COSC2196: Assessment Task 2: Team Project (Group)

Group #200:

**Just Do IT**

Group Report PDF

Ben Gabriel Barrios, Christian Fota, Philip Porte, Mina Roh, Fazil Syed, Jayden Watkins

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**Meet The Team**

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My name is **Fazil Syed** (s3941438) and I'm in team Just Do IT. I was born in Hyderabad, India and raised in Melbourne, Victoria where I currently reside with my beautiful wife and two young boys. My hobbies are cooking, fishing, traveling, watching movies/TV shows and DJing. I can speak both Hindi and Urdu. My interest in IT started at a very early age in the early 90's, and although I did do some IT studies approximately 20 years ago, I decided to follow a different career path. My interest in IT reignited recently whilst working on some IT related work projects and my own personal IT ideas. I felt helpless as I lacked the advanced tools, skills, and knowledge to achieve the desired outcome and expanding on the full potential of the work project and my personal ideas. My IT interest are based on the role of a Full Stack Developer, and I'm fascinated with the idea of automation and machine learning. These are the skills I'm hoping to gain during my Bachelor of IT at RMIT.

**Ideal Job:** Full Stack/Front End Developer

**Website:** <https://fuzzgit.github.io/IntroToIt_A1_MyProfile/>

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My name is **Philip Porte** (s3951231). I was born and currently live in Sydney NSW. My Mum and Dad's family come separately from Italy and Germany. I have completed Year 10 of high school and have done some other learning about IT by myself. My hobbies mainly include playing video games and using my computer for things like programming and other entertainment. When it comes to IT, I love being able to program my own applications and websites. Right now the extent of my experience is basic HTML and CSS. But I am learning about other topics in programming that interest me such as Python and JavaScript. I also aim to learn many other IT skills overtime that interest me and will help me get the job I want.

**Ideal Job:** Linux Software Developer

**Website:** <https://qube14.github.io/PersonalProfile/>

My name is **Jayden Watkins** (s3954899) and I was born and raised in Central Queensland. My main hobbies are music (listening and playing guitar/bass guitar), photography (landscape, portrait, macro), building Bandai Gundam toy robots and everything Japanese (food, language, travelling). My interests in IT stem from growing up in a rural town having to entertain myself, starting out in video games from as early as I can remember to eventually taking every IT elective in high school and building computers for fun. I've dabbled in coding in the past but haven't stuck with it long enough to learn unfortunately. This is one of the main reasons I enrolled in RMIT to keep me focused on something I love and enjoy, and hopefully in the future I can graduate and begin a life-long career in the IT field.

**Ideal Job:** Games Software Developer

**Website:** <https://yojiflea.github.io/AssignmentOne/>

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It's my pleasure to introduce myself as Mina Roh (s3927844). I migrated to Australia 14 years ago from South Korea and I currently live in Melbourne, Victoria. I am a working mother of two young girls. I enjoy paper crafts, playing the piano and listening to music. I am interested in all areas of design. The inspiration to study IT came from studying big tech companies such as Apple, Microsoft, Amazon, Tesla and Google to invest in US stocks. I became fascinated with their growth and contributions to the creation of computer-generated value and prosperous technology. My particular interest is cloud computing and cyber security, and I want to pursue a career in that field when I graduate. At the moment, I have basic skills in HTML and CSS, but I would like to improve my computer skills as well as my programming skills after completing my course.

**Ideal Job:** Cyber Security Analyst

**Website:** <https://s3927844.github.io/MinaRoh/>



I am **Ben Gabriel Barrios** (s3958378). 24 years old and born in Quezon City, Philippines, I arrived in Brisbane, Australia on the 12th of September 2021. I love pets and I've fostered a chicken, two fish and two cats back in Philippines. My favourite pet is cat. At the age of 4, my father died and even though I did not have my real father, my uncles and grandfather took care of me when my mother left for Israel so she can support us financially. My first time seeing a computer was when I was 8 years old in the care of my uncle who was an IT professor in a Cagayan State University in Sanchez Mira, Cagayan, Philippines. That is the first time I was amazed by a device that can do so much. My first love was the game Zuma by PopCap Games. My love for games gave me the interest to pursue IT program and I hope RMIT can help me. Currently, I have basic skills in HTML and CSS and would like to improve to achieve my dream of becoming a Web 3 Developer.

**Ideal Job:** Web 3 Developer

**Website**: <https://unicedcoffee.github.io/ePortfolio/>

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**Chris** (s3785541). I'm 21 years old and was born, raised and currently live in Melbourne, Victoria. I also have a full Romanian background. I have completed Year 12 VCE and applied mathematics course through OUA to help me get into a Bachelor of Software Engineering. My hobbies involve playing tennis and gaming as well as going out with my friends, going to the gym and entrepreneurship. My interest in IT began at a young age through interacting with technology and I look up to people such as Elon Musk and other business leaders. My skills in IT involve basic HTML and Python. Eventually I'd like to create my own applications/websites and use them for my entrepreneurial endeavours.

**Ideal Job:** App Software Developer

**Website:**

**Team Personality Results**

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| --- | --- | --- | --- |
| **Fazil** | Fazil Personality Test PictureENFP | Auditory 25%  Visual 30%  Tactile 45% | Creativity Score: 68.31 |
| **Christian** | Cristian Personality Test PictureINTJ | Auditory 10%  Visual 30%  Tactile 60% | Openness: 37.5%  Conscientiousness: 48%  Extraversion: 42%  Agreeableness: 37.5%  Neuroticism: 37.5% |
| **Jayden** | INFP-T  Jayden Personality Test Picture | Mainly Auditory Learner | "Work In Progress" Creative |
| **Mina** | INTJ  Mina Personality Test Picture | Auditory 25%  Visual 37%  Kinesthetic 38% | Openness: High  Conscientiousness: High  Extraversion: Medium  Agreeableness: High  Neuroticism: Medium |
| **Philip** | INTP-T  Philip Personality Test Picture | Auditory 23%  Visual 41%  Kinesthetic 36% | Openness: 77  Conscientiousness: 80  Extraversion: 32  Agreeableness: 102  Neuroticism: 104 |
| **Ben** | INFP-AJayden Personality Test Picture | Auditory 40%  Visual 35%  Tactile 25% | Extraversion 6%  Emotional Stability 22%  Agreeableness 45%  Conscientiousness 15%  Imagination 18% |

Our team's individual personality results indicate that we are quite a mix of different people who all think in our own ways. This is a good thing as the variety that comes with having different thinkers will allow us to come up with more original ideas together than we ever could on our own. All our individual personalities will be able to provide unique insight into ideas, problems and solutions from one another allowing us to create more in-depth information and come up with very well thought out solutions. The way that having a large variety of personalities will help us achieve this is by considering everyone's individual thoughts, ideas, feedback, and then building on those individual thoughts as a team to come up with the best solution together.

