ASSIGNMENT 2: THE IT WORLD



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Mehul Bhatia | Omar Adnan
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Tech Support

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PERSONAL INFORMATION

Marcel Nowosiak - S3539505

I was born here, however, my parents are from Poland, and naturally, I have inherited that rich culture (and language) despite being a Melbournite from birth. Apart from my passion for Information Technology and computing, I am a HUGE American football nut, both as a fan and as a player.

Dhrumil Vaseta - S3719240

Born in Gujarat, India but I've been living in Melbourne since 2013.

I speak 5 languages including: Gujarati, Hindi, English, Marwari and Punjabi. English being my third language. Yet, the most fluent language I can speak.

I love playing and watching cricket in my free time. It's something that I'm immensely passionate about and just enjoy doing.

Joseph Heifetz - S3722140

I'm an 18-year-old high school graduate of Russian/Jewish heritage born and raised in Melbourne. I speak both English and Russian and play both Trombone and Guitar as well as some piano. I have a younger brother and pet cat named Ron. In my spare time, I enjoy playing video games and making music as well as going on bike rides, watching Soccer and American Football.

Omar Adnan - S3721552

I'm currently a student at the Royal Melbourne Institute of Technology(RMIT) and am currently doing a bachelor's in information technology. I was born in Pakistan but migrated to Australia 10 years ago. Coming from an Urdu speaking background,

I was quickly able to learn the Arabic language and then English coming to Australia.

My main hobbies are mainly based around Sports. I see myself as a very Sporty and competitive person regarding any matter. Ideally, I look at myself as a decent cricketer yet still can perform well in Soccer and Aussie Rules.

Mehul Bhatia - S3724281

Currently studying a Bachelor of Information Technology. I was born in New Zealand, but I am of Indian background, I speak English, Gujarati and Hindi. I really enjoy photography and it is a hobby of mine. In my spare time, I like to explore new and interesting places to take photos. I normally take photos of cities and buildings.

TEAM PROFILE

Here is a collation of all members' personality tests:

1. **Myers-Briggs Test**

a. Joseph - INTP-T

b. Dhrumil - ENFP

c. Marcel - ISTJ-A

d. Omar - ESFJ

e. Mehul – ESFJ

2. **Online Learning Style Test**

a. Joseph - Auditory/Tactile Learner

b. Dhrumil - Fairley even spread (35% A, 35% V, 30% T)

c. Marcel - Tactile Learner (55%)

d. Omar - Auditory/Tactile (35% A, 45% T)

e. Mehul - Auditory (50% A, 25% V, 25% T)

3. Big Five Personality Test

a. Joseph - Mostly ‘Analytical Thinker’ and ‘Logical Mechanic’ with a little ‘Empathic Idealist’

b. Dhrumil - (using a different test)

Openness: Score for openness was 60%. This is in the moderate range.

Conscientiousness: Score for Conscientiousness was high, at 71%.

Extraversion: Score for Extraversion was high, at 62.5%.

Agreeableness: Score for Agreeableness was moderate, at 60%.

Neuroticism: Score for Neuroticism was moderate, at 54%.

c. Marcel - Empathic Idealist

d. Omar -

OCEAN

Open-mindedness + Conscientiousness + Extraversion + Agreeableness + Negative Emotionality

The result from each test identifies my personality in different aspects. These results do portray the significance of my work ethics in a team and through I can confirm that I'm not very good with teams but in a field such as I.T., I have no other choice.

e. Mehul -

ALL these tests are useful when it comes to personal development and working in a group for a variety of reasons.

Firstly, knowing which personality one falls under helps understand their strengths and weaknesses - using this information one can properly delegate work between group members and confidently work on their drawbacks while utilizing their strengths to get work done.

IDEAL JOBS

All Ideal Jobs:

- Marcel - Level 3 Support Technician
- Joseph - Mobile Developer
- Dhrumil - Cloud Network Engineer
- Omar - VR Rendering Developer
- Mehul - Software Tester

It appears that most (bar Marcel) wish to exit university into a development field. Whereas, Joseph, Dhrumil and Omar all would like to be hands-on in development processes - albeit in different areas (mobile, cloud, VR). While Mehul wishes to be a tester, a key member in development but in a different way. All the team members of the group have clearly distinct goals regarding their career and would like to gain experience in their area of interest within the IT industry.

TOOLS

GROUP WEBSITE LINK:

http://www.techsupport.com.s3-website-us-west-2.amazonaws.com/

GROUP GITHUB LINK:

https://github.com/josephheifetz/Tech-Support

GROUP GOOGLE DOCS LINK:

https://drive.google.com/drive/folders/1noX0EcifcjeA2dYOv9Qo4nfNh7yHJ6yN?usp=sharing

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AUDIT TRAIL AND GENERAL COMMENTS:

The audit trail on the git repository was primarily used to share the individual website's code done by each group member in assignment 1. These websites were then received by one of the group members to collectively build the final group website and link each group members website in it. Using GitHub for sending and receiving codes made it easier for everyone as it allows to upload large files, that can't be sent anywhere else. This helped the members build the website in quick time effectively as well as efficiently. We also used to google drive to upload our work to our group's folder. The main reason for the group to use Google drive instead of GitHub was that Google drive is much more familiar to everyone and it is easy to use and understand even when you first interact with it. On the other hand, GitHub was extremely difficult to understand and use. That's why most members made changes on google drive but at the end submitted all the files on GitHub. Later, all the files were downloaded by one of the team members and formatted it into a professional report. Google drive assisted the whole group to keep track of what each member is doing and if their work is meeting the group requirement of quality and quantity data. This was later used to give feedback to each team member.

