Assessment 2: Group project.

Team Profile

Team Name: Awesome Breakfast Club.

Annesha:
"My name is Annesha Sharp, student number S3691179, and I am a 23-year-old Software Tester, with one and a half years of experience in the IT industry. In my spare time, I like to embrace creative hobbies such as knitting and sewing and make a great effort to maintain my health with strength training workouts and walking my dog. I discovered my Interest in IT after partially completing an arts degree and feeling unsure of my future career, in my study sabbatical I began working as a database officer and have enjoyed working in IT ever since. I found from experience that I flourish working in IT, and that I really enjoy assisting others to understand Technology."

Connor:
Hi there, my name is Connor James Simpson, my RMIT student number is; s3965238. I come from a middling family, both mum and dad have worked in a variety of jobs, and I went to a public school. Made friends and lost friends and eventually found who my real mates were through trial and error! Education wise I have completed year 12 and done a Certificate II in Information and Technology. On top of that, if you can believe it, I am a college drop-out! My home language is English, though my folks, my sister and I all speak a little bit of everything, some days we will greet each other in a mix of English, German and French or ask for something in any number of other languages that we have investigated and studied enough to have some basic understanding of, what can I say, we all enjoy languages though we were all born in Australia. When it comes to down time, I enjoy gaming, whether its video games or tabletop RPG's so long as I get to chat with some mates and celebrate good wins, I am a happy Chappy!

Dominic:
Hi! I usually go by 'Dom', student number S3961464, I'm naturally hard-working and outgoing with a positive outlook. I can quickly build meaningful relationships and I gravitate towards people who are self-motivated. Should issues unfortunately arise, I believe in fully understanding the view of all involved by discussing them openly and honestly. I also believe that there is always a reasonable solution that can suit all parties in such instances. I enjoy walking in woodland with my wife and dogs, watching a variety of sports and movies, particularly fantasy or sci-fi, reading fantasy books and trying to keep up with current affairs. I am currently studying toward a Bachelor of Commerce in my spare time, being one year into the six-year, part time degree, I have a long way to go but am enjoying the learning experience. My wife and I are also excitedly expecting our first child on the break of the coming new year, so we are spending lots of time planning for them!

Jared:
My name is Jared I am an aspiring IT (Information Technology) student of RMIT (Royal Melbourne Institute of Technology). I am starting my journey again into the world of education after the 2 years of break from the schooling system to set myself up for the future ahead (as well as the hindrance of covid). I moved away from my hometown after graduating year 12 to re-evaluate myself and what I wanted to do for the future. Using the extra free time, I had I began to pick up hobbies and interests I was not able to do from my old home. I went out to

buy my first skateboard being unsure if I was going to be interested and invested enough to learn. The first few days were like learning to walk again with my balance completely off for every new movement I tried. Although I still feel like a novice to the sport and have much to learn, it has become the most peaceful, calming, and fun activities that I am dedicated to mastering. Skateboarding allowed me to strengthen my physical abilities, clear my mind when needed, as well as understanding how to express myself internally and externally. Using my love for skateboard art and the board itself to express myself within the sport by using the skills I had learned and the art I use to convey my love for the sport and emotions.

Trent:

I was born here in Australia in a country hospital at the time now a major hospital in Busselton I have not really been brought up with any cultural background spent most my life inside and kept to myself mainly because I had been put in one of the to hard basket. education to date: high school Yrs.9, working at heights, confined spaces, gas atmosphere testing, construction white card, demonstrate first attack fire equipment, confined small workplace emergencies, safe food handling preparation. languages spoken: English mainly, basic Dutch.

Team Profile:

Annesha:

Myers-Briggs Test:	The Big 5 Personality Test:	Learning style:
ISFJ-T – Defender 52% Introverted 52% Observant 53% Feeling 71% Judging 63% Turbulent ISFJ-T = Introverted, Observant, Feeling, Judging and Turbulent	60% Extraversion 75% Openness 81% Conscientiousness 73% Agreeableness 54% Neuroticism	Visual

Connor:

Myers-Briggs Test	True Colours Test:	Learning Style:
INFP-T – Mediator INFP-T = Introverted, Intuitive, Feeling, Prospecting and Turbulent	20% green and Orange 14% blue and yellow	Tactile

Dominic:

Myers-Briggs Test:	VIA strengths test: (top 5)	Honey & Mumford learning type:
ESFJ-A – Consul 52% Extraverted	1. Kindness 2. Fairness 3. Hope 4. Humour	Theorist – 13 Reflector – 11

60% Observant 59% Feeling 74% Judging 68% Assertive ESFJ-A = Extraverted, Observant, Feeling, Judging and Assertive	5. Honesty	Pragmatist – 10 Activist - 7

Jared:

Myers-Briggs Test: ENFJ-T ENFJ-T = Extraverted, Intuitive, Feeling, Judging and Turbulent.	Emotional Intelligence Test: Self-awareness = 4/10 Self-Management=3/10 Social-Awareness=7/10 Relationship management= 5/10	Learning style: Visual

Trent:

Myers-Briggs Test: ISTP-AT – Virtuoso ISTP-A = Introverted, Observant, Thinking, Prospecting, Assertive and Turbulent.		

<u>Analysis of what these test results mean for the team:</u>

As our team has completed a wide range of personality tests, this analysis will focus on the Myers-Briggs test results for each individual member. Within the Myer's Briggs test there are four foundational personality groups: Analysts, Diplomats, Sentinels, and Explorers (Personality Types, 2022). As a team, the Awesome Breakfast Club is quite diverse, covering three of the four personality groups with Trent in the Explorer group, Connor and Jared as Diplomats, and Dominic and Annesha in the Sentinels group.

This diversity in personality types means that as a group we have a variation of different attitudes, opinions and perspectives. In terms of communication, we have 60% Introverts and 40% Extroverts. With this mixture of introverts and extroverts, we will need to consciously make our meetings a safe space in which both introverts and extroverts have the space and time to express their thoughts with the group, so they do not go unheard. In practice this can mean proactively running our meeting with an agenda so that all members can come to the meeting prepared for discussion, and then within the meetings, ensuring that every member has a chance to voice their thoughts on the agenda items prior to proceeding with the next

topics. As the team contains introverts, it's important that we utilise these methodologies in practice encourage equal expression and involvement.

Within the Myer-Briggs test results, the third and fourth letters letter of a personality type indicate a person's decision-making techniques and their perception of their surroundings (Myers-Briggs personality type and conflict - what causes fights between MBTI types?, 2021). In analysing the personality types, both traits combined provide insight as to how individuals view and react to conflict. Of the four possible combinations for these pairs, the ABC team has three of the four combinations. The majority of the team have the traits Feeling and Judging (Annesha, Dominic and Jared), whilst Connor is Feeling and Perceiving, and Trent is Thinking and Perceiving.

