

THE RESTLESS BOLTERS

ASSESSMENT 2 – TEAM PROJECT REPORT

TEAM MEMBERS

BRUCE MANIRATH	S3805194@STUDENT.RMIT.EDU.AU
JARYD CAVANAGH	JCAV27@OUTLOOK.COM
JENNELLE ROBERTS	S3788427@STUDENT.RMIT.EDU.AU
JACK MARSDEN	S3803381@STUDENT.RMIT.EDU.AU
KYLE FRANCIS	S3805196@STUDENT.RMIT.EDU.AU

<i>GITHUB PAGES LINK:</i>	HTTPS://S3805194.GITHUB.IO/RESTLESS-BOLTERS/
<i>GITHUB REPOSITORY:</i>	HTTPS://GITHUB.COM/S3805194/RESTLESS-BOLTERS

TABLE OF CONTENTS

Group Members Profile	Page 3
Team Myers Briggs Test Results	Page 6
Other Personal Testing	Page 7
Personality Testing Assessment	Page 8
Ideal Jobs Comparison	Page 9
Industry Data Analysis	Page 10
Interview of an IT Professional	Page 13
IT Technologies	Page 18
Project Idea	Page 25
Group Reflection	Page 26
References	Page 30

GROUP MEMBERS PROFILE

BRUCE MANIRATH



Bruce is from Western Sydney and has a goal of getting into software development and is interested in AI and automation.

He is a music buff that loves to play bass guitar and has an affinity for cats. He has an interest about how people and governments are going to adapt to the increased use of AI and automation. Geopolitics is an interest for both Jennelle and Bruce and AI and automation brings up some interesting questions in this perspective. These questions fascinate Bruce and Jennelle.

Questions like, “who owns the data from facial recognition programs?”, “Can facial recognition surveillance contravene the right to privacy?”, “Who sets the ethics that self driving cars use to make decisions?”, “Is there any way to regulate the use of data and police these regulations?”, “How do we protect ourselves from unsavory governments that ignore international conventions on privacy and data collection?”

JENNELLE ROBERTS



Jennelle is also originally from Western Sydney, but now living in Melbourne. The second child of 5, Jennelle is used to noise, differing opinions and nerds. The whole family are nerds made up of scientists, psychologists and IT professionals.

Jennelle has a 9 year old daughter who is autistic. So Jennelle is always up for a chat about diversity advocacy, neurodivergence acceptance and aliens. Aliens are a big topic at the Roberts house.

Jennelle loves to make things fit into lists and tables and as she continued through her career, she realised that this way of organising things meant that data was something that came naturally. She currently works as a Data Analyst for a volume residential builder focusing on Material, Procurement and Costing Data.

GROUP MEMBERS PROFILE

JARYD CAVANAGH



Jaryd is a born and bred Melbournian. He lives in Mill Park and has a brother and sister, 2 dogs and a cat.

Jaryd loves computer games and metal music, his favourite type of game being Action Single Player games and his favourite band is Powerwolf, a German power metal band.

Jaryd is excited about IT and would love to be a Web Developer. Providing client specific solutions with a creative difference.

If you want to talk about Game Of Thrones, Jaryd is your man.

JACK MARSDEN



Jack was born in Tasmania but has also lived in Mount Gambier and Melbourne. Jack joined the Army in 2012 and was assigned to the Royal Australian Signal Corps before commencing training in radio communication systems. Jack currently lives in Brisbane with his Alaskan Malamute, Odin.

Jack has previously been deployed to Afghanistan and currently leads a team that provides telecommunications services via secure voice and data networks. Jack has always had an IT interest since being introduced to IT at school. The thing that appeals to him the most is the potential and possibilities that can be achieved with IT. The ability to communicate, connect, access entertainment and move money around the world. All in seconds! Jack's current interest in IT is mainly server management focused. He hopes to begin formal training on this aspect of IT soon.

GROUP MEMBERS PROFILE

KYLE FRANCIS



Kyle was born and bred in Brisbane. He is in fact, still there. Kyle grew up in a family that loved to be on the cutting edge of technology. So IT was a second nature for him that saw him develop a love of computer games and hardware. He would love to be involved in troubleshooting and repair as well as the development of application software.

Kyle's other loves is for all the cats. We are pretty sure that Kyle has never met a cat he doesn't love. He has his own cat Braum who is named after a League of Legends character. Braum (The heart of the Freljord) has a wicked moustache, and some of his abilities are to propel freezing ice from his shield as well as become Un-Breakable. All good qualities for a cat.

Kyle has also represented Australia, not once, but twice, at the NASA hosted Space Settlement Design Competition. He is still not sure if he is going to Mars after the initial 2030 mission.

TEAM MYERS BRIGGS TEST RESULTS

INTP

Intellectual, logical, precise, reserved, flexible, imaginative. Original thinkers who enjoy speculation and creative problem solving.

INTJ

Innovative, independent, strategic, logical, reserved, insightful. Driven by their own original ideas to achieve improvements.

ISFP

Gentle, sensitive, nurturing, helpful, flexible, realistic. Seek to create a personal environment that is both beautiful and practical.

INFP

Sensitive, creative, idealistic, perceptive, caring, loyal. Value inner harmony and personal growth, focus on dreams and possibilities.

ISTJ

Responsible, sincere, analytical, reserved, realistic, systematic. Hardworking and trustworthy with sound practical judgment.

Bruce	INTP	(Introversion, Intuition, Thinking, Perceiving)
Jennelle	ISTJ	(Introversion, Sensing, Thinking, Judgment)
Jaryd	INFP	(Introversion, Intuition, Feeling, Perceiving)
Jack	INTJ	(Introversion, Intuition, Thinking, Judgment)
Kyle	ISFP	(Introversion, Sensing, Feeling, Perceiving)

OTHER PERSONAL TESTING

BRUCE

Bruce completed the Vark Questionnaire and the Big Five Personality Test

The VARK assessed Bruce as a Mild read/write learning type. People with this Vark Assessment prefer to write and read, use lists, extract meanings from headings and titles and like to have clarity in what is written. The Big Five Personality test result was that Bruce's personality was about Openness, Conscientiousness, Extraversion, Agreeableness, Neuroticism

JARYD

Jaryd completed a Learning Style and an IQ test.

The learning style test assessed Jaryd as a Tactile learner

The IQ test gave Jaryd an IQ score between 105 – 120

KYLE

Kyle completed a Learning Style and Creativity Style test.

The learning style test assessed Kyle as a Visual learner. This indicates that Kyle learns by seeing.

The Creativity Style Test assessed Kyle with a Creativity score of 77.37

JENNELLE

Jennelle completed Learning Style Test and a Verbal Reasoning Test.

The Learning Style test assessed Jennelle as 60% Auditory, 30% Visual and 10% tactile. This indicates that Jennelle learns by listening and store information the way that it sounds.

The Verbal Reasoning Test result for Jennelle was a high result of 8 out of 10. This indicates the ability to quickly go through presented verbal data, identify the issues and reach logical conclusions

JACK

Jack completed a Learning Style Test and the Big Five Personality Test.