INDUSTRY DATA

For the purpose of comparing our job titles to the Burning Glass data, we researched which key skills/languages are required for the developer jobs and grouped them accordingly.

Mobile/Cloud/VR Developer and Software Tester can be grouped under:

1. Front End Developer
2. Java Developer
3. Software Developer

These jobs are so broad (see '3' different denominations for what is reasonably considered the same position) that they can be considered the best of IT job titles, however, Support Technician is not on the list as its most closely related position (Service Desk Analyst) is among the top.

The developer skills are mostly at the same bar however with some minor differences. This is the case as the group members are all looking into similar fields that require similar characteristics for them to get the job. The key skills for all these jobs include:

1. Communication
2. Problem Solving
3. Collaboration
4. Meeting Deadlines
5. Planning

The top 3 skills are considered to be incredibly important as they all exist within the top 5 generic skills list in March (as of the last 12 months in AUS/NZ).

The top generic skills found within the position of a Support Technician and on the Burning Glass list is:

1. Communication
2. Problem Solving
3. Troubleshooting

The top 3 **IT-specific** skills **not** in our required skill-set are:

1. SQL
2. Project Management
3. SAP

And the top 3 **generic** skills **not** in our required skill-set are:

1. Writing
2. Detail-Oriented
3. Creativity

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

The data provided by the Burning Glass is very accurate in terms of identifying the 'key skills' required in the modern era to get specific jobs. But, the group already had a good understanding of the fields of IT from where they could pick out their ideal jobs knowing the set skills required. Therefore, the Burning Glass data does not change the group members' opinion of having to change their desired ideal jobs as everyone already had a hunch of what will be required in the future in this industry.

IT WORK

1) https://www.youtube.com/watch?v=hFhuMGanjT8
   - Simon Ferrari - DATACOM
   - IT Manager

What kind of work is done by the IT professional?

Being an IT Manager, Simon must deal with any activities with the staff, working with managers, one on one meetings, performance reviews, video reviews with staff or Customers and reviews that come from beyond the region of the organisation's location.

What kinds of people does the IT professional interact with?

Simon mainly deals with the staff as he is at a very high-profile position, therefore he must consistently have conversations with his staff including the managers and at some occasions, Simon also has to deal with customers.

Where does the IT professionals spend most of their time?

Simon spends most of his time working with people that introduce him to new and innovative ideas. He loves that creative aspect of software development as everything at the company is made completely from scratch. He also loves the

flexibility that the company gives him, which therefore means he can do specific tasks when he wants and where he wants, hence he is able to allocate his tasks to certain times and schedule his meetings without any disruptions. Simon also loves to go mountain biking and as the company gives him the freedom to do what he wants, he is able to freely go biking and enjoy his time away from work.

What aspect of their position is most challenging?
Having a very significant role in the company, Simon has to be prolific in his approach to his staff and customers. Therefore, Simon has to be very professional in dealing with people that have issues with products and services and has to be open-minded in the sense when someone is trying to portray a possible idea that can be used for innovation in a certain field.

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2) https://www.youtube.com/watch?v=RYdmWa-i7Gs
   - Chris Sheehan - DATACOM
   - IT Support Technician

What kind of work is done by the IT professional?
Being an IT support technician, Chris has to portray a professional role in tasks including responding to technical queries raised by customers, can include having to update a software, application releases, service support and knowledge of networking issues.

What kinds of people does the IT professional interact with?
Chris being in such an important position, has to interact with all kinds of people. This includes having to interact with customers and also staff members that are in a similar role. This can also include having interactions with managers as Chris might be given more tasks that are more significant in other fields of IT.

Where does the IT professionals spend most of their time?
Chris mainly spends his time working on websites, to ensure they are running at all times and that they don't crash in case of heavy traffic. For Chris, it is not necessary from to be working from his office desk at all times, sometimes he's working from home depending on the work whether if it is after hours due to busy websites.

What aspect of their position is most challenging?
For such a position, the most challenging aspect will be that of dealing with customers as sometimes it can be difficult to understand a customer's problem. Chris would also find solving issues with the website challenging as sometimes it can become frustrating but once solved can be a major accomplishment and he can take all credit for it.

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3) https://www.youtube.com/watch?v=vt79JcPfZQA
   - Victoria Sun - HOMEJOY
   - Software engineer

What kind of work is done by the IT professional?
Victoria is a software engineer; therefore, her work is very practical and hands-on as she mainly deals with the programming and coding things for the computer. However, in HOMEJOY, Victoria's main job is to be that of a website developer. She built the main website for the company and takes full credit for everything that the User can see on their screen.

What kinds of people does the IT professional interact with?
Being in a position which is considered 'behind the scenes", she doesn't have many interactions with the customers. However, she is heavily dependent on her staff members and other IT engineers that are in a similar position.

Where does the IT professional spend most of their time?
Victoria mainly spends her time working on her projects and developing software that can be of benefit. She also has a major interest in game development, therefore she is always looking forward to working in another profession where she could create games or build apps for phones as she has the experience.

What aspect of their position is most challenging?
The main issue she has had working in the field is that the technology field is very male-dominated, therefore she hasn't been able to fully express her "girly" traits. However, after working with female mentors from big companies such as Microsoft and Google, Victoria is now able to portray her true self and be the person she wants to be.