To summarise the different traits, Annesha, Dominic and Jared are likely to have conflict arise when their core beliefs are challenged, and will approach it in an extraverted way, discussing and resolving the conflict verbally (Myers-Briggs personality type and conflict - what causes fights between MBTI types?, 2021). As a Feeling and Perceiving type, Connor is likely to face conflict for the same reasons, however, is more likely to feel this conflict internally. Whist Trent is also likely to experience conflict internally, this conflict alternatively arises when trust and credibility are challenged (Myers-Briggs personality type and conflict - what causes fights between MBTI types?, 2021). In practice, the group can attempt to reduce conflict by being aware of the potential triggers for each member. For the FJ and FP types, one of the most important values is maintaining positive relationships and making sure all members feel heard. For the TP members of the group, it is important that trust is maintained and everyone's credibility within the group is respected. By respecting each member's values, the team will be able to uphold a strong level of productivity, reducing conflict and unease withing the team. In respecting each other's values, beliefs and integrity, the team also creates a safe environment which encourages both creativity and cohesion. (References to be included)

Section Reference List:

MBTIonline (2021) *Myers-Briggs personality type and conflict - what causes fights between MBTI types?, MBTIonline website*, accessed 6 July 2022. https://www.mbtionline.com/en-US/Articles/2021/May/MBTI-Type-and-Conflict

16Personalities (2022) *Personality Types*, 16Personalities website, accessed 6 July 2022. https://www.16personalities.com/personality-types

Ideal Jobs:

Annesha: **Technical Business Analyst**

Technical Business Analyst's overall role involves aligning technology systems with business operations by analysing and developing innovative integrated software solutions. Their duties include providing internal IT support and managing web-based software solutions as well as regularly reporting to management (Technical Business Analyst Job Description, 2022).

Connor: **Cybersecurity Analyst**

Cyber Security Analysts works to protect the hardware, software and networks of the company, organisation or individual they work for from cybercriminals and attacks. They need to understand the IT infrastructure in detail, have a means of monitoring the system at all times whilst evaluating threats that could breach the network and threaten the security of the company. Overall, they're job is to attempt to enhance the network security and protect

sensitive information by those they're employed by (How to become a Cybersecurity Analyst, 2022).

Dominic: **Financial accountant**
Financial Accountants are responsible for, obviously, running the accounting and financial activities of an organisation. They analyse the economic stability of the company and provide financial information to other departments to make budgeting and investment decisions. They report on costs, productivity, margins and company expenditures alongside tax and inventory, balance sheets, funding advisory and internal audits, among a plethora of other things (Financial Accounting Job Description Guide, 2022).

Jared: **Cyber Analysist**
Cyber Analysts are an army career that goes through the Cyber Specialist pathway they share a similar role to the Cyber Security Analyst however they're capacity as a military unit changes a great deal of things. They are dedicated to defending military systems and networks, ensuring they remain secure and stable alongside finding rapid-fire solutions to defend against cyber threats. Furthermore, where a Cyber Security Analyst is part of the corporate field, the Cyber Analyst's military role means they are working with other agencies, governments and international organisations, here they also operate at a tactical and strategic level conducting cyber activities to defend and assure the integrity of their systems (Cyber Analyst, 2022).

Trent: **Security Development**
Security Engineers keep a company's security systems up and running including, but no limited to implementing and testing new security features, planning computer and network upgrades, and troubleshooting and responding to security incidents. They are also tasked with identifying security measures to improve incident response times, responding to security incidents and coordinating incident response across teams (What is a Security Engineer?, 2022).

Comparison:
The largest common element with all the jobs listed that we've chosen as our "Ideal Jobs" is that they all involve Computers and Information Technology in one aspect or another.

Security Engineers, Cyber Security Analysts and Cyber Analysts play very similar roles to one another; keeping the systems they're in charge of secure from outside threats and ensuring those systems are up to scratch. All three analyst jobs involve going over data and dictating non-urgent tasks over to the appropriate teams to be taken care of in multiple areas.

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Western Governors University, Millcreek (2022), *How to become a Cybersecurity Analyst*, WGU Website, Accessed 15/07/2022, https://www.wgu.edu/career-guide/information-technology/cybersecurity-analyst-career.html#close

Tools

Group Github links:

Group repository link: https://github.com/anneshars/Assignment2-AwesomeBreakfastClub

Group Website link: https://anneshars.github.io/Assignment2-AwesomeBreakfastClub/

Personal Github links:

Annesha: https://anneshars.github.io/Assignment1/

Connor: N/A

***Dominic*:** https://dominic-gee-rmit.github.io/Assignment-1/

Jared: https://jarheado.github.io/IIT-personal-profile/

Trent: N/A

Teams video meeting links:

- Meeting 28.06.2022
- Meeting 29.06.2022
- Meeting 05.07.2022
- Meeting 06.07.2022
- Meeting 09.07.2022
- Meeting 12.07.2022
- Meeting 14.07.2022

Meeting agenda links:

- Meeting 1 28.06.2022 - Agenda, notes & actions
- Meeting 2 29.06.2022 - Agenda, notes & actions
- Meeting 3 05.07.2022 - Agenda, notes & actions
- Meeting 4 06.07.2022 - Agenda, notes & actions
- Meeting 5 09.07.2022 - Agenda, notes & actions
- Meeting 6 12.07.2022 - Agenda, notes & actions
- Meeting 7 14.07.2022 - Agenda, notes & actions

Teams Group Link:

https://teams.microsoft.com/l/team/19%3arw4lKn5PhbIxbrwp9WRGjRuY4uq_np6a7NLM5IcTQZs1%40thread.tacv2/conversations?groupId=21b568c2-2f7e-477e-abea-cb1b6fc46843&tenantId=d1323671-cdbe-4417-b4d4-bdb24b51316b

Teams Group Chat Link:
Currently we have been unable to generate a link to share our Teams Group Chat, however upon request we can add users to the Group chat for review if required.

Review of GitHub Audit Trail:
Although GitHub was the tool which we used to convert our assignments into a website, it didn't serve much function for our group other than that. The audit trail on the GitHub repository would not reflect a realistic timeline of specific item completion, it would read more like a list of completed works being uploaded within a very short amount of time, if not simultaneously.

A much better representation of our timeline for progress would be an audit trail of teams (if available), or our meeting 'Agenda, notes and actions' documents. We decided to manage, share and edit our documents primarily in teams because it offers a much 'friendlier', more intuitive interface and we could easily navigate ways to file redundant drafts, live chat with each other and edit shared documents without confusing ourselves.

I think the most influential aspect of the decision to primarily utilise teams (other than the assignment specification) was that our group thrived from regular live conversation to maintain organisation and motivation. If GitHub had facilitated this feature, I believe that we may have been more likely to use the file sharing platform more consistently, rather than using it as a final destination as we have.

Due to changes in the structure of the group towards the end of the assessment, we did need to migrate the GitHub repository from Trent's GitHub account to Annesha's. In doing so, some of the initial commit history from building the foundation of the website were lost. An exported list of the GitHub commits from our original repository can be found on our website.

Industry Data

What are the Job Titles for your group's ideal jobs?
Annesha: Technical Business Analyst
Connor: Cybersecurity Analyst
Dominic: Financial accountant
Jared: Cyber Analysist
Trent: Security Development

How do each of these rank in terms of demand from employers?
Cyber security roles such as those chosen by Connor, Jared and Trent are currently in high demand with Australia being short 25,000 skilled or qualified people to fulfill the industries workforce as of November 2021. (Braue, 2021). This demand gap will likely continue as the 'Australian Skills Commission' expects an enormous 38.9% future growth in the field, (Australian Government Labour Market Insights, 2021) with Australians set to spend between $5.6 - $7.6 billion in 2022 (AustCyber, 2021).