**Ideal Jobs**

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| **Fazil: Full Stack/Front End Developer** | **Common Elements** | My ideal job would be a front-end developer, more specifically, someone who is responsible for the design and development of a website or a mobile app.  Common elements within the group's individual ideal jobs, whether it's for an IT developer, designer or security include some form of coding/programming knowledge. In addition, a bachelor of IT would be the most common learning requirement as the foundation to be competent in the individual ideal job. |
| **Differing Elements** | In comparison, what makes my ideal job different to the team would be the programming language required. Although majority of the group's ideal job lean towards a developer, we all have different programming languages that will be utilised in the job roles. As a front-end developer the programming language commonly used is JavaScript and HTML, game developer's focus heavily on C++, Python and Java, Linux developers commonly use C, an app. developer may require Objective-C and Swift, Web3 designer may use Solidity along with JavaScript and Python is commonly used for cybersecurity. |
| **Career Plan Across Group** | Although career plans across group will differ, they will all essentially link together in some way or another with a possibility of all individual jobs working together on the same project or company. As an example, a company that develops games would require a game/software developer to develop the game, a web developer as the game and the company will likely have a website or mobile app and cybersecurity to ensure all aspects of the software and website is safe and secure, with online purchases. |

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| **Christian: Software Developer apps** | **Common Elements** | An ideal job of mine is to be a Software app developer which specialises in creating apps for mobile devices such as smart phones and tablets. I think that most of our jobs are similar in the sense that they all require some sort of a development of something weather its applications, games or cyber security systems. We all must understand how to write software and engineer it to suit our needs in the field that we work in. A cyber security analyst however may require different approaches to their jobs, they are a common need for all developers to keep the software safe. There is a common interest in developing skills in writing different programming stacks such as JavaScript, python etc. |
| **Differing Elements** | The main differences between my ideal job and the rest of the team are what we are developing. For example, I will develop mobile applications whereas others will develop games and security systems. Another difference can be the programming stack that is required to develop different areas. Although, our jobs may be similar in the sense that we are developing some sort of system, we might be required to write in different languages to suit the system we are building. |
| **Career Plan Across Group** | The groups career plans are going to be similar due to the nature of it all being in IT. When studying IT we will be learning the general idea of the subject until we eventually split off into specializing to our specific path such as game development or application development. In my case app development will be different to learning how to develop security systems or games so eventually I must split from my peers to learn specific languages and techniques required for application development. However, in relation to a cyber security analyst, they might want to work towards getting the necessary certifications, something that a software developer may not need. |

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| **Philip: Linux Software Developer** | **Common Elements** | My ideal job is to be a Linux software developer working on making Linux work with custom CPU's for IBM. While there is variety between our jobs, they all link back to one core concept that being programming software. We all need to know how to think like a programmer so that we can create healthy maintainable software and we also all need to know and understand programming concepts in depth so that we can solve logic problems effectively. Finally we all need to proficient in the tools necessary for the platform we are creating for whether that be programming languages or applications that apply to our line of work. For example, experience with C and Assembly for programming operating systems and experience with existing operating systems on a highly detailed level like Linux and or Windows. |
| **Differing Elements** | The key difference between our ideal jobs is the platform we are developing software for. My ideal job is all about the development of operating systems whereas my teammates ideal jobs revolve around different areas of programming such as game development, web development and cyber security. The differences in our platforms will see us working with different programming languages and tools to get our job done. Another difference between our jobs is how close we are working to the machine. My ideal job will allow me to work directly with the CPU on the computer to develop the systems that are needed for people to build their applications on top of like game engines, web browsers and the applications made for computers overall. |
| **Career Plan Across Group** | Our career plans will take us in different directions, those directions being the area of IT we wish to get into, but the path to get there will be similar even if split up. My path towards getting my ideal job would first to gain proficiency and experience with any popular programming language to develop my understanding of essential programming concepts before moving on to the skills more desired in my area those being writing programs with C and eventually some Assembly code. On top of that proficiency, I will need to learn the ins and outs of how operating systems work and computers in general on a very low level, not just on the software side but also the hardware side to be proficient around the area of IT I like the most. My path in IT will branch off from my peers when we all eventually focus on what we want to specialize in, right after we are adept in general programming which we are learning in the university subjects we are doing currently we will break off into pursuing our chosen IT fields. |
| **Mina: Cyber Security Analyst** | **Common Elements** | The most desirable jobs on our team are software developers. My ideal field of work is different, but I think there are some commonalities in the field of keeping the software you create safe. There is a common field of safe software development by developing software so that there are no security weaknesses, which are the main causes of hacking incidences, or by using a security technique to diagnose and remove security weaknesses in the source code within the software using a specialized framework. In addition, there is a common point in recognizing the importance of software development security with security programming classes such as Java, C, Android-Java, etc. in development languages. |
| **Differing Elements** | The main difference is that cybersecurity is not limited to software security, but is a broad concept that includes several specific areas of activity. It is the activity of protecting computers, networks, and data from malicious electronic attacks. They include network security to prevent intrusion into the corporate network, application security to find and secure vulnerabilities in application code, data security to keep data safe from unauthorized access or manipulation, operational security to evaluate and protect public data and operational security to secure data from unauthorized access or manipulation and disaster recovery. It seeks ways to prepare for attacks before they occur from various malicious codes, phishing, ransomware and to reduce the attack surface that attackers can exploit as much as possible. |
| **Career Plan Across Group** | When I examine the career plans across the group, the first step is to have an ability to read software source code. Hence, it is necessary to understand programming by familiarising myself with development languages such as Java and C languages. Furthermore, what we talked about at the group meeting was that other team members would develop the programs and I would like to keep it safe. So, the ideal plan would be to acquire a SANS certification to learn computer security, how malware is developed and how hackers hack. For computer systems auditing or security management studies, I plan to attain a certification called ISACA. |

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| **Jayden: Software Developer (Games Developer** | **Common Elements** | One of my ideal jobs that I would like to pursue in the world of IT, is as a programmer specialising in games development. Games have long since been my favourite hobby and having the opportunity to work on them would be a dream come true.  Regarding common elements in our team, there’s a lot of related skills in terms of software development so a knowledge of a few programming languages, such as Java, C++, JavaScript and Python is a definite must. Most of our ideal jobs will also require the ability to work well in a team to produce quality results in a timely manner. Almost every role will benefit from having a university degree in the field with some requiring possibly further studies. |
| **Differing Elements** | The biggest differing element when it comes to programming video games is the platforms in which they’re developed for, as well as the platforms used to develop these programs. A knowledge of specifically C++ would be extremely beneficial as there is a need for the ability to use functionality of computer hardware to optimize performance. There are also platforms such as GDevelop, Autodesk and Unity which are designed to help programmers create games for multiple platforms, as most video games these days are released across several platforms. Game development teams can also have team sizes in the triple digits and span the entire globe with simultaneous development, so understanding working in massive teams is a must have skill. |
| **Career Plan Across Group** | The biggest differing element when it comes to programming video games is the platforms in which they’re developed for, as well as the platforms used to develop these programs. A knowledge of specifically C++ would be extremely beneficial as there is a need for the ability to use functionality of computer hardware to optimize performance. There are also platforms such as GDevelop, Autodesk and Unity which are designed to help programmers create games for multiple platforms, as most video games these days are released across several platforms. Game development teams can also have team sizes in the triple digits and span the entire globe with simultaneous development, so understanding working in massive teams is a must have skill. |

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| **Ben: Web 3 Developer** | **Common Elements** | Since I got involved in crypto currencies and decentralized application (dApps), I am interested in the idea of creating my own website inside this new wonderful world which is the decentralized world.  There are a lot of commonalities in our group. The most common skills we must be programming for example, in coding we the Languages we need to know is C, Python and JavaScript. Analytical thinking is a required skill when working in this field because we will encounter a lot of problems. I believe that understanding of mathematical and computer science is one of the key skills we need. When working in a team communication is necessary. |
| **Differing Elements** | The most significant difference is that when developing Web 3, one must have knowledge in these three concepts: blockchain, Smart contracts and Decentralised application which is unique to Web 3 Developer. In programming, Solidity and Vyper are languages used in Web 3 Development that are not involved in other jobs. |
| **Career Plan Across Group** | It is crucial in developing Web 3 to have a group. Having a team is important because generating ideas can be limitless and like a website it is like a structure, in website it is the pages and elements and in team it is the people and experiences. To practice this job, it is a necessity to be in a group environment and based on my experience, I have learned a lot in this group.  I plan to learn all the skill required to be a Web 3 Develper like knowledge in C++, Phyton, JavaScript, Solidity and Viper and taking Bacherlor in IT will help me. A team can correct me if I make mistakes, can motivate if I am lagging, teach me things I do not know and help me develop the general skills I need. |

**Tools**

For this group project, a few technological tools were required in order to successfully plan, work on and develop each of the stages of the website and report. The main tool that was used for communication and planning was Microsoft Teams. MS Teams was crucial in being able to complete this project as due to the nature of distance between each member, meeting up physically was impossible. We began creating our team by inviting each member and having regular scheduled meetings bi-weekly, collectively creating and editing a document shared on the platform that outlined each element that needed to be worked on and finally using the platform as a database for any information, documents or media sources that would be useful. Having MS Teams available was fantastic for productivity as we had a cloud-based repository of all the information everyone had contributed so that the project could be worked on by anyone, anywhere, on any device etc.

