

Assignment 2 The IT World - Team 37

COSC1078 – Introduction to Information Technology

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| s3718266 – Amy Thompson s3718706 – Esther Hoang s3661949 – Jonathan Keusgen s3724958 – James Robertson |  |  |  |  |

Table of Contents

1. [Team 37 2](#_Toc512800061)
2. [Tools 5](#_Toc512800062)
3. [Industry Data 6](#_Toc512800063)
4. [IT Work 8](#_Toc512800064)
5. [IT Technologies 9](#_Toc512800065)
6. [Project Ideas 15](#_Toc512800066)
7. [Group Reflection 17](#_Toc512800067)

# Team 37

## Personal Information

**Amy - s3718266**   
I am Australian but love to travel and one of my favourite things to do is to go snowboarding. Since a young age I've wanted to study in the STEM fields. Throughout my secondary education, my passion for science and the prospect of learning the foundations of the future have inspired me to take my education further. During year 12 I studied computing: informatics. I would also say I have a keen interest in design and creating: applications, websites and artworks. In the future I would like to work with both the skills of logic and creativity. I do not have any previous IT job experience.

**Esther - s3718706**  
I was born in Australia to Vietnamese immigrant parents. My hobbies include making watercolour art and watching YouTube videos of derpy animals. I studied Computing Informatics for VCE. I'm interested in the UI/UX design and research industry. I have no IT related job experiences.

**Jonathan - s3661949**  
I'm Australian, but my dad was born in Germany and my mum in New Zealand. I play basketball, video games and read. I'm interested in System Administration, Data Analytics and Software Development. I worked in the IT department at McKinnon Secondary College as an Intern in 2017. I also studied some IT subjects at secondary school.

**James - s3724958**   
I'm Australian, my mother is Filipino, and my father is English. My hobbies are health, fitness and drinking wine. I'm interested in cryptocurrency, data analysis & mining, cloud computing and app / web design. I've had exposure to multiple fields of IT through previous studies and freelance work, ranging from programming, databases, web development and web design.

## Team Profile

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Myer-Briggs Test** | Amy | Esther | Jonathan | James |
| **Result:** | ENTJ  “Commander” | INFP  “Mediator” | INTJ  “Architect” | ESTJ  “Executive” |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Learning Styles Test** | Amy | Esther | Jonathan | James |
| **Result:** | Auditory | Visual | Visual | Visual |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Third Test** | Amy  (Coping & Stress) | Esther  (Big 5 Personality) | Jonathan  (IQ) | James  (Creativity Score) |
| **Result:** | 86% Problem Focused  Vs  14% Emotion Focused | Open Mindedness = 64%  Conscientiousness = 21%  Extraversion = 14%  Agreeable = 73%  Negative Emotion = 61% | >125 | 66.43% |

**Reflection**

As a group we understand that all this information is valuable insight into how we should work together as a team. Expanding on communicating with each other it helps us understand our individual personalities and how we learn best. We have also used this information to divide roles to the individuals in the group and discussed the best ways for us to collaborate to complete this assignment.

## Ideal Jobs

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Career Aspect | Amy Scrum Master / Agile Project Manager | Esther UX Researcher | Jonathan DevOps Engineer | James Cloud Consultant |
| Location | South East Suburbs | CBD / South East | Melbourne CBD | Sydney CBD |
| Flexibility | Flexible 4-day work week | 5-day work week | 5-day weekends off | 5-day work week |
| Work Variety | Management in all areas | All types of research and analysis | All stages of development and deployment of an application | Different clientele, multiple solutions possible |
| Creativity | High | Medium – High | Medium - High | Medium - High |
| Travel Prospects | Agreeable | Not preferred | Would like to travel for work | Domestic and International travel, working with multiple clients abroad and inside the office |

**Reflection**

Amy’s ideal job as a SCRUM master is centered around dynamic group management. Jonathans ideal job of DevOps Engineer includes working with systems administration and software development. Esther’s ideal job as a user experience researcher requires researching user attitudes and behaviors on products and systems. And finally, James’s ideal job as a cloud consultant involves working in different parts of the IT Industry ranging from cloud solutions, big data, analytics, infrastructure, design / migration, development life cycles and machine learning.

