Group Name:

Personal information

Personal information - Luke

Luke Bleeser, s3782106

My name is Luke Bleeser and I have been born and raised in country Victoria before moving to Melbourne to begin my Bachelor of Electrical and Electronic Engineering (Honours) in 2019. I completed high school in a small country town, and I love to spend time outside exploring the countryside. An interesting fact about me is that I live on a beef cattle farm about 4 hours north east of Melbourne! My interest in IT began initially with an interest in all things electrical as a young boy, hence my bachelor revolving around the topic. My interest stems from the ever growing daily need to integrate and utilise IT as it becomes more and more entrenched into our daily lives. I do not have a lot of experience in IT and have developed most of my basic programming skills throughout my bachelor's degree (C, C++, MATLAB). I do however wish to increase my knowledge in the area as I find it extremely interesting and relevant to a lot of work done in everyday life.

Personal Information - Zen F

I am a Bachelor of Biomedicine graduate who recently re-evaluated their career path and found IT the place to be. I am a Kuwait-born, Lebanese individual. During my spare time when I am not doing university work, I am usually playing the guitar (been playing for 9 years or so), playing computer games, or messing around with code in python or java. I hope to become a proficient programmer in various languages and develop a strong intuition for programming in general. My primary interests are web development, app development and AI development. I take most of my inspiration from modern technology & programs.

Personal Information - Soe YNH

Soe Yan Naing Htet, s3874708

My name is Soe and I came to Australia to study overseas from a country called Myanmar. I have little experience with IT and am currently studying for the bachelor of IT. I love playing competitive video games with my friends and love music. I like cycling but have not ever since I got into an accident. I love both cats and dogs. I came to RMIT on a later enrolment for having a

hard time deciding to go back to my home with my parents. I am interested in the likes of video game designing or creation.

Personal Information - Xavier Occhipinti

Xavier Occhipnti - s3658061

Hi, my name is Xavier, I am 22 years old and live between Melbourne and Warrnambool. I was born in New Zealand and moved all around for my dad's work, before settling down in Warrnambool where I grew up most of my life. My father is Italian, hence the tricky last name, whilst my mother is Australian. I enjoy playing sports such as basketball, tennis, and soccer. I also spend my time playing guitar and piano or getting hooked on video games.

Personal Information - Radhika Chopra

Radhika Chopra - S3873355

Born in Melbourne, I am of Indian descent, and currently work as an ESL teacher in regional Victoria. I got interested in IT during my highschool years playing around with website coding and design in my spare time. As of today, I have around 7 months of experience working for a small digital startup in Melbourne where I worked on copywriting and SEO, digital marketing, data analysis, and web development. With my learned skills, and as part of (group name) I hope to bring together my love of the environment and education to create technological solutions for the future. When I am at home, I love playing with my dogs, being creative, and spending time at the beach.

Personal information - Suhayb

Suhayb Walton - s3842119

Hey my name is suhayb walton, I am half British and half Somalian and I was born in Perth. I can only speak one language which is English however I can also understand Somali. My recent educational achievement was completing VCE year 12. My hobbies include playing basketball or reading manga mostly. An interesting fact about myself would be that as for a 190cm male I am afraid of cockroaches.

Test results from A1

Test results from A1: Luke

• The results of an online Myers-Briggs test.

https://www.16personalities.com/enfj-personality

• The results of an online learning style test.

http://www.educationplanner.org/students/self-assessments/learning-styles-quiz.shtml?event=results&A=9&V=5&T=6

• The results of one further online test of your choosing.

https://www.truity.com/personality-test/17315/test-results/24151361 (Big 5 personality test)

Test results from A1: Zen F

Myers-Briggs test:

INFJ – The counsellor INFJs are creative nurtures with a strong sense of personal integrity with a strong drive to help others realize their potential. Additionally, INFJs are creative, dedicated and have a talent for helping others with original solutions to their own personal challenges.

Learning style test:

Visual: 50%
Auditory: 40%
Tactile: 10%

5 personality test:

O: 48%
C: 67%
E: 25%
A: 67%
N: 56%

Test results from A1: Xavier

Myer-Briggs test – for this test, my personality type was a 'mediator' (INFP-T).

Online learning style test – my results for this test were that I am an Auditory learner.
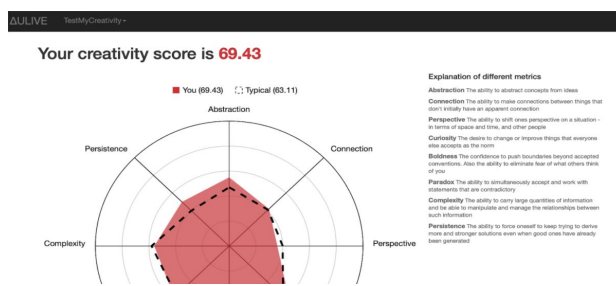
Five Factor Model personality test - the results of this test highlighted that I have two predominant personality traits. Them being Openness and Neuroticism.

Test results from A1 : Soe

- The results of an online Myers-Briggs test
  https://www.16personalities.com/istp-personality

- The results of an online learning style test.
  http://www.educationplanner.org/students/self-assessments/learning-styles-quiz.shtml?event=results&A=9&V=6&T=5

- The results of Big 5 personality tests

  https://www.truity.com/personality-test/17315/test-results/26187100

Test results from A1 : Radhika Chopra

- Myers Briggs
  https://www.16personalities.com/enfj-personality

- Online learning
  https://www.how-to-study.com/study-skills-articles/visual-learner.asp

- Creativity test

Test results from A1 : Suhayb Walton

The results of this first Test were: ISFJ which means introverted, sensing, feeling and judging.

The results of the second test were: I am a visual learner and tend to learn more through pictures etc.

The results of the third test were: I am a trusting and outgoing person who is confident.

Summary of team traits

Our strengths

Our weaknesses

How they work together

DONE

Interview

We chose to conduct an interview with an IT professional, these were the interview results:
What kind of work is done by the IT professional?
They are a lead AI programmer and developer, they develop AI, VR experiences and mobile applications for their start-up company called PlayingForward. They are currently developing an

AR app for physical therapy.

What kinds of people do you interact with? Are they other IT professionals? Clients? Investors? The general public?

I mostly interact with other developers and investors, people who are interested and willing to invest in our product. Our company is still in it's start-up phase so at the moment I would probably say that I communicate with investors most at the moment.

