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# Introduction

The following report analyses various aspects of the IT industry and how they relate to group members and their career paths. It outlines each member and their experience, analyses industry data and how it impacts each member, as well as the project idea that will be explored through to Assignment 5.

# Team profile

## Introduction

Meet **RECLAIM**, a group of like-minded students working together to produce an application to motivate and assist individuals to reduce their weekly household waste and get the most out of their weekly spending. The name **RECLAIM** has been chosen because it is memorable and directly relates to our message of making the most of household waste and reclaiming materials that would otherwise be thrown away.

The following section of the report will outline the students involved in producing this project and will compare the test outcomes and ideal jobs identified in Assignment 1. Information has been reviewed based on prior feedback and new learnings within the team.

## Personal Information

**Blair Horgan**  
s3868252

My name is Blair Horgan, I am pushing 48 this year and loving it. I’ve spent the last few years as a freelance photographer and photojournalist. I have a few hobbies that I enjoy, and these include photography, gaming, and electronics. I tend to travel a lot, with most of my time spent in either Thailand or Bali. I have always had an interest in IT and all things techy for a long time now. Working as a photographer/ journalist I’ve had to learn a lot of the IT techy stuff as I’m a one man show and don’t have the IT backing of a large media outlet, so I do it all on my own. Being able to connect to the cloud anyway and be able to edit and submit my photos via Adobe Creative Cloud is how I get things done. I also have a love for graphic designs and making visual stuff and so I guess it goes hand in hand with wanting to get involved in UIX/UI and even Web design. I guess I picked to study at RMIT because it suited my needs for where I wanted to go in the IT industry.

**Justin King**  
s3266310

I am 38, born and reside in Brisbane, Queensland. My hobbies include weightlifting, hiking, sports motor bikes, electronics and gardening. I manage the family business manufacturing liquid fertilizers for use in Agriculture. My studies have been in Chemistry and Biology and this is the first experience I have with IT. I have a passion for electronics and robotics which was sparked when I was in primary school and a friend’s father who was an electronics enthusiast showed me how to solder and helped me make my first project, a simple blinking light that I thought was the coolest thing in the world. I have no background in the IT industry however I do have experience with coding in Python and use of Raspberry PI. I hope to move into robotics and AI from here.

**Justine Frost**  
s3862333

I am 22 and I was born and raised in Melbourne for the most part. I spent a lot of time growing up San Diego, as I hold dual citizenship to the United States. Having parents from across the globe definitely comes with perks. Which in this case was my dad, whereas my mother’s side migrated from Syria to Australia many years ago. I attended all my schooling in inner city Melbourne. Completing high school encouraged me to take a gap year, which sent me straight into the work force – and have yet to start in tertiary studies, so here we are! I found myself sinking a few years into a Barista position, which followed a few bar tending and general hospitality roles.

Over the past few years I’ve really embraced and channelled myself a creative side, found an outlet in ceramics, I took classes for about a year and then it became something I just always wanted to do, even when I was occupied at work, I couldn’t stop thinking about going home and getting my hands dirty. It is definitely the most satisfying ways to switch your mind off.

Studying IT was always an option for me, considering my interest has stemmed from when I was a young gal. My dad actually introduced me to it all so it’s been something that has been around for as long as I could remember. In his spare time, or whenever we hung out, he was always showing me some program that he had been making or the latest computer he was building. I have very fond memories of always tripping over computer shells and stacks of motherboards and disk drives. I also loved tagging along to work with him, heading up to the IT department of the National Australia Bank was very exciting, my dad was part of the team that wrote the initial software to start up and develop online banking. Knowing those kinds of job still exist is definitely motivation to get into development.

**Kirby Schwenke**  
s3866528

My name is Kirby Schwenke, I am 25 and based in Sydney. I enjoy spending time with my pets, turning my one-bedroom apartment into a plant sanctuary, walking my way around Sydney, or using my creativity to create anything from a chair to a new planter box. I have previously completed a Bachelor of Management in Events and Leisure and worked in the event's industry since graduating. I was drawn to study in the IT industry as I have always been someone that thrives in an environment that fosters creativity and analytical thinking, and the IT industry presents many opportunities to apply this. I have previously used drag-and-drop website editors to create event and registration websites and often found myself lost in an internet rabbit hole researching HTML and CSS so that I could alter my websites and make them more dynamic and engaging. I have also worked with several technologies including, event registration software, project management software and file management software. I am interested in exploring more of UI/UX Design to improve the usability of software for individuals and industry professionals.

**Stephanie Briggs**  
s3383506

My name is Steph and I grew up on the Mornington Peninsula in Victoria. I was born in Australia and everyone as far back as my great-great-grandparents have been born in here in Victoria. My ancestors mostly originated from Europe with a mixture of Irish, English and German.

I have previously attended RMIT a few ago where I completed an Associate Degree and Bachelor in Fashion Design, this being the reason I have chosen to study with RMIT once again. My interest in IT started from quite a young age, but in my early teens was when I really started to enjoy learning about building websites so I started using basic HTML and chat widgets to create websites for my school friends. I hope to be able to gain a further understanding of programming languages and software development throughout my studies as I would like to move into a career in this area. Outside of work and studies I enjoy hobbies such as skateboarding, snowboarding and pottery.