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4) https://www.youtube.com/watch?v=om8AygYdrto
   - Zach – PC simplest
   - IT Systems Technician

'Day to Day Work Life in Information Technology - What do I do?'

What kind of work is done by the IT Professional?
On a day to day basis, the IT professional, whose title is IT Systems Technician performs a range of varying IT tasks and assignments. This can include checking and creating tickets, answering phones, performing computer imaging as well as creating and managing user accounts. Furthermore, the IT Professional is also responsible for going out into the

field and into business facilities to troubleshoot issues with computer systems. Overall, the main responsibility of the IT Professional is to use a variety of directory, imaging and troubleshooting tools to do the work in his portfolio.

What kinds of people does the IT professional interact with? Are they IT professionals? Clients? Investors? The general public?

While doing various work in his portfolio, the IT Professional interacts with his fellow colleagues on daily basis, as the job requires an aspect of teamwork and cohesion to ensure that tasks are done fully and properly and in a timely fashion. The IT professional's job also requires the engagement and meeting of clients and other employees at business facilities offsite.

Where does the IT Professional spend most of their time?

The IT Professional spends most of their time in their offices working with and around their colleagues on day to day tasks. When they are not on site, they are spending time at various business facilities consulting and troubleshooting systems with other company employees.

What aspect of their position is most challenging

The most challenge aspect of the IT Professionals position is juggling the many tasks, deadlines and spontaneously occurring problems that occur in and around the workplace. Furthermore, making sure that systems are well managed, backed up and operating normally is most challenging as a critical failure can result in a backlog of troubleshooting and administrative work.

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5) https://www.youtube.com/watch?v=Rt3rLVJTTAw

'A Day in the life of IT Specialist'

What kind of work is done by the IT Professional?

The IT Specialists daily job revolves mostly around administrative tasks such as answering phone calls, emails and more hands-on tasks such as travelling to company branch locations and performing system upgrades and maintenance as well as troubleshooting a variety of different system issues. Furthermore, the IT professional is also responsible for attending meetings with management.

What kinds of people does the IT professional interact with? Are they IT professionals? Clients? Investors? The general public?

The IT Professional interacts with many different people on a daily basis as part of his job. This includes working in conjunction with fellow IT professionals in the workplace as well as other employees who require IT troubleshooting and maintenance services. Interacting with administrative management is also something the IT Specialist does on a regular basis. As part of his portfolio, the IT specialist also interacts with external employees of the company he works for.

Where does the IT Professional spend most of their time?

The IT specialist spends most of their time in the head office of the company, working on administrative tasks, troubleshooting and system maintenance work. Alternately, to perform the essential task of on-site troubleshooting, the IT Specialist travels to various company branches and facilities.

What aspect of their position is most challenging

The most challenging aspect of the IT Specialists profession is juggling the many requirements and aspects of the job. Whether that may be troubleshooting problems as they arise while answering emails and phone calls regarding a separate issue. Moreover, the multitude of responsibility put in the hands of the IT Specialist makes the job that much more challenging as meeting all the requirements and company deadlines can be tough when juggling multiple problems and systems.

IT TECHNOLOGIES

AUTONOMOUS VEHICLES:

Autonomous vehicles are defined in the Merriam – Webster dictionary as being ‘an unmanned vehicle designed to operate without guidance according to pre-programmed instructions'. To envision and subsequently create the machine that can essentially perform the complex task of driving without human input or ‘guidance', state of the art technologies have had to be invented and implemented in cars and other vehicles. Furthermore, the technologies that have been developed as part of autonomous vehicle research are state of the art due to their complexity, as developers have had to integrate advanced software and machine learning capability with traditional vehicle hardware as well a variety of different camera,

radar, and sensor systems, in order to create a true self driving vehicle that performs all the functions necessary to not only drive a vehicle but also be aware of the vehicles surroundings and all the threats and obstacles that vehicles can face on the roads. State of the art Machine Learning and Artificial Intelligence technology play an essential and crucial part of the systems that make an autonomous vehicle a reality. These advanced technologies are used to make rapid decisions on the road that would traditionally be made by a human driver, such as moral decisions and decisions that can potentially affect the safety of occupants inside an autonomous vehicle.

In the present day, autonomous vehicles are currently being developed and tested around the globe, with many traditional automobile manufacturers and newer start-ups working on their own autonomous vehicles. The current state of machine learning and autonomous technologies allows many self-driving vehicles to perform almost all the tasks and operations required to be considered 'fully-autonomous'. In many vehicles, this is in the form of functions such as: 'lane-keep assist' (which allows the car to track road markings and follow them without human steering input.), automatic breaking (which allows the car to use radar and cameras to sense the distance between the vehicle and another vehicle or obstacle and apply the brakes if necessary.), and in some vehicles, full self-driving capability in scenarios such as highway/freeway driving (meaning that the vehicle is in full control of steering, acceleration, braking, indicating and changing lanes without human input).

Furthermore, automotive manufacturers such as Tesla, Volvo and Mercedes-Benz have been developing and integrating Artificial Intelligence systems to enable autonomous vehicles to be able to use cameras to identify and follow road signs as well as enabling them to 'see' and avoid other road users such as pedestrians and cyclists. In the near future, autonomous vehicle technology specifically advances in Machine Learning and Artificial Intelligence, will likely enable autonomous vehicles to make 'human-like' decisions on the road such as moral choices in the event of a possible accident and be fully self-driving without any requirement of human input or interaction. Moreover, the future of autonomous vehicles will be defined by the way in which these vehicles interact and communicate with each other. Technology that will enable a vehicle to vehicle communication is still in the early stages of development but should be operational in the next 3 years, thus its

implementation into vehicles will be vital to make autonomous vehicles not only possible, but a viable solution to replace human drivers and make driving safer.

