

Autonomous Robots

The beginning of new era

Perception (Sensor)

Autonomous robots have digital sensors installed to detect the physical environment just like how humans have 5 senses (sight, touch, smell, taste and hear) to perceive the world. For instance, robots have bump sensors to detect and avoid obstacles.

Precise

Decision (Processor)

This is the process where robots receive and analyze the data provided by sensors. The information is processed and interpreted before sending to actuators.

What are they?

The intelligent machines that are able to perform tasks continuously in a complex and dynamic environment without the intervention of human. They are designed to perceive and process the surrounding environment and make decisions independently according to actual conditions.

Highly Autonomy

Actuation

Robots have modified actuators to generate a series of action such as grabbing an object and bending mechanical arms. Motor in robots enables the movement by converting energy into operations.

Independent

Self-maintenance

What can they do?

Autonomous robots are widely used in various field especially in the manufacturing of products and warehousing. Nowadays, technology enables the robots to assist the inventory department in handling and updating the data from time to time in the warehouse. By generating results of data analysis and classification, they are even capable of lifting and transporting heavy goods in space. While in the workshops and factories, robots can involve in the production process with attached robotics arms that can sort, choose and pack products accordingly to the system. Autonomous robots are also facing high demands in the healthcare field especially in pandemic time like Covid-19. Frequent contact between patients and nurses can be reduced indirectly yet a proper treatment can be guaranteed by using robots to transport medicine and monitor the condition of patients.

Fun Fact

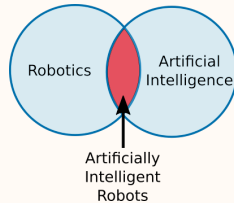


Image: Alex O. (2017)

People often confuse the concept of AI and robots. A robot is an electromechanical device that satisfies certain tasks of motion, and artificial intelligence can be understood as an algorithm written on an integrated circuit chip carrier. It is the algorithm that gives the robot the ability to learn and think independently. An autonomous intelligent robot is an advanced form of robot, the key is to be able to learn independently to perform activities.

Real Life Example

The **Roomba** is a series of autonomous robotic vacuum cleaners introduced in the year of 2002. They have sensors to navigate the floor map and able to import the information into its system. It's one of the most popular and inventive products in today's market due to its capability on cleaning the house without supervision from human. [Jason Walker (2016)]

Reflection

Autonomous robots are undeniably becoming increasingly significant in today's world as they can replace human labor by completing tedious and repetitive tasks with higher efficiency, allowing people to work on more advanced tasks. Although these intelligent robots are not highly involved in our daily lives, however, with the continuous development and maturity of intelligent robot technology, unremitting efforts by groups of scientific researchers, intelligent robots will surely become more ubiquitous in the near future by entering thousands of households, just like what were shown in those science fiction films, robots can serve people well and enhance human's life by leading the world to a better place.

Reference: <https://waypointrobotics.com/blog/what-autonomous-robots/>

<https://blog.robotiq.com/whats-the-difference-between-robotics-and-artificial-intelligence>



Wong Li Jie A21EC0238



Toh Kang Lun A21EC0234



Ng Qian Hui A21EC0212



Ng Keng Keat A21EC0211



Ng Jing Yi A21EC0210

INDUSTRIAL TALK 1 BY

EXECUTIVE SUMMARY

Ever since 1946, TM has provided its stakeholders that ranging from government, business and telecommunication, investor or developer and residential the global connection into and from Malaysia.

Prior to 2015 when Industrial Revolution 4 (IR4) hit the global citizens unprecedentedly, TM also embarked on its journey to take the lead in evolving Malaysia into a digital nation. As an initiative, TM has started the promotion of IR4 in the cloud and digital systems, smart cities, and 5G network. Contributions such as approaches in adopting smart services for smart cities and building world-class data centers were some of the efforts generated by TM in this great event.

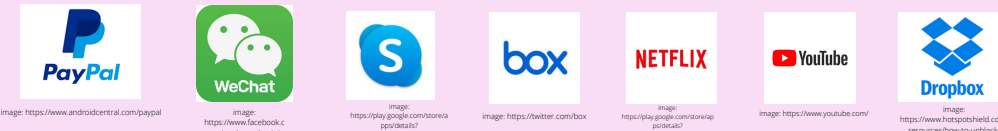
INTRODUCTION

The launching of IR4 has overturned our conventional practices greatly as we are not only becoming more effective and productive but wastage can also be reduced in this digital age. As the national telecommunication company, TM is endeavoring to enable digitalization a realization in Malaysia. For example, workforce performance, logistic performance, and water integrated management are now delivered to us in a digital system. Furthermore, with the launching of 5G wireless technology by TM as soon as January 2022, information can be delivered at a higher speed and lower latency.