## Team Profile

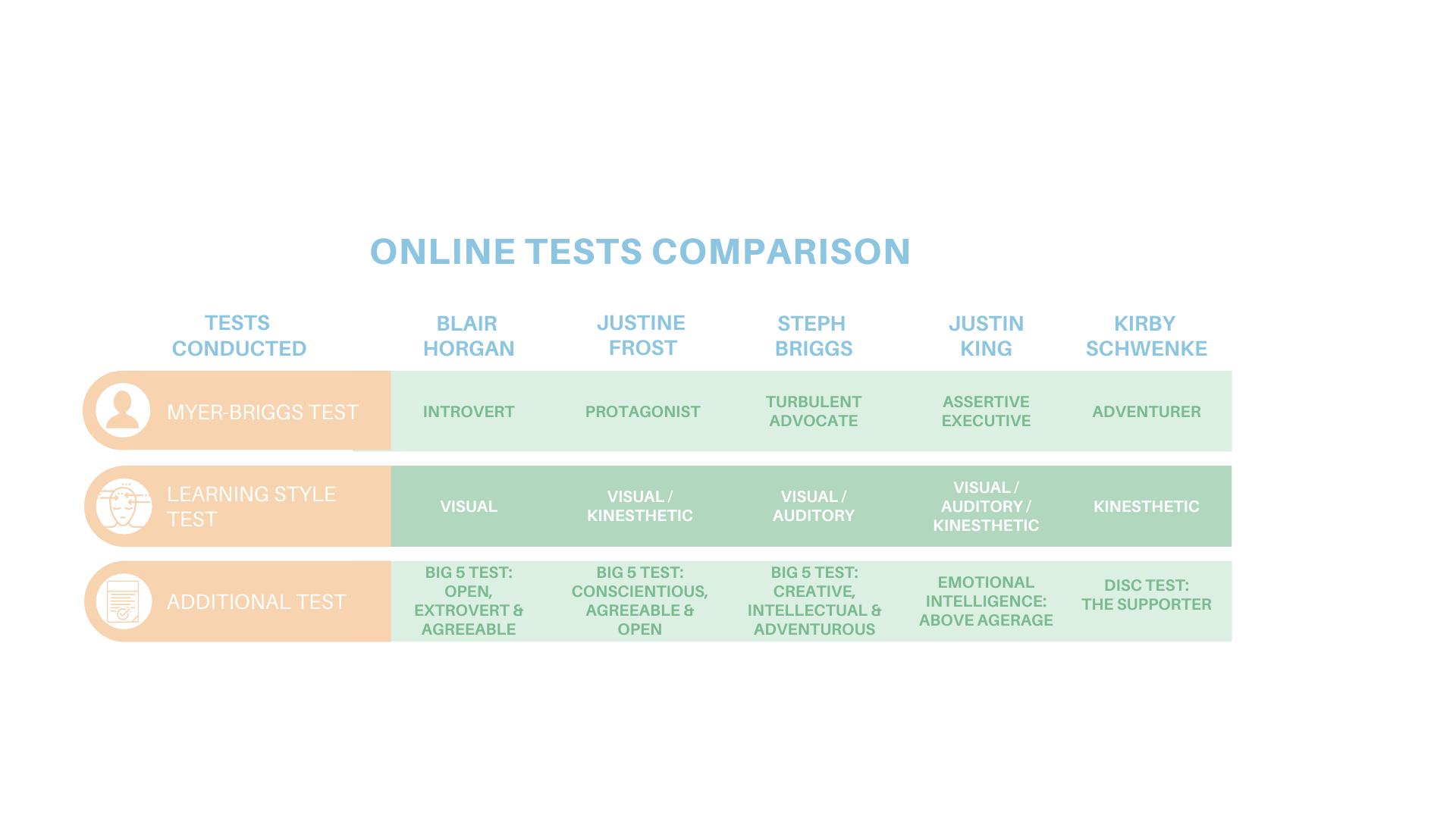


Figure 1

After conducting a comparison of the tests conducted in Assignment 1 by each individual it is evident that our group hosts a range of skills and personalities. The Myer-Briggs Type Indicator test is split into 4 personality types across 16 different personalities, including analysts, diplomats, sentinels and explorers all of which bring different values to a team (NERIS Analytics Limited, 2020). The comparison conducted identified that the individuals in this group fit into the diplomats, sentinel and explorer categories, meaning we have strength in creativity, conflict management and attention to detail. The group lacks analysts which could result in a lack of leadership and organization across the projects.

In terms of learning styles, each group members differs in this area which results in different interpretations of course content and therefore is a strength to the group as it ensures a holistic understanding. Everyone will also be able to take on different aspects of the project that best suits their learning style.

Although the additional tests differed for most individuals, it is evident that the group possesses a range of characteristics, with strengths in being agreeable and supportive. Further from the Myer-Briggs tests, the lack of leadership characteristics is an area is of slight concern and needs to be focused on by the group to ensure this does not affect the overall performance.

## Ideal Jobs

|  |  |
| --- | --- |
| **Blair Horgan:** UX/UI Designer  **Justine Frost:** Technical Lead | **Steph Briggs:** Software Engineer C++ **Justin King:** Robotics Engineer |
| **Kirby Schwenke:** UX/UI Designer | |



Figure 2

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Figure 3

Overall group members ideal jobs are highly technical with a requirement of at least 3 years of experience to obtain these jobs as was identified in figure 3. Group members have a high level of interest in UI/UX Design and Programming with several careers identifying these areas as key components of this selection of jobs, a visual representation of this comparison can be found in figure 2. Steph Briggs and Justine Frost careers have a high degree of similarity with both requiring knowledge of programming as well as web/software development, interestingly a software engineer of C++ differs slightly in its requirement for a bachelor’s degree. Kirby Schwenke and Blair Horgan both have interests in UI/UX design, and the components of each job advert are similar particularly in its requirement of agility, however, requiring a different level of experience. As Justin King’s ideal job steers away from software development and works more with hardware there is a different set of skills required with more kinesthetic skills required, however the basic element of knowledge around programming remains.

# Group Website

Link to group website: <https://stephaniebriggsrmit.github.io/Reclaim/landing>

Link to repository: <https://github.com/StephanieBriggsRMIT/Reclaim>

Overall the GitHub Repository displays a substantial amount of work completed by group members, however, initial conversations were hosted on both Canvas and Microsoft teams and code developed on Dreamweaver so a holistic understanding of the groups progress can be obtained across all four platforms. The audit trail on GitHub Repository is a good representation of the final collation of work and sections completed by everyone in the report. It also identifies the progress and changes made to the landing page outside of Dreamweaver. It is noted that several commit’s were undertaken on another individuals behalf due to technical difficulties and this is identified through commit notes.

To get a better understanding of initial group work, appendices 1 displays the conversations and files shared over Canvas in the initial formation of the group. From here the group moved on to Microsoft Teams for a better platform to share and discuss information. Appendices 2 displays the meetings conducted by the team as represented by the calls made as well as the files shared between the team throughout conversations through Microsoft Teams’ chat function. In hindsight meeting minutes should have been taken for greater organization of the group and a better audit trail. Blair Horgan has conducted the coding work in Dreamweaver. Moving forward the group will not be using Canvas and will continue with a mix of Microsoft Teams and GitHub.

# Industry Data

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Figure 4

The above table outlines the ideal jobs that our team has selected and their position within the burning glass data provided. Out of the 200 jobs listed in the burning glass data, they are all ranked quite high and are sitting within the top 50 job titles in demand. The only job from our team that was not listed in the report was Justin’s ideal job of a Robotics Engineer. This is most likely due to the position being a more engineering based job which requires skills in mechatronics which does not always sit within the IT classification when it comes to job listings.

After doing some further research through ‘Seek’, there was a bit of a contrast in the available jobs currently available under the same/similar job titles as highlighted by the number of jobs below.

* **User Experience Designer:** 960
* **Technical Lead:** 2,384
* **Software Engineer:** 2,733
* **Mechatronics (Robotics) Engineer**: 130

Software Engineer positions seem to be the most in demand out the of four job titles with the Technical Lead positions following closely. The User Experience position still produced a positive amount of job listings with close to 1000 positions in Australia currently being listed. The Mechatronic Engineer position had the least amount of positions currently listed, but this may be due to it being more of a niche area, especially in Australia. It is very interesting to see the change in the amount of positions available now in comparison to the data from 2018 as it has had continued growth over the last couple of years and is only projected to increase for most of the ideal jobs our team has selected.

## The RECLAIM Teams Skill Set



Figure 5

The skills highlighted above have been chosen as our groups required skill set. Within the IT skills required across all of our ideal jobs, there has been quite a diverse range of required skills so the selected skills above are not necessarily a requirement of all of our team members, but are shared with at least two team members.

* **Python**: Required for the Robotics Engineer, Software Engineering and Technical Lead position
* **UX/UI Design**: Required for all the positions except for the Robotics Engineer position
* **Java**: Required for the Robotics Engineer and Technical Lead position.
* **C++:** Required for the Robotics Engineer and Software Engineer positions

Unlike the IT Skills, the generic skills selected above are shared across most of our team members ideal jobs required skills and are quite important in a lot of job positions that do not necessarily sit within the IT classification. All the positions that were selected required teamwork and collaboration along with problem solving and communication. Creativity was another skill which was common amongst the team as most of the positions required some level of creativity, whether it be user interface design or mobile/web application design and development.

