Higher education cover sheet for submission of work assessment

RMIT UNIVERSITY

Cover Sheet

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School: School of Science (CS & IT), RMIT

Program name: OUA Study Period 4 **Program code:** UG 2020 (2097)

Course/unit name: Introduction to Information Technology **Course/unit code:** COSC2196

Name of lecturer/teacher: Anthony Clapp

Name of tutor/marker: Umera Imtinan – Group D

Assignment no: 2 **Due date (DD/MM/YYYY):** 22/01/2021 **Class day/time:** Tuesdays 7pm and Monday 8pm **Campus:** OUA

Student/s

Family name: Batten	**Given name:** Phillip	**Student no:** S3882329
Family name: Watson	**Given name:** Michelle	**Student no:** S3632469
Family name: King	**Given name:** Nathan	**Student no:** S3887135
Family name: Cameron	**Given name:** Alasdair	**Student no:** S3884660
Family name: Mpantellis	**Given name:** Nicholas	**Student no:** S3863803
Family name:	**Given name:**	**Student no:**

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1. Phil Batten (electronically acknowledged 22/01/2021)
2. Michelle Watson (electronically acknowledged 22/01/2021)
3. Nathan King (electronically acknowledged 22/01/2021)
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GitHub Public Repository URL: https://github.com/nathan-king/COSC2196_Assessment2

GitHub Public Pages URL: https://nathan-king.github.io/COSC2196_Assessment2/

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Figures

Welcome to Team PANNM.

Figure 1: Phil
Link to Website

Phil Batten | s3882329

Phil is a retail executive, from Hoppers Crossing Victoria. He has over 30 years' experience in the supermarket industry with varying managerial roles during this time but is now ready for a career change. Phil lives with his partner Veronica, three children Tayla, Jai and Brodie, and dog Rocky. They love to get away camping three or four times a year, with his favourite spot being off the grid in the high--country Howqua Hills. Phil has always had an interest in IT, since the early days of computers; however, life got in the way, he is now only just following his passion. Phil works daily with Microsoft Office and Google Suite. He has expanded knowledge as an end-user of SAP BW, SAP R3, SAP WEBI, TM1, KRONOS, in financial reporting. He has also used JavaScript and SQL Developer in the past and recently worked on his SQL scripting skills. (Batten, 2020)

Figure 2: Alasdair
Link to Website

Alasdair Cameron | s3884660

Alasdair is back living in Perth, WA, with his fiancée and two cats, after growing up in a country town Capel. Working in an administrative role and studying, his free time is limited, but thanks to online study combined with his current role, he has the right amount of flexibility for it to run smoothly. However, when he does have free time you find him gaming, one might say he has a particular set of skills, which allow him to play no better than the average player. Alasdair has had an interest in IT since taking a robotics class in year 8. He learnt to program the behaviour of the Lego models using a program that graphically represented logic gates. During his later years in high school, he learnt to program complex games or methods on his graphics calculator for solving maths and physics problems. (Cameron, 2020)

Figure 3: Nathan
Link to Website

Nathan King | s3887135

Nathan is a British Australian living in Sydney, NSW. Over the years he lived in multiple countries including France, Canada and Japan and can speak French, Portuguese and Spanish on top of English. He has a Bachelor of Psychology but has taken the leap and is now working as a freelance web developer. As a child Nathan was fascinated by computers, spending hours discovering his first PC - a Windows 95 Dell. Nathan's main interest in IT is the way technology shapes our civilisation. Ever since undertaking a Udemy course on web development, he knew he wanted to work in and study IT in a serious capacity. While Nathan has experience with development and programming, he wishes to expand his understanding and knowledge and learn different aspects of the IT works, the science behind computer systems, the directions that IT is moving and more profound programming aspects. (King, 2020)

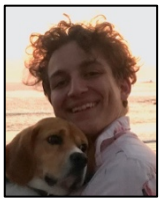

Figure 4: Nicholas
Link to Website

Nicholas Mpantellis | s3863803

Nicholas is living in Melbourne Victoria, working in sales while studying. While living in Australia his whole life, his mum is from the Seychelle Islands, and his dad is from Greece. He is currently teaching himself Mandarin and enjoys American Football. Although it can be painful at times, he has recently become infatuated with mountain biking. Nicholas has always loved games and continuously wondered how they work, ever since his family had their first console, a Super Nintendo. Game design is not necessarily the career path he desires in IT, but it sparked his interest in learning more. He aims to understand better IT's aspects, including computer systems, i.e., how they work, cyber-security, i.e., how to prevent breaches and improve programming skills. (Mpantellis, 2020)

Figure 5: Michelle
Link to Website

Michelle Watson | s3632469

Michelle is a paraplanner from the Newcastle area in NSW. She has only five subjects to go in completing her Bachelor of Business (Financial Planning). She has a strong background in the financial planning industry, soon to become a senior paraplanner. Memphis is her 7-year-old white bi-eyed Siberian Husky, who is pretty much her everything. She is currently obsessed with Hamilton the musical receiving tickets for Christmas, to see a Sydney performance in April. Michelle has no real interest in IT and is only completing the subject as it is a core subject of her degree. She has the essential Microsoft Office knowledge and an understanding of the software she uses for work. Michelle will rely significantly on this group to help guide her to understand the IT world better. (Watson, 2020)

Team Profile

The tests' results indicate we have a diverse range of personalities and learning styles within our team. When asked how we would take these results into account when forming a team, we all said we would like to find team members that complement our strengths and weaknesses. We believe this information/results will allow us to each gain a better understanding of one another (how we all tick individually) and an expectation of how we will take on a group assignment via distance education.

Test 1 - Myer - Briggs

MYER - BRIGGS 16 PERSONALITIES TEST		
Alasdair	**Nathan**	**Nicholas**
Logician INTP-T	Campaigner ENFP-A	Debater ENTP-A
Phil	**Michelle**	
Defender ISFJ-A	Adventurer ISFP-T	

Table 1: Myer - Briggs 16 Personalities Profile Test Results.

Test 2 - Learning Styles

EDUCATION PLANNER TEST		
Alasdair	**Nathan**	**Nicholas**
• Auditory: 20% • **Visual: 60%** • Tactile: 20%	• Auditory: 15% • Visual: 40% • **Tactile: 45%**	• **Auditory: 55%** • Visual: 20% • Tactile: 25%
EMTRAIN WP 8 TEST		
Phil	**Michelle**	
• **Pragmatist Style: 0.316** • Theorist Style: 0.250 • Reflector Style: 0.250 • Activist Style: 0.136	• **Reflector Style: 0.353** • Pragmatist Style: 0.278 • Theorist Style: 0.211 • Activist Style: 0.095	

Table 2: Learning Styles Profile Test Results.

Test 3 - Optional choice

BIG 5 TEST		ERROR CHECKING TEST
Alasdair	**Nicholas**	**Nathan**
• Openness: 80 (high) • Neuroticism: 86 (high) • Extraversion: 56 (low) • Conscientiousness: 62 (low)	• Openness: 73 • Neuroticism: 54 • Extraversion: 73 • Conscientiousness: 44	• Percentile: 91st • Score: 5 out of 5 • Average speed: 13 seconds
CLIFTON STRENGTHS TEST	**DDI (Development Dimensions International) CANDIDATE TEST**	
Michelle	**Phil**	
1. Harmony 2. Empathy 3. Consistency 4. Adaptability 5. Responsibility	**Strategic Reasoning** |Reasonably effective at putting problems in context and deciding whether they are worth solving. **Tactical Reasoning** | Able to identify causal chains and sequences of events that tend to reoccur, to predict outcomes. **Critical Thinker** |Likely to contextualise problems correctly in terms of the short-term and long-term benefits of their solution and solve them effectively.	

Table 3: Optional Personality Profile Test Results

Ideal Jobs

	Phil	Alasdair	Nathan	Nicholas	Michelle
Ideal Job	SAP SuccessFactors Consultants	Software Engineer	Senior .Net Developer	Account Manager	Financial Adviser
Industry	Information Technology & Services	Information & Communication Technology - Engineering Software	Information Technology	Information & Communication Technology - Sales - Pre & Post	Banking & Financial Services - Financial Planning
Degree	Bachelor of Commerce (Finance)	Bachelor of Information Technology	Bachelor of Information Technology	Bachelor of Information Technology	Bachelor of Business (Financial Planning)
Brief Description	SuccessFactors is a cloud-based platform for organisational structure management, payroll, learning and managing goals and objectives.	Working in a team to improve an existing piece of software and its integration with other software.	Senior .NET/C# developer utilising AI technology to assist in the automation of tasks.	To work at ways to acquire new clients and service current clients in providing them with the most suitable IT products to meet business needs.	A financial adviser to provide financial advice about personal wealth management and insurance needs.
Skills Required	• Certified SAP SuccessFactors • Experience in one or more HXM projects • Customer service skills • Ability to work within a team	• Five years' experience in C++ or similar language • Experience with UML • Experience with unit test framework • Ability to work within a team	• Expert level skills in C# and .NET Core • Experience solving algorithmic problems. • Understanding of Containerisation and Cloud technologies • Ability to work in a team	• Previous Sales Experience in the IT industry • Strong Customer service skills • Professional Communication • Proficiency in Microsoft Excel	• FASEA approved degree • Undertaken professional year • Understanding of Financial Planning software (Xplan, COIN) • Exceptional interpersonal skills
	(Batten, 2020)	(Cameron, 2020)	(King, 2020)	(Mpantellis, 2020)	(Watson, 2020)

Table 4: Comparing the ideal jobs of Group 6 Team PANNM members.

Based on the information above we can see that four of us have ideal jobs within the IT Industry, with Michelle's ideal job within the Financial Planning industry. Although four of these jobs are within the IT Industry, they all focus on different areas, from client-facing to software engineering and development and require different IT skills. While the IT skills differ between all five jobs, there are common elements, including working in a team and customer service skills.

Tools

MS Teams

Figure 6: MS Teams Logo ("Microsoft Office is part of Microsoft 365 | Office Apps FAQs" 2020)

After forming our group on the Canvas Discussion board, MS Teams has been the primary communication form. We are utilising the built-in discussion board to post about essential communications, using the Teams Meeting site to have our thrice-weekly catchups and the file-sharing for agendas, actions, and sharing of other documents relevant to this assignment. The other essential tool was the Chat function on MS Teams used for general ad-lib discussions to share ideas, reminders, or check-in. Copies of the Agendas, recordings of Meetings and Actions evolving from those meetings available on the below links.

MS Teams Group 6 PANNM Joining Link

- Link to Join COSC2196 Introduction to IT (Study Period 4) Group 6 Teams Channel

Meeting Records

• 05/01/2021	Link to Agenda	Link to Recording	Link to Actions
• 07/01/2021	Link to Agenda	Link to Recording	Link to Actions
• 10/01/2021	Link to Agenda	Link to Recording	Link to Actions
• 12/01/2021	Link to Agenda	Link to Recording	Link to Actions
• 15/01/2021	Link to Agenda	Link to Recording	Link to Actions
• 17/01/2021	Link to Agenda	Link to Recording	Link to Actions
• 19/01/2021	Link to Agenda	Link to Recording	Link to Actions
• 21/01/2021	Link to Agenda	Link to Recording	Link to Actions

Other Documents

- Project Resources
- Interview Record of IT Works | Alistair Elliott. Director, Discovery Consulting
- Module 7.2.1 Group module

Figure 7:Git Hub Logo ("Build software better, together" 2021)

GitHub Team Website

- Link to Website

GitHub Team Repository

- Link to Group 6 – PANNM Repository

Whilst we agree the GitHub Repository Audit trail is a powerful tool for tracking and logging the work completed with the website's development, we did not find it practical to form an audit trail to complete this report. The group has successfully worked together, maintaining strong communication daily using the Chat application on the Teams site, using the discussion board for significant points, but found the Chat app more user friendly and just as easy to share information links.

The group used SharePoint in the Teams Site to share all the necessary files, including the Agenda and Actions outlined above. Though the main piece was collaboratively creating this report using SharePoint and Word, we simultaneously worked on the same document. Allowing us to actively see each other's work develop and gave the ability to use the comments section to tag and discuss points, and pose questions and alternatives. Interestingly, as the report was getting closer to completion and file size more extensive, we had issues with images disappearing from our document (X Image cannot be displayed.), thankfully, as this file was being saved using Share Point, we were able to use version history to restore images from previous versions.

Industry Data

Job Titles and Demand from employers

PANNM is quite varied in that each member of the group has a different overall goal for our career path and where we see ourselves working after our academic journey comes to a close. Although some of our ideal jobs are in the IT industry, other members hope to work in a role that requires minimal technical skills or a position outside of the industry altogether. Here we will be using Burning Glass Data and other forms of data to analyse the demand for our ideal jobs.