Where do you spend most of your time?

Given this pandemic state I am currently working from home, I work remotely. For the most part my work entails a lot of coding & programming with the occasional work meeting. Prior to the pandemic I had to bounce between America and Australia quite a lot as we have investors in the US with our own offices there as well.

What aspects of your position do you find most challenging?

Coming up with solutions to problems, working with cutting edge technology without any documentation to help whatsoever.

Compare and Contrast Jobs

Job	Learning Designer	Project Manager	Software Developer	Game Developer	Game Designer	Junior Software Developer
Main purpose	Developing engaging content for online learning platforms	Planning, monitoring and executing projects	To build software programs for computers	A Game Developer is a Software Developer who specialises in creating computer or video games.	Model, program and create the concepts for the gameplay experience	create , test and debug programs for computers, phones etc
Pay (avg. Aus)	**$81, 591**	**$88, 814**	**$71, 598**	**$64, 715**	**$59,951(US)**	**$70,000 AUD**
Tasks and duties	*Developing and editing	*Developing process for		-Modifying	*Developing game rules,	Research & design new

	online learning materials and content *Assessing learning needs and analysing existing material * Oversea the implementation of a learning system *Train others how to use the system	project execution *Communicating roles to others within the team *Budgeting the project *Analysing and interpreting risk *Closing and submitting an end product		and documenting the program code to correct errors. -Testing specific elements or products and implementing improvements. -Solving problems using logic and methodical testing processes.	game design ideas, gameplay exp and design *Work alongside external parties and development teams to bring game ideas to life. *additional tasks independently	programs Testing new programs Fixing bugs in software Writing and implementing efficient code Debugging programs Designing software based on client needs/what they want to achieve from a particular software
Qualifications	*A masters degree in Instructional Design *A qualified teacher	*Minimum bachelor is specified area of work *Perhaps masters in business/management		Advanced Diploma of Professional Game Development	*broad technical and artistic skill set obtained through a bachelor's degree program,	*A bachelor in IT or equivalent degree *previous experience in an IT environment
Technical skills	*Know how to navigate an LMS system	*Excellent knowledge of a large range of		-C programming -Unity	*software and practical experience	JavaScript HTML/CSS SQL

	*Can use UX techniques to further iterate material, such as user testing, surveys and questionnaires *Have knowledge of HTML, CSS *Knowledgeable about curriculum building *Have additional design skills to create visuals and graphics	areas involved in the design process. *Proficiency in a programming language (C,C++, python, Javascript) *Financial planning and budgeting skills *Be able to forecast and track performance.			through game design portfolio projects *need to learn Adobe Creative Suite for video and image editing; C++, Python and C# for object-oriented programming; and Visual Studio and Unity for coding and game development.	Python Java C++ Familiar with many IDE's
Teamwork and communication requirements	*Must be able to work independently as well as part of a design team *High level of written and verbal communication	*Extremely good delegation skills *High level of communication skills *Need to be an all round 'people person'		Team members who can openly and articulately communicate with each other, are more effectively able to share ideas and visualize concepts, which is a must for a game development team.	*Must have high communication skills to work in teams in a professional member	Need strong communication skills as you would constantly be working with either other developers or clients. It is important to clearly understand what a client wants out of a program and execute the way they envision it Can work individually too

Similarities & differences in career paths:

The roles for the most part involve the core development & production of either programs & games. Additionally, from the table above it can be inferred that being familiar with various coding languages is a necessity in the IT industry. Another common denominator is teamwork & communication, this is quite essential in any work place to ensure everyone is aware of what are the daily goals, tasks that need to be done & create a synergistic workplace environment. Generally speaking, the listed jobs all test a wide array of employee skills, it can be said that a commonality amongst these jobs is a high & diverse skill set requirement.

The salaries have quite a significant range when comparing the jobs, ranging from $64,000 AUD to $88,000 AUD. This is highly dependent on the role, whether it is at an entry or expert level. For example, the project manager role has a base salary of $88,814, as it is a lead position within certain industries. On the other hand, the salary for a game developer is $64,000, as you are typically employed amongst other game developers working on the same project. Whilst there are also a lot of common skills amongst the listed jobs, in a way, they are generally expected to be executed differently.

For example, a junior software engineer & game designer both require proficiency in programming languages, however, they would utilise the languages differently. IE a game developer would use said languages to design and develop visual & functional aspects of a game, usually for a company with set expectations or even as a project for themselves if they are an indie game developer. On the other hand, a software engineer would still utilise the same language for visual and functional aspects for a variety of applications & programs based usually on client/industry specifications.

On the topic of a high and diverse skill set requirement, another notable difference is the minimum qualifications required to be considered for the listed careers. Ranging from an advanced diploma to a masters degree. There is a direct correlation between minimum qualification and the expected salary for fulfilling a certain job. Another diversity amongst the listed jobs is that some require you to work well in either a team or on your own. Both are essential to any IT workspace as it demonstrates that you are fully capable of executing requirements on your own but are still able to collaborate with others efficiently & progressively.

As a general statement, whilst there are a handful of differences amongst the above career paths, they all in some way or form intertwine and correlate. 5 people can have the same skills, but they can all be executed in a diversity of ways.

Industry Data

What are the Job Titles for your group's ideal jobs? How do each of these rank in terms of demand from employers?

Job titles for our ideal jobs are

- Learning Designer (Does not feature in burning glass)
- Project manager (Does not feature in burning glass)
- Software developer (Ranks in at around ~350 jobs/month)
- Game developer (Does not feature)
- Junior software engineer (Does not feature)
- Game designer (Does not feature)

The burning glass data covers only a small area of IT and does not include an extensive list of all jobs available in the area and hence does not include all of our jobs. [1] The demand for learning designers has greatly increased and is in much higher demand now. Similarly for project managers [2] and any jobs in the game development industry [3]. Junior software engineers with work become senior software engineers and are mentioned in the burning glass data as a job that is in demand similarly to a software developer.

[1]
https://www.linkedin.com/pulse/demand-grows-instructional-designers-so-too-efforts-better-selingo/
[2]
https://www.pmi.org/learning/careers/job-growth
[3]
https://www.channelnews.com.au/australian-video-game-development-industry-up-21-to-143-5m/

• From your group's ideal jobs, you can identify a set of skills required for these jobs (we will refer to this as your group's required skill set). These can be divided into general skills (communication, problem solving, writing etc) and IT-specific skills (Javascript, SQL, etc).