For autonomous vehicles to be a commercial success and a viable way to get around, a variety of technological advances will have to be made. This includes rapid development and improvement of Artificial intelligence and Machine Learning technology as well as further development of radar, camera and other sensor systems. Crucially, the parallel technological advancement of software and hardware in autonomous vehicles will enable them to first and foremost exist and be a safer more efficient way to travel.

As growing numbers of autonomous vehicles are developed, tested and eventually released to the public as consumer products, they will overwhelmingly impact the way in which people travel and interact with their cars. The potential of autonomous vehicles to change the very landscape of modern society is vast, given that by putting human trust into the hands of artificially intelligent machines, humanity will test the very advancement of technology that enables autonomous vehicles with their own lives.

Furthermore, human trust in driverless vehicles will be a crucial factor if they are to be a success. This hinges on the successful development of artificial intelligence as moral decisions on the road formerly reserved for a human driver will now be carried out by the vehicle. However, the potential benefits of autonomous cars and other vehicles are tremendous. Erik Coelingh, Volvo's Senior Technical Leader for Safely and Driver Support Technologies, stipulates that the era of driverless cars will 'transform our lives in more ways than one' and that the advent of autonomous vehicles will improve our lives in three key ways: 1. Roads will be safer; 2. Traffic and fuel efficiency will greatly improve; 3. People will have more free time. The direct impact of autonomous vehicles will be a dramatic shift in the way people use and interact with cars. This may take the form of autonomous ride sharing, whereby owners of vehicles will be able to send their cars to pick up paying passengers and/or autonomous cars will be able to pick up their owners simply with a request through an app or remote. Because of the era of driverless cars, many professions revolving around driving a vehicle may disappear. This may include taxi drivers, professional

chauffeurs, bus drivers, truck drivers, etc. Therefore, people in these professions may find themselves out of a job. However, new technological and maintenance positions may be created because of autonomous vehicles being widely adopted.

In the not so distant future, driverless cars will most likely have a profound impact on my life. I may own a self-driving car and thus, will be able to make money by sending it out to sell rides to other people. Furthermore, the way I use my car will drastically from present day, whereby I would be able to simply enter the desired destination and my car would just simply be able to take me where I need to go. Using public transport would also be quite different from the current system. Bus, train and tram drivers would all be obsolete and therefore catching these forms of transport would involve trusting the Artificial Intelligent systems in these modes of transport to get me to my destination. The era of self-driving vehicles would dramatically change the way in which my family and friends travel. For example, my family could send their car to provide rideshare services or when going shopping could send the car to park itself, etc. Requesting a self-driving car remotely may become a norm, with thousands of cars travelling on roads on route to their owners or on their way to pick up passengers. In the event of an emergency, for example, one of my family members may be able to just simply request the family car comes to his/her location and be able to travel to a hospital. Subsequently, autonomous vehicles may fundamentally change the way that I hang out and socialise with friends, as a driverless car may allow me for example, to call and request it to come to my location to pick me and/or my friends up from one location and take us to another.

CLOUDS, SERVICES, SERVERS:

Cloud Computing is an ever-growing field in the Information Technology(I.T.) department that enables Users to access shared information resources and higher-level services that are easily provisioned with minimal management effort. Cloud Computing or "the cloud" is also identified as a 'service' using a network of remote servers hosted on the Internet to store, manage and process data in the replacement of the User using a local server or a personal computer. Currently, the field of Cloud Computing consists of 6 services including Software as a Service(SaaS), Platform as a Service(PaaS), Infrastructure as a Service(IaaS), Public Cloud, Private Cloud and Hybrid Cloud.

Software as a Service

Software as a Service(SaaS) is simply defined as cloud-based applications accessed through the web. Main benefits of SaaS include being able to sign up and almost immediately be able to use innovative business apps, apps and data are easily accessible from any connected computer, there is no data loss if the User's computer breaks down as data is stored in the cloud and the service is able to dynamically scale to usage needs.

Platform as a Service

Platform as a service(PaaS) provides a cloud-based environment with everything required to support the complete lifecycle of building and delivering web-based

(cloud) applications — without the cost and complexity of buying and managing the underlying hardware, software, provisioning, and hosting. Main benefits of PaaS include being able to develop applications and getting them in the market faster, being able to deploy a new web application to the cloud in a matter of minutes and to reduce the complexity with middleware as a service.

Infrastructure as a Service

Infrastructure as a service(IaaS) provides organisations with computing resources including servers, networking, storage and data centre space on a pay-per-view basis. Advantages of IaaS include no need for investment in one's own hardware, infrastructure scales on demand to support dynamic workloads and having flexible and innovative services available on demand.

Public Cloud

Public clouds are owned and operated by businesses that offer almost immediate access to Users over a public network to affordable computing resources. With public cloud services, users have no need to purchase hardware, software, or supporting infrastructure that is owned and managed by providers. Main aspects of the public cloud include innovative SaaS business apps for applications ranging from customer resource management(CRM) to transaction management and data analytics, having flexible and scalable IaaS for storage and computer services on a moment's notice and powerful PaaS for cloud-based application development and deployment environments.

