interest in

IT since young. As an expert IT user and a full-time musician, Ian applies a variety of applications and instruments to record music, perform live and teach.

Lenny, an inspirational person, introduced Ian to sound synthesises, MIDI sequencing and other industrial electronics that sparked Ian's interest in IT.

With an inquisitive mind, Ian learned about the fundamentals of how a modern PC operates. His experience in using command line and principles of Linux & GNU helped him set up a personalised home IT system.

As an Assertive Protagonist, Ian is an expert in being a diplomat and a coordinator. He believes that a good coordinator works for the group and facilitate the implementation process of decisions made by the group.

With years in the field of music, Ian scores very high in auditory being his preferred learning style. Nevertheless, Ian believes writing can help absorb information better and will appreciate consistent verbal communications with the team members.

Scored 125 on his IQ test, Ian reaffirmed that success is a result of discipline, determination, hard work and perseverance. As a team member, Ian will be a reliable player and contribute stable output to the success of the team.

As a Sydneysider, **Charles Patterson** enjoys working on cars

and the uncapped potentials of IT systems. While having a busy lifestyle, Charles aims to develop further knowledge that can land him a career in IT.

While designing custom Minecraft servers and troubleshooting in primary school, Charles discovered a wide range of possibilities with the IT machines.

As time progress, Charles excelled in python programming, web design and video production that He realised a career in software design will be an ideal choice.

With very stable personality traits that make him compatible to work with a variety of team members, Charles value the opportunities for alternative voices in a team to enhance creativity and productivity.

As a well-rounded person, Charles' learning style is no exception. He focuses evenly more on visual and tactile and much less with auditory (20%). As a great example, he is more prone to drawing diagrams as a way to present information, which is highly compatible with the group.

Thinking in abstract and sophisticated ways while having the self-discipline to pursue his goals, Charles will be an excellent team member in putting others first. At the same time, provide remarkable progress for group projects.



Charles Patterson

S3865499



Jayden Stewart

S3863559

From Brisbane, **Jayden Stewart** always has the drive to

create his own technology company. While he was working full time and had exposure in business, he is aiming to learn and explore some aspects of IT he hasn't heard of.

Elon Musk, as an innovative leader, hoping to enhance the livelihood for future generations, has relit the fire for Jayden to pursue the path of IT and improve sustainable future for humanity.

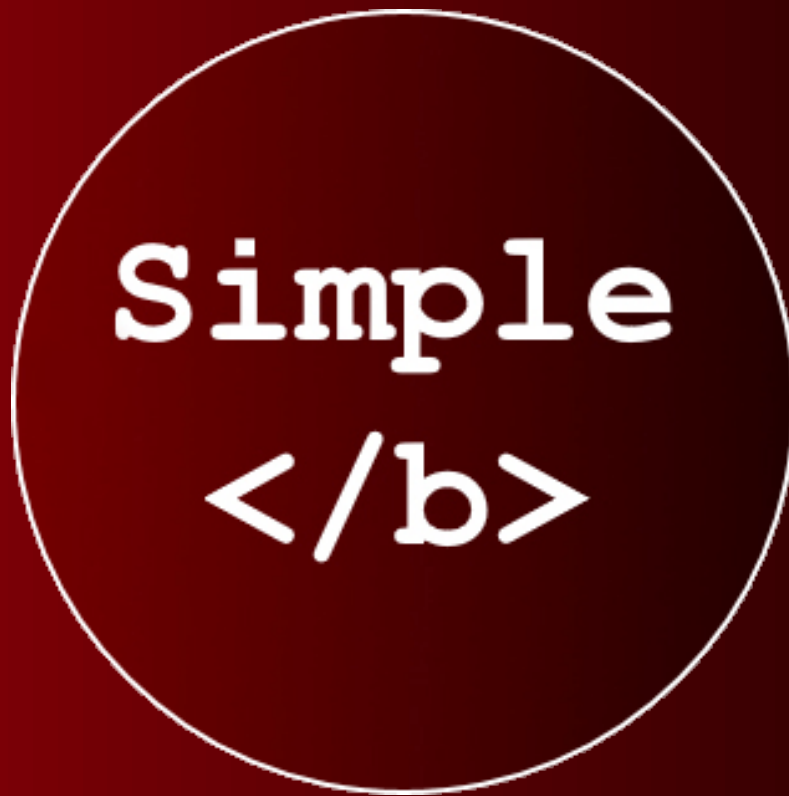
With a decent knowledge of C++, Linux and a fair bit of experience in machine learning, He is hoping to progress through the course and built a solid foundation for his career goal and to create his projects.

Jayden is an extrovert with a tendency to be more blunt and forthcoming with their emotions. In a group work setting, Jayden can be more spontaneous and deemed as relaxed in comparison to other team members. Jayden's personality traits will fit into the group relatively well and contribute his strong knowledge in programming for group projects.