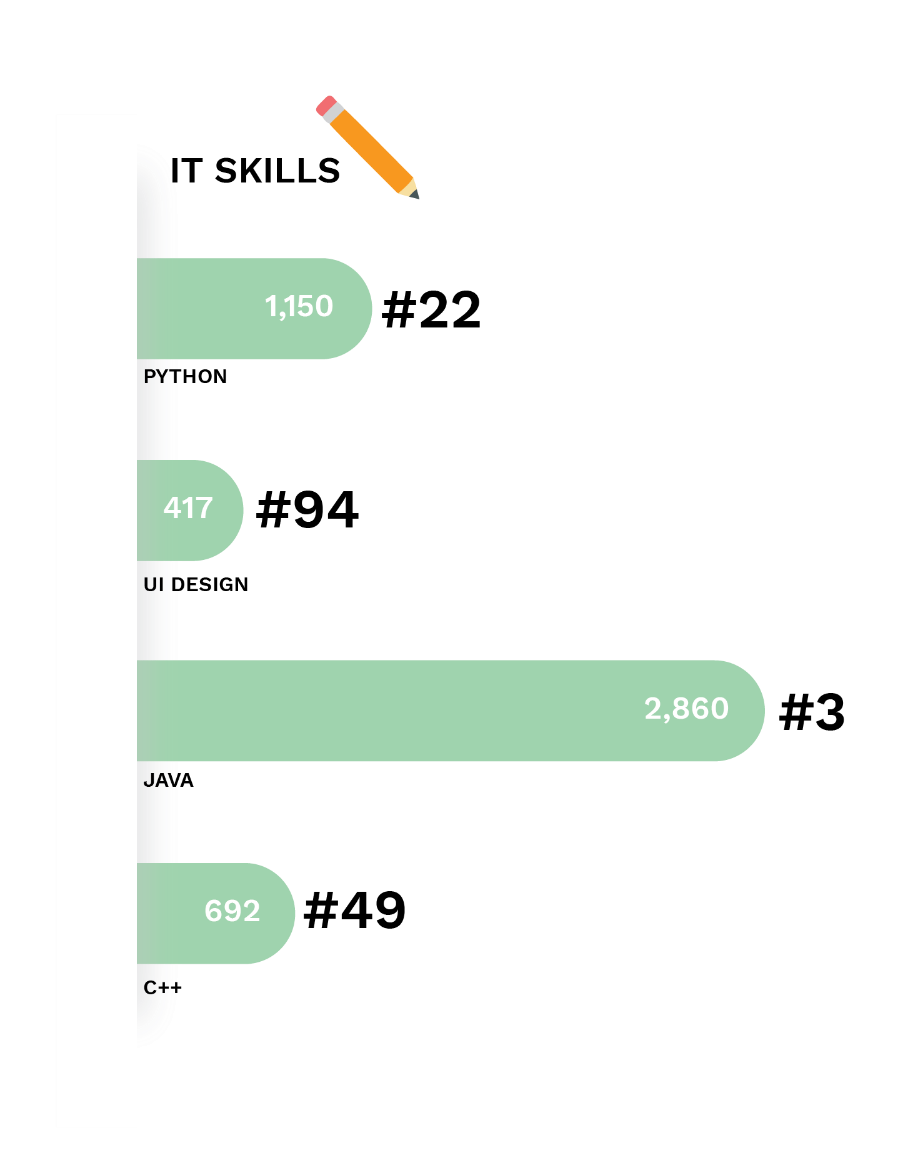


Figure 6

Out of the selected IT-specific skill we have chosen for our group they are quite varied in demand according the Burning Glass data. As the figure shows, the most in demand skill out of the selection is ‘Java’ which was ranked third in demand within the Burning Glass data. This skill was required for two of the programming related ideal jobs from the team including the Technical Lead and Robotics Engineer. Python was also ranked quite high as a programming language that is in demand, this was not as surprising due to it being commonly listed under skills amongst programming related jobs especially on Seek. UI Design was not ranked as high up as expected within the IT skills data, along with UX design not being listed in the data at all. This did somewhat align with the data on Seek as there are not as many listings available under the job titles User Interface and User Experience Design.

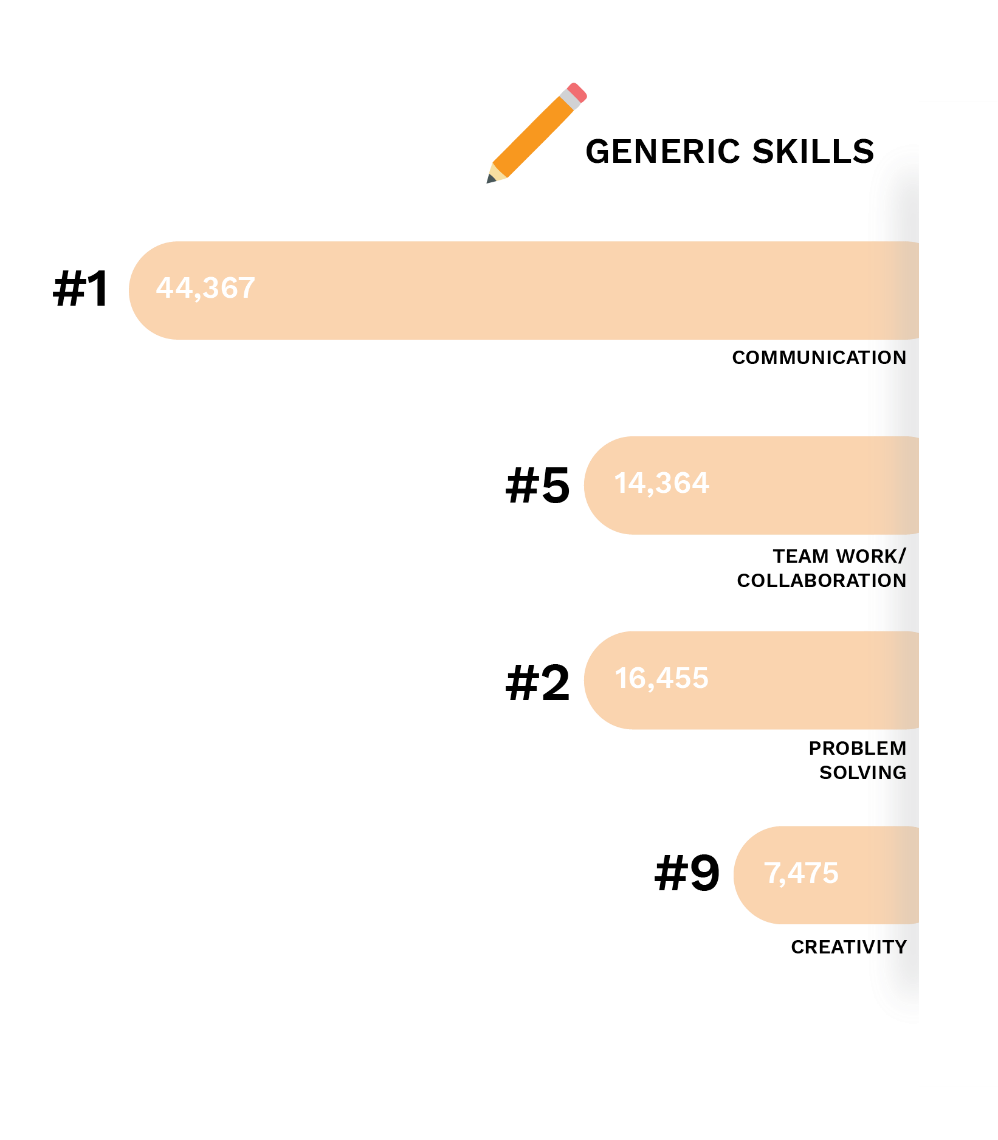


Figure 7

The generic skills we have selected for our group have ranked quite high within the report from Burning Glass. As mentioned previously, these skills are quite commonly listed within a lot of IT job descriptions as most of these positions require a high level of communication either with clients or with the team that you work with. Further to this, problem solving and collaboration are both very relevant skills within a lot of industries, especially within IT as there is a lot of trial and error required with programming and web development which is generally done with the collaboration of others. This data has proved quite positive regarding the jobs that we have selected as these skills are already quite strong within the team from both life experience and previous work experience.

