*Kaleid AI: The IT World*

## Students:

## Emre Altunsu s3942994

## Jack Gale s3286616

## Yousef Fares s3955987

## Dominic Hutchinson s394438

## Mark Schroeder s3895337

## Gabriel Jones s3957629

## Tutor: Anthony Clapp

## Tutorial day: Monday

## Tutorial time: 2:30pm

**Abstract:** The purpose of this report was to build a proof of concept on a piece of technology that could benefit everyday users, in this case the technology was a data visualisation application called Reflections. The method consisted of 6 RMIT students studying an Introduction to Information Technology (COSC1078) who discussed their project ideas from assignment 1 and compared their feedback.

Reflections is the result of a collaborative effort by team members identifying their technology interest and future ideal job encouraged by the Burning Glass skill and occupation data from 2018. Harnessing a direction to play the role of a technology department the group formed the image of a data collection company called Kaleid AI. Under this appearance the team chose to interview the Information Communication Technology Operations Manager Russell Garner from Crest Education for expert opinion and guidance. A deep analysis was then executed on Machine Learning, Natural Language Processing, Cyber Security and Cloud Services to provide motivation for the groups project idea.

Reflections is a digital diary which stores experiences and memories in a visualiser as stars in the nights sky, with consecutive entries linking together to form a constellation. Using the application, users could see beauty in their own reflective attitude, like how one wonders at the night sky on a clear night and engage in the experience of reflecting. Kaleid AI believe that data can be beautiful and with reflections everyone can see and share their own journey.

At Kaleid AI it is our endeavour to gather and structure unorganised data for supervised and unsupervised Machine Learning (ML) information systems, and to connect unidentifiable patterns that are accessible to everyone. We believe that data is the new oil, and we plan to refine information sharing with accurate analysis and rich datasets.

## Meet Our team

IT Interest: Computer Programming, Computer Circuits, Arduino (C++),

IT Experience: Marks leadership is a result of early his early IT experience building and programming circuits using Arduino. Mark is currently studying a Bachelor of Information Technology at RMIT and is equipped with certificates in Information Digital Media and Small Business. Marks current role as a STEM Technician exercises his curiosity every day by questioning existing technology and reinventing new processes for information and communications technology.

Ideal Job: IT Manager

Armed with a strong passion for technology Mark possesses the desire to lead a team of developers and to manage many diverse business functions across technology. Mark has excellent delegation and management skills and is always the first to raise his hand. With strong ambition Mark wishes to explore the demanding nature of project management as he welcomes any challenge that he may face.

# Mark Schroeder

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# A picture containing toiletry, cosmetic Description automatically generatedChart, bubble chart Description automatically generatedENTP (Debator) | Entp, Mbti, Personality typesText Description automatically generatedJack Gale

Learning Style: Auditory

Creativity: Complexity

Myer-Briggs 16 Personalities

* Extroversion
* Intuitive
* Thinking
* Prospecting

s3895337

s3895337@student.rmit.edu.au

Melbourne, Australia

Education:

Information Technology @ RMIT,

Information Digital Media,

Small Business (Innovation/Operatons)

Hobbies: Guitar, Computer Science, Computer Programming, Cat

IT Interest: Data Analysis, Machine Learning, Software Design & Implementation.

IT Experience: As a Business Analyst Jack is exposed to many facets of technology and business. He is the bridge the connects technology to operations and it’s his responsibility to improve operations through technology solutions. He has achieved this by utilising Six Sigma DMAIC and Agile Software Development. As an agent of change Jack is involved in the end-to-end process of product control; this involves facilitating meetings with developers, showcasing requirements, building quality assurance test cases and training users on the front-line.

Ideal Job: Full-Stack Software Engineer

This position appeals to Jack because it’s an opportunity to express his creativity through technology by building the architecture in the back-end and influencing the design at the front-end, this means that Software Engineers challenge their critical thinking and design skills every day. There are many similarities between computer programming and Jack’s favourite hobby, playing the piano, both demonstrate a structured learning approach.

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s3286616

[s3286616@student.rmit.edu.au](mailto:s3286616@student.rmit.edu.au)

Melbourne, Australia

Education:   
Information Technology @ RMIT, Applied Science @ Deakin,

Web Developer @ Linkedin Learning

Six Sigma @ Linkedin Learning

Hobbies: Piano, Classical Music, Psychology

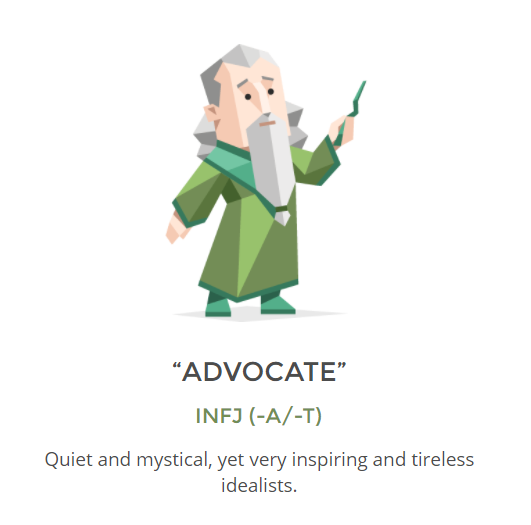
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Big Five: Openness

Adobe Creative: Thinker

Myer-Briggs 16 Personalities

* Introversion
* Intuitive
* Thinking
* Judging

# Dominic Hutchinson

IT Interest: Emotive Technology, Disability Support, Computer Programming, Story Telling

IT Experience: Dom continues to exploit rapid technology solutions by expressing creative thinking to disability support. This has allowed Dom to understand emotion on a deeper level and has encouraged unique streams of thought. Studying Computer Programming at a VCE level provides Dom with a competitive advantage over his peers as he transfers this knowledge to higher education. Dom believes that technology platforms create the perfect space for users to share their narrative and build a global consciousness.

Ideal Job: Full-Stack Software Engineer

Responsible for creating, testing, and updating applications for clients, Dom is set to excel as a Software Engineer. Combining the aspects of creativity of front-end design and logic-based back-end architecture Dom will apply his innovative nature and critical thinking skills to solve technical problems.

A person smiling for the camera

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s3943438

s3943438@student.rmit.edu.au

Melbourne, Australia

Education:   
Information Technology @ RMIT,

Programming @ VCE,

Hobbies: IT, Media, Reading, Writing, Casual Gaming

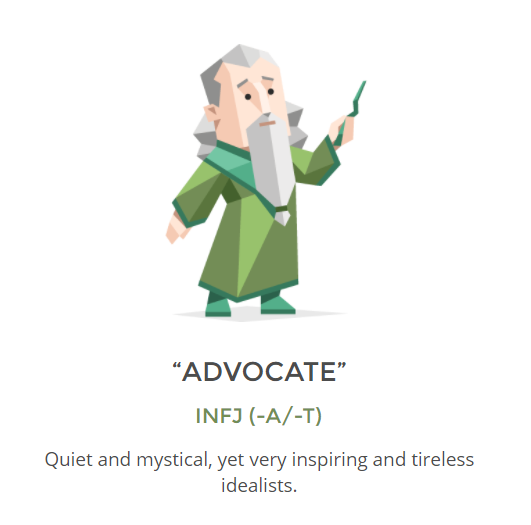
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Myer-Briggs 16 Personalities

* Introversion
* Intuitive
* Thinking
* Judging

Big Five: Openness

Learning Style: Reflective

IT Interest: Artificial Intelligence, Machine Learning, Video Game Development

IT Experience: Yousef has been exposed to many diverse cultures from Australia and the Middle East, which has allowed him to absorb the curriculum from different perspectives around the world. Yousef is a global expert who is blessed with an analytical mind and is always thinking user experience. Comfortable with Python, HTML and CSS, Yousef’s tech portfolio continues to grow with one day hoping to be proficient in Machine Learning languages.

Ideal Job: Machine Learning Engineer

Yousef’s projection of understanding Computer Science technologies paves a direct path toward becoming a Machine Learning Engineer. Yousef acknowledges the difficulty of this career path but is already investigating computer mathematics and natural processing languages to achieve his goal. Back-end developers of this calibre are the backbone of any project, and Yousef is honest and committed enough to fulfill the responsibility.

# Yousef Fares

A person taking a selfie

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s3955987

s3955987@student.rmit.edu.au

Istanbul, Turkey

Education:   
Information Technology @ RMIT,

Hobbies: Gaming, Movies, Exercise, Food

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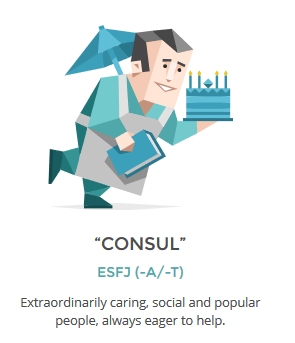
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Myer-Briggs 16 Personalities

* Extroversion
* Observant
* Feeling
* Judging

Learning Style: Tactile

Creativity: Complex

IT Interest: Electrotechnology, Hardware, Computer Graphics, Video Game Development

IT Experience: Gabe’s in-depth knowledge of electrotechnology brands him as a hardware specialist. The electrician industry has allowed Gabe to learn the design, maintenance, installation, and repair of many forms of electrical and electronic equipment. Studying the construction of micro processers instils Gabe with a craving to understand ‘how things work’ from end-to-end. Now studying a Bachelor of Information Technology Gabe is in search of further meaning to appreciate more complicated hardware design and information systems.

Ideal Job: IT Technician

Valuing the history of complex computer systems Gabe’s next step is to become an IT Technician and he isn’t just limiting his knowledge to hardware. With insightful comprehension for software planning and development Gabe can extend his support to production requests. Additionally, technicians are confronted with a multitude of problems, therefore Gabe’s talent for deep learning will be challenged at every opportunity.

# Gabriel Jones

A person with a beard

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s3957629

s3957629@student.rmit.edu.au

Brisbane, Australia

Education:   
Information Technology @ RMIT,

Electrotechnology,

Hobbies: Gaming, Computer Graphics, Hardware, Gaming

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Myer-Briggs 16 Personalities

* Extraversion
* Observant
* Thinking
* Prospecting

Learning Style: Adaptable

Creativity: Abstract

IT Interest: NFT’s, Online Fund Raising, Online gaming

IT Experience: Emre’s aspiration studying a Bachelor of Information Technology is to graduate with the skills and knowledge to support his volunteer work at the Cancer Council Foundation. Emre has managed to lay an early foundation by beginning to explore web design and logic-based programming such as Python. These skills will setup Emre to build attractive technology to draw user attention toward charity work in an attempt to make aid more accessible among community. Emre’s vision is to make the world more accountable for their time and actions.