ADOPTION AREA WITHIN 4IR

• Cloud / digital

In terms of the market, digitalization of services is common now in many enterprises. The service such as IT infrastructure, enterprise and consumer apps, television, telco, payment, taxi, gaming, music, education and many others have allowed services digitally.



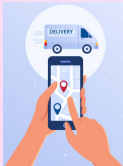
• Smart Cities

4IR digital solution allows the organization to become more effective in managing logistic.



Google Map street view

image: <https://satelliteview.com/locations/5990479>
#google-maps-streetview-marker-changes-location-based-on-vantage-point



Real-time tracking

image: https://www.sopito.com/cn/sp_news/show-382.html
#real-time-tracking-app-uses-qr-code-to-track-parcel-status

Smart manufacturing solutions increase the production volume and speed up sales transactions and manage overall manufacturing performance.



Sales performance report

image: <https://www.dashgpt.com/blog/real-time-report-for-examples-for-daily-reports/>

Smart water integration management system (SWIMS) is a system that can reduce water wastage, increase water revenue and total visibility for the water industry.

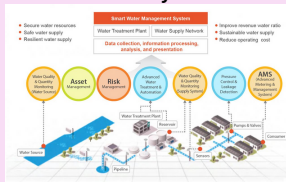
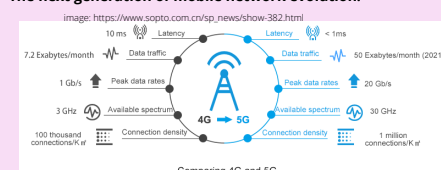


image: <https://development.asia/en/planer/what-smart-water-management/>

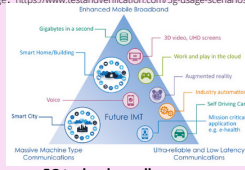
• 5G

The next generation of mobile network evolution.



Comparing 4G and 5G
5G technology is more superior than 4G in many aspects

image: <https://www.testandverification.com/5g-usage-scenarios-nsa-5g-enhanced-mobile-broadband/>



5G technology allows many things to be done

Example of the use cases of 5G:

- smart retail analytics
- smart water system
- smart vehicle system
- smart helmet
- geolocation safety app
- UNESCO 8K virtual reality
- smart tourism app
- smart parking
- smart traffic light
- smart safety
- security and smart agriculture.

INDUSTRIAL REVOLUTION 4.0

Industrial Revolution 1.0
- Mechanization and the use of steam power and water power.



Industrial Revolution 2.0
- Electric power is used for the mass production and assembly line production



Industrial Revolution 3.0
- The production process can be automated through the use of computer and electronic.



Industrial Revolution 4.0

- The use of cyber-physical system



image: <https://www.forbes.com/sites/andrewrossow/2018/04/11/forring-blockchain-into-industry-4-0/?h=7fe87da6dc7>

REFLECTION

From this industrial talk, we have gained a lot of new and useful information in our life.

Firstly, we have learned about the evolution of industry from 1.0 to 4.0 and what Industrial Revolution 4.0 related to. From Industrial Revolution 1.0 to 4.0, we can clearly see that the technology is continuously evaluating and all of the technology that occurred are the effort and the innovation of people to improve the quality of life. The technology of 4IR have helped people in many aspects like the cloud computing allows people to store their data in the cloud storage without using the space of computer's hard drive and allows people to access their data anywhere with an internet connection.

Secondly, we have gained knowledge about the adoption area within 4IR which are cloud and digital, smart cities and 5G. In terms of cloud and digital, there are many services that have allowed services digitally. For example, the payment services like Paypal and Touch and go e-wallet allow users to use their application for paying money digitally without cash. This technology helps people a lot as we do not need to worry if the cash is not enough. In terms of smart cities, the 4IR digital solution let the management of logistics become more effective. For example, with this technology, we can easily track our parcel to know the status of the parcel. This technology helps people to estimate the parcel arrival time so that people can arrange the time to receive the parcel. In terms of 5G, it is the technology more superior than 4G which mean it allows people to have a better experience in internet usage. With 5G technology, it allows more technology products to be done like UNESCO 8K virtual reality and self-driving car and this will improve the quality of life.