As a person who is experienced not only in the field of IT but also business, Jayden is happy to deploy different tools for his learning journey and enjoy different formats to study.

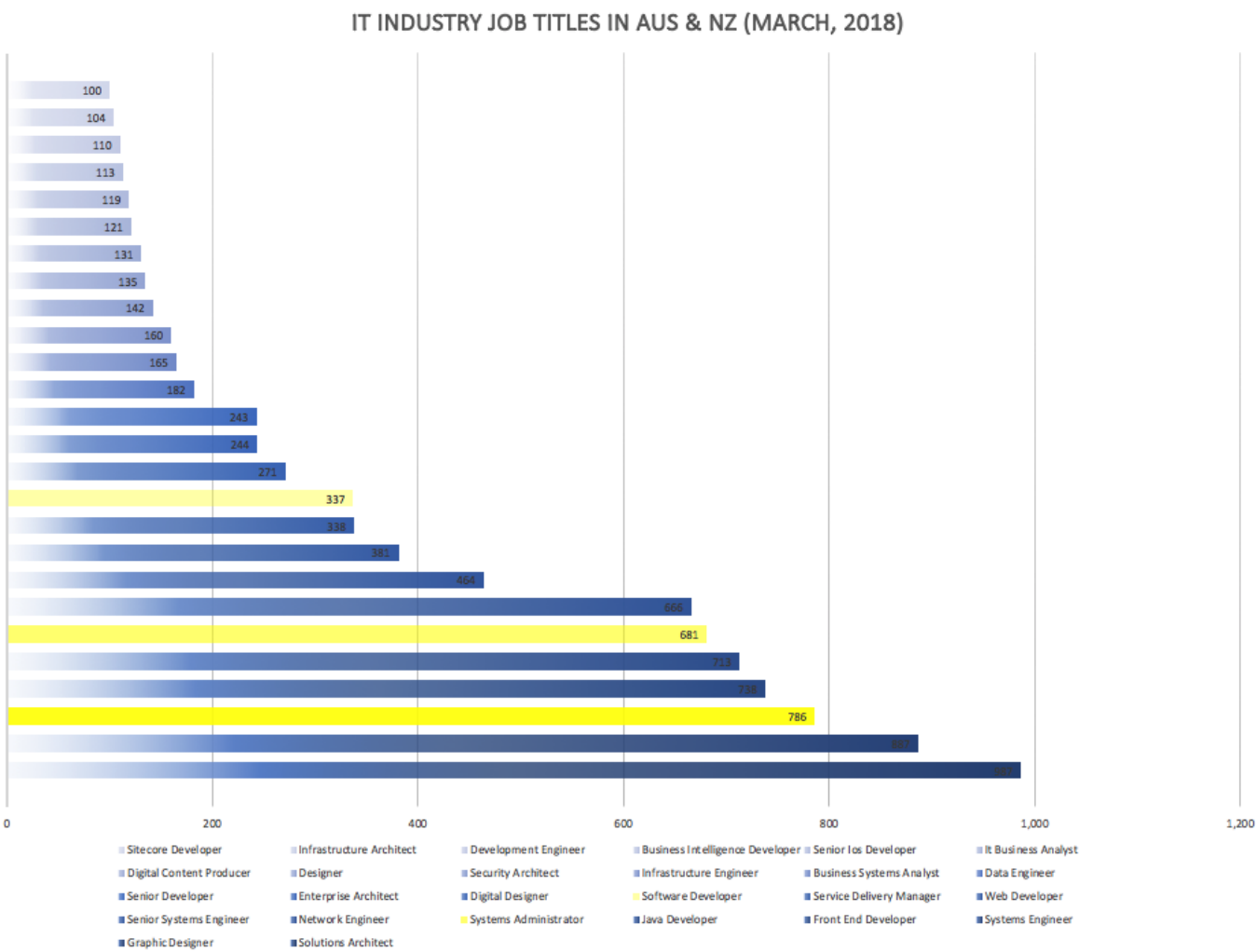
Aligned with his career goal, Jayden has a high level of curiosity and complexity in his creativity. It will work in the team's benefits to provide ideas and to facilitate the brainstorming process of group works.

Ideal Jobs



Industry Data

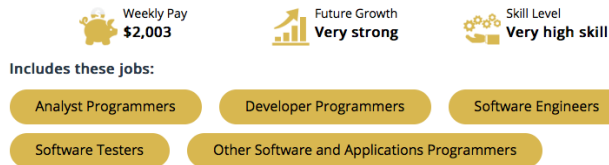
For our group, the three ideal jobs that most of our group mates resonate with are systems engineer, systems administrator and software developer. According to the data supplied by Burning Glass Technologies, the three ideal jobs were in the 98.5, 96.5 and 91 percentiles of the IT jobs in March 2018. According to the Australian Government – Job Outlook website, both the Software & Applications Programmers and Systems Administrators categories indicate a robust future growth with great weekly pay.¹ These statistics can prove that the ideal jobs we are aiming for in the IT industry provide a stable career path with high demands in the present and future labour markets.



