Group Members:

- Charlie Morrison - https://Cofm98.github.io
- Katherine Sullivan - https://katie-pixel.github.io/katie-Pixel-IT-basics.github.io/Index%20Page.html
- Panagiotis Papanastasatos - https://peterpapas1.github.io/
- Samith Buthgama Mudiyanselage - https://samithbuthgama.github.io/rmit-IT-assesment-ass1/
- Mihail Basargin - https://mishbee.github.io/github.io/
- Sunggil Kang - https://github.com/liggnus/SudoAplus/sunggil-kang-website.html

Github Public Repository URL: https://github.com/liggnus/SudoAplus

Github Pages URL: https://liggnus.github.io/SudoAplus/index.html

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Team Profile

We are Sudo A+! The team has chosen this name due to the Unix command 'sudo,' which raises the user's security privileges to administrator. We have done this in order to raise our privileges and give ourselves an A+ for all assignments we complete.

Charlie Morrison - s3658449

My name is Charlie Morrison. I am 24 years old and apart of the group "Sudo A+". I have been working in IT within the Department of Defence for the last 4-5 years. I am undertaking the Bachelor of Information Technology in order to expand my knowledge of the area, and to progress my career from a level 1/2 helpdesk operator. I first got interested in computers when my dad would work from home, back in 2004. I thought everything that the computer did was magical. Just like everyone else my age, I wanted to be a magician. I wanted to learn how to use this box of magic. And thus, grows the passion of this, then, 6-year-old boy, playing around with the computer.

Katherine Sullivan - s3670541

My name is Katherine Sullivan S3670541. I am an Australian that is currently living, working and studying abroad in Dusseldorf, Germany. I am in my final year of a Bachelor of Business in Logistics and Supply Chain Management, and I have taken on the Essentials of Information Technology COSC2196 as an elective subject. Outside of working in the Supply Chain industry I enjoy traveling, cooking, making music and doing all of these things with friends and family. I enjoy group work and hope to broaden my IT and team works skills through collaboration in this subject.

Panagiotis Papanastasatos - s3997743

My name is Panagiotis Papanastasatos (Peter), and my student number is 3997743 My team's chosen name is SudoA+. As far as my educational background I had previously started a degree in computer science at Swinburn university but due to work and recent changes in my schedule I needed to change to RMIT online in order to better accommodate my other commitments. I enjoy web development mainly front-end, and I love building new concepts and seeing new ideas come to life through my work. I have some basic experience in the field, mainly in my spare time I was able to, build a few full-stack web applications with a number of web frameworks and libraries and have also built smaller apps trying to experiment with different programming languages and try out new things. I have also worked in a professional setting with a Melbourne-based start-up as a 'full-stack web developer intern' for 3 months and more recently I have also worked at Nintendo ANZ as a 'junior frontend web developer' for a period of 6 months. When I am not

behind a computer or working, I enjoy keeping fiscally active so I usually go to the gym or bouldering with my group of friends.

Samith Buthgama - s3994960

My name is Samith Buthgama and I previously worked in the automotive industry. I have recently decided to pursue further education in the field of information technology. In my free time, I enjoy traveling and watching science fiction documentaries. I also enjoy playing cricket and badminton. My student number at RMIT University is S3994960 and my email address is s3994960@student.rmit.edu.au (mailto:s3994960@student.rmit.edu.au)

Mihail Basargin - S3987647

have been living in Brisbane, Queensland for the last seven years, currently studying Introduction to Information Technology, combined with Introduction to Programming. My aim is to gain a bachelor's degree in Information Technology or Computer Science. Past educational experiences include attending TAFE studying information technology at a certificate level, completed certificate III, started certificate IV. I also studied Automotive Engineering during my teenage/early twenties. Unfortunately, circumstances out of my control prevented any further study at the time. Additionally, I studied Web Communications as an initial entry attempt into university, about three years ago. My interests are programming, 3D (3 Dimensional) modelling, gaming, playing guitar and playing golf on odd occasions. I do not usually have an ample amount of time to practice any of these skills to any great extent and my lack of expertise shows it. I am of partial Russian/New Zealander decent, although being born in Australia. I am only fluent in one language being English, though I know and understand a miniscule amount of Russian. I have lived in Queensland for most of my life, once venturing to Sydney for a few months, an experience to remember which had its highs and lows.

Sunggil Kang - S3992011

My background is South Korean, and I moved to Australia when I was 5. I enjoy playing video games on my pc with my mates and also love making music and listening to music. My interest in IT began as early as I began playing games and also when helping out my friends and peers with problems regarding technology. I do not have any formal IT experience other than my own diy projects completed via YouTube videos whether that was optimizing my PC setup to run hard to run games to hacking simple phone games, so I had millions of coins. My team went with the name SudoA+ courtesy of Charlie as it was related to IT and had a meaning where it allows you to temporarily elevate your current user account to have root privileges and in this case our grade to an A+.

Reflection on team member's personality results

Charlie - Written by Mihail

After examining Charlie's profile and test scores, I think that he would be a valuable asset to any team. His work ethic and pursuit for continual improvement, and attention to the details, will ensure the success of any project that he is involved in. His willingness and ability to step up and take the lead, will take any wayward team and would help the team stay focused and in the right direction. With the assertiveness, as described in the personality profile, Charlie would most likely not hold his tongue and air the issue with mind to resolve and dispute any discrepancies that may affect the team workflow.

To my understanding, a visual learner, which is most prominent in the learning styles quiz results, show that Charlie would do better to have materials in a visual format, meaning they need to see the materials in front of them, whether it be images, diagrams, or text, and can also include excellent spatial awareness and photographic memory. The strengths this style of learning brings to the team are, well-managed organisation, visualisation of tasks, follows directions (Visual Learning Style Traits and Strategies (thoughtco.com)

Katherine - Written by Samith

Kate's profile gives us an idea of her personality and learning styles and some insight into her potential strengths and weaknesses in a group setting. According to her results on a learning styles test, Kate has a strong preference for auditory (67%) and visual (59%) learning and a weaker preference for kinaesthetic learning (44%). This result suggests that she has a good memory for spoken information, strong public speaking skills, and can effectively explain ideas.

The results of the Myers-Briggs personality test shows that Kate is introverted (52%), observant (71%), thinking (71%), judging (93%), and assertive (74%). These traits suggest that Kate is honest and direct, dutiful, and responsible, calm, and practical. Overall, Kate would be an asset to any team.

Mihail - Written by Charlie

Mihail lives in Brisbane, Queensland and has for the last seven years. Mihail's aim is to obtain a degree in information technology or in computer science. Mihail has previously completed certificates in IT. Mihail has interests in 3D Modelling, gaming, playing guitar, and golf. Mihail's multi-cultured upbringing of Kiwi/Russian will likely introduce more varied opinions and thoughts into our group, which will be eager to invest our interest within.

Mihail's personality is defined by the Myer Brigg's 16 personality of a turbulent logistician, ISTJ-T. This personality's primary trait is to be a meticulous hard worker. This is prominent throughout our works, as Mihail is ready to volunteer to do work and the produced work from him is always work a dedicated read, as it often has insights we would not ordinarily see ourselves. This is evident as Mihail's energy is through observance, and his personality is strongly down to earth, and he maintains a strong realistic view of the world, and what is realistically feasible for everyone to do as a group.

Mihail is a visual learner, which is optimised in fast paced meetings with solo learning/contribution efforts. We will require to adapt our meetings and confidently assign work as required to be done in an organised and fluid fashion, which does not deficit the remainder of our group members.

Panagiotis (Peter) - *Written by Sunggil*

Peter is an INTJ-T which indicates he is rational, informed, independent, determined, curious and original. However, it also indicates that he can be arrogant, dismissive of emotions, overly critical, combative, and socially clueless.

To best help our group in our work with Peter, we should allow Peter to help make and finalise decisions. His rationality, determination and being informed, he would have a respectable place in making important decisions for the group. His independency would prove useful to complete any tasks that needs to be completed. His curiosity and originality would be useful for brainstorming ideas for the group.

His weaknesses in my opinion are just a by-product of how useful he can be towards the group and would not necessarily affect the group in a bad way. I personally could overlook his arrogancy, emotional dismissiveness, socially cluelessness if it meant that he would provide good ideas to the group, make good decisions, and get his parts done. If any group members do have issues, we could just have a conversation about what is affecting certain members and compromise.

Samith - Written by Peter

Samiths personal profile is providing us with enough information to make some assumptions about his team dynamic in the group. Based on his results from the Myers-Briggs test his role seems to be one of the diplomates in the group he focuses on empathy and master's diplomacy. In addition to that, he seems to be a people master, he seems at ease at social gatherings such as meetings and he is comfortable expressing his own thoughts and opinions with the group.

Adding onto that based on his personality-max report, one of his learning styles seems to be auditory (33%) based on that we can assume that he would be comfortable learning by actively listening to the information in the meetings. In addition to that he is visual (35%) so some sort of imagery or graph in the meetings could help him and assist his learning and ability to effectively gather and retain information. Finally, he is also a kinaesthetic (32%) learner so having some examples as we talk in the meetings could further assist him.

Sunggil - Written by Kate

Sunggil's personal profile gives us an insight into his personality and learning styles, and some suggestion to what may be his strengths and weaknesses when working in a group.

His results from the learning styles test showed he is Auditory 40%, visual 35%, Tactile 25%. This is a fairly balanced result, with a tendency towards auditory learning. This indicates Sunggil will be adaptive to learning in different ways and has the capacity to learn from others in a group setting.

The results of the Big 5 test returned a very high result for openness; suggesting he is imaginative and down to earth, which could complement some other logical thinkers in our team. His extraversion also suggests he will be an active participant and could bring the group together during difficult times.

A result of 23% for conscientiousness suggests other group members may need to hold him accountable in to complete the task at hand in this project.

Ideal Job

Our group's five ideal jobs primarily revolve around software development. There seems to be quite a bit of diversification in the type of software development. With group members want to do Front-End work that focuses more on the design and development of the user interface of a web application. They would work with technologies such as HTML, CSS, and JavaScript to build the visual and interactive elements of websites and applications that users interact with through their web browsers.