Name	Title	Rank
Phil Batten	SAP Consultant	-
Alasdair Cameron	Software Engineer	11
Nathan King	.NET Developer	3
Nicholas Mpantellis	IT Accounts Manager	-
Michelle Watson	Financial Adviser	-

Table 5: Group 6 Team PANNM Ideal Job rankings.

Above we have used the Burning Glass Data provided to rank the demand of our Ideal Jobs. We determined that Alasdair and Nathan's ideal jobs were some of the more highly demanded roles in the IT industry. There was no information regarding the other three ideal jobs. However, we identified the below results after completing an independent search on the job site "indeed" and using the same parameters as the provided Burning Glass Data (Australia OR New Zealand).

Name	Title	Listings	Rank
Phil Batten	SAP Consultant	110	76
Nicholas Mpantellis	IT Account Manager	15	202
Michelle Watson	Financial Adviser	17	201

Table 6: Comparing Group 6 Team PANNM Ideal Job Rankings with Advertised Job Listings.

The above table does not indicate the demand for our ideal jobs; it should be used only as an idea. This is due to very narrow search parameters such as only one site being used for the search to avoid any duplicate listings on different sites, and the only listings returned were the ones that contained the exact name of the role. For this reason, the data would not be beneficial when identifying demand for a position.

Skills in High Demand

SAP Consultant	
IT-Specific Skills	**General Skills**
• SAP • JavaScript • JAVA • Git • Software Engineering • Database Administration • Technical Support • Software Architecture	• Communication Skills • Problem Solving • Organisational Skills • Analytical Skills • Research • Time Management • Multi-Tasking • Building Effective Relationships

Table 7: SAP Consultant IT Specific and General Skills Requirements.

Software Engineer	
IT-Specific Skills	**General Skills**
• JavaScript • SQL • Software Engineering • Microsoft C# • JAVA • Debugging • Linux • Microsoft Windows	• Communication Skills • Problem Solving • Teamwork • Strategic Planning • Creativity • Time Management • Decision Making • Project Planning and Development Skills

Table 8: Software Engineer Specific and General Skills Requirements.

.NET Developer	
IT-Specific Skills	**General Skills**
• .NET Programming • Microsoft C# • SQL Server • Software Engineering • Visual Studio • JavaScript • Database Management • HTML5 • CSS	• Teamwork • Problem Solving • Self-Motivation • Creativity • Time Management • Detail-Orientated • Multi-Tasking

Table 9: .NET Developer Specific and General Skills Requirements.

IT Account Manager	
IT-Specific Skills	**General Skills**
• Microsoft Windows • Microsoft Operating Systems • Microsoft Office • Software Use Instructions • Software Architecture • System Architecture • Hardware and Software Configuration	• Self-Motivation • Detail-Orientated • Teamwork • Presentation Skills • Building Effective Relationships • Initiative • Needs Assessment • Research • Communication Skills

Table 10: IT Account Manager Specific and General Skills Requirements.

Financial Adviser	
IT-Specific Skills	**General Skills**
• Microsoft Office • Data Analysis • Xplan • COIN • Insurance Quoting Programs • Xtools	• Communication Skills • Research • Analytical Skills • Strategic Planning • Initiative • Critical Thinking • Presentation Skills • Listening

Table 11: Financial Adviser Specific and General Skills Requirements.

Ranking the Demand for our IT-Specific Skills

Below we have a table of our groups required IT-specific skillset ranked to allow us to compare the skills and see which skills are more transferable in the different roles. From the table, we can determine that the SAP Consultant, Software Engineer, and .NET developer have more demanded skills and require more understanding in different programming languages.

Rank	IT-Specific Skills	SAP Consultant	Software Engineer	.NET Developer	IT Account Manager	Financial Adviser
1	SQL		■			
2	JavaScript	■	■	■		
3	JAVA	■	■			
4	Microsoft Windows		■		■	
6	SAP	■				
11	Technical Support	■				
12	Microsoft C#		■	■		
13	Linux		■			
15	Software Engineering	■	■	■		
16	.NET Programming			■		
18	Microsoft Office				■	■
21	Git	■				
27	SQL Server			■		
28	HTML5			■		
40	Software Use Instructions				■	
60	CSS			■		
69	Data Analysis					■
74	Database Administration	■		■		
110	Debugging		■			
121	Software Architecture	■			■	
127	System Architecture				■	
129	Hardware and Software Configuration				■	
131	Visual Studio			■		
190	Microsoft Operating Systems				■	
-	Xplan					■
-	COIN					■
-	Insurance Quoting Programs					■
-	Xtools					■

Table 12: Comparing the Ranking of the IT Skills Demands for the Ideal Jobs of Group 6 Team PANNM members.

Ranking the Demand for our Generic Skills

We have also ranked all our required generic skills based on employers' demand and used the table to identify any highly regarded skills between multiple roles. We can see that there is a very high demand for someone with good communication skills across all industries, and time management is very much needed in some of the more technical roles.

Rank	Generic Skills	SAP Consultant	Software Engineer	.NET Developer	IT Account Manager	Financial Adviser
1	Communication Skills	■	■		■	■
2	Problem Solving	■	■	■		
3	Organisational Skills	■				
5	Teamwork		■	■	■	
8	Detail-Orientated			■	■	
9	Creativity		■	■		
10	Research	■				■
12	Time Management	■	■	■		
15	Presentation Skills				■	■
17	Analytical Skills	■				■
20	Multi-Tasking	■		■		
22	Building Effective Relationships	■			■	
25	Decision Making		■			
28	Project Planning and Development Skills		■			
36	Initiative				■	■
37	Listening					■
38	Strategic Planning		■			■
40	Needs Assessment				■	
43	Self-Motivation			■	■	
53	Critical Thinking					■

Table 13: Comparing the Demand Ranking of Generic Skills of the Ideal Jobs of Group 6 Team PANNM members.

Ranking the Demand for the top 3 IT-Specific and Generic Skills Not in Our Skillset

Here we have ranked the top 3 IT-related and generic skills that are not in our required skillset. This does not mean that these skills aren't used by someone performing the role; having these skills isn't going to make you stand out to an employer necessarily. These tables confirm what is already stated in the previous tables: the IT Accounts Manager and Financial Adviser positions don't require many of the highly demanded technical skills that the other roles require.

Rank	IT-Specific Skills	SAP Consultant	Software Engineer	.NET Developer	IT Accounts Manager	Financial Adviser
1	SQL	■			■	■
2	JavaScript				■	■
3	JAVA				■	■
4	Microsoft Windows	■				
6	SAP		■	■		
10	Graphic Design	■				
11	Technical Support		■	■		
18	Microsoft Office		■	■		

Table 14: Comparing the Top 3 IT Related Skills Not in the Skill Set of Group 6 Team PANNM members.

Rank	Generic Skills	SAP Consultant	Software Engineer	.NET Developer	IT Accounts Manager	Financial Adviser
4	Writing					
5	Teamwork					
6	Troubleshooting					
9	Creativity					
13	Mentoring					
17	Analytical Skills					

Table 15: Comparing the Top 3 Generic Skills Not in the Skill Set of Group 6 Team PANNM members.

Ideal Job Opinion

Phil Batten

My view of the ideal job remains unchanged though it is still several years before coming to fruition. I was fully aware of the skills that required developing to be successful. However, the plan's largest piece is completing a degree in Finance or HCM, supporting the role with credibility. With nearly one-third of the degree completed over the last two years, it is still at least another four years of study while I work full time. Outside of the degree, SAP and JavaScript skills will form part of an essential development plan.

Alasdair Cameron

My ideal job is still one that involves using programming skills to solve a problem. Software engineering is a job that is in high demand, as evidenced by the data. Many jobs require similar skillsets, so fulfilling a software engineering role requirements would see me in good stead for other job titles. For example, software engineering requires a good knowledge of Java. In the Burning Glass data, Java Developer is ranked seventh, and Senior Java Developer is ranked thirteen. Thus if I continue to work towards a software engineering role, focusing on programming in my Bachelor of IT degree, I will be well placed for several positions.

Nathan King

My ideal job will remain the same as it is a natural evolution of what I am doing right now as a hobby. Furthermore, this course will make my ideal job more tangible along with the subsequent exposure to the industry. According to the Burning Glass data, this particular job is in very high demand, ranking 6th In terms of industry demand. Amongst the skills that I will need to acquire is SAP, which I know absolutely nothing about. Despite the time it will take me to obtain something resembling my dream job and the skills I will need to develop and master, I think I am in good stead going forward.

Nicholas Mpantellis

I believe my ideal job has not changed, although I am still very intrigued by Cybersecurity. Still, I think that a sales position is the preferred role for me to get into. I am currently in the process of taking on a role with an IT company and working in this sort of environment while completing a Bachelors in IT would allow me to get a head start so I can make my way into an account manager role as soon as I have completed it. Overall, the Burning Glass Data has not changed the way I see the role in any manner as it still allows me to utilise my sales and customer service experience to build relationships with new clients every day.

Michelle Watson

My ideal job remains unchanged. I have worked in the industry for almost five years as a paraplanner and work closely with the Financial Advisers. This hands-on experience allows me to gain insight as to what this role entails. With only one year left of my degree, I am well on my way to my ideal job. I will be able to undertake my professional year at my current workplace and then take on a Financial Adviser role once I have passed the FASEA exam.

IT Work

Interview with an IT Professional

Name: Alistair Elliott.

Role: Director and Managing Partner.

Company: Discovery Consulting.

Website: https://discoveryconsulting.com.au/

LinkedIn Profile: https://www.linkedin.com/in/alistairelliott/

Figure 8: Alistair Elliott. Director & Managing Partner, Discovery Consulting. ("LinkedIn" 2020)

> *As the Managing Partner at Discovery Consulting, my team and I provide assistance to organisations who want to discover a new competitive advantage through SAP's industry-leading technology solutions, including S/4HANA and SuccessFactors. We also offer expert consulting services, including programme and project management, functional and technical consulting, change management and business engineering. ("LinkedIn" 2020)*

LinkedIn Videos

- What is your role and responsibilities at Discovery Consulting? What does your company do? (SocialGen 2018)
- Why do organisations move to Cloud ERP and what is Intelligent Enterprise? (SocialGen 2018)
- What are you and your organisation passionate about? (SocialGen 2018)

What kind of work does he do?

Our interviewee Alistair Elliot is a director for an IT consulting organisation, Discovery Consulting. Discovery Consulting specialises in SAP software, which is a type of Enterprise Resource Planning (ERP) software ("What does SAP stand for?" 2020). ERP is essentially the software that integrates all enterprise processes into one system, allowing for central management and integration of processes such as Finance, HR, production etc. ("What Is ERP Today?" 2020).

This means that Alistair works with his clients to develop IT solutions for their business that use SAP software. As a consultant, it is his role to get an idea of what his clients want and work collaboratively to create a solution. The end goal is his clients end up saving money and can work more freely.

Alistair finds it rewarding to plan and design systems that go beyond what the organisation has envisaged. He has had many cases where he has assisted organisations with vast amounts of manual work and processes, causing significant inefficiencies and some significant errors to occur – front page newsworthy. By implementing the system that he has designed along with his company, Alistair can demonstrate to his clients' tangible results and increased productivity. By allowing his clients to work faster and more accurately, Alistair finds job satisfaction.

Who does he interact with, and how?

Working between a vendor and customers, Alistair is needed to interact with three groups of people: his customers, the software vendor, and internal company members.

Customers

As with most businesses, customers are at the centre of what Discovery Consulting and Alistair do. As his customers are implicitly all businesses, his interactions with clients are of a B2B (business to business) nature.

ERP software will touch all parts of a business, so Alistair predominately deals with his customer's organisations' executive level. Usually, this would include the Chief Information Officer (CIO) for outlining the strategic plans for IT systems, Chief Financial Officer (CFO) for planning financial systems and budgeting, and Chief of Human Resources (CHR) for when solutions involve human resources.

Key to all his interactions with customers is collaboration. As a consultant, he is a bridge between what the client wants and what is technically possible, or feasible. This requires online or over-the-phone collaboration and travelling to the customer's premises to better understand what needs to be completed and implemented.

Software vendor

The suite of software programs that make up SAP are not released and then remains as-is, with minor updates for bug fixes. Instead, SAP is continually evolving, requiring constant communication between the vendor and Alistair's company to stay up to date. Alistair works with account managers, partner managers and solution architects. Since Discovery Consulting is reliant on SAP, and not the other way around, it is up to Alistair and his colleagues to reach out to SAP. This frequently involves travel, including international travel to Singapore, the US or Europe.

Internal

As a Discovery Consulting director, Alistair must interact with people across his organisation's entire breadth. He mainly works with others providing IT consultancy, who design, build, deliver and support. He also works with the company's accountant for financial matters, the HR manager for human capital matters, and Payroll, reporting and internal IT staff to ensure the company itself is supported from an IT perspective. This occurs within the (Melbourne) office with occasional travel to the Sydney office.

