COSC2196
Introduction to Information Technology
Assessment 2: Team Project

Team 24

Group Website

https://s3728065.github.io/A2-24/

Group Repository

https://github.com/s3728065/A2-24

Prepared by:

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Team 24 Profile

About us Our Team

Motiana Tusa

S3873180

https://github.com/MotianaTusa/my-profile

Motiana grew up in the pacific island of Western Samoa. Beautiful Polynesian country where family is the core of all values and traditions. Motiana migrated to New Zealand before eventually settling down in Australia. Motiana is bilingual and has undertaken various courses as part of her professional development in New Zealand and Australia. After having pursued a successful career in Disability services she is now aiming to go further by studying IT. Her interests in IT developed overtime as she saw the remarkable pace at which IT Technologies have grown and have had a positive impact on all facets of life. Through her work experience she also saw a need to have basic IT education which can compliment any chosen career. Her IT experiences so far have been from user's perspective, but she is aiming to expand her skills as she progresses in her IT degree and apply those to further her career.

Joanna Jane

S3873742

https://github.com/s3873742/My-I.T-Profile

Jo was born in Australia to English parents who settled here in the 70s. Artistic in nature, Jo also loves performance vehicles and owns a WRX. Her interest in IT stems from a strong desire to understand how technology works. This began about 7 years ago when she started working on the helpdesk of a software company. Jo came to enjoy the troubleshooting aspect of it and would often test things in her downtime to fill gaps in her knowledge. She also really enjoyed writing technical guides and documentation on how to perform certain processes, and found it quite rewarding to not only solve problems for clients but teach them new or better ways of doing something using technology. Her experience is somewhat limited in that work was more-so related to the software itself rather than the computer or programs running on it, but by proxy she also learned a range of skills such as the process of troubleshooting by elimination (which largely comes down to knowing the right

questions to ask), the software testing process, knowledge of client-server systems, and the basic concepts of database maintenance and repair.

Mason Brown

S3876704

https://s3876704.github.io/Intro-to-IT-/

Mason is from North Queensland and has fond memories of playing video games on pcs and PS4. This led to his fascination with IT technologies and their potential applications in tackling issues such as coping with deteriorating weather patterns and unpredictable storm surges due to global warming. Mason is passionate about building an application which integrates data available in public domain such Bureau Of Meteorology and uses Raspberry Pi to create physical indicators which alert users before they leave the premises, of possible stormy weather.

Roshan Khadka

S3876349

https://rk121.github.io/

Roshan was born in Nepal and came to Australia at a very young age and loves to showcase his cultural heritage by celebrating Nepalese festivals. He plays soccer and loves FC Barcelona. Roshan had a keen interest in IT and even though has pursued another career, his main interest remained with IT and he is doing a bachelor's degree. His main interests are programming and web development. He would like to develop an application which integrates front-end and back-end development with practical application in hospitality industry. This idea is particularly useful in the context of social distancing and responsible practices promoted within hospitality industry in the wake of COVID pandemic.

Simon Mckindley

S9406133

https://s9406133.github.io/IntroToITAssigment1/

Simon grew up in Heywood, a small town in country Victoria, and moved to Melbourne after finishing high school. A family man with a successful career at Australia Post, he also likes to play guitar. Simon is hoping to develop an app for teaching beginner guitar playing, one which will incorporate many unique features currently missing from available apps. Simon's interest in developed at an early age when he got his first PC to do his homework. He also pursued a degree in IT early on but decided on an alternative career. He possesses programming skills in C++ and is also a Microsoft Certified Systems Administrator.

Amer Muhammad

S3728065

https://s3728065.github.io/My-Profile/

Amer was born and brought up in a rural town in Pakistan. Passionate about cricket and football, avid reader of history and politics, and is passionate about cooking, specialises in Indian and Pakistani delicacies. After migrating to Australia, chose to study Business Management and has held various jobs ranging from Administration to middle management. Interest in IT only grew after starting an investment and trading proprietary. Would like to study cloud computing and cybersecurity further to enhance the outreach of current technologies available in the financial sector.

Test Outcomes

Name	Test type	Test Score and outcomes
Motiana Tusa	1. Myers Briggs 2. https://personalitymax.com 3. Creativity	1. Protagonist-ENFJ- Extraverted, Intuitive, Feeling, and Judging personality traits 2. Kinesthetic – 36% 3. 71,31 Abstraction, Connection, Perspective, Curiosity, Boldness, Paradox, Complexity, Persistence
Joanna Jane	1 Myers Briggs 2 Work Style Quiz 3 Education Planner – Learning style	1. Mediator – INFP -T Introverted, Intuitive, Feeling, Prospecting 2. Supportive, expressive, emotionally oriented 3. Visual learner – 50%
Roshan Khadka	1. Myers Briggs 2. Education Planner – Learning style 3. Creativity	1. Adventurer - ISFP–Introverted, Observant, Feeling, Prospecting, Turbulent 2. Auditory – 45% 3. 50.97
Simon Mckindley	1. Myers Briggs 2. Career Test - 123test.com 3. whatismylearningstyle.com	1. The Adventurer – ISFPT – Introverted, Observant, Feeling, Prospecting, Turbulent 2. 9356 – Realistic 3. Visual Learner
Mason Brown	Myers Briggs	Defender – Introverted, Observant, Feeling, Judging, Turbulent
Amer Muhammad	1. Myers Briggs 2. Education Planner – Learning style 3. Big 5 Personality Test	1. Protagonist- ENFJ-A Extraverted, Intuitive, Feeling, Judging, Assertive 2. Visual (50%) 3. Outgoing, Social, Optimistic, Friendly, Diligent, Creativity (52%)

Our group is predominantly introverted while personality types are split between Protagonists, Adventurers, Defender, and a Mediator. Members who tested themselves for creativity tend to think of themselves as not very creative and test results tend to reenforce these presumptions. Learning style for most members is visual while rest of the group is split between Kinesthetic and Auditory.

These test results have not been taken into account while delegating tasks for this project. Some team members may assume they are not creative because test result reenforced their preconceived notions, but creativity is complex and test results can be very subjective. Therefore, test results have not been part of the discussion in terms of task delegation and work allocations. It is worth noting though that ultimately project idea was picked for a team member who scored low on creativity and team member whose scores indicated Extraverted personality ended up hosting team meetings and project coordination role.

Ideal Jobs

Name	Ideal Job	Job titles ratings	General skills	General skills in demand ratings	Core IT skills	IT skills in demand ratings
Motiana	Scrum Master	18	• Communication skills • Team Building • Project management	1 18 19	• Project management • Business management • Scrum master	5 7 23
Joanna	Test Analyst	10	• Communication skills • Interpersonal skills • Quality Assurance and Control	1 5 14	• JavaScript, MSSQL), • C#/Python • HTML/CSS, JIRA, • Browser Stack, • CI/CD tools, Selenium, Agile development, Git,	1 12 17
Roshan	Senior Full Stack Developer	17	• Communication • Problem solving • Teamwork	1 2 5	• SQL, WCF, WPF • JavaScript, React, • C# • .NET, NET MVC,	1 2 12
Simon	Software Design Engineer	11	• Communication • Problem solving • Detail oriented	1 2 8	• Java • C# • Software engineering	3 12 15

Mason	Geek2U Field Technician	18	• Communication skills • Problem solving • Troubleshooting	1 2 6	• Microsoft Windows • Technical Support • Microsoft office	4 11 18
Amer	Cyber Security Consultant	1	• Communications skills • Time management • Multi-tasking	1 12 20	• Business analysis • Technical support • Microsoft Windows	9 11 12

Ratings Source: Labour Insight Jobs (Burning Glass Technologies)

Ideal jobs for group members are as diverse as group itself. Mason has chosen a self-employment option where he works as IT vendor who comes to you for your basic IT needs, most customers in this line of work are going to be households with limited knowledge of products and services they use, providing technical support for Microsoft operating systems and Office products is ranked very highly among core IT skills most in demand at present.

Motiana has chosen to work as scrum master where she will be managing small teams and actively engaged in project managements delivering tangible benefits for her employers. Her core IT skills required for this kind of work are listed among top five in desired IT skills in demand.