Annesha's chosen role as Business Analyst looks to have a safe future with seek adverts for similar roles increasing by 8.6% in 2019 (iRM Training, 2019). This was before 90% of Australian businesses reacted to the COVID-19 pandemic by instating new technologies to survive, furthering the need for business analysists. (UTS Online, 2022). Current projections from the 'Australian Skills Commission' expect to see a further 12.9%

growth in this field between now and 2024. (Australian Government Labour Market Insights, 2021).

The outlook for Dominic is not quite as positive because although the accounting industry is set to have an increased demand for work of 9.2% between now and 2026 (Australian Government Labour Market Insights, 2021), there is set to be high competition in the field putting downward pressure on salaries and job opportunities. (IBIS World, 2021). However, if Dominic looks to specialise in taxation or audit style accounting, there would be a greater demand for work and potentially less downward pressure on wages (You unlimited, 2021).

The Group's Required Skill Set:

	Annesha – Technical Business Analyst	Connor – Cybersecurity Analyst	Dominic – Financial Accountant	Jared – Cyber Analyst	Trent – Security Development
General Skills	- Critical thinking. - Reading comprehension. - Quality control analysis. - Active listening. - Judgement and decision making.	- Reading comprehension. - Critical thinking. -Complex problem solving. - Judgement and decision making. - Active listening.	- Critical thinking. - Mathematics. - Reading comprehension. - Active listening. - Speaking.	- Problem solving. - Written and oral communications. - Teamwork. - Initiative. - Task prioritisation.	- Reading comprehension. - Critical thinking. -Complex problem solving. - Judgement and decision making. - Active listening.
IT specific skills	- Programming. - A wide range of systems evaluation. - Troubleshooting. - Testing and debugging. - Advanced process modelling.	- Programming. - Extensive coding knowledge. - Knowledge of Firewalls and VPN's. - Knowledge of 'Kali Linux' and penetration testing. - Systems evaluation.	- Advanced excel knowledge. - Enterprise resource planning tools. - Knowledge of SQL. - Basic Microsoft visual skills. - Understanding of 'Hyperion'	- Programming. - Extensive coding knowledge. - Knowledge of Firewalls and VPN's. - Knowledge of 'Kali Linux' and penetration testing. - Systems evaluation.	- Programming. - Extensive coding knowledge. - Knowledge of Firewalls and VPN's. - Knowledge of 'Kali Linux' and penetration testing. - Systems evaluation.

(Glenn N, 2022), (Australian Government Labour Market Insights, 2021), (Australian Army, 2022), (simplilearn, 2022) , (Australian Government Labour Market Insights, 2021), (Half R, 2022), (Australian Government Labour Market Insights, 2021).

How do the IT-specific skills in your required skill set rank in terms of demand from employers?

In the jobs relating to cybersecurity employers are demanding that employees maintain a strong knowledge of security trends, new technologies and new risks as the field is developing

so rapidly. They also hold knowledge and application of security standards, such as the ISO27000 series in high regard alongside professional certifications in the field. (Beckley R, 2021). These demands aren't a direct reflection of the industry required skills perse, however qualifications and knowledge of industry standards would heavily imply that the technical skills we have listed above would be present in the applicant. The technical skills listed such as knowledge of operating systems (e.g. Linux) and a wide range of coding knowledge are also highly regarded by employers. (Dice, 2022).

Business analyst employers have a high demand for computer literacy with a wide array of tools, such as SQL, Excel and 'power BI'. (indeed, 2022). Another skill required by many employers is process modelling. This visual interpretation of business systems and their practical uses is extremely useful in communicating ideas to management and the teams utilising them. (IBM Cloud Education, 2021).

In accounting there has been an increase a 33% in demand for 'Python' programming skills in 2021 which was surprising (Williamson R, 2021). This contradicts our table of required IT skills which focussed more on the use of industry tools. Other IT skills including knowledge of Applications & Products Data Processing, Enterprise Resource Planning, Structured Query Language and Scrum have become in huge demand since the COVID-19 pandemic significantly increased businesses need to go digital. (Williamson R, 2021).

How do the general skills in your required skill set rank in terms of demand from employers?

Employers of Cyber Security analysts and developers state high demand for communication skills such as active listening, attention to detail and problem-solving skills (Krakoff S, 2022). These skills are a very good reflection of the general skills which we identified in the table above. Communication seems to be one of the most desired skills, to enable clear communication of complex ideas, especially to customers. (Dice, 2022).

For Business analysts, employers have highest demand for analytical decision making with 69.49% of job adverts in the field stating this as a desirable skill. Other high-ranking skills included teamwork (listed on 63.48% of industry job adverts) and communication (listed on 60.78% of industry job adverts) (Verma et al., 2021).

The general skills, or soft skills, most highly regarded by employers are accounting organisational skills such as task prioritisation and accuracy, written and verbal communication and continual learning. (Ottawa University, 2021). These skills closely matched those identified in our required skill set. Another greatly demanded skill is ethical commitment due the deservedly scrutinised nature of the work. (Boyd K, 2021).

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

Annesha: In 2021, three of the most required Business Analyst IT skills outside the standard business analyst skillset included Statistical analysis software, Database Querying languages, and Surveying/query software (Iacolino, 2021).

Connor: For the Cyber Security Analyst role the three highest ranked IT Specific skills are; 1: Programming, 2: Extensive Coding Knowledge, 3: Knowledge of VPN's and Firewalls. Based on the data above.

Dom: In accounting, the three highest ranked IT specific skills which are not listed in our required set are:

1. Understanding ‘Artificial Intelligence’.
2. Data visualisation.
3. Understanding of data analytics software.
(AvidXchange, 2021).
These skills seem to be as important as the IT skills which have been listed in the table above.

Jared: Not completed.

Trent: Not completed.

What are the three highest ranked general skills which are not in your required skill set?

Annesha: From a general skills perspective, the top three skills for a Business Analyst include Analytical and problem-solving skills, interpersonal skills, and creative thinking (Bahirat, 2022).

Connor: In order the three general highest ranked general skills for the Cyber Security Analyst role are 1: Reading Comprehension, 2: Critical Thinking, 3: Complex Problem Solving, based off the data above.

Dom: In accounting, the three highest ranked general skills which are not listed in our required set are:
1. Knowledge of accounting practices.
2. Ability to prepare financial statements.
3. Knowledge of general business practices.
(Ottawa University, 2021).
These skills are all based around experience and could be significantly developed through an internship or work experience.

Jared: Not completed.

Trent: Not completed.

Having looked at the Burning Glass data, has your opinion of your ideal job changed? Why or why not?

Annesha: After reviewing the Burning Glass data on the role of Technical Business Analyst, my opinion of my Ideal job has not changed, in fact it has been further confirmed. Personally, I find that the general skills required for the role suit my skill, particularly critical thinking, and analytical and problem-solving skills. Additionally, the IT skills mentioned which I have not already obtained are of great interest to me, particularly programming.

Connor: Even after looking at the Burning Glass data my opinion stays unchanged... though my outlook might be considered cynical I don’t really have an “Ideal Job” no job I’ve looked at in the past, including this one, has been able to even remotely fit all the niches I’d like to have in something I would consider ideal as a job. A job is a job, so long as I learn the skills necessary to do the job well or, even better, excel at the position I’m in within that job's boundaries then I’m happy enough to utilise it for what it does for me at the end of the day, which is simply earn me a wage I can, at the very least, live on.