According to the required IT-specific skills for our ideal jobs, Java, Microsoft Windows, Linux and C++ ranked the highest in terms



Software and Applications Programmers



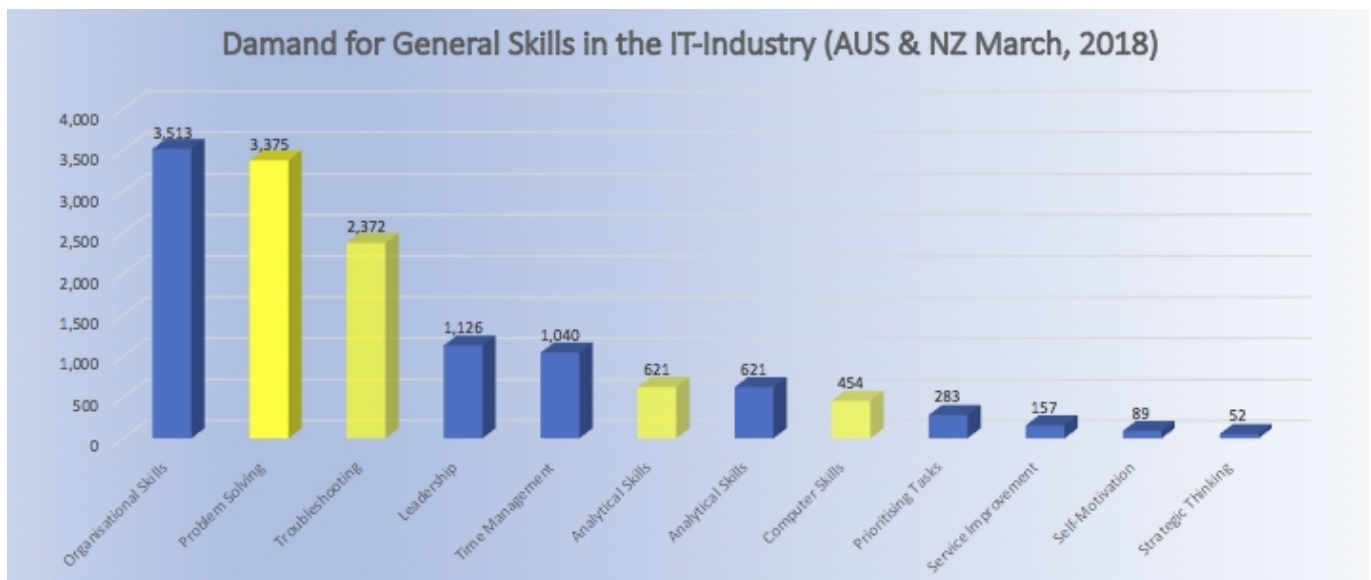
of demand from the employers. It can be interpreted that the ability to write different computing languages and experience in using different operating systems will make you a highly

competitive professional. Other required skill sets that are not quite in demand are the experience in VPN, Hyper-V and VMware ESXi.

The highest-ranking IT-specific skills that are not in our necessary expertise are SAP, Oracle and Git. For a visual interpretation of the competitiveness of required skill sets, please refer to the diagram below for the ranking and respective percentiles.

Apart from the required IT-specific skillsets for the ideal jobs, some general soft skills are equally important. For our ideal jobs, having the ability to solve clients' issues and last-minute obstacles through investigation and critical-analyse is crucial. Those three skills ranked at the 96, 92.5 and 78 percentiles and can be deemed as high demand from employers for the foreseeable future.

While communication, writing and organisational skills are the highest demands of general skills that a potential employer wants, those are not the particular skills that are required for our job requirements.



After investigating the available data, our opinion in what career paths we wish to pursue had not changed. The team members who will seek to be a developer or administration position have knowledge in coding and exposure with different operating systems. Once they went through the degree with RMIT, the necessary technical skill sets in high demand will be acquired.

