IT Technologies

There are a lot of fascinating developments going on in the IT world, many of which may fall by the wayside, but some of which are likely to change the way the world works. Historic examples of such developments include the Internet, smartphones, cloud computing and public-key cryptography.

In this section you should report on 4 of the areas below.

* Clouds, services, servers
* Cybersecurity
* Blockchain and cryptocurrencies
* Machine Learning
* Autonomous vehicles
* Natural Language processing and chatterbots
* Robots
* Raspberry Pis, Arduinos, Makey Makeys and other small computing devices

Some starting points and other information will be made available on Canvas.

For each of the areas covered, you should report on the following.

**What does it do? (600 words)** What is the state of the art of this new technology? What can be done now? What is likely to be able to do be done soon (say in the next 3 years)? What technological or other developments make this possible?

**What is the likely impact? (300 words)** What is the potential impact of this development? What is likely to change? Which people will be most affected and how? Will this create, replace or make redundant any current jobs or technologies?

**How will this affect you? (300 words)** In your daily life, how will this affect you? What will be different for you? How might this affect members of your family or your friends?

Topics:

1. Clouds, Services and Servers:

Clouds, Services and servers or Cloud computing is a service made available to users on demand via the Internet from the cloud provider's software/hardware as opposed to being provided from a company's own on-premises software/hardware. The Cloud is a “safe” data storage system where one can conveniently store information, transfer files and receive files amongst other activities. Presently, companies are now working hard on the back-end of cloud storage systems, examples being: Blockchain, Quantum Computing and enhancing their Algorithmic systems.

The impact of improved systems is a better overall Cloud experience. Removal of bugs and augmentation of the overall algorithm, should result in users having greater confidence and trust in Cloud, thus leading to an increase in usage. With greater volume of users, comes increased business opportunities. It is possible that companies such as Dropbox, Apple and Google will increase their use of ads and focus more on marketing (as we’ve seen in the past with companies such as YouTube) as the money making contingency is there. The individuals who will most be affected by are existing users and organisations. Career wise, it’s hard to determine how large an impact it will have, but it is possible that it will disrupt the volume and flow of hardware manufacturing. We may see a drop in purchases of hardware such as harddrives and USB drives, as they become increasingly less necessary and less important. Ultimately this would probably negatively affect hardware manufacturing company related positions, but may also create new opportunities for I.T personnel such as programmers, developers, engineers, etc.

Not all of us use cloud currently. For those that don’t, it won’t impact us whereas for those that do, cloud is great in a variety of ways as mentioned above such as quick, convenient storage and easy transfer of files. A potential negative is privacy. Whilst secure, cloud systems are not infallible, meaning private documents, photos and videos can be leaked, many examples of such have been reported in the media. Additionally, it is possible that data stored in the cloud is there forever and can not be taken back or deleted. The cloud can be unreliable as hardware faults can cause data loss, especially due to the fact the cloud providers are responsible for maintenance which the end user has little to no control over. On the other hand most cloud providers are structured with redundancy plans to prevent loss of data, often with multi-site operations severely limiting outages and issues caused by localised things like natural disaster. Had the ATO’s storage solution been on the cloud in 2016 they could have prevented [a petabyte of data loss and months of system outages] (<https://www.ato.gov.au/About-ATO/Commitments-and-reporting/In-detail/ATO-systems-report/>)

1. Cybersecurity

Cybersecurity or digital security is the protection of computer systems from theft of

Hardware, Software and electronic data. Some of the technology that is improving for

Cyber security is; Blockchain, Cloud technology, IoT security, AI and machine learning &

Application security. All of these technologies are continuously working together and

Being upgraded to better cyber security.

The potential impact of this will be improving cyber security and trying to make it “safe” for  users. It will also protect companies who develop apps and work mainly online. People

may not be very much affected by these changes due to them not being well known to

outside of the IT workforce, but people will have better protection on apps etc.

This has the possibility to create more jobs due to the amount of people that use the internet, devices that can connect to wifi and home devices that children may use

Apps on.

Realistically this won't affect me or any of my family members due to it being the back end of Cyber security. However they can have a little piece of mind that people are working on Cyber security to make using many different devices and apps safer. Considering now days children as young as 5 have their own ipads to play games and watch tv shows that may be streaming on stan or netflix. With family members who have just had children this means that when they’re older my family members can have ease of mind when they allow their children to play on ipads and watch shows, not to mention the world of cyber security is ever changing and it’ll be even more safer for them to use.

1. Autonomous Vehicles

Autonomous vehicles are very similar to current day mainstream motor cars however the key difference is they are ‘driverless’. This is achieved by computer systems programmed to control the vehicle, which has been a big part of vehicles for a long time, but including driver inputs like acceleration, braking and steering. Present day, vehicle autonomy in is still in its infancy, but over the past 5 years or so has made big leaps in development. Vehicle autonomy is part of current production vehicles though on a smaller scale than full driverless autonomy. Functions such as reverse parking assist, emergency responsive braking and even cruise control form part of vehicle autonomy. Each day researchers, manufacturers and engineers are all working towards making the car a driverless experience which can be expected in the future - how far into the future is hard to say but Bentley have already displayed a prototype low speed vehicle that is completely driverless.

With this technology advancement would come an array of changes in everyday life. On the good side of change would be increased ability for productivity, comfort of private travel, eliminated risk of driving incidents caused by motorists driving under the influence of alcohol/drugs, more efficient motorways with less congestion (should all vehicles be autonomous and communicate with each other to prevent slow merging traffic, cutoffs, etc.) and eliminated driver fatigue. On the negative side is the risk of system failures such as speeding, failing to brake and/or steer, inability to control the vehicle in case of emergency (assuming there is no manual override) and hacking. The changes brought on by autonomous vehicles would impact all road users including pedestrians. Industries such as transport and logistics along with taxi travel (just to name a few) would be heavily impacted by this technology as both industries revolve around the operation of motor vehicles to transport goods/people from point A to point B. With autonomy taking over, the vehicle operators would no-longer be required in that role (though in the early days the vehicles will likely require an operator).

This will affect all of us and our families in one way or another we all use some form of vehicle for either transportation or labour. The effects are hard to judge as this stage but impacts outlined in the above paragraph should be thought about, discussed and understood as the use of autonomous vehicles becomes more prevalent.

1. Robots

Robots are machines designed to perform a task. Modern day robots are computer programmable and are able to achieve an array of tasks depending on their design. Robots are used very heavily in manufacturing along with healthcare, transport, labour and domestic use such as vacuum cleaners. Robotic development is moving more and more in the humanoid space which is developing robots that are more like humans in behaviour and appearance.

With robots, greater productivity is achieved as they are able to better perform repetitive and precise tasks with a greater level of accuracy than humans. As they are (generally) programmed to complete a single task, robots are often very good at what they do. Overall, this would greatly impact workers, as it often means redundancy of positions within a business. This has especially been seen over the years in car manufacturing around the globe. On the plus side, should redundancy not be on the table, it does open up the ability for workers to focus on more decision based tasks (providing the robot isn’t good at decision making) which in turn increases the productivity of a business further.

Ultimately, we believe robots could have a positive impact on our personal lives, likely serving as aides in day to day tasks, such as house or garden work etc. The extra time afforded, could be put towards a variety of different activities, whether it be creative pursuits, more opportunity to interact with friends and family, or even simply to squeeze in a netflix show.