Dom: Although my general opinion about my ideal job has not changed, the burning glass data has made me consider that I might need to specialise in a less competitive area of the

industry since the slow growth rate is being outpaced by the available workforce. If I don't look to specialise, I could struggle to find work, or find myself receiving low pay. Other than this, I think the burning glass data has reaffirmed that my skillset is well suited to my ideal job, and I still look forward to working in the industry when I complete my studies.

Jared: Not completed.

Trent: Not completed.

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IT Work

Chris Scott, Systems Administrator of a local high school, was kind enough to agree to an interview with us. Unfortunately, due to him contracting covid and having a sore throat he wasn't able to conduct the interview over video, so we conversed via email instead.

We were meeting with Chris to find out about his experience as an IT professional and hoped to get a deeper understanding of the field, along with any insights he had to be successful within it.

We first sought to find out how long Chris had been working as an IT professional. He noted that he had been working full-time for approximately 10 years but had been working part-time for businesses during his final 3 years of high school. Intrigued as to what types of work would be compatible with school hours we posed the question, 'What kind of work were you doing toward the end of high school? Was it a substantial amount of work?'. Chris answered, 'Towards the end of school, I was doing quite a few shop fit outs for franchises that were opening stores and then provided them with ongoing support.'

Having established a base for Chris' experience working as a professional, we wanted to understand how he broke into the field. He surprised us by saying that initially he was totally self-taught and just following his passion for the field. He applied for holiday work at his school which led to full-time job following his completion of high school. Once he was comfortable in his position, he enrolled in a Bachelor of Science (Cyber Security), studying online so he could continue his full-time employment. Although Chris had already gained full-time employment in his chosen field, he still says that 'If I was to do it again, I'd start university right away', with the key takeaways from his study being communication and time management skills 'aside from the actual course content'.

So, we had covered the experience and qualifications and now it was into the nitty gritty. Chris told us that his day-to-day job lists included 'patching software and systems, backup management, log reviewing, application deployment, network changes, network monitoring and end-user support' with occasional work 'developing project proposals and deployment of new systems and technology throughout the College'. Most of Chris' time, however, is spent on 'Research and documentation' as well as 'reviewing the latest patches or software, testing and then deploying'.

On a weekly basis, Chris doesn't have significant communication with other IT professionals, in fact the majority of his regular contacts are 'end-users, management, the helpdesk, and vendors'. He mentioned that he is part of an online group for IT professionals within the local school system, however it does not prompt regular discussion and Chris reflected on the matter stating, 'I don't know if this is a school IT issue, a location issue or something of the wider IT profession'.

We asked Chris if he was spending an increasing amount of time working remotely due to advances in the field, but he says that, although he can perform some aspects of the job from home and this allows him to focus efforts without distraction, most of his working time is spent in the office because 'for some things, it is easier to be in the office'.

For the final part of our interview, we gathered some great insights into the challenges and rewards of the professional IT world. Chris told us that other than budget approval, the greatest difficulty he faces in his position is 'Keeping up to date with the latest technology trends'. Chris says his primary sources for overcoming this are 'vendors or value-added resellers (vars)'. Chris also says that research is vital whether it be via online blog or conferences which are held consistently. This need for education and research backs up Chris' personal insight into the IT industry, 'You can't stagnate and stop learning otherwise you'll be left behind'.

To highlight the rewards and great benefits of the IT industry, Chris shared with us a project that he had developed which captured the essence of the industry as a whole. 'I digitized our purchase order books into an automated system that gets approval from multiple people. It

saves multiple peoples time, leaves an audit trail and stops us buying paper purchase order books'. Innovative developments like this offer economic and environmentally friendly solutions to old and laborious problems, that when implemented across businesses can have an enormous impact on our lives.
So, with our interview concluded we are going to wrap it up and take Chris' sound advice 'Always have tested offline backups'!

IT Technologies

Autonomous Vehicles
Written by Dominic Gee

Autonomous vehicles or Automated driving systems (ADS) are driving systems that require varying levels of human intervention to propel and navigate themselves in a safe manner along pre-determined routes (Wikipedia, 2022). The Society of Automotive Engineers (SAE) has categorized autonomous driving into six different levels ranging from 0 – 5.

Level 0	No driving automation
Level 1	Assisted driving – in certain circumstances the vehicle can control steering or speed to assist the driver.
Level 2	Partial automation – in a wider field of certain circumstances the vehicle can control steering or speed to assist the driver.
Level 3	Conditional Automation – In normal conditions the vehicle controls steering and speed, but drivers are required to always maintain supervision.
Level 4	High automation – In normal conditions the vehicle can completely control the vehicle without driver supervision.
Level 5	Full autonomy - In any condition the vehicle can completely control the vehicle without driver supervision.

(SAE international, 2021).

The first prototypes of autonomous driving systems were unveiled in the early 1920's but were closer to remote controlled than autonomous. (Kroger, 2016). In recent years, catalyzed by the integrated circuit due to its affordability, reduced size, capacity, and speed, autonomous vehicles have seen considerable progress with commercially viable options starting to emerge. (Masello et al., 2021).
Although the well-known brand 'Tesla Motors' are currently producing vehicles with significant levels of autonomy, they can only be classed currently as level 2 automation due to a higher level of scrutiny, but CEO Elon Musk claims that they will achieve level 4 by the end of 2022. (Fox, 2021).
'Waymo', owned by 'Google', have been carrying out a driverless taxi service in Arizona since 2020. This service is classed as level 4 autonomy with no driver present for the ride, however due to complexities with wet roads, American left turns, and the inability of these vehicles to operate in any unknown city, they are not yet capable of being classed as level 5 (Coppola and Bergen, 2021).

According to ABI research, by the year 2025 there will be 8 million consumer vehicles with SAE rating 3 or higher on the roads (ABi Research, 2018). Motor giant 'Volkswagen' are also targeting 2025 for the release of their commercial vehicle the 'I.D. BUZZ'. It is set to offer an 'SAE level 4' driverless taxi service to selected cities across the world (Hanover, 2021).
LiDAR sensors are an integral part of the future of automated driving (Wang, 2021). LiDAR sensors send out a series of light beams that bounce of the surrounding environment, and when those light beams return to the sensor, they can use the elapsed time to work our distances travelled and therefore create a map of nearby objects. The main issue with them however is that their application in inclement weather such as rain or fog becomes inaccurate (Baker-Campbell, 2020). Overcoming this challenge will be essential for any manufacturers hoping to reach level 5 automation.
Another huge barrier for autonomous driving is 'turning against traffic' or the 'unprotected left-hand turn' (on American roads). Particularly in busy traffic conditions, autonomous driving systems are unable to correctly identify times to edge forward and cross safely over lanes of two-way traffic. 'Waymo' have been trying to combat this by using 'TensorFlow Ecosystem' to train its nets (Rangaiah, 2021) and by simulating the outcomes of 'disengagement reports' should the driver not have intervened (Verger R, 2019).

What is the likely impact?
The advancement of autonomous driving systems will have a large range of economic, social and environmental benefits, especially if SAE level 4 standard can be reached on a wide scale. Environmental benefits would be that the automated cars would be programmed to drive at the most economical rates but more importantly, if people begin sharing vehicles a smaller number of ADS vehicles could service the same population and needs as a much larger number of non-autonomous vehicles, with current estimates assuming that any one autonomous vehicle could replace 2.5 conventional vehicles (Othman, 2022). For example, after being driven to work, the passenger can send the vehicle back home to pick up the next household member for their commute.
Societal benefits include greater vehicle utilisation and reduced vehicle ownership, meaning less registration and maintenance, improved traffic conditions and better time utilisation, because commute time could be much more productive. Driverless cars could also provide great conditions for quarantined travel, a pertinent benefit given the recent pandemic.
Economic implications are that although many new jobs would be created in the development and management of autonomous driving systems and the structures that govern them, it might not outweigh the loss of driver jobs which it causes (Klaver F, 2020).
Governments could benefit by reducing costs of paroling police and paramedics, utilising driverless systems to transport non-urgent casualties or to allow humans to remain at the scene as an apprehended person is taken to a local police station.