The Learning Style Test assessed Jack as 62% Visual, 59% Kinesthetic and 46% Auditory. This indicates that Jack learns by seeing (Visual) and doing (Kinesthetic)

The Big Five Personality test result was that Jack's personality was about Conscientiousness, Extraversion, Criticalness, Neuroticism

PERSONALITY TESTING ASSESSMENT

The Myers Briggs results seem to indicate that the Restless Bolters are a collection of Introverts.

We do not like to be front facing and often prefer quiet reflection and privacy.

We process ideas and concepts thoroughly by ourselves before taking it out to be used/evaluated by someone else.

We are also Thinkers that prefer objective truths and a process of elimination to determine outcomes.

Where we differ is between Sensing/Intuition and Judgement/Perceiving.

Sensing people need concrete and tangible ideas and deal with the current presented situation, whereas Intuition people place an emphasis on meaning and associations and are very good at spotting patterns.

Judgement people are structured and postulate theories about the world, always willing to try new information in their structured understanding.

Whereas Perceiving people are more unstructured and like to keep their options open. But this also means that they are more open to change as they do not have an existing structure.

The collection of other testing the team members went through show that we all come from a different perspective, and learn and create differently.

Having these differences means that we have some diversity in the team.

Not everyone will have the same opinion or idea. However all our personality testing shows that we reason and process well, so whilst we might be coming from differing ideas, we all seem to possess the skill to manage that and come up with a concise plan that reflects all our abilities.

IDEAL JOBS COMPARISON

Compare everyone's ideal jobs.

What common elements are there, if any?

Not only do we have some similarities across our preferred Career Paths, Bruce and Kyle both want to be software developers.

The other jobs that the team are looking into the future with are Web Developer, Systems Design Engineer and a Senior Data Analyst/ Data Scientist.

Software Developers and Web Developers will be very code heavy and will need to work within the confines of the systems their customers use.

All roles, including the Data Analyst will need to have a sound understanding of the technologies being used but their customers in order to produce the solutions or Analysis that is required. Whether they are analysing data, systems or software, strong analytical skills will be needed

What differentiates each position from the others, if anything?

Software Developers will be working on defined hardware while Systems Engineers will have a more hardware focus. A web developer will be working so that sites are optimized for all different types of browsers and operating systems, but will not have these able to be changed, whereas Software Developers are producing the applications and programs that will run on hardware that Systems Engineers have designed.

A data Analyst is the outlier in the groups preferred Careers. A Data Analyst will be looking at the data that is captured in all different types of systems. Data extractions, formatting and output of insights will be entirely dependent on the system that the data is contained in.

How similar or different are your career plans across the group?

All of these jobs are going to require a very sound understanding of how applications, operating systems and the data contained in them sit and talk with each other. In business, the roles we are looking at are very broad terms. All business have very specific requirements for the processes and systems that they run. All of our roles will need a sound discovery process. What does the client need? What does the Client actually want? Is there anything that are defined in Business Process that might need to be changed because the System hardware/ Software/ Data Analysis won't be able to produce?

Clear communication, analysis skills, clear documentation and flexible solution design is going to be required by all of the Restless Bolters.

INDUSTRY DATA

What are the Job Titles for your group's ideal jobs? How do each of these rank in terms of demand from employers?

Our groups Ideal Jobs consist of Software Developer which 2 people put as their Ideal Job, System Engineer, Web Developer and a Senior Data Analyst/Scientist.

In terms of demand the job that has the most demand would be a Senior Data Analyst/Scientist which has a demand of over 360,000 job openings worldwide and second would be System Engineer with 786 in Australia alone, then third would be Web Developer with 381 jobs in Australia and out of all the jobs listed in this groups Ideal Jobs the least demanded job is a Software Developer with 287 job listings in Australia.

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

Our groups Ideal Jobs require some IT Specific skills and when ranked in terms of demand the most demanded to least demanded is SQL with 3,570 jobs requiring this skill, Javascript with 2,946 jobs requiring this skill, Project Management with 2,252 jobs requiring this skill, Business Management with 2,141 jobs requiring this skill, Website Production with 1,366 jobs requiring this skill, Systems Engineering with 1,037 jobs requiring this skill and last but not least Business Process with 1,033 jobs requiring this skill.

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

Our groups Ideal Jobs require some general skills and when ranked in terms of demand the most demanded to least demanded is with SQL with 17,570 jobs requiring this skill, Javascript with 15,368 jobs requiring this skill, Communication Skills with 44,367 jobs requiring this skill, Problem Solving with 16,445 jobs requiring this skill, Organisational Skills with 15,844 jobs requiring this skill, Team Work/Collaboration with 14,364 jobs requiring this skill, Time Management with 5,059 jobs requiring this skill, Meeting Deadlines with 3,346 jobs requiring this skill, Analytical Skills with 2,997 requiring this skill, Management with 2,906 jobs requiring this skill and last but not least Decision Making with 1,850 jobs requiring this skill.

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

The top three IT Specific Skills that are not required from our groups Ideal Jobs are number 1 is knowing JAVA with 2,860 jobs requiring this skill, number 2 is Business Analysis with 2,096 jobs requiring this skill and third highest ranked would be Technical Support with 1,830 jobs requiring this skill.

INDUSTRY DATA

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

The top three General Skills that are not required by any of our groups IdealJobs are number 1 is Troubleshooting with 11,471 jobs requiring this skill, number two would be Mentoring with 4,538 jobs requiring this skill and third and last would be Presentation Skills with 3,716 jobs requiring this skill.

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

Jaryd – Having looked at the Burning Glass data I have not changed my mind about my Ideal Job of Website Development because from all the data I looked at the demand for Website Production and the skills that come with it are in the middle in terms of demand and that suits me just fine as a job.

Jennelle – After reviewing the Burning Glass data, I feel a little validated in the skill sets that I am seeking to learn or further develop. I currently have advance SAP experience, as well as basic SQL and Javascript skills. I am seeking to learn more about SQL and Javascript. Ultimately looking towards a Data Scientist role, I was already aware that I needed to learn what would be required for an ETL function with the data that I would be analysing. ETL means Extract, Transform, Load. Data from different sources needs to be brought into a single format in order to compare. This ETL function is mostly done with SQL. Seeing that SQL is the most sought after technical skill, I feel that I am on the right track for an enjoyable and employable role.

Bruce – After reviewing the burning glass data, I feel surer of my preferred profession. It is the job with the most job postings; more than the second and third job titles combined. However, I find communication skills being the top-most generics skill mildly disconcerting, but I have a lot of time and opportunity to work on this over the course.

Another thing that concerns me is that most jobs require 3–5 years' experience. This may make it harder for me to get my foot in the door regarding employment. I may also need to make some sacrifices, such as changing location, in order to get those jobs that do not require years of experience.

Jack – I have reviewed the Burning Data Glass and while the information within it does not overly surprise me it is still interesting. However in saying that it does not affect my idea of an ideal job, as i would rather pick a career path that i am interested in rather than one that is just highly sort after by employers.