The general skills required for each of the jobs range but also have some points of similarity between them. Some of the jobs such as game and software developer as well as learning designer required the individual to be competent in working on their own as well as have strong team skills. All jobs were heavily focused on extremely good written and verbal communication, a skill which is needed in everyday work. All required a high level of problem solving abilities as they will face problems on a daily basis that would need to be worked through.

In terms of IT specific skills there were a few but they were quite programming specific. Virtually all our jobs required proficiency in at least on HLL the most common on our list were; Variations of C (C#, C++, C) Java, HTML (CSS) and Java. The learning designer required high levels of design ability while the project manager required good money/financial ability to maintain projects.

o How do the IT-specific skills in your required skill set rank in terms of demand from employers?
Javascript, HTML and C# ranked among the highest of the burning glass data that we required. Some others which we did not include but were ranked very high were SQL and Linux. Although not included in our list every single person would need proficiency in Microsoft which all of our jobs required. Project management ranked highly in IT specific skills and relates to more jobs than just the project manager as all employers suggest they tend to lean towards employees with leadership and management ability.

o How do the general skills in your required skill set rank in terms of demand from employers?
The very highest ranking general skills would be a very good problem solving mindset and a high level communication skills which is both verbal and written. These are the highest ranking general skills that employers demand because you are expected to work in a team and complete tasks efficiently. The lower ranking general skills sets would be the ability to work alone.

o What are the three highest ranked IT-specific skills which are not in your required skill set?
- SQL
- Linux
- SAP

o What are the three highest ranked general skills which are not in your required skill set?
- Troubleshooting
- Presenting
- Detail orientated

• Having looked at the Burning Glass data, has your opinion of your ideal job changed? Why or why not
For our group each individual was very invested in their particular job. Although the burning glass data did not reflect each of our jobs as being highly in demand a small amount of internet research shows that IT jobs as a whole are increasing in demand greatly. This gave us confidence that proficiency in our individual areas would find us jobs regardless of data provided. Although some may be harder than others this was not enough to waiver our belief that our original choices were correct.

IT Technologies

<u>Soe – Autonomous vehicles.</u>

What does it do? (600 words) What is the state of the art of this new technology? What can be done now? What is likely to be able to do be done soon (say in the next 3 years)? What technological or other developments make this possible?

For the means of transportation, one major way is the use of vehicles which has been going on for a long time. However one of the drawbacks is that it causes road carnages or road accidents leading to the losing of the lives of approximately one million people every year. Countermeasures such as introducing traffic lights and officers to regulate road traffic and Autonomous vehicles is one of the solutions. "Autonomous vehicles or also called self-driving cars is a vehicle that can navigate itself without the need for a human driver, and get to its predetermined destination."
Although this technology currently has not reached the point of fully autonomous cars. There are 6 levels of Automation in autonomous vehicles classified by the Society of Automotive Engineers (SAE International), '0' being fully manual and '6' being fully autonomous (driver not required at all times). Level 2: also known as partial hands off, 'the car can control the acceleration, braking and steering without drivers.' That said, self-driving cars and automated cars are a bit different, self-driving cars fall on the Level 3 as they still need to be assisted by a driver to take over at any time. Whereelse, fully automated cars fall in the level 5 (Full automation) which can operate without a driver. By the help of sensors(radars), GPS mapping and cameras, automated cars are able to monitor the surroundings and detect obstacles e.g people, other vehicles and traffic signs to find out the fastest and safest route to the destination. The state of the art of this technology has achieved up to level 2 and 3 where vehicles can drive itself but it is not 100% safe. For example Lvl 2: Tesla Autopilot and Lvl 3: Audi Traffic Jam Pilot and no such cars for Lvl 5 exist yet however there is a driverless-car project by Google. For what this Technology can achieve in the near future, European Road Transport Research Advisory (ERTRAC) claims to have 'automated shuttles and buses on dedicated roads backstopped by remote control centers by 2024 and will be fully automated by 2030.' They also claimed that Ford's geo-fenced Lvl 4 AV will be available by 2021 for personal purchase however the released date is vague. Geo-fenced is the ability for AVs to self-drive within a geographic area or on a specific road type e.g freeway. Other technologies that AV uses to make it possible are such as 'lidar, a laser mapping technology which is very expensive; it is used to detect light, measure the distances and identify lane markings by bouncing pulses of light off the car's surroundings.' AVs also rely on other techs like sensors, actuators and complex algorithms or powerful processors to function accordingly and execute software.

What is the likely impact? (300 words) What is the potential impact of this development? What is likely to change? Which people will be most affected and how? Will this create, replace, or make redundant any current jobs or technologies?

Automated cars and self-driving cars can have both positive negative impacts on the environment. Currently, only self-driving cars are officially released but there is still a long way to go for fully autonomous or automated cars. However, when they do introduce the Level 5 (Full automation) reliable and safety proof vehicles, due to the help of these mobiles there will be fewer road accidents leading to fewer traffic policies, better traffic flow as people are no longer driving. AIs and vehicles will always follow traffic laws and help reduce the occurrence of traffic jams. This also helps limit the usage of money in the case of being lost finding a destination as the vehicle can find the best possible route and park the car accurately. 'With full potential of autonomous cars, vehicle automation, vehicle electrification, and ridesharing unleashed: by 2050 there will be 30% fewer traffic congestions, 40% lesser transportation costs and reduction of urban CO_2 emissions by 80%.'

The cons of the autonomous vehicles is that its full potential has not been reached yet. As of now, the most applicable product for autonomous vehicles are AVs by Tesla. Which only has 3rd Level of driving automation (Level 2). First up, it is very expensive for it has made use of expensive technologies in making and designing one. In addition, it is still just a machine which without perfecting, has tendencies to have errors which might potentially lead to life threatening accidents to either to the passenger or the pedestrians. There are a lot of challenges to overcome even accidents caused due to the potential stupidity of the persona. For example, consumers and owners not acknowledging the capabilities and limitations of the driving automation Levels the vehicles support and using as it has higher levels of automation. For example crashes/accidents where an owner of a Tesla vehicle on Autopilot was playing a video game or shooting a pornographic film in a Tesla that is driving on Autopilot.