Roshan and Simon have opted for a high-end software development and engineering roles, respectively. This career path requires competencies in high end programming languages and web development applications, which are listed among top 3 most desirable IT skills in the industry.

Joanna has chosen to be a test analyst. Her work experience closely matches her chosen career path and competencies required to perform this role include knowledge of JavaScript, SQL, and Python. These core skills are among top 3 most desirable skills for IT professionals.

Amer has chosen to work as a cybersecurity consultant. Work will involve engaging clients in determining their business needs, analysing existing IT infrastructure, and delivering client-oriented cybersecurity solutions. This role will involve combining generic business management skills and technical knowledge of latest industry trends available in the market.

Notwithstanding obvious differences in chosen career pathways by group members, almost all job selections have general and core competencies listed in the top ten most desirable for IT professionals. These include, communication skills, problem solving, teamwork, SQL, Java, operating software and packaged software such as Microsoft Office.

Industry Data

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

The ideal jobs of the six group members most closely align with the titles of I.T Support Officer (Mason), Cyber Security Consultant (Amer), Software Engineer (Simon), Full Stack Developer (Roshan), Test Analyst (Joanna) and Service Delivery Manager (Motiana). Using the dataset provided by Burning Glass Technologies demonstrating the number of positions advertised under each job title from 2017-2018, it can be seen that out of 201 possible job titles, Test Analyst ranks at number 11, Software Engineer ranks at number 12, Full Stack Developer ranks at number 18, Service Delivery Manager ranks at number 19, Security Consultant ranks at number 81, and I.T Support Officer ranks at number 112. It is worth noting that several positions had other job titles which, it could be argued, would be considerably similar, however the titles which most closely matched the positions our team members had selected were chosen. As an example, Solutions Architect was the number one job title in postings for this period, .NET developer was number 3, and Front End Developer was number 5, all of which overlap Simon and Roshan's positions of Software Engineer and Full Stack Developer. On the contrary, it was noted that the position of Scrum Master or Agile Lead was not included in the dataset, and so Service Delivery Manager was chosen as the closest matching alternative.

From your group's ideal jobs, you can identify a set of skills required for these jobs (we will refer to this as your group's required skill set). These can be divided into general skills (communication, problem solving, writing etc) and IT-specific skills (JavaScript, SQL, etc).

Ideal Job	Aligns with what job title?	General Skills	I.T Skills
Geek2U Field Technician (Mason)	I.T Support Officer	Troubleshooting, Communication skills,	Technical Support, Microsoft Windows, Macintosh OS
Cyber Security Consultant (Amer)	Security Consultant	Multi-tasking, time management, organisational skills, Presentation skills, Leadership, Project	Technical support, Microsoft Windows

		management, Building relationships	
Software Design Engineer (Simon)	Software Engineer	Problem solving, verbal and written communication, Detail oriented	C, C++, Java
Senior Full Stack Developer (Roshan)	Full Stack Developer	Teamwork, time management, verbal & written communication, problem solving, organisational	C# .NET, NET MVC, JavaScript, React, SQL, WCF, WPF
Test Analyst (Joanna)	Test Analyst	Verbal and written communication skills, interpersonal skills/, Quality Assurance and Control	HTML/CSS, JIRA, BrowserStack, CI/CD tools, Selenium, Agile development, Git, Powershell/C#/Python/JavaScript,MSSQL),
Scrum Master (Motiana)	Service Delivery Manager	Leadership, Team Building, Project management	Confluence, JIRA, Knowledge Agile frameworks, Scrum Master/Product Owner/Agile Coach certification,

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

Our group has a very broad range of required I.T skills and this poses a problem in that as a group, certain skills are over-represented whilst others are under-represented. Thus, the unique requirements and nuances of the individual positions should be taken in to consideration by group members when they reassess their opinions of their ideal jobs. We can however make some observations based on skills that most frequently appear in the ideal job descriptions (required skill set) and that also appear in the skills in greatest demand dataset provided by Burning Glass Technologies.

Knowledge of Microsoft Windows features heavily in our required skillset and this ranks at 4th place in in-demand skills, represented in 8% of job postings. To give that figure some context, SQL was the highest ranking in-demand skill, sitting at 11%, though only one group member had SQL as a required skill. JavaScript ranks second highest at 9%, followed closely by Java in third place, also at 9%. Technical support, which is a requirement for two of our group member's jobs, ranks at 5%. Programming languages C# and .NET accounted for 5% and 4% of postings, respectively, while C++ came in at 2%. Knowledge of Scrum methodologies ranked at 3%, while JIRA sat at 2%, and Selenium 1%. An analysis of job posting data by Indeed (The Skills Needed to Work in Australia's Tech Sector Are Changing Rapidly, 2020) has shown the top skill required in postings in the March quarter of 2018 was Agile software development, at 34%, which most related to the job title of Full Stack Developer. The next most popular skills required were JavaScript (29%) which most related to Front End developer titles, Java (22%), .Net (20%), HTML (19%) and CSS (19%).

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

The general skills in our required skill set predominantly consist of verbal and written communication skills, followed by problem solving, troubleshooting, team leadership, time management skills, and organisational skills. This seems to be an accurate representation of industry demand given communication skills rank most highly in terms of general skills desired by employers, with 31% of positions posting this as a required skill. It was noted that this skill was not technically listed as a requirement in Motiana's ideal job, though, it could be speculated that employers would assume an experienced Scrum Master has effective communication skills due to the highly people-centric nature of the role. Problem solving, organisational skills and writing ranked the next highest in terms of demand from employers, each being a requirement in roughly 11% of postings. The next highest-ranking skill in the group's required skill set was troubleshooting, which appeared in roughly 8% of job postings. Following that were leadership and time management, which were each represented in approximately 3% of job postings.

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

The three highest ranked I.T specific skills which are not technically a part of our required skill set are LINUX, Oracle and ITIL, though it is worth noting these specialised skills were only mentioned in 5%, 4% and 4% respectively of job postings. In relative terms, these do not rank particularly high, given the highest-ranking technical skill was knowledge of SQL at 11%.

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

The three highest ranked general skills not already in our required skill set are research, creativity, and mentoring, which ranked in at 10th, 11[th,] and 15th place. The low rankings of these skills and the fact they do not appear as requirements in our group's ideal jobs suggests these skills are genuinely of less demand in the industry.

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

The analysis of the burning glass data has revealed that demand in the tech industry is leaning towards favouring programming knowledge, effective communication skills and problem solving skills, and that Solutions Architect and Software Developer roles represent the greatest number of required positions. This has changed Joanna's opinion of her ideal job as Test Analyst in that, although ranking well overall in postings, it does not require proficiency in many programming languages, and so seeking a role utilising the top 3 most in-demand technical skills of SQL, JavaScript and JAVA (e.g. software developer) may be a more viable long term plan. Amer felt his ideal job as a Cyber security consultant had key responsibilities which were similar in nature to those of a Solutions Architect. These included delivering both operational and strategic solutions, as well as hands on involvement in delivering client focused, customised, and integrated cyber security solutions. After having viewed industry data for the top IT job Titles, he realised that Solutions Architect was listed at the very top, and this re-enforced his beliefs and passion for his chosen job. He also recognised that hands on involvement with clients and delivering customised solutions would involve active engagement with a variety of stakeholders, which would require effective communication skills. Given that communication was listed as the greatest generic skill in demand for IT professionals, and that he considers communication and people skills to be his key strengths, he felt his views of his chosen field of study were strengthened and his passion for the role was reinvigorated.

Roshan also felt his opinion of his ideal job as web developer did not change after reviewing the industry data. The statistics reaffirmed his beliefs that the skills are highly in demand and will continue to be so, particularly with the trends in business to use social media as a key marketing platform, as well as replacing traditional desktop applications with web based applications. Simon similarly felt his opinion of ideal job as software design engineer did not change, despite knowing a significant amount of study would be needed. This was because the skills

required for his role essentially topped the lists of in demand skills, which included C, C++, JAVA, communication, and problem solving. Motiana and Mason also felt undeterred after reviewing the industry data, given they had both already dedicated time to gaining the skills and knowledge needed for their particular roles, and that these were very much long-standing pursuits for them.