Table 1 – Job Growth

Job Title	Current projected job growth in AUS	Future Demand in AUS
Front End Software Developer	27%	Strong Future Demand
Graduate Software Developer	27%	Strong Future Demand
Software Developer	27%	Strong Future Demand
Full-Stack Developer	27%	Strong Future Demand
Software Engineer	27%	Strong Future Demand
Supply Chain Business Manager	3.5%	Strong Future Demand

In contrast to that, we also have team members who are more interested in the process of web development on a more holistic basis thus being interested in Full-Stack development basically a web developer who is proficient in both front-end and back-end development. In addition to having the skills of a front-end developer, they also have the skills to work with servers, databases, and the back-end logic of web applications. They would work with technology's such as HTML, CSS, and JavaScript, react.js, vue.js and make use of concepts such as test driven development and REST API's.

Similarly, we have other members interested in software development thus looking for careers as software developers responsible for the development of computer programs. This can include creating applications for desktop or mobile devices, as well as developing systems and utilities that run on computers. Software developers work with a variety of programming languages and technologies to build and maintain software systems. Some of the skills and technologies that a software developer would use are strong Debugging skills and knowledge of Object Oriented Design Principles, understanding of basic algorithms and being familiar with agile development methodologies and version control systems such as git.

In contrast we also have team members interested in getting a role as a graduate software developer, graduate developers usually work independently or as part of a larger team and they are exposed to all deferent types of development in order to them to discover what they enjoy the most and develop an expertise on that skill. There main goal is to keep up to date with the latest industry trends and technologies, and have the ability to learn and adapt quickly as they are constantly improving their skillset. Graduate developers can use a number of tools and languages and concept throughout there graduate program and some

of them may include, C#, Net core, AWS Angular and more programming languages and frameworks.

Finally, in contrast to the previous roles that are more tech focused, we have members looking for a career in Supply chain and business management, a supply chain business manager is responsible for overseeing and coordinating all aspects of an organization's supply chain operations. This includes managing the flow of goods and materials, from procurement and production to distribution and delivery. The supply chain manager will develop and implement strategies to improve efficiency, reduce costs, and increase customer satisfaction. They will also manage relationships with suppliers and vendors, negotiate contracts, and track and analyse key performance indicators. Additionally, they may also be responsible for forecasting demand, developing logistics and transportation plans, and managing inventory levels. They also monitor and review supply chain processes, identifying and implementing improvements as necessary. In order to achieve those objectives some of the skills and tools that a Support chain Business manager might use are ERP software and the Microsoft office line up of tools. The main skills would include strong organisations and communications skills that would include negotiation and strategic thinking and being able to translate ideas to actionable tasks that reflect business requirements.

Industry Data

The groups ideal jobs have a strong common theme, with one noticeable outlier: The 'group skill set' has been compiled by reviewing the require IT and General skills for each of the ideal jobs and identifying the skills which are common to more than one of the roles.

Table 2 – Skills Comparison

IT Skills	General Skills
JavaScript programming	Communication skills
Debugging skills	Analytical thinking
HTML/CSS programming	Ability to lead/mentor in a team
C++ programming	Problem solving
Database experience	

Each member of the group has chosen a career path that looks promising in terms of demand from employers in Australia. When we examine demand for skills, as outlined by the Australian Government, the roles of Front End Developer, Graduate Software Developer, Software Developer, Software Engineer and Full-Stack Develop would all fall under the category title of either Software Engineer or Developer Programmer. In 2021, both of these categories were identified as currently experiencing a skills shortage, and having a strong future demand (National Skills Commission, 2021). The outlier role; the position of Supply Chain Business Manager, most closely links to the role of Manager Supply Chain and Distribution, which is identified as currently not in skills shortage, but also with a strong future demand (National Skills Commission, 2021), suggesting that while future prospects look good in this field, currently the job market may be competitive in this skill set.

There are many differing skills that employers may require from job applicants. Based on data collected and analysed form Burning Glass Data and Seek.com, the most common skills that are not found in our group skill set are as follows:

Table 3 – Skill Set

IT Skills	General Skills
SQL	Building Relationships
TypeScript Programming	Teamwork Skills
Microsoft Windows	Attention to Detail

Interestingly, there were just five IT Skills from the top 20 required IT skills, that were not included in at least one of the groups ideal roles (Burning Glass Technologies, 2018). In terms of General skills, an interesting observation is that only one of the groups ideal roles included the requirement for good communication skills- when this is the most common required skill in IT roles (Burning Glass Technologies, 2018).

The data analysed from Burning Glass Technology has not changed the perspective of the group as a whole on their ideal job and its required skills. It has given insight into the wide range of skills that are applicable across the IT industry, and brought light to how diverse the technical requirements can be, particularly in comparison to the Supplier Chain Manager role that had very limited technical requirements. It highlights the need for an IT professional to have a broad range of skills and to be committed to continuous learning in order to remain competitive in the job market. The data from burning glass that depicted the number of positions advertised in our ideal roles is encouraging to the prospect of future job security. Another piece of data that is affirming in this space is that for each of the chosen ideal IT jobs, Seek.com, 2022, have projected a 27% job growth in the next five years.

IT Work

Jesse Cavanagh – Oobe / Contractor to Defence Industry.

Please tell us about your IT work. What do you do?

I am an IT Consultant with the Company Oobe.

Please tell us about the industry you work in.

I work in the public sector specialising in Department of Defence and the Royal Australian Navy.

What other kinds of work do you have to do?

As a consultant my work ranges depending on the nature of the project I am resourced to. Currently I am resourced to a transition into sustainment project however I also perform Level 3 (within the ITIL framework) Identity and Access Management.

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

My day today interactions include but are not limited to the following:

- *Customers and Clients*
- *Service Delivery Managers*
- *Operations Managers*
- *Change Managers*
- *Problem Managers*
- *Incident Managers*
- *Service and Solutions Architects*
- *Fellow junior, senior and managing consultants*
- *Engineers*
- *Technicians*
- *Analysts*
- *Please tell us about your interactions with other IT professionals.*

My interactions can be varied and depend heavily on the nature of the work and/or project that I'm currently resourced to or undertaking. Interactions with management may pertain to commercials, project resourcing and reporting of assorted metrics. At the architecture level there may be engagement to assist in the drafting SOW's, coming up with solutions to problems or development work. I also engage in offering L3 support and sustainment to fellow consultants, engineers and technicians/analysts.

What about your interactions with clients or investors?

As a Consultant I have only limited engagement with investors and account managers etc. however I frequently engage with clients during day to day activities and as part of projects.

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

Under the project I am currently working on most of my time is spent tuning and baselining the Privileged Access Management (PAM) system in preparation to transition it into

sustainment this also includes providing documentation and artefacts that highlight risks that could impact the support organisations ability to sustain the product moving forward.

Which aspects of your work do you find most challenging?

The greatest challenges that are part of my work include working with degraded or extremely low bandwidth network infrastructure and backbones, poorly defined or non-existent documentation and policy, co-operating with competitors and other vendors on projects and contracts and working with colleagues of varying technical ability.

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

One example of my work that captures the essence of the industry is the development of a new technology and/or software solution as this involves a combination of technical skills, problem solving, creativity and the ability to constantly learn and adapt to a rapidly change industry landscape.

Technologies

Autonomous Vehicles

Autonomous vehicles, commonly referred to as self-driving or driverless automobiles, can navigate and drive independently without a human driver. Autonomous vehicle technology aims to create cars that can carry people and products safely and effectively without requiring human intervention.

The state-of-the-art autonomous vehicle technology varies greatly depending on the application and necessary level of autonomy. There are already some autonomous cars on the market that can operate by themselves in certain situations, including on highways or geographical areas. There are still several autonomous cars being developed and tested in regulated settings.

The development of autonomous cars depends on several technologies, including sensors (such as lidar, radar, and cameras), machine learning algorithms, and sophisticated control systems. Through these technologies, autonomous cars may observe their surroundings, make judgements, and carry out actions that will help them navigate and drive safely.

In the next three years, we will see further developments and advancements in autonomous vehicle technology, including deploying more autonomous vehicles on public roads and introducing new applications and use cases for the technology. It is also possible to see the development of new technologies and approaches that will further enhance the capabilities and performance of autonomous vehicles. Some specific results that could be possible in the next three years include the following:

Improved performance and reliability of autonomous vehicles, with a more remarkable ability to operate in a broader range of environments and conditions.

Increased deployment of autonomous vehicles in specific applications, such as trucking, taxi and ride-hailing, and delivery services.

The introduction of new regulations and standards for autonomous vehicles could help ensure the safety and reliability of the technology.

The development of new technologies and approaches that will further enhance the capabilities and performance of autonomous vehicles, such as new sensors and machine learning algorithms.

Several technological and other developments have contributed to the development and advancement of autonomous vehicle technology. Some of the critical factors that have made autonomous vehicles a reality include the following:

Sensors: Autonomous vehicles rely on various sensors to perceive their environment, including lidar (light detection and ranging), radar, and cameras. These sensors allow autonomous vehicles to detect and understand the features and characteristics of their surroundings, such as the position and movement of other vehicles, pedestrians, and obstacles.

Machine learning algorithms: Autonomous vehicles use machine learning algorithms to analyse and interpret the data collected by their sensors and to make decisions about how to navigate and drive safely. These algorithms allow autonomous vehicles to learn from experience and adapt to changing environments and conditions.

Advanced control systems: Autonomous vehicles use advanced control systems to execute actions based on the decisions made by their machine learning algorithms. These systems allow autonomous cars to control their speed, steering, and other strategies to navigate and drive safely.

High-performance computing: Autonomous vehicles rely on high-performance computing systems to process the large amounts of data generated by their sensors and machine learning algorithms and to execute the complex calculations needed for decision-making and control.

In addition to these technological developments, the advancement of autonomous vehicles has also been influenced by other factors, such as regulatory changes, consumer demand, and the availability of funding and investment.

Overall, the future of autonomous vehicle technology is exciting and full of potential, and we will likely see many exciting developments and advancements in the coming years.

What is the likely impact?

The impact of autonomous vehicles on society is likely to be significant and wide-reaching. Autonomous cars have the potential to improve safety on the roads, reduce traffic congestion and emissions, and improve mobility for people who are unable to drive.

In terms of safety, autonomous vehicles have the potential to significantly reduce the number of traffic accidents, which are often caused by human error. Autonomous cars, which do not get distracted, tired, or drunk, could help reduce accidents.

Autonomous vehicles also have the potential to improve traffic flow and reduce congestion on the roads. One of the potential benefits of autonomous vehicles is their ability to identify infrastructures such as traffic lights and signs. The communication between infrastructures allows them to coordinate their movements, which can help to reduce the need for braking and acceleration, leading to reduced fuel consumption and emissions. Additionally, Autonomous vehicles can use their communication and coordination capabilities to optimize routing and to platoon, further improving traffic flow and reducing road congestion.