Considering these different career paths, all our ideal jobs have a need for communication and crossover between a user or client to information that can be transferred to be useful.

Some differences between these jobs include the amount of back end work needed. Where Jonathans job clearly creates a solution to a problem. Esther’s job requires more research to uncover potential problems to be solved. This is also in comparison to Amy’s ideal job where understanding of backend work is required, however is more centered around communicating and delegation. Moreover, James’s ideal job is like Amy’s as a range of IT knowledge is required, however the focus is on the interaction between him and the client.

# Tools

**Group Website:**[team37.s3-website-ap-southeast-2.amazonaws.com](http://team37.s3-website-ap-southeast-2.amazonaws.com)

**Git Repository:**github.com/S3661949/Team-37

**Reflection**

<Comments on how well the audit trail on the git reflects group work>

# Industry Data

**Job Titles**

|  |  |  |
| --- | --- | --- |
| Ideal Job | Closest Job Title | Rank |
| SCRUM Master | IT Manager |  |
| UX Researcher | UX Researcher | 156 |
| DevOps Engineer | System Administrator | 9 |
| Cloud Consultant | Technical Consultant | 56 |

|  |  |
| --- | --- |
| IT-Specific Skills | Rank |
| SQL | 1 |
| JavaScript | 2 |
| Java | 3 |
| Microsoft Windows | 4 |
| Project Management | 5 |
| Business Analysis | 9 |
| Linux | 13 |
| Python | 22 |
| Scrum | 23 |
| Hardware Knowledge | 31 |

**Team 37 required skill set:**

|  |  |
| --- | --- |
| General Skills | Rank |
| Communication | 1 |
| Problem Solving | 2 |
| Organisational Skills | 3 |
| Team Work | 5 |
| Planning | 7 |
| Creativity | 9 |
| Leadership | 11 |
| Time Management | 12 |
| Management | 19 |
| Multi-Tasking | 20 |

**Three highest ranked general skills not required:**

* Writing – Rank 4
* Troubleshooting – Rank 6
* Detail-Orientated – Rank 8

**Three highest ranked IT-Specific skills not required:**

* SAP – Rank 6
* Business Management – Rank 7
* Graphic Design – Rank 11

**Reflection**

As a group we agreed that our opinions on our ideal job had not changed, although we did have concerns about the rank and demand for our future jobs. We identified that a lot of the general skills our jobs required were common from role to role, thus placing emphasis on our need to refine those general skills to ensure our employability and greater our chances of working in different fields of the industry. We understood that the data is a standpoint for the “now”, and we were open to the fact that by the time we finish our degrees, those rankings are likely to undergo great change and even our ideal future jobs.

# IT Work

What kind of work do you do?   
Systems Engineer / System Administration / Tier 1-3 Technical Support.  
In charge of:  
Virtual Servers  
Backup  
Identity & User Accounts  
Windows Fleet (Laptops & Desktops)  
Cases Management

What kinds of people do you interact with?   
Educators (Teachers, Teaching Support Staff), High School Students and Parents.

Are they other IT professionals? Clients? Investors? The general public?  
Co-workers, or clients. The only IT professionals are the other 5 in the ICT Team.

Where do you spend most of your time?  
Physically? In the ICT Office, at my desk.

What aspect of your position is the most challenging?  
Managing peoples expectations, and people in general.

# IT Technologies

## Raspberry Pis, Arduinos, Makey Makeys, etc. – Amy

Arduino, Raspberry pi and the like are open source electronic hardware and software that exist on small boards to allow for prototyping and enthusiasts to build their own Internet of Things (IoT) system. From a hardware perspective these devices are nothing special, in that anyone could copy and create their own just by purchasing the individual parts and building one. Where the Arduino separates from this, is the combination of the hardware, software and the community. Currently Arduino have four prominent designs for this technology, the Arduino UNO, the Arduino Robot, the Arduino Pro and the Arduino Mega 2560. The UNO is the most commonly used as it is suitable for a wide range of projects. The Arduino Robot is a rounded device with attachable wheels, designed for robotics. The Arduino Pro is a slimmer device created for smaller projects. The Mega 2560 accommodates “a larger space for your sketch it is the recommended board for 3D printers and robotics projects” ( <https://store.arduino.cc/usa/arduino-mega-2560-rev3>).

