ASSESSMENT 2

Group Name: Magpies (Group 10)

GitHub Pages:
Home | The Magpies [A2 Group 10] (rodriguessunil.github.io)

GitHub Repository:
RodriguesSunil/Magpies: A2 Group # 10 COSC2196/2021 (github.com)

GitHub Pages Branch:
RodriguesSunil/Magpies at group-website (github.com)

Contents

Personal Information and Team Profile

s3923382

Working as a Superintendent – Maintenance Systems in a mining company **Sunil Rodrigues** looks after SAP Plant Maintenance configuration, improvements, and data loading. Also responsible for Document Control Applications and other applications used to perform maintenance activities. Married and has two kids, is also passionate about dogs. His IT experience is mainly from SAP configuration and implementation work and deploying and supporting the maintenance applications. Has always been the go-to person in the family and at home for PC faults and software, now slowly having this delegated to his son. New to this field and hopes to learn as much as possible to improve his work output to the team and the organisation. His passion has been ensuring good sound data capture to make the correct decisions and hence have been looking at methods to improve some of the applications and processes at work. Understanding how these applications work and what innovative technologies are there to adapt will help him to achieve this.

As an introvert, Sunil likes to observe a situation and is receptive to new ideas. However, as an assertive defender, he will need more information about the ideas because his feelings will make him act when needed. Although he tends to sit back and analyse situations, Sunil is comfortable presenting his thoughts and opinions during the meetings. Kind and Helpful, he is always ready to take control of his duties and help the team to be better.

Jacqueline Penas was born in the Philippines and migrated to Australia in 2008 to build a family. Married to a QA/QC Civil Engineer working in the construction field, she is a full-time mother of a year 7 student. Has also proven time management and organizational skills developed from home, school, and employment overseas. Has a strong academic background and above-average results gained overseas in 1999 with a bachelor's in information technology and a Certificate III in Information, Digital Media, and Technology in 2019 from TAFE Qld. A highly articulate individual able to work confidently with diverse cultures and situations in which cultural awareness and appreciation are integral.

As a protagonist, Jacqueline likes to be part of the team and give ideas to improve the work when needed. Diplomate, she will always be kind and help the team when we have an issue to solve. Although she tends to sit back and analyse situations, Jacqueline is always present in the meetings and showing that she is capable to do her job with confidence.

s3925262

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Natural of Glasgow, Scotland, Scottish father and English mother, **Alexander Hutton** moved between Scotland and England numerous times which resulted in an interrupted education. Completed high school in Cambridge, England in 1992 and rapidly managed to get a job as a database programmer using a technology used at that time called dBase. In 1994 emigrated to Perth Australia with his family and have lived in Perth ever since. After his arrival, he studied various industry certifications, including Microsoft Certified Systems Engineer, Cisco Certified Network Associate, VMware Certified Professional, NetApp Certified Storage Administrators, EMC Storage, EMC Avamar and Hitachi Storage Systems. Nowadays he lives with his wife and the two youngest children and in free times enjoys his passion for motorbikes.
As an introvert, Alex likes to observe a situation and is receptive to new ideas. However, he believes that a good coordinator works for the group and facilitate the implementation process of decisions made by the group. A tactile learner he likes to start the work and get it done while learning.

31 years old, Brazilian/Australian citizen, **Joao Pedro Nunes Doege** was born in Brazil and migrated to Australia in 2010, since then, built his connections here in Australia, has a lovely fiancé and 3 children that keep him busy. For the past 10 years has been a Chef, started as a kitchen hand and worked his way up to the Head Chef position, during this process he has learnt valuable skills for life, with the recent pandemic he decided to revaluate his career. His fascination for understanding how the world works made him think about starting a new path in the IT industry. His love for technology and endless energy to invest in learning all he can about it. His IT experience is mostly as troubleshooting and using technology, a fast learner so completing this Bachelor of IT will take him where he needs to be.
Imaginative and curious, Joao is a logician, he can find endless fascination in the workings of his mind. An introvert but when presented with an opportunity to swap ideas he can be friendly and connect with someone who can match up that same energy can also analyse patterns well, making it easy to spot discrepancies.

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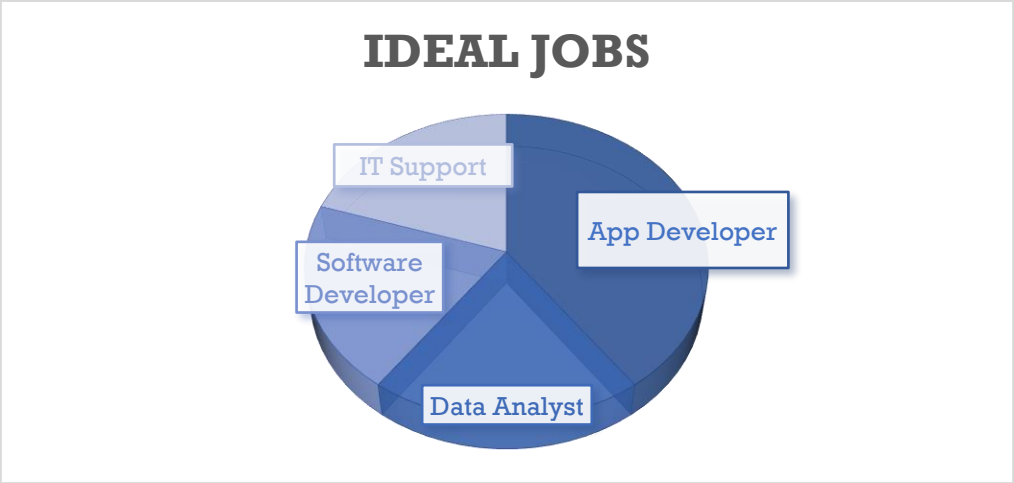
Raul Junqueira da Silva, 25 years old, has been living in Australia for six years now, was born in Brazil, to be more specific in the state of Sao Paulo, one of the biggest cities in the world, so life in Sydney was not too hard to adapt. At the age of 19, he decided to turn his life around and emigrate to Australia, and it could not be any different as he has always been into camping at secret beaches and going to mountain hikes, Australia can offer him everything he has always dreamt of. As soon as his permanent residency was granted, they got a dog, an exotic Italian greyhound. Even though he has been working as a Waterproofer for an extended period He decided to change careers and chase happiness doing what He enjoys most, working and learning about technology, so He decided to start a Bachelor of IT at RMIT. Visionary, He is always thinking about what society struggles with and what can be invented or added to a project that would be developed or improved to make people lives easier.

As an assertive debater person who is passionate about things he does and unafraid to speak up when something needs to be said, Raul will be an excellent value-add to the team working closely with the team while building good relationships among team members.

Ideal Jobs

At this stage, most of the Team members, have already thought about the next Paths to take and a certain idea of the field they want to fit in when they achieve sufficient skills. The Ideal Job is in some ways a reflection of the results taken when we have done the profile tests in the last assignment. Some of us want to keep in the same field but also articulate more skills to fit in the market and on the other hand, some are just starting a new career and challenging ourselves when changing drastically the actual field.
There are also some overlaps between team members that were good for the development of this assignment.

Sunil Rodrigues is looking for an upskill for the market he is already in. A Data analyst job is ideal in the mining field as he has vast knowledge in it and wants to solve problems that he sees daily.
Jacqueline Penas wants to help others in the IT Support Specialist field, her goal is to achieve enough knowledge and be able to assist and lead others in the industry
Raul, Alexander and Joao are looking for the Development part of the IT industry, with overlapping skills needed like Programming, they are aiming for the creative section of this gigantic world, Alex and Raul are looking for the App field that has grown exponentially for the last decade and Joao is looking for the Software development that has also made an impressive difference for the improves on the technology.



Tools

Magpies

A2 Group # 10 COSC2196/2021

Group Members

Members	Location
Alexander Hutton	Perth
Raul Junqueira Da Silva	Sydney
Joao Nunes Doege	Newcastle
Jacqueline Penas	Brisbane
Sunil Rodrigues	Perth

Github Repository - Magpies

GITHUB

We started the group communications using a GitHub repository. Our group was called Magpies. Our initial documents were stored here whilst Microsoft Teams was being setup. As we had members from different time zones the Readme file was a good way for us to show who and what location they reside in. The Blue White and Black Magpie became our logo and we have used the colours in our website. The group contributed using GitHub for changes using the push and pull requests.

Microsoft Teams - Magpies

MICROSOFT TEAMS

Microsoft Teams was the tool chosen by the group as our repository for storage of documents, booking meetings, and chat amongst the group members. It also served as a calendar for reminders. Meetings were organised through Teams and each meeting had a designated person for taking minutes. The meetings were recorded so we could go back to them to view and listen to what we discussed. Minutes of the meetings are taken by a team member and posted to the folder in Teams. Teams served the group as a collaboration tool to discuss issues and get peer reviews of the work assigned.
You can find our Microsoft Team at this link.

You can request access to join Magpies MS Teams at this link

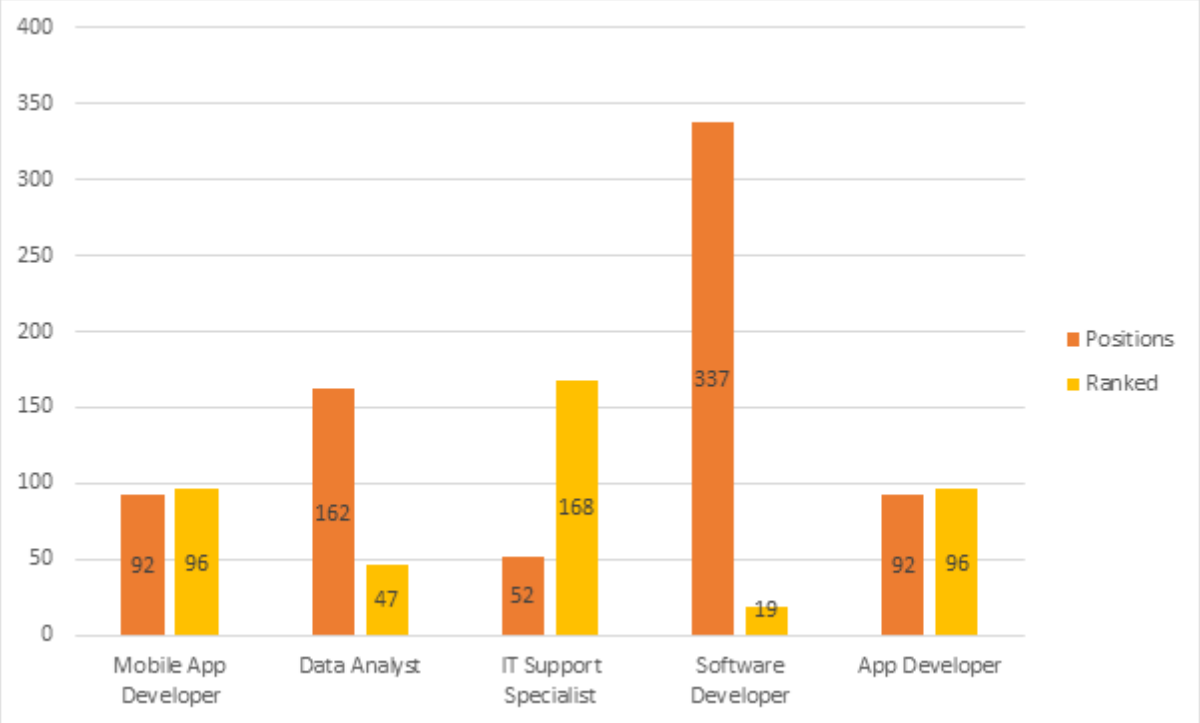
Meeting Minutes are stored in Teams at the links below:

30/09/21 Agenda Recording Actions
04/10/21 Agenda Recording Actions
07/10/21 Agenda Recording Actions
11/10/21 Agenda Recording Actions
14/10/21 Agenda Recording Actions

Industry Data

The Magpies have a diverse range of ideal jobs, while 3 members picked similar roles for their ideal job. Everyone's ideal job is shown below along with the number of positions advertised and where the roles rank regarding advertised positions in 2018 according to Burning Glass:

Team Member	Ideal Job	Advertised Positions	Future Outlook [2]	Rank sought after
Alex Hutton	Mobile App Developer	92	Very strong	96
Sunil Rodrigues	Data Analyst	162	Very strong	47
Jacqueline Penas	IT Support Specialist	52	Very strong	168
Joao Pedro Nunes Doege	Software Developer	337	Very strong	19
Raul Junqueira	App Developer	92	Very strong	96



We can see from the above that software developer is by far the most in demand job from all the ideal jobs of the group. Data analyst comes second with around half the advertised positions as first placed software developer and IT support specialist has the least demand. Due to the volume of job titles listed in the Burning Glass document, the above does not represent a fair comparison because a job can have many different titles depending on who the employer is and we could get a better representation by grouping job titles into one job to remove what the industry would consider duplicate titles. IT support specialist for instance can also be referred to as System Engineer (which is the number 4 in demand job on the list), Desktop Support, and many others. The same applies to the development

roles, an argument could be made that Mobile App Developer, Software Developer, and App Developer are very similar, with the differences being negligible. According to joboutlook.gov.au, in 2018, all the groups ideal roles had a very strong outlook [2].

To identify a set of required skills we have put Mobile App Developer, Software Developer, and App Developer under the umbrella of 'Programming', as they practically duplicated each other, and used the Burning Glass data to identify the following:

The groups required skill set is detailed in the table below:

- This table lists the top 30 skills in demand from employers
- The following 4 IT Specific skills; Building Relationships, Business Management, Customer Service, and Business Process have been considered General Skills and as such, moved to the appropriate table section
- Numbers 31-34 from the IT-specific skills were used to replace 4 skills that moved section.

Skill	Programming	Data Analyst	IT Support Specialist
IT Specific:			
SQL	x	x	x
JavaScript	x		
Microsoft Windows	x	x	x
JAVA	x		
Microsoft C#	x		
Technical Support	x		x
Project Management	x	x	x
LINUX	x	x	x
.NET Programming	x		
ITIL	x	x	x
Microsoft Office	x	x	x
Oracle	x	x	x
SAP			x
HTML5	x		
Software Engineering	x		
Git	x	x	x
Python	x	x	x
SQL Server	x	x	x
jQuery	x		
Cisco			x
Graphic Design			
Microsoft Excel	x	x	x
Scrum	x	x	x
Business Analysis		x	
Website Production	x		
ASP	x		
Systems Engineering			x
Technical Industry Knowledge	x	x	x
PHP	x		
AngularJS	x		
General Skills:			
Building Relationships	x	x	x
Business Management			

Customer Service	x	x	x
Business Process	x	x	x
Communication Skills	x	x	x
Problem Solving	x	x	x
Organisation Skills	x	x	x
Writing	x	x	x
Team Work / Collaboration	x	x	x
Troubleshooting	x	x	x
Planning	x	x	x
Detail-Orientated	x	x	x
Creativity	x	x	x
Research	x	x	x
Leadership	x	x	x
Time Management	x	x	x
Mentoring	x	x	x
Quality Assurance and Control	x	x	x
Presentation Skills	x	x	x
Meeting Deadlines	x	x	x
Analytical Skills	x	x	x
Team Building	x	x	x
Management			
Mutli-Tasking	x	x	x
English			
Building Effective Relationships	x	x	x
Articulate	x	x	x
Self-Starter	x	x	x
Decision Making	x	x	x
Computer Skills	x	x	x

The top 30 IT specific skills account for 48% of total job postings for 2018. Programming doesn't require 5 of the top 30 skills, that's 83% of top 30 skills being required for programming. Data Analyst has 16 of the top 30 skills not required so requires 47% of those skills. IT Support Specialist sits in the middle with 12 top 30 skills not being a requirement. IT Support Specialist requires 60% of the top 30 skills.

96% of all general skills in demand in job postings in 2018 are taken by the top 30 general skills. All 3 ideal jobs do not have a requirement for 3 general skills, that means 90% of the skills in demand are required.

Summary:

Ideal Job	% of top 30 in demand IT specific skills	% of top 30 in demand general skills
Programming	83%	90%
Data Analyst	47%	90%
IT Support Specialist	60%	90%

From this summary we can see that the majority of the general skills in demand are required for all jobs which demonstrates that general skills are in high demand and considered imported to employers. The IT Specific skills is slightly different with a range from 47% to 83%. We wonder if it is a case of the fewer percent of IT specific skills required would indicate a specialised job whereas a higher percent indicates a more generalised role.

In relation to demand from employers, this indicates that there would be most demand for developers followed by IT Support Specialists and lastly Data Analysts.

The 3 general skills not required by the ideal jobs are identical for all 3, they are Business Management, Management, and English. The 3 highest ranked IT-specific skills which are not in the required skill set differs by job and are detailed below.

Programming - SAP, Cisco, and Graphic Design
Data Analyst - JavaScript, JAVA, and Microsoft C#
IT Support Specialist - JavaScript, JAVA, and Microsoft C#

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

Alex: The only change I would make to my ideal job is that I would broaden the job description to software developer simply because that's the role most in demand in the field I am aiming for.

Sunil: Given the job market data shown and the differences in skills required between programming and data analyst, I would most likely upskill myself so that there are opportunities to sway either way. The skills in programming would enable me to work well in data analytics. It would give me a future pathway in Business Intelligence and data modelling also.

Jacqueline: Based on the job market data, my ideal job has not changed. I would still like to become an IT Support Specialist. I can upskill my abilities by obtaining certifications and accreditations that align with my ideal job, but at the moment my knowledge is sufficient.

Joao:

Raul: After all the research given, my position would not change, I would just also look into software developer because the demand is really high and it would be easier to try it when I start my IT career.

[2] Joboutlook.gov.au. 2021. *Professional, Scientific, Technical Services* | *JobOutlook*. [online] Available at: <https://joboutlook.gov.au/industries/industry-profiles/?industryCode=M> [Accessed 13 October 2021].

IT Works

Interview an IT Professional

Interview Date	12 October 2021
Interview Time	22:00 (AEST)
IT Professional	Janesh Raghwani, *Solution Architect*
Location	Teams Meeting
Interviewer	Joao Nunes Doege
Transcriptionist	Jacqueline Penas
Duration	17 min 40 sec.
Meeting Link	https://rodriguessunil.github.io/Magpies/it-work

Joao Nunes Doege took the opportunity to interview Janesh Raghwani a Solution Architect working in the IT field for many years. Jacqueline Penas was the observer and transcribed the interview for the group. The audio recording file is attached in our website

Interview Transcript

Joao: Hello,
Janesh: Hey, how's it going?
Joao: Oh, good.
Janesh: You're now good to go.
Joao: This is my first interview.
Janesh: I'm the one getting interview.
Joao: I'll get exactly that.
Janesh: That's it.
Joao: I'm gonna have, I'm gonna record it if that's okay with you.
Janesh: Yeah, sure.
Joao: So, what's gonna happen? One of our teammates is going to transfer, just write it down and we're going to post it on the website.
Janesh: Okay, so there is a video going to get posted on the website, or just, Okay, cool. That's all good. Let's see, check my camera then.
Joao: Excellent. And then see Sorry about that.
Janesh: That's okay.
Joao: Hello. How can I say your name again?
Janesh: Janesh
Joao: I hope you don't mind my accent?
Janesh: Yeah, It's okay.
Joao: You can understand.
Janesh: Yeah, I have a strange accent to.
Joao: It can barely, can barely see any problems at all.
Janesh: Yeah, no worries.
Joao: Alright, I'm going to start recording. Hello, Janesh, thank you for taking your time and talking to us today. **We are just making this interview to find out about your IT work? all the areas. Everything you do. So please tell us about your IT work? What exactly do you do?**
Janesh: Okay, so I'm Enterprise Architect for kinetic IT. So I've been in IT for quite some time. But yeah, so basically, my, my work involves a lot of planning and solution designing for the customer. And basically tried to line them up with roadmaps for the next three to five years. And working through that.

Joao: So seems that you work with a lot of customers. **You work with customers every day**.

Janesh: Yeah, so we basically are a managed service provider and we outsource to customers. So our customer we based out on site and working with the customer daily and work with their requirements and what they need from us. So yeah, we're pretty much at a customer site 24 basically 40 hours a week

Joao: Oh, and with the current pandemic, and of health, have you been working from home, **are you still have been able to do your job, like you used to before the pandemic?**

Janesh: Yes, so they're the pandemic has changed a few things for us. In my role, we have a lot of face-to-face meetings. So, I haven't been on the tools for some time on mostly either on meetings and designing and architecture work. So that has changed where we have to kind of evolve similar to the way we're having this conversation usually you'd be in a meeting room talking to each other and have that personal connection going and talking and reading how the customer is reacting to what you're saying. So, it's improved output and because we have everyone the meetings are lined up and you kind of just go in and finish and then walk up and up quickly. So, there's a bit more efficiency out there but we've noticed that we just sitting in back to back meetings. So not great for the health per se in it because we sit at desks a long time but it's definitely had positive outcomes.

Joao: Sorry..

Janesh: That's okay, take your time, no rush.

Joao: And besides the customers, **what type, who are the other people you interact with?**

Janesh: So we interact with a lot of vendors. So we will have vendors from like VMware, Dell EMC, pointed Cisco, all top vendors out there. And whenever designing solutions or working with them, we will work with them to do pre sales. So we do have a lot of pre sales work in the design. So we're trying to find a solution for the customer and trying to work with what they would meet the requirements. So yeah, we work with a lot of vendors.

Joao: **And what aspects of your work do you spend most time on?**

Janesh: A lot of the work is design work. And so we in architecture spaces, spend a lot of time in Visio, or basically drawing diagrams, drawing up solutions, and documentation around design and solution architecture work or technical architecture documentation. So we spend a lot of time in documentation mostly

Joao: Documentations, yeah. In your words, like in a simplified way, **for someone who doesn't know much about IT, what would a Solutions Architect do? Like?**

Janesh: So what we do is, the simplest term is, for example, if you're the customer, when you come and say, hey, I want to I want to use a system or design, if I want you to design a system for me that does a certain function, or there is an application that is a legacy application, and we want to make it basically upgraded and bring it up to the new age, using cloud technologies, cloud native solutions, for example. So what we do there is we'll go and then find out what this application would be doing. And then actually start designing a solution for it. So we would have to talk to the application owners, the users, go through case studies, see what it is what they using, and then we kind of build a whole new solution, starting from the solution, document itself, and the second time, so that's why we're spending a lot of time in the architecture is based around designing and documentation, because we're understanding how this whole thing will be good together.