Moreover, autonomous vehicles have the potential to improve mobility for people who are unable to drive due to age, disability, or other reasons. Autonomous vehicles could provide a convenient and reliable transportation option for these individuals, giving them greater independence and access to opportunities.

One potential negative impact of autonomous vehicles is the automation of specific jobs currently performed by humans, such as truck driving, taxi driving, and delivery jobs. As autonomous cars become more widespread, technology may replace these jobs. However, deploying autonomous vehicles could also create jobs in vehicle maintenance, software development, and data analysis.

Overall, the impact of autonomous vehicles is likely to be multifaceted and will depend on several factors, including the rate of adoption, the regulatory environment, and the specific use cases for the technology.

How will this affect you?

Transportation plays a vital role in our daily lives by allowing us to travel to work, school, and other essential destinations, facilitating the movement of goods and services, and connecting us to friends and loved ones.

Autonomous vehicles (AVs) have the potential to impact transportation in several ways significantly. Some of the critical habits that AVs may impact transportation include:

AVs are expected to significantly reduce the number of accidents caused by human error. Autonomous vehicles are equipped with various sensors and advanced software to navigate the road, avoid obstacles, and make decisions without human input. Because human error is a significant contributor to car accidents, it's believed that self-driving cars have the potential to significantly reduce the number of accidents that occur on the road. Autonomous vehicles could lead to fewer deaths and injuries on the road.

Some of our group members may have disabled or elderly family members. They will no longer rely on friends, family, or public transportation to take them anywhere. Autonomous vehicles can also help people with disabilities or the elderly to have a more active and independent life by making it easier for them to get to work, social events or appointments. It can also increase access to essential healthcare, shopping, and entertainment services.

Vehicle pollution significantly impacts our health. For example, Diesel engines specifically emit high levels of particulate matter, which can cause respiratory problems and irritation of the skin and eyes. Autonomous cars are expected to be electric vehicles, as EVs are better suited to autonomous cars' sensing, processing, and communication systems. These vehicles can help decrease transportation emissions and reduce dependence on fossil fuel saves could reduce fuel consumption and emissions by optimizing routes, driving at consistent speeds, and minimizing idling. So it also Reduced environmental impact.

In conclusion, Autonomous vehicles allow us to move people and goods between locations safely, efficiently, and economically.

Robots

Robots are a particularly interesting area of technology that has developed rapidly in recent years. Specifically in the area of agriculture, different types of robotics solutions are used in various ways to improve efficiency and productivity in agricultural processes (Bogue, 2021).

About Robots in Agriculture

Du et. al. (2022) describes remote sensing technologies in drones that are currently being utilised during the growing process. In this part the farming process applications include the monitoring the health of crops, monitoring for infestation and identifying areas of crops that require irrigation. The tool has the benefits of time saving and high levels of precision; a drone can carry out these tasks much faster than any human could and can pinpoint issues requiring attention with more accuracy than even the trained human eye.

Furthermore, considering that water is a scarce resource in many farming environments, the ability to water only where it is needed is great opportunity to optimise the allocation of scarce resources. Drone technology can also be used also to identify irrigation leaks (Columbus, 2021) further optimising on a finite resource.

Remote sensing is also utilised for crop yield predictions; Remote sensor technologies consider crop health and rate of growth, and are used alongside 3D mapping carried out by drones (Columbus, 2021) to predict the impact of poor weather and disease on the ultimate yield of a crop (Du et. al. 2022). This gives farmers the ability to plan for harvesting with a high level of accuracy, (Bogue, 2021) ensuring the right amount of labour is hired at the right time.

Utilisation of drones for crop spraying is another recent development. This robotic solution also allows crop spraying to be carried out much faster and with a high level of precision in comparison to a human operator. This is considered a “labour saving technology” (Du et. al. 2022) so, while there are still human tasks to carry out as a part of the process, the manual labour is minimised, by the work done by the drone. Here through the high level of accuracy

reduction in the damage to crops through mistaken spraying is observed, and weeds and infestation are quickly and effectively eliminated; a drone can apply herbicide to an individual weed.

Future developments in the area of Robots in agriculture are fascinating and innovative. In the coming years, Mobile Field Robots (which are currently in prototyping) will have the functionality to perform many traditionally human functions in the industry, for example preparing soil, seeding as well as the application of herbicides, pesticides and fertilisers (Bogue, 2021). It is in this space of herbicide/pesticide application that great innovation exists, as these robots have the potential greatly reduce the use of chemicals due to their high rate of precision. They also have the potential to apply alternative methods outside of chemicals, such as uprooting and heat treatment to eliminate weeds (Bogue, 2021). These robots will be made possible by the development of mobile platforms that are capable of operating in outdoor environments, in dynamic and undefined conditions (Bogue, 2021)

Another potential that is emerging in the field of robotics in agriculture is Artificial Intelligence (AI) in robots. AI is being developed to assess food quality prior to harvest, through the use of large datasets of images of the relevant food sort (Du et. al. 2022) alongside captured images of the growing crops. Columbus (2021) described the future of agriculture as one where “AI, machine learning, in-ground sensors, infrared imagery and real-time video analytics all combine to provide farmers with new insights into how they can improve crop health and yields”.

The Impacts of Robots in Agriculture

As with any new and innovative technological advancement, there are many impacts to be considered in this space. Some positive impacts, some negative impacts, and some that are certainly cause for debate.

As determined by Bogue, (2021) and discussed in the previous section, these technologies aim to improve the efficiency and productivity of agricultural practices, and they are successful achieving that purpose. When we look at the possibility of minimising or eliminating the use of herbicides in agriculture, the positive impact on planet, people and land owners is undeniable. The negative impact of herbicides is well documented, effecting the environment, farmland (by killing beneficial insects that live in the soil) and humans (causing cancer and birth defects) (Bogue, 2021). Certainly, then, any technology that results in fewer herbicides being used is a great positive impact.

When we consider the future of robots in agriculture, farmers, to have an accurate insight into the quality of their crops and their upcoming yield will ensure they secure the best possible prices for their goods (Columbus, 2021). The implementation of AI will reap benefits from upper to lower food supply chain: when a farmer has accurate forecasts of ‘to be yielded’ quantities and visibility over a negative impact to the quality of a harvest, supply can be managed more effectively. Results are less likelihood of shortage or overstock situations; and issues can be identified quickly to avoid bottlenecks in the supply chain which could result in wastage of fresh goods (Du et. al, 2022).

A negative impact to the implementation of robots in agriculture is the certain loss of labour jobs in the industry (Bogue, 2021). Fewer workers are required in farm settings to carry out the labour-intensive work that is now replaced by robotics solutions, with this likely to increase further. Interestingly, Columbus (2021) argues that due to the labour shortages in the industry, replacing the human role with a robot gives the farmer more certainty that a time sensitive task can be completed.

How This Affects Us Directly

As with the impacts on the greater community, as a group we will be impacted both positively and negatively by innovations in robotics and agriculture. Some of these impacts are dependent on our differing personal circumstances, other are dependent very much on our differing perceptions.

Each person in our group, and out families and loved ones are positively impacted when there is improved food availability at a decreased cost to consumers. We are similarly, all to benefit form improved food quality and safety of fresh foods (Du et. al. 2022).

More than one member of our group is living in or grew up in farming communities in Australia. They will see and know people that are directly impacted by this technology. People who have limited skills and limited access to other jobs in their rural communities, who will no longer have a reliable income due to these technological advancements. Certainly, when the people we know and love are directly impacted like this, it is more difficult to accept the positive impacts of this change.

There is an argument to counter this perspective, however. Salimova, et. al. (2021) looked at the expected wages that farm labourers often lost when a crop was negatively impacted by weather or infestation, or when yield was much lower than expected. While fewer jobs may exist in the industry, when farmers have a good oversight of these issues and predictions, it allows for a more reliable view of the seasonal work these labourers can expect.

Overall, it is interesting that (especially in farming communities) these changes are seen overwhelmingly as negative due to the loss of jobs it brings with it. The technologies are bringing with them great benefit for profitability, food supply and sustainability (Recuro-Virto and Valilla-Arrospide (2021). It will take time and education to shift that perspective in the greater community.

Clouds, services, servers

What does it do?

The role of clouds, services, and servers is to provide a function to a customer. These functions vary greatly and they can range from externally hosting a web server, to having a system where personnel within a company can contribute to a document together, or even a location to store files like pictures you want to access from your phone to your computer. Clouds are the overarching models behind services and servers.

They are what is obtained when both are combined; providing a service through a server. Services vary in three different levels or types, from Software as a Service (SaaS), Platform as a Service (PaaS), and finally, Infrastructure as a Service (PaaS). Straying away from cloud computing, the terminology used which is referred to as the step before SaaS, is “on premises.”[1]

Servers

Servers do exactly what they say, they serve (HP, 2020). Servers deliver a service or functionality to a customer. They work as large and powerful computers, which have been purpose built, to process mass amounts of data quickly and send it efficiently through to a user or device on the other side. Therefore, once you connect to the internet, you are connected to an array of servers throughout the world. If a server is designed to perform just one task, like printing, it is considered a “specialised server.”

Additionally, servers vary in size. They can be the smallest network cluster considered a “PAN” or a “Personal Area Network” all the way through to a “WAN”, a Wide Area Network. The largest WAN in the world spans from every corner high and low, and it is called the internet. The internet is not in one sole location, however it is a large collection of servers, switches, routers, and other technologies which have been interconnected in order to provide the customer, client, or user with a seamless experience from browsing Google, to researching on Wikipedia.

Within businesses and organisations, servers can be hosted in-house, or they can be rented from another company which specialises in server management. Businesses can host their servers in a closet or a ‘glass house’, which prevents unauthorised access to these servers. If the servers are not held on premises, then it is likely they would be hired out from a company such as Amazon which offers data centres worldwide, with technicians available on-site for any emergency maintenance. When a business hosts their own server room within a glass house, they are required to provide this availability in order to ensure their customers can utilise their server at all times. However, these internally hosted networks, often referred to as “intranet”, can be more secure as they may be a lower priority target to any adversaries.

All servers use technologies and methods which are compatible with one another to create the world-wide-web work flawlessly. The current state of the art of these technologies lies within the large scale monitored and secure LANs (Local Area Network), within schools, universities, and workplaces. The extent of the current technology is a secure means of communication throughout a business setting. The technologies with this rides on is the current security practices and cybersecurity standards, as often the most utilised cloud services used are social media communications and mass storage solutions, which are vulnerable and high priority targets for adversaries.