## Ranked Skills Outside of RECLAIM’s Skill Set

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Figure 8

The three IT-specific skills above are not listed within out teams’ skill set but are not necessarily irrelevant to some of the ideal jobs selected. Microsoft Windows is not necessarily a necessary skill within some IT jobs due to the use of different operating systems such as Linux, but most IT professionals would be proficient with Windows so if this skill was required it most likely not be an issue for most applicants.

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Figure 9

As shown is the figure above, the three highest ranked generic skills that were not within the listed skill set are also quite common over most industries and not just within IT related jobs. Though these are not listed within our groups required skill set, organization skills are somewhat expected from most employers as it is an important part of running a smooth business. Although troubleshooting was not a part of our group’s skill set, it did appear within the Robotics Engineer position as the role is more engineering inclined and requires trouble shooting of robotic mechanics. From the data it was interesting to see that writing skills are still largely in demand from employers as a lot of the roles selected are either design or programming related so it is not an obvious skill within these types of job positions.

## Industry Data and How It Impacts Ideal Jobs

##### **Blair Horgan**

In taking time to reflect on, what I originally started with as my ideal job which was an interest in Cyber-security and the vast potential of work in the area and now reflecting on information I've learnt since starting this group project is that Burning Glass wasn't that helpful. It's been through research and working with my team that I think I've found my calling, which is working on UIX/UI and even a little web design.

##### **Justin King**

My ideal job in Robotics and AI has shown a future growth trend in jobs and salary by Burning Glass and many other sources giving me confidence in a future career in the field. C++ and Python are still amongst the most highly sort after skills in the tech industry up 21% and 19% respectively based on Dice insights report on Burning Glass Nova data and the job listings and pay rates on seek currently shows a great prospect for future employment.

##### **Justine Frost**

Since the completion of assignment 1 my ideal job has shifted - initially, I had chosen a security specialist. Being a security specialist is still something that I would love to do, but it is not necessarily my first preference anymore. Upon reflection over the course of this subject, I have come to realize that a position that highlights the technical side of things, as well as creativity and interaction/collaborations with others would be something I would get a kick out of. This position to me is a full stack web developer. According to Burning Glass data, the skills that are required for this job are more highly ranked and these skills are also in high demand. Knowing this, it has re – assured me that this avenue would be the better way to go down for my career.

##### **Steph Briggs**

With the data provided from both the Burning Glass data and the research of Seek jobs available, I think I am still quite happy with the Ideal job I have chosen as it has a strong ranking within the data and the number of jobs available is quite high. I also believe that the skills within my ideal job are also well ranked and in demand so I am confident that this job is a foreseeable option for me in the future once I have gained the right experience

##### **Kirby Schwenke**

Although the Burning Glass data provides valuable insight into the trends within the IT industry, it doesn't impact the selected ideal job as it was selected based on the skillset required and general interest in this area rather than trends. The top jobs identified are interesting, however, the tasks required in these jobs do not fit my need for both an analytical and creative job.

# IT Work

For this part of the assignment we have interviewed Mr. Simon Gibson, a  Solutions Architect currently employed by Coles Supermarkets. Mr. Gibson’s role is to ensure the software written will support and reflect the requirements and needs of the business, as well as to guarantee its compatibility with existing IT systems. In addition, the programs must follow implemented patterns, giving the company a sustainable and cost-effective solution to use.

***“…What kind of work do you do?...”***

*“…It’s not that straight forward. My title is, lets go with solution architect. Which means that I sit somewhere in IT projects, making sure that whatever the business wants or needs, the software will actually support and deliver..” and making sure that it fits in with the other IT or digital systems… make sure that it follows the pattern that we’ve entered in the other areas. So that it one, meets the business requirements. Two, that it doesn’t lock us in and take us down the wrong path and three, makes it a sustainable solution meaning that the business can actually use it and it doesn’t cost us a fortune to own and run once it’s actually in…”*

Mr. Gibson’s spends most of his time managing his team ensuring a smooth workflow. It’s common for a team to get stuck on small details so Mr. Gibson’s role is to monitor his team and guide them through to the finished product. Due to his extensive understanding and knowledge this often leads Mr. Gibson being called into many different tasks from software selection, dealing with software providers/ consultants or pinpointing issues in production.

***“...Is that what you look at every day? Or is it different?...”***

*“…It’s what I try and look at every day, but it doesn’t always pan out that way. On a project, some people get stuck in little pieces of detail and don’t understand the bigger picture and how things all hang together form end to end from either people, process and tools...and I’m that person who understand typically how that works from end to end, so I do get called into lots and lots of different tasks… anything from software selection to dealing with software providers or consultants to pinpointing a particular production issue… so I try to do what my role says but sometimes I get sucked into lots and lots of little things…”*

***“…What kind of software do you have to deal with?...”***

*“…Typically, anything from a Concept Management System, so a website. Something like RACV.com.au, Surf Life Saving Australia, Swinburne University public facing website. Anything from that end all the way through back end financial accounting software systems for managing ledgers and accounts … Through to things that robots that cut and build products, so manufacturing software or Point Of Sale (POS) for all of Coles is my handy work…Typically* *its always corporate type/business type software…There are also apps in there, the RACV mobile app fell under my umbrella when I was at RACV previously…”*

***“…So it’s really quite broad, it can vary from intense important software that’s really dire to a company to just websites?...”***

*“…Yes, that’s a really good way to put it, some things are mission critical like Coles POS has to work. Because if not there’s no trade, then no money is made and nobody gets paid…but all the way through to websites…they are probably on the more sacrificial end of the spectrum where it doesn’t really matter if they go down because it’s not a trading website…*

*Some people tend to stick to a domain, whereas I’ve moved around quite a lot…”*

***“…what kind of, obviously your role is quite large and you do lots of different things, but in terms of the kinds of people you have to deal with at work… as far as your team and your bosses, to what extent are the kinds of people you have to deal with?...”***

*“…Software is easy, people are harder. My role is actually one of the ones that deals with everybody unfortunately… I spend a lot of my time with project managers and business analysts and developers and that’s on the tech side. I do have to spend time with other architects but that’s only when I have to…”*

*“…So that’s on the technical side, but on the business/customer side a good chunk of my time is spent working with them to make sure what they think they’re getting Is actually what they’re going to get or helping them and sort of, tease out of them what they really need as opposed to what they want because they all think they want an iPhone app or a mobile app, when they don’t…”*

A Solutions Architect spends a lot of time communicating with clients from all sorts of technical and professional backgrounds to assess their needs and guide them to a solution. From beginning to end, extensive communication is maintained with clients ensuring they understand the work that is being done and whether it reflects what their desire helping them articulate and differentiate between what they want and their actual needs. On the digital side of his role, Mr. Gibson works primarily with developers, project managers and business analysts though on occasion is accompanied by other architects and software testers.