IT Work – Interview with IT professional

Contributor profile

Parneet was born and brought up in Northern India. She had a passion for all things technical and pursued a degree in Computer Engineering. Her desire to be the best in her chosen field took her across the country to Southern Indian city of Hyderabad, which is known around the world as "Cyberabad". This city is the Indian version of Silicon Valley where venture capitalists support local tech starts ups and some of the biggest tech companies are also based here. Through her exposure to this vibrant environment, Parneet developed expertise in Cloud Computing and Cybersecurity and started working for Deloitte India. After migrating to Melbourne, she transitioned into a similar role for Deloitte Australia where she is working as a senior consultant.

1. **Please tell us about the industry you work in.**

I work in the Cyber Risk domain which comes under the wider umbrella of the Risk Advisory services that my organisation offers to their clients. Risk Advisory Services are meant to help their clients which can be a business, or an organization understand the risks it faces and minimize such risks. The risks that an organisation faces can be of any of the below types:

- **Operational Risk** refers to risks associated with employee conduct, business processes, and overall operational structure
- **Regulatory Risk** refers to risks associated with meeting and adhering to government regulations
- **Strategic Risk** refers to risks undertaken by the organisation related to the implementation of its business strategies
- **Cyber Risk** refers to risks associated with cyber-related threats

2. **Please tell us about your IT work. What exactly do you do?**
   After pursuing my bachelor's in computer science, I started working in one of the Big 4 consulting firms as a Business Technology Analyst. I work in the Cyber Risk department as a Senior Consultant. Cyber Risk focuses on the technological aspect of the risks the client's business might face i.e. their applications, systems, servers, etc. This area of services further comprises of the below technology services for client:
   1. Identity and Access Management

2. Application Security
3. Governance Risk and Compliance
4. Data Privacy and Protection

I specialise in the Application Security space with an expertise in security strategy and design, architecture, and implementation of security in client's applications.

3. What other kinds of work do you have to do?

Apart for providing general consulting services to clients, depending on the projects – I assist in the project management, resourcing and writing statement of work for various clients

4. Who are all the different people you interact with in your work? Please tell us about them.

The people I interact with as a part of my job are the client counterparts, who are usually IT professionals. These client professionals provide insights into the client's business and the define requirements for the work to be undertaken by our team.

We interact with people and teams from diverse range of industries, for example – Consumer and Industrial products, Public Sector, Financial Services, TMT – Technology, Media & Telecommunications, etc which gives us an opportunity to understand how these businesses work, their products and services, goals and also their problems and vulnerabilities.

5. Please tell us about your interactions with other IT professionals.

Being a senior consultant, I act as an intermediary between the organisation's leadership and the operational staff. My interactions with the leaderships mainly comprise of discussions on expanding the cyber risk practice, design trainings for staff, acquiring new skills to keep the professionals up to date with the emerging trends and contributing to business proposals

With the operational staff, my interactions focus majorly on coaching the staff around various upskill trainings and help them make aware about different career pathways in the Cyber world

6. What about your interactions with clients or investors? – Same as No. 4-

7. What aspects of your work do you spend most time on? Please tell us about these.

Most of my time at work is spent on conducting workshops with the clients to understand the requirements of the work. As a part of my work, I also train the junior staff and university graduates to bring them up to the speed and make them aware about the new trends in the industries

8. Which aspects of your work do you find most challenging?

Honestly, every day is a new challenge when working in a dynamic consulting environment solving real-time problems of the clients. Due to the current situation, the most challenging aspect of my job is virtually connecting with the clients' stakeholders and my team. For a person like me, who values and thrives on human interaction, it was quite challenging to adjust and adapt to the remote working scenario initially.

But to overcome this, I always encourage my team to switch on their videos, frequently organise team building and networking events and have virtual drinks/ coffee catchups with other professionals in the organisation.

9. Finally, can you share an example of the work you do that best captures the essence of the IT industry?

My role requires me to wear different hats to manage and sometimes lead the projects. To capture the essence of the consulting world, below are a few examples of the various tasks I perform as a part of my routine:

- Design, manage, lead, and evaluate projects
- Lead and develop team members on projects
- Manage project resourcing
- Manage clients and key stakeholders
- Be able to facilitate and hold workshops
- Be proficient in assessing where a business is at and how to move them forward with greater financial viability.
- Write proposals and reports competently and succinctly

*Please provide your consent to use your first name and job title for the purpose of this assessment only.

I agree to provide my consent to use my first name and job title for the purpose of this assessment:

Parneet M
Senior Consultant, Cyber Risk Services
Deloitte Australia

IT Technologies

1. Clouds, Services and Servers

"Cloud computing is the practice of using a network of remote servers hosted on the Internet to store, manage, and process data, rather than a local server or a personal computer." (Nick Hastreiter, 2017)

The concept of cloud computing was developed in the 1960's, in 2006 Amazon Web Services introduced its Elastic Compute Cloud (EC2). In the 2010's development and releases of services like Microsoft Azure, IBM SmartCloud, and Google Compute Engine occurred. (Cloud computing, 2020)

Cloud computing is named as such because the information being accessed is found remotely in the "cloud" or a virtual space. Companies that provide cloud services enable users to store files and applications on remote servers and then access all the data via the Internet. This means the user is not required to be in a specific place to gain access to it, allowing the user to work remotely. In fact, the use of cloud services is becoming more and more prevalent amongst both individual users, as well as businesses. The growing number of cloud network services support this, some examples of cloud networks and providers include: MS OneDrive, CertainSafe, Google Drive, Dropbox, IDrive, Apple iCloud Drive just to name a few of the growing number of networks and providers. (Muchmore, 2020)

The advantages, benefits and efficiencies provided to users of a cloud service include the following:

Cost effective - Cloud computing eliminates the need for physical data centres and server rooms on location, so cost is reduced on hardware, software, IT services and the overheads involved for maintaining a functioning data centre such as electricity and cooling. Over time the cost saving can be quite substantial when using a cloud service over the conventional data centre. For individuals this allows them access to the cloud services without the cost involved with the running of conventional data centres and expenditure on expensive data storage hardware while allowing for access to the cloud service.

Speed - cloud computing services generally provide self service and on demand, where computing resources can be accessed for use in a matter of minutes, typically with just a few mouse clicks, giving individuals and businesses a lot of flexibility in accessing large amounts of data in a timelier manner - especially with deadlines looming.
Global scale - cloud computing services include the ability to scale elastically. Which means delivering the right amount of IT resources - for example, computing power, storage, bandwidth - as required and from the right geographic location, allowing for effective service and troubleshooting for both businesses and individuals.

Productivity - on-site data centres typically require a lot of "racking and stacking" - hardware setup, software patching, and other time-consuming IT management chores. Cloud computing removes the need for many of these tasks, so IT teams can spend time

on achieving more important business goals. For individuals this allows them access to the cloud services without the cost involved with the running of conventional data centres, allowing for the focus to be on productivity.

Performance - the biggest cloud computing services run on a worldwide network of secure data centres, which are regularly upgraded to the latest generation of fast and efficient computing hardware. This offers several benefits over a single corporate data centre, including reduced network latency for applications and greater economies of scale. Individuals are also able to access this to take advantage of the performance offered by a cloud service.

Reliability - with the movement away from physical storage such as server rooms and storage devices such as hard drives; mobile phones; USB drives etc. Data is more readily accessible with the improved ability for data backup, disaster recovery, and business continuity through a cloud network. Dramatically reducing the likelihood of any data loss.

Security - many cloud providers offer a broad set of policies, technologies, and controls that strengthen your security posture overall, helping protect your data, apps, and infrastructure from potential threats. This benefit both individuals as well as business organisations. (What Is Cloud Computing? A Beginner's Guide | Microsoft Azure, 2020)

Disadvantages of this technology include the following:

With all the speed, efficiencies, and innovations that come with cloud computing, there

are, naturally, risks.

Security has always been a big concern with the cloud especially when it comes to sensitive medical records and financial information. While regulations force cloud computing services to shore up their security and compliance measures, it remains an ongoing issue. Encryption protects vital information, but if that encryption key is lost, the data disappears.