INDUSTRY DATA

Kyle – The burning glass data in itself is no surprise to me, most IT fields are dependent on multiple systems working in harmony with each other and communication between developers and IT specialist is how this is done. This means anyone with direct experience working in team orientated environment especially ones focused towards solving problems will have a much easier time getting into the field of IT. I feel I already have a large majority of the more essential skills like problem solving, communication, organisational skills and writing from my own experiences and that this will set me up to one day get the role that I want.



Image Source: <https://www.flickr.com/photos/kamiphuc/11396380473/in/album-72157638719274064/>

INTERVIEW OF AN IT PROFESSIONAL

Everyone in IT likes to Distill Order from Chaos, Simplicity from Complexity.

What every good IT person should know is that the only difference between doing something on a piece of paper, and doing something in a computer system is that with a computer system, you can make mistakes at the speed of light. That's the only difference. They are dumb, they are a high speed moron, despite the advances into Artificial Intelligence even up to today, they are still a high speed moron.

– Allen Roberts (International Director of IT)

Jennelle conducted an Interview with Allen Roberts. Allen has recently retired after 40+ years working in the IT Industry. Prior to retirement, Allen was the International Director of IT for a multi-billion dollar American Manufacturing Company.

Jennelle: What kind of work have you done as an IT professional?

Allen: Everything. From Hardware research and install, software development, application analysis, business planning, logistics management, hiring and firing of staff, everything. I had the responsibility for all the countries in the world except USA, Canada and Mexico.

Jennelle: So you had the R.O.W?

Allen: Yeah, in fact we called it ROWBOAT – Rest of World Business Operations Application Team

Jennelle: In your role as Director of IT, what were you doing? What did that role encompass?

Allen: Herding cats? There were cats on my side (Australia) and cats on the rest of the world. Different teams doing different projects in different parts of the world on behalf of different parts of the business. So I had to manage the business expectations, the customer relationships, the team execution and performance. The team management basically. I was managing multiple teams in multiple parts of the world, simultaneously.

Jennelle: What kind of people did you have to interact with on a day to day basis, and a semi regular basis?

Allen: The majority were internal stakeholders, meaning heads of parts of the business, management functions or groups in those parts of the business, suppliers, many of them offshore suppliers.

Jennelle: Suppliers in an IT scope?

Allen: Yes, suppliers in architecture services, hardware management suppliers, software development, data analysis, and migration services etc., all those kinds of suppliers in different parts of the world.

Jennelle: What part of that job did you love?

Allen: Going live with new projects. The joy of successful implementation, but part of the reason that I retired was that I wasn't enjoying it as much anymore as I used to.

INTERVIEW OF AN IT PROFESSIONAL (CONTINUED)

Jennelle: What do you mean by, “what you used to”. What did you enjoy?

Allen: One of the things I enjoyed was being hands on. Being able to get your head into analysis, design and programming. It has been a long time since I did any actual code cutting. And the second part of it was Customer Education. I actually did a stint in the early days with IBM. I was an Education contractor for IBM and I taught operations and programming languages and hardware platforms on contract and I found I enjoyed it immensely.

Jennelle: What part of it?

Allen: Just the communication. I mean, it was an ideal role because what you had was defined course constructs and someone else managing the student administration and the curriculum administration. You had a whole bunch of materials and resources provided to you and you just turned up and taught. It was fabulous. And what was most fabulous about it was seeing the joy of learning on people’s faces. Being able to communicate something complex effectively and they get it. And the only reason I didn’t do that long term, is that IBM cancelled my contract when they found out that I was teaching methods that were not IBM sanctioned. I’ve got a better way of doing that I would say, and in my intellectual arrogance I didn’t realise how staid an organisation IBM was. They said “Nope, you’re not doing that”. The role disappeared. Which is a shame. It was, for the day, and I am talking late 70’s and early 80’s, it was relatively lucrative to do that, but it was few and far between. I would do a dozen courses a year. They would fly me to different parts of Australia and I would just do instruction. But it wasn’t enough for a full time job, it wasn’t sustainable. In between I worked for customers demonstrating my skills in being able to create solutions with different forms of IT constructs.

These are early days of PC’s networking wasn’t what we knew today with internet and high speed capability between machines. Being able to communicate with databases on different architectures in different parts of the world with what was then primitive communication technology was a skill that I developed.

Jennelle: What gave you your start in IT?

Allen: What gave me my start in IT was when I was in Accounting. The company that I worked for at the time, Rheem, had a program called Commercial Traineeship which requires the trainees to participate in all aspects of the business. I answered calls on a plug and cord switchboard, I was out on the road with Salesman, I drove a forklift in a good receiving dock, I worked in the tool shop, I worked on the shop floor moving materials around. That gave me was a basic grounding in how manufacturing and distribution businesses worked. Then in 1977 and I went to the then company Secretary– his name was Sedric Malcomson Edgar Richard Bolt the Second – came up with an idea.

INTERVIEW OF AN IT PROFESSIONAL (CONTINUED)

He said “We are transitioning from mainframe computing into distributed computing and with your business background knowledge, I think you will be ideal to help lead the effort”.

I accepted his offer then lead a series of projects which converted mainframe applications over to distributed computing and became frustrated along the way with the speed of progress when we needed to do change to the system. The IT guys would say, “Sure, add it to the Do List”. And the Do List was thousands of items long with a 2 or 3 year lead time before you would see something come out the other end. So I said, what options have we got, can we hire people to do this? And I was told we had no budget to hire anyone, but that I could always teach myself programming.

So I did and I made the changes myself

Jennelle: **What do you wish that was different about the way the IT departments work or how it was different so that IT departments could be more effective?**

Allen: There were very few people in business groups that I have ever worked with that understood the basic importance of data quality, process rigidity and function management. For those who did, they were a joy to work with, they got it. But what did frustrate me was that you could build good systems, but if people were not disciplined in managing data, they found smart ways around your good system, they could put crap into the system and suddenly it is the system at fault, so it is your problem and therefore your fault.

Jennelle: **So you think a higher value placed on a higher understanding of the way that technology collects and uses and outputs data that means that people will probably then assign a higher value for the function of IT?**

Allen: Essentially that is what I am saying. If those few people that I worked with were able to drive the strategic approach to IT solutions within businesses, they would be much more successful. But most people just didn't get it. So when you want to invest in a full time role as an overseer or manager of Data Quality and you get rejected for it, you know what is going to happen. You know that the Data Quality is going to degrade, you know that crap is going to creep into the system that will mount up IT help tickets and create all kinds of work arounds which will lead to further bizarre IT expectations that just become over time a mess.

But if you understand the value proposition of investing the right amount in technology controls and management, you can approach perfection, but that costs a lot of money.

Jennelle: **In every person that you are hiring, what are the things that you look for, when you are hiring those people to be part of your teams?**

Allen: If you are talking about Technical People, I evolved a technique for hiring good technical people, without realising it. What I was looking in Technical People, were two key attributes.

One of those was an eye for detail and the other was the ability to think coldly and logically.

INTERVIEW OF AN IT PROFESSIONAL (CONTINUED)

For that first attribute, in the early days we had computer print outs only. I would have columns of figures in 15 by 11 sprocket feed paper print out and I would say to the interviewee, "I've got columns of figures on a page. You have got 3 seconds to spot one of the 3 data anomalies that are on that page". People with an eye for detail, could spot the data anomalies quite quickly.