Services & Cloud Computing

Cloud computing is the overarching term of each service, SaaS, PaaS, and IaaS. Whether the servers are located locally or are in an offshore datacentre, all services which they are providing make up for the broad term of “cloud computing.” Public clouds are externally

hosted services, where the external provider is held responsible for all on-premises security, maintenance, and assurance. None of the hardware, software, and supporting infrastructure is owned, managed, or held by the lending business. Private clouds, however, are held completely by the business and are held completely on-premises, the opposite to a public cloud. However, depending on how the private cloud has been set up, it may not be available to employees at home or outside the boundary of the office.

Software as a service is often run from an external server, operating on the internet. The lending company is responsible for all software upgrades, security patching, and the underlying infrastructure of the software being provided. Often these software products are either based on a subscription basis, to ensure income is produced to conduct these maintenance tasks, or they may be generating revenue through other mediums. SaaS is primarily advantageous because it is often the cheapest option, making it simple for small businesses and start-ups to afford, though, this does come at an increased security risk as interactions are being made through the unsecure internet. Therefore, if a business is large enough, it may fall victim to man-in-the-middle operations or otherwise undetectable vulnerabilities. Additional to this, software as a service is often a non-customisable application made for general use, and serves to please a large audience.

Platform as a Service, often referred to as “middleware”, are scalable options for any sized business with the availability to hire a dedicated IT department. The platform being marketed is the underlying infrastructure of servers and platform which the servers to run. This is inclusive of operating systems. The client then no longer has responsibility for software maintenance, resource management, patching, server maintenance, or any further level of managing the servers. The lender can also offer different products such as container engines, artificial intelligence, through to big data analytics. This is the middle ground between Software as a Service and Infrastructure as a Service, which IaaS is the simplest form. IaaS is the basic building blocks of networking, it offers the highest amount of flexibility, just below hosting an independent server farm, which the client hires a network on virtual or dedicated hardware. The hardware is scalable, as the lender can associate higher resources to different clients asking for differing services.

What is the likely impact & how will this affect you?

Cloud computing is reaching full maturity in the world, as Amazon Web Services (AWS) is beginning to dominate the field. A disadvantage to these technologies is that when a disaster occurs at a site, all hosted services utilising that site are then affected. However, Amazon’s world-wide scale of their cloud computing technologies builds an advanced level of redundancy which smaller businesses cannot compete with. This exemplifies the monopoly which can be easily achieved by a large company in a growing IT field, when executed correctly.

The largest threat which the world of cloud computing faces is the maverick individuals, state-based cybercrime, and issue-based threat actors. The news-worthy cyber criminals. The more that cyber security enhances, the more data industries are willing to store, making the target more attractive to these cyber criminals. The world has recently faced a shift since 2020, a record year in cybercrime, which is forcing a shift in the development of these

cloud and online services. Cyber security is becoming a highly sought after profession, and unfortunately may risk over saturation with inexperienced workers. Since cyber security is sought after so incredibly, cyber engineers which are well known to hirers are getting plucked from underneath. This hunt and seek culture which is building up, may end up leading to a worry of under training, since personnel are moving around more often than the time it takes to train an employee. Or, since there is a major lack of workers in the cyber field, it may end up you get placed into a position which is of a higher expertise, and you end up becoming responsible for more than what you are comfortable with.

However, this will be occurring in the coming years, and self-training and additional learning is an option that we can all volunteer ourselves for in our spare time leading up to our professional life.

In terms of a more positive outlook of the future of the internet, cloud computing and other networks, this will become a larger standard amongst the average industry and IT may begin to continue to work in specialised groups and organisations rather than working directly for a company, may it be through a contract or through a business investment between two companies. This will affect IT technicians as they may work at a multi-site business, having to travel between buildings with varied standard operating procedures and other technical documentation pertaining to their standards. IT will need to account for a larger amount of technologies being used, as within the business I currently work in, it is standard to track every single computer, printer, and general asset pertaining to IT, and this may end up that IT professionals will be required to track more devices, opening up more time-intensive tedious activities which extend the already increasing workload on the IT workforce. However, this will open opportunities for additional levels of automation to take over other manual, data entry, jobs. As IT is a general field and contains a vastly in-depth level of many differing technologies, it increases the availability for all IT professionals to learn about differing subjects from their expertise. I.e., it may be expected from an employer that you are capable of cloud computing, DSPF management, and trained within ISM – which are three varying fields, yet they all require to be connected within the well-structured field of information technology, since they all pertain to networks.

Blockchain Technology and Cryptocurrencies

Blockchain Technology

A blockchain is a decentralised, distributed ledger that holds the records of transactions, then corroborated and retained by a peer-to-peer network of computers. No central authority governs the blockchain, such as governments or any centralized organization, but a collective of global individuals. Once a record has been added to the blockchain, no one individual can modify or erase records or any previously recorded. Each record contains the public key for the sender, a public key for the receiver (with the possibility of multiple receiver keys), and the information of the transaction. Every recorded transaction is cryptographically linked to previous recorded transactions and a copy of the transaction is stored on every computer within the network. This helps prevent unauthorized access and modifications to each

record as the append would have to occur on each computer to be valid. (Yli-Huumo J, 2016) (Sarmah, 2018).

Blockchain technology first appeared with launch of a new digital currency, Bitcoin, in 2008, theories on blockchains and papers outlining the fundamental concepts and initial prototypes of blockchain technologies were created since the late 1980's and early 1990's (Dylan Yaga, 2019). But when a developer going by the pseudonym, Satori Nakamoto released his paper; "Bitcoin: A Peer-To-Peer Electronic Cash System in 2008, it was only then that blockchain technology's' inception became official. Within a few months of it release, and usage of a combination of previously outlined technologies, an open-source implementation for bitcoin was created and the initial bitcoins were released in 2009 (Sarmah, 2018).

Besides the use of blockchains within the realms of crypto-currency, additional industries have researching adopted the technology within their given field. Healthcare, for example, the potential for increased patient management, used to maintain supply-chain management, as well as have more stringent control measures for data access. Through the use blockchain technology, security and access control could be more enhanced, giving more control to the patient, as well as providing a more secure method to share records between providers. (Hölbl, 2018).

The impact Blockchain will have.

Blockchain technology has great potential for use the business and private sector for record management, assets and digitization of goods and services, without the need for third-party authentication and control. Blockchain can be merged to use with other technologies such as artificial intelligence, vehicle automation and cloud computing to mention a few. A key example of how blockchain can be used to increase efficiency within a business, is immutable record-keeping. As each file is created as a single entity and validated by a consensus, this provides only one version of the document, thus lowering the need for audits and keeping dispute resolutions to a minimum. Also, blockchain provides proof-of-existence, validating only one copy, and can prevent prohibited duplication and the ability to counterfeit (Aste, Tasca, & Di Matteo, 2017). Blockchain provides greater transparency as it allows a view of the digital form start to end and provides an auditable trail of all transactions added to the ledger. (Could Blockchain Have as Great as impact as the Internet)

How will this technology affect me:

As a potential software developer, I am sure I will encounter this technology either during the study of Information Technology or integrating the technology into software that I may develop in the future. This, of course will increase the learning I will have to undertake, along with other technologies that may appear during the course of my study and/or employment. Through the course of daily life, I may or may not know if the current technology would have incorporated into the applications that I use.

This cause no difference in the way that I would go about my life. Being a backend technology, no visibility would occur unless I was working with technology first-hand. As far as affecting friends and family, I do not believe they would know if the technology was

present in the applications they were using, without further delving into fine print of the applications. Neither groups would have any first-hand experience in dealing with technology and may not in near or far future.

Cryptocurrency

The definition of cryptocurrency is a digital payment method for the exchanges of goods and services via a computer network that does not rely on a central authority to maintain and control it (Milutinović, 2018). The aim of cryptocurrency is to a have decentralised system where parties can verify that each of the parties has the funds available, removing the need for an intermediary. (Yaffe-Bellany, 2022). Information of ownership is stored in a digital ledger, which also records all transactions, controls the flow of supplementary coins and ensures verification of all transactions. All information stored is secured cryptographically in a database called a blockchain.

The original cryptocurrency that was first introduced was Bitcoin, released in 2008, by the developer, Satoshi Nakamoto. (Dylan Yaga, 2019), but since then, a multitude of other various cryptocurrencies have emerged into the market, known as altcoins. These include Litecoin, 2011, and Ripple in 2012. Litecoin offers advantages over Bitcoin in the way its mined or verified, by offering a memory-intensive algorithm know as a Scrypt POW algorithm. This allowed more users to participate in verification without the need of specialized hardware, as required by Bitcoin. Litecoin offers the advantages of a quicker processing time, and able to process a higher volume of transactions at any one time. Another technology introduced with the advent of Ethereum, were smart contracts. These allow the control of events and actions within the guidelines of the contract/agreement (Röscheisen, 1998). The outlying purpose for smart contracts, was to reduce the need for trusted third parties, costs and prevent the possibility of fraudulent attacks. (Fries, 2019)

With investments into blockchain technology, such as the introduction of BAAS; Blockchain as a service, which will rely on cloud-based technologies. Tech-giants such as Microsoft and Amazon have invested heavily into this technology. Typical usage for this type of product could be decentralized apps and smart contracts. Other uses in include DeFi (Decentralized Finance applications), and Payment Settlement Systems. This investment could see the rise in value for cryptocurrencies such as Ethereum and Bitcoin (CryptoGT, 2021).

The impact Cryptocurrency will have:

With emergence of cryptocurrencies and the advancement of surrounding technologies, cryptocurrencies are promoting growth and development with the fintech industry, namely supply chains and value chains. As a growth proponent for the fintech industry, cryptocurrency promotes the independence from intermediaries and reduces centralised control while contributing to the development of a digital economy (Innov, 2021).

While there are benefits in utilising cryptocurrency, many believe that cryptocurrency has had an environmental impact with increased energy consumption associated with “mining” of cryptocurrency. Environmentalists believe that this may result in an increase to carbon emissions and effectively speed the process of climate change. (Research, 2021)

How this technology will affect me:

The effect, if any, that this technology will have on myself or others around me, will ultimately come down to whether this technology will become a mainstream payment system. Currently, I have no investments in cryptocurrency nor any future interest in this technology at this current time. However, during my studies or hopeful employment in the future, I may encounter this technology and further learning and possible investment may occur.