How will this affect you?
Our daily lives would be benefitted in numerous ways. Being able to share a single vehicle with partners, family or friends would reduce vehicle storage space on our properties (potentially even reducing building cost), allow multiple people to share the costs of maintenance, registration, and purchase price of vehicles. Taxi and delivery services would also become cheaper because the cost of human involvement would be removed. The ability to utilise commute time for other activities would improve personal productivity to complete employment tasks or respond to personal emails etc. This would in turn increase 'free time' for recreational activities and time spent with friends and family or for working on personal projects. This could lead to improved personal wellbeing and productivity in employment.

Taxi and delivery services would become cheaper because the cost of human involvement would be removed.
The reduced risk of crashes associated with autonomous driving systems would be a great benefit to any society that adopts them. Not only the immediate effect of being removed from the harm that could be caused, but the improved traffic conditions and reduction of hospitalisations would create room for other casualties. In unfortunate circumstances this could potentially save our lives (Pettigrew et al., 2018).
Autonomous driving systems would also remove the ability to drive under the influence of drugs or alcohol. This would free up police time and allow us to feel that the services they provide are better serving us.

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Robots & Humanity

Written by Connor Simpson

First Law

A robot may not injure a human being or, through inaction, allow a human being to come to harm.

Second Law

A robot must obey the orders given it by human beings except where such orders would conflict with the First Law.

Third Law

A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.

Asimov I, 1964, *The Rest of Robots*, Doubleday, United States

When robots are mentioned, many people think of things like Wall-E, Terminator, Short Circuit or even Chappie. Whilst fiction is far from reality, robots have many applications that are used today, and some movies are much closer to what we might see than they might be given credit for! Due to the broadness of robots or robotics as a topic I have chosen to narrow things down to a single field; robots in medicine. The reason for this, beyond the sheer limitlessness of the applications of robotics (from automotive and military to mining and construction) medicine is the one thing that will have the most immediate and long-lasting impact on humanity.

What is state of the art for this technology?

The current medical applications of robotics in medicine are quite extensive, however there are many things that are being tested, are experimental or mere theories. Now, according to Intel medical robots were providing surgical assistance from the 1980's in the form of robotic arms. As the years wore on artificial intelligence gave these assistance a broader scope of abilities using AI enabled vision and data analytics meaning robotics could be used in other areas of medicine.

Intel states that; "As technologies evolve, robots will function more autonomously, eventually performing certain tasks entirely on their own." in theory this will allow doctors, nurses and other healthcare professionals to spend more time providing patient care. As those

technologies progress further it will allow for more efficient processes in clinical settings, safer working environments for patients and healthcare workers and a higher grade of patient care.

What can be done now?

At this point in time, according to an article published to PubMed Central; "...medical robots are well known for their roles in surgery, specifically the use of robots, computers and software to accurately manipulate surgical instruments through one or more small incisions..." Robots and robotics are also used to assist surgeons in their procedures, monitor life support systems and even keep people alive, though the latter is only in a limited capacity with much oversight. There is one instrument, known as da Vinci, that was approved by the FDA in the year 2000 that's said to have been used to perform over six million surgeries globally. The same article mentioned earlier claims; "Surgeon's benefit from improved ergonomics and dexterity in comparison with traditional laparoscopy." but goes on to state that the system costs upwards of one million dollars and that the surgeons and surgical teams that will use the device need to be trained in its use.

There are several unnamed companies that are attempting to build systems for specific procedures such as knee or hip replacements, one Toronto based company has been developing the Modus V for neurosurgery. The robot is an automated arm that has the ability to track surgical instruments and move to the appropriate area as the surgeon is working, the device is also supposed to be able to create high resolution images on a screen and is proposed to have "AI-enabled voice-activated control."

What could be possible in three years?

All things considered from the above information there are a plethora of things that could occur within three years. At its present rate I can see a possibility that there will be a wider range of surgical robotics available in more hospitals with advanced versions of older models being placed in hospitals that have been carrying the systems for the longest period. I can also see more robots in aged care facilities and assisted living centres where those being looked after may not have the physical or mental faculties to fully look after themselves. These units will, naturally, be designed with a focus on helping carers in the facilities, thus bolstering their ability to effectively look after those under their care. One such robot is known as Labrador, designed by California based Labrador Systems. With two variations on the robot itself called the Labrador Retriever and Labrador Caddie respectively, both having different functions that will enable them to help people that have assisted living requirements.

What technological developments make this possible?

In all honesty I couldn't rightly say what would make these developments possible, increasingly advanced AI, better materials and programming, a more streamlined design, a better user interface. All those things would help to make the potential developments mentioned in the previous question possible, though not necessarily cost effective or quick to manufacture, regardless as technology improves so to will our capacity to heal utilising robots and robotics.

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Raspberry Pis, Arduino
Written by Jared Martin

What does it do?
Raspberry Pi and Arduino are small computers on a board that enables people to design and create endless and unique creations. They are easily adaptable and mouldable with their uses with many small components such as cameras, voltage controllers, relays, water sensors, smoke sensors, IR (infer-red) controllers, RFID (Radio Frequency Identification) card reader/Wrighter kits, and many more. These allow the computers to be adaptable to create endless machines.

Arduino
Arduino computers are simpler and cheaper than raspberry pi's and come with more component options designed for them. Arduinos have very limited computing power but allow for easy small tasks. Their size allows them to be placed in small discrete locations where they can be used. A small project they can be used for is a LED strip light controller. Using an infer-red receiver, infer-red remote, power supply and LED strip lighting you can connect to an Arduino and code it to create patterns with the strip lighting as well as program the remote to adjust or change the LED strip lighting's function and colours. Although Arduino are powerful machines capable of much, they are not the most optimal for uses in commercial products due to their limitations. They are easy to replicate as the parts to use in Arduino are easily accessible though the ease of them being already assembled is what makes them such a popular and useful tool.
Arduinos though somewhat complex machines have the capacity to become more powerful throughout the years they are limited from more powerful processors such as ARM as ARM is Patented.

Raspberry pi
Raspberry Pi's are a much more advanced computer than the Arduino and come with more features included in them comparatively. They use ARM processors which are processors using the ARM architecture. This architecture makes them some of the most advanced small computers.
Raspberry pi contain the power to do anything an Arduino can do and more. They can create small projects such as simple alarm systems, temperature controllers and LED controllers but these things are simple enough that they are generally made using Arduino. For the pi they are generally used to create or recreate complex and commercial products. One example of a popular use of the Raspberry pi is a portable simple game system. Using a raspberry pi and a SD (Standard Deviation) card they can be used to store and play on thousands of classic games that can be recreated or downloaded from the internet. Allowing people to play classics such as donkey Kong or Marrio to the classic mortal combat games. Another project is to use an old, outdated tv and bring it into the modern world by using the raspberry pi as a smart tv box. Bringing platforms such as Netflix and Stan to the loungeroom without buying a premade

smart box from a cheap online store. Relating to the smart tv the raspberry pi is often used to make smart homes, allowing the user to turn off and on their accessories away from home or control them with less need for more components and hassle.
Given the effort most people can harness the power of the raspberry pi without much need-to-know coding or engineering skills. Many resources online include already created software and easy to follow guides for the most popular of its' uses. The pi can be bought with components and project allowing anyone to be able to pick one up and learn to use it. Effectively making it not just a powerful machine but also, its own learning tool.