*“... In the beginning there’s lots of workshops, there’s lots of interactions, there’s lots of getting to a common language and an understanding of what the business wants to do…The first phase involves a lot of talking to people, the second phase is a little less talking and more documenting and putting things together and socializing what the vision is… and then part of my role is trying to sell what we are doing so that people understand what we are doing so then it becomes more presentation work in the later phases…”*

While communicating technical information to non-technically minded individuals poses a challenge, relaying information in larger teams can be equally difficult and even more time consuming. Larger projects have more people with a greater variety of professional backgrounds involved which creates a complex array of information of different languages essentially, that needs to focus into concise instructions and relay them back in a way that can be understood by everyone.

An IT professional works with clients in very different fields and needs to constantly evolve to suit the current employer or project. In Mr. Gibson’s case, all work was completed in a team environment in which he performed a variety of roles. Throughout the interview focus was brought back to communication which seems to be one of the most important yet difficult aspects of a job in IT.

# IT Technologies



## Clouds, Services and Servers

##### **Introduction**

Cloud computing refers to “the delivery of computing services – including servers, storage databases, networking, software, analytics and intelligence over the Internet” (Microsoft, 2020), or in the cloud. It has paved the way forward for several developments and has resulted in a new set of offerings of services. Cloud computing is encompassed by several service models, including, Infrastructure as a service (IaaS), Platform as a service (PaaS), Serverless computing and Software as a service (SaaS).

IaaS allows companies and individuals to host their servers, storage, and networks on the cloud rather than expensive physical infrastructure that must be maintained, reducing the need for the maintenance of private data centers. This goes a step further with PaaS and Serverless Computing where companies are providing developers with platforms to develop applications flexibly, without worrying about maintaining infrastructure. Serverless computing, has utilized visualization, to allow companies to host numerous servers on one piece of hardware and in this case, the cloud. This then flows on to SaaS where software is stored on the cloud to be accessed anywhere and on any device.

Cloud computing has been imperative in paving the way for developments through its ability to help “lower operational costs, run your infrastructure more efficiently and scale as your business needs change” (Microsoft, 2020).

##### **New Developments**

Clouds, services, and servers are developing and changing at a fast pace, particularly in a world where more people are being connected to the internet every day and gaining access to these services. The globalized society requires users to be able to connect with one another quickly and no matter the distance and transfer copious amounts of data. This has presented a demand for efficient, flexible and secure ways to transfer data to optimize overall organization efficiency and keep us connected to one another. This is particularly present in unprecedented times that call for higher data transfer that results in increased pressure on commercial networks, like with COVID-19 where more people are using the internet to stay in touch with colleagues, friends and family.

**Omni-Cloud Computing**

One of the key developments that is being adapted by numerous companies as of late is that of Omni-cloud computing. It refers to the ability to ‘use multiple devices to complete a transaction or activity – all while being able to access the latest version of the data’ (Bharadwaj 2018). It has developed as a result of gaps in terms of connectivity between different IaaS providers and the complexity of managing multiple systems leading to errors in multi-cloud solutions. For businesses to maintain competitive advantage they must be able to store big sets of data in a ‘secure and seamless connection’ (Digital News Asia, 2020) and be able to draw out analytics to optimize their solutions. Google is currently developing BigQuery Omni which is a multi-cloud analytics system that will connect data across Google Cloud, AWS and Azure for analysis (Digital News Asia, 2020), they will then be able to use this service to obtain data insights to improve efficiency and effectiveness of their company.

**Edge Computing**

Another key development emerging within the clouds, services and servers’ space is the rise of edge computing. Edge computer refers to when “data processing and computing are pushed closer to the “edge” (Petersson, 2020), with devices that produce data, also being the ones to process it resulting in lower network costs and reduced use of bandwidth through the utilization of the increased number of internet connected devices. Developments such as those in artificial intelligence rely on the processing of large amounts of data through the cloud, however, new developments such as AI chipsets that can handle processing on the edge are starting to gain popularity through their ability to obtain better real-time responses and instant computing (Shaw, 2019) in comparison to utilizing the cloud. The advancement in technologies and requirement to process large amounts of data, call for more local alternatives to centralized or cloud-based locations so that data can be processed quicker and cheaper. An example of edge computing can be found in consumer devices such as Amazon Alexa, which utilizes an ‘audio edge processor’ (Young, 2019) to handle functions that were originally handled in the cloud locally, therefore increasing battery life, latency and connection reliability.

##### **Impacts of New Developments**

Developments in the clouds, services, and servers’ space such as omni-cloud computing and edge computing have significant impacts on the everyday lives of individuals in both their professional and personal settings.

**Omni-Cloud Computing**

Omni-Cloud computing, provides the ability to streamline infrastructure as a service providers to allow for quicker data transfer and from any location. For example, this technology provides the ability for data entered such as stock levels in a store to immediately be accessible to a company’s operation team so they can immediately work to rectify the issue. Despite this information being stored across multiple locations, omni-cloud computing works to communicate between different IaaS providers to provide quick up to date information. This hopes to reduce errors and costs with transferring data between two service providers, optimizing the efficiency of a business. The increase in the adoption of omni-cloud computing will put pressure on Infrastructure as a Service providers to streamline their data in order not to be overtaken by big conglomerates such as Google or Amazon and remain competitive within the market. ‘Migration from an Omni-cloud is easy’ (Understanding E-Commerce, 2020) therefore users of multi-cloud have the ability to transfer over with ease, putting pressure on IaaS providers to innovate quickly.

**Edge Computing**

As discussed earlier, edge computing allows for data to be processed quicker and without the utilization of increased bandwidth. One of the key developments that has assisted edge computing in gaining popularity is that of AI chipsets, which allow for devices such as the Amazon Alexa to take their processing off the cloud. These devices have been a game changer for increasing the capabilities of digital assistants and would not have occurred without the help of edge computing. The development of 5G has also brought to life developments such as autonomous vehicles that rely on this network that “have new bandwidth and latency characteristics that will require support from edge-compute infrastructure” (Shaw, 2019). Developers are presented with increased processing capabilities due to edge computing, providing a base for further developments to progress, such as with the example of autonomous vehicles. On the flip side, developments that are enabled by cloud computing such as autonomous vehicles also can create redundancies in industries outside of tech with drivers and truck drivers replaced with these alternatives. Edge computing also reduces the need for on-premise data centers resulting in decreased jobs in the maintenance of this hardware.

##### **How will this affect you?**

Cloud computing encompasses a large degree of everyday life with users accessing the cloud daily whether they are aware or not. Similarly, this statement is true for the developments within clouds, servers and services, omni-cloud computing and edge computing as they are integrated into everyday technologies.

**Omni-Cloud Computing**

Omni-cloud computing allows for faster transfer of information, particularly when it comes to business. For example, a restaurant manager of a large conglomerate will be regularly required to provide updates on store KPI’s. With a multi-cloud system this information may have to be interpreted by multiple cloud systems increasing room for error. With the omni-cloud system, this interpretation is streamlined so the information is provided quickly and accurately.