Project Idea

Overview

The project SudoA+ has chosen to do is building a website for farmers. Our goal was to choose a project that could be used in a real-world application and to solve the issue that farmers face when looking to cultivate their farming business. Our first and main point for our website was to figure out what information farmers mainly look for when preparing for a new season of farming. Upon research, our group has all agreed upon that forecast would be the main information farmers sought out for before planting anything. A forecast website for farmers would prove to be a valuable tool that helps farmers make informed decisions about planting, harvesting, and other important agricultural activities. The website will provide a variety of weather and climate data, including current conditions, short-term and long-term forecasts, and historical records. One of the key features of the website will be its ability to provide localized weather information. This is important because weather patterns can vary greatly even within a small geographical area. This will allow farmers to input their location and view weather information specific to their area, including precipitation, temperature, wind speed and direction, and other relevant data. Another important feature of the will be its ability to provide long-term forecasts. This is particularly useful for farmers who are planning to plant crops or make other investments in their land. By looking at long-term forecasts, farmers can make more informed decisions about what types of crops to plant and when to plant them. The site will also provide historical data that helps farmers understand how weather patterns have changed over time in their area, allowing them to make even more accurate predictions about the future. The website will also provide alerts and notifications for severe weather events, such as storms or heatwaves. This allows farmers to take action to protect their crops and livestock, and minimize damage to their land.

Motivation

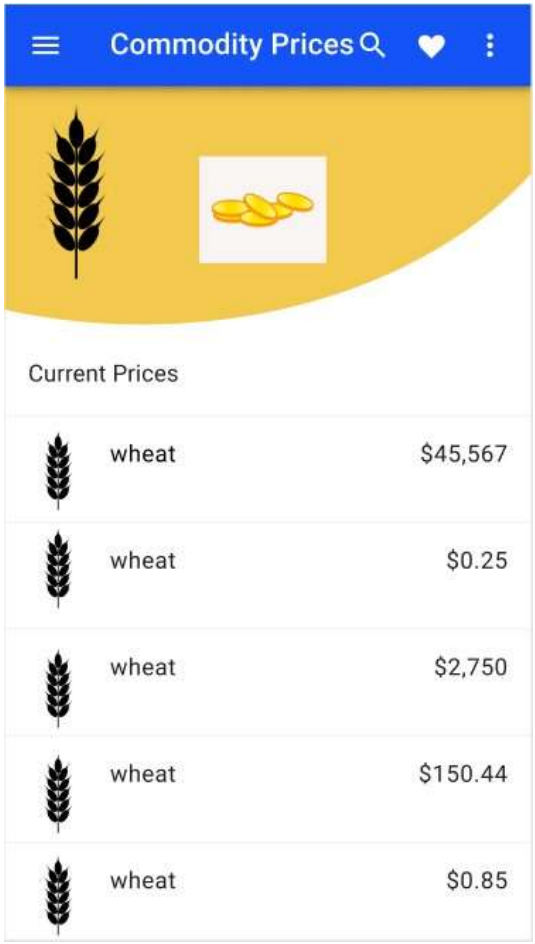
Timing in farming is a crucial factor to achieving the best possible yield when harvest time comes around (Kerr, 2016). Planning for the right time to carry out any growing activities is highly dependent on weather patterns and every farmer spends time researching weather patterns as a part of the planning process. So, we see a market for delivering a variety of weather information in one place for farmers.

Farming can be a very solitary way of life, which often involves living in remote locations and working alone for long hours. We see the opportunity to connect farmers, their knowledge and expertise via our website in the way of blogs and a social platform.

Our research found that there are many technological solutions on the market that provide one or two of the features our website will incorporate. We see our solution as innovative because it can be used by our end user as a hub; a one stop shop to find different types of weather forecasts specific to an area, a forum for sharing advice and learning from other farmers, a place to refer to when you have questions on everyday farm repairs and a forum for social interaction and support. To combine these aspects into one platform that is easy to use and navigate we see as an appealing source for our target audience.

The challenge of drawing each of these elements together is a great learning experience for our team and will provide us each with the opportunity to develop our growing skills in coding and design. This is a strong motivation for the groups decision to pursue this project idea.

Description



Price data

Upon further search, we established that another useful feature that we would want to include in our app is the addition of live price data for the commodities that farmers would be interested in. This would give them the ability to have one centralized platform hub for all their business-related needs as they would be able to receive live price data for commodities such as oil, grain wheat, etc. This feature is useful for farmers as they require to sell their produce at a specific price for them to be able to make a profit on their crops. In addition, this feature can also include alerts for when the prices of specific commodities reach a certain threshold set by the user. This way, farmers can be notified when the market conditions are favorable for them to sell their produce. This feature can also include historical price data for specific commodities that the user selected. This will help farmers to have a better understanding of the market conditions for the current commodity that they are producing, which will enable them to make more informed decisions on when to sell their produce. It will also increase the usability of our app by providing more value for our users and it will enable us to retain our current user base.

Furthermore, this feature will also help farmers to stay up to date with the market conditions and make better decisions about what to grow and when to sell. This will ultimately help farmers to increase their profits and become more successful as a business.

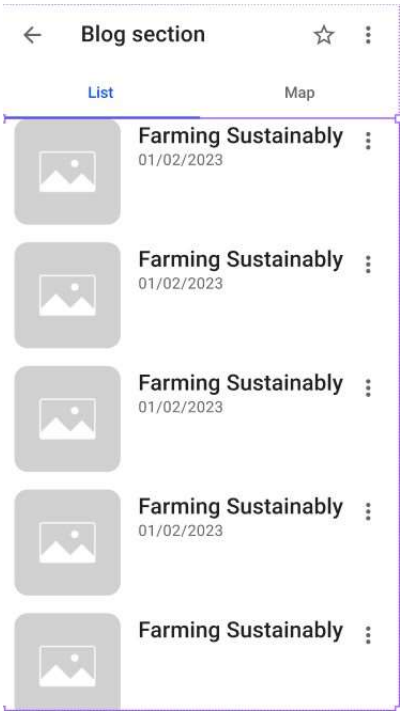
Weather Forecasting

Weather forecasting is a critical feature that our team has decided to include on our website, as it plays a crucial role in determining the success of agricultural pursuits. Seasons and weather are vital factors in agriculture and farming, and the website's forecasting feature provides farmers with the necessary updates on temperature, wind speed, and precipitation levels. This allows farmers to make informed decisions regarding growing various fruits and vegetables.

The wind speed and temperature forecasting feature are handy for farmers as it helps them to determine the optimal time to apply fertiliser, including the appropriate rate and type. This helps ensure that fertiliser application's lousy timing does not hinder the crop's growth. The feature also allows farmers to determine when to apply pesticides and insecticides to avoid crop loss. Additionally, the wind speed feature helps farmers determine the best time to use pesticides and insecticides so that the sprayed chemicals do not miss their target areas.

Precipitation is also crucial for agriculture, providing the water needed for plants to grow and thrive. Without adequate rainfall, crops will suffer from drought and may not be able to produce a harvest. Additionally, consistent, and well-timed precipitation can help to prevent soil erosion and maintain soil fertility. Our website's precipitation feature is designed to help farmers save water and money by not irrigating when rain is forecasted.

Providing access to accurate and reliable weather forecasts can help farmers make informed decisions that can lead to a more successful and profitable agricultural operation. Weather forecasting can also assist farmers in making crucial business decisions. It helps them plan for the many daily decisions that need to be made, such as crop irrigation, when to fertilise, and when to work in the field. These decisions can significantly impact a crop's profitability and a farmer's competitiveness in the market. With accurate and up-to-date weather forecasts, farmers can make informed decisions leading to higher yields and better crop management.

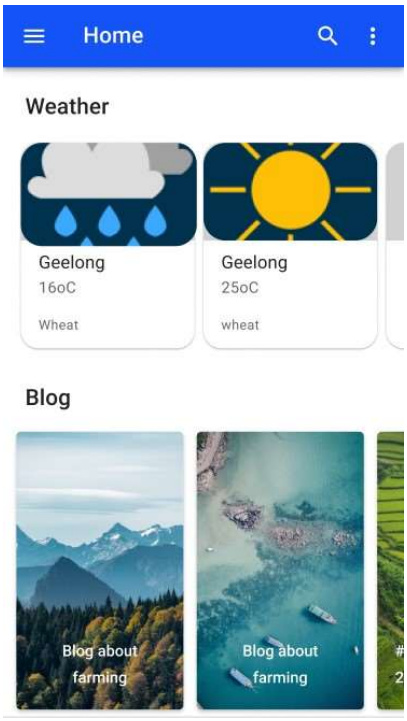


Blog Section

The website will contain a blog, which will display relevant information such as news pertaining to insect and other pest migrations, sustainable farming techniques, and other relevant information to farmers. The purpose of this feature is to enhance the useability of the website, and the interest in regular checkups to the website. If the website only contained relevant weather information, then it would only ever need to be checked once per day. However, with a live news feed, we will be able to attract farmers to check up on the website at the end of the day, by displaying interesting information such as discounts of important equipment. This regular news outlet will culminate all important data for farmers, and prevent the need for browsing a large amount of website in order to find information, and decrease the likeliness of local Australian farmers missing out on opportunities which are for short term only. This feature will fetch data from an RSS feed, or multiple RSS feeds, which have data and news relating to the Australian farmers. It will also include a local RSS feed which will be able to be updated from a location external to the website itself, ensuring a level of security; making uploading to the RSS feed inaccessible from the internet. The matter of fetching data from multiple RSS feeds will be able to generate a passive revenue to our website and reduce the requirement of cumbersome advertising (which may decrease the useability since Australian farmers often run on slower or intermittent network connectivity). Through using multiple RSS feeds as well, it will be able to increase the available information to the farmers accessing our website, by not requiring our staff to manually update and find news articles themselves.

Mobile View

An important feature of the website is ensuring it is mobile friendly by creating a visually appealing mobile view to improve the user experience. Responsiveness in the web design is important for our end product, this will ensure that when the website is accessed on any device that the interface is user friendly. Taking a responsive approach to the web page development will mean that different style aspects will serve different screen sizes, allow orientation switch and will consider displays to various resolutions (Berry, 2021). Focusing on responsiveness during our web design will eliminate the need to design several different web pages for each different device that the end user may need access from. Because a key concept our of project is to offer differing resources in one place; this is not just a weather website, it makes the responsiveness of our page



design important. The user should be able navigate easily from section to section. They should be able to contribute on forums easily whether accessing via a mobile phone, tablet or desktop and they should be able to search and enter filter criteria with a smooth user experience (Human Service Solutions, 2022). When we consider a lifestyle of a farmer; working long and unusual hours, operating machinery for many hours at a time, performing physical and repetitive tasks. These factors lead us to believe that our end user may rarely be accessing our website from their PC or laptop in the comfort of their home. This makes a responsive web design a requirement to provide a satisfying user experience from any possible device.