The second important tool used for the group project was GitHub. GitHub acts as the official repository for all the work that would eventually be used to produce the website, also hosted on GitHub pages. An organisation repository was created and after everyone was added, a boiler plate file structure was added to support website development (html file, folders for images, readme etc). As we became ready to produce the website, a HTML/CSS template was used for the structure of our website and our information was added and formatted collectively in order to meet the needs of the assessment and project. Once we had a near-finished website, the relevant GitHub pages information was setup to host our source code and display the project website.

**Group Website:** <https://just-do-it-22.github.io/JustDoIT-Assessment2/>

**Group GitHub Repository:** <https://github.com/Just-Do-IT-22/JustDoIT-Assessment2>

**Microsoft Teams Information:**

01/04/22: [Recording](https://rmiteduau-my.sharepoint.com/:v:/g/personal/s3941438_student_rmit_edu_au/EVTMIUXHCh5Il-SsRGfSTOoB8OOIUd1qy_4W8soGC8Ar7w)/[Minutes](https://rmiteduau.sharepoint.com/:w:/r/sites/AA-A2Group39/Shared%20Documents/General/MeetingMinutes010422.docx?d=w829a3547a123438ca87b5a31349e46d8&csf=1&web=1&e=QK4ESe)

06/04/22: [Recording](https://rmiteduau-my.sharepoint.com/:v:/g/personal/s3954899_student_rmit_edu_au/Efp12A-i9KZDnKnEuTZcCBMBa3XxJE0jWYHVLwPay515hQ)/[Minutes](https://rmiteduau.sharepoint.com/:w:/r/sites/AA-A2Group39/Shared%20Documents/General/MeetingMinutes060422.docx?d=wec2c8b7758ba4779a843759ef658b088&csf=1&web=1&e=R3D2wu)

08/04/22: [Recording](https://rmiteduau-my.sharepoint.com/:v:/g/personal/s3954899_student_rmit_edu_au/EfcqA87gSlZMuWelNMpIK-UBGSkuXx5BlEofxq8XCxFSiw)/[Minutes](https://rmiteduau.sharepoint.com/:w:/r/sites/AA-A2Group39/Shared%20Documents/General/MeetingMinutes080422.docx?d=w8c977d6de7b94d65912e5888ed656c39&csf=1&web=1&e=h5I936)

11/04/22: [Recording](https://rmiteduau-my.sharepoint.com/:v:/g/personal/s3951231_student_rmit_edu_au/EWxGNVGs0rNFkYn9FWKEZ3cBMa-eWBJNH4q4ts5Q7p7N7A)/[Minutes](https://rmiteduau.sharepoint.com/:w:/r/sites/AA-A2Group39/Shared%20Documents/General/MeetingMinutes110422.docx?d=w0a0ded462a7b4b6d89882eabe14d5ad8&csf=1&web=1&e=uXIAkM)

13/04/22: [Recording](https://rmiteduau-my.sharepoint.com/:v:/g/personal/s3785541_student_rmit_edu_au/ETq060ozHJ5AhtsyQ5snUU4Bu4GhwO-R9GfeQ8dC9p3eHg)/Minutes

17/04/22: [Recording](https://rmiteduau-my.sharepoint.com/:v:/g/personal/s3951231_student_rmit_edu_au/EUt-7PwNuDlIrKlOW_tyhY0BtYcLapRg61qAFe6pz0qqLA)/[Minutes](https://rmiteduau.sharepoint.com/:w:/r/sites/AA-A2Group39/Shared%20Documents/General/17,04,2022.docx?d=wefc9a641e2464b14beea716366d0a7c3&csf=1&web=1&e=JZGRQa)

19/04/22: [Recording](https://rmiteduau-my.sharepoint.com/:v:/g/personal/s3785541_student_rmit_edu_au/Efj-hkID3tFPuiCuFrWSvEcBkRZJPELzf69fj8zTXuGOUA)/Minutes

21/04/22: Recording/Minutes

**Industry Data**

There are a wide range of job titles in our group. There are web designers, software developers, full stack developers and cyber security analysts. According to Burning Glass in Australia or New Zealand, web designers are 75 job postings, software developers are 337 job postings, full stack developers are 344 job postings and cyber security analysts are 173 job postings out of average 120,353 postings between 24, March 2017 and 21 March 2018. The top rank of job titles in our group is full stack developers and the least rank of job titles is web designers (Burning Glass, 2018).

**IT Work: The Interview**

The IT industry is one that is constantly evolving at a rapid speed to keep up with society and the everchanging needs of people using technology. In order to help understand what it’s like working in the IT industry, team Just Do IT conducted an interview (lead by Philip) with a professional in the industry. This interview is to get an idea of what it is like working in today’s fast paced and innervational IT industry.

Our interview goes over multiple topics about what it is like having a job in IT with IT professional Biagio Abignano, who has been working in the IT industry for over ten years and has valuable insights that are beneficial to those looking to join the IT workforce.

***What kind of work is done by the IT professional?***

Biagio Abignano is a senior engineering manager for the startup company Bright. His job includes managing a team of five software engineers, giving his engineers access to pathways and education for increasing their skills in their field of work and ensuring software's quality through maintenance and customer feedback. Biagio's workplace has several tools used to maintain their software, one of those tools' records how the user interfaces with their applications so that they can analyze the users input and variables like how long the user took to do a certain task. This information helps Biagio and his team figure out how to improve and or fix their applications as needed.

***What kinds of people does the IT professional interact with? Are they other IT professionals? Clients? Investors? The general public?***

Biagio interacts with many different professionals throughout his company. He interacts most with his engineering team who create the software. The other person on his team is the product manager who he is partnered in managing the team with. Outside of his team is his boss, the head of engineering, P&C, which is another name for HR, the support teams who give him the information he relays to his engineering team and the talent acquisition who are a small team of internal recruiters that he interacts with a lot to help them ensure they hire the right people for the job.

***Where does the IT professional spend most of their time?***

The most time-consuming aspect of Biagio's job is the delivery of new software features in which he coaches his team on what to do and ensure the feature is completed by the deadline. When there are new features that his team needs to create, he first must work with the engineers to break the feature down into things called tickets which are individual sections of the feature which they produce linearly. The tickets have three stages they go through as the feature is created those being ready for development, in development, in testing and released in that order.

***What aspect of their position is most challenging?***

Biagio finds that because of the switch to remote work it is difficult to ensure everyone is on the same page. For example, because everyone is on their own as opposed to a more collaborative environment like the office where Biagio can easily track and make sure his team are working correctly he instead must deal with the fact that many members of his team may work very differently from one another, and it is extremely hard to make sure all those people are working in tandem towards a shared goal using the same practices and processes.

*Please find a full transcript of the interview in Appendix A below.*

**IT Technologies**

In order to understand some of the newer, modern elements of technology, some reports were prepared by the members of team Just Do IT in the fields of Cyber Security, Cryptocurrency and the Blockchain, Machine Learning and Autonomous Vehicles. These reports were created to further understand our knowledge of a few of the recent technological developments that are being developed in modern day society. Please find relevant links to each report in the references section at the end of this report.

**Cyber Security**

Cybersecurity refers to all actions taken to protect users' assets from risks such as information leakage, cyber terrorism, internet hacking and financial accidents (Groot, 2022). Cybersecurity is necessary to safeguard sensitive information such as large amounts of collected financial data, intellectual property, and personal information. As the scale of cyber-attacks increases, steps must be taken to safeguard information related to national security, data of businesses and organizations, and health and financial records (Groot, 2022).