Private Cloud

A private cloud is an infrastructure operated solely for a single organization, whether managed by the organisation itself or by a third party and hosted either internally or externally. Private clouds can take advantage of cloud's efficiencies while providing more control of resources and steering clear of multi-tenancy. Key aspects of a private cloud include a self-service interface controls services, allowing IT staff to quickly deliver, allocate and supply on-demand IT resources. Another key aspect is that of highly automated management of resource pools for everything from computing capability to storage, middleware and analytics. The private cloud also

addresses the sophisticated security and governance designed for a company's specific requirements.

Hybrid Cloud

A hybrid cloud uses a private cloud foundation combined with the strategic integration and use of public cloud services. The reality is a private cloud can't exist in isolation from the rest of a company's IT resources and the public cloud. Most companies with private clouds will evolve to manage workloads across data centres, private clouds, and public clouds - thereby creating hybrid clouds. Main features of a hybrid cloud allow companies to keep the critical applications and sensitive data in a traditional data centre environment or in a private cloud. A hybrid cloud also enables taking advantage of public cloud resources including SaaS, latest applications and IaaS mainly for virtual resources. Finally, the hybrid cloud facilitates portability of data.

The latest and most innovative idea that has become a trend among the large companies is that of Building "Digital-First Infrastructure". This new trend will provide the digital infrastructure for the cities of tomorrow where an estimated 6 Billion of the World's population will be living by 2045. Therefore, this trend will be the idea that companies will focus on as an expansion for the future and will utilise every aspect of Cloud computing including all the services to get this done and out in the market as soon as possible.

The potential impact of Cloud Computing can be situated in both a negative or a positive conclusion. Cloud computing can be taken to advantage as it will give companies scale and cost, choice and agility, next-generation architectures and encapsulated change management. However, the Users of cloud computing can be face issues with the security of the cloud, reliability of the cloud and the user's lack of control over personal information and data that is being stored in the cloud. The expansion of Cloud Computing will bring a change in a variety of aspects including that of creation of a new generation of products and services, a new lightweight form of real-time partnerships and outsourcing with IT suppliers, a new awareness and leverage of the Internet, the rise of new industry leaders, more self-service and more tolerance and innovation. For many organizations in the short term, the apparent

potential of the individual changes following the expansion of cloud computing will often not be sufficient to them to make the transition to cloud computing, particularly as the cloud market is very modern and major players such as IBM and HP have yet to arrive in full force. But gaining competency in cloud computing today by conducting pilots and building skills will allow companies to gain an upper hand on their fellow rivals and will begin to position them for the future of IT. In the long term, cloud computing is increasingly appearing to be a transformative change in the business landscape. Redundancy in cloud computing will be defined as the supplying of duplicate copies of various data and other resources. Therefore, for technologies that involved a chance of failure for duplicating data and required maintenance, the cloud will provide a very reliable storage where the User will be able to freely store data with no chance of having a failure and therefore will overshadow the other technologies.

Cloud Computing will have a positive effect on my knowledge in the IT field. With Cloud Computing, there will be a safer storage place for users to store personal data with no chance of having it interfered or tempered. However, to get around the whole idea and to be able to freely put personal information on the Internet will still be a very big step for my personal gain. Cloud Computing will have a similar effect to those around me as they will also have the freedom to freely share information and to have the control and feel secured of not having their information tempered will give them more courage to use the modern system.

CYBERSECURITY:

The term 'cybersecurity' refers to the act of protecting systems, networks and programs from intrusions and attacks. The world of cybersecurity moves fast - with every emerging technological development, there is a flurry of questions being asked in relation to the feasibility of implementing them in business environments with regard to security concerns. Examples of exceptional cybersecurity measures tend to have a range of methods put in place across all layers of a system (be it two-factor authentication for low-level access or firewalls and anti-virus solutions for cloud applications), and education of all users to be mindful of some basic security concepts - such as the makings of a strong password or ensuring one's data is consistently backed up.

Anyone who utilises the internet for anything is under the risk of cyber-attacks. Recently, a total of 87 million users data were leaked by Facebook to the trump campaign for them to target these users and get political votes from these users. Resulting in Trump attaining the American president status. This is what cyber attacks can cause; people who don't even use internet get affected by it in some way or another. This is a major issue and people are always coming up with different ways to secure themselves or avoid cyber-attacks in any way possible.

Cyber-attacks can disrupt and cause considerable financial and reputational damage to even the most resilient organisation.
If an organisation suffers a cyber-attack, they are at an immense risk of losing assets, reputation and business, and potentially face regulatory fines and litigation – as well as the costs of remediation.
The UK government's Cyber Security Breaches Survey 2017 found that the average cost of a cybersecurity breach for a large business is £19,600 and for a small to medium-sized business is £1,570.

Every time a new security method is put in place and is made widely available, time is given to the black hats for them to reverse engineer and find a way to crack it. Thus, it is in the best interest of those who develop them to continue utilizing newer technologies and concepts in order to stay ahead of the curve. The biggest development we're seeing at the moment is Hardware Authentication.

Intel - with its new Core vPro processor, is aiming to embed the authentication process into a user's hardware - taking factors from a variety of different hardware variables in order to validate identity. There are a few examples of Hardware Authentication already implemented, ranging from a USB security key to Optical Recognition. Traditionally, two-factor authentication mainly

involved a password and another code issued by a security token or an app. Intel's new authentication feature can even utilize a user's own smartphone (with Bluetooth on) by detecting that it is within range and acts as one of three factors (something you have). So long as the phone has the right security certificate pushed to it, it can be used to identify the user.