Ideal Job: Systems Analyst

Emre believes in lending a hand in whichever way possible, therefore the role of Systems Analyst is perfect for his character. A line of support for both operations and technology Emre will resolve requests from users and present them to the development team. It will be his responsibility to ensure the developers are building reliable product for end-users to experience on the front-line. Emre core duty is to translate the jargon of dense tech terminology and define it in a way that is understandable for the business.

# Emre Altunsu

A person taking a selfie

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s3942994

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Turkey

Education:   
Information Technology @ RMIT,

Business

Hobbies: Vintage Trading Cards, Memorabilia, Cancer Cancel Support

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Learning Style: Visual & Auditory

Creativity: Paradox

Myer-Briggs 16 Personalities

* Introversion
* Intuitive
* Thinking
* Judging

## Team Analysis

After reviewing each individual profile it’s clear that we are a Technology driven team. The team ranges from; three Software Engineers, one Technician who has a passion for both hardware and software, and one Systems Analyst who aspires to support applications in production. This demonstrates that the team is aligned across many aspects of studying Information Technology at RMIT, but one core element shines above the rest, the desire to understand programming languages.

But where does this desire come from? Each one of us has a different origin story pointing in the same direction. Dom, Yousef and Emre have just finished VCE, with Gabe and Mark only a year ahead, while Jack has returned to study 10 years after finishing school. There must be defining similarities that exist within the co-ordinated effort of this group and what differences arise when working together. The following team analysis required that each member detail their interest and experience in IT, along with their ambition to reach their end-goal job after graduation. To strengthen the team analysis members have provided their test results from the Myer-Briggs Personality test, and from two additional personality tests of their choosing.

**Myer-Briggs**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Member** | **Myer-Briggs Results** | | | | | |
| Mark Schroeder | Debater | *Extroverted* | *Intuitive* | *Thinking* | *Prospecting* | *Assertive* |
| Jack Gale | Advocate | *Introverted* | *Intuitive* | *Feeling* | *Judging* | *Assertive* |
| Dominic Hutchinson | Advocate | *Introverted* | *Intuitive* | *Feeling* | *Judging* | *Turbulent* |
| Yousef Fares | Consul | *Extroverted* | *Observant* | *Feeling* | *Judging* | *Assertive* |
| Gabriel Jones | Entrepreneur | *Extroverted* | *Observant* | *Thinking* | *Prospecting* | *Assertive* |
| Emre Altunsu | Architect | *Introverted* | *Intuitive* | *Thinking* | *Judging* | *Assertive* |

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The Myer-Briggs Personality Test is a self-report questionnaire designed to reveal the user’s personality type. Each personality type has its own criteria of strengths, weaknesses, and preferences that a user is more likely to identify with (Cherry, 2020). It is important to note that the results are merely an indication of the user’s interpretation to the question, and the most crucial element to obtain from a self-assessed personality test is the awareness of self.

**Advantages**

The compiled team results of the Myer-Briggs indicate that there is an even spread of personality types among the six members with the exception to assertiveness and turbulence. The team has a healthy mix of introverted and extroverted characters who can learn from each other, but this doesn’t necessarily indicate that the group will thrive. Listed are a few tips from Lepore (n.d.) that could encourage group success between introverts and extroverts.

* Acknowledge strengths of each individual
  + Decision-making and brainstorming benefits extroverts
  + Individual writing and thinking benefits introverts
* Provide introverts with clear communication of their role
* To balance contribution schedule time for participants to speak

Another positive is the even scores of thinking and feeling. Thinkers excel at technical and scientific fields when logic is vital, compared to feelers, who are more strategic at communicating change (myersbriggs.org, 2019). This creates a symbiotic relationship between empathetic characters and pragmatic theorists and could be considered advantageous for software development and implementation. Establishing and upholding key values will align the thinkers and feelers across the group and keep each other accountable.

* Respect
* Technology Excellence
* Transparency

**Disadvantages**

Although the group has more judgers than prospectors, the two traits propose a clash between team members in respect to organisation. Judgers tend to rely on certainty and are more comfortable with direction, whereas prospectors prefer a spontaneous outlook (NERIS Analytics Limited, 2015). If the team have poor time-management skills and are mostly full of judging personalities, then determining project deadlines will help ease those who require control to complete their goals. Stress response can manifest itself physically (Everly, Rosenfeld & Allen (1981), therefore prospectors may have to sacrifice their laidback attitude to prioritise the healthy and safety of the group.

The group scored highest in assertiveness with only one member exhibiting tendencies of turbulence. With this many assertive individuals the group is at risk of overconfidence (NERIS Analytics Limited 2015), especially in a team environment. The behaviour could see members assume they know what is expected of each other rather than having the discussion. It would be beneficial if requirements were documented as per action item to steer the project on course and to keep members honest.

Sharing the results from the Myer-Briggs aids the team to analyse who each other are and provides further understanding of each other’s reactions and choices when dealing within a group. Considering this group is online, team members could review each other’s results of the Myer-Briggs test to increase familiarity before each meeting session.

**Strengths & Weaknesses**

Each member has provided a self-report on their soft skills; three strengths and three weaknesses to identify the value and gaps that they bring to the team. These parameters are then accumulated and translated into packed bubble charts to represent the team dynamic.

**Strengths**

We are skewed toward problem-solving, innovation and analysis, and the team consists of individuals who are great communicators and are team-orientated. Fortunately, these skills are favoured in the technology space and they align with the team’s evaluation (Point Jupiter, 2019). To expand further, large-scale software development cannot be achieved alone, it is important to build a team of subject-matter experts who are able to bring value to the projects journey.

One key strength missing from the group dynamic is leadership. This could be a result of our average age bracket and with minimal experience in the workforce, but leadership comes in more forms that just experience. The team may surprise each other when each member takes on different roles at different times. Leadership can look like, controlling the agenda and action items, directing project vison, or expressing resilience when the team is met with roadblocks (corporatetraining.usf.edu., n.d.). It is hard to forecast who will play which role and roles change over time, but if the team can spend moments in reflection at the end of each week, then they can assess their performance accurately and apply their self-learnings to their future work.

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| --- | --- | --- | --- |
| **Member** | **Strengths** | | |
| Emre Altunsu | Creativity | Dedication | Disciplined |
| Jack Gale | Innovation | Problem-Solving | Creativity |
| Yousef Fares | Analytical | Team-Orientated | Self-Learning |
| Dominic Hutchinson | Innovation | Problem-Solving | Analytical |
| Mark Schroeder | Communication | Enthusiasm | Dedication |
| Gabriel Jones | Communication | Adaptability | Problem-Solving |

**Weaknesses**

The team is at risk of a trifecta of weaknesses; time-management, impatience, and prioritisation. It’s concerning to imagine the group succumbing to their worst traits resulting in incomplete work and not prevailing these barriers. To avoid poor time-management and prioritisation it would be beneficial to create daily schedules, consolidate similar tasks together and evade the urge to multitask (Lucid Content Team, 2017).

Another major weakness that the team expressed is indecisiveness. It is alarming to compare this to the major strength problem-solving if there are scenarios that require time pressured critical thinking and risk mitigation. During moments of indecision extroverts of the group can control the room by taking polls on conflict and mediate streams of thought to create open-lines of communication (Dike 2021).

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| --- | --- | --- | --- |
| **Member** | **Weaknesses** | | |
| Emre Altunsu | Time-Management | Patience | Self-Critical |
| Jack Gale | Indecisive | Empathetic | Time-Management |
| Yousef Fares | Lack Creativity | Indecisive | Time-Management |
| Dominic Hutchinson | Easily Overwhelmed | Time-Management | Prioritisation |
| Mark Schroeder | Unclear | Stress-Management | Forgetful |
| Gabriel Jones | Insensitive | Unstructured | Impatient |

**Ideal Jobs**

Whether it be curiosity, fear, or a mixture of both, each member has decided to study IT to broaden their knowledge of in-demand coding languages to invest in their future. While the majority are code heavy others wish to focus on more tangible aspects of technology by either building hardware or managing people and users.

The below organisational chart highlights the role of each member in the technology team and the area they wish to specialise. The roles below were translated from each team members personal profile by identifying their ideal job and the direction they wish to proceed.

Diagram

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There are many similarities and differences that exist between each member’s ideal job and what they wish to accomplish while studying a Bachelor of Information Technology at RMIT.

**Similarities**

All roles require that each team member leave university with a strong understanding of programming languages. The three software engineers, Jack, Dom and Yousef share a very similar journey throughout their study as they wish to minor in information technology. Mark and Gabriel are planning to become computer science experts due to their hands-on approach, while Emre is hoping to focus on application support

Each member will share different experiences but hopefully the same gratitude after completing the core subjects of Information Technology. The prerequisite skills for the third year subject Software Engineering Project Management will align many of our elective choices. Everyone will benefit from the end-to-end procedure of project management which could potentially change our ideal job as we each get closer to graduation. The roles we have elected now are not out of reach from anyone with the exception to Mark who is bold enough to accept the challenge of leading team of people as soon as possible, but there is no doubt that toward the end of graduation each team member could go beyond their limits and become a leader in their chosen technology field.

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**Differences**

Delving into further detail there are many differences in roles that set each team member apart and this is dictated by skills we want to develop before graduation. Jack, Dom and Yousef share the most similarities, but each are experimenting with different programming languages for different reasons. Jack needs to learn data extraction with APIs to support his role as a Business Analyst, Dom wishes to learn the structure of syntax that’s translatable across platforms and Yousef aspires to automate manual processes with machine learning. Gabe and Mark have experience with electronics, but Gabe is more interested in computer and graphics processing, while Mark is expanding his appreciation for smart devices using IoT. Emre is the most unique of the group, hoping to support applications in production as a conduit between business and technology.

Other differences among the group are the industries we wish to apply our technology learnings. While Jack and Dom both want to become software engineers Dom has a passion for disability support and Jack is already working in gambling. Yousef wants to fuse artificial intelligence and his passion for middle eastern cuisine but isn’t yet sure how. Mark seeks new ways to connect technology and people by streamlining processes and Gabe increases his opportunity to work for any respected technology hardware suppliers throughout the course of his study. Emre’s charity Chart, diagram, bubble chart

Description automatically generatedwork will see him translating technology for not-for-profit organisations making technology more accessible for people in need.

Although the core material will bind us together throughout the duration of our study it is exciting to think where we could be 5 years from now and to compare the similarities and differences then. It is within the groups best interest to stay connected over time for support because we each believe that studying at RMIT will be a defining moment for all of us.