How will this affect you? (300 words) In your daily life, how will this affect you? What will be different for you? How might this affect members of your family or your friends?

Personally for me and my friends AVs of level 2 driving automation like Tesla will have no effect on our lives as we for one are not willing to spend large amounts of money on transportation plus I have not driving experience. In the perspective of walkability and livability for the case of fully automated cars as most of my means are transportation are by feet and trams so it will be a safer environment as it will reduce chances of traffic carnage and car accidents. The other advantages of fully automated cars are that the elderly and physically disabled people or handicapped individuals will be able to drive by themselves. However, back in my home country I mainly use cars and with fully automated cars and improved traffic policies especially not allowing cars to park anywhere on the side of the roads, there will be a huge decrease in wasted time commuting and being stuck in traffic congestions and way fewer car accidents. Everyone in my hometown is just J-walking all over the place, pedestrians popping out breaking traffic policies in the fault of both drivers for not driving under speed limit and pedestrians not crossing the road in a safer method.

Links and references used in this report.

1. *https://www.caranddriver.com/features/a15079828/autonomous-self-driving-car-levels-car-levels/*
2.*https://thenextweb.com/shift/2020/02/27/6-levels-autonomous-self-driving-explained-tesla-waymo-autopilot/*
3.*https://www.forbes.com/sites/uhenergy/2019/05/21/self-driving-automobiles-how-soon-and-how-much/#7ef6273f38bd*
4.*https://www.electronicslovers.com/2018/09/how-do-autonomous-vehicles-work-automation-levels-pros-and-cons.html*
5.*https://www.synopsys.com/automotive/what-is-autonomous-car.html*

Luke – Cloud, services, servers

What does it do? (600 words) What is the state of the art of this new technology? What can be done now? What is likely to be able to do be done soon (say in the next 3 years)? What technological or other developments make this possible?

Cloud services, and servers is a very broad area relating to data transfer and storage through either a physical or virtual server. Both services are a way to process and store data in varying applications. State of the art technology for both types vary and are classified by many factors e.g. Size of storage, cybersecurity, speed, and ease of access. Physical servers have been around now for a long period of time and are used to store anything from data to media all the way down to web servers. Cloud servers are however a much newer phenomena and provide an alternative to storing things in a physical location. The cloud is a way to connect to several servers and lease part of an application or software service. As mentioned, both provide a similar service however, they are used very differently. A physical server provides a space upon which a single business or person can use for their own needs. This is often very helpful for large businesses that require high levels of security and have a need for a high bandwidth due to steady,

heavy demand. Cloud services allow users to access data or applications on the go and pay much lower amounts than a physical server. Now there are many ways of accessing cloud data and cloud computing offers a variety of different things as a 'service'. Some of the more basic operations include, software-as-a-service (SaaS) which often involves the leasing of software for a price. This is mainly because any specific user will only pay for what 'space' they utilise and are usually rented at low costs. One main example of this system is Microsoft Office's 365. The second of these is Infrastructure-as-a-service (IaaS). IaaS involves delivering everything from operating systems to servers and storage through special IP-based connectivity. A main example of this is Microsoft Azure, something which RMIT uses to lease students large and expensive programs for free. The third type is Platform-as-a-service (PaaS). PaaS is considered the most complex of the three and shares similarities with Saas. PaaS however provides a platform for creating software that is then to be delivered via the internet. An example of this is a platform such as Salesforce.com[2]. Likely in the next few years cloud computing is expected to boom. More than 1/3 of enterprise IT spending is related to cloud services and it is only expected to grow, in the last 5 years it has grown 20% and is expected to be worth a massive $260bn by 2021[3]. State of the art technology in the cloud computing area varies and is always growing. A few examples are community clouds, big data clouds and multiclouds. A community cloud is a multi-tenant platform which allows multiple companies to work on the same platform as they all have similar desires. This may mean multiple companies are wishing to use the same application, instead of giving each person their own individual server they all work from the same one while their sessions are split into separate segments.

What is the likely impact? (300 words) What is the potential impact of this development? What is likely to change? Which people will be most affected and how? Will this create, replace, or make redundant any current jobs or technologies?

Cloud based services and servers offer something to an average user that they would not normally be able to afford if they were relying on its physical relative. This allows small-medium businesses or individuals to host servers at a much lower cost as well as with less IT knowledge required, especially if people choose software-as-a-service. The ever-growing need of on demand cloud services will create jobs as IT professionals will need to maintain the 'cloud'. These numbers could become so large that around 800,000 jobs could be created over the next 5 years [3]. All these jobs will be related to data management, an integral part of cloud services. Some of these jobs include but are not limited to: data mining and statistical analysis, web architecture and development as well as cybersecurity analysts. All these will have major influence on people wishing to study in the IT field and unsure of what to choose. By looking at the cloud computing area there are going to be many available jobs to people with the right technical skills and training. It could however make some positions redundant as there may be less need to work on and maintain physical servers. Online cloud services could have huge impacts and are likely to change the lives of many people. As cloud servers become bigger and more popular, they may begin to make physical servers more redundant. A physical server requires a lot of things that newer cloud servers do not, some of these things are extremely important and can make work a lot easier to do. As cloud servers are virtually always online (Google promises a 99.9% uptime on servers [4]) there is no downtime to update or backup things that are on a server. Furthermore, a cloud server has data backed up and can be accessed by any worker or employee at any time without a need for a physical connection.

How will this affect you? (300 words) In your daily life, how will this affect you? What will be different for you? How might this affect members of your family or your friends?
Cloud services provide on demand access to an extremely large variety of things for people daily. For people who are not in professional fields such as myself and my friends, cloud services will not provide as much of a benefit as they may for some others. Mainly for us it will be used to backup, store data and access applications easily and quickly rather than physical hard drives. For small businesses however, this provides a huge upside in terms of how data is stored and processed. All data for a business can now be stored in the cloud and can be accessed by anyone, anywhere. Similarly, applications used within the business such as accounting programs and package suits can be accessed at low cost and a relatively low IT knowledge level. By utilising multiclouds or SaaS small to medium businesses can access programs and software on demand for a fraction of the cost and much easier use than storing

things on a specific server. Furthermore, it provides safe storage of data which is encrypted by the service provider making it difficult to be corrupted. Most companies that offer cloud services nowadays practice extremely good security on your data so an average business or individual will be protected well. For example, data is all encrypted when saved to the cloud and often bigger companies are starting to practice redundancy on your data. This implies that your data is stored in multiple locations so if a particular server goes down your data will still be accessible and safe elsewhere. All these factors are extremely important in a small business and allow for easier and more cost-efficient solutions to people with minimal IT knowledge.