Where does he spend most of his time?

Discovery Consulting's priority is to ensure successful delivery of their IT projects, and thus most of Alistair's time is spent with customers. While Alistair's company will help with the ERP software implementation, the customers will be using it on a day-to-day basis and will require a knowledge of how their setup works and how to use it. Alistair will spend time with customers to ensure they understand how to do tasks and manage any issues. There are certain risks inherent with using any software to manage processes, and the clients need to know how to handle this risk, which requires Alistair's assistance.

How did he get where he is?

Alistair started as an accountant, with a Bachelor's degree in business and an MBA. With interest in IT, Alistair started using his accountancy background to assist with developing IT systems in Finance. He moved on from IT development to management and consulting, which led to a partnership with SAP technologies. As Alistair moved along his career bath, he learned that the most important thing is the organisation for which you work for – while money is essential, it's vital to find a role in an organisation that is enjoyable to work at, supportive and appreciative. "You work to live, not live to work".

What does he find challenging?

One challenging aspect of Alistair's work is people management, interacting with those both internal and external. As part of his role, Alistair needs to interact with people of diverse backgrounds and personalities. While this can be seen as refreshing, it can also mean that there are elements of the teams he deals with that require significant time to assist, coach and manage.

Another challenging piece in his current organisation is staying up to date with developments and changes to the software used by the company, SAP. A new version is released to the market every six months. Those at Digital Consulting need to stay current or else fall behind their competition; both in the consulting space and behind those using other competitors to SAP. This is a significant investment for the organisation and at an individual level, with 5-10% of his time spent annually on professional development.

To get to where he is, Alistair has had to learn quickly. He found that he started out of his depth when performing specific roles and had to get up to speed. He mentions, however, that many roles were related or had some transferable skills.

What are his recommendations for those looking to enter the industry?

Practical experience within the business is highly recommended for looking to enter into a business IT consulting role. Alistair considers that people with business experience and acumen are valued greatly within the professional services/ERP field. A person having a background and experience in how business works in the real world would have great insight into the processes that go on in a business. This fundamental understanding of "real business" can be applied to the IT side, enhancing this person's abilities to manage the processes and challenges faced and credibility that the person knows what they are talking about.

IT Technologies

Natural Language processing and chatbots.

What does it do?

Natural language processing (NLP) attempts to reconcile the differences between human language representation and the computer instruction set in basic terms. In essence, NLP translates human language into a language understood by computers (Kyrill Poelmans 2020). On a broader note, NLP is a subdivision of artificial intelligence (AI), itself a subdivision of computer science, concerned with developing technologies that enable a computer to understand human language at a human-like level (IBM Cloud Education 2020). How NLP aims to do this is through tasks such as speech recognition, co-reference resolution, part-of-speech tagging, sentimental analysis, word-sense disambiguation, and natural language generation (IBM Cloud Education 2020):

- Speech recognition is how computer analyses the spoken language data and represents it as human writing, considering factors such as grammar, syntax, product branding, the sanitisation of profanity, and even identifying and labelling the source of a speech segment (IBM Cloud Education 2020). An excellent example of speech recognition is YouTube's automatic captioning feature which generates words and phrases from the audio of videos.
- Co-reference resolution is the identification of different words and expressions that point to the same individual or object. In an example given by the Standford NLP Group, the term "he" may refer to a man named "Nader," so being able to identify that the two words refer to the same entity is especially important in NLP ("The Stanford Natural Language Processing Group" 2016).
- Part-of-speech tagging is the classification of words as serving a particular grammatical function. These grammatical functions are defined by as being a part of speech such, as a noun (an object or person), a verb (an action), an adverb (how an action is performed) etc. ("The Stanford Natural Language Processing Group" 2017).
- Sentimental analysis is the classification of sections of language as negative, neutral, or positive in sentiment. NLP achieves this by breaking down speech or text into components or phrases, assessing its sentimentality, and then devising a score evaluating the language section's general sentimentality. ("Sentiment Analysis | Lexalytics" 2021).
- Word-sense disambiguation understands how the meaning of a word or phrase can differ depending on its context—utilising resources such as dictionaries, artificial neural/connectionist networks, and statistics (Stevenson & Wilks 2012) as programming languages are unlike human language which is mostly abstract and full of homophones, homonyms, idiomatic expressions etc.
- Natural language generation takes a set of data, identifies patterns within the data, and then generates human-like and natural language (TechTarget Contributors 2017). Natural language generation generates news or allows a computer to interact with human beings (e.g., chatbots).

NLP has developed many well-known tools that we use today, such as spell-checking, autocomplete and spam-filtering (Kyrill Poelmans 2020). Furthermore, it has resulted in the development of chatbots.

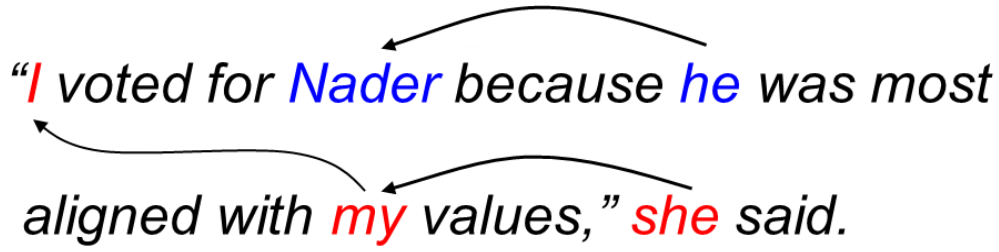

Figure 9: An example of co-reference resolution (“The Stanford Language Processing Group”, 2016)

Chatbots are artificial intelligence programs that attempt to utilise natural-sounding human language to converse with human beings in a human-like manner (Chatbot: What is a Chatbot? Why are Chatbots Important? - Expert.ai 2020). Chatbots take advantage of NLP to bring robots closer to human beings and allow human-computer communication that is mostly simplified and natural.

There are generally two forms of Chatbots. A task-oriented Chatbot used for queries about products from customers or

Data-driven predictive Chatbots often seen as virtual assistants who aim to personalise themselves according to the user and adapt preferences over time, such as Cortana, Alexa etc. (What is a Chatbot? 2020). In summary, chatbots represent NLP principles' culmination and increasingly allow more human-like interactions between human beings and Artificial Intelligence.

What is the likely impact?

There are numerous ways natural language processing will generally impact human beings and how they interact with technology. NLP features already impact our everyday life, with tools such as autocorrect, virtual assistants (such as chatbots), “Google Translate”, automatic video captioning etc.

Indeed, NLP is becoming more and more present in our lives and is a field that is growing exponentially. As NLP improves, so will the accuracy of its tasks. For example, the sentimental analysis will consider more of the unspoken aspects of human communication, such as facial expressions and body language. Furthermore, NLP will likely integrate Machine Learning more and more in developing robust and adaptable chatbots. The ubiquity of such innovations may create a market that comes to expect such technology as part of the consumer experience ("The Future of NLP in Data Science "2018).

Some other future NLP applications are in healthcare, personal virtual assistants, and the automotive industry (Radhika Madhavan 2019.) In healthcare, NLP could be utilised to improve medical imagery interpretation through captioning, assistance in the diagnostic process, and the generation of medical reports. NLP could enable more fluid and natural task giving by the user with personal virtual assistants, where a task would be split up into smaller commands. Lastly, in the automotive industry, NLP could be harnessed to bridge the gap between the breadth of functions that the AI system can perform and those that can be executed by other systems. Thus, if the command were made outside of the system's capabilities, this task would be delegated to another integrated system, such as opening a garage door (Radhika Madhavan 2019).

How will this affect you?

On a personal level, NLP will change the way I interact with technology daily. As NLP improves, communicating with technology will be more and more like interacting with human beings. As I wish to become a programmer and software developer in the future, we will probably see the emergence of more human-like programming languages and paradigms. While I doubt that traditional programming languages will cease to exist, speech-to-text may make its way into development circles to deal with the problems associated with conventional typing.

Repetitive Strain Injury (RSI) resulting in physiological problems that may preclude programmers from coding in traditional ways may benefit from improving NLP software in fields such as software development and scientific disciplines that use programming. While currently programming by voice may sound like a "staccato" of commands, I expect that more human ways of writing the code will emerge as NLP increases its robustness and accuracy (Nowogrodzki 2018). Furthermore, NLP in programming may allow for more fluid development and boost creativity through natural human expression.

As a consumer, I am already starting to see automation to make its footprint in the world. I believe that as NLP is ameliorated and perfected, we will begin to see automated interactions become more human-like. In that respect, I will probably be less likely to notice whether an online exchange, for example, is with a human being or a chatbot.

Furthermore, I will probably start to see more reasons to utilise personal assistants to become more ubiquitous and straightforward. This will affect how I do shopping, make plans, interact with others and execute basic daily tasks. Whether as simple as turning on a light, writing a software application, or setting the GPS on a self-driving car, I expect NLP to have a large and lasting impact on how I live and interact with the world.

Cyber Security

What does it do?

Cybersecurity refers to methods that are used by Individuals and IT professionals to secure information and devices, keeping them protected against any attackers (TechRadar 2020). The main aim is to preserve the confidentiality of the information, so access is granted to authorised users while restricting access to anyone else to prevent data leaks and data misuse for malicious purposes.

Cyberattacks have been happening since the late 1980s. They have become a regular occurrence in the last two decades (Spanning, 2020), with more and more businesses storing information on local and cloud servers. As a result of data access being required globally, more people are aware of their internet presence and the necessary software to secure them. In turn, this has pushed hackers to become smarter in finding ways to catch people off guard and trick them into giving access to their systems. Therefore, most businesses use multiple security layers to ensure their systems are completely protected against all kinds of breaches and malware that can be accidentally downloaded from websites, spam emails and other forms of intrusion.

To ensure a system is entirely secured from breaches, an individual or business will often use any combination of the following highly recommended security forms to ensure that all fronts are covered.

- Information Security works to directly secure files using encryption tools to ensure that even if an unauthorised user accesses a file, the information is all unreadable (TechRadar 2020). Information security is found in most sites and programs that store data on them.
- Cloud Security is a security method on cloud servers that observes any activity and access to data in the account and will send out an alert when any suspicious behaviour occurs. Cloud computing is overall entirely private; however, security is recommended to ensure a high protection level (What Security? 2020).
- Network Security involves protecting your local network from external threats and intrusions. It is more likely to be required by an individual than cloud security as it allows for a user's home network to be protected against breaches. Network security can be broken up into the physical aspect such as physical access to network components like routers, Technical which includes the protection of data on the network, and administrative security which addresses user authentication, levels of access and password management (Forcepoint 2018).

- Application Security is one of the more needed forms of security that is usually implemented by the software developer. It is especially needed as applications can prove to be quite vulnerable to attacks because they are accessible over different networks (What Security? 2020). Application security is a way of adding features to specific software to protect it from a range of attacks and data theft (Techopedia.com n.d).

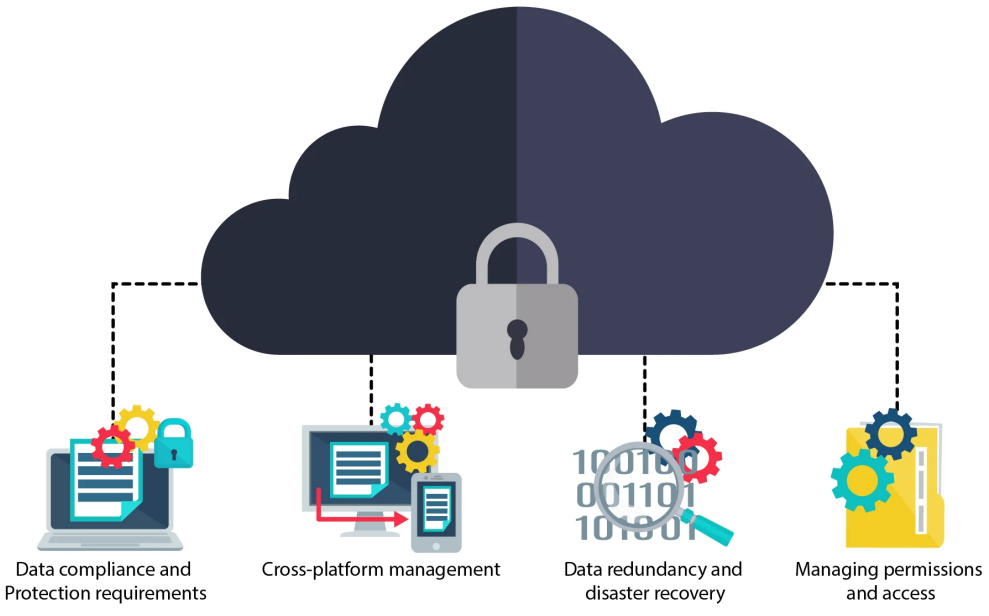

Figure 10: "Mitigating Cloud Risk" (Inedo 2020)

These security tools are implemented using different kinds of software, all of which have improved quality, price and accessibility over the years. Some of these applications offer a free version with limited features which is still enough for the average user. These forms of the software include:

- Antivirus Software allows users to scan their system in search of any malware or try to enter the system that could be attempting to access and steal sensitive data (Lifewire 2019).
- Firewalls manage the incoming network traffic and prevent any suspicious data packets based on set security rules. It works as a protective wall between the local network and any external sources ("What Is a Firewall?" 2018).
- Encryption Programs are a security program that will work to encrypt a stream of data to ensure it is not accessible unless by an authorised user ("What Is Encryption Software?" n.d).
- Anti-Spyware is a software that will continuously search for spyware which has the primary goal of getting access to your computer to log any passwords and keystrokes made by the user. It will do this by scanning any new and existing applications on your hard drive (Financesonline.com 2017).