Machinery Manuals for Farmers

A feature we would like to add to our website is a subsection dedicated to providing links to workshop manuals for various farming machinery. We believe this will aid farmers in finding the right information and with this, the possibility of minimizing spending on costly repairs. The initial links will point to paid workshop manuals, and then in the future, will provide information in finding either free manuals or advice to how to find the right information. If free manuals are available, links will be provided to download the file. All attached will files will be pre-scanned for viruses before uploading to ensure the safety of our consumers. Initially, links to the most common machinery will be provided with future updates to expand the database to lesser-known machinery. These links will either be posted on the main page or with the blog section of the website and will be integrated into navigation bars via html for the website This will ensure ease of accessibility. There is also the possibility of monetization by adding affiliate links provided by the publishers of the workshop manuals. The goal of providing these links to relieve some the stress in finding manuals, as it can be a tedious task that can provide little to no results. Having a place where information can be accessed at the click of button, relieve the stress, minimize the time for looking for the right information about a particular piece of machinery, putting more time back into more important tasks. There are also benefits for the site. The benefits in adding these types of links are, attraction of repeat visits from previous visitors, plus the attraction of new visitors to the site.

Social Platform

Another important feature on our farming website would be a social platform. This will allow farmers and gardening enthusiasts to share information, ask questions, and connect with one another. One of the main benefits of a forum is that it allows users to share their experiences and knowledge with others. For example, a farmer who has successfully grown a particular crop in their area can share tips and advice with others who may be struggling with the same crop. Similarly, a gardener who has found a solution to a common pest problem can share their solution with others who may be experiencing the same issue. This type of information sharing is invaluable, as it can help farmers and gardeners to improve their yields and reduce their costs. Another benefit of a forum is that it can be a great place to ask questions and get answers. For example, a new farmer may have questions about how to set up their farm or how to care for their animals. They can post their questions on the forum and receive answers from more experienced farmers. This type of community support is essential for new farmers, as it can help them to get started on the right foot and

avoid common mistakes. A forum can also be a great place for farmers and gardeners to connect with one another. For example, farmers who live in the same area can connect and share resources, such as equipment or labor. Similarly, gardeners who have a shared interest in a particular type of plant or gardening technique can connect and share information. This type of networking can be beneficial for farmers and gardeners, as it can help them to build relationships, increase their knowledge, and improve their yields. We will be taking inspiration from successful social media platforms such as Facebook as it proves to be an already working layout that we may be able to replicate but in a more farmers friendly twist to it.

Tools & Tech

For us to be able to successfully build our project we would require to identify the exact tools and technologies that we would need to achieve each of the tasks required. We would need to split those technologies into three separate categories based on the tasks that each of them is going to achieve. Firstly we would need to look into The front end or the visual aspect of our website. For this part, we could make use of Figma and or Zeplin for prototyping. Then the javascript library react.js or gatsby.js for us to be able to make use of the ease of prototyping and the flexibility that it provides with all the addition of UI libraries. In conjunction with react.js for the front end, we would also make use of Material UI components or templates to speed up development and prototyping coupled with tailwind CSS, In addition to that we would also make use of vanilla HTML, CSS, JS and get introduced to JSX that incorporates HTML elements into JS. For us to be able to serve images as the right resolution regardless of screen size and to make sure we organize all our static images in one place we would make use of the Cloudinary CDN. Secondly for our web app to be able to serve dynamic content we would need to make use of external APIs such as the 'dark sky' API to collect and display the weather data, and 'yahoo-finance' to collect and display the commodity price data. The way we would make those API calls is by using the Axios library instead of the built-in fetch method as it will speed us the development process. In addition to that, we might require to make use of graphQL depending on what type of calls the API allows for and what we require. Finally, to host our app we could make use of either GitHub pages or netlify that would depend on the future whether the project would require more backend functionality such as a connection to a CMS such as contentful for ease of authoring new articles and making editorial changes. For us to be able to keep our project on track and manage our team's progress we could use Microsoft teams, Jira, and Mirro to create a visual representation of our project tracking in combination with git/GitHub for paired programming and VSCode or atom as a code editor. Although the technologies listed above all work for our project as of now during the development life cycle we might come across the need to swap out or substitute new technologies based on the current needs of the project.

Skills

The skillset required in order to create a website for farmers can be broken up into three different sections: The back end, where we will mostly be dealing with the technical challenges and skills required to complete the task. The middle end, which will contain all the management, teamwork and associated interpersonal skills in order to create a product.

And finally, the front end, which is what our target audience will see, which is the attention to detail, our farming knowledge and our ability to advertise this product correctly and accurately to our target audience. If any element of this project fails, there will be no product in the end. The back end is required in order to create the structure behind our project, the middle end is required for the task to be built correctly and accurately, and the front end – what is a product without a customer?

JavaScript, HTML5, API implementation, and design skills will be required to create our website. HTML5 is the basis of the internet, it is what tells our computer what to show to us on a website. JavaScript will communicate with a partnering industry's website in order to collect relevant data and display it live. APIs will be implemented through the use of JavaScript, however this skill also contains the ability to scope out the best product for our service. Designing the website may end up complex as we will be required to make the website feel natural to a farmer and not be cumbersome, and effectively, we are seeking to increase the efficiency of the farming industry.

Analytical thinking, communication skills, problem-solving, and our teamwork skills will ensure a strong product delivery. We will be required to think analytically and problem solve in case we encounter any unforeseen issues throughout this project, and will must be able to communicate these effectively within our team.

Our attention to detail and general crop knowledge is what is going to be seen on the surface by our customers. If we are fetching data in the incorrect format (Fahrenheit instead of Celsius), we may end up ruining our project and therefore, ruining the efficient use of our project. Our general crop knowledge will be what the farmers will be judging most harshly, therefore, in later stages we will be required to take onboard feedback, which may change our project completely, maybe even three times over. Yet, we will be required to be resilient in order to successfully complete our project and send it out to the general public.

Outcome

The outcome of this project is a comprehensive and user-friendly website that serves as a valuable tool for farmers to make informed decisions about planting, harvesting, and other critical agricultural activities. The website provides weather and climate data, including current conditions, short-term and long-term forecasts, historical records, price data for commodities, and weather-related tips and best practices. It also includes a social platform like a forum, critical weather conditions, and pest and insect warnings and is optimized for mobile view.

The outcomes for farmers using our website could be:

Increased crop yields and profits: By making informed decisions about planting, harvesting, and other agricultural activities, farmers can improve their crop yields and increase their profits.

Reduced crop loss: By receiving alerts and notifications for severe weather events, farmers can take action to protect their crops and livestock and minimize damage to their land.

Increased efficiency: By accessing localized weather information, farmers can optimize their irrigation and fertilization plans and determine the best time to apply pesticides and insecticides, reducing the chance of crop loss due to bad timing.

Improved farming practices: By learning from other farmers through social platforms and reading weather-related tips and best practices, farmers can improve their farming practices.

Increased accessibility: By having the website optimized for mobile view, farmers can access the information they need from any device, regardless of their location.

A Better understanding of the weather patterns in their area: By using historical data, farmers can better understand how weather patterns have changed over time, making even more accurate predictions.

Increased knowledge of the commodities prices: price data for commodities can help farmers to plan their sales and purchases.

Increased farm safety: critical weather conditions and pest and insect warnings can help farmers prepare for potential hazards and protect their farms.

Overall, the outcome of this project is a website that provides farmers with a wealth of information and resources to improve the efficiency and success of their farming operations.

Group Reflections

Charlie

Working in a group increased our efficiency and produced a better product. Our personalities conflicted perfectly in a constructive manner, bringing together the worlds of imagination, realism, and focus to our project.

When we worked in our group it was common for people to attempt to make the workload even amongst all people. However, there are times when this would not work since if someone delayed their workload due to external commitments, the entire project would end up delayed. This problem may have been averted if we properly formatted our workload and time, utilising tools such as a Gantt chart.

When working in groups, I have learned that it is important that somebody takes charge and assigns work as necessary. We are all acting on the same level, and it is creating times of confusion or moments where people are waiting on someone else to decide what to do next.

Unfortunately, as our group did not assign work through GitHub and the final GitHub activity seems as if one member did the work, it was collectively done on another medium (Microsoft Teams), which ended up being more community focussed and efficient for the method we undertook.

Kate

Our group used Microsoft teams as a platform for communication and collaboration fairly effectively. We created a OneNote Notebook within the Teams Channel and used this to collaborate on our work, to share resources and for meeting Agendas and actions.

Communication overall in our group could be improved. When members are missing from calls without prior communication it makes it difficult in our calls to assign work and to ensure previously assigned work has been completed. I feel like we could have completed the assignment sooner and more easily if our communication was more consistent as a group.

One surprising thing for me was the different ways of working we observe within this particular group. We have group members that communicated a lot and some that communicated not so much, we have group members who work to timeframes well and others who followed their own timeframes but ultimately the work got done. This was challenging for me, but I learned that alternate ways of working are not wrong ways of working, and I should not expect others to work the same way I do, as long as we reach our common goal.

Mihail

What went well:

Overall, I think the participation level within the group was an above satisfactory, where in most of the time, everyone was able to have an input into ideas and objectives, decisions were made unanimously, and we were able to achieve a majority of the objectives before the deadline.

What could be improved:

The group operated successfully and there was not much need for improvement. The only issues were late submissions of work, this delaying other parts of the project.

Surprising Fact:

The one fact that I found surprising, was lack of effort needed to work together. The group seemed to feel at ease with each other quite quickly, and an absence of conflict. Nobody tried to override decisions or cause issues within the group.

Group Learning:

Even though we were all strangers before starting the group, it was not difficult to start collaborating on ideas and opinions, and that working within a team, more can be achieved quicker, than just a singular person.

Tools Activity:

The GitHub workflow reflects that only one or two people within the group actively participated. This was due to assigning certain members to work on that part of the project.

Peter

The one thing that went really in our group was the use of teams and the integration of OneNote to it to keep all our work together in one place and make it more efficient to create amendments. In addition to that the table of actions to be completed which I believe Katherine was responsible for putting together, was a grate in highlighting the key actions that need to be taken for our next meeting and who is responsible for them. One thing that I believe could be improved would be the visualisation of the scope of the project as a whole to allow for better priority management and us to always be able to keep track of where we are. I believe a tool like 'Jira' or 'Trello' would be ideal for our next group project. One thing that I found surprising was the commitment of the group in being able to complete tasks on time and being so active in scheduling meetings, in addition to that the consistency of the meeting times was also quite intriguing. One thing I learned about groups was that everyone has a different way of thinking about tasks and it allows for a quick change in perspective. I don't think that the GitHub log activity fully reflects the group's work, as the website was built mainly by Charlie consequently he will have more commits.