**Edge Computing**

Individuals experience the benefits of edge computing daily, whether it be through digital assistants, smart homes, or wearable tech. Edge computing allows for these devices to process data locally, reducing the pressure on networks and increasing the speed and battery life of these devices. Throughout COVID-19 many people have been experiencing connection issues with their networks, for example, the NBN has seen “data demand increase by more than 70 to 80 per cent during daytime hours”. Without edge computing, these devices would also be taking up a large amount of bandwidth further reducing the speed and capacity of networks.

## Cybersecurity

##### **What is Cyber Security?**

With all that is happening all around the world in recent times, with things only made worse with the onset and spread on Corona Virus, which in turn is making people adapt, along with businesses to adopt a work remotely from home policy. With these changes come many more risks, using your own devices is just the starting point. So, what is cyber security? According to the definition set out by Wikipedia, “Computer security, cybersecurity or information technology security is the protection of computer systems and networks from the theft of or damage to their hardware, software, or electronic data, as well as from the disruption or misdirection of the services they provide.” So, what is the plain explanation that everyday people would understand? Cyber security is the protection of systems that you would use to access say the internet or how you do online shopping. You could consider it as how can I do things online safely. The current situation that is going on globally is this, more and more people are working from home which in turn put a greater strain not only on internet use, but also people become more complacent.

Cyber security is a wide range of practices that everyone should consider making part of their daily online use or perhaps consider this, the current statistics from the website, Scamwatch as current for June 2020 puts Phishing related crimes at a rate of 3009 reports, compared to the previous month of May 2020 to a number of 2,362 which is an increase of 647 reports made. For the month of June 2020, the figure for lost monies related to phishing was an amount of $185,282. Online related cybercrimes have increased since the spread of the corona virus, and with people more and more working from home. So cyber security is simply the best set of practice to lessen this risk.

Cybersecurity allows you the ability to surf online without the risk, using simple steps to stop others gaining access to personal information or putting your hardware at risk of being compromised. Home computers these days come stock standard with some basic form of anti-virus software, MacAfee or AVG, which in turn allow you to surf to your hearts content, there you are browsing or perhaps checking something on Facebook and all the while in the background your anti-virus is doing its magic checking on things you may of accessed, or downloaded. Other things running in the background of your computer could be, or should I say should always be running, is a firewall. The definition according to Wikipedia is, “In computing, a firewall is a network security system that monitors, and controls incoming and outgoing network traffic based on predetermined security rules. A firewall typically establishes a barrier between a trusted internal network and untrusted external network, such as the Internet.” So, having your firewall running in the background is just another layer of security that helps your online presence. A perfect analogy is this, with the onset of Covid19 everyone has taken extra precaution to lessen the chance of catching it, for examples masks, antibacterial hand sanitizers, and generally better hygiene practices, so why not take on a similar approach to cybersecurity practices as well. Shouldn’t we make sure our online habits are secure as well?

##### **What is the likely impact of Cyber Security?**

Short and simple version of what impact this will have on people in general? I would have to say more cyber related theft, Identity theft and I could only imagine the loss financially will be massive. Even just looking at the basic figures listed on ScamWatch you can already see the increase. Up until recently I had never heard of Cybersecurity Insurance and doing a quick search around Google you can already see how many new and existing insurance companies are offering this type of insurance. One such insurance company list a brief definition as, “**Cybersecurity insurance** is a product that is offered to individuals and businesses in order to protect them from the effects and consequences of online attacks. ... It can also be sold as a third-party **insurance** product that covers the businesses and people that are found to be “responsible” for a “breach”(CyberInsureOne, 2020).

Other impacts on a larger scale could include cyberattacks on Governments, various Government systems, infrastructure, hospitals and so on. Overall, this puts it as a threat to national security. In a recent attack on Australian Government systems it was clear what could be done and how disruptive it could be, and this comes down to the three D’s of cybercrime, “Disrupt, Deny and Destroy”  You can consider no matter what the scale or the intended victim, cyber related crimes have a huge impact. There are so many aspects to cybersecurity and the impacts in general on everyday life. A more common type of attack that has been happening recently is what's called a DDoS attack or a distributed denial-of-service attack which in short is a series of attacks that cause a machine or network unusable by denying access to it.

##### **How does Cyber Security affect my daily life?**

For me directly, cybersecurity is starting to become a more serious routine for me to do daily. I have invested in time and some additional funds into newer practices. I now have a fully licensed copy of AVG which gives me access to better tools to defend myself. Another thing that I’ve changed is the web browser I use, which I've recently changed over to Brave, which offers some better practices for when surfing the web. I think honestly, it's also about having a different mindset and not being so blasé about it. I am responsible for my web surfing, or what I do online and with that Its me that needs to make those changes. It is all about being smarter, changing habits and realizing how serious cybersecurity is.

## Blockchain and Cryptocurrency

##### **What is Blockchain and Cryptocurrency?**

Cryptocurrency is a relatively recent form of decentralized currency where bits of code and encryption are used to manage and generate units of digital currency. Cryptocurrency all started with Bitcoin which was invented in 2008 by an unknown person(s) under the name Satoshi Nakamoto. Unlike traditional currency, Bitcoin/cryptocurrency is not reserved in banks or involve a ‘middleman’, it relies on the technology behind it called the Blockchain.

Blockchain is a decentralized distributed ledger meaning that it can exist outside of governmental authority and control and no single entity oversees it. In juxtaposition to tradition currency, which is issued through centralized banks, cryptocurrency relies on the use of a collection of ‘nodes’ or computers that all connect to create the blockchain.  Along with this, the decentralization of this data means there is more trust involved as an entire network of computers is required to verify data rather than having a potentially vulnerable centralised database or bank. This helps to stop the tampering of this data and keep a permanent copy of that transaction within that blockchain.  In order to add a new block to the existing chain, a complex puzzle must be solved by a computer, once solved the proof-of-work is then automatically updated to the network and verified. A hash exists as the backbone of blockchain, which works to assist encrypted demands that are required, ensuring they are met for the new blocks to be added.

Though blockchain technology was originally created for Bitcoin, it has become increasingly popular when adapted into other types of transactions due to the level of security that the it provides especially as the chain cannot be altered. This gives businesses the confidence in the authenticity of the records and transactions once that data has become part of a block as it is will always be a part of that blockchain. Blockchain technology has been adapted for storing such data as medical records and smart records. One of the most valuable parts of using the blockchain for records such as these, is that the it allows for a non-destructive platform for storage and processing information of value and avoids that data being hacked by untrusted entities.

Recent trends can give people an insight to the potential development of Cryptocurrency within the upcoming years. As institutional money (from banks etc) enter the market, the credibility of Cryptocurrency can be further improved with the potential of it being traded in the equities market, for example Nasdaq.

Cryptocurrency allows users the ability to exchange their conventional money (AUD, USD etc) into these digital currencies, for the use of digital transactions. Over time bitcoin has gained more popularity which has led to the creating of more cryptocurrencies including, Ethereum, CRP, Tether, Dogecoin and Bitcoin cash which was creating from a fork of Bitcoin.

In previous years, cryptocurrencies have entered a phase where essentially, they have been halved. This has particularly been the case for Bitcoin where less units are available after mining and as a result the worth of bitcoin increased, as it grew in scarcity. This encourages the development of other cryptocurrencies and growth in the market. (Benzinga.com.au, 2020)

##### **Impacts of Blockchain and Cryptocurrencies**

When it comes to cryptocurrency it only continues to become more popular with the increase in businesses accepting cryptocurrency as a payment method. This will only lead to an increase in people opening Bitcoin or cryptocurrency wallets in the future and could potentially become the more popular option especially with the efficiency in processing transactions.