## Industry data

Diagram

Description automatically generatedIf Kalied AI is to progress, then it is crucial that the team analyse the data of technology trends provided by Burning Glass. The data collected in 2018 measures job demand and the required generic skills and IT specific skills employers advertising. To begin, the teams have nominated their ideal jobs that they wish to pursue at the end of graduation, this is to help them navigate their course structure throughout RMIT.

The organisation chart below identifies each members nominated ideal job and the area they wish to specialise. Mark wishes to lead a team of developers but may have to increase his experience in his chosen minor before reaching an occupation that high level. Jack, Dom and Yousef are determined to become software engineers, while Gabe is eager to challenge his computer science skills as a technician and Emre is keen to enter the workforce as a systems analyst.

The data below lists the most in-demand jobs in the technology industry for both Australia and New Zealand in 2018.

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**The IT Manager**

As the ingenuity and reliance of technology continues to expand the workforce will be in search of more IT Managers (BLS, 2018). Marks desired occupation IT Manager is ranked 10th from the burning glass occupation data, with his steppingstone job, Solutions Architect ranked 1st. Mark wants to solve business problems with technology solutions and manage projects across IT. Managers usually need 5 years + of experience in any role to gain the knowledge, respect and attention of their peers (Indeed Career Guide, n.d.). For Mark to excel as a manager he would need experience leading teams as either a Solution Architect, Technician Lead or possess transferable business management skills.

IT Managers generic skills typically develop over several years of industry experience, Mark must begin to think big-picture to develop his strategic planning and evolve his communication and composure to address high level. These generic skills will be a result of Mark exploring his IT Manager pathway by learning Business Intelligence Reporting, Project Management and in-demand Programming Languages.

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**The Full-Stack Engineers**

Jack and Dom’s end-goal is to apply for a Full-Stack Software Engineering Role. The successful candidate is a subject-matter expert on both front-end and back-end programming and will need 2-4 years’ experience (Coding boot camp, n.d.). Generally, the job is usually split into two roles, client side and server side, suggesting that there is more demand for software engineers (1st), and computer programmers (8th) than full-stack (17th). Depending on the knowledge of the team and the size of the project full-stack responsibilities can be unmanageable if the scale is too large (Bhagat, 2021). For Dom and Jack to reach their goal during their university degree both could transition into either front-end or web development to build their technology portfolio accelerating their journey before tackling Full-Stack.

Full-Stack engineers are knowledgeable in both client side and server-side programming, their attention to detail and communication must be well developed to be successful in their role. Managing their expertise across many platforms would require high-level organisation skills, this could involve scheduling, version control, documenting, and writing clean code (Bhagat, 2021). The most in-demand IT skills for Dom and Jack to learn from the Burning Glass data are SQL, JavaScript, and Java. Many other programming languages are considered favourable such as .NET, HTML, CSS, Python; these Chart, bubble chart

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Bubble chart

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**The Machine Learning Engineer**

The Burning Glass data from 2018 does not include any job advertisements for Machine Learning Engineers, this could be due to its small attention at the time, but since then society has slowly begun to adopt artificial intelligence concepts (Lazzaro, 2021). Now it’s 2022, machine learning is beginning to boom, and Yousef is determined to minor in this field at university with high hopes to enter the industry before the end of graduation. To put his foot in the door, Yousef will need to become well equipped with mathematical models, including algebra, calculus and graph theory (Gillis, n.d).

Machine Learning Engineers need to be well versed on data-modelling and evaluation to determine technology requirements, as well as natural processing language theories (NLT) to begin building artificial intelligence systems (IBM Cloud Education, 2020). If NLT connects the interactions between human language and computers, then Yousef will need to utilise his problem-solving skills with his applied mathematical background.

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**The Technician**

The closest occupation to represent Gabe’s job title as a technician is a help desk officer. Ranked 5th, Help Desk Officers are a necessity in medium to large scale organisations due to the increase in technology hardware and software; we are becoming increasingly reliant on technology and not everybody can dedicate their lives to understanding how it works, it will be Gabe’s responsibility to ensure the company’s software and hardware is efficient and reliable (Software Reviews, Opinions, and Tips – DNSstuff, 2021). Technicians must learn more than just in-demand computer programming languages, it is their duty to supply the hardware for onboarding users and to troubleshoot any technical problem that may face throughout their employment (Chambers, n.d.). This would require strong problem-solving skills and communication skills to decipher problems and to translate technical jargon to staff. Chamber continues to suggest that high organisation skills are necessary to manage the data of resolved and unresolved tickets because they create opportunities to improve the business.

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**The Systems Analyst**

Long-term companies must build a responsive relationship between legacy systems and the new technology implemented throughout the business (Stackscale, 2020). It is impossible for old and new systems to exist problem free, therefore it is up to the Systems Analyst to diagnose advanced technical problems in production and to resolve user issues. Another key duty is to advise management about system innovations to improve operational efficiencies (roberthalf, 2017). The compounding role of enhancing systems to benefit user experience is why the occupation is in high-demand, ranked job 3rd from the Burning Glass data.

To keep up with the influx of new and changing systems companies engage System Analysts, who must possess quick learning, teamwork and problem-solving skills (Prospects, 2018). Data analysis and project management are two core components for senior level System Analysts, but entry level must be adept in similar platforms to SAP (Betterteam, n.d.). SAP is a cross-platform software system that communicates to all departments. SAP Systems Analysts are constantly in revolving communication with operations, help desk and development teams to help solve problems cases that are easily understood across all business units.

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**Group Skills**

The Burning Glass Data was compared to the ideal jobs of each team member to pave a career pathway throughout the duration of their study and to identify the generic and IT skills considered successful in their role. A shared vision was then established by the team by collating the collective skillset and distributing them into packed bubble charts for heightened visibility.

Chart, bubble chart

Description automatically generated**IT Specific**

The three most common IT skills desired by employers for an IT Manager, Software Developer, Technician and Systems Analyst are a deep knowledge of in-demand programming languages, familiarity of project management frameworks and prioritising the value of data analysis. The necessity of these skills are described in further detail below.

**Programming Languages**

Out of the 25 IT specific skills provided by the Burning Glass Data, around 15 were related to programming languages with the demand in 2018 in favour of SQL, JavaScript and Java. If these three languages are ranked above any other programming language then technology industry must be recognising data management, digital interaction, and rapid application development as the core components of digital success (Berkeley Boot Camps, 2020).

SQL is a database communication platform required to manage and structure data in a relational database management and the advantage of the structure is that users can access data with a simple command and view the relationship between business and stakeholder information system (Berkeley Boot Camps, 2020.). The volume of data is only increasing as many industries are migrating to the web with new generations giving birth to their ideas solely on digital platforms, this claim indicates that 64% of small business owners run their own website which was a rapid increase from 2018 when 46% didn’t have a web presence (Liedke, 2019). It is essential to follow the money when predicting growth, Liedke (2019) continues to extrapolate that by 2040 95% of the world’s purchases will be through eCommerce.

Paired alongside HTML and CSS, JavaScript is the interaction element of web design. With 4.6 billion users browsing the internet it’s the developer’s obligation to utilise JavaScript as best they can to hold the audience’s attention (Johnson, 2021). Significant tools found online such as search engines, eCommerce, content management systems, social media and mobile device applications are all competing to maximise their user experience (Big Commerce 2021).

There are over 6.3 billion smartphone users accessing applications in the palm of their hand making Java an integral member of the programming family (Build Fire, 2021). Big Tech prefers this reliable language because Java has easy syntax, security and can handle a high volume of data (Kashyap, 2022). Java’s platform has reached such success due to it’s ability to run on any supported device and its capability with legacy systems.

**Project Management**

Broadly speaking project management is not IT specific but it has become a critical aspect of technology. Project management in the tech industry is goal-specific and must be managed and delivered on-time and within budget (Smartsheet, n.d.). There are many structures to achieve project success but agile leads the project planning competition with scrum as the main framework choice at 56% (Adeva, n.d).

The focus of Agile is to respond to change by holding face-to-face collaboration to continually deliver and improve working software (Dinnie 2018). Embracing change during the short project-cycle caters for alterations, providing opportunities to refine and reprioritise project items. Scrum framework is great for tracking progress by breaking the business requirements into sprints, which are usually weekly or fortnightly team goals. Focusing on smaller items over big picture ensures that the developed software is working and deliverable.

Scrum adds more components to Agile but with the emphasis of the following roles, Product Owner, Development Team and Scrum Master (Dinnie 2018). The Product Owner represents the voice of the end-users by constantly suggesting areas for improvement, usually backed by data analysis. These ideas are presented to the development team who pitch realistic timeframes for completing code and adding design. The Scrum Master is a supportive leader who is a subject-matter expert helping the team in any area lacking expertise. Scrum is organised by events that bring the team together for planning, reviewing and reflecting; this keeps the team honest and transparent during project life.

**Data Analysis**

Clive Humby’s phrase “data is the new oil” is a well-known expression in the technology space (The Economist 2017). Organisational labour is now moving toward managing and analysing technology, business and customer data, with deep analysis organising and structuring correlations for financial gain. Data analysis is a core component of project management, it is used for Big Data manipulation and is the mechanical beating heart of artificial intelligence (Grant, 2020).

Today’s technology has data under the microscope and it’s constantly streaming into every feature of business, but it’s how the business captures and interprets the analysis to discover any benefit. Data analysis has many advantages; reducing cost, improving decisions and developing product, and combined these aspects arrange and influence consumer behaviour by uncovering concealed patterns and correlations not visible to process control (sas, n.d.). Unfortunately, traditional data-processing software is beginning to reach its limit due to the compounding surge of dataflow, therefore it’s up to modern methods to interpret the large quantities.

The concept of Big Data is to deal with incoming data that traditional data sets cannot evaluate or hold, this is usually due to the extreme Volume, Variety and Velocity, but with modern methods of analysis these three V’s can address business and technology problems that usually go unnoticed (Oracle 2021). Volume examines the data that is considered valuable when assessing unstructured and low-density datasets. Social media is a prime example of finding value while sifting through terabytes of insignificant information. Velocity is the handling of the rapid amount of incoming data and how to process that in real-time. Variety recognises the diverse types of data that is accessible in unstructured streams and how to translate that into data and metadata that is tangible.