Servers maintained by cloud computing companies may fall victim to natural disasters, internal bugs, and power outages, too. The geographical reach of cloud computing cuts both ways: A blackout in California could paralyse users in New York, and a firm in Texas could lose its data if something causes its Maine-based provider to crash.

As with any technology, there is a learning curve for both employees and managers. But with many individuals accessing and manipulating information through a single portal, inadvertent mistakes can transfer across an entire system.

There are 4 types of cloud services: IaaS, PaaS, Serverless, and SaaS

Knowing what they are and how they are different makes it easier to accomplish business and individual goals. Each service is stackable and progresses from the most basic IaaS to a completely virtual service (SaaS). Regardless of the kind of service, cloud computing services provide users with a series of functions including email, storage, backup, and data retrieval; creating and testing apps; analysing data; audio and video streaming. delivering software on demand.

Infrastructure as a service (IaaS)

The most basic category of cloud computing services. With IaaS, you rent IT

infrastructure—servers and virtual machines (VMs), storage, networks, operating systems

Platform as a service (PaaS)

Platform as a service refers to cloud computing services that supply an on-demand environment for developing, testing, delivering, and managing software applications. PaaS is designed to make it easier for developers to quickly create web or mobile apps, without worrying about setting up or managing the underlying infrastructure of servers, storage, network, and databases needed for development.

Serverless computing

Overlapping with PaaS, serverless computing focuses on building app functionality without spending time continually managing the servers and infrastructure required to do so. The cloud provider handles the setup, capacity planning, and server management for you. Serverless architectures are highly scalable and event-driven, only using resources when a specific function or trigger occurs.

Software as a service (SaaS)

Software as a service is a method for delivering software applications over the Internet, on demand and typically on a subscription basis. With SaaS, cloud providers host and manage the software application and underlying infrastructure, and handle any maintenance, like software upgrades and security patching. Users connect to the application over the Internet, usually with a web browser on their phone, tablet, or PC. (What Is Cloud Computing? A Beginner's Guide | Microsoft Azure, 2020)

The consensus amongst IT professionals, CIO's, and CEO's of the use of cloud computing and its future, is the adopting of hybrid IT solutions – the utilisation of public cloud and private cloud networks, with the gradual phasing out of physical on premises IT infrastructure.

"Traditional data centres and the traditional model of delivering IT services will become extinct. The days of building your own data centre, owning your own equipment and installing/updating hardware will leave us rapidly. There will be some on premise solutions, but that will diminish dramatically." (Source: David Hartley, Virtual CIO & Principal, Technology Advisory Services for UHY LLP, (Nick Hastreiter, 2017)

As has already been outlined, the development of cloud technology has changed the technological landscape of Information Technology.

Mike Smith (Founder of AeroComInc.com) foresees the following changes and developments in the industry:

"In the next 15 years, the biggest change we'll see is 50% of small companies (with 1-500 employees), doing away with buying computer towers and servers and instead, adopting Desktop as a Service (DaaS), as the method for deploying workstations to employees. Companies will simply buy a monitor, keyboard, mouse, and a thin client (which basically controls the keyboard, mouse & monitor), for each workstation. All the desktop appearance, applications, and compute functionality will be handled by a 3rd party cloud provider.

This will allow employees to essentially have the exact same computer appearance, regardless of the device or their location. It will also allow companies to more easily manage the deployment and security of computers and applications, across all devices and locations.

Furthermore, companies will never have to worry about having the latest version of any major productivity software, such as Office, Adobe, etc." (Nick Hastreiter, 2017)

The most notable change will be the movement away from on-site physical servers and data centres and even the possible reduction in storage space and memory in personal devices – with data storage readily accessible via an internet connection.

Budding developers and application creation (and hosting) will become more prevalent, in particular with SaaS. With self-service and access to computing resources at your fingerprints, the engaging of IT service providers will decrease over time. Likewise, for the reliance on technical support with the need for IT field technicians becoming redundant with 3rd party cloud service providers footing the bill for service and maintenance for their data centres.

In my daily life, this will enable me to access any data, photos, documents etc. that I have stored on a cloud service (e.g. Google Drive). In terms of IT itself, I will be looking more at the development side that the cloud service provides (SaaS) for applications – with the potential to create an app that will benefit others and share it. As a student I currently have access to a Canvas, which allows students to access course content and announcements, submit assignments, and receive grades and feedback (Canvas is a

rapidly growing, cloud-based service that helps improve student and faculty collaboration by integrating Web services such as Google Drive, Calendar, SMS, social media, and RSS (Buss, 2020)

At this stage I will adopt the use of cloud services more and more over time, there will be less of a need to buy hardware and storage/memory devices, with only the basic hardware with an internet connection allowing access to a cloud with a near unlimited amount of virtual memory (at a cost). The use of clouds for collaboration, sharing and accessing of various media will be more and more relied upon because of its convenience, both personally and by businesses and organizations (potential employers).

For both family and friends, once they realise the benefits (if they are not already utilizing a cloud service) will adopt the use of a cloud service to share, access media, store data and conduct business with the advantages it presents. I am currently aware of a family member currently using O365 (which uses the Azure Cloud) for work purposes to access the full suite of MS Office products and in particular SharePoint. The use of cloud computing is the future of IT for all users, with the innovation it brings far outweighing the disadvantages with developments in the areas it currently lacks to improve it.

2. Autonomous Vehicles

What are they?

Autonomous vehicles, automated vehicles, self-driving cars and driverless cars are the names used to describe vehicles which have technology that allows them to move through their given environment with little, or no input by humans (Self-driving car, 2020). Although there is debate about what the different names describe, to the public they all mean the same thing; a car or truck which can drive itself. The SAE (Society of Automotive Engineers) has defined five different levels of vehicle automation.

Driver assistance for a specific function. e.g. Cruise control, auto parking.

Partial automation. The vehicle is fully controlled by the technology, but a human driver must be ready and watching to take control immediately.

Conditional Automation. The vehicle is fully controlled by the technology, and the human driver does not need to monitor the performance. The vehicle will notify the human driver if it needs assistance.

High Automation. There is no need for driver assistance at all, however the vehicle will only operate within a defined area.

Full Automation. There is no need for driver assistance at all and the vehicle can operate anywhere in the world that a human driver could. (En.wikipedia.org. *Self-Driving Car.* 2020.)

Anything from level 3 and above is considered an autonomous vehicle.

Currently nearly every major technology or automotive company in the world is developing autonomous vehicles, either as part of a collaboration or individually. It is difficult to get an exact number, but collectively hundreds of billions of dollars has been invested to develop this technology. All the companies involved see this technology as the future of the automotive industry and do not want to get left behind (CB Insights Research. *Autonomous Vehicles & Car Companies L CB Insights.* 2020.)

There are currently trials of automated taxi services in major cities around the world, including Shanghai in China, San Francisco, Las Vegas, and Phoenix in the USA (Korosec, 2020). They all allow the customer to book and pay for a trip like they would any other ride sharing service, and a trained person, known as a "safety driver", is present in the drivers' seat of the vehicle. (CB Insights Research. *Autonomous Vehicles &*

Car Companies L CB Insights. 2020.) However just recently the Google subsidiary, Waymo, began services in Phoenix where no safety driver is present. All the vehicles are still monitored remotely by Waymo staff, but this is the first "next step" for this industry. (The Washington Post. *Waymo To Launch Fully Driverless Service To The Public — A First Just In Time For The Pandemic*. 2020.)

These ride sharing services are likely to expand to most major cities around the world in the near future. Because the cars are prohibitively expensive for an individual person to buy and are heavily regulated, self-driving vehicles will continue to be only used for ride sharing services. Although, like any technology, this cost over time is likely to decrease allowing other uses to be implemented. Options such as companies or governments purchasing as fleet cars may become possible.