Cybersecurity can assist corporations or organizations to corroborate that their security standards are in conformance with a procedure, policy or process, analyze their security advantages and drawbacks, and describe security trends throughout the institution's control. It is acknowledged that an organization must detect its security administration progressively and analyze changes that are essential to acclimatization in the institution's security position. This perquisite can be integrated to assist an organization attain its mission by assessing its acquiescence with regulations and legislation, upgrading the performance of applied security conduct, and replying to high grade operation questions in terms of security, which promote approach building by the instructions' highest quality of operation (Voeller, 2014).

The most common tactic to protect a network is a firewall. A firewall can be a software tool, or a hardware device physically connected to the network. In both ways, the role of the firewall is to keep track of which network connections are recognized on ports, and to obstruct all other requests. Typically, a server administrator sets up and manages these firewall policies, which are coordinated by the change management process. Once hackers have circumvented firewalls and network security, the next line of defense is an antivirus tool that scans the hardware for malware. The goal is to eliminate malware before it spreads to other devices and launches attacks like ransomware (Ullrich, Cropper, Frühwirt & Weippl, 2016).

Backup management is also fundamental to a company's cyber security strategy. Businesses should establish a disaster recovery plan to prepare for emergencies. If it regularly backed up all the critical systems, it could have the ability to recover from a power outage or data breach in a reasonable amount of time. Most existing cyber security tools require some level of human intervention and configuration. For example, IT team members must establish firewall policies and backup schedules, and then verify that they are running successfully (Ullrich, Cropper, Frühwirt & Weippl, 2016).

Soon, companies will be able to handle event monitoring and incident response in bulk using smart tools. The next-generation firewall will incorporate machine learning, so it will be able to recognize patterns in web requests and automatically block potentially threatening requests. Experts also expect AI's natural language processing capabilities to play a significant role in future cyber security tools. In other words, AI (Artificial Intelligence) systems can scan enormous amounts of data from the Internet to learn how cyber-attacks start and suggest solutions to decision makers within organizations. Machine learning is also expected to expand rapidly in the security field (Thomas, 2021). ABI Research analysts predict that cybersecurity-related machine learning investments will increase spending on artificial intelligence and analytics to $38.2 billion by 2026 (Echosec.net, 2022). And some of the world's leading technology companies are using machine learning to better protect their customers. For example, Google uses machine learning to analyze threats on Android-based mobile devices and finds and removes malware from infected mobile devices. Although it is still in its infancy, it is expected to become a major technology in the future. Artificial intelligence and machine learning will change the way security is handled.

AI is starting to help with cyber defense. The most obvious use cases are malicious behavior on endpoints and networks, fraud detection, or pattern analysis in SIEM (Security Incident and Event Management). It is expected that this IT technology will continue to grow. For example, it can be applied in the field of preventing service interference, identifying the cause of responsibility and correcting user behavior (Thomas, 2021). Machine learning-based tools excel at identifying patterns and discovering events before human users. For the time being, organizations will have to combine humans with these next-generation tools when implementing their cybersecurity strategies and keep an eye on new AI advances (Thomas, 2021). What is the likely impact? (300 words) What is the potential impact of this development?

Passwords are essential, but they can be cumbersome. Most Internet users create their own passwords for each service or website they subscribe to online. Not only is this difficult to manage, but it can also leave users vulnerable to attacks if they use a simple password or use one password on multiple sites. The performance of password manager software has improved in recent years. They simplify and enhance online security by eliminating much of the manual work through algorithms that indicate and store identification that are complex enough to diminish the possibility of being hacked.

But eventually, AI could take us to the unknown world of password-free online environments. Advances in the field of identity and access management (IAM) suggest that passwords will one day be replaced by intelligent AI-powered systems. In other words, AI tracks everyone in an organisation based on job title, authority, and universal behaviour. A second authentication is requested from the user for any deviation from the norm. For example, it can be biometric authentication that can scan fingerprints or facial features (Aware, 2022). Investing in cybersecurity solutions and tools is essential for businesses of all sizes. Businesses on a small budget might be tempted to take a shortcut and save money, but that is why they are often a primary target for hackers. Cybersecurity products prove their value overall by reducing their risk and protecting them from dangerous unknowns. The possibility is that advances in AI technology will eliminate the need for companies to maintain large cybersecurity teams within their IT departments in the future (Thomas, 2021). Machine learning-based tools excel at identifying patterns and discovering events before human users. For the time being, organizations will have to combine humans with these next-generation tools when implementing their cybersecurity strategies and keep an eye on new AI advances (Thomas, 2021).

There are times in my life when I feel insecure about the security of my information. If I use public Wi-Fi to access your bank account or personal information, I may be afraid that hackers will steal that information. I am also concerned that a hacker might be stealing important photo files stored on my computer, such as a copy of my passport information, driver's license, or documents related to my personal identity. As such, cybersecurity is so intimately linked to our lives that intellectual property is so important. So, the enhanced technologies mentioned above will protect our intellectual property and personal information and a lot of data to make our society safer. Attacks with cyberweapons can destroy individuals, friends, businesses, and even countries. In fact, in 2015 at a German steel company, a furnace control unit was hacked, causing great physical damage. At a Volkswagen plant, a robot malfunctioned and pushed a worker, causing casualties. These cybersecurity issues have not ensured the safety of the company and the employees who work for it. Therefore, the issue of enhanced security is an especially critical issue that holds not only our individuals but also the members of society accountable to a wider extent and even the country (HackRead,2015). But even with this organizational and personal escalation of responsibility, cybersecurity incidents are like fires and cannot be prevented 100%. However, the current market situation is that the field of cyber security is more subdivided, such as risk management, control and assurance, law and regulation, security evaluation and audit, and there is a demand for experts who fit each element. In the future, the responsibilities of information, companies, and users will be further expanded.

*Please find references in References under \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**The Blockchain and Cryptocurrency**

The concept of the blockchain derived in 1991 however, its first widespread use was along with the creation of cryptocurrency, Bitcoin (Investopedia 2022). The blockchain is an immutable ledger that is shared in which it facilitates the process of recording transactions and tracking assets in a business network (IBM 2022). It is important for businesses to receive accurate information, fast. The blockchain is ideal for doing this as it provides instant, shared and transparent information that can only be accessed by network members that have permission. The blockchain is able to track information such as payments, orders, accounts, production and more at a high confidence level due to its transparency and end to end details of the transactions. This transparency allows for greater confidence within the industry involving it (IB 2022).

What differentiates a typical database and the blockchain is how the data is accumulated and structured. Unlike a typical database, the blockchain ollects information together in groups known as “blocks” which hold sets of information. Once these “blocks” are filled, they are then closed and linked to a previously filled block, forming the blockchain (Investopedia 2022). This line of data blocks essentially created an irreversible line of data that becomes set in stone and part of the time-line, in turn creating an exact timestamp of when this data is added to the chain. This allows digital information to be recorded and distributed however, not edited, deleted or destroyed (Investopedia 2022).

The term ‘cryptocurrency' or ‘crypto' is heavily associated alongside the blockchain. Cryptocurrency is a peer-to-peer digital payment system that doesn't rely on banks to verify transactions, essentially becoming decentralized (Kasperksy 2022), hence why it is often referred to as decentralized finance or Defi for short. Cryptocurrency has been around since 2009 with the launching of Bitcoin by an unknown person / group named Satoshi Nakamoto (Investopedia 2022). Ever since then thousands of cryptocurrencies have been released with each of them coming with its own utility benefits along with a new age of blockchain technology.

Cryptocurrency is run on the blockchain to record all transactions made by currency holders which can be tracked. Owning cryptocurrency doesn't mean you own anything tangible, what makes cryptocurrency valuable is the key associated with the unit of said cryptocurrency stored on the blockchain which gives it its scarcity and uniqueness (Kaspersky 2022). This, just like any other type of finance, can be transacted to another person without the use of another third party such as a bank (Kaspersky 2022). Crypto's main use is being a payment system, however not every crypto will have an underlying asset as that depends on if people are willing to pay and trade for it. This means that the price of crypto assets can fluctuate at extreme levels due to market speculation such as media focus, public announcements or actions of individuals (Moneysmart 2022).