What is the likely impact?
The endless uses and power of the Raspberry pi have given it a staple name known largely throughout the computing and engineering world. Paired with Arduino they are both staples in today's world that will continue to grow. Arduino originated from 2005 with various improvements with new models introduced over the years. Raspberry pi was conceived less than a year later, and the first model being introduced in 2011 where it has seen many new models and improvements. One of the largest impacts of these both is their ability to be used and learnt by most allowing new generations to learn about technology in a fun and opportunistic manner, being able to create boundless project ideas. Much of the computer science-based world knows and uses these tools as fun side projects and learning tools. Their impact has reached youth and older users who interact with them and gain meaningful skills. Gaining the interest of many and helping many into a field that impacts their individual lives and for some the lives of others. The increasing development of these technologies will allow for more unique and powerful projects, encouraging more people to invest in tools that educate and elevate individuals into lifestyles and life decisions more passionate and rewarding.

How will this affect you?
More commonly people are beginning to learn about raspberry pi and Arduino as the world becomes more based around electronics and computer-based jobs. On a personal basis I have only learned about Arduinos and Raspberry pi recently over a year ago and I have interacted with many people who use them in their daily lives. Many owning multiple devices for many different projects. They shared their uses and capabilities. This inspired me to delve into electronic and computer-based studies. For many of my friends that use them, they use them for simple automation such as an automatic door closer, and an ad-block server. These have proven to be useful and fun projects that were only possible due to the pi and Arduinos capabilities.
Eventually I plan to buy myself some Arduino and Raspberry pi. I want to use them to improve my skills and gain new ones as the world of electronics spans vast areas. With them I will be able to create useful tools to make my life easier as well as projects such as a PS2 emulator using a raspberry pi emulator or an Arcade game console for small portable games.
Using the Arduino and Raspberry Pi, I can introduce them using my projects to family and friends and hopefully inspire them to learn and create something using them as well. I could also use them as gifts by creating something unique and fun to give to someone for them to use and enjoy. The uses of them will allow me to not just purchase something but create something of my own design for others.

The Raspberry pi and Arduino are incredibly simple computers that allow people to create, learn, discover, and play with. Moulding lives and giving a base for many to explore their interests in technology. They are and will continue to be staple part of many lives with advancements that will give the ability for more complex and powerful uses.

Clouds, Services, servers
Written by Annesha Sharp

The term Cloud Computing encapsulates a wide range of virtual computing services delivered over the internet, commonly referred to as the Cloud. Cloud Computing Services includes four different types of services; Infrastructure as a Service (IaaS), Platform as a Service (PaaS), Software as a Service (SaaS), and Serverless computing (What Is Cloud Computing? A Beginner's Guide, 2022). As the name suggests, IaaS offers users the ability to rent IT infrastructure, including Virtual machines and Servers, on a pay as you go subscription. The primary benefit of using IaaS is the reduced cost for usage, and the regular maintenance cost for the infrastructure by incurred by the service provider, rather than the user. PaaS is a cloud development environment which facilitate the web and application development. In addition to the infrastructure supplied in IaaS, PaaS also includes resources such as development tools and database management systems to assist in development (What is PaaS? Platform as a Service, 2022). SaaS adds an additional element of support on top of PaaS, by also providing web hosting services for the application, allowing customers to access the cloud application in a web browser, a popular example of SaaS is Salesforce (SaaS: Software as a Service, 2022). With pay-as-you go service, Serverless Computing is designed for developers, to reduce the server management tasks and costs associated with software development. Rather than reserving and paying for the maximum number of servers the project may require, the server usage is managed by the provider to allocate servers as needed (What is serverless computing? | Serverless definition, 2022).

State-of-the-art Cloud computing technologies can be seen in the data centres of the three leaders within the industry: AWS, Microsoft, and Google (Gartner, 2021). As per the Gartner Report for 2021, All three of these companies have geographically diverse datacentres located across the globe, upgrade technologies to improve performance and efficiency, and provide a wide range of growing services.

In the coming years, the widespread adoption of cloud computing is expected to continue to grow as it has over the course of the COVID-19 pandemic. According to Gartner, the world-wide annual expenditure on public cloud services is expected to increase from 410 billion dollars in 2021, to $494.7 billion dollars in 2022, and then almost 600 billion dollars in 2023 (Gartner Forecasts Worldwide Public Cloud End-User Spending to Reach Nearly $500 Billion in 2022, 2022).
Whilst this growth has been widespread across all areas of Cloud Computing Services, four new trends in Cloud Computing came to light in late 2021 and are expected to be the future of the service, these four trends include Cloud Ubiquity, Regional Cloud Ecosystems, Cloud Sustainability, and Automated programmable Infrastructure (Gartner Says Four Trends Are Shaping the Future of Public Cloud, 2022).

The term Cloud Ubiquity is related to the concept of Ubiquitous Computing, where computational services are available and any time or place across a wide range of devices (What is Ubiquitous Computing? | Security Encyclopedia, 2022). Ubiquitous Computing is a very broad term, referring to various aspects of IT including Communication, Entertainment and Smart home integrations etc. (Vahdat-Nejad, Eilaki and Izadpanah, 2018). Through increased adoption and availability of Cloud Computing, Cloud Ubiquity will support the adoption and growth of Ubiquitous Computing, by providing the services required.

The Regional Cloud Ecosystems trend predicts that in the coming years Data Centres will become more prevalent in different regions to support local demand (Cummings and Was,

2021). For many years Cloud Services have utilised overseas data centres to fulfil the work, however this has presented issues due to varying data laws and regulations in different countries.

In Cloud Computing, there are two primary environmental risks; Carbon Dioxide emissions resulting from Data Centre energy consumption, and the water consumption required to cool the servers in Data Centres. In theory, the use of Cloud Computing services is likely to reduce energy usage, by optimising resource consumption using virtual machines (Trivedi and Sharma, 2014). However, in practice these Data Centres need to be managed rigorously to ensure server virtualisation and consolidation are used properly to effectively minimise the Centre's energy usage. In 2016, the US Department of Energy provided two Improved management solutions to minimise the footprint of data centres. The first option 'Improved Power Usage Effectiveness', encourages a reduction in the infrastructure energy consumption used by smaller data centres, through environmentally friendly means such as improving airflow within the facility. The second recommendation is to remove inactive servers, which at the time were estimated to be 10-30% of Data centre servers in the US. At the time of this report, these two changes were estimated to reduce data centre energy usage in the United States by 10% (Shehabi et al., 2016).

Automated Programmable Infrastructure refers to cloud services which utilise Artificial Intelligence and/or Machine learning for infrastructure management. In the long-term, adopting the Artificial Intelligence and machine learning managed infrastructure will greatly reduce the operational costs associated with system administration and maintenance (Gartner Says Four Trends Are Shaping the Future of Public Cloud, 2022).

What is the likely impact of these changes to cloud computing?