Lastly, we are moving toward the digital world and our contribution is vital. Hence, we must require ourselves with more knowledge and always update ourselves so that we can support and contribute to this industrial revolution to obtain a better quality of life. We believe that Industrial Revolution 4.0 can bring a bright future to all human beings.

Group members:



Wong Li Jie A21EC0238



Toh Kang Lun A21EC0234



Ng Qian Hui A21EC0212



Ng Keng Keat A21EC0211



Ng Jing Yi A21EC0210

EXECUTIVE SUMMARY

Cybersecurity Malaysia is an agency under the Ministry of Communications and Multimedia. It is established with the aim of securing the nation's cyber space. Alongside with the development of IR 4.0 in Malaysia, cybersecurity is important to be frontend to defend our country from cyber-attack.



INTRODUCTION

The manufacturing sector has seen rapid evolution in IR 4.0 era. The usage of artificial intelligent and robotics that make human-machine interface more universal. The goal is to establish a highly flexible production model for personalized and digital products and services. In this industrial revolution, traditional industry boundaries will disappear, and various new fields of activity and forms of cooperation will emerge.

INDUSTRY 4.0 TRANSFORMATION DRIVES



1. **Global economic Order** - The supply chain network is increasingly complex by distributed procurement engineering. In a borderless world, suppliers are not affected by geographic product location
2. **Knowledge and Skills** - Use the opportunity of transformation to retain talent, local talent and cultivate the workforce of the future to improve efficiency
3. **Competitiveness** - Countries and companies must defend their domestic markets. So we need to move forward and open up new markets at the same time because of its globalization



TECHNOLOGICAL ADVANCEMENT AND CONVERGENCE

Artificial intelligence- With the introduction of artificial intelligence, it is automated to recognize whether the face in the video matches the suspect.

BIG DATA - We can predict the trend of the market so that we can anchor our business based on the trend.

THE NEED TO EMBRACE:

1. An include technology changes driven by applications into manufacturing industry being such as big data IOT cloud computing.
2. Provide more training to create high skills workers.
3. The application of technology to improve efficiency and product quality is becoming a new model. Therefore, it is necessary to innovate and invest in new technologies in market segments featuring enterprises to maintain competitiveness.

MALAYSIA ISSUES & CHALLENGES

DEMAND

- Awareness on the impact of the need of the industry four point zero both in terms of opportunities and business model
- Demand innovation a evolving customer expectations and demand for customization to produce better quality
- There to increase the market lack of integrated and digital approach to data gathering.
- Manufacturing firms are required future skills expertise

SUPPLY

- Governance each ministry have their own agenda and own program
- Funding and incentives is underutilized for example a training and development and put a higher education for system education and science technology
- Increase that more limited collaboration and industry take up a for industry 4.0 shortage of experts in this industry.



REFLECTION



In order to try to prevent information from being accessed by unauthorized network users, enterprises use appropriate technologies such as network split ends and intermediary systems to collect, protect and provide information. For example, some suppliers in the digital supply network may compete with each other in other areas. Therefore, they are reluctant to disclose certain types of data such as patent information and pricing. Enterprises can also apply encryption and marking tools to the data in transmission to ensure communication security when the data is intercepted or the system is compromised. Secondly, trust is the linking factor between data sharing and supplier processing. Blockchain technology has been considered to help resolve the above concerns and deal with possible changes in the payment process. Although Bitcoin is a classic case of establishing currency history, other companies are still exploring how to use this new tool to determine the flow of goods from the production line to buyers at all levels. Creating a shared historical account book for groups can build trust and transparency, protect buyers and sellers by verifying the authenticity of goods, track the logistics status of goods, and use detailed product classification instead of batch sorting when processing returns and exchanges. If the authenticity of the product cannot be guaranteed, the manufacturer may conduct product testing and verification before introducing the product to ensure adequate safety.



Wong Li Jie A21EC0238



Toh Kang Lun A21EC0234



Ng Qian Hui A21EC0212



Ng Keng Keat A21EC0211



Ng Jing Yi A21EC0210