As the blockchain and crypto become more popularized, businesses will begin to accept payment in this form. Many businesses in the present day have adopted the concept and many more will join. More than 2300 US businesses accept Bitcoin and an increasing number of other worldwide companies are using bitcoin or other digital assets for investment, operations or transactional purposes (Deloitte 2022). The block chain can be used for more than just the validation of crypto tokens for example music. Recently music streaming company, Spotify, announced its plans to join the Web3 space and plans to integrate blockchain technology in an effort to boost artist earnings (Weraveyou 2022). As the blockchain develops and becomes more adopted, the technology will be used for other big transactions such as real estate. Real Estate transactions are expensive, involve lots of paperwork and third-party assistance to close a deal. However, by using digital real estate tokens stored on the blockchain through tokenization, these tokens can be used to represent physical assets (Moneysmart 2022). This will cut out the “middleman”, provide undeniable proof of ownership via the digital ledger on the blockchain and improve market security. This is one of the many ways that blockchain technology can be used in the future as it improves.

The potential impact of blockchain technology has the ability to change the way traditional businesses operate. This is done by offering greater transparency, increased efficiency, improved traceability, improved speed of transactions or reduced costs (The European Business Review 2021). There is a high chance that there is a financial and social revolution on its way which will change the way we own and transact finance currencies and other real life ownerships such as real estate. According to Deloitte's 2021 Global blockchain development survey, 76% of executives said they expect digital assets will be a strong alternative to fiat currencies in global finance within the next 5-10 years (The European Business Review 2021, Deloitte 2021). Not only will blockchain technology impact the way we do future transactions of digital assets, it will also impact the way ownership is held for real life assets such as art, real estate, music and almost anything tangible. This is done through the newly developed oncept called ‘non-fungible tokens' or NFTs for short. NFTs is an emerging piece of blockchain technology that revolutionized the way we buy and sell digital assets that represent real world items (The European Business Review 2021). All NFTs are stored onto the blockchain and therefore cannot be replaced nor destroyed, only traded, sold or given away by the owner.

Other ways that the blockchain will impact the world is through:

* Improving cyber security by having all data verified and encrypted onto the blockchain.
* Unified communications by enabling faster and safer automated communication.
* Reduced government bureaucracy and increased security, efficiency and transparency.
* Crowd funding and donating to charities by ensuring money gets to the right place.
* Healthcare by having all medical information be stored in a secure centralized database.

These are just a few of the many ways blockchain/cryptocurrency technology will impact society (Forbes 2018. This technology can make some jobs redundant such as potentially removing the need for real estate agents, bankers or other middle ground jobs that are reliant on paperwork to verify ownership or transactions. However along with the blockchain will come many new opportunities and a higher demand of skills within the IT world that involve managing and developing blockchain technology (tKey 2018).

*Please find references in References under \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**Machine Learning**

Machine learning is a branch of artificial intelligence and computer science which focuses on using data and developing algorithms to imitate how humans learn, gradually over time improving its accuracy and precision (IBM, 2022). The term was first used by Arthur Samuel in 1959 in a paper which looked at analysing the possible moves in a game of checkers. Because computing power was miniscule compared to what is available today, checkers was ideal because the number of possible games that could be played is 10^31 compared to chess and Go's 10^123 and 10^350 possible moves respectively (Gabel, 2019). The relative simplicity was what made checkers a good potential to analyse for early proof-of-concept AI's. Samuel in his paper outlines two of the foundational learning techniques (rote learning and generalisation learning) that are still used today.

Machine learning in its simplest form works by breaking a learning algorithm down into three main parts (IBM, 2022). A decision process in which algorithms are used to make a prediction or classification and based on input data from the user, the algorithm produces an estimate about the pattern in the data. Next an error function is introduced to evaluate the prediction of the model from the decision process. If there are already existing examples of the preferred outcome, the error function compares its prediction to the known outcome to assess the overall accuracy of the model. Finally, the model is optimised by repeatedly making changes and reassessing against the example input and estimate until a threshold of accuracy has been met.

Machine learning is currently being used in a multitude of ways to assist in day-to-day tasks, product recommendations based on personal trends and even playing an important role in self-driving cars. Some more examples of machine learning in the real world today include such things like virtual assistants (Siri, Alexa, Google), traffic predictions for daily commuting, social media predictions and recommendations, email spam and malware filtering, search engine result refining, online fraud detection and even used in video surveillance.

One of the technologies that will benefit machine learning soon is the further development of quantum computing technologies. Quantum computing would allow the performance of simultaneous multi-state operations, enabling faster data processing. In 2019, Google's quantum processor performed a task in 200 seconds that would take the world's best supercomputer at the time 10,000 years to complete (Zhydik, 2021). Because the basis of machine learning relies on the ability to process large quantities of data multiple thousands (sometimes even millions) of times, the ability to improve the speed at which computers could process information would greatly benefit the strength and performance of algorithms used. There is currently no commercially ready quantum computer readily available. However, several large tech companies are investing heavily in the research and development of this technology, so the rise of quantum machine learning is potentially closer than ever before.

As outlined above, the main impacts of machine learning are the ability to streamline certain tasks, as well as making more precise recommendations and expanding the ability for computers to process data. However, with the recent advancements in machine learning, and artificial intelligence, there are some concerns with how it could potentially negatively impact industries and people. One issue is the idea of a technological singularity. Also referred to as superintelligence, this is the idea of AI vastly surpassing human intelligence in aspects like scientific creativity, general wisdom and social skills (Bostrum, 2003). In the past, this was considered only in the realm of science fiction but with the rate of technological innovation in the last half century, it has many people concerned although many researchers have expressed that this is an issue of non-concern.

Another large area of concern for machine learning is the impact on jobs. There is currently a large amount of public perception around AI replacing jobs and making several jobs of all skill levels redundant. Companies such as IBM are suggesting that this issue should be reframed as when the market experiences disruptive, new technologies, the demand for specific job roles shift (IBM, 2020). For example, in the automotive industry many large car producers are shifting from traditional fuel–based consumption vehicles to creating electrical vehicles and machine learning should be viewed in a similar manner, where jobs will be shifted elsewhere instead of completely removing the need for people to work certain positions. As machine learning and AI capabilities expand, the need for individuals to manage these systems will grow and change every day, so there is still a need for resources to address more complex problems within the industries that are affected by the development of machine learning.

With the development of these systems designed to streamline certain processes, there is an ethical question around how to protect individuals from bias and discrimination. In certain examples where companies have used machine learning algorithms to streamline processes such as hiring that have had unintended negative consequences. In 2014, Amazon had been building machine learning based computer programs to review resumes for job applicants searching for what they considered to be top talent. automation had been the key to Amazon's dominance in the e-commerce business with warehouse optimisation as well as driver optimisation (Dastin, 2018). It was made apparent not too long after however that the algorithms were prioritising men over women for the positions due to how the algorithms analysed the applicants over a ten-year period. Due to the tech industry being a male dominated industry, this unintentionally taught the system to prefer male candidates to women. Amazon had changed the algorithms to retrain these systems but there was no guarantee that other ways wouldn't be devised to discriminate against candidates, so the team was dismantled in 2017 as executives lost hope for the project.

As machine learning progresses to handle more complicated tasks, there will eventually be more widespread adoption of computers making decisions for humans. The first example that comes to my mind of this is with Tesla's becoming more common on the roads. Tesla has already begun to implement fully autonomous driving in the form of the company's proprietary Full-Self Driving (FSD) systems and although this isn't available in Australia currently, it's only a matter of time before there will be fully autonomous vehicles driving in Australia. This sentiment is something that concerns me as it leads to possible scenarios, albeit very rare, in which computers will have to make split second decisions that can result in serious harm or death to the driver or pedestrians, or systems fail completely. In 2016, a driver was using Tesla's autopilot on a US highway and the car's software couldn't distinguish an 18-wheel truck while crossing lanes, causing the car to drive under the truck and crash which unfortunately ended in a fatality for the driver (Yadron, 2016).