Bostrom’s (2014) work in Superintelligence challenges the doomsayer question that the world will be overrun by machines, and instead proposes a more realistic view, that AI systems will eventually collect enough data to hold information at ransom, and the power will reside on the discretion of the intelligent minds who control those systems. Chowdhary (2020) expands by explaining that unstructured text is growing by the second and it is the biggest human generated data source involving web data, emails, instant messages, digital records, social media. To unveil the trends of words in an efficient manner ‘natural language processing’ can evaluate tremendous amounts of text faster than manual intervention, aiding investigations of process control and consumer behaviour.

**Generic**

The three most common IT skills desired by employers for an IT Manager, Software Developer, Technician and Systems Analyst are strong lines of communication, high problem-solving and structured organisation.

Chart, bubble chart

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**Communication**

The Burning Glass data has communication as the leading in-demand skill from employers by more than double of the next in-demand skill. The unanimous lead could be due to many over sought factors in the IT industry considering most of the billed time is spent on computers (Thrive Global, n.d.). There are a few communication measurements which make it a multifaceted skill: interpersonal, listening, writing, and collaboration (Thrive Global, n.d.). Interpersonal skills are about building relationships and coming across as a likeable. Listening establishes connection by allowing the person who is speaking to feel valued. Writing demonstrates knowledge and knowledge sharing. Collaboration is the networking of idea sharing and execution among teams with the emphasis on engagement.

The technology industry has many areas of expertise for one person to do it alone, to deliver working software individuals must work in teams and call on each of these communication micro skills to achieve success.

**Problem-Solving**

Problem-solving is the art of identifying business problems and applying solutions with minimal negative impact (Doyle, 2020.). Problem-solving can be in the form of a long-term business problem that must be solved to improve brand or can be damage control in time-critical scenarios requiring risk mitigation, such as an unplanned system outage.

Problem-solving isn’t necessarily something and individual is born with but is the ability to implement solutions that benefit all parties and there are numerous ways this can be achieved (Indeed Career Guide, n.d.). Analysing contributing factors through data gathering and data analysis is a great place to start, holding group interventions by brainstorming with subject-matter experts, mediating solutions that interests both customer and business, and executing a plan with target metrics to measure success. Problem-solving is a learned skill and should be one of the defining features on every resume.

**Organisation**

Project management and communication are the two of the most important skills in the IT industry, but it is almost impossible to express the two without high-level organisation skills (Estrada, n.d). Today organisation is presented digitally, with platforms like Confluence and Jira, teams can provide heightened visibility of documentation across business units (contegix, n.d.). The vision is to create an online workspace so that if any employee were to leave another can pick up exactly where they left off. Many projects are planned using Confluence and the available tools help teams track progress by prioritising items and adhering to time-management requirements.

High organisation skills establish a foundation of order and will boost productivity by determining project scope and another advantage is that with high organisation skills teams understand project vision and can communicate this up and down stream (Indeed Editorial Team, 2021).

**Final Thoughts**

For the team to reach maximum potential each of the skills above must be a primary focus while studying at RMIT, with emphasis on communication and programming languages. It’s clear that the shared role we play is to be a conduit between man and machine, translating the technical jargon to end users whether it be on or off-screen. Among the Burning Glass data were favoured skills that will take even longer to develop. The team should consider exploring leadership qualities in addition to the six skills, but what does leadership look like to a team of entry-level students? To develop the perspective of leadership based on the information above the team can learn to communicate effectively, take on constructive criticism and practise mapping tools to understand project vision (Krakoff, n.d.).

After reviewing each team members ideal job the ambition to reach their end-goal hasn’t changed but the challenge instead should be for everyone to enter the technology space before the end of graduation. Mark could explore his position as a lead, either as a technician lead or solutions architect at a larger company before becoming an IT manager. Jack and Dom might enter front-end web design to begin thinking customer while Yousef could start building automated programming in python. With Gabe’s knowledge he could become a helpdesk specialist immediately and consider a stretch goal to become lead, and Emre should consider entering operations to gain further user experience.

## IT Work: Interview with an IT professional

# Who is our Interviewee?

The IT professional we interviewed is named Russell Garner. Garner is the ICT (Information Communication Technology) Operations Manager at Crest Education where there are 2 colleges, Hillcrest Christian College, and Rivercrest Christian College. Garner “manage[s] the day-to-day operations of the college’s, IT infrastructure, and contribute[s] to the strategic and future planning of the equipment and infrastructure” for both colleges. Garner is in his fifth year at Crest Education; however, he has worked in the IT industry for 30 years. Due to Garner being in the IT industry for so long, he is full of knowledge and wisdom regarding the IT industry which made him the perfect IT professional to interview. Garner helped us gain a valuable perspective and great insight into this area.

Most of Garner’s time is taken up by “the day-to-day IT operations” where he performs “administration functions and [works on] system projects” which he describes as “keeping the lights running”. Garner is also “continually seeing where we can improve and streamlining infrastructure and systems”. When Garner is focusing on big picture projects and infrastructure like this, he works in collaboration with the IT Manager, his superior. By having two IT related managers at Crest Education, there are always two sets of ideas, experience, knowledge, and thinking. This creates an IT strategy at Crest Education that has more than one perspective, making it well rounded and well thought out. This is something we aim to embody when collaborating.

Garner interacts with a wide range of stakeholders, “from executive principle through department heads, through the teachers, and also at times students and parents as well”. Due to the nature of his position, these stakeholders often “contribute their time, sometimes their budget and the knowledge of their areas that we’re dealing with”, opposed to technical input. Contrastingly, in addition to the tasks mentioned earlier, part of Garner’s role is to manage a team of IT professionals. This gives Garner ample interaction with other IT staff who do give technical input into his role.

# Change in the IT industry

Drawing on Garner’s extensive experience, we asked him about the changes he has seen throughout his career. Garner says that due to IT being a “constantly changing field”, “everything is changing”; “IT [has been] changing from 30 years ago to now”. More specifically, he said “cloud computing and data analytics” are the “most current [changes in the IT industry]”. Garner also “[doesn’t] see any reason why it would not continue to change”. Broadly, IT has changed in they by growing to be more than just the PC, “it used to be very specific to a particular IT system where now it's everything from AV to security to cameras”. Garner says that “what [IT professionals] have to look after” is “getting broader and broader and broader”. When Garner said this, we asked if being in IT entails a consistently expanding knowledge base of the area, and he responded with “absolutely yes”. When asked if he likes that aspect, Garner said, “I like that, I like change, I like new things”.

Schreiber (2019, p. 373) argues that “technological advancements like artificial intelligence, machine learning, and blockchain have the potential to redefine organizational structures in the future”, and it seems that Garner agrees, at least in relation to artificial intelligence. Garner states, “AI (Artificial Intelligence) is starting to impact how we do things”, and that “they'll be less reliance on people doing things, and more AI coming into things to make lives easier”. Garner believes that “[AI] will be the biggest change [in the IT industry]”. More specifically, Garner talked about how “a lot of [their] firewalling now is becoming AI driven in the background”. The way that this is done is by having “AI develop rules to determine [how to protect against] attack vectors coming in”. Amazingly, Garner says “there's no longer a person or a team of people having to do that, it's just an AI robot in the background”. This exploration of AI has really brought an awareness to the team of how crucial AI is and will be in coming years. Upon further discussion of AI in our team meeting (post interview), we have been eager to use investigate its possible use in our project.

# Positives and negatives of the IT profession

Garner is passionate about “making lives easier” by “providing skills and resources”. An example of how he does this in his job is: cutting a large data manipulation job down from “five hours every day” to “a button click”. Garner says, he “gets a buzz out of” “seeing how happy [people] are when they don’t have to spend 5 hours doing that job”. It is wholesome to see an IT worker excited about helping people opposed to just being enthused by the computers. This has also brought a perspective shift to us as a team as now we understand that the applications we produce, should be about helping people, not just for the endless pursuit of revenue and profit. Following this, we asked Garner about the most challenging aspect of his role, he talked about the multitude of tasks that he needs to be aware of and “keep on top of”. Garner describes this by saying that “IT system are no longer this tiny little black box in the corner that one or two people use. It touches everyone, people rely on it 24/7 and if it doesn’t work then they can’t do the job properly”. This highlights the breadth of IT as a whole and again, touches on how much IT has changed over time.

# Conclusion of interview analysis

Russell Garner is an experience IT professional who has many insights into the IT industry. Our short conversation with Garner has given us a window into the business of IT and what it is like. This has empowered us to further explore what IT has to offer and where it can take us. With the knowledge garnered from Garner, we are better prepared to take on our project and feel that we have all learned valuable lessons that we will hopefully take into the field of IT.

**For transcript of the interview, please see appendix 1.**

IT Technologies: Clouds, Services, Servers:

# What does it do?

While clouds, services and servers are three separate technologies, they fall under the same category. Physical servers and the services they provide were the most prominent for many years as they were the only option. These servers are powerful computers, most often stored in data centers for businesses. They help the company by running operating systems and applications off of the relevant internal hardware. One of their biggest drawbacks, in this case, is the fact that each of these setups can only be used by a single tenant, as the resources cannot be distributed.

Over the last decade, the world has slowly begun to shift to utilizing cloud computing and servers virtually over the former option. Therefore, there must be some benefits to taking this approach. Cloud servers list a host of advantages in comparison to its counterpart, some of which include reliability, availability, mobility, speed, efficiency, and affordability.

Cloud servers take a new approach to storing data and providing services. They instead act as a software-based representation of a physical server, with all data being sent to a virtual space that runs in a cloud computing environment. This allows all information to be accessed online and run as independent units.

Cloud computing can be found in many forms, the most important utilization of them for businesses is commonly seen around the world. Infrastructure-as-a-Service (IaaS) or Platform-as-a-Service (PaaS) are two fundamental types of this product. IaaS lets consumers purchase infrastructure which can be accessed and utilized online. PaaS is very similar; it offers the same features as IaaS but also the firmware and development tools for selling their services. These two alike allow companies to save on the cost of expensive physical hardware.

One of the more impactful negatives of physical servers was the complexity of backing up data, and in turn, restoring it if something was to go wrong. Disaster recovery also runs in a similar vein. The benefits of using the Cloud to store, backup and recovery data are the cost and time-efficient compared to their previous counterpart.

Another important form is the ability to buy and sell big data analytics, this is seen within companies who desire to extract and use information derived from customers and their data. Companies that are usually interested in this form of the Cloud would be social networking platforms or suppliers that wish to learn more about how they should be marketing and advertising.

The concept of cloud computing launched around the mid-20th century but only became mainstream in the early 2000s. Since around 2020, most up to date companies will utilise a hybrid of both physical and cloud-based servers. The split will depend on the said company, which can either be equal in usage or skewed more towards all virtual. A 2019 IDC study did however show that physical servers are still an important part of the data center, they just are not receiving the same advancements as their counterpart.