What is the likely impact?

With a more considerable emphasis on the importance of Cybersecurity, good quality and secure software are highly sought out. There is a vast market for security software with very competitive prices and different programs offering their own individual features such as some antivirus platforms offering free Virtual Private Networks (VPN), and browser extensions so that a website can be vetted to verify that it meets the security requirements provided by the software.

Cybersecurity advancements allow technology to be implemented securely in more ways, such as through the Internet of things (IoT). Most people tend to not worry about IoT device security even though most of us have one in the form of a smartwatch, google home and even robot vacuum cleaners. These appliances are most vulnerable as they are also connected to WIFI networks to be controlled by our phones and therefore can be used as a back door into our private networks. This is where Cybersecurity should be used to allow these appliances to function correctly and securely. Having encryption set up on your private network is recommended. Ensure your passwords are strong enough to secure your network correctly and keep all device software up to date as updates can contain patches to security flaws (US.norton.com 2019).

Advancements in Cybersecurity have also allowed for greater digitisation of healthcare records such as in the Medicare my health record implementation which stores all health care records on a single database to be accessed by healthcare professionals. This system is not possible without the use of high-grade technology, data management controls and audit trails that record information such as the organisation accessing a record, when the record was accessed and the reason for accessing this information. This helps to maintain a log of any external threats that may have gained access to the system so that any data leaked can be accounted for (My Health Record 2018).

How will this affect you?

Technology is a massive part of my life. I play games online, I study online and throughout 2020, like many other people I was encouraged to work online from home. It has only been this year, where I was forced to look at the digital footprint I am leaving online and consider how much of my data is accessible by external threats. I often re-used the same passwords, and I rarely performed scans on my system for malware. Still, since I was required to have access to my works database and email accounts that contained confidential information regarding insurance customers, I have been encouraged to increase my home computer's integrity. I am now back at work; however, I still have regularly scheduled scans for malware on my system and in emails, and I use a VPN for added privacy when browsing on my phone and computer.

My internet presence has become increasingly concerning for me as I enjoy having a high privacy level on the Internet. However, I know many other people, including some of my own family, do not see the risk posed by unprotected devices and out-of-date software. Overall, the risk of cyberattacks is rising, with an increased internet presence and is something that needs to be prevented.

Machine Learning

What is it?

Have you ever wondered how Google always knows how to finish your search requests? Or when Gmail accurately predicts the rest of the sentence that you are typing before you do? How can tools such as Excel and Google Sheets predict which formula you want to write? These are all primary forms of machine learning. If it is possible to store the data, your behavioural history electronically, it is possible for the data to be entered into machine learning algorithms'.

Geoffrey Hinton commonly referred to as the father of deep learning first invented machine learning in 1986. The principal was simple enough, basically searching for patterns in the data, and then applying it. (Hao 2018) Similarly, as Google knows what you are about to write, or Netflix knows what type of movies you like, they have identified the pattern based on your previous search history and writing styles. The platforms you are using are tracing your patterns and learning from them, whether it is Google, Twitter, Facebook or hundreds of other platforms used every day. This is the basis of early stages of Artificial Intelligence or AI.

Deep learning is where this ability is amplified, so even the smallest patterns can be identified, referred to as “deep learning” due to the many layers of computational nodes used to search through the data, delivering its results. (Hao 2018). Hinton was ahead of his time with this form of machine learning, and it was not until c2012 that the concept started to take off again.

The learning concepts utilised can be broken down into two main categories, though it is more complicated than in the details. See figure 11.

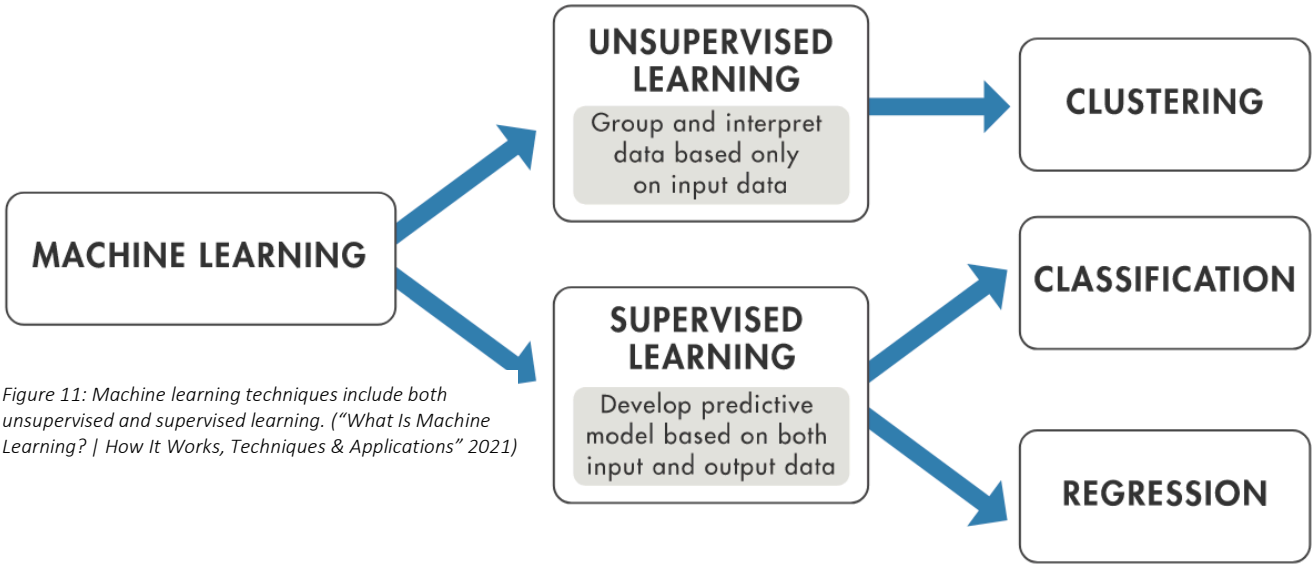

Figure 11: Machine learning techniques include both unsupervised and supervised learning. (“What Is Machine Learning? | How It Works, Techniques & Applications” 2021)

1. Supervised Learning is where guidance provides what type of patterns you are looking for within the data. Broken into two categories, classification techniques to predict discrete responses and regression techniques to predict continuous responses. ("What Is Machine Learning? | How It Works, Techniques & Applications" 2021) Think of a police drug dog – it knows what it is looking for and keeps looking until it finds it.
2. Unsupervised Learning is where the data has no conventional form of labelling to assist in sorting. This form of machine learning will continue to search through the data until it finds any pattern to start clustering the results to form a prediction.

Machine learning is the basis of Artificial Intelligence. The ability to learn from repetitive behaviour or identifying patterns within a data set to make a predictive decision successfully. While it has been around since the late eighties, the ability to apply complex mathematical calculations automatically to large amounts of data (big data) is still relatively new. ("Machine Learning: What it is and why it matters" 2020)

Popularly known examples of this form of machine learning and artificial intelligence (AI) are items such as Googles self-driving cars, Fraud detection protocols used by banks such as FALCON and online recommendations such as what movie to watch on Netflix. Use the flow chart in Figure 12 to identify what is Artificial Intelligence.

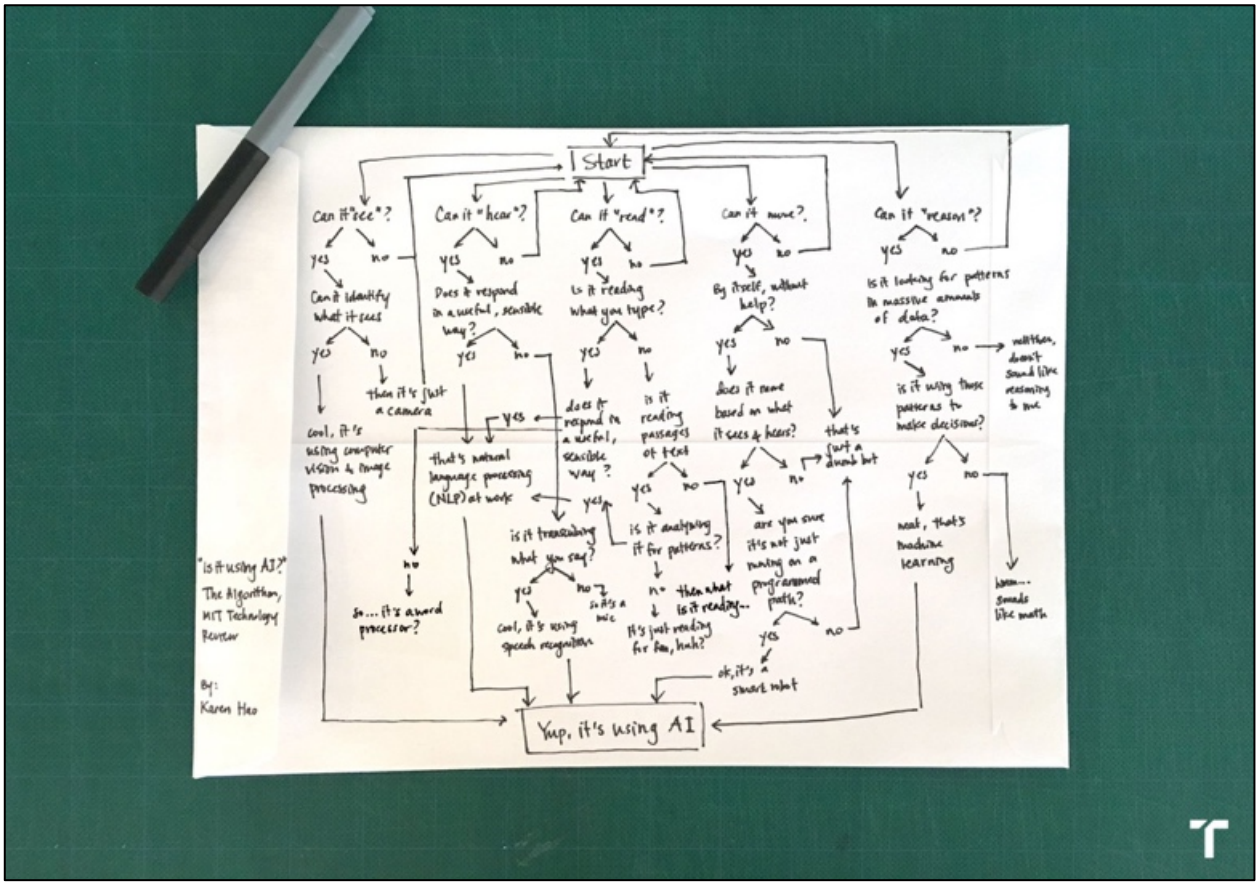

Figure 12: What is AI Flow Chart? (Hao 2018)

What is the likely impact?

There will be various forms of impact on society due to Machine Learning and Artificial Intelligence (AI). Even though it still be in its infancy with significant developments in the last five years, we see the impact in our everyday lives.

When we think of fully automated transportation, we automatically think of self-driving cars, though the development in this area is still potentially further away than we anticipate. How do you program a vehicle that if it will crash too one of two different people, which one does it choose? The aviation industry's Autopilot and Flight Management Systems are both examples of machine learning and artificial. We may also see the use of machine learning in our everyday lives in the form of environmental protection where the use of the data to predict future climate and pollution impacts, or in-home security or automation with the help of facial recognition or automatically calling for emergency assistance in the event of types of alarms.

The two most significant impacts we see on our daily lives in recent times is the use of digital personal assistants such as Google or Alexa, or predictive suggestions on movies you want to watch, or websites you want to visit. However, it is hard to avoid the fear in much of the community that the development of machine learning and AI will lead to the loss of employment as it takes on tasks previously completed manually, weather forecasting, reporting, or even ordering. Supermarkets have been using automated ordering systems based on Machine Learning since the early 1990s and jobs evolved. The order writer position made redundant, and a new role created maintaining the perpetual inventory (PI) accuracy that the machine learning uses to base its ordering predictions. The key to success is the possibility of the machines evolving and our ability to grow and develop alongside it.