Samith

Regarding what went well during our group reflection, our communication was effective, and everyone could contribute their ideas and thoughts on the assignment via our group chat and virtual meetings. Additionally, we divided tasks and worked efficiently to complete most of the work on time. We provided constructive feedback to each other throughout the project, which helped improve the final product's overall quality.

We have done a better way of establishing clear roles and responsibilities throughout this project. So, we only have a little to improve.

One surprising thing was the level of engagement from all group members. Despite being in different physical locations and time zones, we could effectively collaborate and complete the assignment. I was impressed by the level of participation and the quality of the work that everyone produced.

Through this group project, I have learned the importance of clear communication, effective task management and setting roles and responsibilities in a group. Also, establishing trust and respect among group members is vital to foster a positive and productive working environment.

The GitHub activity log doesn't accurately reflect everyone's work on this assignment because most experienced members in CSS and HTML took responsibility for delivering a quality product at the end of creating the website.

Sunggil

I thought that our team working and communication went well as everyone had contributed and responded to the meetings as planned. The work that was assigned to each of us was completed on time and without stress. I think that maybe our meeting schedules could have been improved however this was expected as it was impossible to figure out exact time and days everyone was free (if there even were any matching time slots that everyone was free)

in their busy personal schedules. One thing that surprised me was how everyone made an effort to make our project complete as I have had plenty of experiences before where there would always be that one person that would not do any work. One thing that I learned about our group is that this is what mature, adult group projects are meant to be where everyone did/does jobs they are assigned. To be brutally honest, Charlie has done all the work converting our work into our website as he was most familiar using html and css coding. Although he could have used some help I believe it would have been a drag down for Charlie to teach the rest of the group how to complete the vision he had in mind about our website.

Group reflection

What went well?

The meeting schedule was consistent, despite everyone's busy schedule and working from differing time zones. Overall, the group reflects that members were consistent with the attendance, or had valid reasons when they could not attend the meetings.

We allocated different tasks to different people based on their skills, previous contributions and current workload and over the timeframe of the assignment this worked out well with all group member contributing equally to the final result.

What could be improved?

The tracking of assignment components could have been improved by utilising a project software solution such as Trello or Jira. The group reflected on a lack of leadership in the sense that we waited till someone volunteered to do a specific task rather than assigning tasks. Assignment of tasks could have been more time effective in achieving our end result.

Application familiarity would have benefited the group in this project; because few members were familiar with Microsoft Team prior to this assignment, we could have utilised the scheduling function more effectively by scheduling meetings ahead of time; small things can make a big impact with group work.

Something that was surprising

The most surprising thing about this group was the ability of the group to collaborate effectively; despite the fact that the group were strangers, at differing stages of their studies and living in multiple parts of the world- one group member is even living in Germany- but we have managed to work together! This, we agree is quite an achievement. As a group, despite the challenges, we are happy with the quality of work we have been able to produce.

One thing we learned about working in groups

The personality contrast between our group members is drastic, yet we were able to produce a project we are all happy with. Amongst our group we observed quiet people and dominant personalities. We also had members with differing IT skills and all level of knowledge. Our interest may vary and the reason we are getting into the IT industry are quite different throughout the whole team, yet, we are all able to cooperate and produce a

quality product. In this sense we learned the differing strengths of different group members can end up complimenting one another to contribute to a great end result.

References

References

15, J., Watts, S. and Raza, M. (2019) SAAS vs paas vs iaas: What's The Difference & How to choose, BMC Blogs. Available at: https://www.bmc.com/blogs/saas-vs-paas-vs-iaas-whats-the-difference-and-how-to-choose/ (Accessed: January 19, 2023).

Anon, (2022). Autonomous Vehicles as a Replacement for the Human Workers. [online] Available at: https://studycorgi.com/autonomous-vehicles-as-a-replacement-for-the-human-workers/.

Aste, T., Tasca, P., & Di Matteo, T. (2017). Blockchain Technologies: The Foreseeable Impact on Society and Industry'. Retrieved from Kings's College London: https://kclpure.kcl.ac.uk/portal/en/publications/blockchain-technologies(d6de3925-05be-44dc-a6df-724cb2e51bfe)/export.html

Basargin, M, (2022) My Ideal Job, accessed December 30, 2022, https://mishbee.github.io/github.io/Ideal.html

Basargin, M, (2022) My Ideal Job, accessed December 30, 2022, https://mishbee.github.io/github.io/Ideal.html

Bogue, R, (2021) 'Robots poised to transform agriculture', Industrial Robot: the international journal of robotics research and application, 48(5): 637–642, accessed January 6, 2023, Emerald Insight Database

Bogue, R, (2021) 'Robots poised to transform agriculture', Industrial Robot: the international journal of robotics research and application, 48(5): 637–642, accessed January 6, 2023, Emerald Insight Database

Burning Glass Technologies (2018a) Skills In Greatest Demand (Baseline Skills), Burning Glass Technologies, accessed January 4, 2021, https://rmit.instructure.com/courses/96273/files/27115620/download?wrap=1

Burning Glass Technologies (2018a) Skills In Greatest Demand (Baseline Skills), Burning Glass Technologies, accessed January 4, 2021, https://rmit.instructure.com/courses/96273/files/27115620/download?wrap=1

Burning Glass Technologies (2018b) Skills In Greatest Demand (Specialised Skills), Burning Glass Technologies, accessed January 4, 2021, https://rmit.instructure.com/courses/96273/files/27115582/download?wrap=1

Burning Glass Technologies (2018b) Skills In Greatest Demand (Specialised Skills), Burning Glass Technologies, accessed January 4, 2021, https://rmit.instructure.com/courses/96273/files/27115582/download?wrap=1

Burning Glass Technologies (2018c) Labour Insights Jobs: Top Titles, Burning Glass Technologies, accessed January 4, 2021, https://rmit.instructure.com/courses/96273/files/27115583/download?wrap=1

Burning Glass Technologies (2018c) Labour Insights Jobs: Top Titles, Burning Glass Technologies, accessed January 4, 2021, https://rmit.instructure.com/courses/96273/files/27115583/download?wrap=1

Buthgama, S, (2022) COSC2196 Introduction to Information Technology Assessment 1: My Profile, accessed December 30, 2022, https://samithbuthgama.github.io/rmit-IT-assesment-ass1/

Buthgama, S, (2022) COSC2196 Introduction to Information Technology Assessment 1: My Profile, accessed December 30, 2022, https://samithbuthgama.github.io/rmit-IT-assesment-ass1/

Cloud computing (2023) Wikipedia. Wikimedia Foundation. Available at: https://en.wikipedia.org/wiki/Cloud_computing (Accessed: January 19, 2023).

Columbus, L (17 February, 2021) '10 Ways AI Has The Potential To Improve Agriculture In 2021' Forbes, accessed January 7, 2023, https://www.forbes.com/sites/louiscolumbus/2021/02/17/10-ways-ai-has-the-potential-to-improve-agriculture-in-2021/

Columbus, L (17 February, 2021) '10 Ways AI Has The Potential To Improve Agriculture In 2021' Forbes, accessed January 7, 2023, https://www.forbes.com/sites/louiscolumbus/2021/02/17/10-ways-ai-has-the-potential-to-improve-agriculture-in-2021/

Could Blockchain Have as Great as impact as the Internet. (n.d.). pp. https://www.jpmorganchase.com/news-stories/could-blockchain-have-great-impact-as-internet. Retrieved from https://www.jpmorganchase.com/news-stories/could-blockchain-have-great-impact-as-internet

CryptoGT. (2021, 8 February). Blockchain Advancements and Crypto Prices. Retrieved from CryptoGT: https://cryptogt.com/en/blog/blockchain-advancements-and-cryptos-prices

Declaration for the future of the internet - united states department of state (2022) U.S. Department of State. U.S. Department of State. Available at: https://www.state.gov/declaration-for-the-future-of-the-internet (Accessed: January 19, 2023).

Department of Infrastructure, T. (2021). Connected and automated vehicles. [online] Department of Infrastructure, Transport, Regional Development and Communications, Australian Government. Available at: https://www.infrastructure.gov.au/infrastructure-transport-vehicles/transport-strategy-policy/office-future-transport-technology/connected-automated-vehicles.

Department of Infrastructure, T. (2021). Connected and automated vehicles. [online] Department of Infrastructure, Transport, Regional Development and Communications, Australian Government. Available at: https://www.infrastructure.gov.au/infrastructure-transport-vehicles/transport-strategy-policy/office-future-transport-technology/connected-automated-vehicles

Du, X., Wang, X. and Hatzenbuehler, P. (2022), "Digital technology in agriculture: a review of issues, applications and methodologies", China Agricultural Economic Review, Vol. ahead-of-print No. ahead-of-print. Accessed January 3, 2023, Emerald Insight Database

Du, X., Wang, X. and Hatzenbuehler, P. (2022), "Digital technology in agriculture: a review of issues, applications and methodologies", China Agricultural Economic Review, Vol. ahead-of-print No. ahead-of-print. Accessed January 3, 2023, Emerald Insight Database

Dylan Yaga, P. M. (2019). Blockchain Technology Overview. Retrieved from Cornell University: https://arxiv.org/abs/1906.11078

Editorial (2021). The impacts of autonomous vehicle technology in our lives. [online] RoboticsBiz. Available at: https://roboticsbiz.com/the-impacts-of-autonomous-vehicle-technology-in-our-lives/.

Frankenfield, J. (2023) What is cloud computing? pros and cons of different types of services, Investopedia. Investopedia. Available at: https://www.investopedia.com/terms/c/cloud-computing.asp (Accessed: January 19, 2023).

Fries, M. &. (2019). Front Matter.” In Smart Contracts, I–IV. Mohr Siebeck GmbH and Co. KG, 2019. Retrieved from Wikipedia: http://www.jstor.org/stable/j.ctvn96h9r.1.

Green, J. (2018). Effects of Car Pollutants on the Environment. [online] Sciencing. Available at: https://sciencing.com/effects-car-pollutants-environment-23581.html.

Help Net Security (2021) How to retain the best talent in a competitive cybersecurity market, Help Net Security. Available at: https://www.helpnetsecurity.com/2021/09/20/retain-cybersecurity-talent/ (Accessed: January 19, 2023).