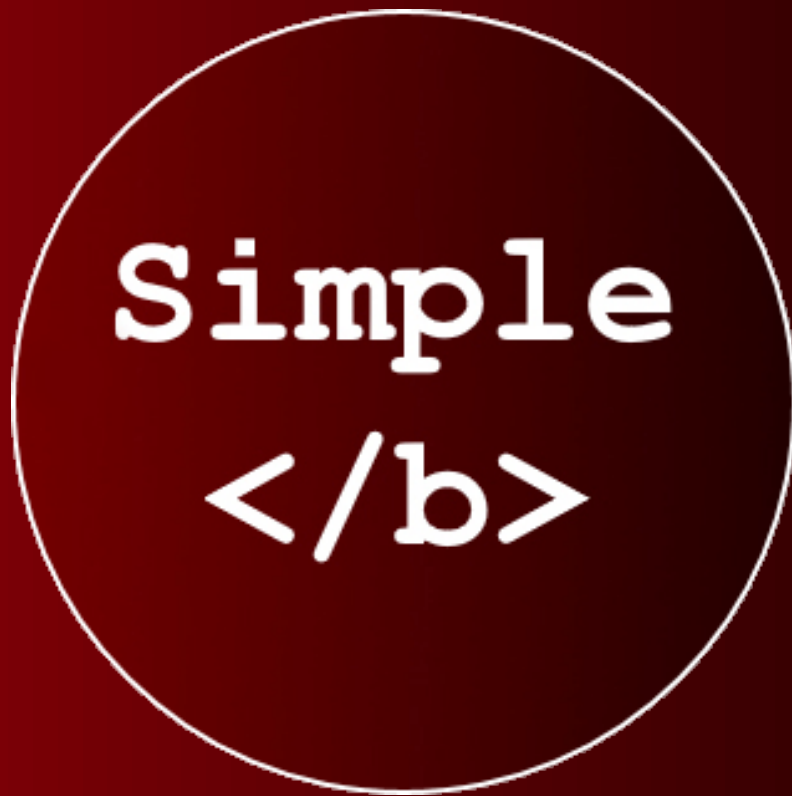
From working through the assignment together, it is proven that the teammates have soft critical skills such as problem-solving and analytical skills. As the expertise is perfectly aligned with the future demands for IT-related positions, we believe that the ideal jobs provide a stable career path for future growth.

While the demand for usual jobs like software developers and systems engineers are on the rise, an avalanche of new technologies and surging globalisation are reshaping the future needs in the IT industry. As Amanda McIntyre – Consulting Partner, PwC Australia pointed out, creativity, cognitive flexibility and negotiation skills are going to be highly desirable to meet the ever-changing market. It is vital to not only looking at past data to be job-ready but also analyse what new jobs will emerge and subsequently, will we still be competitive in 5 to 10 years .2

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IT Work

Interview an IT Professional

Jess Bayly, Interviewer, Simple B

Rene Cocks, Senior Systems Engineer at Subnet

Monday, 6 July 2020

Jess Hello Rene

Rene Hello

Jess First of all, thanks for taking some time out of your busy schedule to have a chat with me, I really appreciate it. I hope you don't mind that I am recording this and if you want a copy, I can pass it along if you need it for anything.

Rene Nope, That's OK

Jess All right, well I'll get straight to it. So you're a Senior Systems Engineer at Subnet?

Rene Correct

Jess What exactly does your day to day work involve?

Rene It kind of changes on a day to day role, a day to day basis sorry. .. like we do here... helping with design solutions, costing solutions and yeah, just general support and implementing solutions as well.

Jess Right..... and the type of clients that you typically work with for solutions, what fields are they in?

Rene Yeah, a bit of everything. We touch a few not for profits. Trying to think of who else.

Jess You guys do Education, like the schools as well don't you?

Rene Yeah, that's kind of dropping off though. Pulling it all into them self, to try and push any third party providers away but personally myself, I'm kind of accounting and not for profit... mostly around Citrix solutions.

Jess What is Citrix?

Rene Okay... So that is a solution that allows you to work from home... It's come in quite handy over the last few months

Jess Right, so due to COVID you have a lot of interest in Citrix at the moment.

Rene Well I wouldn't put it like that because of the time setting it up for people, but for the people that already got it, have really managed to take advantage of it.

Jess Ok gotcha. What other kinds of work are you required to do at Subnet that isn't really typical of a Systems Engineer job?

Rene Look after the front desk.

Jess Yep, oh so help desk stuff

Rene Well, even Reception.

Jess Oh right

Rene I'll sit in reception if reception's not there.

Jess So if clients come in you might be sitting at the front greeting them?

Rene I'll go and look after them if reception is not there, apart from that though that's probably the only case.

Jess Right, so you obviously have a lot of client relationship experience

Rene Correct!

Jess To get to where you were, did you study many years, did you study a degree?

Rene Yes, I've got a Bachelor of Computer Science

Jess Computer Science, Ok, and was that your goal, to become a Systems Engineer?

Rene Probably not at the time. So Computer Science degree is more focused on programming and that kinda stuff. I was kinda a bit burnt out when I finished Uni I kinda just fell into this path to be a Systems Engineer

Jess What aspects of your work do you find you spend the most time on every day

Rene Um it can change from day to day. A lot of it is UAT and testing

Jess You find you do that on a daily basis, something routinely.