> "We are currently preparing students for jobs that don't yet exist … using technologies that haven't been invented … in order to solve problems we don't even know are problems yet."—Richard Riley, former Secretary of Education ("Preparing Students for Jobs That Don't Exist Yet" 2017)

How will this affect you?

Personally, in my current role as a commercial analyst, the need to develop and upskill in different forms of analysis, using other platforms and learning different skills such as learning SQL has never been greater. As more and more of my daily workload is automated, predominantly reporting, it allows the shift in focus from writing reports to analysing them, identifying opportunities and creating more work. It is one of those great fears that as I automate more and more reports, I will ultimately put myself out of a job, or do I take the opportunity to show this is the future, and create a new role to aspire to within the evolution. It is incredible how many times we interact with machine learning in my daily life, making it nearly impossible to avoid. While Google Assistant and Alexa are familiar in our lives, others appear less obvious, such as the GPS in your car, predicting words in your text, or what movie you may like to watch on Netflix, and interests on Facebook. Machine learning is working its way into our daily lives, whether you realise it or not.

Society has two options in responding to this evolution, accept or reject, and the decisions that people make to grow and evolve will reflect on their future within the world. I have worked in supermarket management for thirty-five years, and last year, I decided that it was something I could not do for another twenty until I retire. Though the food industry is essentially drought-proof, people have to eat; I changed, I moved into Finance. I have returned to study for the first time in thirty years at University and have developed more skills in the last eighteen months than I have in the previous ten years. The future is yours to manage, and how you accept these developments will be the difference between success and failure. Learning about IT, machine learning, AI and robotics will be the difference in my career.

Blockchain and Cryptocurrencies

What does it do?

A blockchain is an ever-growing list of records chained together, in a way that means if a previous entry in the list (i.e., link in the chain) is changed, it will change all subsequent entries. This allows for the decentralisation of the list, or ledger while verifying the correctness of the contents. The decentralisation of this is known as the distributed ledger system (Hussey 2019).

Invented to power Bitcoin, Blockchain runs using some powerful cryptographic algorithms, and 'the technology behind bitcoin lets people who do not know or trust each other build a dependable ledger' (The Economist 2015). The way it works to do this follows the following steps:

1. A transaction is proposed between two users, user A paying user B.
2. The Blockchain is checked to ensure that user A has sufficient currency for the transaction.
3. A record of the transaction is encrypted then bundled with several other transactions, and these are merged and "hashed" (reducing their size using cryptographic techniques) to prepare a new, provisional "block".
4. The provisional block is given a mathematical puzzle involving this provisional block's data and the previous block's hash. This puzzle requires significant computational power to solve as it is calculated using trial and error. However, it is easily verified, e.g., It is much easier to confirm that 34 * 2 + 35 – 3 = 100 than it is to work out what the symbols are for 34? 2? 35? 3 = 100.
5. Once solved, the provisional block is added to the chain along with a timestamp and the solution.

The mathematical puzzle is the core of what makes cryptocurrency work. By controlling how difficult the mathematical puzzle is to solve, we can maintain the new blocks and the new currency. (Hong 2021). As any cryptocurrency such as bitcoin is used and matures, the Blockchain's size gets more extensive and can increase exponentially as take-up increases (De Best 2021).

State of the art technology in Blockchain sees it moving on from being used solely for cryptocurrency into other purposes where it is useful to track items or even regular currency. As it is decentralised, no single point of failure or designated third party is required to verify.

One use for a decentralised system is a concept known as smart contracts (Hussey 2021). A smart contract relies on a blockchain to verify and perform a transaction, instead of a third party. For example, if a customer purchases an item from a business using a credit card, a bank must be involved in the transaction. The bank will then check if the customer has sufficient money and then transfer the funds to the business – the weakness is that if the bank is unavailable for any reason, the transaction will fail. The bank is removed from the equation in a smart contract and checks performed on the Blockchain. Blockchain is held in many different locations, making it much harder to interrupt the transaction.

Another exciting upcoming use for Blockchain is its use on the Internet of things. The Internet of things is a modern concept meaning the network connectivity of "smart" devices, such as smart plugs and smart lights. With these devices' proliferation, existing internet infrastructure cannot handle the volume of small transactions that these devices can make (Hussey 2019b). By using Blockchain technology, the devices can, in a way, run themselves by needing to verify two other IoT transactions to make a third, known as an Internet of Things Application and is its own cryptocurrency.

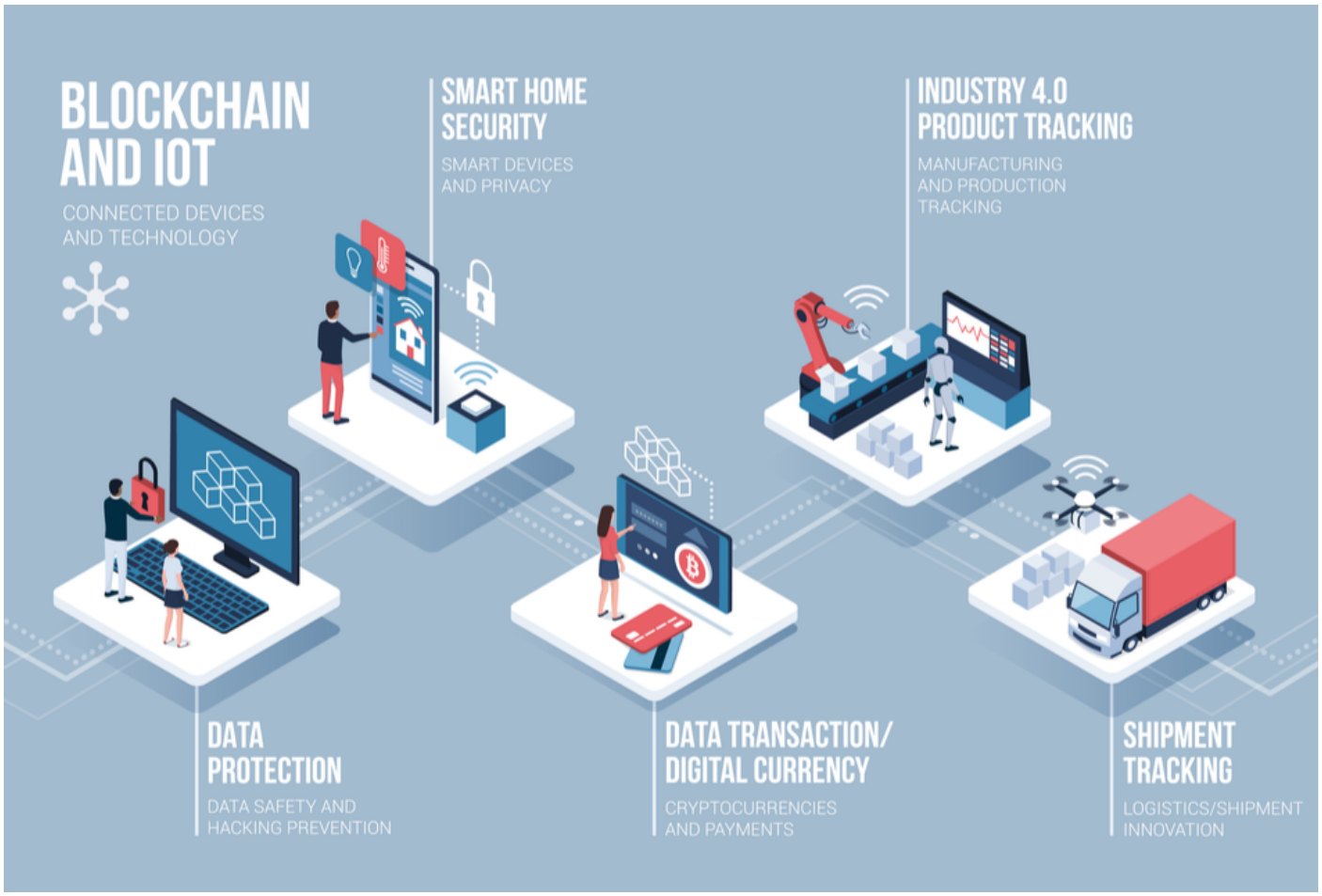

Figure 13: Blockchain and IOT ("The Power of Blockchain Paired with the Internet of Things | OpenLedger Insights" 2019)

What is the likely impact?

Offering applications far beyond cryptocurrency, Blockchain has the potential to change record-keeping and trade in ways unprecedented.

Blockchain will enable much greater transparency in supply chains, which is a current issue globally (Blockchain Council 2019). One application is in pharmaceuticals, verifying that medication is the genuine article. It will be possible to track a particular batch of medicines from the point of purchase, back through dispensing and to original manufacture meaning greater accountability from all parts of the supply chain. With a lack of government infrastructure, third-world countries or those with no trusted central authority for pharmaceutical regulation and tracking will show the most significant impact with their decentralised nature. Similar measures can be employed in other industries prone to counterfeit, such as fashion and electronics.

The removal of a central authority for payment processing has the most potential to affect those who act as these central authorities, banks and credit providers. (Praveen Kumar 2020) Banks are currently slow to react to this new technology's emergence – though some banks such as the People's Bank of China are experimenting, others are only performing perfunctory research and development. In the way, Uber changed the taxi industry, or Netflix changed video rentals, this disruption could be disastrous for the banks with loss of employment as banks too slow to react are left behind.

A negative result of Blockchain and cryptocurrency is the environmental impact of all this computing power. The amount of energy used to perform a bitcoin transaction is many orders of magnitude higher than a regular transaction (Digiconomist 2020).

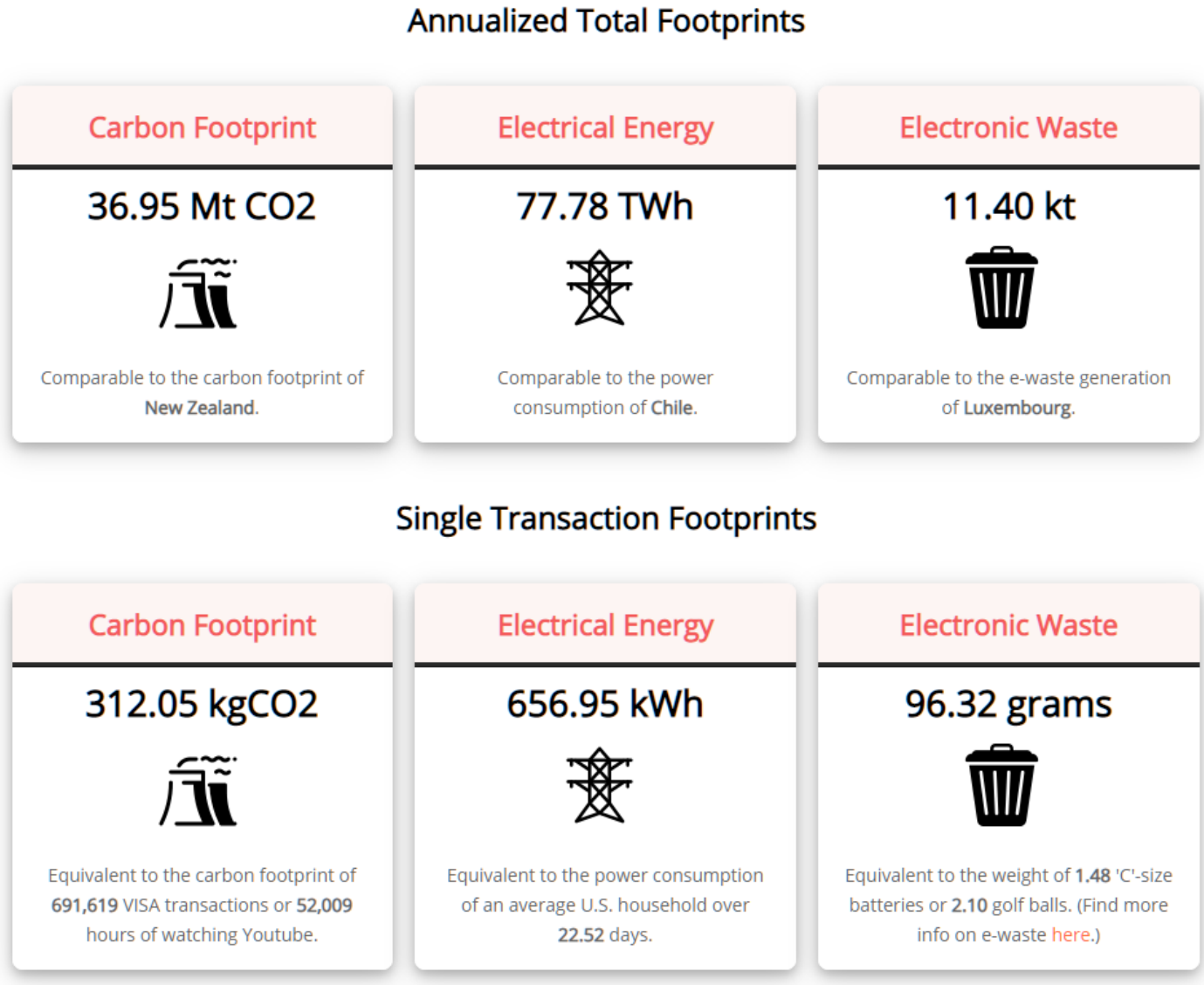

Figure 14: Bitcoin Energy Consumption (Digiconomist 2020)

As seen in Figure 14, bitcoin and carbon footprint's energy consumption is more extensive than some countries. Given that bitcoin is not the only cryptocurrency (though it is the largest), this suggests that the actual environmental impact is far more considerable and not sustainable.