Hölbl, M. K. (2018). A Systematic Review in the Use of Blockchain in Healthcare. Retrieved from https://www.mdpi.com/2073-8994/10/10/470

Hp (2020) What does a server do: HP® Tech takes, What Does a Server Do | HP® Tech Takes. HP. Available at: https://www.hp.com/us-en/shop/tech-takes/what-does-a-server-do#:~:text=A%20server%20stores%2C%20sends%2C%20and,provide%20one%20service%20or%20several. (Accessed: January 19, 2023).

Innov, Z. F. (2021). The function and impact of cryptocurrency and data technology in the context of financial technology: introduction to the issue. Retrieved from SpringerOpen: https://jfin-swufe.springeropen.com/articles/10.1186/s40854-021-00301-w

Kang, S, (2022) Ideal Job: accessed December 30, 2022, https://liggnus.github.io/index.html

Kang, S, (2022) Ideal Job: accessed December 30, 2022, https://liggnus.github.io/index.html

Kerr, B, (2016) 'Timing Makes a Big Difference In Farming' Farmer's Weekly, accessed 11 January, 2023 https://www.farmersweekly.co.za/crops/vegetables/timing-makes-a-big-difference-in-farming/

Kerr, B, (2016) 'Timing Makes a Big Difference In Farming' Farmer's Weekly, accessed 11 January, 2023 https://www.farmersweekly.co.za/crops/vegetables/timing-makes-a-big-difference-in-farming/

Le, Y. (2017). The State of the Art in Crytpocurrencies. 5.

Litman, T. (2020). Autonomous Vehicle Implementation Predictions Implications for Transport Planning. [online] Available at: https://www.vtpi.org/avip.pdf.

Market Business News. (n.d.). What is an autonomous vehicle? Definition and meaning. [online] Available at: https://marketbusinessnews.com/financial-glossary/autonomous-vehicle/#:~:text=An%20autonomous%20vehicle%2C%20also%20known%20as%20a%20driverless,a%20combination%20of%20sensors%2C%20cameras%2C%20radar%20and%20AI..

Market Business News. (n.d.). What is an autonomous vehicle? Definition and meaning. [online] Available at: https://marketbusinessnews.com/financial-glossary/autonomous-vehicle/#:~:text=An%20autonomous%20vehicle%2C%20also%20known%20as%20a%20driverless,a%20combination%20of%20sensors%2C%20cameras%2C%20radar%20and%20AI

Milutinović, M. (2018). Cryptocurrency. Retrieved from wikipeadia: http://scindeks.ceon.rs/Article.aspx?artid=0350-137X1801105M

Mitchell, B. (2021) What is a server in computer networking?, Lifewire. Lifewire. Available at: https://www.lifewire.com/servers-in-computer-networking-817380 (Accessed: January 19, 2023).

Morrison, C, (2022) Charlie's Profile, accessed December 30, 2022, https://cofm98.github.io/

Morrison, C, (2022) Charlie's Profile, accessed December 30, 2022, https://cofm98.github.io/

National Skills Commission, (2021) Skills Priority List, Australian Government, accessed December 28, 2022, https://rmit.instructure.com/courses/96273/files/27115688?wrap=1

National Skills Commission, (2021) Skills Priority List, Australian Government, accessed December 28, 2022, https://rmit.instructure.com/courses/96273/files/27115688?wrap=1

O'Byrne, R, (2022) 7 Key Supply Chain Leaders’ Skills and Why You Need Them, Logistics Bureau, accessed January 3, 2023,

O'Byrne, R, (2022) 7 Key Supply Chain Leaders’ Skills and Why You Need Them, Logistics Bureau, accessed January 3, 2023,

Papas, P, (2022) My Ideal Job, accessed December 30, 2022, https://peterpapas1.github.io/

Papas, P, (2022) My Ideal Job, accessed December 30, 2022, https://peterpapas1.github.io/

Recuro-Virto, N and Valilla-Arrospide, C (2021) "Forecasting the next revolution: food technology's impact on consumers' acceptance and satisfaction" British Food Journal, 124(12) 4339-4353, accessed January 8, 2023, Emerald Insight Database

Recuro-Virto, N and Valilla-Arrospide, C (2021) "Forecasting the next revolution: food technology's impact on consumers' acceptance and satisfaction" British Food Journal, 124(12) 4339-4353, accessed January 8, 2023, Emerald Insight Database

Research, I. J. (2021). Cryptocurrency & Its Impact on Environment. Retrieved from SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3846774

Röscheisen, M. (1998). The Stanford InfoBus and its service layers: Augmenting the internet with higher-level information management protocols. Retrieved from https://link.springer.com/chapter/10.1007/BFb0052526#citeas

SAE International. (2021). Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles. [online] Available at: https://www.sae.org/standards/content/j3016_202104 [Accessed 3 Jan. 2023].

SAE International. (2021). Taxonomy and Definitions for Terms Related to Driving Automation Systems for On-Road Motor Vehicles. [online] Available at: https://www.sae.org/standards/content/j3016_202104 [Accessed 3 Jan. 2023].

Salimova, G, Ableeva, A, Galimova, A, Bakirova, R, Lubova, T, Sharafutdinov, A and Araslanbaev, I, (2021) "Recent Trends in Labour Prductivity" Employee Relations: The International Journal, 44(4) 785-802, accessed January 8, 2023, Emerald Insight Database

Salimova, G, Ableeva, A, Galimova, A, Bakirova, R, Lubova, T, Sharafutdinov, A and Araslanbaev, I, (2021) "Recent Trends in Labour Prductivity" Employee Relations: The International Journal, 44(4) 785-802, accessed January 8, 2023, Emerald Insight Database

Sarmah, S. S. (2018). Understanding Blockchain Technology. Retrieved from https://d1wqtxts1xzle7.cloudfront.net/60715489/Understanding_Blockchain_Technology20190926-26770-147v9qi-libre.pdf?1569545201=&response-content-disposition=inline%3B+filename%3DUnderstanding_Blockchain_Technology.pdf&Expires=1673694075&Signature=KS5gKjABe

Seek, (2022a) Career Insights Frontend Developer, accessed January 3, 2023, https://www.seek.com.au/career-advice/role/frontend-developer

Seek, (2022a) Career Insights Frontend Developer, accessed January 3, 2023, https://www.seek.com.au/career-advice/role/frontend-developer

Seek, (2022b) Career Insights Full Stack Developer, accessed January 3, 2023, https://www.seek.com.au/career-advice/role/full-stack-developer

Seek, (2022b) Career Insights Full Stack Developer, accessed January 3, 2023, https://www.seek.com.au/career-advice/role/full-stack-developer

Seek, (2022c) Career Insights Software Developer, accessed January 3, 2023, https://www.seek.com.au/career-advice/role/software-developer

Seek, (2022c) Career Insights Software Developer, accessed January 3, 2023, https://www.seek.com.au/career-advice/role/software-developer

Seek, (2022d) Career Insights Software Engineer, accessed January 4, 2023 https://www.seek.com.au/career-advice/role/software-engineer

Seek, (2022d) Career Insights Software Engineer, accessed January 4, 2023 https://www.seek.com.au/career-advice/role/software-engineer

Seek, (2022d) Career Insights Supply Chain Manager, accessed January 4, 2023 https://www.seek.com.au/career-advice/role/supply-chain-manager

Seek, (2022d) Career Insights Supply Chain Manager, accessed January 4, 2023 https://www.seek.com.au/career-advice/role/supply-chain-manager

Server (computing) (2022) Wikipedia. Wikimedia Foundation. Available at: https://en.wikipedia.org/wiki/Server_(computing) (Accessed: January 19, 2023).

Sullivan, K (2022) My Ideal Job, accessed December 30, 2022, https://katie-pixel.github.io/katie-Pixel-IT-basics.github.io/IdealJob.html

Sullivan, K (2022) My Ideal Job, accessed December 30, 2022, https://katie-pixel.github.io/katie-Pixel-IT-basics.github.io/IdealJob.html

The internet of the future will be bigger, faster, safer, and more private (2019) Maryville Online. Available at: https://online.maryville.edu/blog/future-internet/ (Accessed: January 19, 2023).

What is a server? (2022) Computer Hope. Available at: https://www.computerhope.com/jargon/s/server.htm (Accessed: January 19, 2023).

What is cloud computing? - aws.amazon.com (no date). Available at: https://aws.amazon.com/what-is-cloud-computing/ (Accessed: January 19, 2023).

What is cloud computing? (no date) What is Cloud Computing? | Oracle Australia. Available at: https://www.oracle.com/au/cloud/what-is-cloud-computing/ (Accessed: January 19, 2023).

What is cloud computing? A beginner's guide: Microsoft azure (no date) What Is Cloud Computing? A Beginner's Guide | Microsoft Azure. Available at: https://azure.microsoft.com/en-us/resources/cloud-computing-dictionary/what-is-cloud-computing/ (Accessed: January 19, 2023).

What is cloud computing? everything you need to know about the cloud explained (no date) ZDNET. Available at: https://www.zdnet.com/article/what-is-cloud-computing-everything-you-need-to-know-about-the-cloud/ (Accessed: January 19, 2023).

What is Paas? (no date) Oracle Australia. Available at: https://www.oracle.com/au/cloud/what-is-paas/ (Accessed: January 19, 2023).

What is the purpose of a computer server? (no date) Techwalla. Available at: https://www.techwalla.com/articles/what-is-the-purpose-of-a-computer-server (Accessed: January 19, 2023).

Yaffe-Bellany, D. (2022). Crypto's Long-Awaited 'Merge' Reaches the Finish Line. Retrieved from NY Times: https://www.nytimes.com/2022/09/15/technology/ethereum-merge-crypto.html

Yeruva, V. (2022). Council Post: Autonomous Vehicles And Their Impact On The Economy. [online] Forbes. Available at: https://www.forbes.com/sites/forbestechcouncil/2022/02/14/autonomous-vehicles-and-their-impact-on-the-economy/?sh=420a84c760de [Accessed 4 Jan. 2023].

Yli-Huumo J, K. D. (2016). Where is the current research on Blockchain Technology. Retrieved from PLOS.org: https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0163477

www.usda.gov. (2021). Potential Future Increases in Intense Precipitation Events and Implications for Agriculture. [online] Available at: https://www.usda.gov/ [Accessed 14 Jan. 2023]

Tractorgyan. (2023). Top 5 Reasons why weather forecasting is important for farming? [online] Available at: https://tractorgyan.com/ [Accessed 14 Jan. 2023]