Rene Well it depends, I'm kind of knee deep in project stuff at the moment. I'm kind of just trying to finish off a server refresh for council. All of it has gone really, really easy, until the last bit which is the end user interface bit and that's taking up, taking multiple months because it requires testing and users don't.

Jess You test for months on end, or do you get people to test, how does that work?

Rene We get users to test, cause we don't know how the applications work our self in terms of the finance package or...

Jess Where do you find users to do that?

Rene Clients get volunteers – we get volunteers via our contacts

Jess Do you find any aspects of your work quite challenging?

Rene Probably just keeping up with workload.

Jess Keeping up with workload, so it's just constant busy time.

Rene Yeah, um cause I've got a pretty good relationship with so many clients

Jess It's hard to give them all... the same?

Rene Yeah, same level of service every time.

Jess Do you like the challenge that comes with your job?

Rene Yeah yeah for sure. One day we'll retire and be a IT Manager but we can't do it now because we'd get too bored.

Jess Are there any other areas of the IT Industry that you'd like to work on or possibly move into?

Rene Yeah down the road, when you retire – something less stressful.

Jess Less stressful, so an IT Manager do you think will be less stressful?

Rene Depending on what level it is.

Jess Do you think you'll be a Systems Engineer for a while yet? Can you see yourself changing paths?

Rene Probably not in the next couple of years but maybe after that yes

Jess Do you get to work with new technology? I wanted to ask you when you speak with clients, do you sometimes always have to sell what you work on. For example they might need to upgrade to office 365 but they might have a CFO that doesn't agree with that, do you find that challenging? Having to know that you've already upgraded and you're working with clients that are advanced and then you go back to other client who is still in the dinosaur ages?

Rene I wouldn't say dinosaur age but yes, can be challenging yes.

Jess So your normal 48 hour work week, is that normal for you? or are you on call after hours when things go badly?

Rene Yeah, so I'm on call 24/7,

Jess So that's part of your contract with Subnet?

Rene Yes, well its extra on top of what we already do. We do get compensated for it... quite generously.

Jess With technologies constantly changing, is there any technologies that you haven't worked with yet? or want to work with given the chance?

Rene All the time, its a matter of only being able to take on so

Jess Like AI or Robots?

Rene I'm thinking more from a product perspective. I think AI and Robots and that kind of stuff is still getting there... Still in the future.

Jess So what kind of programs would you be interested in at the moment but haven't explored yet.

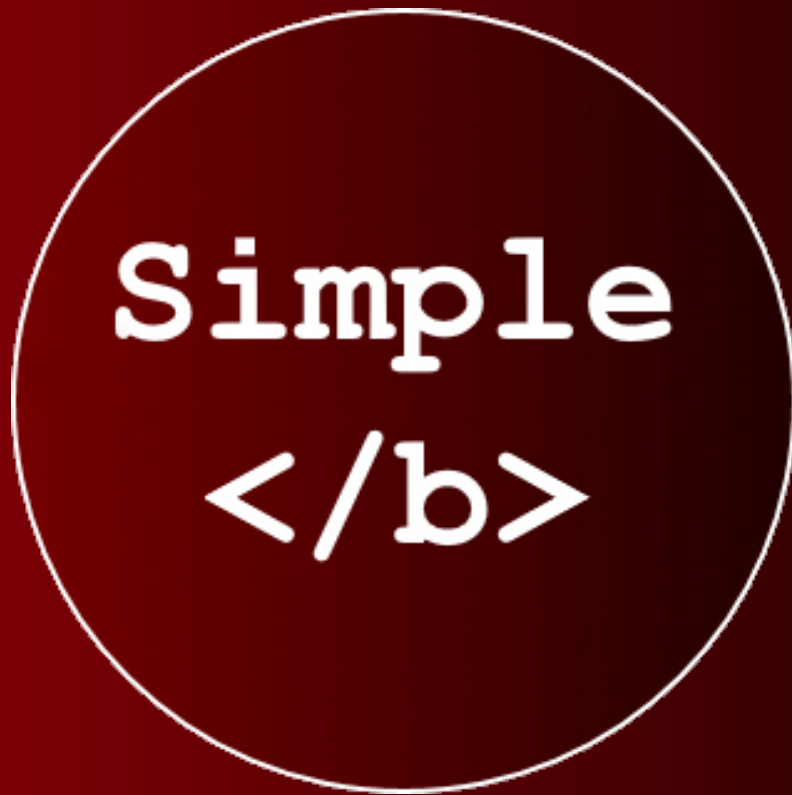
Rene I would like to do a lot more Azure, which is basically Microsoft's public facing crowd offering.