How will this affect you?

Currently, I have four cards in my wallet that identify me, and six cards that are used for performing transactions in some way (e.g., credit cards and public transport). Each of these relies on a single central authority to be verified if I try to use it. Each of these can be replaced by Blockchain, removing the reliance on the central authority. For example, when getting on a bus and tagging on using my Smartrider, if there is a communication issue between the bus and the central authority (Transperth), the Smartrider will not function. If records were instead maintained on a blockchain, even if there was a communication issue with Transperth the Smartrider would still perform. Similar could apply to each of the cards I carry in my wallet, increasing the reliability of the services I use.

Being able to track the source of items and their journey will help me know what I'm getting. Commonly restaurants claim they are serving Harvey beef, a particular brand of beef grown in a South-West WA town ("Harvey Beef, West Australian Beef" 2015; "Settlers Tavern Main Menu AHA Awards of Excellence' Hall of Fame'" 2019). There is no way to verify this, other than to trust that some regulatory agency somewhere is doing their job. With Blockchain, it would be possible to trace the beef used in the restaurant back to the source and verify that I am eating the genuine article. This could be applied to other applications where the origin is important, such as my partner's jewellery collection. With Blockchain there will never be a reason to unknowingly accept a counterfeit product.

Project Idea | Use-by Date Tracker Application

Overview

PANNM is developing an app that would allow the user to reduce the amount of food that goes to waste within the household. A user would scan the barcode on the food product with a smartphone as they are putting their shopping away. Defaulting to a date screen in which the use-by date is captured, generating a database within the device of the products stored in the pantry, fridge and freezer and what date they will expire.

A weekly email sent to the user with the list of products set to expire over the next ten days, would also be visible in the App, and notifications would appear three days out, one day out and date of expiry. When the notification is received, the user will select one of three responses.

1. *Consumed.*
2. *I'll wait a little longer.*
3. *Disposed.*

Once acknowledged as either consumed or disposed of, adding the item to a shopping list is offered, before removing the product from the date expiry list.

Motivation

With over thirty years of experience in the supermarket industry, Phil is accustomed to seeing large amounts of food waste. Whether damaged, slow sales or use-by date expiring before it could be sold, or simply the quality did not meet the consumers' expectations.

Over the years, the industry has developed many strategies to avoid food waste, ending up in the landfill. Food rescue partners such as "Fairshare", "Second Bite" or "Oz Harvest" *rescue* food close to use-by and unable to be sold, even product that may be now past use-by, though frozen before it expired. They also form partnerships with farmers to take green waste and day-old bread to feed to livestock.

The real motivation is generated, knowing how much food goes to waste without even being purchased in the supermarkets. Let alone standing at the fridge and throwing food products in the rubbish bin because it has passed its use-by date before being consumed at home—just thinking of not only this waste of product but the waste of money along the way. We all need to play a part in this journey to prevent food waste, not only because of what we can see but also the environmental impact of producing these products.

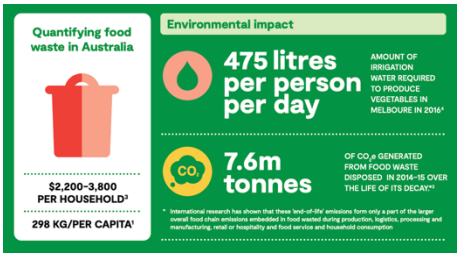

Figure 15: Household Waste (Food Innovation Australia Limited 2019)

Figure 16: Cost of Waste (Food Innovation Australia Limited 2019)

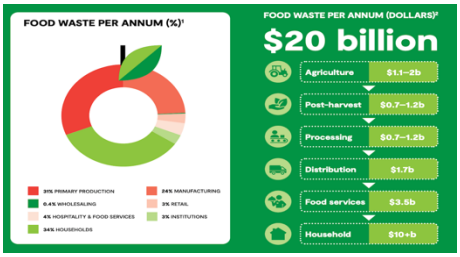

Figure 17: Waste Tonnage per Year (Food Innovation Australia Limited 2019)

Approximately $3.5 billion in food waste is generated annually after arriving in stores and then failing to be sold. The genuinely alarming number at more than 300% higher is that over $10 billion annually in food waste after people have purchased it from the supermarket, greengrocer, butcher or corner store. At nearly 300kg per capita, Australian households discard on average between $2,200 and $2,800 worth of food every year. The environmental impact presents an even more frightening image with an average consumption of 475 litres of water per day per every Australian, simply to produce this food, then wasted. Or 7.6 tonnes of greenhouse emissions generated from the decay of one year's worth of food waste. (Food Innovation Australia Limited 2019) We all need to play a part.

Further Research

Feedback provided by Umera Imtinan was to complete further research into the proposal, as there are similar products on the market, and similar to a project completed by a previous study group. We reviewed some apps on the market that offered a similar experience with the below findings. Of the ten Applications we found, six we were unable to investigate in detail due to them not being available on the Australian market resulting in no information appearing when directed to the online stores to review. The remaining four applications all offer varying levels of functionality, that if all brought together in a single tool, would prove to be incredibly powerful.

Fridgely App (Ehlert 2015)

Figure 18: App Image (Ehlert 2015)

The Fridgely application available through the iTunes App store offers to tell you when your food will expire, offers barcode scanning and generates an estimated expiry date. It will send notifications when your food will expire and finds recipes based on the ingredients provided in your custom lists. The US-based application includes options to link in Coupons to major US retailers, though I admit a lack of knowledge in this space.

The App is initially free and offers further options by upgrading to a premium app for $4.49, though it does not mention any time limits for this amount. The upgrade options include the ability to export shopping lists, export to CSV files and customise notifications. Although offering the ability to scan barcodes or use a receipt reader, a test within my pantry found that the scanner only recognised 25% of scanned barcodes, suggesting the linked databases are not international.

CozZo ▪ Food Inventory Manager (COGZUM BULGARIA OOD 2017)

Figure 19: App Image (COGZUM BULGARIA OOD 2017)

Cozzo is a food expiry tracking app that offers the users the choice when first opening the App, the choice of nine different languages. The free version of the App is simplistic, either manually entering products and dates, or using flashcards to add product and dates generically. Upgrading to a subscription plan of $24.99 per year, or $2.99 per month, users can access group up to ten devices sharing lists, and activate additional features, including barcode scanner and receipt reader. Product list storage size also increases on the plans.

The subscription version of the application also includes the functionality to match ingredients in your list to recipes to consume products before expiry. Recipes can be imported from any website. On purchasing the App to try, despite some innovative features offered, I found it challenging to use, with the App repeatedly shutting down on the recipe page, selecting "search by stocked products" and the Developer only offering a single recipe of their own. Sell point was engagement with eCommerce websites, though I could not work out how to instigate this option.

Expr Food Date Expiration Tracker (Lim 2020)

(Student Projects from Web Development Bootcamp Course April 2019 batch.)

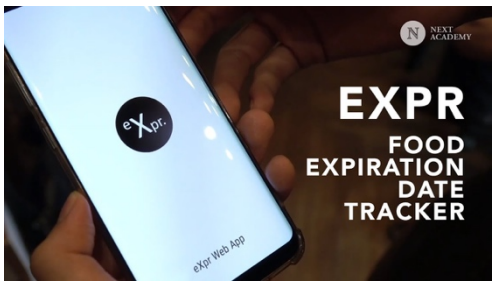

Figure 20: App Image ((Lim 2020)

The EXPR app was a project completed by a class at Next Academy in Malaysia. The App, like others, is designed to set reminders of food that is going to expire, while being able to search the web by selecting ingredients in the generated lists. While the App does not appear to offer a barcode scanner, it is incredibly intuitive, with voice engine software, to add items to the list, by providing a product and a time frame or a specific date, recording the actual date, e.g. the date in three days. The application also offers the ability to scan the expiry date and enter with the device camera. We were limited to the information available to that provided by their video on the academy website. We were unable to locate the App in any iTunes or Google store.

BEEP - Expiry Date Tracking (BGPworks 2017)

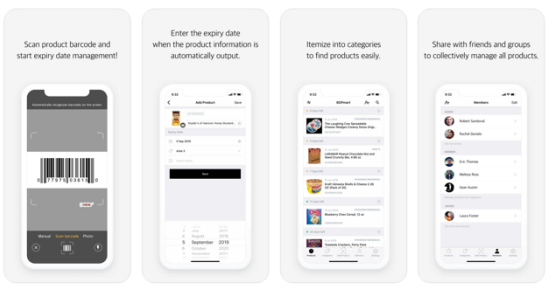

Figure 21: App Image (BGPworks 2017)

This App was available through the iTunes App Store, with a one-month free subscription before being available on a tiered pricing plan. Payment options are monthly at $12.99 per month, quarterly at $32.99 per quarter, half-yearly at $55.99 per six months and annually at $89.99 per annum. Whilst free, the App does include advertising.

With a quick and responsive scan of barcodes with the option of two different scanners, I could not tell the difference. Once a product is scanned, it quickly defaults to a date enter screen with a scrolling date function, starting at the current date. The App is accessing a significant database, quickly bringing up the product scanned, including an image. If the product is not in the database, it will

default for you to enter a description, and photo, before entering the expiry date. The App also can be shared within a group, allowing users within a household to add to the same list, whilst offering the ability to download the current list to an excel file. Products can be categorised into groups based on your criteria.

Prep & Pantry (Ci 2014)

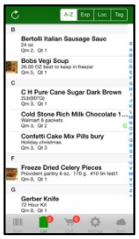

Figure 22: App Image (Ci 2014)

(not available in Australia)

Due to not being available in Australia, little is known about this App, other than capturing the use-by dates, and then you are reminded before expiry. Will help with shopping, but unable to ascertain any details.

Expiry (Ci 2014)

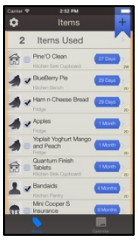

Figure 23: App Image (Ci 2014)

(not available in Australia)

This App is designed to track expiration dates on both food and medicinal products. Due to the product not being available in Australia, little information is provided on how the product is loaded. You can set the time frame you wish to be reminded prior expiring.

Fridge Pal (Mejia 2013)

Figure 24: App Image (Mejia 2013)

(not available in Australia)

This App, once uploaded, will remind you when product is getting close to expiration. Will also suggest a time frame on fresh products that do not include dates such as fresh fruit and vegetables.

Fresh Box (Mejia 2013)

Figure 25: App Image (Mejia

(not available in Australia)

Due to not being available in Australia, little is known about this App, other than capturing the use-by dates, and then you are reminded before expiry. The App also provides recommended expiry times on fresh items.

Fresh Pantry (Ci 2014)

Figure 26: App Image (Ci 2014)

(not available in Australia)

Due to not being available in Australia, little is known about this App, other than capturing the use-by dates, and then you are reminded before expiry.

Shelf Life (Mejia 2013)

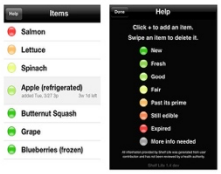

Figure 27: App Image (Mejia 2013)

(not available in Australia)

Due to not being available in Australia, little is known about this App, other than capturing the use-by dates, and then you are reminded before expiry.

Group discussion and proposals.

After completing research and identifying a couple of products similar to our proposal, the group discussed whether we should change projects or proceed by adding further enhancements. We intend to proceed with the project working to produce the App, including the below ideas generated from in-depth discussions.

- Add the functionality to take an image of the use-by date, which would convert it to text to enter the date rather than complete manually by the user.
- A product listed as short-dated, the email list would include recipe suggestions that could help in consuming the product before the use-by-date expiry.
- When the list of the products is emailed, it would include a copy of the barcode that could be scanned by the major supermarkets' shopping apps.
- Review the opportunity to work with the major supermarkets to include adding to shopping list, automatically add to the lists within the supermarkets shopping apps, and reduce the need to add manually later.
- Review the long-term opportunity to sell the App to the major supermarkets to integrate into their existing shopping apps.