This current implementation of the technology is still only level 4 on the SAE's classifications. All the vehicles operate in a well-defined area which is fully mapped and scanned before the vehicles can operate there. To reach level 5 vehicles need to be able to operate on any road that they need to get to their destination. A lot of work and research is going into this area, particularly in the field long distance trucking, which requires the vehicles to operate across large areas. A major area of research for automated trucking systems is what is termed as "platooning", which is where automated systems virtually tether vehicles close together on long fast-moving roads such as freeways and motorways. While this can be achieved without full automation and is yet to be implemented beyond testing, it is considered to be the first step towards a fully autonomous trucking industry. (En.wikipedia.org. *Platoon (Automobile)*. 2020.)

The main reason there has been such a fast development of this technology over the last five to ten years is that data processing capabilities have reached a level where systems are able to process data from multiple sources and make complex decisions on that data within a fraction of a second. Without this processing speed, fully autonomous vehicles would not be possible. To accompany this there has been a lot of time and money spent to develop the monitoring devices that give the processors the data they need. These include vehicle mounted Radar, Lidar, cameras, and motion sensors. Even with the development of these advanced systems vehicles still also rely on external inputs such as GPS and virtual topographical maps. (Waymo. *Technology – Waymo*. 2020.)

What are the likely impacts?

This technology once fully implemented will have a major impact on the way everybody lives, works, and moves around. Our communities, particularly our cities and suburbs, have been designed and shaped around our use of cars and trucks. The majority of transport infrastructure built in Australia in the last 60 years has been for roads and private transportation. As a result of this people who are not car owners tend to be disadvantaged in the community.

The use of autonomous vehicles will be a major shift for the way Australians think about transport. Presently most people own their transport. It has been estimated that cars spend 95% of their time parked, so when all the costs associated with car ownership are added in, people who own cars are paying a high cost per trip. However, people are happy to pay for the convenience that this gives them. If people take up the on-demand self-driving services when they become available to them, they will be getting a similar amount of convenience at a much-reduced cost per trip (Parliament of Victoria, *Automated Vehicles*, 2017). This will push people away from private vehicle ownership.

Once autonomous vehicles are in widespread use there will to be several positive impacts to the economy and society.

A reduction in the number of road accidents. Estimates say that 94% of traffic accidents can be attributed to human error.

A reduction in congestion. The vehicles will drive more safely and will communicate with each other to increase traffic flow and efficiency.

Increased road capacity. Because the vehicles drive more efficiently there will be a greater capacity on the current roads.

Space saving. The vehicles will have less need to park for long periods space will be freed up for other purposes.

Personal cost savings. Private car ownership will no longer be necessary so this will free up money normally used for this.

Increased productivity. Because of reduced transport times and the removal of the necessity to drive, people will have time freed for other purposes.

Reduced product costs. Because of the reduced cost and increased efficiency of the transport of goods, the cost of these goods should also reduce. (Parliament of Victoria, *Automated Vehicles*, 2017)

These changes will have the biggest negative impact on people who work as vehicle drivers. It is estimated that there are more than 200,000 people who work as taxi, bus or truck drivers in Australia and this technology will completely wipe out their jobs (Parliament of Victoria, *Automated Vehicles*, 2017). However, it is expected that the changes will be implemented gradually so that any major disruption to the job market is diminished.

How will they affect me?

I find it hard to imagine my life where I do not own a car or know how to drive. But for children today it may be an unusual situation and even a luxury to own your own car that you drive yourself. My children are currently 4 and 2 years old and it may be the case that they will never get to drive a car.

Like other people it is most likely to be economic considerations that will change how I use transport in the future. If it is cheaper me to use the on-demand autonomous vehicles than to own a car that may become very expensive to buy, it is a good incentive to change. I imagine that I would continue to use mass/public transport for the same reasons and occasions I do now, but for trips to locations not easily reached by public transport it would be necessary for to me to use the autonomous vehicle option.

I know a number of people who work as drivers and in the transport industry and I can see that this technology will have a big impact on their jobs. Hopefully, they are able to transition to other work without too much disruption to their lives.

3. Natural Language Processing & Chatbots

What are they?

Chatbots are software programs designed to interact with humans in lieu of interactions with other humans. They are mostly used by companies to supplement online customer service capabilities and direct people to dedicated customer service agents, and as assistance apps on mobile phones and computers (e.g. Siri, Cortana, Google Assistant). Natural Language Processing (NLP) is the name used for software processes which are designed to interpret human communication. Different chatbots will use different types of NLP depending on the environment they are implemented in and the level of technology available to the organisation which created the chatbot. (En.wikipedia.org. *Natural Language Processing*. 2020.)

Because chatbots rely on NLP to communicate with humans, the development of both has gone hand in hand. The first chatbot developed was call ELIZA and was developed primarily to evaluate the Turing Test. This test devised by Alan Turing was to assess a machines intelligence from a person's ability to determine if they are communicating with another person or a machine. The NLP used in these early model chatbots was basically a database of phrases that were manually matched up to the input from the human. (En.wikipedia.org. *Turing Test*. 2020.)

Since then there have been two major shifts in NLP implementation. The first of these began early in the 1990's when the increase in computational power made it possible for algorithms to be written which allowed software to "learn" by studying written text. The algorithms then used statistical models to infer further information about the language that they were processing and to formulate responses base on probabilities. This is called Statistical NLP. (En.wikipedia.org. *Natural Language Processing*. 2020.)

Skipping forward to current technology, NLP has progressed to understanding human speech, which is much harder for a computer to do than understanding written text. Peoples speech is very variable, for instance not only are there many different languages spoken, people speak different dialects and with different accents. Speech is also not as structured as text as people can mumble, slur, use slang and can use terms from other languages. (Sas.com. *What Is Natural Language Processing?*. 2020.)

This progress has been made possible by the second shift in NLP implementation, which has also been made possible because of the further increase in computation power. This latest implementation is termed as Neural NLP and is a subset of Artificial Intelligence research. Neural NLP uses Artificial Neural Networks (ANN) to "learn" in a more efficient way. ANN's are, simply put, a collection of computational segments designed to mimic the structure of animal brains. There are "neurons" interconnected with "synapses" and the individual synapses are strengthened the more they are used (En.wikipedia.org. *Artificial Neural Network*. 2020.). The main processes the ANN's use to learn are known as Deep Learning and Data Mining. Deep Learning is a process where the ANN's repeatedly perform set tasks on different sets of data and alter their responses and methods according to the results they receive. This technique has been made possible by the massive amount of data available with the current ubiquitous use of the internet (Marr, B., *What Is Deep Learning AI? A Simple Guide With 8 Practical Examples*. 2020.). Data Mining is the method of analysing large amounts of data using statistical algorithms to extract predictions about other events and processes. This is like what was used with Statistical NLP, but with much larger amounts of data available and more efficient ANN's to process it. (Sas.com. *What Is Data Mining?*. 2020)

Current chatbot technology is widely used in customer service situations. While they are very efficient at simple tasks, they are generally programmed to transfer the customer to a human agent when more complex situations arise. It is also generally made obvious to the customer by the companies that use the chatbots that they are communicating with a bot (Chi, C., *7 Of The Best AI Chatbots For 2020*. 2020). Although, at the moment there is a rapid increase in the level of Artificial Intelligence being implemented in public fields and Natural Language Processing is a part of this. It is quite feasible that in the near future all our phone and text interactions with companies will exclusively be with chatbots and we may not be able to tell the difference between them and a real person. Also, as technology becomes more complicated tech companies will need to find better user interfaces for their products and chatbots are the best option for this. If you can interact with your device the same way you would another person, it would be the easiest option for the user.

What are the likely impacts?

The biggest impact that chatbots will have in society is the improvement in the general public's access to services and technology. The use of technology such as accessing the internet and mobile phone use has become an essential part of life, and people who are not IT literate are in danger of being left behind. Chatbots can give people easier access to technology by allowing them to simply talk to an interface that can assist them to use a device or navigate websites. They can communicate with the chatbot just like they were talking to another person, so they

would not need to learn anything new. People can also get greater access to essential services such as legal help, medical advice, education, news, and community information (Zilkha, G., *What Chatbots Are Doing For Social Good.* 2020). Many of these services are under resourced or expensive so people can wait long periods of time for access or not be able to get access at all. Chatbots are a very cost-effective solution to this problem, because for instance if a person is employed as a customer service assistant to answer phone calls, they can only answer one call at a time. Whereas the chatbot can answer as many calls as there are phone connections. When implemented online the chatbot can also communicate and assist an almost unlimited number of people simultaneously.