Jess Are you a MAC or a PC guy?

Rene PC

Jess Well I think I might leave you with that. Thank you so much.

Rene That's alright.



IT Technologies

An **"Autonomous Vehicle"** can be any vehicle

that is capable of sensing its own environment and drive without human operation meaning there doesn't even have to be a passenger in the car. There is also a difference between

automated and autonomous

vehicles. Automated vehicles take

instructions and will not go beyond

that whereas an autonomous

vehicle can fully think for itself so if

it decides to drive somewhere

without human instructions it can.

There are currently many reasons

why autonomous vehicles haven't



Photo by Mitch Nielsen on Unsplash

been released to the public as of yet however they are **still being developed** and

tested to ensure the best results. Companies such as Alphabet (Google's parent company),

Tesla, BMW, Audi, Amazon, Uber and plenty more are all working towards a future for

autonomous vehicles. These vehicles have many different detection mechanisms to assist the car becoming aware of its surroundings.

The current methods of the vehicle awareness is using Radar and or Lidar as some companies progress choosing one or both of these mechanisms in the combination with artificial intelligence and driving experience. These vehicles gain experience by driving in the real world and in a simulated reality over millions of miles making them more experienced than humans however they still had to learn to drive which could have taken a long time especially if they didn't have the option to create a simulated reality for their vehicles.

Developing autonomous vehicles can be quite challenging due to many implications such as the type of awareness the vehicle manufacturer is going to implement since Lidar is an expensive option and can interfere with other autonomous vehicles on the road while radio

frequencies can be a better alternative if there is enough frequency range to communicate with all the vehicles which is why 5G radio frequencies will be a very good advancement towards the future to support technology advancements that may have been restricted. The type of weather can also have an impact on the use of autonomous vehicles if they are unable to detect the road and drive to limiting awareness conditions, for example if the road was covered in snow there may be no way the vehicle to continue driving since it doesn't know where the road is. Road regulations in Australia will be quite strict on the future vehicles as they are only preparing to automated vehicles and ***no mention of autonomous vehicles*** unlike the United States who have been welcoming the future advancements while staying political about the matter. Another hurdle autonomous vehicles need to leap over is artificial intelligence vs emotional intelligence in being able to make decisions based on instinctive behaviour that technology cannot comprehend currently to a capable extent. Benefits of autonomous vehicles are beyond current circumstances with the manually operated vehicles used by society today. During the first major COVID-19 outbreak, everyone had the chance to notice ***pollution levels had lowered*** especially in Hong Kong due to planes not flying and other transportation methods reduced. A prediction made with the rise of autonomous vehicles all being electric will be an outstanding 80% reduction in urban CO2 emissions on a global scale which will positively impact the earth and its beings. The current stage of autonomous vehicles is not anywhere near the prediction that was made five years ago however there have been a lot of advancements towards the technology that will contribute in making vehicle autonomy a reality. Further development is necessary to provide a vehicle that is safe enough to be on the road and have passengers, smart enough for decision making and intelligent to perform tasks that require critical thinking. A lot of these advancements may contribute to other technology advancements in the future such as better performing artificial intelligence, Sci-Fi like transportation as seen in movies and overall being more ecofriendly.



Photo by Roberto Nickson on Unsplash

Automated vehicles ***could be another ten years away*** with the current progression made in the field however this is just an assumption and autonomy vehicles could be a further ten years away so around the year 2040 as artificial intelligence should be much more advance, giving time now for computer scientist, engineers and other fields to develop the technology in a popular and growing industry that will revolutionise the world and will keep on continuing until civilisation reaches a plateau. Overall the technology advancements will take a fair amount of time but it is good to know companies have already been working towards vehicle autonomy for near two decades now so

they should be close to reaching a breakthrough that will give them the answers they need to release the vehicles publicly as most of the time the vehicles are on private property continually being tested.

Autonomous cars are the main goal for industry leading companies in the motor and computer sectors and once they have been achieved to a satisfactory level the next step is to engineer trucks, motorbikes, boats, helicopters and other transportation. Conventional cars today will be the old and electric cars will be the new with the main benefits being they are faster, cheaper and more durable than any car before. Vehicle safety will increase by a large number with the car having automated safety features that will be able to calculate what to do next. Traffic congestion levels will decrease while freeing up parking lots since to call your car to pick you up will only require download the cars manufactures app.

People who can afford these vehicles will definitely choose them over the motorised vehicles of today with the cars being so advanced and all it's features being very futuristic and more convenient for the owner. Companies that pay truck drivers will choose autonomy in the future

with the potential to save money and delivery will be faster with the driver not needing to have any lunch break or a sleep overnight. The advantages of autonomous vehicles will carry over to plenty of industries leading the way and encouraging the robotics field to replace many working roles.