References used in my piece (Can be put in the website using the URL link function)
[1]
https://www.investopedia.com/terms/c/cloud-computing.asp
[2]
https://www.zdnet.com/article/what-is-cloud-computing-everything-you-need-to-know-about-the-cloud/
[3] https://www.collabera.com/find-a-job/career-resources/how-will-cloud-computing-affect-it-jobs/
[4] https://www.microsoft.com/en-au/microsoft-365/business/microsoft-365-for-business-support-options/

Xavier – Robots

What does it do?

The robotic arm was first developed in 1964 by two men named George Devol and Joe Engleberger. Since then, robotics has expanded and improved as they have further integrated it into the everyday life of humans all around the world. In simple terms, a robot is a machine that operates autonomously and is generally used to replace human works and efforts. Since the robotic arm was implemented by the large company, General Motors, in the 1960's, manufacturers around the world have begun replacing human workers with machinery. As the development of robotics increases, more and more jobs are at risk of being replaced by the likes of robots, providing more automation, and in most cases, greater productivity and the incurrence of less costs. Currently, robots can be seen all around us, from basic robots such as toys for children, and going all the way through to advanced robots working alongside skilled doctors to assist in precise surgery situations, that would otherwise be impossible for the human hands and eyes to complete.

During this year, more significant breakthroughs continue to be announced, with the National University of Singapore announcing the development of an electronic 'skin' that has the ability to detect and respond to touch 1000 times faster than that of the human nervous system. The artificial skin also has the ability to differentiate between different textures, hardness, and shape with a very high accuracy. Moving forward from this breakthrough invention, researchers at the university aim to equip human-like androids and other prosthetics with this electronic skin so that they can collaborate with humans in an effective and natural manner.

Another breakthrough development is the creation of nanobots. They have been used for mainly medical use in the bloodstream. Scientists from both China's National Center for Nanoscience and Technology (NCNT), as well as from Arizona State University, both claim to have developed mini nanorobots that are only a few hundred nanometers across. This is groundbreaking considering there are 25 million nanometers in one inch. Scientists hope that once the nanobots enter the bloodstream, they will be able to successfully perform life saving procedures such as shrinking tumors, injecting drugs with unmatched precision, and destroying cancer cells. In the future, scientists have stated that the nanobots will be able to find tissue damage, monitor diseases, and destroy plaques in our blood vessels.

What is the likely impact?

The development of robots also plays alongside the development and curation of artificial intelligence (AI). With the continued development of artificial intelligence and the ability of machines to learn and retain information through interactions, the future of life-like robots who can hold human conversations is not as far away as some might think.

According to research conducted by the U.S. Army Research Laboratory, autonomous machines in the future may operate and build trust through emotion with humans. Researchers at the laboratory claim that actions and other nonverbal signals will be a primary contributor in promoting cooperation between humans and robotic AI. For example, smiling after mutual cooperation with a robot will inspire further cooperation in the future. This will allow humans and robots to communicate in a non-verbal manner, potentially opening up a vast array of different uses. For example, in military use, non-verbal communication could be used in operation scenarios where noise cannot be made. Technology such as this being integrated into a robot with electronic skin is paving the way for advanced intelligent robots who we may be coexisting with in the near future.

In regards to nanobots, the effect these tiny robots will have will be felt immensely world wide. The massive amount of money spent on running hospitals, developing medication and procedures, may see decreases of over 50% once this technology becomes mass produced. The creation of nanobots for medical use also brings to light the idea of these nanobots being used in more areas than just medical. In the future, nanobots could be used to build infrastructure. Theoretically, nanobots could be programmed to come together to form massive structures, potentially through the use of magnets. However, in our current time,

How will this affect you?

The continued development of robots will most likely affect me in the same manner as it affects most individuals around the world, and that is the inevitable takeover of robots in the workplace. Manufacturing, medical, finance, military, and other popular fields will gradually be replaced by robots who not only save companies money, but also boost productivity by massive amounts due to the speed and precision that robots and machines can operate at. Simply leaving humans incapable of matching a robot's capabilities. However, in the future, robots may provide assistance to humans in simple everyday tasks such as brushing your teeth and cooking dinner for the family. Potentially, as robots evolve, society as we live in today may be almost unrecognizable. Workspaces may prove to be quite dull, where there was once a large assembly of people socially interacting with each other to reach a goal, there soon could be a lifeless automated workspace where the only noises heard are the clunking and churning of robots in operation.

The use of nanobots for medical purposes will not only positively affect me, but also every individual around the world. The success of this technology could revolutionise the entire planet. Vast amounts of money used to fund hospitals and research could be minimised as the nanobots will be able to replace a vast majority of procedures. Millions of lives would be saved every year. Preventing and curing terminals illnesses that were once a death sentence. Through mass production, nanobots are predicted to be affordable to the general public sometime after their initial release, further releasing families from the financial burden of having a loved one treated for life threatening illnesses.

The increase in the use of robots for medical to industrial purposes will further lead us into the Internet of Things. The Internet of Things establishes that all objects are connected to a network cloud, and therefore everything is interconnected. Using nanobots within the bloodstream to help diseases would increase medical knowledge as the nanobot would be communicating with other medical technologies outside of the patient, leading to more efficient treatment of diseases and injuries. However, medical purposes will not be in the only place that benefits from the connectedness of all objects, this would follow through towards industrial practices, transport, and even mundane chores. Therefore, with the ever evolving science behind robotics expanding at an alarming rate, it is only a matter of time till the whole world is affected by the increased use of technology and robotics, for the better. The result would be a more intertwined and efficient society.

References

https://www.nbcnews.com/mach/science/these-tiny-robots-could-be-disease-fighting-machines-inside-body-ncna861451

https://www.robotics.org/joseph-engelberger/unimate.cfm

https://www.sciencedaily.com/releases/2020/09/200915194240.htm

https://www.zdnet.com/article/national-university-of-singapore-demonstrate-artificial-skin-to-help-robots-feel/#:~:text=Researchers%20from%20the%20National%20University,of%20touch%20through%20artificial%20skin.&text=The%20artificial%20skin%2C%20NUS%20said,the%20blink%20of%20an%20eye%22.

https://www.zdnet.com/article/what-is-the-internet-of-things-everything-you-need-to-know-about-the-iot-right-now/

Suhayb – Cyber security:

What does it do?