The future lies within the services that cloud computing can provide and increase its cost efficiency, performance, and reliability. There is no doubt that the many attributes that makeup cloud computing like its storage capacity, security enhancements or networking speed will see vast increases over the next few years. It is not the real benefactor of this state-of-the-art technology. However, the disadvantages of the cloud should not be overlooked. Any downtime in network connections will make accessing its services and data very difficult.

The advancements in virtualization technology are one of the biggest components in making cloud computing what it is today. Virtualization at its core is the ability to let software simulate hardware and create a virtual computer system. Cloud computing is simply one of the consequences of this process.

There is no denying that the monetary increases found within the IT industry have also helped to further push and advance cloud computing. Of course, many other technologies helped with this development such as enabling faster broadband internet access, networking infrastructure and increases in storage devices.

# What is the likely impact?

The greater impact of cloud computing and servers, in general, is the way that they allow end-users. Empowering businesses and companies to work from anywhere and the hew of other new outlooks it has created. Giving the ability to access these features to not only those who could afford the hardware, but now everyone with an internet connection can access those that were previously inaccessible.

For example, in recent years the possibility to stream video games from a cloud computing device onto your own was made possible. This alleviates the lack of expensive hardware that one may have and allows you to stream any game to your device and play it from the cloud. While this is a relative innovation, it still has a long way to go with most of the world’s internet not being able to provide a strong enough connection. The advancements of these streaming services along with developments of the cloud itself will hopefully strengthen the quality of streaming video games without having to spend thousands on a computer itself. The likely changes over the next few years will line up with that above. Changes in performance, cost efficiency, internet speeds and reliability and the likes are more common than any changes in how cloud computing or server infrastructure work.

The reconstruction of servers and the implementation of cloud computing came to fruition. Only a small percentage of the jobs lost in this period were attributed to the cloud. In reality, cloud computing reconfigured the workforce. While it did remove some of the previously required occupations, it also created many new jobs and job opportunities. The short-term negatives are far outweighed by the many big picture positives. Providing people and small businesses with the ability to create start-up businesses and sell their ideas for minimal investment has been a huge addition to the industry. After all, companies that utilise a hybrid of both forms of technology or a majority of physical hardware still need those occupations that were caught in the fire.

# How will this affect you?

Cloud computing and the services it provides have affected the average person’s day to day life immensely. It may go unrecognized by some but a large percentage of everyday life activities such as banking, shopping, education, and media streaming services all use the Cloud. Not only does it affect personal endeavors, but cloud computing also runs the business side of many of the world’s most famous industries and workplaces as well.

The increase in possibilities for students within the cloud is one of the largest advances in education for a long time. Being able to send, receive and access information from anywhere at any time gives students and teachers the ability to store their data securely without the need for complex and expensive hardware. While most first-world countries did have access to those physical servers and such previously, less developed areas can now reap the same rewards without the need for them.

Another daily life advancement cloud storage introduced was the advanced navigational systems seen in modern vehicles. Cloud computing can store such a large amount of data and automatically update it accordingly has allowed the way we drive to be superior to its previous iterations. The cloud also has changed the way people interact with their cars entirely. This is most seen in the plethora of third-party applications like music software, phone calls and payment tools.

Unlike some other new technological innovations, the way that Clouds, servers, and services affect us is all the same. It may be utilized differently in some regards and help each person differently. Overall, it helps every category and group of individuals as a whole in the same way. A lot of these advancements are simply a result of evolving previous technology and were possible beforehand. They have now provided us with far greater efficiency, reliability, comfortability, and usability in the way it lets people perform tasks.

## IT Technologies: Natural Language Processing

# What does it do?

Natural Language Processing (NLP) stems from a branch of artificial intelligence, it gives computers the ability to understand the text and spoken words similarly to humans. A combination of both computational linguistics and the human language, along with statistical machine learning has allowed this new technology’s birth. NLP is the driving force behind many language-based computer programs. These include applications that aim to translate text from one language to another or anything that can respond to spoken commands as well as many others.

The two largest advancements in the evolution of natural language processing were made in 2017 and 2019. The first considerable development came as a new form of deep learning model called Transformer. This made it possible to parallelize the AI training more efficiently, which resulted in a far more accurate and improved product. A short two years later, another implementation of Transformer was made. Pioneered by Google in 2019, the architecture of Transformer was greatly improved by their Bidirectional Encoder Representations from Transformers (BERT). After this breakthrough, the depths that NLP could reach were far greater than the average human in many tasks. Now in 2022, there is a fast projected expansion of 20.3% in the next 4 years, and this start-of-the-art technology is looking at one of the greatest futures in the current industry. The future of NLP will heavily rely on the investments of further research within companies such as Google and Facebook.

NLP has many prospects and continues to look promising every day. There will most definitely be avenues where we see this technology more accurately begin to not only read but also write articles and other important news. An important utilization of NLP is chatterbots or chatbots, which have changed the way we interact with computers. In its most simple form, a chatterbot is a program that simulates and processes human conversation. It allows humans to interact with the program as if it was communicating with a real person. Ranging from the most basic query with a single-line response, all the way to the very sophisticated digital assistance that we see today.

Chatterbots were created throughout the era of digitization. Allowing businesses to free up time by setting up a system where an automated list of questions and responses are communicated to the customer. While they can sometimes be quite frustrating and hated by many, they do save time by answering many frequently asked questions or helping to send the caller to their required service.

The long term aim of NLP is to control the human-to-machine interaction space, and hopefully to the point where talking to a machine is far easier than talking to a human. With more acquisition of data and information over time, the artificial intelligence and tech surrounding NLP will continue to evolve and become more reliable and impactful.

# What is the likely impact?

NLP helps companies automate processes that would in turn reduce costs or provide insight into improving business strategies. Answer Rocket, software that organizations could apply to their systems, allows staff members or users to access and view specific publicly available company data with search queries that would include natural language. The idea is to make information regarding the company more accessible for all people when they aren’t limited to data that can’t be accessed because they couldn’t word their search correctly. Furthermore, Parlamind is a system that uses NLP to analyse customer communications and automatically answer queries. Analysis of communication can grant businesses with necessary insight into what practices may be failing and why. Additionally, Netomi, another system that uses NLP, automatically grants resolutions to everyday queries instantaneously of everyday support tickets. This effectively allows a company to increase their workforce without actively increasing its headcount, thus, reducing costs for the company and allowing it to be managed more easily.

In contrast, NLP may threaten numerous jobs in multiple industries. Digital Genius, a system that utilizes ML, machine learning, and NLP, assesses common customer service interactions of different businesses to understand their client needs which serve as an example of how a job like a customer service agent may be threatened. For now, Digital Genius can help with queries but will refer to a customer service agent when one is required to handle the call; if software like Digital Genius were to advance further then customer service may become entirely handled by AI (artificial intelligence), thus, rendering customer service agents redundant. According to the World Economic Forum**\*1**, jobs that fall under the financial services profile**\*3**, on average, have a 20.8% share of workers at risk of displacement due to the advancements in technology which is the highest percentage share of workers at risk of displacement amongst all the industry profiles**\*2** mentioned in the text where the mining and metals profile**\*4** is second with a 19.9% average share of workers at risk of displacement. Customer service workers are categorized into the profile of the financial services making them, on average, threatened by technology the most when compared to others.

We are likely to see businesses able to implement solutions according to customer needs and client requirements as data can be gathered and analysed based on customer interactions with the company by utilizing ML and NLP. Although some people will lose their jobs, companies will theoretically be able to place more funds into research and development, quality assurance, production, and more factors that may make their goods and services more affordable and accessible.

# How will this affect you?

NLP, natural language processing, can affect us in many different aspects of life, whether for convenience or support – both emotionally and physically. NLP allows users to translate text from or to any language they desire which has numerous applications. Users may find themselves looking into taking a holiday to a foreign country to experience something new; where in the past they may have been limited by a language barrier, we are now able to simply input some text whether it be through a keyboard or by speech recognition technology and be granted a result. The emotional well-being of a person can drastically affect their performance of tasks during the day.

Replika AI**\*5** is a chatbot that utilizes NLP to learn more about a user through mutual interaction and, their motto being, a friend who will be there for you, talk, listen, and without judgement 24X7. According to the World Health Organization**\*6**, depression is a common mental disorder that affects an estimated 5% of adults globally – where more women are affected by depression than men. Depression is a matter that needs to be taken seriously and Replika AI aims to contribute to fighting the effort to reduce and defeat depression. Replika is an accessible solution and according to Partap**\*7**, “85% of Replika users find it helpful to ease their anxiety and stress. Simply talking with the app has helped a plethora of users.”, which proves that it is an effective solution that utilizes NLP. Having the Replika chatbot be a free and accessible program for users globally means people have a greater chance of preventing themselves from succumbing to the effects of depression, as a result, may create a slightly more productive society.

## 

## *A picture containing text, room, gambling house, vector graphics Description automatically generated*IT Technologies: Cyber Security

# Current and Future Applications

***A person using a computer

Description automatically generated with low confidence***In contemporary times, protecting our personal data has become a prevalent concern in many aspects of life. The application of cyber security brought on by the need to preserve confidentiality has further compelled advancement in related fields. Instances of mass and targeted fraud, intrusion, spam, and cyber harassment have led to unthinkable losses in revenue, trust, and reputation for many large-scale organizations. As a result, large corporations have diverted a large scale of resources into mitigating such issues. The lead organization providing affordable, manageable, and fundamental security services for the past 20 years is IBM Security. IBM’s services have branched out in recent years, leading other organizations to form comparable products and services directed toward individual systems. Some examples include Norton Security, Malwarebytes and AVG, all of which provide basic support in malware prevention, data protection and restoration, ensuring users are not only protected from malicious activity, but to also provide assurance in events of large-scale data loss. Although present day services provide extensive cyber security coverage, the ‘potency’ of cyber-attacks are increasing exponentially to the point that implemented systems are becoming obsolete. Phishing schemes, APT attacks, spyware, targeted hacks have become more common throughout recent years, more notably since the start of the coronavirus pandemic beginning in early 2020. Intuitive solutions in countering malicious threats are being drafted and implemented each day. Artificial intelligence and machine learning advancements have improved in the early detection/prediction of current vulnerabilities and potential future threats. Implementing a ‘zero trust policy’ in many organizations have additionally reduced the risk of data breaches and network intrusion, as many as 70% of large-scale organizations have introduced this policy indefinitely to protect employees, client confidentiality as well as internal workplace data.