How will these vehicles help?

How will this affect you?

Will they be affordable?

Electric cars are the future for society and to encourage usage they will be affordable and competitive allowing the majority of people being able to purchase them however the autonomous vehicles may be slightly more expensive with it having more features than a standard electric and automated vehicle. Traffic congestions will happen less frequently meaning more people will be on time for work as the cars will be able to calculate travel time and less people will be driving slow as cars will know the speed limits and will adjust accordingly. If someone doesn't own a car than they can order Uber Autonomy and be chauffeured to their destination.

More people will be living a luxurious lifestyle with better built cars and can be doing their work or study while travelling which will increase productivity for the majority of society.

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Due to technology expanding rapidly, **"Cybersecurity"** is a growing field that will continue to grow until such time. New devices are being created and will be connected to the internet using 5G. Most devices will be vulnerable to attacks and that's why machine learning is also growing in the Cybersecurity field in hopes to minimise vulnerabilities in technology.

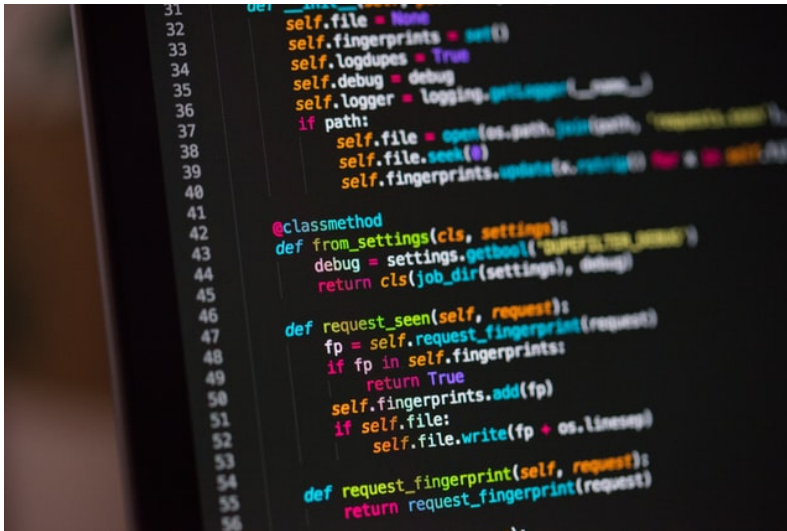


Photo by Chris Ried on Unsplash

The most common attack vectors in Cybersecurity are already regulated with machine learning, specifically when it comes to financial assets.

Hackers will continue to target health and financial organisations due to their high value and worth. These organisation sectors will always work to be the most secure and will

implement strategies to prevent attacks and protect its customers.

The rise of ransomware has costed organisations billions of dollars every single year and machine learning may not be able to prevent every attack vector. Quantum computers are designed to calculate complex algorithms that non-traditional computers can't. Quantum computers will be able to break cryptography and weaken ones that can't be broken. This may be possible within the next three years but only to people and organisations who can afford a **quantum computer** due to how expensive the system costs and to maintain it.

Security experts continuously look for vulnerabilities in both software and hardware to report the flaw to organisations. Usually, these organisations offer a bug bounty program that offers money or reputation in return for reporting the vulnerability. Because of this, the Cybersecurity industry will become increasingly more competitive, and more people are coming to the field due to the high demand.

In the next few years, Cybersecurity will have evolved becoming entirely different from the current circumstances due to technology evolving but the principals and methodology will have stayed the same. Security will have changed massively as companies increasingly make employees more aware of ***social engineering attack vectors*** which is one of the most effective ways at attacking targets as people can be more vulnerable than the machines they use and once an attacker gains access it can be difficult to claim back the device and costing millions of dollars.

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"Machine learning" is a program that has been

instructed to learn using mathematical equations. There are different types of machine learning such as unsupervised learning, supervised learning, semi supervised learning, reinforcement learning. Each type of machine learning technique uses a different or a combination of algorithms. Machine learning is actually a subset of artificial intelligence and without the mechanic of machine learning, creating an artificial intelligence becomes increasingly more difficult.

As machine learning is a subset of AI; ***deep learning*** is a subset of ***machine learning***. Deep learning is the process of a bunch of nodes (also known as neurons) that take input and output. Each node has weights that when processing data, the neurons can have influence the outputs. This being said, a lot of machine learning has to be configured after trial and error.

Programs that make decisions based on machine learning continually evolve and become superior than traditional programs that have been coded to complete tasks statically. Since machine learning has made a lot of progress over the decades, it has been implemented into the daily lives of billions without the realisation or understanding from its users.