Fortunately, an MIT Media Lab in 2014 developed a modern, interactive version of the trolley problem to use the information to help develop further algorithms to add a human element to problems in which the AI systems are making these decisions. The trolley problem stems from a thought experiment in which a runaway trolley (or tram) is speeding uncontrollably down the tracks, about to hit several people. A lever nearby could be pulled by a bystander which would change the direction of the track so the people are spared but will instead cause another unsuspecting person to be hit instead. It asks the moral question of which is worse? Do nothing and hit multiple people or pull the lever, diverting the trolley to hit one person. The website known as “Moral Machine” over the span of four years logged 40 million decisions from 233 different countries to analyse how people would react to similar situations involving autonomous vehicles. The authors of the study emphasised that the results from this experiment would help technologists think more deeply about the ethics of AI beyond just self-driving cars (Awad, 2018).

*Please find references in References under \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_*

**Autonomous Vehicles**

**Project Idea**

**uDecide: *“The ultimate guide to streaming and media.”***

*In a time where it seems every provider has their own streaming service, choosing something to watch can be an endless, overwhelming decision. Take the thought and pain out of choosing and say goodbye to hearing, “No, you decide!”. With the ultimate guide to all things TV, movies and animation, let us here at uDecide decide for you!*

**Overview**

uDecide will be a multi-platform application built to be a TV guide for all streaming services (Fazil 2022). This catalogue of movies and shows will be viewed in multiple separate ways such as a home view, manual filter settings, different themes, and categories, and finally a machine learning algorithm to recommend movies and shows based on the user’s preferences gathered automatically through site use. On top of the different search options there will be detailed information about every piece of media in uDecides catalogue. The information contained will consist of ratings from the likes of IMDB and Rotten Tomatoes as well as links to trailers, reviews, and other such factors for the user to use in their decision on whether to watch the movie or tv show they chose.

**Motivation**

Today almost every household is subscribed to one or more streaming services (Fazil 2022). In today's world the entertainment industry is so vast especially when it comes to streaming services. One of the major problems with this is that with such a large amount of content spanning so many different applications, choosing what to watch turns from a way to relax into a daunting task that can take any amount of time from minutes to even hours in extreme cases. This is where the idea of uDecide was born, now you will not have to spend even minutes picking a movie because of uDecides recommendations and if you have something particular in mind you can use the manual search to find what you are looking for. This alongside being able to see ratings, reviews, and overall people's thoughts on a movie, you can always find something you will enjoy watching in a timely manner.

**Description**

uDecide is a web and mobile application that contain listings for all movies and tv shows that the user is subscribed to. To accomplish this the user will be able to link up their used streaming services so that uDecide knows which catalogues of entertainment to display. The feature in uDecide that will make choosing what to watch easier than any streaming services ability will be its machine learning algorithm that recommends users what to watch based on previously collected user data. Some of this user data may include things like previously watched entertainment, likes and dislikes built into uDecide, ratings given to watched entertainment, preferred entertainment themes and categories, minimum rating for use to consider watching and many more.

When the user gets to a movie or shows listing on uDecide there will be a breadth of information about that individual page for the user to consider when picking whether to watch said movie or show. A prominent piece of information that will be on every piece of media is a rating from IMDB and Rotten Tomatoes. Gathering the IMDB and Rotten Tomatoes rating data will be achieved through the likes of IMDB and Rotten Tomatoes free API's. Underneath the ratings section will be reviews that the user can then read if they decide they want specific input from people who have already watched the movie or show.

The planned catalogues that uDecide will support is so far planned but not limited to Netflix, Amazon Prime Video, Disney Plus, Stan, Paramount Plus, BINGE and Foxtel Now. Having all major streaming services used today is especially important for uDecide to be popular as missing a streaming service means missing a large demographic of people who use that streaming service. In uDecide you will be able to link your chosen streaming services not only through the signing up page but also in setting afterwards if you sign up to more streaming services later down the line.

uDecide's recommended movies and shows will be presented in a watch list format for the user to view on the home page or in an expanded whole page format to view more options at once. These options will come from the machine learning algorithm and depending on what the user is in the mood to watch can be customised beyond the machine learning algorithm with the users own manual filtering. These two methods of listing movies merged allow the user to pick between only movies they will enjoy which removes any sort of time wastage that is normally associated with finding a movie or show to watch on multiple different streaming services.

For every theme and category in uDecide’s catalogue will be a top 100 listing of the most popular movies or shows in that category at that point in time. This allows you to pick from the cream of the crop movies or shows in that category across the world. The source of this information will come from IMDB and sometimes other API's depending on what is needed. It will be contained on its own page in a simple listed view with each movie listing bringing you to the details such as the description, ratings, reviews, and trailers.

The manual filters feature is common amongst almost all forms of video media searching because of how powerful the options can be. On uDecide the settings will be relevant to its purpose and features such as streaming services and ratings. Streaming service options will be in manual filters that allow you to choose which streaming services you want to see listings from. These streaming services may be ones you are subscribed to, or you might even want to see options on services you are not currently subscribed to. A classification setting will also be an option allowing you to choose between CTC, G, PG, M, MA 15+ and R 18+. Next is the classic genre selection that will contain not only broader genres of movie such as horror and comedy but also combinations, for example instead of having to pick between a horror and a comedy you can join them and only get listings of movies with both genres. You will also be able to filter movies based on their IMDB score so that you can choose what quality of movie you are okay with watching. Finally, there will be an actor search bar in case you want a movie with or without certain actors as well as an awards filter.

Moving on from the filter options, there is one more way to search through movies that being the simple search bar which can work in tandem with the manual filters and recommendations pages. It will have its own page where it can be used as an individual tool however as limiting the search bars usage to other forms of entertainment searching would limit its overall results in searching different queries. The search bar will be for name's only as the manual filters take care of the rest of the users wants in movie choice.

In addition to the above features, uDecide will have one key element that will help provide entertainment recommendations for kids as previously there has been none of that on almost all platforms. The kid's recommendation section will also be influenced by the machine learning algorithm so that six-year old's and sixteen-year old's do not get the same movie and show recommendations. Depending on a young kid's preference they may get "Paw Patrol" in their recommendations whereas a teenager might get an anime like "The Seven Deadly Sins".

**Tools and Technologies**

For the uDecide program, it will require a variety of tools and technologies and programming languages described in detail below.

|  |  |
| --- | --- |
| **Programming Languages** | **Java**  Java will be an important language used mainly for backend in Udecide implementing heavy duty tasks.  **Python**  Python will also be used as a language for backend like Java, and it will also be utilized for security. It will be operated to analyze security vulnerabilities and risk factors. In addition, it will be designed to provide specific contents for users by forming an algorithm for a specific target through AI of machine learning using Python.  **Node.js**  Node.js will be used as a programming language for the client side and server. It will allow to be able to be debugablity as diagnostic tools and observability for metrics.  **HTML, CSS, JavaScript**  HTML, CSS and JavaScript will be used for front end development to design an interactive website and applications (Ourtechroom.com, 2022). |
| **Tool Kit** | For the tool kit, Android studio for Android and Apple X code for iOS will be used to design an operating system based on IDEA software. |
| **Media Format** | uDecide will support various media formats such as MKV, MP4, AVCHD, AVI, DMW, MOV, FLV, WMV, SWF to play video (Ourtechroom.com, 2022). |
| **Cloud Services** | uDecide will use Amazon Web Service (UWS) to manage storage, process data, and efficiently support video viewing with high speed. |
| **Streaming Protocols** | HTTP Live streaming protocol will be used to communicate with iOS and it will distribute files to Apple devices. Adobe's HTTP Dynamic Streaming will be utilized for workflows for encoding video. Microsoft's Silverlight Smooth Streaming will be operated to minimize buffering and start-up time quickly to provide streaming in real-time basis (Barry and Crowley, 2022). |
| **Hardware Requirements** | In terms of hardware development, as it will require handling a lot of data to process so a Linux based server would be recommended on uDecide program such as Intel® Xeon® E-2286G processor with 256GB RAM, 12 USB 3.0 ports, motherboard with two cooling fans and one cabinet fan, with four network ports (each 1Gpbs per port) (Ankesh Anand 2020). |

**Skills Required**

There are a variety of skills needed for uDecide to function. These skills vary from general team and project management type skills to ensure people work as an effective team and the app is developed in an efficient and high-quality manner, to highly technical skills like machine learning with Python that may require multiple people to have specialized experience in just to implement the related features correctly.

