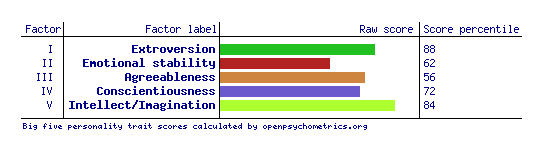
Personal Information

I am Jay Hunter, student number S3855709, I am 22-years old working as a Pharmacy Assistant in Brisbane. In my free time I enjoy reading articles on medical technology and computer engineering, reading books on history and philosophy, and playing guitar. Next year, I will be studying Computer Engineering at the University of Queensland majoring in Image and Pattern Recognition and High-Performance Computing. Currently I have no professional experience in IT, only enthusiast projects and research.

Team Profile

Jay’s three tests were *Myers-Briggs*, *Learning Type*, *and OCEAN* which categorised him as ENFP, a Visual Learner, and the percentiles below:



Using this information, Jay can communicate effectively with the group and work on any task given without dissent. Being a visual learner, he may be able to provide useful graphics or styling ideas for the group.

Industry Data

Observing the Burning Glass Data, I was taken aback at the top IT titles in Australia. After looking through the list I still want to become a Computer Engineer, I may need to look at working in another country. Communication skills and problem solving ranking the two top baseline skills was no shock. No matter the project communication between co-workers and clients is key to moving forward. Resolving issues in large projects requires problem solvers who can communicate with one another.

IT Technologies: Cyber Security

One of the main focuses of Cyber Security is Encryption. This is the process of taking ‘plain text’ a file anyone can easily access and open and converting it to ‘cipher text’ through an Encryption Algorithm (Norton, 2020). ‘Cipher text’ cannot be easily accessed or opened due to the file being ‘scrambled’ by the encryption algorithm, only users with a ‘key’ can ‘unscramble’ or ‘decrypt’ the file and access its contents (Mercer-Myers, 2018). There are two main categories or encryption device encryption and end-to-end Encryption.

End-to-end encryption is used to secure connect two devices. This could be messages, credit card payments, or visiting a website. There are two main types of handling end-to-end encryption: symmetric and asymmetric encryption. Symmetric encryption uses one key for both encrypting and decrypting data. This allows for multiple people to easily access the data that’s encrypted. This method the data is only as safe as the most careless person with a key (Norton, 2020).

Asymmetric encrypted uses two keys. One is a public key which is shared and can encrypt data, and the other is a private key which decrypts data. End-to-end encryption often utilises asymmetric encryption (Mercer-Myers, 2018). This is often seen in the use of HTTPS as explained by CloudFlare, “A client will obtain a website's public key from that website's TLS certificate (or SSL certificate) and use that to initiate secure communication,” by initiating the connection with the public key, the user accessing the website is able to encrypt their traffic and only they can decrypt the information they receive (CloudFare, 2020) (Electronic Frontier Foundation, 2020). Mobile apps such as WhatsApp, Signal, and mobile banking apps also use asymmetric encryption for secure connection (WhatsApp, 2020) (Signal, 2020) (Weil, 2018). In 2017, International Business Machines (IBM) unveiled a line of mainframe computers which focused on encryption. These mainframes ‘IBM Z’ were targeted towards banking and insurance companies encrypting incoming and outgoing connections and the servers themselves through both peer-to-peer and device encryption (Greenwald, 2017). [Elaborate on why this is important]

Device encryption is where the entire device or its storage is encrypted, often through symmetric encryption. This protects the owners’ files if their phone or laptop is stolen, it can also protect businesses and government agencies from local hackers trying to access sensitive information. SSD manufacture’s such as Intel and Samsung include built-in encryption to their storage (Intel, 2020) (Samsung, 2020). Apple has gained a reputation for their iPhones innovation in biometric keys (using finger-prints or face scans as keys) and their devices impenetrability as shown in their 2016 legal dispute with the FBI (The Wallstreet Journal Editorial Board, 2020) (Yadron, et al., 2016) (Wallstreet Journal Editorial Board, 2016) (Mossberg, 2013) (Mickle & McMillan, 2017). The importance of device encryption is emphasised by Bruce Schneier, board member of the EFF, in his blog, “we only use encryption when we're working with important data, then encryption signals that data's importance” (Schneier, 2019).