Cyber security is the act of shielding PCs, workers, cell phones, electronic frameworks, organizations, and information from malevolent assaults. It's otherwise called data innovation security or electronic data security. The term applies in an assortment of settings, from business to versatile registering, and can be separated into a couple of regular classifications. In this current day and age, there are a number of things that cyber security can do. For instance:

· Network security is the act of making sure about a PC network from interlopers, regardless of whether focused aggressors or sharp malware.

· Application security centers around keeping programming and gadgets liberated from dangers. An undermined application could give admittance to the information it's intended to secure. Fruitful security starts in the plan stage, certainly before a program or gadget is conveyed.

· Information security ensures the respectability and protection of information, both away and on the way.

· Operational security incorporates the cycles and choices for dealing with and ensuring information resources. The consents clients have while getting to an organization and the techniques that decide how and where information might be put away or shared all fall under this umbrella.

· Disaster recuperation and business progression characterize how an association reacts to a cyber-security occurrence or whatever other occasion that causes the loss of tasks or information. Debacle recuperation arrangements direct how the association reestablishes its tasks and data to re-visitation of a similar working limit as before the occasion. Business progression is the arrangement the association swears by while attempting to work without specific assets.

· End-client instruction addresses the most erratic cyber-security factor: individuals. Anybody can unintentionally acquire an infection with a generally secure framework by neglecting to follow great security rehearsals. Instructing clients to erase dubious email connections, not plug in unidentified USB drives, and different other significant exercises is fundamental for the security of any association.

The future of cybersecurity will have a hefty spotlight on utilizing artificial intelligence (AI) to make sure about gadgets and frameworks in the undeniably associated world. ... Fit mechanized frameworks that can screen, identify, oversee, and forestall cyber assaults continuously will be what drives cybersecurity going ahead.

What is the likely impact?

An absence of spotlight on cyber security can be significantly harming to a business. There is the direct monetary expense of such assaults to the business, for example, robbery of corporate data, interruption to exchanging or in any event, fixing influenced frameworks all subsequent in budgetary misfortune. Just as the physical effect, cyber security breaks can likewise cause reputational harm. With an absence of confidence in the security of the influenced business, clients will be more disposed to wander somewhere else, bringing about lost deals and benefits. Beside the immediate effects of a cyber security break, there are likewise legitimate outcomes to manage in the result. Inability to deal with a client's very own data considering the ongoing GDPR can bring about administrative approvals. This is whether or not the carelessness starts from the administration or representatives of a business. All organizations, regardless of its size, need to guarantee everybody associated with the organization is exceptional on the most recent cyber security dangers and the best strategies for ensuring information. The most ideal approach to do this is with normal preparation of staff just as utilizing a system to move in the direction of with key objectives for accomplishing a standard which guarantees the danger of an information break is negligible. One such norm, sponsored by the National Cyber Security Center, is Cyber Essentials organizations can get an accreditation for.

How will this affect you?

I feel like without cyber security, it would affect my life greatly. Since the current state of the world relies on the internet, we tend to store our information on the internet. Such as social media accounts or bank apps, without cybersecurity, hackers could just enter and grab our details without us knowing. Cyber threats are a big deal. Cyber attacks can cause electrical blackouts, failure of military equipment and breaches of national security secrets. They can result in the theft of valuable, sensitive data like medical records. They can disrupt phone and computer networks or paralyze systems, making data unavailable.

https://www.kaspersky.com.au/resource-center/definitions/what-is-cyber-security
https://www.cisco.com/c/en_au/products/security/what-is-cybersecurity.html
https://searchsecurity.techtarget.com/definition/cybersecurity

Project idea

Overview (100 words) - This should be a summary of what the project will be.

Our project will involve a piece of hardware that could be built into water storage devices (Cattle troughs, tanks) to remotely assess the levels of water through an application to run on either a smart phone or computer. It will involve work with both hardware elements that will be used on site alongside an application to transmit data remotely and wirelessly. These readings will be done via a microcontroller device that would need to be put inside of the water storage vessel and would rely on either pressure or a buoyancy device to function. These features will allow people who live long distances from water sources such as farmers with bodies of water a long way from residences to check levels of water easily from a smartphone or computer rather than needing to physically check the source. This in turn will hopefully allow them to save time, money and allow solutions to be planned before problems occur (such as a drought). It also has relevance as a humanitarian style device used in poorer countries to monitor water storage levels and allow foreplanning for local community needs.

Motivation (100) words) - This should be a description of why the project will be interesting or useful. This may include statistics or other evidence, such as: "There service. are 1.5 billion cat owners in Australia, and so there is a huge market for an automated cat feeder. Using Raspberry Pi technology is a cheap and easily assembled solution to this problem."

Growing up in Australia we knew the struggle of having to constantly check and maintain water sources during the peak heat of our summer. With an estimated 135,000 farming properties Australia wide, this product could be utilised by a huge range of people and would make it extremely viable due to harsh and contrasting weather conditions in rural Australia. Knowing this we believe this product provides an extremely interesting solution to a common problem in water storage. To fix such a problem would allow thousands of people to save time, money and

resources majorly benefiting Australia's agricultural industry hence our motivation to build a solution to this common problem. Alongside this integral reasoning is the fact we believe this device could majorly benefit the lives of individuals worldwide in their pursuit for safe and reliable water management solutions. To allow less advantaged communities access to a cheap and easy to operate/maintain device they will no longer need to worry about water storage, something which our group found extremely relevant and meaningful to solve.