Joao: So that means that if you have like a team with just gonna do all the technical work?

Janesh: Yes.

Joao: You communicate with them?

Janesh: Yeah, so what we do is we do the design, work and start, we get it all approval by the customer. And then we have a technical team who is on the tools who will actually do the deployment. So that's where we step out. And we basically let

them deal with the actual implementation. So we do the design, we bring them in as we need for their expertise, or what they know or what they would work with environment. And then we go from there, and then they take over for the build and deployment and setup.

Joao: Okay, and what are some of the scheduling tools you use on your daily life for managing projects?

Janesh: So we have we use a few of them, we use Microsoft Project. As a general, the basic tool that we have, then we're using Azure DevOps, for tickets, and working with that, by the projects, those are the main two remains that we use on project planning, and then managing tasks and managing projects. And the lifecycle of the entire deployment will be Azure DevOps.

Joao: Getting excellent. What are your main strengths and skills in the industry? Sorry, for repeating.

Janesh: That's fine. So the thing with us is, if you're looking, we have a wide range of skills for us to be at the level of Enterprise Architect, we've come from basically working on the tools learning every part of IT system that would work from networking software, server land, basically learning all those parts and understanding how everything works together for us to do what we can do. So we we've, we've had a lot of background of almost everything and anything we can do. So then we can get to this position of actually designing solutions. Because we understand or we have enough knowledge in every section of the industry to enable the customer to guide them better. So yeah, it's a bit of it'll be a simpler question. If we had like a systems engineer, with the guy there but for us, it's a much wider scope purely because of what we do.

Joao: Okay, so yeah, so you don't we don't have a system engineer?

Janesh: So basically If you're looking at IT role starting up, you'd go as a service desk engineer avoids taking calls and doing what it is, then you'll have a systems engineer, a senior systems engineer, and then a technical specialist. And then the architects come into play. So you'll have a technical architect, a solutions architect, and an enterprise architect, that's the hierarchy you will come up through, the more higher up you go, the less tools work you do for your actual actual deployment. And actually getting into the systems and doing work is very less you go more on the design part. So the simplest ways if you look at a building architect, he designs the building blueprint, but he doesn't actually build it. This is similar concept, we will design everything, but we wouldn't do any voting there will be given to the engineers to do and then from that class, but we need to know on every part of their work. So we need to know what the skill sets and what they are. So we can actually design something that makes sense that can be deployed, otherwise, we will be designing something that the systems don't exist or wouldn't work with. So it's kind of a you have to know have to have the knowledge of across a broad knowledge of IT, for you to be able to do that.

Joao: Yes. Very, very good. Slowly understanding everything.

Janesh: Yeah, no, no,

Joao: It works and everything. So what would you say are the most sought after skills from your perspective into the job kind of job so far?

Janesh: Yeah, for us. It's usually people skills, and talking and communicating with the director, CTO, CIOs, you have a very high audience who are priority and basically you have to be able to communicate well with them clearly with them and understand what they want be a good listener as well, because they're telling you this is the solution they want. And you don't make sure you want to deliver that and not something else that they didn't ask for. So it's more of the strength of communication documentation is another thing that you'd have to be very strong at. and designing of diagrams. So understanding what they're working for, and then trying to put it in a paper and show the diagram that it actually works. So yeah, those are the main ones that I would say would be in our position.

Joao: Excellent. Pretty much coming to an end here because I am running out of questions, but what advice could you give to to an individual who aspires to join the IT industry?

Janesh: So the IT industry, just be ready to learn all the time. So I've been in it for almost 15 plus years and are still always learning on the job. So you will never stop studying you'll keep going through that the market changes so move with a market where cloud technologies come in. Applications are just moving very quickly, we just need to know it's it's not the studying would not always be something like going to university and doing a studying or doing a course or like just general reading articles. See what's happening in there are a lot of blogs of influences in YouTube that you have that will be running America especially where they have new cloud technologies that come out before we even get them in Australia, for example. So it's be attracting where we are actually it's an advantage of us if you're in Australia, or a country that doesn't have the actual adoption of card very quickly. So we get technology a bit later on the preview or whatever the case is, so we can actually see what they've had. So doing research beforehand, it should be more of an interest than a job. So it's where we'll have an internal IT geek in you and you just try to just enjoy doing what you can and yeah, you kind of the rest of we just follow with it. But yeah, it's we're ready to learn all the way through because and adapt to different changes because the market changes very quickly.

Joao: Yeah, excellent. And have you seen like you said, 15 years you've been doing this? Have the market? Like how, how much did that change it for you? Like is there any skill set you've learned back then, and today you it's pretty much obsolete or, or it's just evolved?

Janesh: No, it's the reality is the concepts of pretty much the same, it's just it's just taken a bit more work out of you or a bit more or less so in the major shift has been about programming. So if you're a lot of a lot of emphasis become into programming and application development. 15 years ago, if you look at it, iPhones were just about coming out. Android devices and all applications weren't that big. It was all just standard solutions and that but now the application is where the market is and where your applicant programming Python language C sharp. That's where you're kind of leaning towards. So everything is software as a cord. You've got core operating systems now. Yeah. So it's the market has shifted, but you kind of have the basic understanding nav is there. But if you haven't done much of programming, then you probably be left quite behind because you have to try and catch up with that. But with with our case, being being at a at the top of the career of per se, and IT ranking. No skill is basically not utilised. Do you have to utilise everything that you've experienced in the last however long you've been in IT for, and pull and understand and make sense of you have to be able to have the depth of knowledge for you to be able to do what we do? In our case, so yeah, any knowledge is will be beneficial. You never know when but it might be beneficial. Maybe? Yeah, so yeah.

Joao: Excellent. I'm sorry, I didn't mean to interrupt you.

Janesh: But I finished.

Joao: Funny. Remember, maybe 10-15 years ago, I'm friends, we're starting. We're doing the same course that I'm doing now. And they were talking about Python and c++ and Java. And I thought back then, I don't know if we should learn this, it’s gonna change. And it seems to be the market seems to be using a lot of that sort of stuff nowadays. Because…

Janesh: Yeah, absolutely. I mean, so it's a lot more adoption, right? It's, it's what the market and that's that's the thing with the market, it will change fairly quickly. It's what demand is and what you need that right. So the pandemic coming in there and everyone using zoom and teams, that market changed very quickly, where before where everyone was requested to go into the office, for example, and be in front of the customer ways. Now they're more adapted to you. I mean, the thing about the

industry is you have to adapt, you'll have to adapt as much as fast as you can, and what's changing. But yeah, as I say, rest of the world moves a lot faster than we do. Therefore, we have a bit of an advantage and you just go and speak to them, network across the world with everyone, try and find out what's going on with different technologies. And that's the key basically, for us to stay ahead. I mean, the course who any course you learn any knowledge you have that it always accompanies will no matter where you go and how you run it, that knowledge will always keep building on. So yeah.

Joao: Excellent. Um, let me see. I think I have most questions here. They are, like, I have a few more questions, but it's gonna be repeating what you've already. But thank you very much for your time.

Janesh: no worries at all.

Joao: I appreciate it. I hope it was pleasant.

Janesh: Yeah. Now you're absolutely fine for first interview, you're pretty good. Don't worry about it once you get a bit comfortable in a job. That shouldn't be awkward.

Joao: Thank you. All right. Thanks. Thank you very much.

Janesh: Cool..

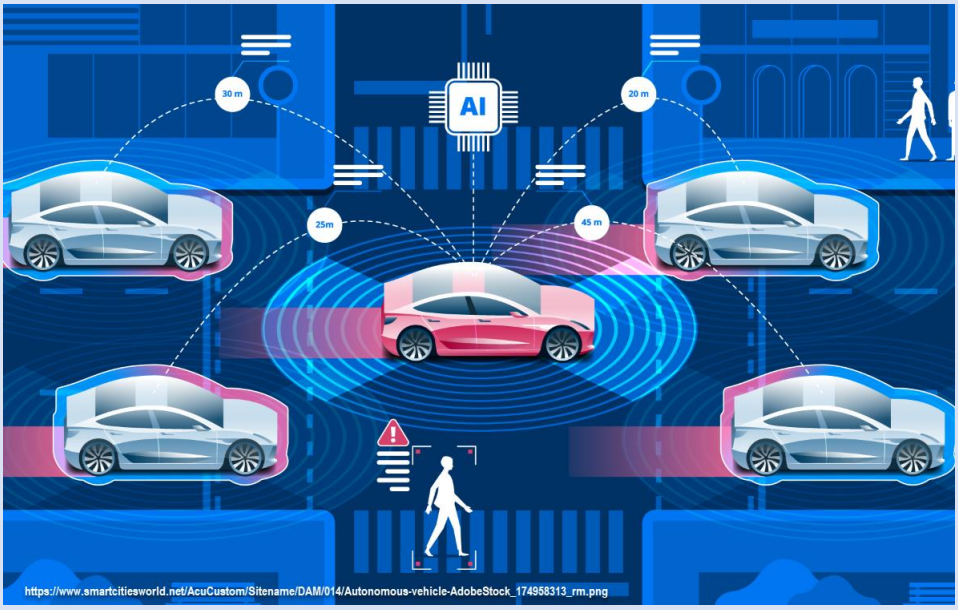
Joao: I think thank you see ya.

Key Outcomes of the interview

Based on the interview, as a transcriptionist and aspiring technical support specialist, I've learnt that you don't need to have a high degree or countless certifications to reach Janesh Raghwani's position as Solution Architect. What's crucial is that you continue to read and learn more about your profession to update yourself on the trends of IT. This allows you to constantly evolve as the IT world evolves too.