The second attribute test was the ability to think coldly logically. I had a basic a Boolean logic construct, three variables, A, B, C, and I would provide a set of possible values for A, B and C and say to the candidate, "One of these values will fail this logic test, can you tell me which one? You have 5 seconds".

Because it was a simple A is less than B and B is equal to C, it's a simple Boolean Logic Test for most people to get their head around, technical people, good technical people could do it very quickly. Potentially, experienced people could do it quite easily, so I would have variations depending on the level of experience that I was interviewing.

Jennelle: So if you we are talking about non-technical people. Talking about Change Management people, your implementation team, your documentation team, your training team....

Allen: Well there are horses for courses. We all learn. What I also learned over time is that it's very difficult to teach IT people business concepts. But it is relatively easy to teach good business people IT concepts.

So what I learned over time is that you need groups of people, some of whom are really good with business processes and even analytical capability, but are bloody hopeless at IT. You need them and you need to teach them basic IT concepts, so that they fit within an IT team. And that is a lot easier than trying to teach people in IT how a workshop should run, or how a service centre, or a goods receiving dock or an accounting system should run. So you need business process expertise and teach them IT concepts. And you need Technical people that can relate to those business process people. All those different kinds of people are part of a composite IT team. And without any one of those skill sets, you are going to struggle as a rounded team.

Jennelle: So people that are wanting to get into scopes of IT projects or IT departments or business people that want learn these technical IT skills. What advice would you give them when they are looking at wanting to build skills or wanting to approach a business. What kind of a journey would you advise them to go on?

Allen: Well I did a lot of career development and the answer to that is a mixed answer as well. But the kernel lies in, what is your passion. What is it that really spins your wheels? What excites you, what do you really want to do with your time when you are earning money. That's the kernel of it.

INTERVIEW OF AN IT PROFESSIONAL (CONTINUED)

Some people have a passion for hardware, and want to understand how gadgets hang together and how TCP/IP protocols relate across a router or Wide Area Network, or how servers interact and how you virtualization works and that kind of stuff. Some people have a passion for software, how to create functionality, some people have a passion just for managing details. Some people have a passion for filling in details – data

Jennelle: **What kind of evolution do you IT departments doing over the next 20 years.**

Allen: Out the offshore outsourcing door. There's a trend today towards reversing offshore outsourcing and bringing application skills back in house. But I don't think that trend is going to last. With the rise of cloud computing, virtualisation in hardware and even virtualisation in apps. Most of the workstations you work on are either diskless workstations and your entire desktop is in fact a virtualized image somewhere in some remote server. That is the most cost effective way to run computing and I don't see that changing. I don't believe that IT departments are going to survive in anything other than administrative capacity. Meaning, you will be administering multiple providers, cloud providers, architecture providers, apps service providers.

Jennelle: **You think that all the development, all the new software design, all the new control, all the data, all the hardware, it is all going to be**

offshore?

Allen: At the big end of town. At the small end of town we are talking about consumer technologies, it's all about apps. Everything is about apps. Now the key to relating end user computing in the retail sense to back office computing in a large corporate global sense is the integration that these apps potentially offer.

Jennelle: **What you don't think that they are not going to be running something like SAP, AS400 or Oracle?**

Allen: Ah! The back office systems have to have to have a way of relating to their end clients. The app is the interface between the customers and the back office processing system.

Jennelle: **So back office processing systems are never going to disappear, they are just not going to be onshore.**

Allen: No, it is going to be in the cloud. And it can't disappear. Because big data will not only exist, it'll continue to grow. The more data that you capture, the more data you have got to analyse, the more trends that you can perceive and the more artificial intelligence you can apply to it, the more streamlined your operations are going to become. But if you don't recognise those things and don't take advantage what big data offers. You will be out of business in 20 years. You need to do data analytics, you need to collect a lot of data to do that, and you need big computing grunt, but you can't afford to run it yourself. So you are going to have to buy cloud computing service providers to run it for you. It is just not cost effective to run your own IT department any more.

IT TECHNOLOGIES

This report looks at Autonomous Vehicles, Cybersecurity, Natural Language Processing and Blockchain.

Autonomous Vehicles

A vehicle is defined as a thing used for transporting people or goods. Thus, an autonomous vehicle (AV) can operate itself without or with limited human intervention. These vehicles come in a variety of different types, like cars, trucks, ships and planes. Many of these technologies are not yet ready for consumers but are being tested by major companies and countries in multiple areas such as the automotive, agricultural, shipping and defence industries.

Examples of AVs in the transport sector include self-driving cars and trucks, like those to be developed by companies such as Waymo, Volvo, Tesla and other major car manufacturers. The Society of Automotive Engineers defines five levels of autonomy (SAE 2018), the first level being absolutely zero features that assist the driver and the fifth being complete autonomy where a driver is not required or even an option. Current developers of self-driving cars, like Tesla with their Autopilot feature, have reached the third level, where the car can drive itself in some conditions, but the driver must drive in others (Tesla n.d.).

Self-driving cars are currently being tested on city roads and highways around the world (Coren 2018). Another place self-driving cars are being trained and tested is in virtual simulations. In these simulations AVs drive millions of virtual miles in situations of varying difficulty. As well as simulating a track Waymo's simulator challenges their AI by simulating obstacles, other cars and even pedestrians. This allows Waymo's self-driving cars to prepare for and hopefully react in a wide variety of scenarios (Silver 2018).

There are many concerns about the introduction of AVs in the transportation industry, chief among these is the impact on jobs. AVs have the potential to both take and create jobs. The jobs that can be taken are primarily in the transport sector, especially truck, taxi and delivery drivers. Jobs that can be created primarily involve the maintenance of AVs these include software developers, hardware technicians and mechanics (Pettigrew, Fritschi & Norman 2018).

Self-driving cars that are being tested have also been involved in sometimes fatal crashes (Levin 2018). In some cases this is the fault of the software or hardware providing and processing information of the cars, in others it is the result of inattentive safety drivers, who are to intervene in the event of the car not functioning properly, such as not detecting an obstacle or pedestrian (Reisinger 2018).

However, another problem, beyond the mechanical, is giving, or not giving, an AV a sense of ethics.

One of these ethical problems that an AV and AV researchers need to tackle is the trolley problem. The trolley problem is an ethical dilemma in which a vehicle is moving at high speed with no option to avoid crashing into two or more different people. The vehicle at this point must make a choice, hit either of the persons or attempt and fail to avoid them and hit both.

IT TECHNOLOGIES (CONTINUED)

It also brings in legal questions as well. The responsibility for a car crash into property or pedestrians can lie in multiple parties. Questioning whether the fault lies in the owner of the vehicle, the manufacturer, the person who wrote the algorithm or even the algorithm itself is something legal scholars will have to contend with as AV technology advances (Lin 2016).

In the mining sector Caterpillar and Komatsu are developing autonomous haulage trucks (Benton 2018) and in agriculture sector autonomous tractors have been tested in China (Gu & Patton 2019). These sectors in particular are more susceptible to automation because distances and areas of operation are often long and large and routes of travel repetitive allow more room for error, and less things to look out for than in busy city streets for instance (Peters 2019).