**Project Management**

Project Management is an extremely important for uDecide because it will act as the glue that brings everyone's skills together so that we can first plan out how we are going develop uDecide in a time conscious manner while also making sure that the final product will be of commercial quality. Good project management will also be the skill necessary for making sure the teams' skills are put to beneficial use and minimising the amount of wasted effort that will go into the project.

**Web Development**

uDecide's web platform will require people with good web development skills both front end and back end so that the website functions correctly with minimal bugs and latency so that customers have good experiences and keep using uDecide. Web development contains multiple individual skills of their own that all glue together to make up web applications. On the front end or user experience side there is HTML, CSS, and JavaScript while the back end has multiple options, a couple of those options are C# or like the front end you can use JavaScript but in a separate way.

**App Development**

The second main platform uDecide will be created for is Mobile. The mobile app itself will be as similar as possible to website so that it is recognisable except it will be designed around the mobile user experience as opposed to viewing the website on a large monitor. Universal Stream Solution LLC (2020) It is also possible to share a back end between an app and a website which removes that part of the development process from the app's creation. Like web development, app development contains many individual skills except it is a much larger pool of skills because you only need to pick the skills you think will work best for your app instead of needing almost all of them.

**Design Skills**

To make sure that uDecide's website and app is not only functional but also a comfortable experience for the end user, people with clever design skills will be needed. The design of the website comes down to two main things, UI (User Interface) and UX (User Experience). UI is the look of the website, meaning the assets used for things like logos, buttons, and others but it also includes making sure the look of the app is comfortable for the end user and is not a bunch of undecipherable rainbow text. Emil Lamprecht (2022) Next is UX which is about the functionality and usability of the app for the end user. This includes things like making sure an apps settings section is easy to navigate even for the tech inexperienced. Both these things make up design as a whole and are equally important for the end users experience.

**Machine Learning**

uDecide's star and arguable hardest to implement feature is its ability to predict and provide the end user with recommendations that tick all the boxes for their idea of a good movie using machine learning. Machine learning is commonly associated with the Python programming language because of its easy usability which has led to its large support network from machine learning experts and enthusiasts today. IBM Cloud Computing (2020) Being good at machine learning requires experience with at least most of its sub fields like deep learning and neural networks. The way machine learning will predict and recommend the end user these personally tailored movie options is through the vigorous consumption of substantial amounts of data about the user. This large quantity of data will then be used to try and predict the users desired movie and then refine this process by repeating it with slightly different variable until it reaches a level the user can rely on.

**Data Skills**

Experience with handling substantial amounts of data and being able to easily use that data in some form of application development is one of the most important skills to make uDecide's machine learning feature work. The core of any machine learning algorithm is the data it uses to refine that algorithm to something useable. In this case we need someone good with handling not only regular data but specifically user data so that we know what we need to collect and what is not required for the machine learning algorithm to create its predictions and recommendations for a human.

**Hardware Skills**

With any form of software, in this case web and mobile there is a physical piece of hardware it is being stored on. Therefore, being able to manage this hardware is a skill uDecide needs to function. These hardware skills will be put to best use when storing the user data that is being used for the machine learning algorithm. In the beginning stages of uDecide the data stored will not be that large but if you start getting lots of users that small amount of data quickly multiplies and you need to be able to scale up effectively, especially in the hardware department as with lots more users come lots more data to store.

**Testing Skills**

Testing is just as important a skill for uDecide as programming the actual application is. With multiple features like different recommendations, settings, and design features that all need to flow and work together seamlessly, there is bound to be bugs, optimisation issues and a complete break of the website at multiple stages during uDecide's development. To ensure these problems are removed as soon as they pop up, we will need to constantly test every feature of the website and mobile app so that we can quickly implement fixes and keep the applications healthy and running.

**DevOps Skills**

In software development you must be able to work as an efficient team that can work together to roll out new features with little to no delay from differing groups and fields of work. For this to be achieved all members of a team must have good DevOps skill so that there is no wasted effort between trying to merge distinct groups work who have not discussed what they are developing properly for weeks or even months. Andrea Crawford (2019) Having a DevOps fluency throughout the team means being able to create complex plans that account for all groups in a team so that workflows join seamlessly rather than trying to merge their incompatible work at the end of the development effort. From deployment on a good DevOps team must also be able to generate and integrate a continuous feedback loop from end users, to developers, to quality assurance testers and back to the end user's product.

uDecide is very much feasible as everything that the web application and mobile app required has tangible tools and resources that have been used and refined extensively for years beforehand. Creating a website or mobile app is no hurdle in such a large website and app ecosystem with hundreds of ways to create one thing. The information that needs to be accessed from third parties is also easily accessible like IMDB and Rotten Tomatoes ratings as there are multiple API's that give free access to the required data. The machine learning algorithm that will predict and recommend the user movies is just a matter of learning how to create it through the multitude of online resources available today. The challenge we face currently is linking streaming services to our app as we do not know of a way to do so yet, it is however a feature on other applications which means we must find out how it is done.

**Outcome**

uDecide will be shipped in phases for efficiency and evaluation purposes. A phased release schedule allows more time to flesh out features that need the most work while still getting a shipped and working product sent out for people to use. We are also able to evaluate the state of the project between phases and see what needs or doesn't need to be changed so that the project can be in its best state. Another advantage to phases is that they do not interrupt a regular development workflow because the first phase will be base features of uDecide that features in phase 2 onward need to be developed to actually be useable in the website and mobile app.

Phase one is currently the focus so phase two and three will be planned out later. Phase one will consist of the websites core features ensuring its base usability and functionality come first before adding more complex things like machine learning. The first aspect of creating uDecide’s website will be creating a static HTML/CSS page with multiple pages for different sections of the website. The first section will need to be a login page which allows users to sign up to the service. Following the login page will be the main content which will have listings of movies and tv shows across multiple different streaming services that you can navigate through with manual filters. On each movie and tv show there will be an IMDB rating displayed so that the user knows how good the movie is. The IMDB rating will also be part of the manual filters so that you can choose how good you want your chosen movie or tv show will be. The other pages of the site will consist of different categories or sub sections for movies and tv shows. These categories include things like action, horror and comedy to name a few.

If uDecide is successful, then almost everyone who enjoys watching movies and shows on streaming services will be using uDecide to cater to their needs and choices of movie. There will be accurate recommendations personalized for each user tastes in entertainment, including different age ranges mainly amongst younger people. uDecide will also have in depth reviews and ratings from multiple sources for each piece of media it lists so that the user can see what people thought of the movie before deciding to watch it. People will no longer need to spend as much time thinking about what to watch which can be frustrating in a group, instead they can now relax knowing uDecide will give them something good to watch.

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**Appendices**

**Appendix A: Interview transcript between Philip and Biagio Abignagno**

**Philip:** Alright, hi this is Philip Porte. I'm interviewing Biagio Abignagno, senior engineering manager for Bright. I'll start with my first question. Please tell me about your IT work. What exactly do you do?

**Biagio**: So, I'm an engineering manager for a fintech that means I manage a team of five engineers, mix of seniors to juniors. There’s a contract there as well. So, my main focus is three areas, delivery of software, the second area is a career path; think education and tooling for the software engineers so making sure they've got the right tools of the trade they're trained up, they're educated, they're learning and third is also our engineering process. So how we manage our environments, how we test, how we ship good quality code and general health of the overall team. So, if I was to give it in another summary it would be I provide, I'm supposed to provide the correct highly trained, highly skilled, well taught engineers, to the company and this team of engineers are supposed to be able to deliver high quality software. If they don't then that’s where I have to come in and help with support.