In 2018, Steve Rosenbush wrote ‘Why Encryption of Corporate Data Remains a Powerful but Underutilized Tool,’ in *The Wallstreet Journal*, two years later following the Covid-19 Pandemic *Zoom* has been banned by *Tesla*, *Google*, and New York City Schools because of the lack of P2P Encryption and security concerns with China (Rosenbush, 2018) (Langley, 2020) (Wood, 2020) (Whittaker, 2020). Despite Zoom’s CEO Eric Yuan publicly apologising for misleading marketing of end-to-end encryption and having the company focus on creating end-to-end encryption, their public image has been tarnished (Tilley & McMillan, 2020) (Lee & Grauer, 2020) (Whittaker, 2020) (Whittaker, 2020). This is furthered by instances of ‘zoombombing’ where pranksters interrupt many types of group calls including Alcoholics Anonymous, classes, and, children’s birthday parties (Bindley, 2020) (Nguyen, 2020) (Hern, 2020). The backlash that Zoom has faced shows that businesses are understanding the importance of Cyber Security, namely encryption, for the protection of sensitive data and communication (Whittaker, 2020). What standards should these businesses follow?

What technological or other developments make this possible?

[Discuss changing encryption standards using previously cited sources] Norton Source

The next critical step for encryption is developing a ‘quantum proof’ encryption algorithm. IBM, Cisco, and Google alongside dozens of companies currently working on this technology (Mann, 2013) (Hackett, 2019) (Porter, 2019) (Metz, 2019) (Vincent, 2019) (Hartnett, 2019) (Bryson, 2019) (Castellanos, 2018). When talking to the Wallstreet Journal, for NSA Director Michael Hayden stated, “I don't know whether quantum computing will inherently favor the offense or inherently favor the defense, when it comes to encryption, security, espionage and so on, but I do know it's going to affect something.” This was in discussion of current encryption methods and future issues cyber security faces (Strong, 2018). <https://www.wsj.com/articles/the-race-to-save-encryption-11559646737>

<https://blogs.wsj.com/cio/2018/04/11/cisco-researchers-develop-new-security-techniques-to-thwart-quantum-attacks/>

Quantum Encryption and Quantum-proof decryption

<https://www.techrepublic.com/article/quantum-encryption-how-it-works/>

<https://www.wsj.com/articles/the-race-to-save-encryption-11559646737>

<https://blogs.wsj.com/cio/2018/04/11/cisco-researchers-develop-new-security-techniques-to-thwart-quantum-attacks/>

<https://blogs.wsj.com/cio/2017/08/07/crypto-researchers-brace-for-quantum-computings-threat-to-security/>

What is the likely impact? (300 words)

An interview with Forbes Journalist Jason Brett and an anonymous blockchain company details the importance of not just encryption but also the legislation on its use (Brett, 2020).

Governmental pushback. Australia and USA

Beginning in 1946, the UKUSA agreement began an intelligence co-operation with the United Kingdom and the United States. Nine years later, in 1955, the agreement was updated to include Canada, Australia, and New Zealand (Farrell, 2013) (National Security Agency, 2020). Colloquially, this alliance is known as the ‘Five Eyes.’ Together, they develop new intelligence methods and data retention legislation. It has later been uncovered that this extends to a further nine countries in an alliance known as SIGINT Seniors Europe (SSEUR) or the ‘Fourteen Eyes.’ This extension shares intel only (Taylor, 2020) (Kelion, 2014) (Gallagher, 2018) (Koch, 2018). As part of the core ‘Five Eyes’ both the Australian and American governments and security officials have pushed both to ban individuals and force companies to introduce ‘backdoors’ into their security systems. Groups like the Electronic Frontiers Foundation (EFF) and companies such as Apple and Google have pushed back on this (Ruiz, 2018) (Mullin, 2020) (Karp, 2018) (Whittaker, 2018). Apple, as previously mentioned, had fought against the FBI in 2016 and creating a backdoor for their line of iPhones (Wallstreet Journal Editorial Board, 2016). Both American government officials and law enforcement had framed the issues to be against a terrorist, Apple knew that the matter would leave precedent and be abused for minor crimes too. The repercussions of doing so would give both Russia and China power over the company to give them backdoors or they would find the one created.

Foreign agencies being able to hack and track unwitting citizens is not the goal of this legislation; it is for domestic agencies to. But given that ability, cyber-attacks and crimes would become far easier for bad actors actively looking for vulnerabilities. The Australian Government proceeding with this legislation

<https://www.forbes.com/sites/jasonbrett/2020/04/10/how-working-remote-and-protecting-encryption-is-natural-for-this-blockchain-company/#219dafdc3771>

<https://www.eff.org/deeplinks/2020/03/earn-it-bill-governments-not-so-secret-plan-scan-every-message-online>

<https://www.bbc.com/news/world-australia-46463029>

<https://www.wired.com/story/australia-encryption-law-global-impact/>

What is the potential impact of this development?

What is likely to change?

Standardised Peer-to-peer encryption (Zoom as an example)

Which people will be most affect and how?

Businesses, personal banking, data sharing and storage

Will this create, replace or make redundant any current jobs or technologies?

Encryption standards will change over time

How will this affect you? (300 words)

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