With the increase in applications of blockchain technology, this could affect centralized banks and financial institutes if they do not find a way to adopt this technology into their systems. If not, these institutions would miss out on their percentage cut of processing these transactions. These types of institutions generally require an intermediary to perform these transactions which requires time and money, whereas blockchain technology removes the need for this and could mean these positions become redundant in future. Along with this the blockchain technology is reliant on the trust of a whole network to verify these transactions and this increases consumer trust as these records are secured in the blockchain and cannot be tampered with.

Compared to traditional cash, Cryptocurrency gives individuals the complete control of their own money. People often find themselves with frozen bank accounts that have been put in place without any warning or preparation, cutting individuals off to accessing their funds. With older citizens, or people that have compromised health, if worst case scenario they pass away, the government and banks become in charge of their money and assets if no will is in place. Cryptocurrencies grant individuals, and ONLY said individuals' access to their money.

Within areas such as real estate, the shift to blockchain could mean the cutting out of the middleman within the property buying process as buyers and sellers can connect with one another more directly and rely more on the security of this technology. Along with this, the legal documentations and records of transactions cannot be altered so there is full transparency for both the buyer and seller. Liebkind (2020) suggests that this would be beneficial for both parties to reduce fees and allow both parties to get more out of their money as it will mean cutting out the intermediaries such as mortgage brokers and real estate agents that both increase costs during the process. This will mean that these jobs could potentially be at risk in the future as they are no longer required within these transactions.

Blockchain technology could make valuable changes to countries with high levels of corruption as they could adapt this technology for purposes such as voting where rigged votes are common. This would allow for the votes to be tallied and calculated with more ease, trust and legitimacy as this data would be virtually not hackable. This would also provide access to individuals, who do not have or have limited access to banks, the ability to conduct digital transactions and access to growing digital commerce.

##### **How will this affect you?**

More recently in Australia there is push for blockchain technology to be utilised within supply chain especially for food and agriculture so that it can be tracked throughout the supply chain process. Understanding the supply chain process is becoming increasingly important to us day to day especially in areas such as food and agriculture as we want to know more about where our products are coming from and the effects it has on the economy. Enabling this technology to improve the supply chain process will create more transparency throughout the processes so customers are aware of where their products come from and the process that have been taken to get to them. This is a great tool for all of us as we can now know more about where these goods are coming from and take back control over what we are consuming and help to support Australian business to help with economic growth.

With the hardships people face with having control over their finances, cryptocurrency and blockchain technology could really help to allow us to take back control over our finances. As aforementioned blockchain technology could have positive effects on how we all purchase property in the future. When it comes to taking out loans and mortgages it can be a daunting experience trying to meet the requirements banks provide, especially with the current economic climate and the uncertain future of real estate. If these transactions could be change to blockchain technology and run through  peer-to-peer lending this would allow for individuals like ourselves to feel less pressured by credit and create easier access to these loans instead of jumping through all of hoops through banks and hope to get the best interest rate.

## Arduino, Raspberry Pi and Maker Boards Technologies

**What does it do? What can be done now?**

In 2005 Arduino released their first microcontroller, the Arduino Serial. Intended as an interactive education tool for students with little to no experience in electronics and programming, the potential applications of this creation and were seen around the world by hobbyists and professionals and was the starting point for the boom in maker boards and hobbyist creations! The device started with a simple serial port but quickly evolved to add USB ports, more memory and processor speed for more intensive applications. Arduino is an open source microcontroller and software that can be created by an IDE on your computer and code written is uploaded to the controller to perform its tasks. This has applications in so many industries from electronics and robotics to arts and crafts which has brought interest from all over the globe in the use of Arduino.

In 2012 the release of Raspberry PI’s Model A was released which was overwhelmingly well received, far beyond the expectations of the developers with all units being sold in the first day, crashing the website. Where Arduino is a microcontroller and can be programmed to run a single program, the PI is a small, single board computer with a variety of open source operating systems that can be used which make the potentials different to that of the Arduino. The PI can be used as a small, inexpensive computer with USB and HDMI outputs for peripherals which makes it an invaluable learning tool for developing nations where the price of computers was out of reach. The PI is cheap enough for most people to access which means virtually anyone, these days can access and learn software programming. This has led to many innovative ideas seen through to creation that would have never been possible. It has engaged the minds of children over the globe enabling them to learn computer sciences and expose them to an ever-growing market and solve problems that are specific to them.

**What is the state of the art of this new technology?**

This year the PI model B was released now with the Atmel Cortex-A72 1.5 GHz quad core processor and 8gb of RAM which gives the computer faster multitasking abilities. A beta version of a 64bit operating system beta version has been released which will allow the use of over 4gb of memory. The board has built in Wi-Fi, Bluetooth 5, Ethernet port, 2x USB 2.0, 2x USB 3.0 ports and 2x HDMI outputs supporting 4K resolution. This means that this tiny single board computer is becoming a real possibility for replacing PC’s for office and media applications.

**Technological developments and likely future uses.**

Developments in semiconductor and microprocessor technology are creating smaller, faster and more energy efficient CPU’s and will increase the capacity and capabilities of the PI and microcontrollers to interpret more data. Materials technologies developing carbon nanotubes are showing increasingly promising results in future nano scaled transistors and techniques such as extreme ultraviolet lithography creating a finer circuit which enables integration of a greater number of components creating a faster and more efficient chip.

The future of maker boards is limitless in its applications with its open source software and hardware. Groups and individuals can freely create their own physical board designs based on the original framework and create a customised board to suit their particular requirements. Unlike companies that use proprietary closed source OS and hardware components we have the entire world capable of making contributions to the evolution of the next era of maker boards. Creativity is the key to advancement in IT, ideas that can be facilitated into the next big thing or solution to global issues.

**Current impacts and potential impacts of this technology.**

The most likely group to be affected by these developments are those in the low socioeconomic group with jobs shifting from unskilled labouring to jobs in IT, robotics, maintenance, and trouble shooting. This will greatly affect older generations who have very little to no exposure to IT and the degree of difficulty learning new technologies at such an age. Entry level jobs, delivery drivers, truck and plant operators are the first in line of a list of jobs that will become autonomous. These jobs are already on the decline in Australia with a very small percentage of jobs listed for entry level positions. If this trend continues there will be a greater divide in classes in Australia and an increase in unemployment for people without an education or trade. This directly correlates with the rise in attendance for tertiary education in Generation Z and the realisation that a university or certificate education will be required to gain employment in the future.

The low cost, open source functionality of maker boards gives so many people access this technology and the education, narrowing the gap in technological disadvantages of people in developing countries. Programming and electronics are no longer restricted to computer specialists and students and is accessible to almost anyone in any walk of life. The introduction of microcontrollers and small computers to classrooms for education alleviates the fear of complexity which will lead to more involvement of people who would otherwise have no exposure to such technologies.

As current trends are showing this will lead to more jobs in software development, robotics and automation while replacing human jobs. Over the decades new work fields have opened up for these and other areas creating new job opportunities, but will it be enough to counter the loss of human jobs to automation? The jobs at highest risk of becoming mostly automated are transport and logistics, storage, and manufacturing.