User-Behaviour analytics are utilized in a new emerging cybersecurity tactic, as part of a grander scheme to catch intrusions when they occur. This is used in a way where systems can differentiate a normal user's activity and an attacker's entry, and following the proceeding protocol in handling a spotted intrusion. Visibility into the activity of the user which is deemed to be suspicious closes a hole in an attack chain - described as a process from the initial penetration through to the "exfiltration of sensitive data".

The development of these new cybersecurity protocols is somewhat of an exchange with the development of new hacking tools. As is the nature of a zero-day attack, new protocols/technologies are developed as responses to these attacks - thus due to the wide availability of all current technologies leads to the eventual exposition of a vulnerability. The direct impact of new security features are generally felt by end-users - where popular apps, websites etc. implement them to stay on top of everything.
Fortunately, for those looking to get into the field of Cyber Security, all of these emerging developments result in a variety of new jobs in the IT sector - ranging from chief security officers to developers and consultants of security in software development, pertaining obviously to these new technologies.

These specific developments may affect me in my day-to-day online operations. I could see a company like Blizzard implementing an always-on Bluetooth authenticator for their Battle.net service given their history of being one of the first few to make the key-chain (and later app) authenticator as a two-factor means of checking identity.

ROBOTS:

The state of the art of robots is that this technology can be used for a wide range of purposes. A robot can be used for many different tasks such as in production lines at factories, at workplaces, at home for assistance and many more tasks. Robots can be designed and built differently for different purposes for example in manufacturing, many jobs in factories are messy or dirty. Dirty tasks may include welding, grinding, moulding and casting. When robots are used to perform these tasks, it enables human workers to partake in more meaningful and creative pursuits factory. Most robots today are used to do repetitive actions or jobs considered too dangerous for humans. A robot is ideal for going into a building that has a possible bomb. Therefore, the robot will be able to replace humans for certain jobs because robots will be able to do certain tasks more efficiently compared to humans.

Artificial intelligence is also known as machine intelligence or AI for short. Some computers and robots have been given the opportunity to act with human-like behaviour. Face recognition software, complicated scheduling software, or computer games that give players a response based on the player's actions are all forms of artificial intelligence. The goal for AI was, at one time, to recreate the intelligence of a human being. At the present time, insect intelligence is the focus of research and development because insects and their behaviour are easier to mimic. Nanobots could be based on insect behaviour, working in swarms together to perform a function.

Some robots and computers have been given the ability to learn and to use information from previous activities to make future decisions. This is known as self-learning, which is a human-like behaviour that many robots are unable to perform. A robot that fills a box with cookies might be able to "count" the number of cookies in the box, or a computer could determine the amount of traffic on a street to calculate when to change the light. This science is in the early stages, but robots are being developed that can make decisions in order to serve food, translate words from one language to another, and get information from outside resources to solve problems.

Unlike in the movies, Robots are unable to think or make decisions; they are only tools to help us get things done. Robots are machines with programmed movements that allow them to move in certain directions or sequences. Artificial intelligence has given robots more ability to process information and to “learn.” But, they are still limited by the information that they are given and the functions they are given to perform.

In three years' time, robots will be designed to replace humans in jobs such as 9in factories on the production line. This is because having robots to replace humans in factories is more economical for big companies because they do not have to pay humans. Hence, they save cost and increase revenue. Therefore, in every factory, there will be robots which will be able to do the tasks which humans do more efficiently.

The potential impact of this technological development is that majority of the task which requires human effort will be replaced with robots. This is because robots are more efficient and will be able to perform certain tasks better than humans. Hence a majority of tasks which require effort will become easier because of robots, therefore, many problems will be solved.

What is likely to change is that the use of robots will increase in different facets of human life. A robot will be designed for the most basics of tasks however also the more complex tasks, therefore, it will be common to have robots everywhere.

Therefore, places like the supermarket and malls will also have a robot and at everyone's homes.

The people who will be most affected will be for the people who work in trade and at factories because robots are more likely to replace their jobs. However, the positive effect which robots will have is that robots can be designed to provide assistance, therefore, this purpose will have a greater positive effect on people who will benefit from robots. Robots may have a positive or negative effect on humans depending on the situation however it will be more of a positive effect rather than a negative effect.

Robots, however, will replace and make redundant of current jobs this is because robots are more efficient at certain tasks compared to humans. Therefore any job which does not require serious decision making will be replaced by this new technology ‘robots'. Serious decision-making means to make a decision which affects a human by causing harm to them. Therefore, jobs such as police officer which require serious decision making will not be replaced by a robot. Jobs like these require human because humans have emotions and knowledge decide between what is accepted or not whereas robots do not.

This will affect my life because robots will become a part of how everything functions for example for the basic of tasks robot will be used. Therefore, it will be normal to see robots at a variety of different places. Some task will become easier however some may become harder because robots do have some flaws for example robots do not have the ability of feeling emotions. Therefore robots will not be good at some tasks which humans are better at.

What difference this will make for me will be that it will change how we do everyday things. Things such as cleaning, driving and other tasks will become easier due to a robot. This is because robots will be designed to accomplish these tasks more efficiently, therefore, this will make a big difference in my life because I would not have to do these tasks myself. Therefore, it will save me time and effort by not having to do these minor tasks which will give me more time to work on more

important and meaningful tasks. Hence having this new technology which is robots will create a difference in my lifestyle.