AVs used in a military context exist as prototypes, concepts and on the battlefield. Those currently in service include the Watchkeeper UAV (Unmanned aerial vehicle) in service with the British Army, which can patrol along points designated by the operator and gather intelligence information to transfer back to the operator and land by itself. Another is a prototype UGV (Unmanned ground vehicle) created by Horbira's Mira company which can carry out a range of missions such as logistics resupply and combat (Horbira –Mira n.d.). A concept that exists is that of swarm. These swarms consist of multiple AVs that are operating and communicating with each other to deliver kinetic impact or to fulfil other missions such as the construction of rope bridges for infantry to cross (Jane's by HIS Markit 2019).

There are ethical considerations with regards to the use of these AVs in the military context, especially when the use of these AVs has lethal consequences. Questions like 'Who or what is responsible for deaths and injuries?' and 'How much should we rely on autonomous systems?' needs to be constantly debated as these systems see increasing adoption (Maurer 2018).

I think AV technology, as it progresses, will affect me positively but younger members of my family may suffer. I can see AVs granting me greater autonomy and to make travel safer as both a passenger and pedestrian, the condition of the driver, for example if they are inebriated or injured, would no longer be a factor in safety of the roads.

Younger members of my family may have opportunities for low or non-skilled work closed off to them. This will restrict them in terms of financial independence and the loss of other jobs due to the introduction of AVs may result in a saturation of skilled workers and not enough jobs for all of them.

Natural Language Processing

Natural language processing (NLP) is a subfield of computer science, information engineering and artificial intelligence that attempts to understand and utilise information given by humans through text or speech. NLP can be used in a variety of ways, these include, but are not limited to, recognition of speech for the purposes of translation and conversion to text, analysing texts to produce content such as news articles and extracting purpose and meaning of words through the understanding of context.

IT TECHNOLOGIES (CONTINUED)

NLP is already present in our everyday lives. They can take the form of assistants; Amazon Alexa, Google Assistant and Microsoft's Cortana. It also resides in word processing applications to correct user's grammar and spelling. In email applications NLP can detect specific elements of text like dates and times so they can be added to calendar applications.

IBMs Watson is one example of an artificial intelligence (AI) program that uses NLP. It can answer questions consisting of context clues. Since winning the IBM Challenge on the American gameshow Jeopardy! in 2010, Watson went on to be used in commercial applications. The first of these began in 2013 in collaboration with health insurance provider Anthem (at the time Wellpoint) as an advisor to healthcare professionals. (Upbin 2018).

Googles Dialogflow is used to power Google Assistant and Amazon Alexa. It uses machine learning; a technique used to teach an AI program by feeding it vast amounts of data and judging what the AI produces in response; teaching right from wrong. It is used to recognise a user's voice and use their vocal input to perform actions like creating calendar dates, reading weather forecasts and converting a user's speech to text. (Google n.d.)

A popular form NLP takes is that of a chatbot. These bots are used primarily used in a business context as customer service representatives. There are programs that already exist that automate some aspects of customer service, such as a program that asks the customer to input certain information like a key press to, for example, transfer their call to a certain department. However, chatbots can understand customers intentions by extracting meaning from the context of the user's input without the need for hardcoded responses.

Jobs such as call centre workers and customer service representatives are affected. As these types of chatbots become more advanced these workers may find their jobs partially or fully automated. This will be particularly felt in developing countries, such as India and The Philippines. (Baraniuk 2018)

However, before then, chatbots can be used to assist these workers by parsing information to guess intent and pick out relevant information. One such system (Observe AI) which aims to help call centre workers by providing information and responses based on their customer emotional state. Allstate use the chatbot Amelia to reduce the time spent on individual customer queries by highlighting trends and important data points. (Morgan 2018)

A more malicious way chatbots can be used is to disseminate and promote disinformation (Stella, Ferrara & De Domenico 2018). Social media companies like Facebook and Twitter have had some successes in dealing with bot operated accounts. In late 2018 Twitter removed an estimated 10,000 automated accounts were suspended. These accounts attempted to affect US voters in the US 2018 mid-term elections by imitating US Democratic party voters and posting messages that sought to discourage voting. Voting in the US is not compulsory. (Bing 2018)

Currently these bots can be detected. In 2017 Pew Research Center performed a study of 1.2 million tweeted links and concluded that around a third of those were shared by suspected bots and automated accounts.

IT TECHNOLOGIES (CONTINUED)

They found this by using Botometer, a machine learning system. Botometer was trained on a dataset of 30,000 twitter accounts consisting of both automated and non-automated accounts. Botometer then examined these accounts for patterns and characteristics that may indicate that the account being examined is a bot. This account was then assigned a number between 0 and 1, the higher the number, the surer Botometer was that the account was automated. Botometer's conclusions were examined by humans who were aware of the actual status of these accounts and this feedback was provided to Botometer to adjust its results. (Gramlich 2018)

Currently NLP are already present in my life. This part of the document was itself impacted by NLPs which suggested alternate wordings for phrases and fixed my grammar and spelling mistakes. When writing emails dates and times are detected and can be added to calendars, the text of reviews for products are parsed to find commonalities so that I can be served content that interests me and sites that I visit often make use of chatbots.

As NLP AIs grow in popularity and become more efficient, I can see parts of my life becoming more automated. Using an AI assistant to perform tasks such as setting up appointments with little input from myself. I will also need to more thoroughly scrutinise information that is presented to me through social media and the people who spread it.

Cybersecurity

According to the oxford dictionary cybersecurity is:

"The state of being protected against the criminal or unauthorized use of electronic data, or the measures taken to achieve this." (Lexico Dictionaries | English, 2019)

From this definition it is simple to see that cybersecurity is a large umbrella term that describes any measure taken to counter a cyber-attack.

There are many different forms of cyber-attacks that a system can come under. From Denial-of-Services (DoS) attacks to Phishing and eavesdropping attacks there are multiple ways that an unauthorized person may conduct offensive actions against your data/systems.

The act of effective cybersecurity can be broken up into different actions taken at different levels in order to mitigate the risks that the ever-evolving information technology world creates. The first act of cyber security begins at layer one starting with the user, a company will usually implement policies that direct personal to maintain certain standards in order to foster a strong cyber security culture. Some of the basic requirements may involve locking terminals when not in use, not writing down/sharing passwords, and not opening attachments on emails sent from unknown addresses.

Securing entry points to allow only authorised personal entry, restricting access to the server room, and installation of security cameras are some more common practices used to secure data within an organisation.

Another portion of effective cyber security is the software installed on devices, from anti-virus applications to strict firewall settings to the implementation of group policies that only allow approved devices to be plugged into terminals.

IT TECHNOLOGIES (CONTINUED)

Cyber security is quickly becoming a very large part of the information technology world and will continue to evolve as more developments are made throughout the years. Due to the fact that cyber security is not so much a technology as it is a policy there is no way of defining what the “state of the art” of this is, the best form of cyber security would be an air gapped system with tightly controlled access to the hardware that makes the system up. Over the next few years both governments and individual’s capability to conduct offensive cyberwarfare will increase, and to counter this more and more emphasis will be placed on privacy of users and security of systems. As IoT becomes a larger part of our life over the next few years the security and privacy expectations placed on companies will rise.