IT Technologies

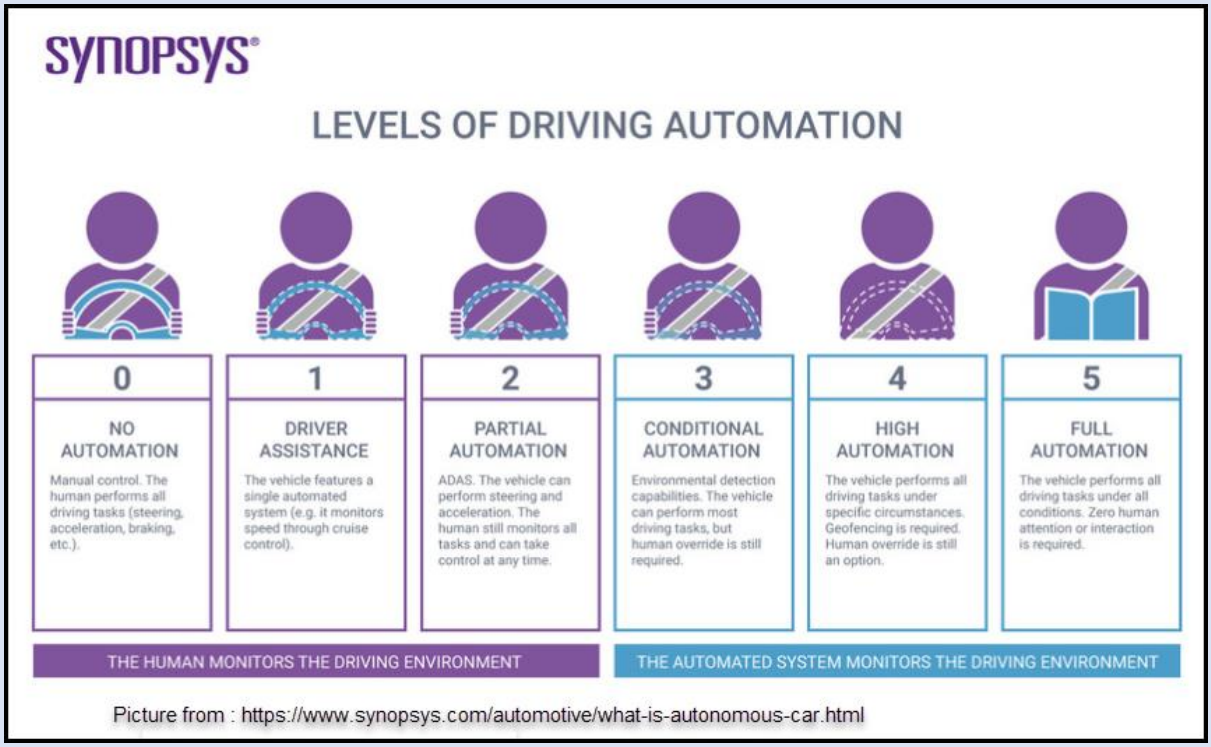
Autonomous Vehicles



What does it do?

An autonomous vehicle is one that operates itself performing the necessary functions that a human would generally perform with the aid of sensors and artificial intelligence. This concept has been there for a long time beginning in the aircraft industry with autopilot where the controls of a plane are taken over by computers to keep the aircraft in its path. Autonomous trains have also been configured to run between stations and mine sites moving people and goods. Cruise control, blind spot detection in cars, lane overstepping and overspeed alarms are some basic types of automation already available in most vehicles today.

The Society of Automotive Engineers (SAE) currently defines six levels of driving automation. The beginning level is where the human being has full control over the vehicles to a slow increase in shift to fully moving the control to the automation built into the vehicle.



To achieve complete shift of control from human to the automation built in the vehicle has have the smarts to sense its surroundings and maintain a safe path to its destination.
Autonomous vehicles use sensors, mapping software, GPS tracking, electronics, software, machine learning and computers to chart out a route, and instruct the cars to perform tasks such as accelerate, steer, brake and stop. Hard coded rules, visual cameras to identify obstacles, modelling and object recognition help these vehicles to follow traffic rules and prevent collisions.

Autonomous vehicles are also used in Mining Operations where large heavy mining Haul Trucks laden with over three hundred tonnes of Iron Ore move from the bottom of the pit to the top with out drivers. This has various advantages over human driven trucks as the decision making is quicker due to the ability of the computing system to process data much quicker. These vehicles move a large payload each trip and hence the speed at which they run, the brake applications and the gradients of the ramp they drive on all has a bearing on the life of components and the fuel burnt by the engines. Hence optimising this with given conditions is very important. It also improves safety where in human do not have to be exposed to high-risk routes with interaction between heavy mobile equipment and the presence of fibrous materials and excessive heat conditions.

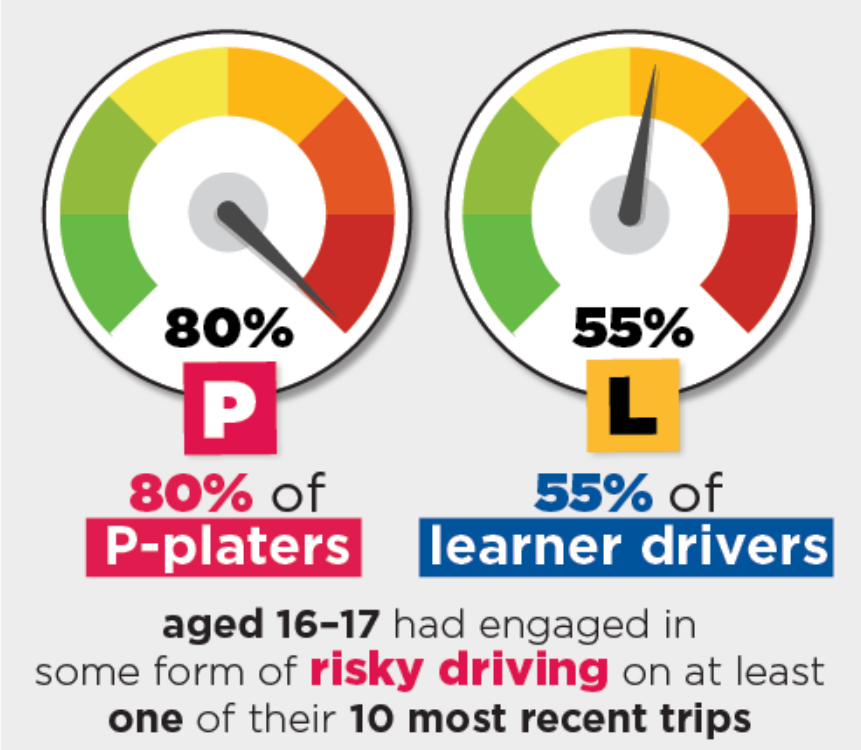
Innovations in Autonomous Vehicles

As mentioned, there are various levels of automation already in use in most vehicles in the market. Toyota Hilux a few years ago introduced a camera on their bumper bars to identify speed signs and allow the vehicle to alert the driver of over speeding. This meant that mapping software did not need to be updated if the road speed were updated.
Some of the innovations taking Autonomous vehicles to the next level are as follows:
Deep Reinforcement Learning (DRL) – this is a subfield of machine learning that combines reinforcement learning and deep learning to resolve complex reasoning and computing. DRL has been used in robotics and games to carryout basic household tasks using robots. DRL also provides manufacturers insights into automation technologies and vehicle maintenance such as predicting component life.

Path Planning – the success of the autonomous vehicles, to some degree depends on the reduction in the number of collisions and interactions with humans (near misses etc.). To achieve better target in this space, the vehicles must choose a path that is efficient to move from place A to place B. Using mapping applications, weather conditions, traffic conditions a safer route can be charted to reduce the impact of accidents and unfavourable interactions of other vehicles and pedestrians. Knowing the speed of the other objects that may come in proximity such as pedestrian or adjacent cars that could come within close proximity, these can be fed into various machine learning models to predict outcome and memorise them for future events that arise.
SLAM – Simultaneous localization and mapping is a technology used to operate a vehicle in real time surroundings where mapping is not available. Constant connection to GPS tracking and re-imaging the position of the vehicle, the AI can chart a map of the movements of the vehicle thereby updating the maps for that area for future.
HD Maps – high-definition maps with technology to work out lane markings, road curves, gradients etc can be used to predict how the vehicle will be travelling in real time.

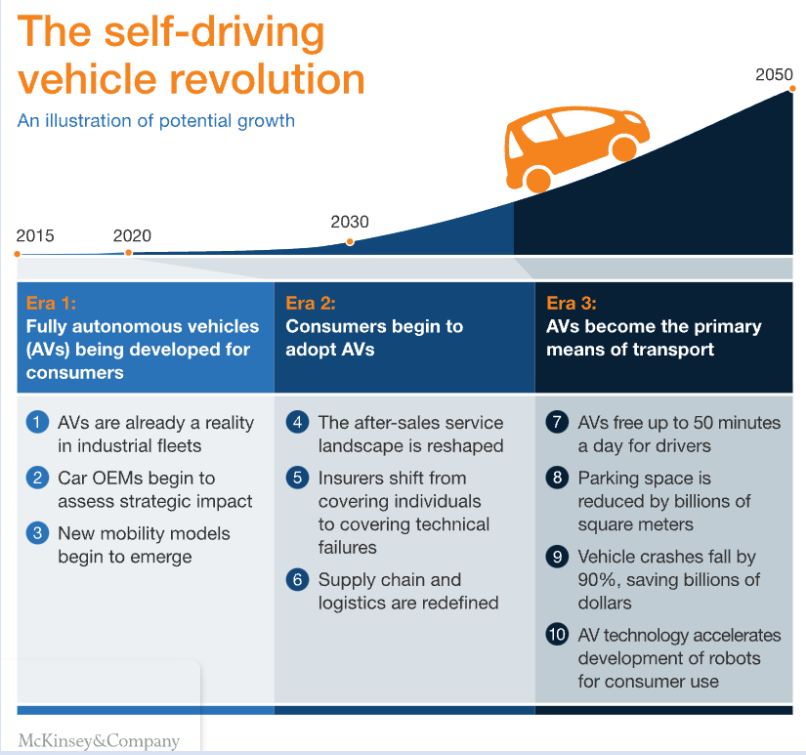
While currently there has been some trials done to completely move to full automation there has been very low success due to the trade off with cost, safety and funding. Tesla, Ford, Volvo, Apple, and Google are few companies testing autonomous cars.
Given the focus on climate change and the road safety, this technology will become more popular in the next 2-to-5-year timeline. Vehicle emissions can be reduced, peak hour traffic congestions can be reduced, accidents due to human behaviours reduced. Transport companies would not need drivers to drive across states away from families. At the current moment with COVID, we can see the spread of the virus between states has been through the transport drivers moving across borders. This could be avoided.
School pick up and drop off can be scheduled while parents are working, thus providing a safer mode of transport for children.
Road accidents with young teens could be avoided to some extent with autonomous vehicles.

Figure 6.1: 16-17 year olds who engaged in risky driving on at least one of their 10 most recent trips



Impact of Autonomous Vehicles

There are various impacts the move to autonomous vehicles will bring about. The following chart from McKinsey & Company shows the progress of the self-driving vehicle revolution over the next 30 years. Below are some of the areas of impact:



Insurance – it is going to a shift in insurance premiums due to the reduction in driver-based accidents. Hence insurance companies would need to consider how the revenue generation to keep their business profitable. Legal questions would also arise on how claim is disputed. Questions like who is responsible, i.e., the manufacturer that had a fault in the AI or machine learning or was it the owner that programmed it incorrectly.

Road improvements would play an important factor in this as there could be designated lanes for various speeds or types of vehicles. Optimised driving could lead to better roads and less emissions. Point to point drop off service would mean quick transit times for most employees. Reduction in traffic accidents will have a social and economic savings also. Driver fatigue over long travels would be reduced thereby reducing stress and fatigue.

Car Pooling, sharing would become more widely used and hence reduce the requirements to own vehicles reducing total cost of ownership and the requirements for charging vehicles and garaging. Workplace parking would be reduced as vehicles could quite easily perform drop off and pickup.

As autonomous vehicles become more affordable, there will be a shift in the transport of personnel industry. The reliance on taxis and rideshares will decrease. Farm equipment and public transport vehicles would replace drivers with autonomous vehicles there by increasing unemployment. Trucking and freight companies would also be in the same situation.

Due to machine learning and predictive real time analysis, there would be less maintenance required on the vehicles thereby reducing the trades required for servicing and maintaining the vehicles.