Description (500 words) - Detailed description of the features of the product or service

As mentioned previously the project would need to be split into two halves, software and hardware. The software side of the project would involve algorithms to calculate the actual water level and must also be able to then transmit those values to a receiver which will most likely be a desktop GUI or mobile application. The hardware side will require a device to be fitted inside a water storage device and would either use pressure sensing technology or a flotation device which could sense a specific water level. As the water level rises or falls the inbuilt computer has a microprocessor that can calculate the water level at any one point in time. This would require the device to be waterproof and able to withstand a certain amount of water pressure at any one time. To overcome this the device would be provided in a small air/watertight container and could be easily transported to any size water storage container as required. These different options of installation are offered as different packages and would suit different situations. The microcontroller within the package would utilise Visual Studio to create an algorithm based upon either the pressure that the vessel faces at a point in time or based upon the height of the buoyancy device. To begin with we believe that the buoyancy option would provide the easiest solution and would work similarly to a buoyancy valve to shut water flow on and off. The device would be stored near the inlet at the roof of the storage solution and would have a buoy connected to it via some kind of non-rust pivoting metal. When first putting the device in the water it could be paired via phone or computer where the maximum capacity of that particular storage and dimensions could be entered. Once determined the microcontroller could calculate based on a predetermined formula the volume of the tank. As the buoy rose or fell the value would constantly be updated via the controller and would then be transmitted via wireless signal. From there the device would then transmit the calculated data directly to the user no matter the distance from the storage device, over extremely long distances this may require repeaters to be placed periodically to stop the signal from dropping out. Another option, (Although a little more costly) would be for users' great distances from the tank to utilise satellite technology to transmit signals no matter the distance. This would also be implemented for people living in mountainous or hilly terrain where straight line transmission would not be feasible. This would pose some challenges as we would need to ensure that the device is operating within a frequency that does not clash with radio/telephone frequencies nearby to avoid external noise. After assessing all the options this provides multiple paths for both the hardware and software applications. The GUI would allow the device owner to easily track and monitor multiple different water storage devices at any one time. An alert system would notify the individual if a tank got below a certain level dictated by the user and relevant action could be taken. If the product were to gain more traction a phone application could be brought into place

to allow users to check their data from anywhere as well as receive updates and warnings straight to their phone rather than to a desktop computer.

Tools and Technologies (100) words) - Describe the software, hardware and/or other equipment needed. Include any relevant open source tools as appropriate.

For this project to be successful it would need aspects of both software and hardware. The hardware could utilise features of an Arduino or raspberry pi. Both devices have wireless transmitting capabilities and could also use their inbuilt chips to do calculations and find specific water values. Alongside this would be an inherent need for some software both in the calculations part and some way for the user to easily access this data. We believe this could be in the form of a basic GUI which could be programmed using MATLAB and easily accessible on desktop computers. If the project had vested interest from stakeholders, this could be converted to create a mobile application and allow people to access their data on the go. All of the above solutions are going to need both servers to store the data and a network to transfer the data. We have explored options and depending on the scale of the project we could invest in cheaper cloud computing or a dedicated physical server. This would be decided once we had gathered some traffic data and worked out specific needs for a large range of customers.

Skills Required (100 words) - List the skills are required for your project, including software that needs to be written, and special hardware (if any). How feasible will it be to find the skills, software and hardware required?

There will be both software and hardware aspects to a project like this. The software would be split into two parts, the GUI/App and the code on the device measuring the water levels. The software required for this could be as simple as MATLAB or Visual Studio which are both more than capable of being able to write and solve complex algorithms. Furthermore, MATLAB has an inbuilt GUI designer and could also be used in conjunction with the code created to create a fully fledged app. This part of the project could be done easily by a large range of people and would not require any specialist skills. The design and implementation of the hardware however may prove to be more challenging. To begin the hardware would need to be sourced at as cheaper price as possible this may prove a challenge as some parts required such as the onboard transmitter and computer could be expensive. This would need to be carefully thought about before diving in headfirst. Furthermore, we would need to be able to consider how data would be stored and transferred from the hardware device to remote desktops. This would need specialist skills which our group believes we do not possess as of yet. Servers would need to be set up to store data as well as figure out how data would be remotely exchanged and kept secure for each individual user. Good networking skills would be required for this and perhaps even more specialist skills if we were to decide that satellite transfer could be used over longer and more topologically diverse terrain. This would be especially relevant when determining how data will be transferred safely and securely without loss of information. It would also need to fit within ACMA (Australian Communications and Media Authority) regulations and could perhaps

utilise the ISM (Industrial Scientific Medical) bandwidth to transfer data at as cheaper cost as possible without having to purchase large amounts of bandwidth.

 If the project is successful, what will be the outcome? How will the original problem be solved? What impact will this development have?

If this project were to be successful it would provide an easy monitoring system for farmers all over Australia and perhaps even disadvantaged communities worldwide. It can save farmers lots of time and resources as well as a functionality that could be used worldwide to help monitor water storage levels on a small scale. This leads to a mountain of possibilities and absolutely solves a known problem, especially in the agricultural industry. Furthermore, developments into cheaper and easy to use alternatives could be implemented into poorer countries to allow them the easiest access to water levels. This would have an incredible impact on their daily lives allowing them to plan ahead for farming or community needs and could allow restrictions to be put into place if water levels were becoming dire.

REFLECTIONS

ONE INDIVIDUAL AND ONE AS A GROUP ~ 200 words on your own reflection, follow guide on A2 PDF

Luke

Overall I believe our team worked fairly well on the project. When work needed to be completed it was done so to a high standard and was almost always completed on time. Our group of six conducted three meetings over the entire duration of the project and allowed us to communicate ideas quickly and easily as well as decide what needed to be completed and by whom. The

document kept with a small agenda and minutes was successful as if people missed meetings they were still able to catch up on work in their own time. This will hopefully follow into A3 with the recordings of the meeting also proving very helpful. Something that could and will need to be improved for A3 will be starting work early. As uni students we have a bad habit of leaving things until the last minute and this assignment was no different. If people were to begin earlier we need to stress less when the work gets close to submission time. Something I have learnt about groups is that they don't always have to be bad! Our group communicated well and everyone was very accepting of feedback and willing to rework solutions until the team was happy with them, something which you definitely don't get in all group projects.

Rads

Team Tekkerz was an interesting group to work with. In terms of content, we were able to assign work to each other and delegate fairly. Most of this work was completed within the specified time frame, and we were good at giving each other feedback and notes on improvement. I think one thing that could be improved would be overall communication. It was disheartening at times to message the group and not hear back, especially close to deadline and as the person who had to build out the final product.

One thing that surprised me was how easily we could compile information and collaborate over the Internet having never met in real life. I think I much prefer face to face communication as I thrive off people's creativity and energy, but having the documented notes and the meetings was really helpful.