In April of 2011 Sony’s PlayStation network (PSN) came under a cyber-attack where it is possible that approximately 24.6 million accounts were stolen, and 10,700 direct debit details were stolen (Sony Global – Sony Global Headquarters, 2019). This attack at an estimated cost of \$171 million dollars (Cbsnews.com, 2019) is just one example of the impact that a cyber-attack can have, it shows that the implementation of cyber security policies is paramount to the effective and profitable running of an organisation. Over the next few years a larger weight will be put on cyber security this has already been trending as you can see by the average salary of a security expert sitting at number 12 on the top 20 highest paying jobs in Australia (Seek Market Insights AU, 2019) this shows that employers are seeking cyber security experts and understand they are valuable so they are willing to pay more for them.

Further development of cyber security is a necessity as more and more advanced methods of conducting cyber-attacks are becoming prevalent in society today. This technology will continue to grow at an exponential rate. Cyber Security will affect everyone that uses any form of IT equipment. This is why I feel this technology will continue to grow and expand.

I believe that due to the current direction cyber security is moving in it will eventually affect everyone that uses information technology. However, it will affect me in two main different aspects of my life. Firstly, in a personal aspect I already utilise some cyber security techniques such as securing my local network at home by ensuring I use strong passwords for both my router configuration and network access, hiding my SSID and ensuring my home router has the most up to date software, Not opening emails from unknown senders and ensuring I have up to date antivirus software are just some small examples of cyber security practices I use in my personal life.

The next aspect of my life cyber security will affect me is in a professional property, I currently work in a sector that focuses heavily on telecommunications systems for a large organisation. Due to the development of cyber capabilities my employer has begun training and employing cyber security experts in order to better protect ourselves from individuals or organisations with malicious intent. Due to this my workplace has also begun to implement more stringent security policies and have begun conducting internal testing of these policies.

IT TECHNOLOGIES (CONTINUED)

My workplace has also begun implementing mandatory cyber security training each year that requires each employee to complete a test to pass. In terms of my family and friends cyber security will affect the majority of them in a similar way to me, however for the elderly who do not have as much knowledge in relation to this topic and information technology they may be affected more adversely as they would be seen as easy targets with less safe practices being put in place. This could be mitigated though by further education of the general public and by providing tailored assistance to the elderly.

Blockchain

Blockchain is the method of storing information in a series of segments called blocks, each block is connected via a “chain” that tracks the changes of information with a timestamp. What makes blockchain so innovative is that it works on a peer–peer network, which means it is decentralised and distributed across a large number of computers. Decentralising information reduces the ability to tamper with the data. As a new block is created a computer must first solve a cryptographic equation. When the equation is solved the terminal will share the solution to all other computers on the network, the network then verifies the solution and will add the block to the chain. Due to the complex nature of the cryptographic equations that require to be solved, and the verification process involved with creating each block we can trust the information. Due to the decentralisation of blockchain no intermediary is required to authenticate a segment of data which in turns will save the end users money and time.

Cryptocurrency is a form of currency such as bit–coin that is completely virtual. Cryptocurrency utilises blockchain. Cryptocurrencies use blockchain in order to verify transactions, and prevent double spending of the same “coin” for example if person A transfers a “coin” to person B, Person A will broadcast out to the decentralised network that a coin is being transferred from A to B. every computer will receive this transfer information and store it, “miners” on the network will then authenticate the cryptographic equation and verify the transaction. Once verified the computer that solves the equation will broadcast the solution to all computers on the network and the transaction will be complete. Miners are people who configure there computer to use a portion of the processing power of the hardware in order to verify the cryptographic equation, miners are incentivised to do this by receiving a small fee on any transaction they verify. Cryptocurrency also has the benefit of being anonymous, all you need is the wallet number that you are sending the “coin/s” to in order to transfer them.

Due to the popularity of cryptocurrencies there are a large number on the market, they are beginning to be used in everyday life to pay for things more and more. Bitcoin being one of the more popular cryptocurrencies currently have ATMs, and debit cards. Cryptocurrency is starting to become more and more accepted as a form of payment internationally.

IT TECHNOLOGIES (CONTINUED)

Blockchain is being used primarily for cryptocurrency however in the future it can be implemented to store and confirm multiple other data sets, from deed titles, digital IDs, Digital voting, to tax regulation the possibilities are endless.

The impact of the development of blockchain technology and cryptocurrency can be both negative and positive. As Cryptocurrency is a virtual currency that is decentralised it has no requirement for a bank, the positives of cryptocurrencies is that you can use it globally, the blockchain technology reduces the risk of counterfeit coins and that by using a currency such as bitcoin you can remain completely anonymous. Blockchain technology itself can reduce paper-based tracking procedures, reduce risk in data tampering, and identify deficiencies in processes. If cryptocurrency is adopted over the next few years as the popular currency it could completely negate the requirement of banks, however it may open up the opportunity for large mining-based operations.

In my daily life this will personally not affect me to much, if a change to this technology becomes a societal norm I will easily adapt and convert from my currency banking system to crypto currency. However due to a large portion of the populations apprehension to change I believe this may take some years before it is possible. The instant transactions, low transaction fees, and transaction confirmation the blockchain makes possible would be a great benefit to myself and everyone. I do believe that the senior generation in society will be hesitant to change and will struggle with this if we implement it.



PROJECT IDEA

Our group project brings to light multiple possible solutions that can be used in a multitude of environments. By utilising a Raspberry Pi miniature computer with a 3G/4G sim installed we can create a mobile platform to both collect and submit data to a cloud based server. This particular data can be accessed by different means, like remote access from a device through authorised login to the cloud based servers, using a Near Field Communication (NFC) standard like Bluetooth or by physical connections and links like a scannable QR code.

Possible solutions that we will focus on include;

- Barking Logs for obedience training of dogs
- GPS tracking information
- Registration details (including owner contact details)
- And activity details (period of time moving/stationary).

Unfortunately not all project ideas come without flaws, for this project to be successful most if not all of these issues will need to be addressed.

Power supply of the device, this isn't much of a flaw but a stepping stone on completing the final design of the project. There are 2 possible solutions for power supply to the Raspberry Pi system, the first being easily replaceable commercial off the shelf battery products such as AA batteries or 9v a more commonly used battery for mobile devices like this. The other solution for power supply is a rechargeable battery pre-installed onto the device that can be then charged through a micro-USB port.

Durability, unfortunately Raspberry Pi's, like most other computer equipment, aren't very resilient in open environments and to physical impacts like rocks or even dust. A suitable housing unit for the device would need to be designed and tested to ensure the durability and size constraints are suitable and do not cause any hazardous scenarios or irritate the wearer.

Radiation Hazard, with all wireless communication systems comes the risk of long term exposure, although mostly miniscule sufficient testing will need to be completed to advise customers of the safety of the device. Reports and results from these tests should be available through multiple means so that customers feel that they know the risks involved with the device if there are any.