Safety of passengers could be compromised if vehicles were target of suspicious tampering of software or hacked. This would need some serious consideration on what security is setup to avoid hacking.

Most of the road rules and regulation are based on human drivers, and these will have to be carefully replaced with new drafted rules. This is an extensive exercise and would take

considerable time to first understand the behaviour and then come out with scenarios that would need regulations drafted.
Ethical concerns such as how to program complex situations where a choice must be made to save a pedestrian against the vehicle passenger, other vehicles coming rapidly in blind spots or proximity. Autonomous vehicles must judge risk versus reward. Dr Nicholas Evans, an assistant professor of philosophy at University of Massachusetts Lowell, mentions that self-driving cars are, for now mostly risk averse. He and his team are working on constructing risk-reward scenarios. The question also arises that would we trust our car to take the correct decision and how long would it be for us to gain this trust.

How does this affect us?

We can be assured that regardless of the cons of autonomous vehicles, they will take over the market share of vehicles in the next 20 to 30 years. We must adapt to these changes and commence skilling ourselves into this technology. AI and machine learning is slowly becoming a key part of day-to-day life and hence having the insight into what this is and how it works will have to be learnt by us and our younger generation. Recharting a path when the vehicle is not taking you where you need to go is one example. There will be challenges as you travel between towns from cities where mapping and GPS tracking may not be available or updated version available.
My daily commute to work has been through public transport and that may not affect me at all. But I enjoy travelling up the country to various camp sites and towns as a hobby. This will be affected if towns I need to visit do not have vehicle charging or places where my autonomous vehicle can be repaired if necessary. I have been driving vehicles for the last 26 years with a good driving record. I feel the safest when I am at the wheel as I know the decisions, I make are more geared towards my safety and the safety of the passengers. Putting this decision making towards a machine that I cannot control or see does not give me assurance now. Also, while on the road, looking at other drivers and their behaviours you can make judgement on where you need to be in relation to them. Given there is no visual contact in the autonomous vehicles you cannot be sure what the other vehicle is going to be doing.
The other major contributing factor is the economic side of things. Autonomous vehicles are expensive compared to the general vehicles. Without subsidies, it becomes a burden to dispose out your current vehicle at low prices and invest in new vehicles at an inflated price. There would need to be incentives by the government to make the shift towards this technology. In conclusion, the decision to move to autonomous vehicles for myself would be purely based on the economic modelling, return on investment and the result of standardised ethically sound rules scripted for the decision making for these vehicles.

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Cybersecurity

Cybersecurity is the practice of protecting data, networks, systems and programs from digital attacks, also known as cyber-attacks, which are usually aimed at accessing, destroying, changing sensitive information, extorting money from users, or interrupting normal business processes.

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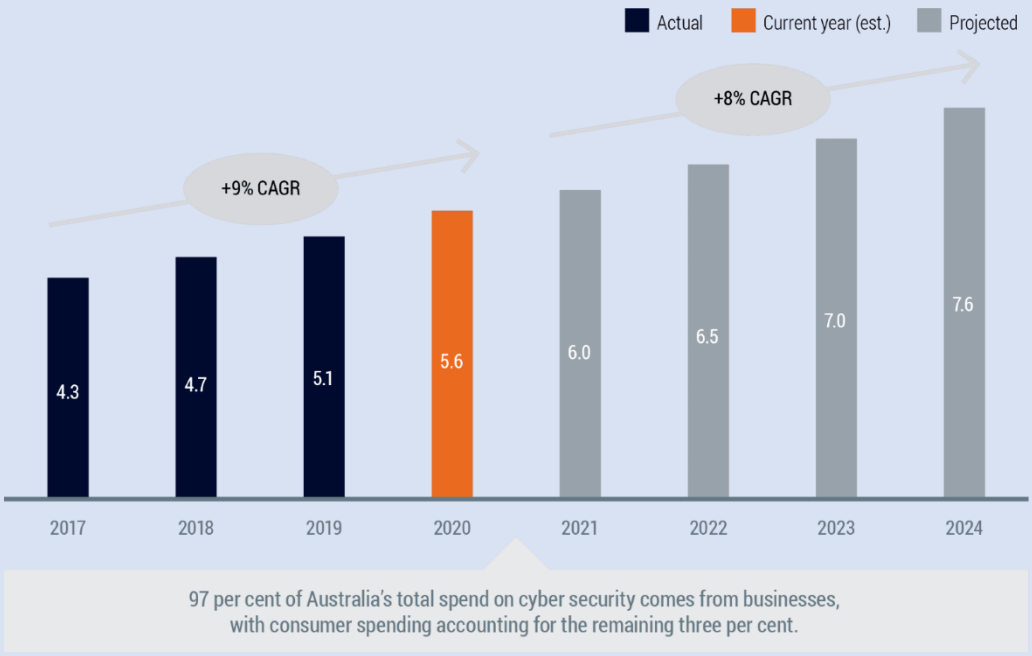
The recent COVID-19 pandemic pushed citizens to work from home, businesses and governments migrated to the Cloud, people relying more on the internet and smartphones to complete their daily obligations, because of that cyber-attacks are on the rise. A shortage of skilled staff is placing organizations at higher risks for data breaches, for the public sector of organizations the stakes are especially high, recent breaches have exposed private information on millions of citizens while compromising classified data and causing monetary loss. In 2020 the estimated cost of cybercrime to the world was about 1 trillion dollars, 50% more than what was predicted for 2018, also it's more than 1% of the global GDP.

In Australia, the Cybersecurity market is expected to increase 9% per year, with Australians spending approximately $5.6 billion on cyber security in 2020 - from both local and international providers - a figure that is expected to increase to $7.6 billion by 2024.



(Sources: Gartner, IBISWorld, AustCyber's Digital Census 2020, AlphaBeta analysis)

A successful approach to cybersecurity has multiple layers of protection spread across the computers, networks, or data that one intends to keep safe. Each of these layers focuses on a specific area where malware could attack and work together to tighten security and have a better chance of stopping intruders from breaching your network.

Some examples of protection layers are:

Firewall/Unified Threat Management (UTM): Firewall stands as the main barrier between your network and cyberspace, it monitors incoming and outgoing network traffic and permits, or blocks data packets based on a set of security rules.

End Point/End User Protection: Antivirus software was originally developed to protect a computer from viruses, however with the proliferation of other malware, the next generation antivirus software started to protect from other computer threats, also available for mobile phones and tablets.

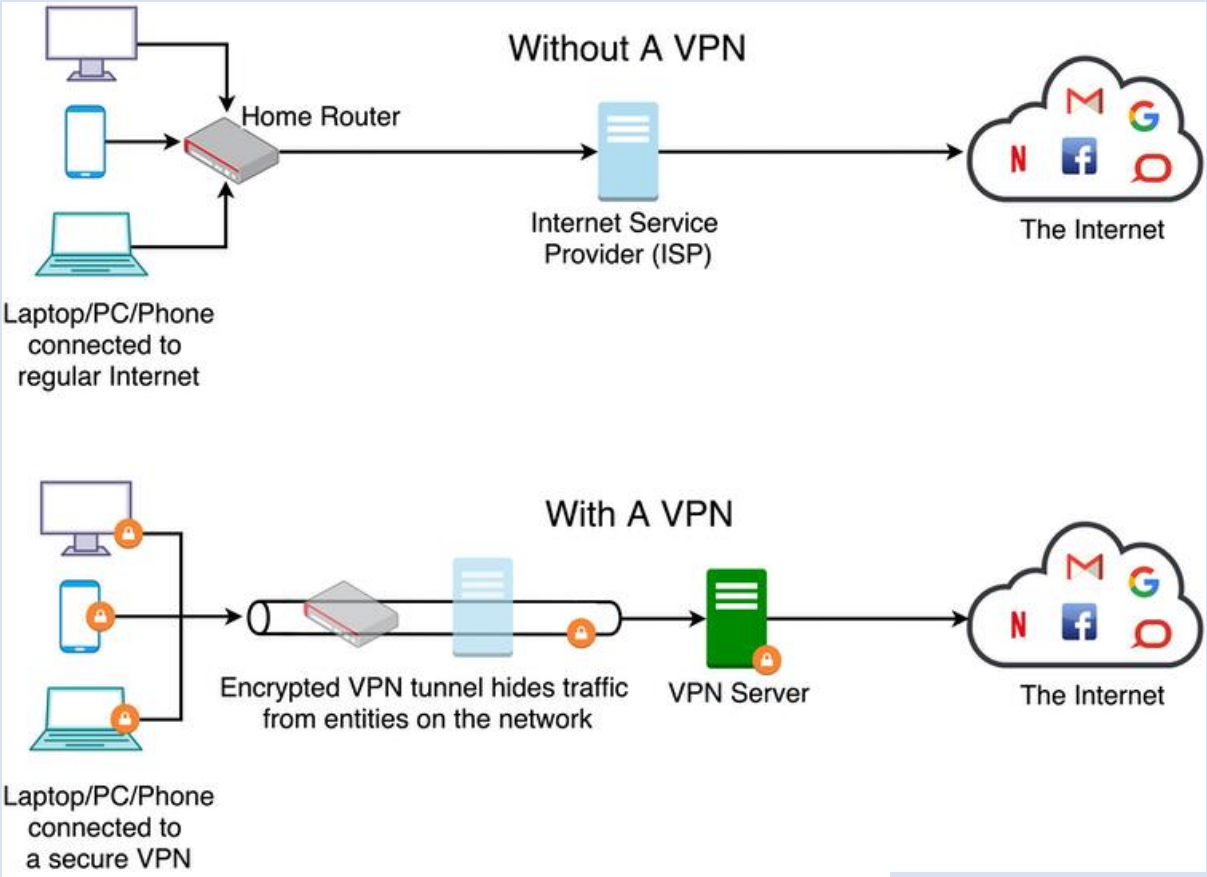
Mobile device Management: Mobile workplaces and virtual offices are becoming the norm, it allows IT teams and administrators to control and distribute security policies to the mobile devices accessing sensitive corporate data in the organization, ensuring the corporate network is secure.

Data backup: in case of any stolen deleted or altered information, backup can save you a lot of headaches.

Security awareness/education: It's important to inform, train and prepare the people that work in businesses, to avoid basic mistakes that could cause losses to the Company like downloading a virus.

Two-factor Authentication: The simplest most effective way users are who they say they are. When you type your password then it sends another temporary password to your mobile phone that you have to type as well.

Virtual Private Network (VPN): makes an encrypted connection between your PC and a VPN server. Your PC uses the VPN encrypted connection to navigate the internet, when you make a request it sends the information encrypted back to your PC. Making it impossible for someone to see your request or the data you received.



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Some of the technologies that are improving for security or have chances of being implemented in Cybersecurity soon are AI and Deep Learning, Mobile security, Cloud Technology security, IoT security and Blockchain.

AI and Deep Learning is a double edge sword that can be used as a security solution or as a weapon by hackers. AI has been used by hackers to create smart malware and launch attacks that bypass the latest security protocols in controlling data. On the other hand, AI applied to Cybersecurity can predict new attacks and notify administrators of data breaches instantly. AI can currently be used to build automated security systems, natural language processing, face detection, automatic threat detection.