This will affect the members of my family and the friends which because of the changes this technological development will bring upon our society. Robots will change many conventions which are normal right now however they will be different in the future when robots will be introduced to society and when robots will be in every household.

PROJECT IDEAS

Overview:

Our project idea is related to sports and accurate decision making by robots using artificial intelligence. "Robot umpires" can replace humans in sports such as cricket and soccer, where they can identify a situation and make precise and informed decisions in quick successions. Having a hardware robot situated at the place where umpires stand with a quality software with the basic rules and knowledge of the sport and sensory information to identify the surroundings. Example: a bowler stepping over the line and bowling a no-ball in cricket. The robot should be able to see and identify that the bowler has stepped over the line and produce an output accordingly.

Motivation:

"Robot umpires" can be useful because it provides precise and correct decisions in quick time which humans are unable to do. This will result in a fair game/match and will provide entertainment for the spectators. More than 30% of decisions given in a cricket match by human umpires are false all around the world, and in some cases, the umpires are biased towards one team. This results in unfairness and is deemed against the spirit of the game, but artificial intelligent robot umpires are the assembled solution to this problem. These robots can revolutionise the sporting industry by giving a much more effective and efficient gaming experience for both the players and the spectators.

Description:

(Taking cricket as the sporting example here) The robot must provide accurate decisions and produce an instant output for players and spectators understanding. Such as signalling four, six, or out in cricket. Their ability to identify the situation and give decision immediately will be the key to making the sporting event highly effective and efficient. It will produce precise detail of the surrounding that a human umpire can't provide accurately. Such as; the pace of each delivery being bowled, if it was a legal delivery or not. It will have a human-like body with the ability to see the surrounding and capture it in a video form. The surrounding and each delivery being bowled and faced will be the input, it will process the information that was received to ensure if it was a legal delivery and if the batsman wasn't out or the batsman made any runs of that bowl. This information will be sent on to the big screen and will be outputted by the robot accordingly for everyone related to that event. Example; players, spectators at the venue or people watching at home. Although minimal user interface will be used in this product; there will be a person to set the dimensions of the ground and the format of the game (20 or 50 overs) will be configured before each match commences. It won't consume the same space as a human umpire does and it will have aesthetically pleasing hardware to make it appear pleasant to the viewers watching the match. It will be programmed to have a deep understanding of the match and its surroundings; a decision review system (DRS) will be implemented in the program too, to reduce the time spent on checking for the correct decision. The only restrain it has is that it can not handle disputes between two players on the field while the match is going. The robot can't communicate, neither it can physically stop players from fighting. Also, it is at the risk of getting hit by a cricket ball on the field as its unable to move around the area when a ball is coming towards it at high speed. This can damage the product and can be significantly expensive to repair or build another system.

Tools and Technologies:

To build a "robot umpire" having a strong software is crucial to be able to carry out tasks more efficiently and effectively than humans. I am unsure as to what exact software is needed to build an artificially intelligent system as powerful as this because I don't have enough experience in creating robots yet. Hardware needs to be sturdy and aesthetically pleasing. It doesn't necessarily have to be a moveable object. Thus, the main focus is on building a strong software and programming the system to produce correct output quickly.

Skills Required:

The skills required for this project will be high levels of programming in a specific language to be able to run a system like that. These skills can be learnt in an IT or computer since university degree, but these skills will probably develop over experience in building such systems. Experience team members in programming and build hardware are required to build this project successfully. The skills and software will be developed from scratch, but the hardware will be readily made and will be bought from a third party. Lastly, the hardware will be put together by experienced team members in hardware engineering and with the finishing touches, the product will be ready to implement in a real-life international match.

Outcome:

If the project is successful it will revolutionise the sporting industry. "Robot umpires" can provide precise and correct decisions in quick time which humans are unable to do. Because of its accurate decision-making program in a quick time, the matches will be played out fairly and effectively. This will solve the issue of biased and incorrect decision given by umpires towards one team. This project can be built for other sports and can be implemented in them too. Thus, resulting in fair sports and more entertainment for not only the players but fans as well.

FEEDBACK

Every member of the group has given their feedback on their performance as well as other team members performance and contribution during this assignment on SparkPlus.

GROUP REFLECTION

- Group Reflection

• **What went well:** The organization of all the files sent by each team member was ideal. All the team members attempted to do the work they were assigned to with their best ability. Although some members didn't attain high-quality standards of work, they did their best to produce a base to work with. Which was formatted and edited later by other team members. The use of GitHub and google docs was an excellent and crucial part of keep track of each individuals work and assisted the team leader to set appropriate deadlines for each task. Everyone finished off their

tasks in a few weeks. This allowed the final editor to proofread all the work and formatted all the draft work into one professional report.

- **What could be improved:** Understanding the tasks and meeting the rubric criteria was something that could be improved. Communicating well with each team member and being present in not only the conversation but the tutorial was a lacking aspect of tech support group. Taking individual responsibility for the tasks assigned to them and asking for help when they're unable to do a specific task could've been worked on at the early stages of the assignment process. The ideas weren't shared adequately in the tutorials in person, they were done on a group chat which led to confusion as to who must do what task. The language used in some parts was not sophisticated and professional enough. Overall, communication and cooperation were lacking in our group which led to many tasks left uncompleted or not professionally done.