By design devices on a smaller scale than usual will attract a higher price due to current day limitations of small scale systems, although in future this will become less of an issue it very much is one today. To counteract this a payment model will need to be decided upon, this could be a single once of purchase which would be quite large and scare away some customers but means they can use the device as much as they wish once purchase or a smaller up front cost with a subscription model attached for monthly payments for usage of the device itself.

The last concern is of device and customer security, as the devices will have access to the cloud based server and customer information direct connections through the device may still allow unwanted guests to connect. Possible means to combat this could include limiting the devices themselves to only send information to the server or to only have access to very specific information such as the owner contact information but nothing else. Another possibly even more secure option would be to require two factor authentication for any external connections through the device, this could allow local authorities and veterinary clinics to have their own access code to allow them to locate information about the owner of the device.

GROUP REFLECTION

We assigned Group Tasks as following:

Jennelle – Group Profile, Interview IT Professional, Report Collation/Format

Jaryd – Industry Data

Kyle – Group Profile website (use info from Group Assessment file on GitHub) and Collation of info for Project Idea

Jack – Cyber Security and Cryptocurrency

Bruce – Chatbots and Autonomous Vehicles

We will be using Jennelle's idea for the Project Idea section

Individual tasks: Upload comments (in txt or docx file) on the Project idea to Git for Kyle to collate.

Write response to "Having looked at the Burning Glass data, has your opinion of your ideal job changed? Why or why not?" to add to the Industry Data section. Upload to Github.

Do 200 words on Group reflection. Upload to Github

We had two "official connection sessions", the rest of the contact was through the chat log in Skype so everyone was kept up to date.

Meeting Minutes:

Team Meeting

Date: 04/07/2019

Time: 6:00PM – 7:30PM

Members Present:

Bruce Manirath

Jennelle Roberts

Members Absent:

Jaryd Cavanagh

Agenda:

Introduce ourselves to group.

Assign tasks to each group member.

Results:

Assigned tasks to each present member.

Exchanged information for use in group profile website.

Created GitHub repo for group use.

Meeting Minutes

Team Meeting

Date: 07/07/2019

Time: 8:00PM – 9:16PM

Members Present:

Bruce Manirath

Jenelle Roberts

Jaryd Cavanagh

Jack Marsden

Members Absent:

Kyle Francis

Agenda:

Introduce new members to group.

Assign tasks to each new group member.

Get information for group profile from new members.

Results:

Assigned tasks to each new member.

Exchanged information with present new members for use in group profile website.

Created 'GroupTasks.txt' to keep track of which member is doing what.

GROUP REFLECTION

All of us have come from different backgrounds, with different experiences and different ideas. Coming together was difficult. It is hard to put yourself out there to complete strangers. However, we feel that now having worked together, we are no longer strangers. We are computer game geeks, data nerds and Army personnel (which was surprising!), and we are all looking forward to our careers in IT. We discovered that there are a couple of cat tragics in the group. No cats were involved in our project work.

It is hard to coordinate people working on different time frames in their lives. There are kids, work and family responsibilities that everyone has to work around. And the hours that people are doing these things never seem to line up with everyone else.

The information that we produced for each other was mostly clear. We only really needed to clarify small points. However getting to that clarity required scrolling through chat logs, looking at commit histories and opening document after document.

We have learned that if we had a single spot, not just a file repository, to track completion status, task assignment and where everyone is up to on the versions that have been uploaded, it would save a bit of time.

Setting clear check in dates at the beginning of the project would have been easier. As it was we tried to set catch up times through out the process and not everyone saw the requests before the time passed.

Also, if catch up times are set and people are not able to attend (and life happens!), then the team needs to be made aware of it so something can be rescheduled. Whilst we all may not be able to sit in the same room, chatting all at the same time in scheduled chats will mean that everyone is up to speed with the progress and requirements.

Our GitHub commit history and doesn't really reflect the groups work. There have been a couple of commits that were a commit of a lot of work. Whereas there was also lots of commits that were small files or comments. Therefore the number of commits does not reflect the work that was done.

Individual Reflection:

Jack –

I entered this group reasonably late into the assignment due to inactive members in my previous group. In saying this Group 21 members welcomed me very openly, they were able to quickly bring me up to speed with where they were at with the assignment and they allocated me tasks so I could provide a meaningful contribution. On joining the group they already has a group repository and a group chat via skype, by utilising skype it allowed us to stay in contact regularly with each other either at home or away via our mobiles. As a group we could have utilised github more effectively by keeping our working documents uploaded in the repo, this would limit the amount of time we spent discussing the status of other team members work. It surprised me how useful it was to have other team members in order to bounce ideas off of. While in the group I learned that not everyone will be available at the same time to discuss ideas/issues and that you need to plan meetings well in advance. In conclusion as a group I think we worked well, however there is always room for improvement.

GROUP REFLECTION

Jennelle –

Our group started off a little rocky. Obviously there were issues with inactive members and ability to post in the Group Discussion (which was resolved by RMIT). After not being able to find any discussion, I posted my email address so that people could contact me and we could start to work out a collaborative space. This did not happen. A couple of weeks before the assignment was due, two of the members posted their email addresses. So I emailed them and suggested Skype, Discord or Whatsapp to be our collaborative environment. We decided on Skype. This meant that we could chat and leave messages when people were not online. We organised our Group Chat to work out our plan of attack. After not hearing from one member, I followed up with Anthony to determine if this was going to be a problem. He advised that he had additional team members if we wanted them. We sure did!

Jack and Kyle joined the team just in time for the Group Chat. Tasks were allocated and off we went.

Bruce was a little shy at first, but after the Group Chat, he was very much involved. He helped with the allocation of work to the new members, suggested minutes, and set up the repo and GitHub page link. Jaryd even came out of his shell!

I think for people that were not able to sit in the same room at the same time, we did ok. It was hard keeping track of who had what outstanding tasks and follow up got caught in the chat log. Trying to set a time prior to the date of submission was also hard as not everyone was free at the same time.

Any more work with this team, I think we need a clear and up to date task list with completion status. Someone to be responsible to maintaining that, so it is a single point of truth.

Bruce –

Could have used an app like Trello to keep track of tasks. This is clearer than the method that we used; keeping tasks in a txt file on the repo. It would be easier to track who is currently working on a task and what tasks have been completed. When using the txt file in the repo it is a lot less clear to tell when it is edited and where each member is at with their assigned tasks, unless that person makes direct communications with the group.

Made better use of GitHub repo branches. Our master branch is very messy. We could have used separate branches to better organise the files for each task. Using multiple branches would also avoid unnecessary downloads of files that the members would not need or don't intend to work on.

Throughout the creation of the project we used Skype as our main method of communication. This was ineffective for anything more than quick communication as some members could miss important details scrolling through long chat logs. Using an application like Microsoft Teams may have aided in communicating more effectively by sorting conversations into specific topics, making it easier to keep track of conversations missed. It also would have, although we didn't do so in this project, the ability to collaborate on individual files in Office apps.

GROUP REFLECTION

Jaryd –

What went well? Everything went as good as possible for a group of strangers working together everyone handed in their work on time and did the work that was asked of them and we all go along well.

What could be improved? I think the one thing that could have been improved would be the fact that it took us a little while as a group to get together and do the work.