Resulting from the widespread adoption of Cloud Computing, Cloud Ubiquity will result in more diverse usage of cloud services, to support a wider range of devices. Given the broad nature of Cloud Ubiquity, it is expected that generally this trend will further advance telecommunication and automation technologies, further growing the user's ability to access technology "in an anywhere/anytime manner" (Vahdat-Nejad, Eilaki and Izadpanah, 2018). By increasing the accessibility of technology, this trend will also support further remote working capabilities.

Regional Cloud Ecosystems will likely reduce the risks associated with using Cloud Services, as more Data Centres will be accessible in each country. When using international cloud services, companies can risk losing data or facing legal difficulties as regulations may be different in the hosting country. Regional Cloud Ecosystems will reduce this risk by having Data Centres available in the country of use and aligned with the local region's regulations (Cummings and Was, 2021). Ideally the future change to Regional Cloud Ecosystems should see an increase in data centre jobs available in each country.

In 2016, it was estimated that Data Centres were responsible for almost 2% of the United States electricity consumption (Francis, 2021). In recent years the components required by data centres have become more efficient in their power usage, however with the widespread adoption of this technology, extra efforts will be required from corporations to ensure Cloud computing does not contribute further to the current climate crisis. In the future, these efforts are expected to result in further transparency around the carbon footprint of Cloud Services Users. Additionally, this has resulted in many Data Centres, such as NEXTDC, offering Carbon neutral options for their customers, and in the long-term switching to renewable energy

sources. (Carbon Neutral Solutions | NEXTneutral, 2022). Google has also demonstrated revolutionary progress with their Carbon-Intelligent Computing project, which redirects cloud computing task to data centres where renewable energy is available, reducing the production of carbon emissions wherever possible (Koningstein, 2021).

In the coming years Automated Programmable Infrastructure usage is expected to grow in Cloud Services. From a corporate perspective, this will reduce operational costs greatly and reduce the workload of Server Administrators, however from an individual perspective this could possibly result in job loss within the IT industry.

How will this affect you?
Working as a Software Tester, the widespread adoption of cloud services has presented many benefits, resulting in more flexible work options and an increase in software development resources using PaaS. The impacts of Data Centre's on the climate crisis presents as a concerning issue, and I am hopeful that the ecological impacts of the technology will be minimised, so it benefits both Technological Advancement and the Climate. The possible job losses that could result from the introduction of Automated Programmable Infrastructure could likely have negative impacts within the IT workforce. Personally, this predicted change highlights the importance of upskilling and staying up to date with new technologies. This point is particularly relevant for me, as I am currently undertaking professional development training in Automated testing, which will likely be the future of Software testing in Cloud Computing.

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Project Ideas

Overview

For our IT Project Idea, the Awesome Breakfast Club Group plan to develop an application for mobile and wearable devices which allows users experiencing chronic pain symptoms to easily record the pain from their Smart Watch. From Annesha's personal experience with Endometriosis, diagnosis can be a long and arduous process, often requiring patients to keep a detailed log of the pain and symptoms. This application aims to create an easily accessible method of recording a patient's pain and symptoms in daily life.

Rather than having to pause activities to record their pain symptoms, this application will allow users to simply record their pain levels from the home screen of their Smart Watch. All these records are then stored within a secure cloud database, which can then be downloaded and

reviewed in a consultation with their health professional to uncover any trends. Originally this project was designed to be an iPhone and apple watch application, to integrate with the company's well-formed health applications. Due to resourcing restrictions the team have decided to focus on building the initial application using easily accessible Microsoft office programs, as building this software will require additional software development skills, which are not currently within the team's skillset. In the long term, this application will ideally be accessible across Android, Google, and Apple devices.

Motivation

Being diagnosed with the chronic pain condition Endometriosis is often a long and time-consuming process, requiring regular specialist appointments, treatment trials and often laparoscopic diagnostic Surgery. On average an Endometriosis diagnosis can take approximately seven years to diagnose from the onset of symptoms (AIHW, 2019). In these seven years, patients are likely to see many different specialists to establish pattern in their pain symptoms and eventually to diagnose their chronic pain. According to Lone Hummelshoj, Chief executive of the Endometriosis Research Foundation, one of the primary reasons for this lengthy diagnosis period, is the normalisation of painful periods (Dysmenorrhea) (Broster 2020). In conjunction with normalised Dysmenorrhea, delays in diagnosis can also be caused by the overlap of Endometriosis symptoms with other gynaecologic and gastrointestinal diseases (Surrey et al, 2020).

In diagnosing Endometriosis, some of the most common questions patients receive from their specialist are "How often do you get this pain?" and "When and where do you get this pain?". However, when patients experience painful cramps daily, it's common for the patient to feel ill-equipped to answer these questions or embarrassed, often resulting in vague and inaccurate answers, depicting non-specific symptoms (Surrey et al., 2020). By equipping patients with a tool to accurately record their pain symptoms immediately at the time of experiencing them, patients are empowered to provide their doctors with accurate information. In providing this resource, it is hoped that doctors will have more information available about the patient's symptoms to determine if it is mild Dysmenorrhea, or something more serious like Endometriosis. This application can also be used after diagnosis to track a patient's progress when receiving treatments, for doctors to evaluate if treatments are effectively reducing pain.

Over the years various methods have been used to record pain diaries, including paper diaries, mobile note applications and in recent years pain diary apps. With the introduction of pain diary apps in recent year, like QENDO, users can record the pain and symptoms for medical usage (QENDO 2020). These apps have been revolutionary in providing convenient ways for patients to record the symptoms; however, they often use tedious user interfaces which mean that completing the diary entries can take much longer than they need to. Today, wearable technologies are now a relatively common accessory in the form of Smart watches. This increased use of smart watches presents an opportunity to create a more convenient method of recording painful symptoms. In public situations where traditional pain diary logging is not a feasible option, or even in debilitating pain occurrences, this technology can provide a quick way of recording the occurrence, to ensure patients maintain an accurate record of their symptoms. In the first prototype of the application, by utilising a simple user interface on Smart Watches, users will be able to record their pain symptoms using Standard entry mode.

Description

This application will reduce user interface difficulty, by creating a simple Watch application which can be used to quickly log painful symptoms, and this data can then be reviewed in the

mobile application. The app is easily accessible from the user's Watch, with a button displaying on the watch face (home screen) for ease of access. In the first prototype for the application, upon selecting the icon from the Watch home screen, the user is presented with Standard entry mode. Standard Entry mode will take the user through a series of screens to record the details of the pain. These screens include a number slider to record the pain on a scale of one to ten, followed by a time screen where the user can specify when the pain occurrence started. In later versions of the app, we plan to include subsequent screens where the user can select the region on the body where the pain occurred, and a page of descriptive words for selection to describe the pain. Once entered, the log is then saved and can be reviewed and updated later using the iPhone app.

In the initial design for the application, there were two options for entering the pain log; Standard Entry and Rapid Entry. In future upgrades to the application, we plan to include the addition of Rapid Entry Mode. Using Rapid Entry Mode, the user will select the Rapid Entry button, the log then saves a timestamp, and the user will receive a notification 30 to 60 mins later to add more details within the watch or phone app. Rapid mode is designed to be used in busy situations when the user does not have the time to enter the full details. By automatically reminding the user shortly after, this should also reduce the frequency of painful symptom logs being inaccurately missed.