Cybersecurity being automated with AI, in the next few years, is a way to keep up with the market demand and lack of qualified security experts.

An example is 'DarkTrace' https://www.darktrace.com/en an autonomous Cyber AI algorithm that in seconds can scan and interrupt in-progress cyberattacks, including ransomware, email phishing, threats to cloud environments and critical infrastructure.

Mobile is the new target because most people rely on a smartphone to complete their daily tasks like internet banking, email, social security, keep up and update their social media, work-related tasks, read the news, take personal photos. Mobile phones are a potential prospect for hackers. Developments towards smartphones security will be needed to match up the need for personal safety.

Cloud technology with the latest advancements, making it more viable for businesses to migrate to the Cloud. The future indicating large amounts of data being transferred in and out of the cloud, and we will become more vulnerable to attacks. Hackers will have more opportunities to steal or disrupt all of that data being transferred. Cyber Security measures need to be implemented and updated regularly within the cloud providers.

The **IoT (Internet of Things) with 5G network** means even more operations and devices will be interconnected, being 5G architecture is still effectively new and requires a lot of research to find loopholes to make the system secure from external attacks, cybersecurity will have to keep developing and updating as this technology moves forward. Also, manufacturers will need to be very strict in building sophisticated 5G hardware and software to control data breaches.

Blockchain the rise of cryptocurrencies is an indication that this technology will be used every time more. If developed, utilized correctly and implemented into the information security landscape, it could revolutionize it. Some experts say this could be the future of Cybersecurity.

Blockchain encryption in theory is mathematically impossible to crack, and it has inbuilt security that when hacked instantly detects it.

What is the likely impact?

The likely impact is that cybersecurity will be an important subject in the IT industry, where professionals will have to learn and develop new solutions along with the new risen technologies.

The potential impact is that Companies, Banks, Cloud Providers and Governments will have to spend billions to keep their cybersecurity up to date, also the evolution of information security will be essential to keep up with the rising number of threats.

There will likely be always a possibility of data breaches that cost organizations billions or expose personal information or malware that could destroy personal data or cause financial harm to individuals.

Cybersecurity professionals could be in shortage in the near future, considering the market today needs more professionals. The implementation of AI and Deep learning into the information security landscape, if successful, could have a good impact and help to keep up with the demands.

How will this affect us?

We will live in a world where its people are more aware of Cybersecurity, this means we could look up and search how to keep our data safe often, where we could invest money in software that could keep us safer, also where expert advice will be needed to keep us updated to the latest security trends, so we don't fall for the latest cyber scams.

The only people who are not much affected are people who don't use technology, but the way globalization is evolving people who don't rely upon technology will be a rarity.

The way the Financial Institutions, Governments and Organizations are migrating to digital, could affect us all in the future. When we rely mostly on digital data, for example, our bank account balances, if one day we wake up and everyone's account is $0 it could create major chaos in our society, the security of this data is crucial to our society even for keeping peace and order.

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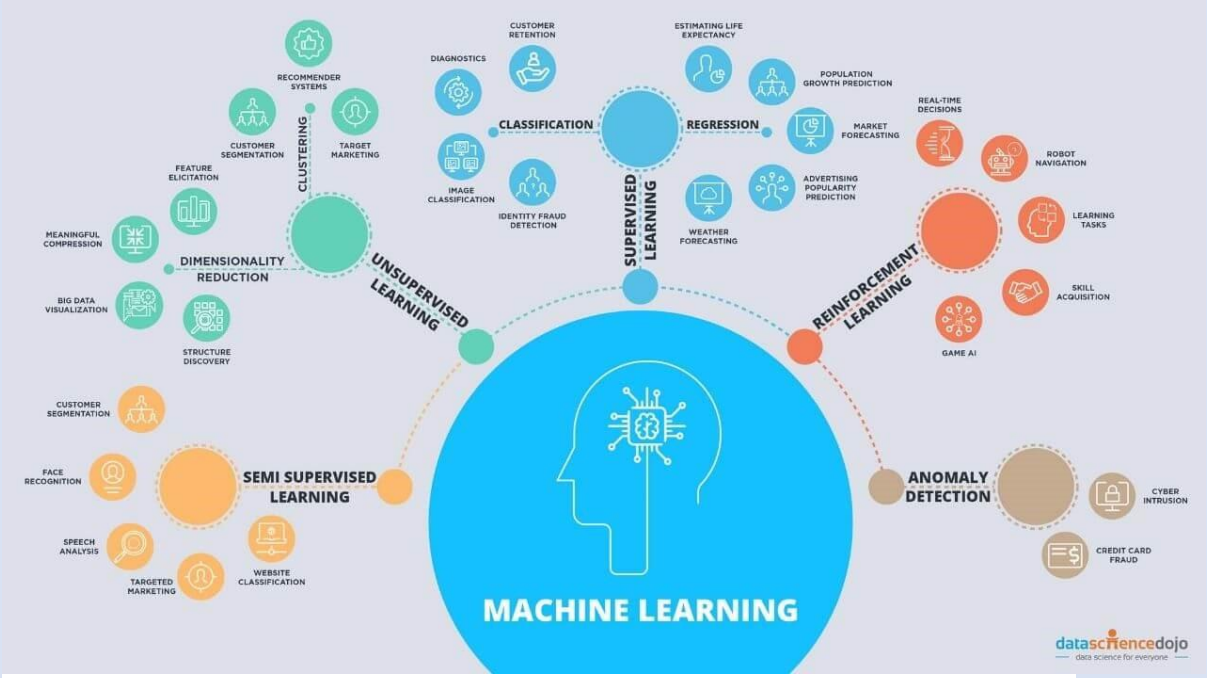
Machine Learning

Machine Learning
Computers are incredible at storing, organizing, fetching and processing huge volumes of data. But what if we could use computers not just to fetch data, but to actually make decisions about data? This is the essence of machine learning – algorithms that give computers the ability to learn from data, and then make predictions and decisions.
Machine learning algorithms build a mathematical model based on sample data, known as "training data", to make predictions or decisions without being explicitly programmed to do so.
There are different approaches to Machine Learning, and these are the main methods used today:
Supervised Machine Learning: you need a “supervisor” to map between inputs and outputs, it will adjust its weights until the model has been fitted appropriately. This method is defined by its use of labelled datasets to train algorithms into classifying data or predicting outcomes accurately.
Unsupervised Machine Learning: You feed the algorithm unlabelled datasets which analyse the data and can cluster or label it. The algorithm discovers hidden patterns or data groups without the need for a human intervention "supervisor". Unsupervised learning is great to discover similarities and differences in information.
Today is used as an ideal solution for exploratory data analysis, cross-selling strategies and image pattern recognition
Reinforcement Machine Learning: This is a behavioural model, similar to the supervised learning model, but instead of training the algorithm using sample data, this mode learns by trial and error using feedback from its actions and experiences the program discovers the correct behaviour.



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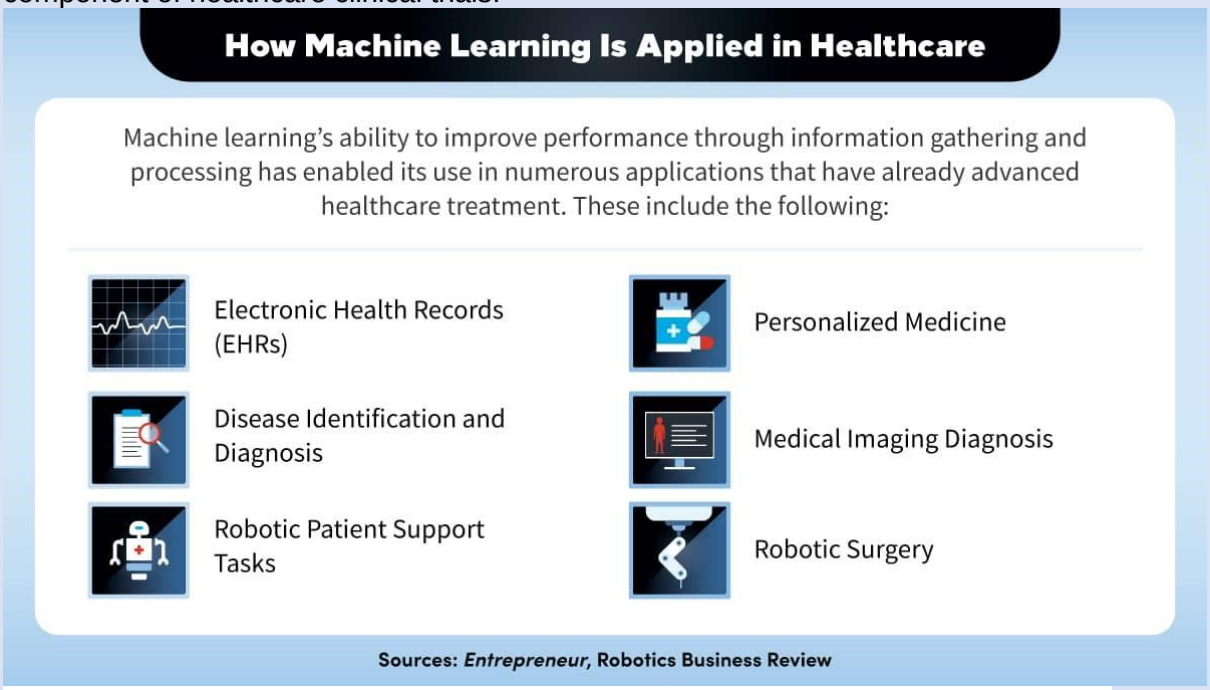
Here are examples of machine learning in our daily lives:

Image recognition: the neural network can analyse pictures to detect objects, features and recognize faces. This technology has been used for photo tagging in social media, radiology imaging in healthcare, and self-driven cars.
Social media analysis: It recognises words and understands the context behind them, monitoring users. **Video surveillance:** This system learns how to spot human figures and scans for physical threats. **Optimization of search engines**: Algorithms look for user habits, analysing the search contents**. Cybersecurity:** Algorithms can immediately recognize cybersecurity threats, analyse similar cases and take measures to keep users or websites safe.
Speech recognition: is a capability that uses natural language process (NLP) to process human speech into a written format, many mobile devices incorporate it into their systems to conduct voice search –e.g. Siri
Automated stock trading: Designed to optimize stock portfolios, these platforms make thousands even millions of trades per day without human intervention.
In the near future, we will see clear Machine Learning innovations within most of our production, health, entertainment and distribution industries, some examples are as follows:
The Healthcare and Medical Industry:
The covid-19 pandemic has highlighted the significance of investing and optimizing the healthcare industry and its systems. This is one of the most promising technologies in the world today, with machine learning healthcare providers can generate extensive volumes of data for making insightful deep clinical decisions.
ML is also used to assist the discovery of new drugs, reducing the time for discovery, helping the industry to save a lot of costs, also helping systems to deal with healthcare delivery to boost its quality under reduced costs. In the future experts predict ML to be an indispensable component of healthcare clinical trials.