Previous to these innovations, creating something similar required a much higher degree of knowledge would have been required and the device would have limited application due to the restrictions of kits. These rapid prototyping machines make it easy to create complex projects with relative ease. Currently a range of robotics can be created using this technology which can utilize and sense the surroundings. The simplest project uses a program to turn on and off a LED light in an adjustable blinking pattern.

Arduino is working more devices for connectivity, motion detection and display as well as miniaturization while still being useful for a wide range of applications. This technology is looking to become more and more miniaturized and more powerful to accommodate a wider range of uses. In the future Arduino would see a peak in the use of this technology in medicine, personal assistance, home automation and gaming. The appeal for the Arduino technology in these sorts of projects is due to the ease of use in programming the devices and the low costs. These two key things mean creating a project has never been easier, prompting forward thinking and innovation.

The Arduino technology allows amateurs to learn how to program and build devices easily, additionally, it also allows developers to prototype their creations relatively cheaply before they are created commercially. The potential impact of the development of Arduino devices would be worldwide, reaching all walks of life as the age of technology allows for more and more integration of Arduino like technology applications in everyday life.

Moving forward in the future the range of Arduino application products will diversify allowing a greater product audience. Currently, an everyday person may not have even heard of Arduino or the likes, this over time is projected to change due to our increasingly technology-based society. It could potentially be seen as an aid to everyday life as the integration of technologies become a part of almost everything around us.

Currently home automation consists of simple yet helpful devices such as touchless motion sensor bins, but the possibilities to automate the home are endless. Thus, the reach of who is affected most would be far reaching as it becomes fashionable and wanted then slowly becoming the norm. This would create a world of new opportunities, including jobs. While this may replace or make redundant current jobs, it would make way for a new enterprise and growth surrounding the Internet of Things, wearable technologies, 3D printing, and embedded environments. This might mean in the future some everyday technology gets refaced and updated due to the miniaturization and ease of use of the Arduino technology paired with the need to automate.

Generally speaking the Arduino technology currently only affects students (like myself) in their studies, developers looking to prototype their device ideas and those looking to create and explore the uses of this technology. However due to the increasing need for more useful and innovative technology, the general public could be seen using this technology to assist their everyday life.

Although the general use would not include creating or designing applications with this technology, but rather the public would be interacting with the products created by this technology that would automate the world around them.

Some examples of this include, personal assistance applied with the Arduino technology. This could see more receptive prosthetics for amputees or self-balancing appliances for those suffering from Parkinson’s disease allowing for a more normal life experience. Moreover, the use of miniaturization paired with powerful processing could make way for new types of treatment in medicine. This could see the dawn of the age of robotic surgeons and sensors that check the components of food for those how suffer from allergies to reduce the risk of consuming foods that could cause a reaction. Finally, Gaming could become more interactive, with the use of sensors to create a more intense gaming experience when paired with virtual reality. Thus, the player would experience the game not only through sight but a sense of touch.

## Machine Learning – Esther

<loremipsum>

## Cloud, Services, Servers – Jonathan

Clouds, services and servers are at the forefront of the IT industry right now. Some examples of major applications include Amazon Web Services or AWS, Google Drive, Google Photos, Microsoft Azure and GitHub.

At a base level, cloud computing is the delivery of computing storage, power, applications, and other IT resources through a platform via the internet. There are 3 main types of cloud computing. IaaS, or Infrastructure as a Service, provides access to networking features, data storage space and computers (whether virtual or on hardware). IaaS is most similar to existing IT resources that are available currently.

PaaS is Platform as a Service. This removes the need for IT departments to manage IT infrastructure. It is a development and deployment environment. Like IaaS, PaaS includes infrastructure. However, it extends to development tools, middleware, database management, etc.

Finally, SaaS (Software as a Service) is a completed product, which is run and managed by the software provider. An example of SaaS is a web-based email where you can receive and send emails, while not needing to manage or maintain any servers or operating systems that the email program might run on.