At least one thing that was surprising? The one thing that was surprised to me was the fact that I was not given as much work as I thought I would be given, usually when I am in a group I am given the most work to do but not this time which surprised me.

One thing that you have learned about groups. The one thing I have learned about groups doing this assignment is that working in groups can be kind of fun and not just annoying which I quite liked about this assignment.

Conclusion: While our groups GitHub repository is a bit messy it definitely has all the logs and data that is required to finish this assignment and with working with this group I can say for sure now I have a better view of what it is like to work in a group in the Industry.

Kyle –

Group 21 wasn't my original group for this assignment, but due to some communication issues with my previous group I moved into it. Once in group 21 it was straight to the punch, the group had already organised a means for communication and a github repository for the project. The group quite easily divided up the required tasks for each member to complete. Unfortunately not every group is perfect and each member has their own commitments elsewhere that need to be addressed which ended up putting a strain on our communications which included a group chat and commits to our github repository. Overall I think the group has managed with their limitations quite well and were extremely accommodating to any issues that arised unexpectedly

REFERENCES

- Benton, D 2018, 'Cat mining autonomous trucks hit one billion haulage milestone', Mining Global, viewed 11 July 2019
<<https://www.miningglobal.com/technology/cat-mining-autonomous-trucks-hit-one-billion-haulage-milestone>>.
- Coren, M 2018, 'All the places self-driving cars are being tested around the world', Quartz, viewed July 13 2018 <<https://qz.com/1488576/self-driving-car-tests-around-the-world/>>.
- Gu, H & Patton, D, 'On the autofarm: China turns to driverless tractors, combines to overhaul agriculture', Reuters, viewed 12 July 2019
<<https://www.reuters.com/article/us-china-farming-technology/on-the-autofarm-china-turns-to-driverless-tractors-combines-to-overhaul-agriculture-idUSKCN1PA0DV>>.
- Horiba-Mira n.d., VIKING Multirole UGV Platform, MIRA, viewed 2 July 2019, <https://www.horiba-mira.com/unmanned-ground-vehicles/media-centre/case_study/viking-multirole-ugv-platform/>.
- Jane's by IHS Markit 2019, Artificial Intelligence and Autonomous Systems on the Battlefield', YouTube, 23 January, Jane's by IHS Markit, viewed 12 July 2019, <https://www.youtube.com/watch?v=skDOe_IAZrM>.
- Levin, S 2018, 'Uber crash shows 'catastrophic failure' of self-driving technology, experts say', The Guardian, viewed 12 July 2019
<<https://www.theguardian.com/technology/2018/mar/22/self-driving-car-uber-death-woman-failure-fatal-crash-arizona>>.
- Lin, P 2016, 'Why Ethics Matters for Autonomous Cars', in Maurer, M, Gerdes, J, Lenz, B & Winner, H (eds), Autonomous Driving Technical Legal and Social Aspects, Springer Open, Springer Nature, pp. 69-71
- Maurer, D 2018, 'Moral Culpability and Autonomous Military Systems: Is Human Responsibility Accentuated or Attenuated by a Reliance on AI?', Modern War Institute, viewed 12 July 2019, <<https://mwi.usma.edu/moral-culpability-autonomous-military-systems-human-responsibility-accentuated-attenuated-reliance-ai/>>.

REFERENCES

Peters, J 2019, 'The future of autonomous vehicles runs off roads and on to farms, construction sites and mines', TechCrunch, viewed 12 July 2019
<<https://techcrunch.com/2019/07/10/autonomous-vehicle-startups-are-dead-long-live-autonomous-vehicle-startups/>>.

Pettigrew, S, Fritschi, L & Norman R 'The Potential Implications of Autonomous Vehicles in and around the Workplace', International Journal of Environmental Research and Public Health, vol. 15, no. 9, viewed 13 July 2019
<<https://www.mdpi.com/1660-4601/15/9/1876>>.

Reisinger, D 2018, 'Humans–Not Technology–Are the Leading Cause of Self-driving Car Accidents in California', Fortune, viewed 12 July 2019
<<https://fortune.com/2018/08/29/self-driving-car-accidents/>>.

Silver, D 2018, 'Simulation Becomes Increasingly Important For Self-Driving Cars', Forbes, viewed July 12 2019
<<https://www.forbes.com/sites/davidsilver/2018/11/01/simulation-becomes-increasingly-important-for-self-driving-cars/#1930eff35583>>.

Society of Automotive Engineers 2018. 'Levels of Driving Automation' Society of Automotive Engineers, viewed 11 July 2019,
<<https://www.sae.org/binaries/content/gallery/cm/articles/press-releases/2018/12/j3016-levels-of-automation-image.png>>.

Tesla n.d. 'Future of Driving', Tesla, viewed 13 July 2019,
<https://www.tesla.com/en_AU/autopilot>.

Baraniuk, C 2018. 'How talking machines are taking call centre jobs', BBC News, 28 August, viewed 8 July 2019
< <https://www.bbc.com/news/business-45272835>>.

Bing, C 2018. 'Exclusive: Twitter deletes over 10,000 accounts that sought to discourage U.S. voting', Reuters, 3 November, viewed 10 July 2019
< <https://www.reuters.com/article/us-usa-election-twitter-exclusive/exclusive-twitter-deletes-over-10000-accounts-that-sought-to-dissuade-u-s-voting-idUSKCN1N72FA>>.

Google n.d. 'Build natural and rich conversational experiences', Google, n.d., viewed 10 July 2019
< <https://dialogflow.com/>>.

Google n.d. 'Google Assistant', Google, viewed 9 July 2019
<https://assistant.google.com/intl/en_au/platforms/phones/>.

REFERENCES

Gramlich, J 2018. 'Q&A: How Pew Research Center identified bots on Twitter', Pew Research, viewed 10 July 2019

< <https://www.pewresearch.org/fact-tank/2018/04/19/qa-how-pew-research-center-identified-bots-on-twitter/>>.

Morgan, B 2018. 'Using AI For Customer Experience At Allstate', Forbes, viewed 10 July 2019

<<https://www.forbes.com/sites/blakemorgan/2018/08/07/using-ai-for-customer-experience-at-allstate/#2ee77fd59d84>>.

Saxena, M 2013. 'Watson Healthcare Products – 1H IBM Watson Progress and 2013 Roadmap', IBM, viewed 6 July 2019

<https://www.slideshare.net/manojsaxena2/ibm-watson-progress-and-roadmap-saxena/7-Watson_Healthcare_Products_1H_2013>.

Stella, M, Ferrara, E & De Domenico, M 2018. 'Bots increase exposure to negative and inflammatory content in online social systems' PNAS, vol. 115, no.49, pp. 1., viewed 10 July 2019,

<<https://www.pnas.org/content/pnas/115/49/12435.full.pdf>>.

Upbin, B 2013. 'IBM's Watson Gets Its First Piece Of Business In Healthcare', Forbes, viewed 11 July 2019

<<https://www.forbes.com/sites/bruceupbin/2013/02/08/ibms-watson-gets-its-first-piece-of-business-in-healthcare/#6fa14e175402>>.