Further, a sizable portion of cyber security software developers and engineers are looking to introduce adaptive security processes in conjunction with various cyber security software’s, widely used in professional environments. The ‘Adaptive’ approach to cyber security involves the analysis of common behavioral tendencies of the user and cross checking with previously encountered threats in order for a highly sophisticated and complex architecturally relevant algorithm to be formed. This algorithm is highly reflective of Artificial intelligence in that it can predict potential threats and either execute required procedures in order mitigate the problem or provide a detailed report to relevant technical staff in which they can effectively compile a viable solution. Based on Paloaltos Networks list for Cybersecurity Automation, the correlation of data is critical in providing rapid solutions in identifying ‘unknown threats’ inclusive of previously unidentified; infected host systems. The concept of cyber security through automated systems and/or artificial intelligence has been up for further study due to potential flaws within secondary backchecking, target accuracy and most notably, unintentional data wiping which can prove extremely troublesome in elaborate/multi component database systems.

Although implementing previously mentioned cyber security systems/services are highly valued in both individual and cooperate settings, a deficiency in available technologies and knowledge is apparent. Applications in cybersecurity via intelligent systems require both skilled expertise understanding machine learning capabilities, programming recognizable features including the reasoning aspects of A.I such as problem solving, resource manipulation with reference to the target cybersecurity requirements and desired outcomes. A wider understanding around elements such as embedded hardware authentication (EHA) is vital in adding further user authentication abilities in respects to providing priority access for designated personnel and in software maintenance. Overall, contemporary technologies in cybersecurity applications are critical in ensuring data privacy, security, and authentication. Emerging technologies such as artificial intelligence, cloud-based systems/servers and various authentical techniques further extend cybersecurity capabilities by highlighting potential flaws or areas for improvement within pre-existing cybersecurity products and services

# What is the impact?

Recent advancements in cybersecurity technologies have demonstrated that the majority of individuals who utilize computer systems; whether it be in a personal or organizational sense, heavily depend upon cybersecurity services and software. Recent developments in implementing automated cybersecurity systems have been showing extremely promising results. These automated systems will increase the users or organizations abilities to detect potential or immediate threats, identify its severity or potential impact on specific operations and quarantine them without the need for human intervention. This can heavily reduce the need for a cumbersome and time-consuming process with addition to increased workplace efficiency. Furthermore, current cybersecurity systems require increased maintenance and resource diversion. Replacing outdated systems with a self-contained and automated variant will undoubtably improve resource management capabilities and heavily alleviate workloads for technical support/analyst units.

Advanced technological developments in cybersecurity will considerably shift standard workplace practices and improve overall security and safety for many individuals. Large corporations such as Apple, Samsung and Windows follow a strict set of business rules, practices, and arrangements with respect to slight differences. The listed corporations store countless quantities of data some of which are extremely confidential. For this reason, companies heavily rely on various forms of cybersecurity including software, firewalls, and physical embedded hardware authentication elements. Although currently described as ‘sufficient’, cybersecurity threats are becoming more prevalent in recent years. Introducing improved forms of cybersecurity can substantially reduce the risk of data breaches or damaging leaks. Automated cybersecurity systems are being implemented in many industry settings, filtering through large server computers, network properties and cloud servers to identify threats and vanquish each with tactical precision.

Many current employment positions require a basic understanding of computer systems and internal functionalities. However, all most all businesses operate with a technical support team who are the most prone to be impacted by workplace change. Introducing automated or self-operating cybersecurity systems may lead to reduced work hours, less application acceptance or in potential cases permeate discharging of technical support members. Although, potential job prospects may be opened in the programming and maintenance operations for the automated cybersecurity systems.

# How will this affect you?

On a regular basis, I utilize various forms of cybersecurity including: user authentication services, ISP, and IP hiders such as Nord VPN and smaller scale web browser extensions including Malwarebytes and privacy.com. The future of cybersecurity provides a sense of safety in that I feel assured that my confidential information and data remains safe in years to come. The use of automated cybersecurity systems and further improvements in threat detection will surely improve my digital as well as my physical wellbeing and safety. Although extremely confronting to some extent, having my files, passwords, confidential data, and search history monitored automatedly can elevate some stress when it comes to protecting personal information.

Improvements to the cybersecurity functionalities within my computer system will undoubtably prove to be a useful asset in a professional sense. Being able to keep track of potentially malicious websites, files or unauthorized access can improve your confidence when using the internet or your computing device in general. According to ZDNET, each year approximately “261 billion data records [are] being lost or stolen” every year. Having advanced forms of user authentication, password management and malware identification software can heavily reduce your chances of losing valuable and confidential information, also protecting your computer from being accessed by malicious hackers’ intent on ruining your digital status.

Friends and family are extremely important to me as they provide me with comfort and support in times of grief, sadness, or general discontent. Majority of my family is over the age of 40 and have difficulties understanding basic computer functionalities. Recently, one of grandparents fell victim to a fraud scheme which involved a scammer entering their computer and stealing their personal documentation. The lack of cybersecurity on their computer was a key factor in this occurring. The promising developments put forth by developers including automated file filtration systems and authentication services etc., provide hope to struggling elderly or inexperienced individuals in that they confidently use the internet without being afraid of potential scams, data loss or invasion of privacy.

## IT Technologies: Machine Learning

# What does it do?

State of the art technology in Machine Learning can be broken down into different categories. Categories depend on what sort of tasks are expected to be completed by the algorithm being put into place. For example, AutoML (auto machine learning) aims to give an accessible solution to non-experts looking to work on machine learning projects. Azure Machine Learning studio**\*1** is an AutoML service developed by Microsoft, a software designed to speed up the process of train, deploy models, and manage MLOps (machine learning operations) for both individuals and teams. According to Enlyft**\*2**, Azure machine learning is adopted by companies with >10,000 employees and >1,000,000,000 US$ in revenue. Auto machine learning may be considered the future of machine learning as machine learning models have become a necessary part of activities concerning both organizations and consumers. Having an accessible solution would help meet the ever-growing demand of businesses to not only create new and efficient models, but also re-calibrate older problems to solve them in a new and more efficient way. MLOps is a procedure to develop reliable and efficient machine learning solutions so they can meet the needs of businesses that can achieve automation of data management on large scales easier and ensures minimal human error. MLOps may be seen incorporated in the near future a lot more when utilizing AutoML software as it would be more geared towards satisfying the needs of a business.

Machine learning in cybersecurity can have applications such as preventing a problem, mitigating damages done, and detecting compromised software. Software that specializes in detection of malware and viruses can use machine learning to perform their tasks more efficiently by detecting abnormal behaviour. Windows Defender ATP**\*3** specializes in detecting threats that are already prevalent within a system by using endpoint sensors that are built into Windows 10. Typically, according to the Microsoft Defender Security Research Team**\*3**, human analysts would create heuristics that alert on breach activities based on their expertise. However, an analyst can only consider a limited set of signals whilst machine learning algorithms would consider thousands of signals instead. Based on statistics provided by Microsoft, they found that the machine learning algorithms they incorporate were at least 20% more precise at alerting than their human’s manually crafted heuristics.

TinyML (tiny machine learning) solves the problem of not being able to make certain IoT (Internet-of-Things) devices embedded system smart where the embedded systems are too small and run-on battery. Machine learning models are not only unfit for placement at the embedded system level, but also require a lot of processing power. The idea is implementing a low energy system, such as sensors or microcontrollers, to perform automated tasks with decreased energy consumption and costs, and no internet connection requirement. Microcontrollers, one of TinyMLs solutions, can shrink deep learning networks to fit into any small hardware system and new machine learning frameworks allow for high-powered AI-IoT devices to perform tasks efficiently. With TinyML, we can expect to see voice interfaces on everything in the future. For example, a fridge letting you know that you need to purchase more groceries or an oven pinging your phone when a cake is done baking.

Finally, Quantum ML (quantum machine learning), which can be referred to as quantum-enhanced machine learning or quantum-assisted machine learning, is an area of research and development that aims to speed up the execution of classical machine learning algorithms by transitioning them into quantum circuits that use qubits instead of binary bits. These new quantum computing systems will utilize qubits rather than binary bits. The difference between the two is that a regular binary bit has two possible states, either a 1 or 0, whereas a qubit has three possible states, either a 1, 0, or a superposition of those two values – an unknown state considered to be both 1 and 0. The idea is that since qubits aren’t limited to two states, they can hold more information and theoretically give quantum computers the potential to be millions of times more powerful than today’s supercomputers.

Singh in ‘How machine learning is changing the world’**\*4** states, “Machine learning is the future of every business”. The broad implication for all kinds of data entry that previously necessitates human intervention can be completed by machines now, for example, ecological experts using machine learning and AI-enabled sensors to analyze data from thousands of sources to make accurate pollution and weather forecast.

# What is the likely impact?

Machine learning has numerous applications in our lives and will impact every industry and most, if not all, people. Machine learning looks to improve all segments including healthcare, education, transportation, entertainment, and a lot more. IoT and cloud computing are implementations of machine learning to create smart objects. Businesses may find value in implementing machine learning as it can study patterns hidden in big data that can introduce businesses to methods which may increase customer satisfaction and revenue.

Machine learning in data mining, the process of analysing data from a database(s) to create findings, allows for the analysis of data to be automated on much larger quantities and provide actual assumptions that may support decisions. As we enter the digital information age, we can understand that manual analysis of data and interpretation by data analysts is impossible due to the volume of data being generated at a faster rate and thus automation can be considered a requirement if individuals or organizations are to benefit from data analysis. A potential application of this can be studying what marketing strategies might be most effective in different markets and which factors impact results, both positively and negatively, according to the business’ interests – for example, do users react positively when they see more familiar faces on personalized advertisements, like a friend of family member, for products or services. Furthermore, hospitals can use machine learning to predict illnesses based on age, socioeconomic status, and genetic history. According to Rajeckas**\*6**, pharmacists are at risk of losing their jobs in the coming decades. Pill-dispensing robots and prescription delivery services will be able to do much of the work that pharmacists currently do. However, the threat may not be imminent as Rajeckas**\*6** proceeds to explain that implementation of million-dollar pharmacist robots is simply costly and is unlikely that it will replace humans in the near future.

According to George-Parkin**\*7**, jobs requiring less than a bachelor’s degree have more than twice the risk of being automated than occupations that require a college degree. For example, non-degree jobs like packaging machine operator, delivery service driver, and retail salesperson have an average automation potential of 55%. In comparison, jobs that require a degree only have a 24% of being automated.