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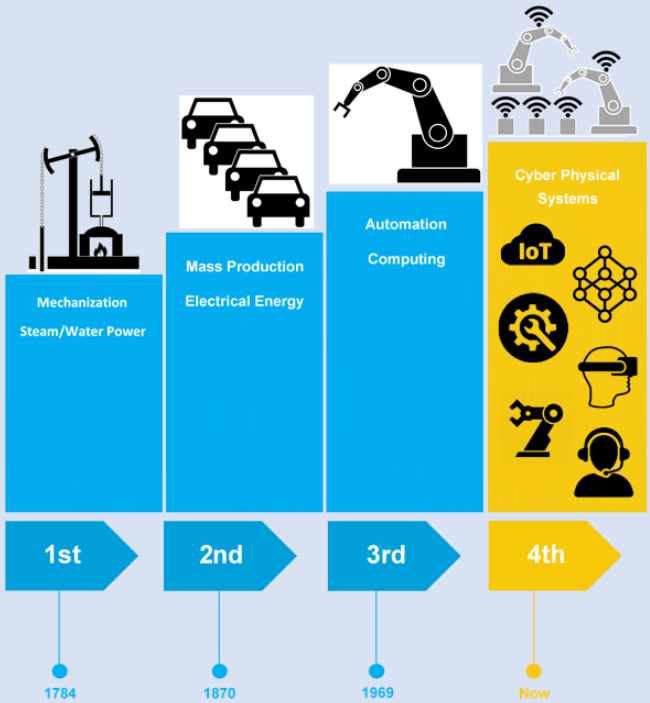
Entertainment and the media industry:
Machine learning emerged to be crucial for the entertainment and media industry, even more with the covid-19 pandemic. Improved recommendations engines for delivering services, as well as predictive modelling for future demands can be anticipated so the industry can make sound investments with better knowledge.
Retail and commerce:
More changes that will affect our near future are the chances in the conventional way we do retail and commerce. We had a bit of a taste of what will be like with the interruption of conventional commerce practices due to the pandemic. There are now machine learning applications for almost every area of e-commerce operations, from inventory management to customer experience.
The manufacturing industry:
Industrial IoT has inundated this industry, 'smart' machinery that sends data about how things or people are performing to a central IoT platform where you can see diagnostics and make necessary changes to improve performance or prevent problems, and in the near future, it will only expand.
ML will become a building block for the whole industry along with the connectivity of data, automation, error detection in real-time, tracking of assets, visibility of supply chains and warehouse efficiency. Machine learning will boost efficiency, innovation and reduce costs.
Agriculture
IoT-enabled Agricultural sensors and real-time data for algorithms increase agricultural efficiencies, improve crop yields and reduce food production costs. According to the UN, the world's population will increase by 2 billion by 2050, requiring a 60% increase in food production. An example is using AI and machine learning-based surveillance systems to monitor every crop field's real-time video feeds identifies animal or human breaches, sending an alert immediately
What is the likely impact?
Machine learning will likely revolutionize the world as we know it, affecting the whole manufacturing chain, from the crops "being planted" to the manufacturing and to our doorstep "being delivered". Some experts say Machine learning and AI are starting the 4th industrial revolution.



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Machine learning will likely make redundant repetitive jobs that don't require a high level of social or emotional intelligence, eventually some of the jobs we know today will disappear. The World Economic Forum reported that 85 million jobs will be replaced by Machine Learning and automation by 2025, but don't worry the good news are that 97 million new jobs will be created due to AI by 2025.

How will this affect you?

The differences that we will have from today in a few years are we will be surrounded by technology, using smart apps for most of our daily tasks, instead of human interactions like we had pre-covid-19 pandemic.

Healthcare and the medical industry have the potential to get better, cheaper and faster with more accurate diagnostics; also cures and medicines will get discovered and developed faster. Due to ML integrated into most of our production lines, prices are likely to go down, also smart monitoring of the market and people needs, where algorithms detect shortages before it happens, will give more time in planning ahead, making the market resourceful. Image recognition integrated with surveillance will most likely drive crime rates down, algorithms can detect crime before it happens as well as to detect when people require help and notify authorities.

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Robots

https://medium.com/@raghav0278/what-is-robotics-types-of-robotics-and-its-uses-a30e5763325

What do robots do?

What is the state of the art? What are the newest developments in technology?
Beginning during the 18th century's industrial revolution, massive technological advancements were made. Poverty has been decreased to a greater extent in the last five decades than in the previous 50, according to UN estimates. That's because the global economy expanded sevenfold, with technology playing a key role. A modern Industrial revolution can occur again. In the 21st century, we are focused on making small, but useful, advancements that let us gets things done more efficiently. This streamlines our daily lives and reduces the workload of most industries.

https://robotsdoneright.com/Articles/assembly-line-robots.html

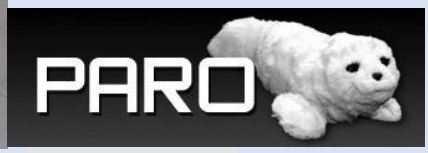
https://www.esticastresearch.com/report/automotive-robotics-market/

What can be done now?

The automotive industry includes the design, development, manufacturing, and selling of products. It is one of the most significant economic sectors, and robots play a big part in this. Currently, robots are easily set up and programmed, and seamlessly integrated into the automotive industry within factory assembly lines. Processes can be repeated without flaws. Unlike humans, they are prone to fewer mistakes, need less maintenance, and are more cost-effective. They can work in environments that are deemed unsafe for humans. On a smaller scale, many household robots have been introduced to make life easier, such as robotic vacuum cleaners.

What can be done in the future? What current tech makes this possible?

Humanoid robots are beginning to be implemented within healthcare, entertainment, and space exploration across the globe. They are a type of system that is designed to accurately replicate human interactions and movements. Some examples of this are Paro and Pepper. Paro, designed by Dr. Takanori Shibata, is a robot designed to assist caregivers and communicate with patients more efficiently to reduce stress. It runs on AI and alters its behaviour according to sound, temperature, and touch, labelled the therapeutic robot. Pepper, created by SoftBank Robotics, is a semi-humanoid robot that adjusts its behaviour based on surrounding people's moods. Both robots use sensors to detect changes, which is becoming more and more prevalent in the robotics industry, beginning to be programmed to an almost human-like emotional intelligence.



PEPPER http://www.parorobots.com/
www.softbankrobotics.com/emea/en/pepper

In today's market, fast courier services are essential for businesses to stay competitive. Delivery robots let companies have customer satisfaction, and even opens new options for service providers, such as Amazon, eBay, and major retailers. Especially with the rise of online shopping during the pandemic, this could help make transportation (gas, people wages) and shipping fees less expensive. Ways this can be done is through automated vehicles and drones.

The company Nuro has been working on autonomous on-road vehicles that are made to transport goods quickly and safely. Its exterior and interior is flexible, not limited to only one purpose. It can handle errands such as delivering groceries to picking up clothes. Zipline is a logistic company that operates a global autonomous delivery service that transports critical healthcare shipments to those who need it most. They transport vaccines, emergency medicine, and supplies, as well as integrating regular delivery services. Having flown almost 12 million miles to date, they are a supply chain industry that is constantly transforming the technology and medical world.

https://builtin.com/robotics/robotics-companies-roundup

What is the likely impact of robots?

Rapidly changing robots could dismiss assembly line and retail workers entirely. Driverless cars are going to replace taxi drivers most likely in the future. Tesla's cars, for example, are integrated with an updating system, like the ones you would fine for an iOS or Android device. Their cars allow you to choose whether you want the new software installed. The software Assembly line robots can be programmed to put parts together, insert fine parts, like screws and pins, and can apply adhesives, such as glue. They are then able to perform employees' jobs more precisely and efficiently, which leads to increased production of goods. According to economists at MIT and Boston University, robots could replace as many as 2 million manufacturing workers alone by 2025.

A great example of retail workers being replaced are the Amazon Go stores. They take advantage of checkout-free shopping that are enabled by computer vision and sensors. Their services connect with Amazon customers' accounts which means it's convenient and flexible.

More people will also gravitate towards the IT industry, as robots will require maintenance and will continue to evolve.

How will robots affect you?
Daily life: How will this affect you? How might this affect family members or friends?

In our daily lives, some tasks can become mundane. Robots, however, can effectively perform repetitive tasks without boredom. Eventually, robots will be able to read things for us, engage in conversation, clean, deliver things, prepare our medications, or even helping us recover if we fall, or can't get up.

When robots are fully introduced, most of our domestic tasks would be completed by robots. Humans would become more lazy and more reliant on technology. Communication would also be an issue as you will lose time with your family, not having any face-to-face meetings. This could also result in our physical and mental health getting worse as we would engage less in physical exercise and contact with other people. It would be bad for our mental state if we were isolated from people all the time.

This is how robots can contribute to our future.

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Project Idea

Overview:
The project is to create a mobile application for some doctor's services. This will provide a convenient and more time friendly way for people without emergencies to interact with the local General Practitioner. There may also be a benefit of reducing the cost of the consultations due to efficiency. The application will provide video and audio consultations, blood pressure readings, weight, and body mass data to the doctor. This information will be obtained through the use of external devices such as a smart watch and smart scales. It will allow prescriptions and referrals to be sent electronically and provide an online booking service.

Motivation:
I have many medical conditions that require medical appointments with my GP. Around 65% of my visits are for prescriptions or blood pressure checks. When I attend the surgery, I can wait anywhere from 10 minutes to an hour just to see the doctor. Once I get called by the doctor, I am out again in 10 minutes or under. If I include the time to travel to and from the surgery, it can take up to 2 hours of my day for a simple appointment. I have a few friends who do not live in the metropolitan area who also must travel more than 20 KM to see their doctor. I believe a mobile app like this will reduce the need to visit the doctor, save time and free the doctor's surgery up for more pressing appointments.

Description
The product will be a mobile application that will run on Android or iOS. It will integrate with smart watches and smart scales. The features will include the following:

- **Online booking service** – This will allow the patient to book appointments with the doctor and select what the appointment is for at the time of booking. This is like other applications on the market.
- **Video and audio appointments** – There will be an option to book a video or audio appointment with the doctor, although this will not be a requirement if the patient is requesting services that do not require immediate contact.
- **Blood pressure** – Blood pressure will be monitored via a smart watch and relayed back to the application. At the time of booking, this will be requested and sent to the doctor.
- **Weight and body mass** – There are two methods in which this can be collected, the first is using smart scales and the second is using a smart watch that provides the feature. Both methods will relay the information to the application and send it to the doctor at the time of the booking.
- **Prescriptions** – Prescriptions can be requested via the app if the patient is currently taking the requested medication. Once prepared, the prescription can be sent directly to a pharmacy or sent electronically to the patient to print out and present at a pharmacy.
- **Referrals** – A doctor will be able to raise a referral for the patient and send it electronically to the place of referral or to the patient to print at home.
- **ECG** - The latest smart watches such as the Samsung Galaxy Watch4 is capable of ECG monitoring and is registered with the Australian Register of Therapeutic Goods. This data can also be sent to the doctor when requested.
- **Historic data and trending** – Monitoring blood pressure, weight, ECG data, and body mass electronically will allow for trending and reference points for the doctor

The doctor will be able to perform all his/her operations on the application either via the mobile application or via a secure web page.
The backend for the application would involve clustered application and database servers with an API written in PHP, fault tolerant storage and network load balancers. To ensure the privacy

of the patients, only doctors will have access to patient data and that will be gained via 2 factor authentication across encrypted tunnels between the client and the server. The infrastructure will be housed in a secure datacentre, with hourly backups be performed using a disk to disk to cloud method.
This application will be useful to individuals who must travel significant distances to go to their doctor or have mobility issues because it will reduce the time of visits and the frequency of required physical visits. In addition to these benefits, it will also benefit time poor individuals who put off visits because they are busy.