By integrating these ideas, we believe we can build an app that initially may appear similar to others on the market, though with the correct selling techniques, will be able to include additional selling points to show this App has far more to offer.

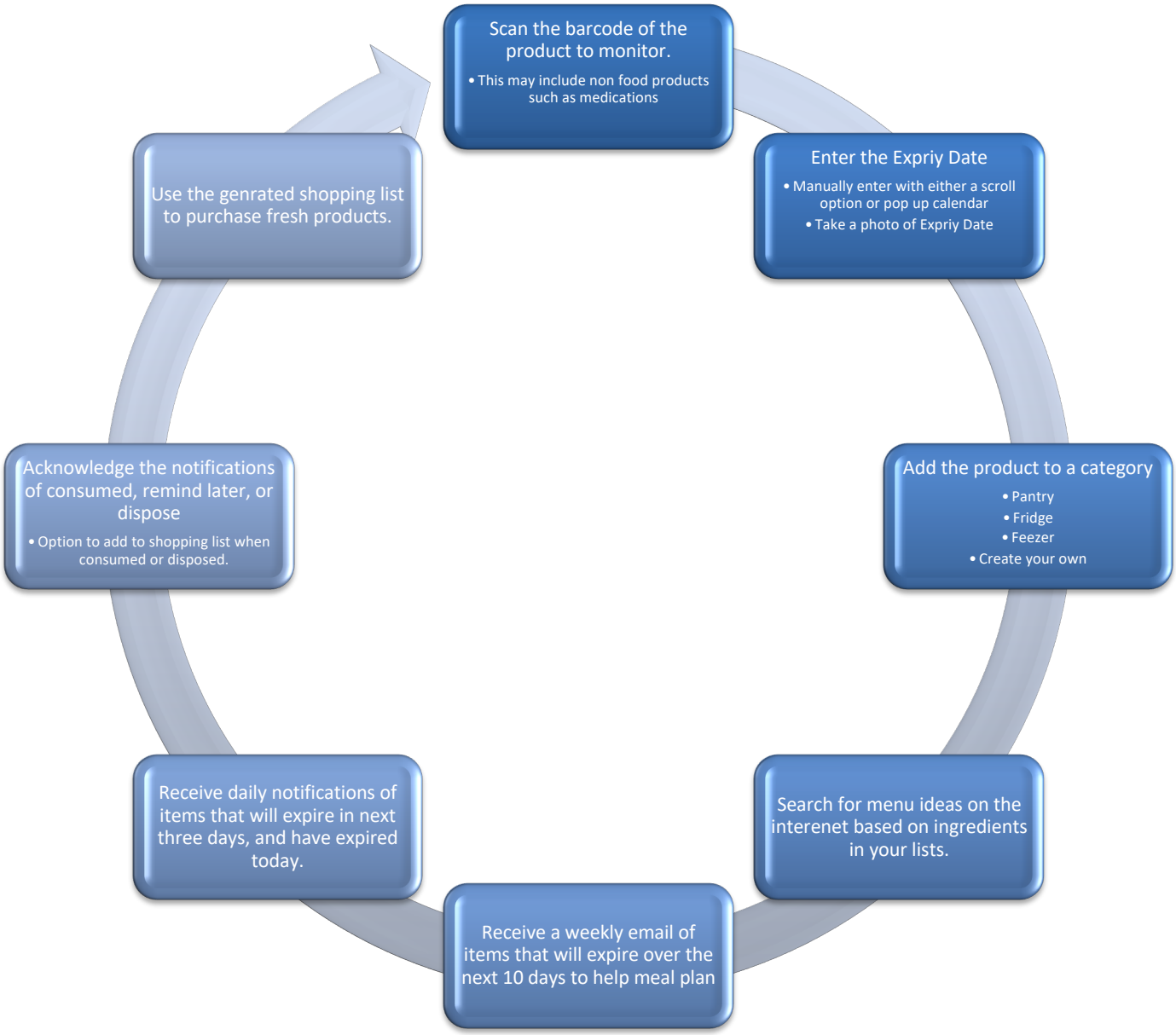

Figure 28: A Flow chart of the proposed application usage

The Skills, Methods, and Tools and Technologies

Many tools and technologies that can be used to develop mobile applications. There are many types of applications used on portable devices such as mobile phones and tablets, separated into four categories: native applications, traditional web applications, advanced web applications (PWAs), and hybrid applications ('Which Is Best - Native vs. Hybrid vs. Progressive Web Apps | Lateral Solutions' 2021):

- Native applications are the most desirable in performance, native functionality, offline storage and native UX/UI feel. However, they are much more costly to make than other types of apps. They require expensive maintenance, need to be approved by major distributors, and are generally not cross-platform, thus necessitating multiple applications using different languages and frameworks.
- Traditional web applications are probably the least desirable for mobile platforms. The benefits of traditional web applications are that they are entirely cross-platform, cost-effective, easy to maintain, and search engine optimised. Nonetheless, they tend to be much slower than native applications, do not have a native UX/UI feel, and do not look particularly professional.
- Progressive web applications are somewhat more desirable than traditional web applications. They provide many of the benefits of conventional web apps while also utilising some native features such as offline functionality, push notifications, offline storage, and access to hardware cameras calendars. On the other hand,

while they address many of the application as mentioned earlier types' drawbacks, they do not give the same quality of user experience as native applications. A major pitfall of PWAs is that iOS support for them is relatively limited.

- Hybrid applications are built with a web development framework contained within a native shell. Enabling developers to build a cross-platform web application while still maintaining most of the benefits of a native application such as access to device features and functionality, app-store visibility, more generous offline storage and a more native-like experience. Furthermore, the development costs are far less than for native applications due to their faster build time and the fact that they are intrinsically cross-platform. These applications' drawbacks are more unsatisfactory performance than native apps, a slightly less than native UX/UI feel, and distribution costs.

Weighing the pros and cons, the two most attractive of the above categories are probably hybrid applications and PWAs as they are cost-effective, fast to develop, yet still provide a somewhat traditional native app experience. In our particular project idea, the lack of iOS support for push notifications (which are essential to our project idea) makes hybrid applications a clear winner here.

React Native, a hybrid framework based on one of the most popular web development libraries would be the right candidate for this development. It is well-maintained, has a shallow learning curve for web developers and used in many significant applications. With a developed ecosystem with many useful packages at one's disposal—the framework is written in JavaScript, the most prevalent utilised programming languages. The develops building this application will need to have a solid knowledge of JavaScript, HTML, CSS, RESTful routing and server-side programming.

Other than the development framework, Open Food Facts maintains an open-source database with comprehensive data on over a million food items and a public API that would allow our application to query and use it for the application's purposes. Furthermore, their website links several SDKs and wrappers to facilitate development, including one for React Native ('Open Food Facts Data' 2021). Lastly, the NPM (a JavaScript package manager) provides packages that decrease the development time of certain features such as scanning barcodes ('qrcode-scanner-react-native' 2021).

Funding

As with any project, the consideration of money. How do we fund the build? How do we fund the ongoing maintenance? How do we fund security measures and data storage? What do you charge for the sale of the App? These all seem like simple questions, though for a start-up, is also a little daunting.

To build a mobile App in Australia, it can cost between $50,000-$250,000+. ("How Much Does It Cost to Build an App in Australia in 2020?" 2020). There are multiple factors to take into consideration when determining the costs to develop an app:

- External or Internal Development;
  Internal development may come at a lower cost, but if the team does not have the necessary skills, it could extend the development process. While external development may seem like it may come at a higher cost, it can be more cost-effective and offers significant advantages; a more incredible experience, flexible development process and shorter timeframe for completion. ("How much does a Mobile App cost to Build?" 2020)
- The number of platforms;
  Will the app be designed for use with, Apple, Android or web app? ("How Much Does It Cost to Build an App in Australia in 2020?" 2020)
- The number of screens;
  Each screen will require design and development, the more screens, the higher the cost. ("How Much Does It Cost to Build an App in Australia in 2020?" 2020)
- App design/Front-end development;
  The design of an app can determine the success of an app. An app needs to be appealing to look at and easy to navigate. ("How much does a Mobile App cost to Build?" 2020)
- Back-end development;
  The use of technologies (e.g. API) for communicating with your app. ("How much does a Mobile App cost to

Build?" 2020)

- App Integrations;
  The type of integration influences cost, i.e., proprietary integration or integration to a well-documented publicly available API. ("How Much Does It Cost to Build an App in Australia in 2020?" 2020)
- The complexity of features;
  The more complex the feature, the higher the cost. ("How Much Does It Cost to Build an App in Australia in 2020?" 2020)
- Marketing;
  A marketing campaign may be required to generate interest in the app. ("How much does a Mobile App cost to Build?" 2020)
- Maintenance;
  The general cost for ongoing maintenance is about 10% to 20% of the start-up costs. ("How Much Does It Cost to Build an App in Australia in 2020?" 2020)

Due to the high costs to start up an App, it would be best to develop a prototype app or minimum viable product (MVP). This can be created internally developed at a relatively low cost, with the app's basic features. This will allow potential investors, stakeholder and users to engage and interact with the app to provide feedback. ("App prototypes - Wave Digital App Development - Melbourne" 2020).

By deciding to develop a prototype, we may be eligible to receive an MVP Grant from the state government. Successful grant applicants can receive up to 50% of approved product costs (maximum of $25,000), receiving 35% up-front and 65% after completing and validating the MVP. ("Minimum Viable Product grants" 2020). To be eligible, we must meet specific criteria.

Initially, the build would be completed as a project between colleagues, not necessarily requiring investment other than time and experience. However, scale-up brings additional costs, including PaaS costs to support customer databases, security and data storage, especially if we offer cloud functionality to share lists across family devices. This kind of development leans towards seeking potential corporate sponsorship in the long term; however, we would look to funding through seeking investors and ongoing with in-app advertising and subscription plans.

1. Free trial period funded by In-App advertising.
2. Advertising Free subscription services of potentially $5 per month or $50 per year, though this would need to be reviewed in line with the economy scales.

Subscriptions would be managed through the respective App Stores to eliminate the needs to store and manage user confidential payment details, though this does come at a cost. Both the Apple App Store and Google Play Store charge a 30% commission for all In-App purchases, including subscriptions. However, this drops to 15% after the first year while the Galaxy Store charges 30% though this negotiable. (Alexander 2020)

Additional Costs to consider are access costs such as Apples Developer Program, which, for the annual fee of $99US allows access to software and tools, SDKs, and distribution services, including technical support. ("What's Included - Apple Developer Program" 2021)

The final piece is the distribution of profits. An agreement would need to be made and agreed to by all those involved. One exact point we are consistent on, is that Open Food Facts offers an open-source to their data, and survive on donations. We believe it would be the right thing to do if utilising their data on an ongoing basis, to include a donation percentage. (2021)

Outcome

The desired results from this app's building are to support consumers everywhere with reducing food waste ultimately. Financially no person or family should need to waste money on food going in the bin, and we believe with a simple tool to use, we can make a genuine contribution to society. We believe we have a model idea that will prevent food spoilage, reduce landfill, make tangible savings to the consumers and most of all have an environmental impact on greenhouse emissions used to produce food, and compost the waste.

Group Reflection and Summary

Overview

Our group formed during a tutorial session. Phil initially created the group and posted on the discussion forum about it. Then we were all in the same tutorial session when our tutor Umera suggested getting groups organised early. Since it was clear that each of us was active, we jumped into a group together. Completed well before the due date for Assignment 1, which meant that we were well prepared when it came time to start working on Assignment 2. If not for a couple of minor setbacks, we could have started work immediately.

We had two things that set us back to start with – the holiday period, and a missing group member. Assignment 1 was due just before Christmas, and usually, you might expect that work would begin on Assignment 2 immediately after. We didn't have our first meeting until 05/01/2021, almost two weeks' delay due to the holiday period. Another issue was the disappearance of one team member. We weren't able to correctly assign responsibilities and workloads until our group was confirmed. After a period of non-response, the sixth group member was removed with the intervention of the course co-ordinator, and we were able to get down to business.

Overall all group members have been pleased with the work that we've contributed. Everyone approaches group work with trepidation, and our team members were no exception. However, it is evident through our contributions that each group member is willing to put in the effort and has a lot to share. Through constant communication, we have been able to get the most out of each team member without overloading them and allowing other commitments in life.

Each team member has their own set of skills which complemented each other brilliantly in this project. No company runs on just an IT department, so it was to our advantage that we have team members who are not pursuing specific IT degrees. With team members who have experience in management, financial planning, web design, sales and administration, we have created a project with views from a broad perspective.

Overall we learned what many us suspected, or perhaps already knew, and that is it takes group members of differing skills and backgrounds to form an effective team. By offering our own experiences and opinions, we have produced a product more significant than what any one of us could. This learning can be carried over into professional life when forming teams, for example, taking care to involve people from other departments when working on a project. With a diverse group, constant communication is vital in ensuring that each team member is coping with their workload and has a clear idea of their requirements at any given time.