Not unlike there being different types of cloud computing, there are also different models of deployment for cloud computing: A cloud deployment, hybrid or on-premises deployment.

A cloud deployment requires that the application is fully deployed in the cloud, and that all parts of the application also run in the cloud.

A hybrid deployment is a way for applications and infrastructure to connect between cloud-based resources and existing resources that aren't within the cloud. A common method of a hybrid deployment is extending existing on-premises infrastructure into the cloud while connecting cloud resources to internal systems.

On-premises, or as its sometimes called, "private cloud", is a method wherein resources are deployed on-premises, using virtualization and resource management tools. It doesn't offer many of the advantages that the other deployment methods offer and is instead commonly used to supply dedicated resources to an organisation.

Currently, cloud services are used for many different applications. They can be used from anything and everything from hosting websites, hosting backups, to hosting virtual machines and ledgers for blockchain tech.

There are quite a few benefits to be found in cloud computing compared to traditional, local computing.

Cloud computing in its modern sense was first realised in 2006, when Google CEO Eric Schmidt used the term at a conference. The main technology that made

## Blockchain and Cryptocurrencies – James

Blockchain technology is a combination of three primary technologies:

* Private key cryptography,
* Distributed network with a shared ledger,
* Incentive to service the networks transactions, record-keeping and security.

These technologies aren’t new but the blockchain is the three, arranged into an application that is. Cryptographic keys are used to establish your digital identity. Combining a public key (how you are identified as a user) and a private key creates your digital identity reference based on possession and the use of both is how you express consent to digital interactions. The distributed ledger is used for recording static data (a registry) and dynamic data (transactions).

The biggest use case right now for blockchains are as a platform for cryptocurrencies. As a platform it can also be used for smart contracting, automated governance, markets, streamlining of clearing and settlement and automatic regulatory compliance. As a system of record its primarily used for digital identity but can also be used for tokenization, inter-organisation data management, audit trails or by the government and financial institutions.

The future of blockchain technologies is vast to say the least. Some potential uses in the next few years are as a prevention to voter fraud, blockchain technology can provide a strong electronic vote-counting system. Securing voter registration, ID and vote information so that it can’t be interfered with. Improving government efficiency and capabilities, in sectors such as healthcare, education and the distribution of public benefits. Protection of self-driving cars, the blockchain as an encrypted database structure can be used to improve the security against cyber-attacks. Creating financial avenues for poverty-stricken countries and its people, the blockchain as a decentralized system can make doing business with hard-to-reach countries and sending money back and forth for migrants, immigrants and refugees more convenient and a lot cheaper.

Blockchain as both an industry and a technology, is still undefined and we are still very much in the exploration stage. With established and proven solutions on the horizon there are some key developments still needed to require traction and project the Blockchain into larger focus. The current technology itself is inadequate to support transaction volumes for most enterprise-scale applications and to add to that, if the technology is to be used across an industry sector, there will need to be governance rules established that could take years to negotiate.

If blockchain technology continues to grow it is likely to be seen in many different operations and industries, mostly used as building blocks for companies to automate, digitize or streamline their operations. It could be the forefront for many private industry sectors, including real estate, banking and health care. If the government uses it, it will transform the way citizens access services and transactions and make it less tedious. The adoption of this technology will increase the demand for blockchain developers greatly.

A cryptocurrency is a digital currency intended to work as a medium of exchange. It uses cryptography as mentioned before to secure and verify transactions, and to also control the formation of new units. The properties of cryptocurrencies can be separated by transactional and monetary. Most cryptocurrencies share a common set of these properties but there are no golden rules.

Transactional:

* Irreversible, no transaction can be reversed
* Pseudonymous, accounts and transactions are not connected to real world identities
* Fast and global, transactions are broadcasted almost instantly and confirmed quickly as well
* Secure, cryptography system
* Permission-less, available to everyone

Monetary:

* Controlled supply, limited supply of tokens
* No debt but bearer, unlike fiat money which is represented by debts, cryptocurrency just represent themselves

Cryptocurrencies can be used for buying goods, investing and mining. Whilst all very simple actions its attention is gathered because it is decentralized, meaning there is no central control authority and no servers involved. Giving the people the choice to use a currency that is not controlled by the government / banks.