**Effects on myself and my family and friends.**

When the first Arduino board was released in 2006, I was so excited to test it out and start making cool projects in my spare time. It wasn’t until a few years later that I bought one and a project book to go with it. I started work on my first project right away and while it was very simple and kind of useless it was incredibly rewarding. Building new projects did become quite expensive after a while buying a new microcontroller and components for each project and learning C++ seemed extremely daunting for projects with greater functionality.

The Raspberry PI was released many years later and again my attention was once again tweaked by projects posted online of cool projects created using the PI controller. Again a few years after its release I bought my first PI and started playing around making similar sorts of projects as the Arduino but there was so much more support and community involvement.

Since I was a child I wanted to work with robots and with the PI I had my first taste of what it was like. Arduino and Raspberry PI have a profound impact on my life and although late in my life I feel with the job trends moving a lot into technical roles in IT I can now move into the field I have been dreaming of since a child.

Living on a ¾ acre block the use of GPS or sensor guided robotic mowers will reduce time spent maintaining the yard on weekends while robotic vacuum cleaners will reduce the time of cleaning around the house. These things are now possible to create using the power of the PI with many people not only posting their successful creations but step by step instructions on how to do it yourself! To me this is It will help me fine tune my work life balance, freeing up time to spend with my family and friends.

The negative implications on physical health through lack of physical activities usually doing household chores and the mental impact of not needing to be motivated to get chores done are the major personal issues I see arising from use of these technologies. Boredom can often lead to overeating or alcoholism which both have severe repercussions. Another negative impact is the increase in power consumption to power such devices and the consequent environmental effects from the burning of fossil fuels.

# Project Ideas

Upon consideration, the team has decided to move forward with the idea of sustainability in the form of an application. Global warming and the environment is an ongoing discussion being had across the world, with countless suggestions and plans of attack to halt the decline of our world. Our aim is to encourage users to be more mindful about their contributions and do their part in the fight towards it. Bringing easily accessible information and education to everyday people is essential in this goal.

The application has a few features, one would allow the user to input their weekly (optional) grocery lists and purchases, the extent of which is completely up to them. If the user decides that they want assistance in ways that they can reduce food waste, they can input these items accordingly. Alternatively, the user can also input any purchases made on items (food or other house-hold items) that come in packaging for material waste purposes.

The food input side would not be restricted to new purchases, if the user already has items in which they are struggling to find what to do with them, these can be entered as well. In result, users would be getting more of their money’s worth out of their purchases and encouraging zero-waste cooking and consumption, there for reducing their food wastage!

This function would provide users with suggestions which would see them through using the extent of their fresh produce where possible. Whether it be recipes that include use of the individual items and their not always desired elements or suggestions in how to combine products from the inputted list in a collaborative way. Users would have the ability to input the amounts of what they already have from previous weeks that are still of use and get the same information, providing a level of education to the user if they are unaware of what is and is not edible from their fruit and veggies!

For non-perishable items (or ones with a little bit longer of a lifespan) with majority left over or completely un-opened, if the user simply does not want to use or necessarily need this item anymore, using their device location, they would be connected to local food drives and charities where these items could be donated and passed on to people who are in need, thus contributing to reducing food poverty.

Another function of the program allows users to input any purchases made on items that have come in packaging. Whether it be cans/tins, boxes, resealable bags, plastic bottles etc, the user will have the ability to enter the quantity in which the material is in. In return, will be presented with a number of different resources.

* Based on location, connect to local reuse and repurpose facilities or locations where these materials can be taken and passed on for better use or to where these materials are needed.
* DIY ideas and ‘how to’ procedures where the user themselves can repurpose these materials.
* Connect user to ‘Clean Up Australia’ or their state’s government/local council resources to retrieve information on how to properly dispose of these items, so that once your weekly trash night comes, the council can sort and recycle/dispose items correctly.

The application would hold an index of the suggestions/recipes/resources that it connects the user to. Although more efficiently would have the ability to scan the web, similar to a reverse image search, with the use of key/’trigger’ words to return pieces of information that are associated with what is entered.

Also included would be the utilization of the device’s camera software, to scan items and barcodes for retrieval of this information, for more of a time efficient experience. This saves the user from having to manually look up and enter all of their desired inputs. This would not limit packaged items, this function could be used on fresh produce as well, all that would be required would be a quantity.

Another use of this tool would be providing an estimated lifespan of your fresh produce, programming the camera to identify indicators of ripeness or optimal quality– giving you a time frame to use the products before they spoil.

Scanning your package barcodes would also return the user information about materials, and how they need to be broken down for proper disposal.

Further development of this application would see the use of Geolocation/location services on the device in which is being used. Allowing this application to be more usable and accessible to people from all over. Location services would also play a crucial part in implementing a forum where communities can come together and contact and hold discussions, for their everyday solutions, advice and ideas. Whether it be to local households or local businesses, it gives individuals an opportunity to be a part of and connect with their community.

Sustainable packaging is where businesses are slowly but surely moving towards. RECLAIM could not only be for the common household, but an application that businesses might deem as useful as they make their moves in keeping up to date and relevant to their customers wanting to support sustainable companies. Businesses that do not already use sustainable packaging for their products, could be provided a platform in which they can connect to already sustainable businesses – and where they can access their eco-friendly products and initiatives.

House-hold sustainability implies that gardening is involved to some extent, RECLAIM would provide a platform for gardeners and gardening businesses to be of service to communities for where they see fit, for either part of the re use of food elements like planting seeds/propagation, or providing information on how composting and food scrap bins.

The list of things that could feature on this application are endless considering the amount of steps that people can take to live more sustainable lives, but ultimately as long as the resources are accessible to people, they are willing to give it a go.

# Group Reflection



## Individual Reflections

##### **Blair Horgan**

Text

##### **Justin King**

Text

##### **Justine Frost**

From my perspective, overall as a group everyone worked pretty well together once the ball started rolling. Initially it was a little difficult to share ideas and opinions but as everyone warmed up to each other and became more confident in what we were producing, communication became a lot easier. All 5 of us held up our contributions and managed to combine our work really well. We may have started off slow due to miscommunications but once that was out of the way and we had a clear direction, everyone really came together. As a group everyone got along quite well as we all are having similar experiences with the course itself, which definitely made working together easier, and when assistance was required with certain parts, we all came together to figure it out! Working in groups online can definitely be more challenging than face to face, but this assignment was well navigated by the team. We did our best to stay organised and set deadlines for sections, which really payed off in the end as we tended to stay on track. I think overall it was a good experience and it was great working with people similar to myself!

##### **Steph Briggs**

Text

##### **Kirby Schwenke**

My interpretation of the overall group dynamic was positive. All group members were active contributors to the assignment and brought their skill sets together to ensure that each element of the assignment was completed well. We were able to discuss our feedback openly and assisted one another in understanding our feedback and ways to improve. One improvement that I believe we can make in the following assignments is around communication. We had difficulty communicating initially surrounding decisions that needed to be made and this delayed our progress reducing the amount of time to complete report content. I was pleasantly surprised while working in a group on the level of support from fellow students regarding course content and loved being able to relate to members in a similar position to myself. Having previously completed on-campus study, it was refreshing to have this support online that would usually form naturally by going to classes. I have learnt that group work is enhanced through greater organization and communication and that for the next assignments our group would get value out of clear and open communication and planning of meetings. We also need to ensure that the trail of our work is more evident from the start as we utilized a number of different programs which makes it difficult to track.

## Group Reflection

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# Appendices

##### **Appendices 1**



##### **Appendices 2**