Like any technology there are also possible negative impacts of chatbots and NLP as well. For example, chatbots could be used to conduct phishing scams on a large scale. Chatbots could be programmed to communicate with people online through social media platforms, pretending that they are real people. They could then use this interaction to elicit personal details (bank account details, date of birth etc.) from their targets. There is also the impact to employment. Currently most chatbots can only help with basic enquiries, so there has not been a great impact on customer service jobs. However, as NLP improves chatbots will be able to engage in more and more complex interactions with people, so online and phone customer service roles will begin to be supplanted by this technology.

How will they affect me?

Currently when I come across a chatbot online I tend to avoid them, because my past interactions have been that the chatbot was not much more useful than a search bar. Simply directing you to another webpage or regurgitating information that is from the website. As chatbots become more sophisticated I am sure they will become the main way that we interact with customer service departments and even our devices, so I will have no choice but to interact with them more and more. Especially if digital assistants become the main way we interact with our devices, everybody will quickly get used to talking and giving instructions verbally to their phone, fridge, oven, media player, TV, etc.

The main negative impacts to my family would be diminished job prospects. Chatbots are most likely to replace entry-level remote customer service roles. These roles are often a way young people can enter the job market and gain experience as they are beginning their career. Without jobs like this available it makes it even harder for young people to enter the job market, and gain experience to move on to other roles.

4. Raspberry Pis, Arduinos, Makey Makeys and other small computing devices

What does it do?

The raspberry pi has bought into the IT world a small low cost per unit computer that can plug into a keyboard or mouse or be accessed over the internet through the use of a SSH tunnel. This low cost and the Pi's ability to interact with the world around it is what provides the state-of-the-art technological abilities to the pi (What is a Raspberry Pi? 2020). When the Pi launched it was the cheapest and smallest computer in the world, it had a 700Mhz processor and 256mb of ram. This low cost and computing abilities brought accessible computing to the population for the first time. From low cost computing for rapid prototyping through to IT accessibility to people in the third and developing worlds who many have not herd of a computer. These abilities won the Pi a T3 award for innovation in 2012 and many more since (Parsons, 2020).

Currently there are many areas that the raspberry pi is used in the following are three key areas that are developing and show where the pi will go in the future. Firstly, the PI is being used as a computer and controller in the IOT sphere. The Pi can be used to control home automation from controlling the thermostat, door locks, appliances, lighting, and security. https://www.ijcsmc.com/docs/papers/May2015/V4I5201599a70.pdf   With an ever-aging population the development in this sector has the potential to have a large impact upon many people's lives (Ageing, 2020).

Secondly the Pi is also being used as a low-cost controller for the automation or buildings, power stations, radio repeaters and factories. It can be used as a telemetry module, server, router, and controller for many different types of machinery. With these abilities the Pi is currently being used in solutions for energy management, vehicle monitoring, medical systems, smart card reader, IT monitoring and telemetry, smart buildings and IOT integration (ModBerry - Industrial IoT Computer based on Compute Module 3, 2020).

Lastly the Pi provided as fast low-cost solution to problems, this can been illustrated in the way the Pi has been used to help fight COVID-19. The Pi has been used to rapidly test and design new low-cost ventilators in countries facing a shortage of ventilators. The PI has also been used to control 3D printers to print out personal protective equipment (PPE) to address shortages due to COVID-19 such as face shields. This ability to not only rapidly prototype but also control the equipment that can build or print the machines or products lie key to the pi's future success and importance. In the future it is not inconceivable that PI's and 3D-printers could be shipped to any location in the world and after rapid prototyping be ramped up to a large distributed scale that could be used to address any new pandemics or problems anyone in the world may face (Hughes, 2020).

One of the most exciting areas of development of the raspberry PI is in the area of artificial intelligence and machine learning. The PI's small size combined with its abilities in processing and power consumption position it as an ideal choice for powering smart robotics. This is an area that is still developing limited by software and how to leverage it to control and teach computers to learn. In 2018 google combined with the Raspberry Pi Foundation to make its TensorFlow artificial intelligence framework compatible with the PI. This self-learning ability and low cost can be illustrated when you compare the following, you can build a raspberry pi based self-driving car for about a tenth of the cost of NASA's Mars rover (Tung, 2018).

What is the likely impact?
The raspberry pi's impact will be significant it will be able to help improve quality of life to millions of people, reduce government costs in healthcare, IT, and many other areas. It has the ability to help people reduce their carbon footprint, it will also be able to bring education to people in areas that may not normally be able to access it. The Internet of Things developments are expected to bring in the area of 4.5 trillion USD in revenue and cost saving opportunities worldwide in the next two years (IoT Opportunities and Impacts | Internet of Things, 2020).

This rapid change from one connected device per person to a future where we could see 10 connected devices per person will create a lot of new jobs and opportunities in the area of IOT this will counteract the majority of job losses from the upgrade and create many more. However, with all this monitoring of people in their data come growing risks of breaches of privacy and security breaches. For example, a smart meter that measures energy usage through the measurement of people's movement in a house to then shut down unused devices. Could be used by nefarious people to record the homeowner's movements and plane when to rob the house. There will be a need for the regulatory bodies in each country and possibly in international law to define the guidelines and polices that this data can be used, how it will be stored and who has access to it. As long term such intrusive monitoring of people could lead to many unwanted social implication such as change in people behavioural patterns and socialization due to their concerns about their privacy and who was viewing or had access to their information (Impact of Internet of Things (IOT) on IT and Iyengar, 2020).

How will this affect me?
The raspberry pi can help me in my daily life because it would be every useful to stop ads on you-tube. The raspberry pi could be set up as a storage cloud for me and my family so whenever we are doing any documents it saves them to the cloud so we can access them, the raspberry pi can also change your IP address using a VPN server so you can watch movies that are in different countries or to make it look like you're in a different country. The raspberry pi will make our life greater because you would not be getting as much virus, malware, and cookies from websites you visit. The raspberry pi can help everyone that I know who browse on the internet, it would help my family members and friends. The raspberry would also make a wonderful small desktop for my family members if we were sharing files with each other that we didn't want

to store in the online storage's like google cloud etc, or just to have a desktop that is not only cheap but can hold work document and access the internet like a desktop would do so you can take it anywhere you go. The raspberry pi will make my life different because of all it features it can do like blocking ads, but it would be very handy to have one just to play around with and test new things and see what it can do like voice recognitions, this would change me a   little bit but that little change would be amazing to have, because of what the raspberry can do for other people and myself.

Project Idea

Overview

The project is a production grade web application that will power a backend and a front end involving both restaurateurs and patrons. The application will be linked to a restaurant website, where customers can sit at the table and place orders and pay via their phone without needing to order at the counter. Customers can scan QR codes or visit the main website to place an order, once the order has been placed the order is then sent to the restaurant's dashboard which will be linked to the docket printer. This system's backend will also integrate to the restaurants' POS(Point of Sale) system. When orders are ready and passed out of the kitchen, the staff will have the ability to send a push/sms notification to the customers allowing them to collect the food from the serving area. The customer will also be able to leave real time feedback about the quality of food and services received right on the platform allowing business to strengthen their weakness. Since this platform is a web application built with mobile first approach, the user experience will be very intuitive. This project aims to provide exceptional service to both customers and the business by reducing human errors that may otherwise occur in taking orders.

Motivation

The motivation behind the project is to help the family business in the technological side. I look for ideas to improve the shop and find ways to fix problems. Recently we have been struggling at busy times with some customers taking too long to order. As customers take longer the wait time increases for others and there are lines of customers while one staff is busy just taking orders and not able to help others.

There are apps out there, but all comes at a premium fee, and they lack certain features. There are also multiple online food delivery companies, but they all charge hefty fees which forces restaurants to increase food prices to be able to profit from their sales.