The future of cryptocurrencies is bright as well. There are some global central banks exploring the options of issuing their own digital currency. Large companies and retail giants could issue digital coins or start accepting payments in the currency, which will support acceptance and encourage trust of the currencies, and with big names behind it, it will show people that its utility cannot be denied, and it is a safe option. Experts also foresee cryptocurrency replacing some national currencies as they’re more efficient in the way they run in comparison to fiat money.

There’s no denying that blockchain technology and cryptocurrencies will have a place in our future. The question is more of a how and when. Both questions come together in the same sense but the how focuses on the impact it will have on society, defined by the scope of acceptance by the government, companies and the people. The when focuses on when the set rules will be defined for the technologies, regarding regulation and governance. Both technologies could help transform the financial system and spawn plenty of job opportunities

If all goes well the future will involve everybody moving across to cryptocurrencies, favoring them as a more efficient banking system. Blockchain technology will also see many companies restructuring how they organize their data and streamlining the way we interactive with their services.

# Project Ideas

The project the group has chosen is a School administration product that is delivered online. It would be used for a multitude of things, such as

* Taking attendance
* Reporting
* Payment from parents
* Consent from parents
* Announcements
* Event planning
* Displaying timetables
* Etc.

In addition to the online portal, we also wanted to have a mobile application (iOS & Android) to streamline simple tasks and create more convenience. These tasks could be things such as taking attendance on excursions or parents paying fees and signing consent forms.

The service will provide many features so that all school administration tasks can be completed within the single application. Focusing on efficient workflow so more tasks can be completed with minimal time and effort, allowing school administrators to focus on higher priority matters.

It will also provide a way for teachers or other administrators to mark attendance, through a simple drop box. Students will also be able to view their own timetable, displaying subject, teacher and room location. Teachers and administrators will be able to create announcements in the service that can be directed to a specific class, year level, subject faculty, parents or the entire school. There will also be a reporting section for school staff members, allowing them to comment on a student’s progress, give grades and this information will be shared with parents and teachers. Expanding on this there will be a feature for parents to book parent / teacher interviews, only displaying time slots that are available to avoid confusion. The recap of what was discussed in the interview will also be available for viewing.

School staff will have access to another layer of tools, this would include things such as the ability to book a classroom for a lesson, set tasks for completion, or write notes for another teacher covering their class. It will also include the ability to create notes on individual students, whether it is regarding an allergy, learning disability or other sensitive situations. They will also have access to budgeting and purchase orders on the service. Included in this, will also be the ability to print a pdf of the purchase order, email the order to a creditor, submit the order for approval or if the appropriate permissions were granted, approving a purchase order. This will all be dynamically tracked in the budgeting section of the service, which will display how much of the budget has been spent, what is remaining and viewing the information per week, month or per creditor.

The mobile applications that are available will allow for tasks that might be prone to error in handling of the information or tasks that will be tedious to instead be completed within the mobile app, efficiently and without error. As previously mentioned it will include taking attendance on excursions, parents check announcements or booking parent / teacher interviews, or students looking up their timetable to see what classroom they are in, what subjects for the day or requirements for special materials for classes.

Tobecontinued…

# Group Reflection

**Amy:**

I feel our group had a slow start as we were one member down and a little lost. However, I think we all worked well together, working fast and efficiently to complete the assignment. I felt that I could have had better time management although during the assignment I fell sick, which didn't help. Overall, I think we have put together an agreeable assignment.

**Esther:**

Loremipsum

**Jonathan:**

Loremipsum

**James:**

My perception of the group is very positive. There is a lot of potential yet to surface and I think it comes down to expanding on our communication. Encouraging each other to give our opinions so we can see how others can view the same problem differently and encouraging feedback, so we can learn better from the work we’ve contributed to the group.

**Group:**

As a group we believe we’ve done well. There is always room for improvement however and we identified communication as something that needs to be improved. What was surprising was the different ways we all collaborated with the group, dependent on our previous experience, knowledge and understanding of how teams should complete a project. One thing we have all learned is the importance of consistent and frequent communication. Breakdown or inconsistency in communication lead to role ambiguity and to second guessing of completed work.