# How will this affect us?

AI is being implemented behind the scenes on numerous things that make our everyday life more convenient. Spotify, for example, uses AI to provide users with recommendations based on their listening history through features like the “Discover Weekly Service” that recommends music every Monday.

We may begin to see our privacy being breached as individuals. Organizations have little incentive to build privacy protections into their system as data can be used to advance their strategic objectives. However, according to Pearce**\*8**, in recent years major privacy breached have made headlines but companies were never held accountable. This could be due to a lack of regulations being put in place to protect a user’s privacy and limit an organizations collection of data. We should hope that they can find a way to create suitable regulations that can both protect the privacy of users and not stifle the advancements of AI technologies.

Self-driving car have recently become a reality; however, we may begin to see that the implementation of self-driving cars in the near future becoming not only commonplace, but also a more moral task as machines can perform tasks more effectively than humans. According to Gibson**\*5**, self-driving cars will not only be safer drivers by 2025, but far safer, moreover, they identified that self-driving cars are rapidly improving whereas human drivers are not. According to Gibson in Self-driving, wave of future**\*5**, the idea was for humans to be behind the wheel ready to take control of the vehicle on short notice, however, studies show that it is difficult for people to remain alert and engaged while automated vehicles is driving, therefore it may not be wise to implement until we can fully rely on the self-driving vehicle to be fully automated under all circumstances.

## Project idea

# Overview

Kaleid AI has begun exploration of an application which consists of a personalised visualisation of past experiences and mementos. We name this project ‘Reflections’, as one both reflects upon the recent past experiences of their day, while also reflecting on a much larger scale. In this application, we wish to create a digital diary which stores experiences and memories (entries) as ‘stars’ in a ‘night sky’, with consecutive daily entries making ‘constellations’ linking these entries in a chain across the sky interface. We also envision that a user would be able to assign the star values based on their experiences, and that at the end of each given timeframe, a ‘star map’ would be produced with all the stars and constellations visible on such. This perhaps could be printed or stored by the user if they wish, while having access to all past ‘star maps’ at their convenience. We feel it best to be explored on a mobile application, thanks to the versatility and adaptability of Augmented Reality, but feel it wise to first create a prototype via computer application/website.

# Motivation

We at Kaleid AI know that finding the motivation to document past experiences and events can be difficult, due to constant pressures of work, life, and many other sources, while also keeping in mind the benefits of reflecting daily upon life. Thus, we wanted to make this reflection process invigorating and engaging, unlike many paper diary documentations which after a while, become tiresome and gruelling. To avoid this same dilemma, we wanted to both add a bit of light to reflecting on the past, actively seeking users to take a few minutes to just reflect and engage, while also not being pressured to do so, and add an incentive to completing such entries. We overall believe that people, by using this application, would see beauty in their own reflective attitude, like how one wonders at the night sky on a clear night, and engage in this experience of looking back, reflecting.

# Functionality of Reflections

In terms of the functionality of the application, we wish to create a system which will be able to store free text under an assigned ‘star’ for each ‘reflection’. This text would be the user’s reflection on any event/day, and the assigned ‘star’ would be a container for such information, which a user would be able to modify by assigning ‘Traits’. These Traits would consist of the stars name (the name of the event/summary), the colour of the star (emotion felt towards the event), the size (importance) and luminance (aspiration) of the reflection. Theoretically, one should be able to create as many stars as they wish, with consecutive day stars linking together with a semi-faded line, creating a branch (constellation), which could stir the user’s desire to create more entries, being an incentive of sorts. Each star would be placed randomly on the interface (a semi dark-violet screen), representing the ‘night sky’ that the user will be able to fill with these stars. Users could also perhaps zoom into and select stars individually after their creation, to see the reflection/event and go between consecutive stars using left and right UI buttons. A search tool/calendar could also be created to target specific dates of events. At the end of a given timeframe (let’s say a month), a user could be given a ‘star map’ of all their entries, which could be collated into a ‘reflective’, which would store each of these, allowing the user to see the evolution of their sky over time. All these specific features we understand to be quite memory-conducive, so we believe that linking this application to a cloud server system would be beneficial, and thus, security measures to ensure privacy may need to be implemented, possibly requiring an account with username and password to access such information, to both access the server, and protect individualistic privacy. While storing this information, we have discussed the implementation of an artificial intelligence (AI), which would gather background data of these reflections, and some of the Traits of such, while not impeding on personal privacy. AI will not be exhibited in the first iterations of Reflections, but it is part of the grand vision of the application. This will be further explored in the ‘Future prospects of Reflections’ section of this report.

# Challenges of development

Some issues that this application could face regard the overall experience that our diverse team has with programming. Some individuals of our team haven’t had detailed professional practice in this field and may require further study of such material to build this application to the extent of what we wish to create. Finding the right platform and programming language to use for this task may be challenging alone, while also developing this application could cause an even greater challenge. Further investigation into this will be needed for our team to create the best experience for our users. Detailed study may be needed if we use certain programming languages/platforms that we are unfamiliar with at this time. Many experiments may have to be trialled before even landing on a possible solution to designing a stable prototype, but we believe that with further research, investigation, and study, we can commit ourselves to overcoming this issue. We also don’t know of the capability to ‘port’ over to a mobile prototype, due to similar issues, and lack of experience in a mobile application development field, thus we agree that we will construct this concept via a computer application/site prototype. In terms of other functionality, we know a possible difficulty that could arise with the user customisation of the ‘stars’, we have discussed using sliders to modify the certain features of such, but programming this, among the other functions may be difficult. Therefore, some features discussed above may have to be removed/replaced with better and more efficient features to better suit the experience, while providing the same service to users. In terms of the entire application, we see this to be a challenge which we seek to overcome, to further improve and refine our skills across the board in application, software, and possibly even AI and cloud server development. We hope to create a stable prototype of ‘Reflections’ in the near future.

# Tools and skills required

Building this program will require a stable, easy-to-learn game engine/application building software which is adaptable, reliable and has a high-level programming language and easy-to-use visual editor. Unity or Cocos2d were good considerations for this program, but both would require in-depth knowledge of how to use and operate the software effectively before even getting to developing the prototype. We instead think that ***[Intended App… we talked about this in the meeting, I can’t remember what it was]*** would be beneficial to create this, as it ***[explanation, as I have no clue what this program is capable of]***. We do not require any sort of hardware or equipment apart from a mid-high-end computer running Windows, capable of running and deploying the application. We instead, need to focus on the software and skills needed to create this program inside the software and deploy a stable prototype via this method. In terms of specific skills we require knowledge on the engine/software being used, the programming language used to create the application, knowledge of visual editors, understanding and comprehension of problem-solving methodologies, patience, and the ability to work cohesively as a collaborative team. Teamwork and clear, concise communication are necessary components of creating this application, as well as cohesive collaboration on all sides.

# Outcome of prototype

If this project is successful, then a stable and usable application prototype will be the result. This would work efficiently and effectively, with elements of thought undertaken towards the overall User Experience and program design. ***[Summary of what we intend to theoretically create in this prototype].*** If this prototype succeeds in the above, this will be a massive steppingstone to publishing the application to users, granting them the opportunity to actively record and recall their experiences in a unique and interesting way.

## Future prospects of Reflections

By digitising people’s experiences, we can bring memories back to life in a much more real and experiential manner, opposed to looking through a physical scrapbook. We believe this is possible by capturing much more than just thoughts written down on paper. Because of this, after we have accomplished creating our text-only Reflections app, we aspire to add much more to it. This will be mainly in the form of how we record our memories.

# Multifaceted data stack

Along with reflective writing, we will aim to encourage our users to input more than just text. This could be in the form of images, text, audio and video clips, location data, etc. Other specific metrics such as distance travelled, or the temperature of the day could be included into the stack of data regarding that day. By receiving various types of data for each day, we will have a multifaceted data stack that we can use artificial intelligence (AI) to manipulate. Let’s refer to a day’s raw data as a ‘data set’. When users include several types of input for the day, our data set is larger and more varied (the more the better). If we have a large data set, there is more that we do with it, for example, link similar memories together and show those memories together, remind the user of a particular day based on their location, the time of day, and the people they are with.

After the day is over, ideally, the user has inputted comments about events that transpired, images, audio, etc into their reflection. In this hypothetical, we have a large data set for that day. All data inputted will have time stamps and location information (with the permission of the user). The collation of a day’s data is what the star will contain. Ultimately, we aim to represent our constellations through a digital kaleidoscope where the user can explore it by going deeper and deeper into this world they have created with memories. This, however, will not be exhibited in our prototype as this is far too advanced and is not needed to showcase our concept. When a user selects a star, they will be able to read about what happened that day, who they were with, where they were, see images of what they saw, hear conversations they might have recorded, etc. This is where AI comes in.

# Artificial Intelligence

By having large datasets about people’s days, with much development, we can train an AI system to refine the data and present only what was worth taking note of out of that day. AI will also play a big part in suggesting stars for users to view. We think Reflections should be capable of selecting appropriate stars and showcasing a concise overview of that day. The way this might be presented is in the form of a micro article or small collage where images, comments, and other forms of content are organised through the use of AI.

# Connection (sharing)

Another important feature of our application that we aim to provide in the very long term is human connection. We want to help people share and communicate their lives with one another. This can be catered to by allowing users to share their stars with other Reflections users. This can be done through cloud sharing services where cloud-based data can be accessed by multiple users when given permission. We believe that this will give people an easy way to share well packaged documentation of their experiences from the real world, in the digital world.

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## Appendix 1 – Interview Transcript

00:00:00.000 --> 00:00:01.050  
Mark Schroeder  
OK, hello.

00:00:02.240 --> 00:00:05.390  
Mark Schroeder  
My name is Mark and I am from RMIT.

00:00:05.460 --> 00:00:15.620  
Mark Schroeder  
We I just wanna first get your consent to have this recorded in form of video and transcript.

00:00:17.120 --> 00:00:18.450  
Mark Schroeder  
Do you allow us to?

00:00:19.290 --> 00:00:22.030  
Mark Schroeder  
I recorded it and then be use it in our report.

00:00:22.850 --> 00:00:23.650  
Russell Garner  
Yes, that's fine.

00:00:27.480 --> 00:00:27.740  
Mark Schroeder  
Oops.

00:00:29.060 --> 00:00:29.770  
Mark Schroeder  
I can't say yeah.

00:00:35.140 --> 00:00:36.330  
Mark Schroeder  
I think your video is off.

00:00:37.070 --> 00:00:38.060  
Russell Garner  
Then my videos on there.