Big companies now use machine learning in order to evolve and be at the top of their game. YouTube for example uses machine learning to read videos both audio and visuals and compares the content uploaded to match suitable videos for its users. This is extremely effective when providing the user suitable

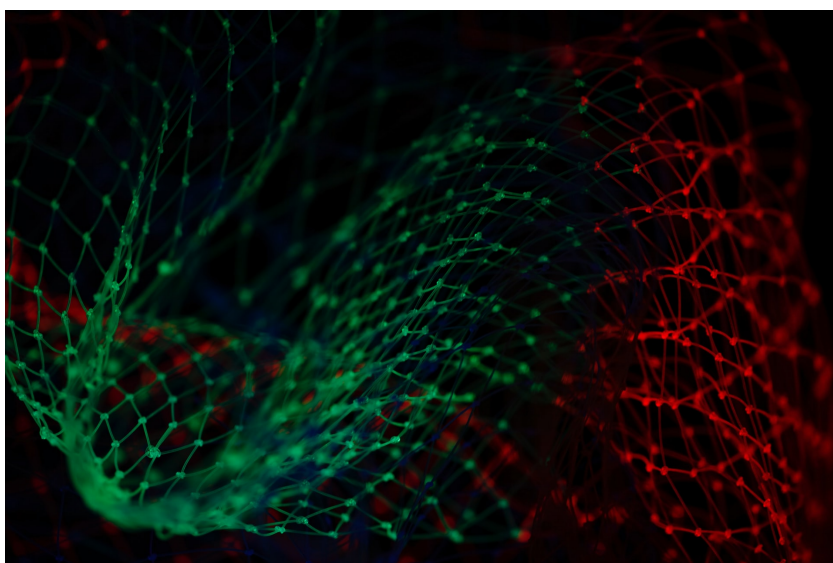


Photo by Pietro Jeng on Unsplash

content that they will much more likely be interested in and watch it for longer than other videos. Previously YouTube would've used video titles and video ratings alone when making recommendations which is not as effective.

Facebook uses machine learning. Since Instagram is owned by Facebook, they share some functionalities. Facebook has the ability to read your photos and understand who and or what is in the photos which is helpful when tagging people, the text you post can be meaningfully understood using a deep learning engine called DeepText. The advertisements displayed on Facebook and Instagram are laser targeted using machine learning when prior the advertisers had to manually select who they want to target but now Facebook know if you like to shop, follow accounts and webpages, if you like funny videos and so much more. The data used Facebook uses isn't just from Facebook themselves, it is provided from other data collection companies as well to accurately profile you with their deep learning engine which shows how powerful data can be when combined with machine learning. Facebook can also translate languages well without errors using machine learning, unlike other popular automated translation services a decade ago.

Machine learning is capable of much more than just interacting with the cyber world. NASA has held a competition that involved machine learning to design and construct a strong, efficient and safe home made out of dirt from Mars. Tesla has fully self-driving cars that uses machine learning, and there are many other scenarios where machine learning can be implemented. It is now realistic to do nearly anything with machine learning, in particular subjects it can become smarter than humans in a short period of time due to hardware like graphic cards that are built specifically with artificial intelligence in mind.

What is the likely impact?

The next few years will hold amazing changes to society through the use of machine learning. Since the COVID-19 outbreak there have been labs using machine learning to predict outbreaks and finding a cure. Agriculture is also another field being changed by machine

learning with a more efficient and effective way of growing food. It isn't too farfetched to say homes will be power by machine learning very soon, assisting the occupants with tasks such as turning a television on when it predicts you're going to watching television or knows when you are to be woken up and going to sleep.

Machine learning will change the world unlike anyone would think because it's not people that will be thinking as much as machines will be. Machines will power advancements to society and humans will most likely just be designing and maintaining the machines until that is no longer needed. Humans will quickly advance the Kardashev scale by having machines do a lot of problem solving it takes to reach the next level. Jobs will quickly be replaced by computers and there will be new jobs generated.

How will this affect you?

A lot of people are worried that machines will take over everyone's job, making people fat and lazy when this isn't true as there will be jobs for a very long time however maybe they are easily replaceable by a machine. If people are worried about being replaced by machines because their job is so simple that at the stage of civilisations technology currently is, than they should be working to equip themselves with more skills and adding value to their lives. It is inevitable that machines will advance and if people aren't willing to advance themselves than they shouldn't be complaining as the entire idea of machine learning is to assist people and creating a better world whatever the small changes may be.

The education system should advance with the help of artificial intelligence so schools will be able to teach more effectively that way children can grow to be more smart and intelligent, contributing to society in a much more helpful way. Shopping can become a lot easier with a computer ordering all the necessities and delivering the product to the door, this can save a lot of time and energy not needed to be wasted while the person is working or spending time with their family. Vehicles will be completely autonomous with the help of machine learning playing a big part. Everyone being a passenger in the car can be a much safer option especially if people are unable to drive.

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Credits