What I have learned about groups is that it can be difficult to make sure everyone is on task and able to understand their individual requirement, if you do not have a direct communication pathway. Especially working online, you have to put a lot of trust in your team members and their expert skills to get to the end product. Technology can be a great helper, but you have to work around everyone's schedule and that can make things harder. Compromise and working with people's strengths is key to success.

Xavier

Overall I was happy with the way the group conducted themselves. Communication was sufficient enough to complete the assignment at an appropriate level, however, more communication could've been done to ensure all ambiguities were resolved. Meetings on Microsoft teams went smoothly with most people attending a majority of the meetings. Work was split amongst each individual in the group. Ideas about the project were agreed upon by each member easily, as we all had similar views on what should occur.

One thing that surprised me was how efficient programs such as Microsoft Teams and Google Docs make working in a group over the internet. Work and ideas were easily shared amongst members, and feedback about those ideas were given to each other quickly and effectively.

After completing this assignment, I learnt that working in groups always has its difficulties, especially during Covid-19. People may have completely different schedules and difficulties to maintain at this time, so working around that aspect in a group is always a challenge. However, as a whole, I believe our group worked very well together and should be proud of each other.

Suhayb

The most important thing that our group was able to do was complete the work that was required, and help each other with what needed to be completed. If something was not completed the others would call it out and remind the other person to complete it which is really good. Overall i believe the major issue that we faced was communication, the communication was good but not to an extent. We could all benefit from attending the meetings more, I myself need to focus more on improving my communication. One thing that surprised me while working together in a group was how we shared each other's ideas and interests. While working together as a group I have learnt to communicate and finish my required works quickly and efficiently. In conclusion I believe we have done a great job working together, while there are places we could improve we still managed to do great even in these rouch covid-19 times where we are stuck in houses and have to communicate online.

Soe

Overall, I think our group was easy to communicate our plans and assign works and separate them easily. Even though I was behind for this class and missed the assignment which was a very important piece as a work input that is used for A2, I was able to understand what needed to be done on my part by the help of the advice I got from my members during our meetings. It was a little struggle to schedule a meeting as we are not campus but we still successfully got through the messages through MS. It was very easy to communicate and listen to other members' ideas and thoughts, planning was very simple. I believe we worked very well together as a team and managed to finish their own parts. I was a bit later on filling my report due to some other assignments I was trying to catch up with and I hope I can finish my work faster in the coming A3.

Zen

Group

As a group we all agreed that we were able to delegate tasks and use our time efficiently to get the tasks done. We helped each other out, and gave feedback as well as reminders to make sure everything was completed on time. We continuously iterated our work, as we could all access the notes and add onto what was there. We worked together to produce a well thought out final product.
 Group members were happy to put their hand up to do extra work and when delegated a task would complete it to a high standard and within a specified time frame.

In terms of meetings, we all tried our level best to attend them, and to contribute as much as we could to the overall project, using google docs to collaborate. The meetings were well spent, as we stuck to the specified time suggestion in the requirements, and stayed on topic. We used MS teams to keep track of our progress, and most of the time it was very useful to get in touch with one another and link notes and documents that were of importance.
 The length of meetings was especially positive as we kept them short and sharp to avoid rambling while still managing to include all relevant information.

However, most of us felt that our communication on a whole was a bit lacking. We felt that we began working on the project a bit later than we should have, and then trying to do work closer to the due date was a little stressful. It was difficult at times to get in touch, and to know exactly what each of us should have been working on.

Next time it would be better for us to start early, and to schedule more time to check MS teams, especially as everyone's schedule is different, we are studying online, and we have the added difficulty of Covid. It is a very hard time for some of us, and so it would benefit the whole group if we attempted to do the work in smaller increments over time, rather than big chucks at the end. Despite this, overall our group was satisfied with our completed work, and felt that we worked well as a team. We all contributed ideas and content, and tried to meet the specifications as closely as possible.</p> We learnt that although times are difficult due to online learning we were able to complete the task to a high standard when we communicated things efficiently. For A3 we will make sure to improve on the few problems we had with this assignment and make sure that work is begun as early as possible to avoid last minute stress.

A1 links

https://luke-bleeser.github.io/index.html
https://radhikachopra.github.io/Index.html
https://s3658061.github.io/ *(Xavier)*
https://zenfarhat.github.io/Assignment1/
S3842119.github.io *(Suhayb)*
Soe did not complete an A1 as they joined the course late.

Meeting minutes and agenda

Meeting 9/9/2020 -
https://web.microsoftstream.com/video/970cea3d-316e-4d0d-a337-1219c7731f12

Agenda/minutes

What is everyone going to do

Everyone to upload condensed A1 data into the word doc and link testing websites/results

Information is being compiled in the google doc

Comparing and Contrasting jobs

To be discussed when we can gather the entire group

Answering questions based upon industry data

As above

Does anyone know an IT professional?

Zens brother works in IT and he is happy to interview.

IT Technologies. PICK 4

4 ideas were picked during the meeting and it was decided that as Zen had organised an IT professional interview he would not need to do one. Radhika was not present at the meeting but due to her very good looking A1 website we would probably rely on her design and formatting hence she would not need to do one either.

Soe – Autonomous vehicles.

Luke – Cloud, services, servers

Xavier – Robots

Suhayb***** – Cyber security

PROJECT IDEA needs to be decided upon

A straw poll was created by Zen and everyone agreed to read each other's A1 project ideas and decide on the best/most suitable for the group.

Meeting 15/9/2020 - FORGOT TO RECORD

Minutes /Agenda

- Talked about Soe's job, needs to choose one and add to the table and finish report on autonomous vehicles

- Radhika to write a paragraph for team traits

- Everyone else to copy and paste in their technology write up

- Project Idea decided - Luke's - Expand on idea, make it as feasible as possible

- Reflection essay for the weekend

- Please send photos to Radhika for your team profile

Meeting 17/9/2020 -
https://web.microsoftstream.com/video/6949a863-1e2a-4cfe-aaca-eea7e529bcb5

minutes/agenda
- Photos
- Zen job comparison paragraph
- Everyone to add to job table
- ~~Rads to write team traits/finish website design~~
- Luke to rework project - Sat/Sun
- Ideas for project * if any send in teams chat or to s3782106@student.rmit.edu.au
- Reflection essay saturday/sunday
- Xavier to add more to IT essay (1200 w)
- Industry data - Xavier or Suhayb please look at this
- ~~Rads to create PDF for site links~~
- Luke to create PDF for meetings trail