00:00:43.040 --> 00:00:43.690  
Mark Schroeder  
Can't say yeah.

00:00:52.120 --> 00:00:53.540  
Mark Schroeder  
Maybe turn it on and off again.

00:00:55.500 --> 00:00:55.880  
Mark Schroeder  
OK.

00:00:56.820 --> 00:00:57.130  
Mark Schroeder  
To.

00:00:56.830 --> 00:00:57.220  
Russell Garner  
You're good.

00:00:58.320 --> 00:00:59.030  
Mark Schroeder  
Oh good.

00:01:03.920 --> 00:01:11.750  
Mark Schroeder  
OK, so to just to start what is your name or who are you and what is your role?

00:01:12.450 --> 00:01:19.140  
Russell Garner  
Yes, my name's Russell Garner. I'm the ICT operations manager at Crest Education in Clyde North.

00:01:20.250 --> 00:01:25.600  
Mark Schroeder  
Awesome. So how long have you been doing that and what do you actually do in that role?

00:01:26.350 --> 00:01:44.320  
Russell Garner  
OK, I've been in IT for about 30 years. This role I've been doing, this is my fifth year doing this role and I manage the day-to-day operations of the colleges, IT infrastructure, and contribute to the strategic and future planning of the equipment and infrastructure.

00:01:45.680 --> 00:01:48.850  
Mark Schroeder  
Yeah, 30 years. It's quite a bit of experience. It's good.

00:01:49.610 --> 00:01:56.880  
Mark Schroeder  
Umm, So what stakeholders do you interact with? So it could be employees could be.

00:01:58.250 --> 00:02:07.680  
Mark Schroeder  
Businesses or other businesses that you interact with. So what sort of people do you interact with and how do they sort of all contribute?

00:02:08.410 --> 00:02:09.360  
Mark Schroeder  
To what you do.

00:02:09.860 --> 00:02:20.680  
Russell Garner  
Yep. Although I would interact with everyone from executive principle through department heads, through the teachers, and also at times students and parents as well.

00:02:21.580 --> 00:02:30.830  
Russell Garner  
Umm, they would contribute their time. Sometimes their budget and the knowledge of their areas that we're dealing with.

00:02:32.070 --> 00:02:41.850  
Mark Schroeder  
Yep. And do you find that knowledge is anything to do with technology or is it more relational input that they have or?

00:02:42.570 --> 00:02:52.560  
Russell Garner  
It it depends what the the project is we're working on. If it's specific to their area then it will be more technical or if it's not, if it's a process, then it's more general to the process.

00:02:53.400 --> 00:02:54.190  
Mark Schroeder  
OK, cool.

00:02:56.120 --> 00:03:00.530  
Mark Schroeder  
Good. So what takes up most of your time in your role?

00:03:02.220 --> 00:03:15.540  
Russell Garner  
Most of my time is probably administration functions and system projects, so it's from keeping the lights running, but also continually seeing where we can improve and streamlining infrastructure and systems.

00:03:17.660 --> 00:03:21.440  
Mark Schroeder  
And what aspects of that is challenging, if there are any?

00:03:22.580 --> 00:03:26.690  
Russell Garner  
The most challenging is probably keeping on top of everything, all the areas that we have to look after.

00:03:27.310 --> 00:03:40.340  
Russell Garner  
Umm IT system are no longer this tiny little black box in the corner of that one or two people use. It touches everyone, people rely on it 24/7 and if it doesn't work then they can't do the job properly without it.

00:03:42.560 --> 00:03:46.450  
Mark Schroeder  
So in that talked about how it's got quite a weird.

00:03:47.080 --> 00:03:49.110  
Mark Schroeder  
Umm, So what sort of?

00:03:49.870 --> 00:03:52.180  
Mark Schroeder  
How is that with of?

00:03:52.920 --> 00:03:54.050  
Mark Schroeder  
Or not with bit.

00:03:55.420 --> 00:03:59.770  
Mark Schroeder  
It's it's a. It's a broad thing. IT. So what? How different does it get?

00:04:00.700 --> 00:04:10.770  
Russell Garner  
Well, it's. It used to be very specific to, you know, a particular IT system where now it's everything from AV to security to cameras to.

00:04:14.280 --> 00:04:24.350  
Russell Garner  
All every teacher uses devices they use technology in their classrooms. They're all you can different systems, so it's just getting broader and broader and broader. What we have to look after.

00:04:25.560 --> 00:04:31.320  
Mark Schroeder  
Yeah, yeah. And would you say that because of that your knowledge base has to expand as well?

00:04:31.820 --> 00:04:32.850  
Russell Garner  
Absolutely yes.

00:04:34.980 --> 00:04:37.910  
Mark Schroeder  
And is that more more of a challenge or do you like that?

00:04:38.600 --> 00:04:47.210  
Russell Garner  
I like that. That's. I like change. I like learning new things, so being an IT, it's constantly changing. So that's I do like that part of it.

00:04:48.240 --> 00:04:48.940  
Mark Schroeder  
Cool, cool.

00:04:50.080 --> 00:04:52.280  
Mark Schroeder  
So more about things that you like.

00:04:53.920 --> 00:05:00.290  
Mark Schroeder  
What's do you have some favorite things about your job or some things that really stick out as positives?

00:05:01.240 --> 00:05:10.680  
Russell Garner  
Probably the most favorite part or favorite aspect of my job that I like is I like the ability that I can do things for people that make their lives easier.

00:05:11.460 --> 00:05:14.150  
Russell Garner  
So whether that's someone spends.

00:05:15.380 --> 00:05:38.710  
Russell Garner  
Five hours every day. Collect collecting all this data and we can create them. Whether it's just manipulating data for them or generating reports that we can simplify and automate all their processes so it becomes a button click and it takes a minute to do that, or whether we're just we implementing a new system to change their work processes just the kickoff. It is just seeing how happy they are when.

00:05:39.550 --> 00:05:49.200  
Russell Garner  
They've now don't have to spend 5 hours doing that job. It's just through what we can provide with just our skills and resources to make their lives easier. I could buzz out of that.

00:05:49.840 --> 00:05:50.460  
Mark Schroeder  
Hmm.

00:05:50.840 --> 00:05:51.370  
Mark Schroeder  
That's good.

00:05:52.100 --> 00:05:55.990  
Mark Schroeder  
Good. So you mentioned 30 years before.

00:05:56.430 --> 00:05:59.740  
Mark Schroeder  
Umm it's it's quite a long time in the industry.

00:06:00.940 --> 00:06:08.860  
Mark Schroeder  
So how would you say that during the during those years? How much has it changed? Has it been pretty major or minor or?

00:06:10.240 --> 00:06:11.940  
Mark Schroeder  
And what are some examples?

00:06:12.990 --> 00:06:19.200  
Russell Garner  
I'd probably say that it it's a constantly changing field. So in that 30 years, everything's changing.

00:06:21.700 --> 00:06:27.570  
Russell Garner  
IT constantly changing from 30 years ago to now it it's still continuously changed.

00:06:28.070 --> 00:06:35.700  
Russell Garner  
Umm, you know soon you get proficient in one thing and then it all changes and you have to then develop a new skill set so.

00:06:36.440 --> 00:06:47.070  
Russell Garner  
Umm probably 2 examples. The most current ones probably cloud computing and data analytics. They're probably 2 semi recent ones which have had which are impacting us in quite a big way.

00:06:50.690 --> 00:06:56.280  
Mark Schroeder  
No, no. And where would you say a role like yours heading in 10 years?

00:06:57.920 --> 00:07:03.080  
Mark Schroeder  
Do you see much change coming in your role specifically and more broadly than IT?

00:07:04.070 --> 00:07:04.700  
Russell Garner  
I think.

00:07:05.510 --> 00:07:11.250  
Russell Garner  
Given that it's the nature, it's always changing, so I don't see any reason why it would not continue to change.

00:07:13.210 --> 00:07:30.460  
Russell Garner  
I think probably one thing will change is we have in the AI is starting to impact on how we do things that a lot of our firewalling now is becoming all AI driven in the background. So they'll be less reliance on people doing things and more AI coming into things to make their lives easier.

00:07:31.690 --> 00:07:33.780  
Russell Garner  
So that's that I think will be the biggest change.

00:07:31.730 --> 00:07:32.240  
Mark Schroeder  
Umm.

00:07:34.540 --> 00:07:39.570  
Mark Schroeder  
Yep. So do you think AI will be a big part in maybe automation and stuff like that?

00:07:39.670 --> 00:07:46.180  
Russell Garner  
Yes, as it had already beginning. Now as IFI will use AI to develop rules for.

00:07:47.650 --> 00:07:48.500  
Russell Garner  
Determining.

00:07:49.380 --> 00:07:49.800  
Russell Garner  
Umm.

00:07:51.440 --> 00:07:52.560  
Russell Garner  
Nicola time.

00:07:54.140 --> 00:08:03.120  
Russell Garner  
Of the one he saw, forget that the tech that just coming in, there's no longer a person or a team of people having to do that. It's just at all an AI robot in the background.

00:07:58.370 --> 00:07:58.620  
Mark Schroeder  
Yep.

00:08:03.770 --> 00:08:04.200  
Mark Schroeder  
Yep.

00:08:05.150 --> 00:08:10.130  
Mark Schroeder  
Yeah, very good. Well, Umm, thank you very much for your time. I think that's all. That's what we need.

00:08:11.570 --> 00:08:15.210  
Mark Schroeder  
And there's that consent form that I sent you.

00:08:14.620 --> 00:08:14.830  
Russell Garner  
Yep.

00:08:16.570 --> 00:08:20.480  
Mark Schroeder  
So yeah, it is it all good. If we quote you in our report.

00:08:20.690 --> 00:08:22.680  
Russell Garner  
Yet that's fine. Not a problem.

00:08:23.400 --> 00:08:24.750  
Mark Schroeder  
Fantastic. Thanks for Russell.

00:08:24.800 --> 00:08:25.670  
Russell Garner  
OK, no worries.

00:08:26.640 --> 00:08:27.290  
Russell Garner  
Catch you later.

## Appendix 1.1 – Interviewee Recording Consent Form

Recording consent form

Thank you for participating in our Information Technology research.

We will be recording your session to allow RMIT students who are unable to be here today to observe your session and benefit from your comments.

Please read the statement below and sign where indicated.

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

I understand that my usability test session will be recorded.

I grant RMIT permission to use this recording for internal use only.

Shape

Description automatically generated with medium confidenceSignature:

Print your name: Russell Garner

Date: 8/04/2022