In the future, there is also the possibility to expand the application to the Apple Watch, which then presents the opportunity to use 'Assistive Touch' technologies. Using the customisable 'Assistive Touch' hand gestures available with Apple Watches utilising Watch OS 8 (Apple 2022), users will have an additional way of recording rapid entry mode. Using 'Assistive Touch', the user can set hand gestures, for e.g. double clenching the fist, to automatically log a rapid entry, so the user will be reminded via notifications within an hour to complete the details of the log. This provides an additional discreet mode of entry, to assist in maintaining accuracy. In the mobile application, users can then review and edit their entries, and even add notes for their doctor. When it comes time for the doctor's appointment, the user can then export a CSV record for their doctor or simply show the doctor the app.

Tools and Technologies

Initially, the proposal for this application was aimed at building an exclusive application for the iPhone and Apple Watch. After consulting as a group, we decided that a more feasible starting point would be developing the application for Android or Google devices, as the application development technology is more readily available. Building the application exclusively for Apple devices also presented an additional issue, as all iOS applications are built using the Swift programming language and currently none of our team have used the Swift programming language before. As multiple members of our team are currently completing the 'Introduction to Programming' course, we decided it would be more beneficial for the group to gain experience using these skills. In the long term we do plan on bring the application to Apple devices, however the initial prototype will be built for Android and Google devices.

Currently we are trying to build an application that utilises time stamps to add a database record for each pain occurrence. The pain occurrence record will include three recorded attributes, Time, Pain intensity out of 10, and user ID (email). To build our initial prototype, we are currently utilising the below technologies and testing if these will assist us in building our product.

Using the Microsoft 365 accounts provided to us by RMIT we can create a list in the cloud-based database 'SharePoint', which could operate as our database for user information.

‘SharePoint’ can easily integrate with ‘Microsoft Power Apps’. ‘Power Apps’ has the advantages of being easy to navigate, it is a zero-cost solution as an inclusion with our RMIT account and we would have full control over the application. The disadvantages of ‘Power Apps’ is that it can only be accessed by users with a ‘Microsoft 365’ account, it can only utilise 2,000 lines of data and it is not compatible with smart watches.

When the application is eventually being developed for Apple device, we plan do so using Apple developer tools. To build the iPhone application, Xcode 14 will be used in conjunction with Swift UI (Apple 2022). The creation of the Apple Watch portion of the application will additionally require the use of Xcode Apple Watch Toolkit, to build the user interface for this device. Using Xcode14 and SwiftUI, the applications can initially be previewed and tested virtually. Once the application is in the final stages of development it will require testing on an iPhone and Apple watch to ensure the app performs as expected.

Skills Required

We are currently exploring which specific coding languages will be best suited to build this application for Android devices. As we have a diverse range of pre-existing programming knowledge within the group, we will likely be able to use the existing knowledge of the group to build the back end of the application and the user interface.

In the long-term, in order to create the application for Apple devices, we will be required to learn the Swift coding language used in Apple Application development. To make the app as medically beneficial as possible I would also like to employ the assistance of a Chronic Pain nurse as a Subject Matter Expert.

Database creation and management will also be required for this task, however as Annesha has previous training and experience managing databases, this will be a feasible task for the group.

Outcome

If this project is successful in coming to fruition, it will aim to provide quicker diagnosis of chronic pain conditions such as Endometriosis, by keeping a convenient and accurate record of the patient’s pain experiences. It will also be a beneficial tool in assessing the efficacy of chronic pain treatments.

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Group Reflection

Annesha: From our initial group meeting I believe our group had strong communication and great comradery. From the outset we met twice a week, with more frequent meetings towards the end of the assignment period. In terms of the quality of work produced by the team, I believe we have done a good job with the resources we had available.

Unfortunately, there was not an even share of work within the team. In our initial meeting with the entire group, I believe we set clear expectations that everyone would contribute equally to the project and work together as a group. However unfortunately, once we started assigning tasks to each individual group member, it quickly became clear that myself, Dom and Connor were volunteering to work on multiple sections, whilst some members were only willing to contribute to one section of the assignment.

I was surprised by how easily I found myself adopting a group administrator type role, creating the Microsoft Team's group, organising meetings, and writing meeting summaries. In practice, I felt that myself and Dom both took on the responsibility of keeping the group on track for the submission. I was additionally surprised by how well we all got along from the start, particularly in an online setting.

In this group, I learnt the importance of openly delivering feedback in a non-confrontational way. In the final group meeting before submitting the assignment, Dominic and I both opened-up to the group regarding the share of the workload, I believe that this constructive feedback promoted open communication and self-reflection within the group, and likely could have been used earlier in the assessment.

Connor: Overall I think we've done well as a group, though we have had a few hiccups with members leaving earlier on and so forth it's been a decent run and we've been entirely on point where meetings are concerned, or so I believe. What could be improved? Well, that's a double-edged sword, in one hand my own performance has been marred by confusion and stress over the course, I don't necessarily agree with some of the questions presented and find myself asking what their relevance is to what I'm supposed to be learning. On the other hand, I could have gotten started earlier or attempted to train my focus on specific tasks better, though this brings us right back to my confusion and stress. At the end of the day my own performance could be improved... but so too could the clarity of what is required of the course's students in the questions we are to answer.
Frankly... there wasn't anything that surprised me overall. I was relieved that I could ask for help from my classmates and receive it with a nod and a smile and that I could get help without asking for it when it was clear I was struggling with something. It was a nice change from what I had come to expect from group work and projects due to my past experiences with them. I'm not sure if I learned anything about "groups" that I haven't already had covered in primary and secondary school. It's a group of people, a team, that are supposed to work together to ease the load of large projects and see them to completion.
As Github is not something I am familiar with, I cannot make a comment on how it reflects the groups work on the assignment.

Dominic: I felt as though our group had great communication from day one, we often met over teams' video and overcame many challenges such as which platform to

meet and share files in, how to first approach the assignment and in setting meeting times to check our progress.
In terms of improvement, I feel that the first set of assigned tasks were seen by some members as their only obligation towards the project, whilst others made reasonable progress understanding that there was more work to be done for assignment completion. I feel that this led to an unfair allocation of tasks (listed against marking rubric below). I believe that this could be improved by earlier communication regarding lack of progress/intended completion dates and maybe by suggesting that an unmotivated team member host the next meeting to try and prompt initiative.

Team Profile 5% (3% Annesha, 2% Connor) - Annesha (comparison and reflection) / Connor (ideal jobs comparison)
Tools 5% (3.5%Annesha, 1.5%Dominic) - Annesha (agendas, notes, meeting organisation and reflection)/ Dominic (agendas, notes and reflection)
Industry Data 10% (6% Dominic, 1% Annesha, 1% Connor) - Dominic (body and comparisons) & All find three skills
IT Work 15% - Dominic (interview and write up)
IT Technologies 25% (6.25%ea) Annesha / Connor / Dominic / Jared
Project Idea 15% (10%Annesha, 5%Dominic) - Annesha / Dominic
Feedback 7.5% (divided evenly between those who complete)- All
Group Reflection 7.5% (divided evenly between those who complete) - All
Presentation 10% - Annesha

I found the interview the most surprising part for me, the light it shed on the industry as a whole and the fact that Chris was able to start working professionally from such a young age after being self-taught, I found very surprising and interesting.
I have learnt about groups that good communication is key to success and any issues should be addressed as early as possible.

Jared: Not Completed
Trent: Not Completed