Description

The project will be a web app linked to the restaurant's main website. Customers can place an order for takeaway from anywhere through the web app but can only order dine-in if they are seated at a table. Ordering from the app helps restaurants a great deal as it will reduce the amount of staff needed to take orders instead, they can use that extra force in the kitchen, this will be especially helpful in busy times. The reduced customer interaction means the restaurant can focus more on the quality of food.

There is a seat reservation function where customers must sign in to book a table, and the booked table will be displayed as Reserved before a certain time from reserved time. When the table is Reserved customers will not be able to place an order from that table unless the person that booked orders from their account.

In the app each table's QR code will be linked to a table in the POS System. Once a customer enters the shop, they will take a seat at the table of their choosing. To view the menu customers will need to scan the QR code at the table or visit the restaurant website then go to order.

Ordering from the table, the customer has access to the full menu and what is being served, can place each item to cart and to place the order they must pay. Once payment is received, the order is then sent to the kitchen printer. Then after the order is ready the chef can send notification to customers that placed the order via Admin App to let them know that their food is ready and they should pick it up from the counter.

Review System - customers can give feedback and rating on their food once they are done, they can choose to leave review as anonymous, this review will go directly to the restaurant which will help them improve. This will help in keeping a good track record of satisfied customers which will work in favour of the restaurant. This will ensure that the restaurant's food and service is always excellent quality.

Loyalty System - customers can place orders as guests or register an account which will track how many visits they have had and will be given loyal customer offers(could be monthly specials or discounts after certain amount of orders etc.). Owners can set up loyalty offers via the admin panel, they can run monthly offers or run offers based on orders where after customers have placed orders a certain amount of times on different occasions they will receive a reward.

The admin/owner features will let them access the admin panel where they can make a variety of changes to the menu - they can add new items, remove items, take an item off for the day, add daily specials. They can also view all orders in detail, they can see the customers details which includes name, number, table number they are seated at, and their order.

Tools and Technologies

Since the project is a large-scale application, in order to divide the workload of the application amongst all the team members evenly, we decided to break down the whole application stack into multiple manageable modules. Each team member will be given a module to work on and research with regards to jobs they are interested in. The modules will be broken down into the following:
- UI and UX design and development module

- Customer sign in and sign out module - Designing and developing sign in and sign out system
- Restaurant menu holding module - Database of restaurant menu
- Ordering module - Design and developing of an ordering system which will have cart function, payment gateway, and send orders to the restaurant
- Admin panel - Basic admin panel to override all the modules if needed, and will have management features for staff, so that staff at the shop can change easily, will have features such as putting items off the menu for the day, adding specials, changing prices, editing menu, add photos etc.
- Application testing, review, and feedback module - testing for bugs and overall use, and extensive feedback as an end user on the application's pro's and con's for further improvement.
- Branding module - promoting and marketing the app to the end users, so shops can receive orders online, this module will also include deployment of the application.

We will look at each members ideal job and will assign tasks accordingly, we all have different interests which will link up well with the modules, Amer will handle the project management, Roshan and Simon will handle the development of Software, Joanna will handle the testing and Mason will assist Joanna on application testing and also handle support after the deployment of project.

Github will be used for group collaboration, as it is a great platform and packed with features, it has seamless collaboration and version control. Trello is a great way to assign tasks and set a due date for tasks to each member of the group, it can also be used for progress tracking through comments.

To use the service, the customers will need a smartphone that can access the internet. The shop will need a Wi-Fi printer, POS System, and a device that can access the web application admin panel for order management.

For technical skills, knowledge and ideas on different programming languages is required. Knowledge of visual language such as HTML, CSS, JavaScript is needed for front end development and to learn other helpful languages like NodeJS. To make the app work and connect to the server it will require knowledge of server sided languages such as Php, Ruby, Python etc. For databases, we will be using MongoDB because of its flexibility and ease of use, MongoDB will not require extensive knowledge like MySQL. We are planning to use NodeJS as a back-end for the application as this provides flexibility of using JavaScript on both front and back end. Angular and React for front-end. We are looking at researching these functionalities for ease of use.

For Application hosting, we will research on Netlify as they provide a free tier for hosting, easy deployment of the project, as you can just Git push to deploy worldwide, this can link up well with GitHub. As Application hosting is a downside of our group because we do not have knowledge on this, so this will provide simplified hosting.

Skills Required

There are various skills necessary for the project including design, management, coding, testing and problem-solving skills, these are the soft skills needed.

Will need to learn how to use Github and Trello for collaboration with others working in the project. Github to share codes and merge all the codes and Trello to assign tasks and keep organised.

For technical skills, The project will require general knowledge on Front-end technologies and how to code HTML, CSS, JavaScript, jQuery, Ajax, Bootstrap. This is required to make the front-end of the web app and make it visually appealing.

As the project technology is heavily reliant on JavaScript, it will need extensive knowledge of JavaScript in order to use NodeJS, jQuery etc.

Knowledge of server sided scripts such as Php, python, Ruby on Rails and NodeJS to connect the app with the shop and send data from customers device to restaurant. Will also require knowledge of MongoDB for database management and inputting all the restaurant data in.

Outcome

Mobile phones have become an integral part of our daily life. With seamless internet connectivity, these devices have become a utility with immense possibility. Among several applications users engage in their daily life, with this web application, we aim to provide a very comfortable, secure, and reliable way for people to experience dining in at a restaurant. Not only that, this application will also allow restaurants to manage their menu online, collect orders and feedback from customers in real time. This project aims to provide exceptional service to both customers and the business by reducing human errors that may otherwise occur in taking orders.

Group Reflection

Joanna Jane S3873742

What went well

I believe most aspects of the group assignment went quite smoothly. I liked that the communication style between each member was open, respectful, and relatively prompt, both via chat and via team meetings. At times it actually felt like I was chatting with colleagues, rather than fellow students, which was a great glimpse in to what it might be like to work on a real life I.T project. I was also impressed that Amer stepped up to lead the meetings and help ensure everyone was on the same page. Group members were on a similar level in terms of motivation and willingness to get the assignment done as quickly as possible, and it was great to see team members volunteering to help others out where needed.

What could be improved

It was a little disconcerting in the early stages in that there seemed to be a lack of timely communication, though any feelings of unease were put to rest after we held our first team meeting and we were able to put faces to names, so to speak. Earlier agreement on the methods of communication would have helped avoid this situation, particularly as I found myself having to use 2-3 different methods to contact people. Some group members also had technical difficulties using Github which delayed profiles from assignment 1 being uploaded, though I imagine this will be less of an issue now that we have all had some experience in using the system.

At least one thing that was surprising

Even though we were essentially six strangers, there was a surprisingly good level of compatibility in the group, and an interesting blend of personality types e.g. some extraverted and others introverted. I did not expect that the meetings would flow so smoothly, and despite being greatly separated by distance and time differences, it felt like there was no real disadvantage to doing the assignment together remotely as opposed to in person. I am pleased to say it has given me greater confidence in the idea of doing an entire bachelor's degree online.

At least one thing that you have learned about groups

This experience has taught me that communication is key and agreeing to one or two preferred methods of contact early on in the project helps ensure time is used wisely and that important information does not get missed. I have also learnt it is always safest to never assume, and that it never hurts to ask something twice than to not ask at all. I understand that our schedules are all entirely different, and some compromise on my part will always be needed to ensure everything gets done in the required time frame, but that this will help ensure a successfully completed project, as well as utmost respect for my fellow team members.

How log of activity on GitHub reflects on group work

We used a range of tools for communicating and contributing our work and ideas, including Teams chat, Canvas, Discord, and email. Therefore, I feel the log of activity on GitHub alone really reflects just a mere portion of the amount of work we had all put in to getting the project completed. My feeling is that GitHub would certainly be useful in work environments such as Software Development where each person would work individually and contribute their changes to a live work in progress. Our work style however was really collaborative and given the differences in levels of experience and knowledge it was far more appropriate for us to also use other tools such as Chat and Discord. Combined, the history and trails of information in each of these tools overall capture our group work very well.

Motiana Tusa S3873180

What went well?

Once our group was established, we arranged our first meeting where we had the opportunity meeting each other face to face and discussed the contents of our Assignment. We collaborated well, setting our goals with timeframes, and it was really great to work with people that were open, honest, and willing to contribute. Help was always at hand if anyone has any issues with the completion of their part of our assessment.