- **At least one thing that was surprising:** One thing that was most surprising to us was that everyone attempted to do their part. Each individual member tried to complete their task with utmost dedication and attempted maintaining high-quality standards. The second most surprising thing was the use of specific tools that were required to be used for this assignment. GitHub was something that most members of the team struggled to utilize within the first few times they had direct user experience with it. The difficult terminology of GitHub and its distinct conventions compared to other applications or website confused the team members and failed to use it upload their work there.

- **At least one thing that you have learned about groups:** Communication and dedication is the key to success for any group task. Even if one team member fails to communicate or produce their work with right intentions then the whole group fails to attain success. Having different types of personalities and attributes in each team member makes a good team. If one of the team member specializes in editing and formatting the rough draft work into a professional report, and the other team member specializes in that same thing, then it's not a good team. For a team to work, each member should be able to do something different than the other member. This is what leads a team to success.

- Individual Reflection

- Mehul: My perception of our group is that our group worked very well together and executed the whole assignment very methodically. We split the parts very evenly and what went well was that we all completed to the assigned tasks to the best of our ability, however, we also gave feedback to each other for their sections and improved each other's sections. However, one thing we can improve on is that we should have had more group meetings to clarify the doubts which some of the members may have had. One thing that was surprising was that even though our group did not have many group meetings we still had good communication with all the members of the group via the internet and social media. One thing I learnt about working in a group is that it is more efficient to work in a group rather than individual work and I learnt that communication is very important to be able to work well as a team/ group. Also, while working in this group I learnt that feedback from the group member was very important because it helps you realise the mistakes you have done which you may have disregarded. Hence, our group worked adequately, efficiently and effectively.

- Omar: The group members of Tech Support co-operated very well. Having a little tardy start to approach the assignment, the group soon became very organised and finished the assignment well before the deadline day. Despite the fact that some people did a little more than equal to others, the group managed to get the work done. Dhrumil and Omar took the responsibility of being the leaders of the group and finishing off the work that others had either forgotten or had left out due to inactivity. Joseph also played a very important role in getting his part of the assignment done and being there to help out others if need be. I believe the work was that of high quality, however, the fact that some members didn't proofread and left it for others to do so felt a little harsh. This was the only aspect where the group felt a little unorganised and might have been the only department where there will be need of improvement in the future.

One of the most surprising aspects of the assignment was that of how organised yet slow the members completed their work. Even though the work was done completed before the deadline day, the fact that people didn't proofread their information was what kept the group back. The one thing that I have learnt about

working in a group is that you have to be ready to do extra work once the deadline gets closer. This is the case as some members decide to be a little lazy around this time and leave the work to last minute or just don't do it all and others have to clean up their mess. I believe the use of tools such as GitHub was utilised to its full potential as time was a factor and members not being used to the functionality, but in the end how the group managed to complete the tasks is exceptional.

-Joseph: During the assignment period the group worked well together and all aspects of the assignment from beginning to end were completed in a timely fashion and to a good standard. All team members took their allocated sections of the assignment seriously and put in the work to make sure it was done. Team communication was also very good resulting in all choirs being resolved quickly and correctly by fellow teammates. The timing of completion of set tasks is something that could be improved in a future assignment, to ensure that the group is ready to submit everything all at once and isn't scrambling to put all sections together. One thing that was surprising in doing this assignment was the sheer amount of organisation needed to make sure each member of the group completes their required work. Group work has taught me the importance of communication and understanding when dealing with a group of people whose actions affect everyone else in the group.

- Marcel: I believe that everyone in the group gave their best to finish off their tasks. The instructions and what each individual's role is were clear and a team member was supervising the changes made to the work and assisting other team members on how to improve their work at all times. The team was highly motivated to complete the task and had a good start however by the end most team members lacked maturity and submitted incomplete work or work that was immensely low in standards. Which then impacted other team members because they had to finish their work and couldn't focus on the tasks they were initially assigned. The communication and team meetings were not adequate, and most team members couldn't clear up their doubts regarding the assignment as they didn't attend all the tutorials. The most surprising thing was teamwork and responsibility shown by other team members who took in charge and finished all the incomplete work other had left. This maturity resulted in completing the assignment on time while

maintaining high-quality standards. The one thing I learnt about groups was that if even one team member doesn't finish their assigned work and doesn't take responsibility for it; then it impacts the whole teams' morale. Choosing the right team members is a crucial part of group assignments which will be considered in the upcoming group assignments.

- Dhrumil: The team attempted to do their best to complete the parts they were assigned to do by the team. The deadlines were clear, and interactions and teamwork were present at all times. When other members struggled to finish their parts before the deadline, Omar and Dhrumil took the responsibility to finish their incomplete work or assist them and guide them in a positive direction to complete the task in quick time while maintaining high-quality detail. The dedication of each team member to finish the tasks before the deadlines set for them could be improved. We had 5 tutorials between the day we formed a group and assignment submission date. But, there wasn't a single occasion where I can recall all 5 of the group members being present in the class and discussing the ideas and doubts each of us had about the assignment or their individual parts.

The most surprising thing about this group assignment endeavour was that everybody finished their tasks before or after the deadline they were given. All the members worked immensely well under pressure and took on the challenge of completing their parts in one week. The tasks seemed extremely small in proportions when the work is distributed to all the team members evenly. The way each individual in the group behaved and presented their work using applications or websites never used before is definitely applaudable.

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