Tools and Technologies:

The hardware requirements for the project are listed below:

- **Network Firewalls** – At least 4 firewalls configured in a failover cluster. The configuration will use CheckPoint firewalls because they are easy configuration, can scale to 52 gateways/firewalls *(next generation firewall buyer's guide, n.d.)* with an intuitive management interface *(next generation firewall buyer's guide, n.d.)*
- **Routers** – At least 2 network routers in a failover configuration.
- **Network Switches** – A minimum of 2 switches configured in a stack
- **Servers** – A minimum of 5 servers running OpenStack, 2 for management and 3 for backend services. For the servers, we will be using Dell PowerEdge R830 Rack Servers *(PowerEdge R830 4-socket 2U rack server | Dell Australia, 2021). We* have decided on these servers because they are designed for virtualisation, with 4 CPU sockets, and 48 DIMM slots for up to 64GB DDR4 RAM in each slot. *(PowerEdge R830 4-socket 2U rack server | Dell Australia, 2021).*
- **Storage** – TrueNAS storage appliances configured in a cluster. These will run storage pools configured on top of RAID 6 disks. The file system used will be ZFS. TrueNAS is an open-source Network Attached Storage device. As this project requires the data to be available 24x7, with easily scalability, TrueNAS Core which is the free edition was not suitable because it is only community supported whereas the TrueNAS ENTERPRISE storage appliances come with "24x7 Professional Support" *(TrueNAS Open Storage | ZFS for the Home to the Data Center, 2021).* TrueNAS also allows the running of Linux containers which will more than likely be used for running services such as Apache2.

The software requirements for the backend are:

- **OpenStack** – OpenStack is "The Most Widely Deployed Open-Source Cloud Software in the world" *(Open Source Cloud Computing Infrastructure - OpenStack, 2021).* OpenStack has been chosen due to it being open source. Not only does this have financial benefits, it also provides a massive support base for the product.
- **Linux OS** – Ubuntu has been chosen as the Linux Operating System for the virtual servers. Ubuntu is the 4th most used Linux distribution in 2021 *(Cánepa, 2021).* Being open-source and extremely popular means that support is in abundance for this operating system.
- **Apache** – Apache is an open-source HTTP server. Its goal is to provide a secure, efficient and extensible server that provides HTTP services in sync with current HTTP standards *(Group, 2021).* Apache holds about 34% of the market. *(Which are the most used web servers? - Stackscale, 2021).* Apache was chosen because it is open-source and hugely supported around the globe.
- **Maria DB** – MariaDB is an open-source relational database, made by the original developers of MySQL. MariaDB is built on the values of performance, stability, and openness. *(MariaDB Foundation - MariaDB.org, 2021).* Maria DB was picked for the same reason as Apache, it is open-source and hugely supported.
- **Software** for development will be MIT App Inventor or Google Flutter.

Skills required for the project:

- Networking Engineer to configure the firewalls, routers and switches
- OpenStack specialist to install and configure OpenStack
- Storage Engineer to configure the storage
- Installers to install the hardware, some vendors require a certified engineer to install their products, others do not.
- A Flutter developer or a MIT App Inventor specialist
- Linux Engineer to configure the Operating Systems and associated services.
- PHP developer – to write the backend and API.
- Database administrator for MariaDB

The skills required are common and should not present any issues finding people with these skills. The hardware is standard across the IT industry and so is the software.

Outcome:

If the project is successful, there will be full working infrastructure to support the application, the application will be complete and thoroughly tested. There will be push to sign up doctors surgeries, specialists and pharmacies so people can start using it to their advantage. A successful project will lead to easier interaction with doctors for patients, patients will have greater access, time will be saved, doctors will be able to serve more patients than before, and the burden on GP waiting rooms will have been reduced.

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Individual Reflections

Alex:

At the start of this assignment, we had trouble getting enough people to create a group. Once that was achieved, it took a week or so for the team to get organised as we are split across multiple time zones with different outside commitments. When we got up and running it all seemed to run smoothly. Everyone had a role to play, and the work was divided amongst the team members during our first official meeting. This worked well as it allowed each member to concentrate on one particular part of the puzzle rather than scattered across multiple tasks. We attended a team meeting twice a week which allowed us to keep updated with the status of each part of the project and voice any concerns that anyone had.

Part way through the project we lost a team member but were unaware until a few days later. To the team's credit, we took it in our stride and distributed the team members work withing the team to get completed.

I would like to thank ALL the members of the team for their hard work and determination in getting this project completed despite some delays and short notice changes.

Sunil:

Being just the second assignment, it was very challenging getting to know what was required. But as the group was formed and we started communicating, it became clear to what we had to do. We started a bit late due to the logistics of getting the group formed. Once that was out, we had an initial meeting to outline what we had to do. Our group had a good mix of people with different skills and hence we were able to get the work done. We broke the assignment into different sections and the team put their hand forward to take on sections in the assignment to champion. Alex with his experience with IT took hold of running our meetings, did the Industry Data section and updating his project to be in line with the feedback he had received. Raul put his hand up being the author of the complete PDF document for submission. Joao did the Technologies section with conducting the interview which was in 2 different time zones. Jacqueline did the transcribing of the interview and helped in the Technologies section.

We lost a member of our group towards the critical time of the assignment. We had some tasks that were assigned. Unfortunately, these things happen and at this time in the course, people move out. It was sad that we were not informed and hoped out messages would be replied. Fortunately for a group that worked together well, the team chipped in and took on tasks that were pending and ensure we completed our assignment.

We used Teams as our main communication portal, as that is on phones and PC's and has video and group chat. GitHub was used to keep the articles that needed to link to the website. The group members were able to update as required and these could be pushed

Jacqueline:

The Magpie group consists of students from different states. Almost all of us are full-time workers, yet we still managed to attend team meetings while simultaneously accommodating to each other's state time differences. After all the obstacles and time constraints, our group still managed to finish A2, which is what went well.

Communication is an aspect of our group that needs to be improved. Lack of communication can reduce the quality of our work and our efficiency. One of our members withdrew from the course, which we only confirmed towards the end of our assignment. This then affected our time management, having to distribute larger portions of the task and complete them in a short period of time.

The surprising part while doing A2 was, when one member of our group disappeared without informing us. The group keep on messaging her via MS Teams and Outlook, yet we received nothing from her. The group only learned that she withdrew from the course when two of our members asked the course tutor. We got through this with determination and resilience.

After years of being away from the workforce, I could not imagine myself being in a group again. At first, I was a bit hesitant to go through the whole experience again, but throughout the assignment I began to feel more comfortable with my group and the environment. Being in a group is not easy as you need to deliberate over things, sharing your opinions to create something you all agree on. However, at the end of the process, I feel fulfilment and accomplished. Establishing teamwork is crucial to complete the assignment.
Completing this assignment would not be possible without GitHub and MS Teams. All our assigned tasks were uploaded through these platforms and if any group members had questions about the task, we could easily collaborate.
This is what I think reflects our group's work on this assignment.

Joao:
All the 5 members that stayed till the end in our group were willing to work towards the same goal, completing the assignment. We were all eager to set up Microsoft teams and keep communicating and attending meetings, also committing to their part of the work and delivering in a reasonable time.
Overall communication could've been improved, the group initially had 6 members but 1 of the members left the course without communicating, we spend 2 weeks without hearing from her, we tried emailing her and messaging on Ms Teams without hearing a response.
What was surprising was, we acted fast after it came to our knowledge one of the members had withdrawn from the group, 2 of the members were able to do the member's part of the work to complete the assignment.
I learnt that groups are fun, when I first read the whole assignment, it seemed to be impossible to complete, but when we divided it into parts and shared the work it was rather feasible, also it was great having more people to discuss the assignment with.
GitHub is a great tool, enabling us to post the website online and allowing collaboration between team members, in this particular assignment we used more MS Teams, setting up 2 meetings per week, both tools are great and vital for the completion of our Assignment 2.

Raul:
The start of this assignment 2 was a bit confused for me as I did not have any groups and was still getting the way this course works. After I got invited to join group 10 it was very exciting as it would be the first time, I would meet different people that are chasing the same path as me.
It took a little while for us to get together and the times were different as we have people from all around Australia. Finally, we booked the meeting accordingly to a time that would suit everybody and since that day I could feel that I would fit perfectly in the group. Joao gave us the name idea which I liked, Sunil was always very kind and helpful with everybody and straight away gave us the option that he would do the website part as he enjoys it, Alex was the most experienced in the field and started to lead the group on a way that everybody would enjoy and feel confident on what we would do. Jacqueline was helpful and present in the meetings giving us the confidence that she would be competent on her part of the work.
We also had another person in the group that left without telling us and straight away we could arrange the time for a meeting and discusses who would do her part so we could still have time to finish the A2 on time.
I found that this group was very helpful to each other, and we work well together. Many thanks

Group Reflection

Our group was called Magpies. Not linked to the football club but unique to our group that was spread across Australia. It was challenging as we had different time zones and family commitments. We also had daylight savings which putting us an hour ahead between the east coast and west coast of Australia. Our team had a clear purpose right from the start which was to complete the assignment by the due date. Having an objective or purpose helped us to organise 5 different people with different working schedules and lifestyles to come together and get this assignment done. Our group worked cohesively to get the work assigned done and help and assist others when shortfalls were identified.

As we reflect on how things worked out for us, there is always room to improve. If we had to do this all over again, we would consider using a Sprint board made up earlier so we could be more organised and planned. Given we lost couple of weeks getting the group organised we could not do this this time. Also having lost a member of the group at the later stage of the assignment put us into some chaos. We had tasks that were self-assigned for this member, but with no communication for a few days we were under the pump. But as mentioned a team with a clear purpose always accomplishes their objectives.

Group are good to work with when all members are working towards the same purpose. Understanding the group members strengths and weaknesses is very important so that tasks can be coordinated within the group. Having assignment 1 profiling to read through gave us an insight into what each member strengths were. Communications also played an important part in the group. Having us online most of the time in Teams and to some extent Canvas emails helps progress our work well.

We used GitHub for the website and to keep read through the groups assignment one documents. It is a good collaboration tool. Most of our group's work was stored in MS Teams. The reason to use MS Teams was that it was handy for most members of the group to use mobile devices when on the road or at home to attend meetings or review documents that were posted. That became our internal repository of data storage. All the changes on the website in GitHub was through constant review and feedback from the group members through documents that were updated in MS Teams.

In concluding we thank all the members of the group for all the contribution, time, and help. The feedback we receive will help us to improve our knowledge and skills. We have gained insights of what is needed to work in teams, and this will help us in our future assignments.

References

References for this Group work are included in each content. Any extra references are listed below**.**

Magpie free image:

https://www.clipartmax.com/download/m2H7d3Z5m2G6d3d3_magpie-clipart-transparent-magpie-clipart-transparent/

Personality texts and examples listed on the team profile section:

https://www.16personalities.com/personality-types