What could be improve?

The uncertainty of establishing a group from the start was hard but once sorted, it all went smooth and well.

At least one thing that was surprising?

The mutual understanding, motivation, dedication, the responses, and collective consciousness from each member was far exceeded expectation and it felt like we knew each other long before. We got along so well with high respect for each other. I think that what makes it easier for everyone to take ownership without hesitation.

At least one thing that you have learned about groups.

1. That everyone is unique, and we are together for the same purposes. Valuing each other regardless of age, background, knowledge, skills, experience etc.
2. Sorting out my GitHub website issue with a group member help.

How well you think your GitHub log of activity reflects your group's work on assignment.

We knew from the start the importance of having records of all our group interactions such as discussions, meetings and meeting minutes recorded, written, and be made available on our Microsoft Team discussions logs and GitHub as well. This is very useful for a quick reference and/or group reflection later. Also grouping the contents of our assignment together makes the lay out in GitHub clear, neater, and easy to access.

Simon McKindley S9406133

What went well?

Once the group was established, we worked together well. We assigned tasks, set targets, and scheduled meetings collaboratively. If someone needed help, help was given. Every group member has contributed and offered to do work. Considering we did not know each other at all before forming this group, the whole process has run smoothly. I have enjoyed working with everyone in this group and all their work is greatly appreciated by me.

What could be improved?

Initially we took a bit of time to get going and find our feet. This was overcome quite quickly though, once a rapport was established within the group.

Surprising things

What was surprising was that people from diverse backgrounds, life stages, experience and work schedules can come together and work harmoniously on a project. This doesn't always happen in a workplace environment.

What did I learn about groups?

Even if people are coming from different situations in life, if we have a common goal and motivation to achieve that goal, it can be quite easy for everybody to work together and help each other.

How well you think your GitHub log of activity reflects your group's work on assignment.

Group repository on Github does reflect active group collaboration because all of us have pushed and pulled documentation using the repository. We also have used Canvas files, emailed and MS Teams to upload and exchange documentation.

Mason Brown S3876704

What went well?

I think what went well as our group that we all contributed to the group assignment, we were able to get everything done before the due date. There were no arguments in the group which was a plus for our group. Everyone was assigned into doing something which was a really good idea. Everyone did what they were meant to do.

What could be improved?

What I think that should improve next time is that we need to be more communicated with each other, so we know what everyone in the group knows what everyone is doing, and should be reminded what to do every few days or so and what other people are doing too.

At least one thing that was surprising.

One thing that was surprising that no one in the group was the leadership in the group assignment, well I was not sure who took the leadership.

At least one thing that you have learned about groups.

The one thing I have learned about working in a team or a group is that you should work on the project the sooner that better instead of leaving it on a time crunch.

How well you think your GitHub log of activity reflects your group's work on assignment.

Github repository log reflects the group work because there are active contributions from all of us. Everyone has contributed by uploading and downloading files from our group repository.

Amer Muhammad S3728065

What went well

Group formation was relatively easy, members were very attentive and cooperative in nature. Team tasks were picked by members voluntary and individual tasks were easy to delegate. Almost all required work was completed on time.

What could be improved

Group came together in late September and by the time tasks were allocated, members were left to do most of the work within 7-10 days. Group formation could have taken place early and that would have allowed more time for the completion of tasks as well as better review and edits before submission.

At least one thing that was surprising

It is almost inevitable that a group comes together for the completion of a project and there is bound to be a conflict or a difficult personality or two, not with our group. Throughout our time together I have not heard a single word with any negative connotations nor has there been any conflict.

At least one thing that you have learned about groups

Our group has wonderful attributes such as cultural diversity, varying levels of age and educational backgrounds. Creating a collaborative environment which was conducive to creativity, the ease with which difficult messages were communicated, adaptations to different personalities where potential barriers became opportunities to know each member at a personal level, these are some of the key takeaways from my interactions with this amazing group of people.

How log of activity on GitHub reflects on group work

Log of activity on GitHub alone may not be an accurate reflection on the contribution of all members. I created GitHub group repository but my lack of knowledge about accessibility issues restricted some members in their attempts to pull/push documents in the early stages of our collaboration. More accurate reflection will be to consider our activities across all platforms we have utilised such as Canvas, MS Teams including meeting minutes and GitHub.

Roshan Khadka S3876349

What went well?

Once we got started, every member performed their assigned task very well. We were all able to communicate very well and was able to assign task, meet up to keep everyone updated on what we have done and what we were up to. The communication was great once we got the team started and organized our first meeting.

What could be improved?

The only problem I found was at the start where the only communications that was done was by email, the response time was slow, and was hard to get the team together but this was all fixed once we organized a Discord server for our first communication, then started meeting on Teams.

At least one thing that was surprising.

It was surprising how well the group functioned and excellent effort everyone put in. We are all at different locations, throughout Australia from different backgrounds and experience but we were able communicate well with someone we have never spoken too or worked with, felt as if we have done it before.

At least one thing that you have learned about groups.

I have learnt the importance of communication in projects, good communication will lead to project being completed in time as well as the project being up to standard and organization is key to completing a task in time, setting up date and time for online meeting beforehand and organizing what to talk about in meetings before hand will keep the project in flow, as well as keep everyone updated on the project stage.

How log of activity on GitHub reflects on group work

GitHub log does not really reflect the group work, as some members had trouble when it came to collaborating on GitHub. As we are all new to GitHub, it's pretty much learn as we do things right now and we are helping each other in the process.

Group Reflection

What went well

Group formation was relatively straight forward, and group dynamics were established very early on when members shared their experiences and backgrounds openly. We became aware that there was wealth of knowledge and expertise within our group which could be harnessed to successfully complete our team project. Selecting team leader was a very smooth process and there were no conflicting personalities or clashing egos. Once assessment requirements were discussed, individual and team tasks were identified, members picked task voluntarily. A very collaborative, cohesive environment which proved to be conducive towards achieving our shared objectives through effective teamwork.

What could be improved

Group formation took place with less than 3 weeks to the date of submission. Notwithstanding the difficult circumstances and uncertainty due to COVID pandemic, our first few days together were not very productive. Tentative communication, uncertainty in terms of how to approach the project and constant overflow of information through announcements and discussion board activities made it a very challenging start to our collaboration. Earlier group formation would have allowed members additional time to be more thorough with their work and allowed others to review and suggest improvements. Time constraints also led to some oversight in task delegations such as Group Reflections and Industry Data questions not being answered in a timely manner.

At least one thing that was surprising

Despite a late start and challenges early on, our group has managed to perform well and adhered to internal and external deadlines. This was made possible due to similar personality traits of the members. Cooperation, collaboration, consideration, and willingness to compromise for the sake of others were the key attributes of our group. Extremely pleasant working environment which has been very conducive to producing results in a timely and efficient manner.

At least one thing that you have learned about groups

Our group is very diverse in terms of cultural and social diversity. Diverse environment can be very vibrant and productive because people from different backgrounds bring their own problem-solving skills to the fore. Diversity can also pose a challenge in terms of communicating within a group where members have varying levels of education, vastly different work experiences and future plans vary a great deal as well.

One of the key takeaways for us collectively as a group has been the ability to overcome potential communications barriers. Throughout group formation, task delegation, meetings and completion checks, our group's ability to effectively communicate with each other and work towards collective objectives has been very successful. This bodes well for us individually and as a group because communication is the most sought-after skill in IT professionals worldwide.

How log of activity on GitHub reflects on group work

To ascertain our collective success on group/teamwork, our collaboration across all platforms needs to be taken into consideration. GitHub presented some challenges for us in the beginning in terms of pull/push requests, members having difficulty in running GitHub desktop application, having right access levels and collaboration invitations across the group. We overcame all those issues but for the sake of better time management and our successful collaboration, Our group has used Canvas Discussion forums, MS Teams, Meetings, RMIT emails and Github for sharing and exchanging ideas as well as uploading and updating documents. There is a trail of all these documents gradually and ultimately uploaded to our group repository. All these documents were updated to a final draft version which forms the core of our project report.

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