**Philip**: Cool, thanks. For the next question can you please tell me about the industry you work in.

**Biagio**: Oh so the industry is fintech or financial technology so what that means is that we use technology to help accelerate the financial business. So our core product is buy now pay later. If you've heard of like Afterpay or Zip, we're very similar to them but we use buy now pay later for sustainable green home improvement. So, our goal is to make every home in Australia sustainable, so we provide targeted loans for sustainable home improvement to the areas of solar panels, batteries, electric vehicles, heat pumps. Pretty much anything that you can do to improve your home to make it sustainable. We specialize in finance for those. The way we make our money is that we charge what’s called a vendor certainty fee. So, the vendor, the person who installs the solar panels will go to the house, they'll say, “Right homeowner, I can install solar panels. It'll cost you ten thousand dollars cash today, or you can get financing through Bright.” If they choose the financing through Bright option, we pay the vendor the ten thousand dollars directly, but then we take over the loan with the homeowner. That's how we make our money.

**Philip**: Alright, cool, thanks. What other kinds of work do you have to do for your job?

**Biagio**: What other kind of work. So, I have to respond to incidents, so if our software systems go down or there’s a wide spread sort of outage I need to manage incidents and make sure that we recover correctly. Also communicate with wider parts of the business. I have to do a lot of recruitment, so I have to do a lot of interviews to make sure that we hire the right people. Interviewing is hard because you only spend like an hour and a half with someone but this person could be spending a long time with you so I've got to put a lot of focus on interviewing. Training as well and just a lot of extracurricular things like our engineering process that sort of I fit to my day. Oh, sorry there is one thing I do manage our technical support. So, we have three levels of support, first level, when a customer has an issue and they call up our customer support team is first level. Then we have an escalation, we have a slightly more technical team called L2. Then we have a team of engineers on call called L3 so I manage the L3 engineers as well. So, anything that requires a code change in terms of customer support will come to my team as well.

**Philip**: Alright, cool. Who are all the different people you interact with in your work?

**Biagio**: Oh, so I've got my team of developers, I've also got my product manager. So, the product manager and me are a partnership, so we direct the stream of work that comes in to the team. I've also got my boss head of engineering. He dictates like, the overall direction that our engineering department or culture should take. I also interact a lot with our support teams as well so if we have a lot of. If we have a lot of support issues with a certain piece of software, that could be a sign that software is un-healthy, so I need to then feed that back into the teams to get that fixed because part of good software is that it operates correctly so that’s a part of it too. I also interact with our TA team, talent acquisition team, all the recruiters. So, we have a small team of internal recruiters’, and they manage the candidates as they come in for interviews, so I interact with them quite a lot. Yeah, salary negotiations, offers, I can red-flag people, say don't hire them etc. The other people I work with is P&C, so people and culture, which is a fancy name for HR. Any questions or any issues I have in terms of people’s direct employment with the company that I can't handle I'll escalate to P&C and they help me out as well.

**Philip**: Cool, can you tell me about your interactions with other IT professionals?

**Biagio**: Yeah, so, I have a peer group of other engineering managers at work so they each have their own team as well, we don't interact on the day to day but we catch up maybe once a week just to keep in line keep sync and make sure that we're running our teams in similar ways. I also interact sometimes with a lot of people in other industries over LinkedIn over meet ups on occasion too. I actually do keep in touch with a lot of ex-colleagues that are also in the same industry as me, we tend to go in the same circles every now and then I'll have a coffee catch up with an ex-colleague and just see how they're going. Sometimes if we need a job, we can help each other out. I also still give a quite a lot of referrals, so I've got a lot of ex staff members that when they need a job they'll call me and say hey I've got a job. Sorry I have a job offer I need a referral can you be my referral, so I'll do several of those a year and that’s just because I've had so many engineers report to me over the years.

**Philip**: Yeah, alright. What about your interactions with clients or investors?

**Biagio**: Oh, I don't have any interactions with investors in my current job but I do interact with clients or with users to a degree. So sometimes when they're having issues it's not clear so I need to basically go direct to customer support and find out what the issue is. But software engineers and myself don't talk directly to customers however we do get their feedback. So, we do that in a couple of ways, we can, we're able to playback customer support calls, we're allowed to do that. So, if the customer is having issue with our software, we can hear phone calls of them. This way so we can hear the feedback directly from the customer. We use some screen recording, sorry, we use some software that records user interface journeys called hot jar. So, for example when a customer interacts with our software online every now and then the screen journey is recorded so we're able to actually see how users play with or interact with our software so we can see where they get stuck, how fast they get through certain screens. So, like a lot of our client sort of interaction is that we see a lot of their activity, but that activity is recorded in some form.

**Philip**: Alright, cool. When it comes to your work what aspects of it do you spend the most time on?

**Biagio**: Oh, the delivery. So, whenever we have some piece or some new feature to deliver, I'm basically the default or de-facto like master for the team so I've gotta get, so product comes to me and says here’s the thing we gotta build for the customers here’s why. I'll work with the engineers to break it down into individual sorta tickets. Those tickets then get estimated and it's my job to plan out what engineers we need, how long it's gonna take and then I do something called I push the tickets, so we have daily stand up and I make sure the tickets go from ready for dev, to in development, in testing, to released. So, I basically just, I'm like the coach or support person to make sure that everybodys getting through the tickets in a reasonable amount of time so we hit our deliverable targets. If people get stuck or they get blocked on a ticket. Blocked means you’re waiting for something outside of your control and you can't progress on the ticket, I'll help get that resolved and get that sort of unblocked. Whether that’s you need to work with another team or we need to talk to another subject matter expert to get a decision made.

**Philip**: Alright, is that also the aspect of work you find the most challenging or is there one that's harder than that?

**Biagio**: Oh god, no the aspect of work I find the most challenging is getting everyone in the engineering department making sure we're all on the same page. That can be really challenging now that we're all remote. For example, I can have a certain style but if that certain style doesn't match up with other parts of the business it can cause issues where we're not aligned on our engineering practice, it can create silo's which is not great. So, the most challenging part is how I make sure that my engineers have enough interactions with all the other engineers so we're all operating as one engineering department with common goals, common processes, common understandings. That's very challenging now that we're remote but yeah.

**Philip**: Cool, finally can you share an example of the work you do that best captures the essence of the IT industry?

**Biagio**: Share an example?

**Philip**: Yeah.

**Biagio**: Oh, yeah so, a good example is one stream of work that I'm helping facilitate now is our instant response, so we serve quite a few customers and we have quite a lot of people who rely on our software being up. The company I work for currently is in scale up mode, so what scale up mode means was that we were a start-up, we now have a successful product, we're now trying to scale that out to more users but as we scale the deficiencies in the software system become apparent in terms of being able to scale properly: bugs, edge cases that were edge cases when we had a small amount of users now become problems we have with a large amount of users. So, our internet response is something we're trying to work at right now, as we have more users we have, we can have the potential for more incidents. When an incident with software happen’s we need to make sure we get the right people, in the right room, at the right time to push forward to a resolution really quickly. We also need to communicate out to the wider business the status, so we've detected an issue, the issues affecting these services, it's affecting our end users in this manner, we're working on the fix and then I'll provide regular status updates. When the incident is resolved or we've provided a software fix I'll then communicate back to the wider business over what the impact was, any financial impact and what communication we can give out to customers. So, it's trying to work on how we respond correctly when things go wrong. Getting the right people in the right room is challenging when we're all remote as well because we're not in the office, we're all spread out over Sydney and some people in Melbourne. So that’s a challenging thing I'm working on now so it's a sign of success in the industry. So when you're a start-up and you've got like two or three people using your software and you've got an incident you don't really care that much, but when you hit success and you start scaling up and you get a lot, lot more users then you're incident response becomes very, very important because it maintains the health and quality of your software for your users and no one wants to use a piece of software that’s continually breaking. It's not fun. So that's a very common challenge in the industry how you scale up effectively.

**Philip**: Cool, Alright, That's it. Thank you so much for taking the time to do this interview.

**Biagio**: You're welcome, Philip.