Phil

I feel blessed with the group we formed, despite an initial hiccup with one member (no longer in our group) who failed to respond to all communication attempts. I feel everyone has got along together well. We had a diverse set of skills across the team that complemented each other. The group felt comfortable communicating with each other, especially with the Chat function in Teams. Together we worked well, supporting each other, agreeing on timelines and ensuring we were ready to move on to the next stage. Although everything has been relatively smooth, using some of the additional tools such as the Tasks list would help everyone quickly acknowledge the rest of the team when each task has been finalised. We discovered this late in the project, though used to track the final piece, the website completion.

The one thing I have learned about working in groups, and more so from previous projects, is it is necessary to keep the communication flowing, checking in regularly. You need to understand what everyone has on their workload outside of the project. Not everyone may be as flexible as yourself and have other commitments hindering their ability to commit to a project as much as yourself. Understanding the pressure I feel working full-time, and completing this subject I have complete admiration for the rest of the team with both Alasdair and Nathan completing multiple subjects at a time (3) and Michelle nearly completing her degree, it is a big commitment to work with others and ensure the correct balance.

Alasdair

Our group worked well together, to the level that one might expect in a professional environment. Our group's overall maturity was on display, as each team member worked towards a common goal. I felt that no one team member was overly controlling, nor did we have anyone that was only willing to contribute the bare minimum. I have worked in several workplaces over the years, and rarely have I seen such a consistent, professional focus.

I think that Phil's leadership of the group has been essential to creating a final product that reflects the group's efforts as a whole. His style has never been dictatorial, but he has been mostly responsible for the doling out tasks. His ability to evenly distribute workloads across the team has meant that each team member has a chance to contribute, and

nobody feels like they're shouldering the burden for others. Each team member has also had the opportunity to showcase their strengths.

I've learned from this that it's essential when working a group that someone does take on the leadership role, a first among equals. My experience has found that work is a lot less efficient without someone willing to take control and responsibility as nobody has a clear role, focus and direction. That has not happened in this case.

Nathan

From the very beginning, this group has been cohesive and positive. I believe I can speak for the group when I say that I have never felt so motivated to work in a team. I was initially quite apprehensive about the group work because of the negative experiences I've had in the past, and the abundant anecdotes about the difficulties others have experience in these kinds of assessments.

PANNM consists of five people from different backgrounds with somewhat different career goals. Nonetheless, I felt more cooperation, solidarity, and encouragement from this group than any other group that I have ever participated in. In our meetings, we were able to define and delegate pending tasks, schedule future tasks, and set deadlines that have, to the surprise of possible all of us, been respected to a tee.

All in all, this group has enabled us to soldier through the workload with a smile on our face and a feeling of partnership and trust. I have been absolutely delighted by the experience and believe that the apprehension I had experience before starting this assignment, will no longer be carried into prospective work with future teams.

Nicholas

When PANNM first formed, I was very concerned in the initial stage as there wasn't a tremendous amount of contact within the group, it was around Christmas time, and everyone was having a much-needed break. However, my concerns were automatically laid to rest when the group made the first contact. Since then, the group has been consistently communicating on what must be daily while also juggling work, other classes and outside commitments. The group is quite diverse in our overall skill set, and I think we have done an outstanding job of playing to each of our strengths.

I was quite surprised to see how open and helpful the group was during this assignment based on past experiences; group work tends to be quite challenging to navigate. I was glad to see that everyone was happy to step into a role and put in the hard work. The thing that I have learned the most from this assignment is to speak up and ask questions, mostly because my team members are all astute and I have never ventured into tertiary studies, so there was a lot of things that went over my head until I asked for help or clarification.

Michelle

I've never been a fan of group assignments in all honesty, especially when studying via distance education. I had always heard the stories of people slacking off and barely contributing and still getting the marks. As it has been made very clear throughout the assignments I have very little interest or understanding of IT, this was a concern when it came to joining a group as I feared people would not be willing to take me on. I have been thoroughly proven wrong, everyone in this group has been very accepting of one and another, and instead of feeling like a burden, I feel a part of a team and not afraid to speak out when I don't understand all the tech talk.

PANNM works great together and has kept up a strong communication line throughout this process via the TEAMS app. If anyone struggled with deadlines or their workload, they made it known, for example, when I was sick one week and couldn't make the deadline I had initially been agreed too. I look forward to continuing with this group for the remainder of the study period.

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Appendix

Interview: Alistair Elliott – Director, Discovery Consulting.

Friday 15th January 2021

Please tell us about your IT work. What exactly do you do?

- I work for an IT Consulting organisation called Discovery Consulting. The organisation specialises in the implementation and support of SAP software. Within the organisation I help customers select the correct software against their business requirements and also oversee implementations of the software across the various streams, such as Functional, Technical, Change and Training.

Please tell us about the industry you work in.

- The industry we operate is classified as Professional Services. This industry is quite diverse in regard to the providers, as dominated by Tier one organisations, such as PWC, Deloitte, EY and KPMG. Our organisation sits within the tier 2 level and consists in our specialist area of ERP with around 15+ competitors across a number of ERP solutions. Hence, we compete with the likes of Tier 1, Tier 2 and the general contractor market. Our value proposition is differentiated predominately from our specialist, dedicated skilled consultants and from a cost base perspective, but is hence very reliant on continual professional development.
- The software we use and those of the competition is being continually updated and released to the market every six months. Hence, we need to ensure that we are ahead of the releases and able to provide our customers with knowledge of the new solutions and where possible with track record of doing so. The investment required both from an individual and organisation perspective, in terms of professional development, is significant and would take anywhere between 5-10% of individuals work effort through the year.

What other kinds of work do you have to do?

- In the consulting field We need to be extraordinarily flexible and be willing to take on tasks for which we may not be comfortable. This is the nature of consulting and the new world of IT and hence myself and my colleagues need to have the mindset to adopt to any different tasks as required. Our organisation is also very small, hence this can mean arrange of tasks required in the organisation, such as sales, pre-sales, delivery and support.

Who are all the different people you interact with in your work?

- My role is quite diverse in our organisation, as I operate across account management, sales and delivery. Therefore, I interact with a range of both internal and external people. For example, customers, vendors and internal members of our organisation.

Please tell us about them.

- Customers: I predominately deal with the C-Level of customer organisations and as we are an ERP delivery team, this would include the CIO as they are generally overseeing an outlining the strategic plans of future IT systems, CFO as they are either planning a new finance system or hold the budget and CHR, for when we are performing Human Capital Management (HCM) solutions.
- Vendors: Our predominant vendor is the software supplier, being SAP. I work with a range of people in our relationship, such as account managers, partner managers and solution architects. This is managed predominately here in Australia but can also require us to travel to Singapore, US or Europe. As their organisation is globally distributed and they have over 90,000 employees it is up to us to travel to them.
- Internal: My primary interaction would be with our internal team. It is our team that deliver to our customers and we need to ensure that we are aligned, equipped and ready to be able to provide the specialist services expected.

What functions do they play in your daily routines?

- Customers: Customers are our primary external interaction. Our interaction is predominately around the communication of their requirements/business needs and we in turn then work, hopefully in a collaborative sense, to put forward a solution and proposal that will solve their business requirements and meet their time

and budgetary expectations.

- Vendor: We are reliant on ASAP and their relationship with them as is the cornerstone of our business. We therefore Work with them continually to ensure our organisation and our individuals are experienced and across all certifications required to maintain our accreditation with SAP. They also assist with our business development for potential new customers and all projects and hence play an important role for the ongoing sustainability and future of our organisation.
- Internal: As I interact across the entire breadth of our organisation this is quite a significant question, so I will simplify it as best as possible. My colleagues in the organisation for whom I interact perform not only a strictly IT consultant task, such as design build deliver and support, but also those organisational functions that are required to run an organisation. Therefore, I interact with our accountant for financials our HR manager for Human Capital matters our Payroll/AP Manager, Reporting and Analytics and our own internal IT staff to ensure our own organisation is supported for IT needs.

Please tell us about your interactions with other IT professionals.

- My primary interaction with other IT professionals is once more based around those in the ecosystem of SAP. This can be quite diverse as it could be at IT conferences, customer sites running different or dependent software, or indeed a collaboration between different organisations and hence the IT professionals in a joint delivery for a customer. We also have and do different forms where we bring together senior and junior IT professionals so to assist in their growth. Therefore, at times I interact with IT professionals to facilitate such forums.

What about your interactions with clients or investors?

- I have mentioned Clients/Customers previously, so I'll look at investors, or in our case, shareholders. I am fortunate to be part of a shareholder group in the organisation for which I work. Therefore, we do meet with our investors on a regular basis which means looking at the performance of the organisation, understanding IT trends in the marketplace and then revisiting strategy and execution plans as required.

What aspects of your work do you spend most time on?

- Customer delivery and satisfaction from a project and account management perspective. Our priority is to ensure successful delivery of our IT projects and hence customers need assistance to understand how to do tasks, how to manage any risks/issues and that would take most of my time to ensure success for both sides.

Which aspects of your work do you find most challenging?

- People Management, whether that is customer, vendor or internal, people management is a necessary evil of IT and professional services. The diverse backgrounds and personalities can be seen as refreshing and almost job diversity experience, which it is, however there is always elements of the team(s) for which considerable time is required to assist, coach and manage people.

Can you share an example of the work you do that best captures the essence of the IT industry?

- Possibly the most rewarding aspect, particularly the tasks that I do, is initially planning and designing systems that will save organisations time and money and operate better and then upon completion, revisiting the metrics assigned against business cases on how the performance has gone. For example, we have many cases, where we have assisted organisations who previously had vast amount of manual work and interpretations that have led to long hours and mistakes, some who have been on the front pages of national papers for incorrect payroll results. Hence when we have completed assisting our customers and we review the outcomes with our key stakeholders from our customers and they see the tangible results, so not forecasted, and they see other things now being achieved in their organisation from freeing up time and things being performed correctly and accurately, it is extremely satisfying.

What path led you to where you are today?

- I had commenced my career looking at working as an accountant, but along the way, found an interest in IT more attractive. I was very much using my Accountant background to assist with the development of IT systems in the Finance area. I then went from IT development to management and consulting, which has led through to long partnership alongside SAP technologies.

What qualifications did you need?

- The role I have now has seen a Bachelor in Business and a MBA. However, I would suggest that a business background qualification, whether Accountancy, Human Resource Management or IT are a great steppingstone to commence into this area for which we work.

What do you need to do to ensure you stay informed about latest developments, and operating at peak form?

- I have mentioned earlier, we spend between 5-10% of our time yearly maintaining qualifications and understanding latest business and IT trends. In our area, particularly with some of the consultants I work with, some of this is mandatory so that they retain their certifications to continue working with the system.

What advice would you give to someone looking to enter your industry?

- In the area that I work, being professional services / ERP, those individuals with business experience and acumen are valued greatly. Knowing business processes and being able to effectively communicate and consult is very important.

Can you talk to us about loyalty in the industry?

- Generally, people once they are within the IT Industry do remain, however the professional services industry certainly do change. We find that, particularly for those working at a tier one, it can be very demanding, as can be seen from recent articles in the Financial Review. Hence you do see people swapping between Professional Services and Industry, but generally remain within the IT sector.

Do you find that people in the IT Industry remain loyal to employers, or do they have a tendency to change regularly?

- I do not believe the IT Industry/sector is any different in regard to loyalty to employers than other industries. There is certainly a percentage that move on an annual basis but would imagine it is relatively stable.

What did you learn from working with different employers?

- The greatest thing I learnt along my career path, is the organisation for which I wish to be working. I understand that although earning money is important, it is around finding a role that is satisfying in an organisation that is enjoyable to work at, supporting and appreciated. The old adage, your work to live, not live to work.

How did you come about to enter the field? / How did you end up taking the current path in the IT industry?

- I have outlined this previously, but essentially through the early part of my career, understanding that my preference was around IT solutions and how they can solve business requirements and issues rather than straight accountancy.

Did you work in different streams prior to your current role?

- Yes, I have worked in different streams both within and outside of the industry. These have included enterprise start-ups (planning / financial), warehouse logistics and planning and financial planning within a CFO office.

What roadblocks did you come across?

- Certainly, when performing logistics roles, I was out of my depth and had to learn quickly, however all other roles although not within the IT industry specifically, were relatable or transferable skills with some application.

What recommendations would you make to someone wishing to enter the industry?

- As I have mentioned previously, I would recommend having some real-world business experience, whether that is operating in an Accounts Payable area, working within a logistics operation, so to understand real world processes. This fundamental understanding of “real business” is important so that when it comes to working on the IT side, you bring credibility to the table in at least having an understanding of processes and challenges that you are looking to assist.