Industrial Revolution 4.0 and Society 5.0:

Are We Moving at the Same Pace?

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Picture: http://www.neighbium.com

Objectives

- To analyse the extent of development of Industrial Revolution 4.0 and Society 5.0 in Malaysia.
- To analyse whether society is ready to face the challenges of the Industrial Revolution 4.0 and Society 5.0 in Malaysia.

Picture: Stedman Elementary

Industrial Revolution 4.0 and Society 5.0: An Overview
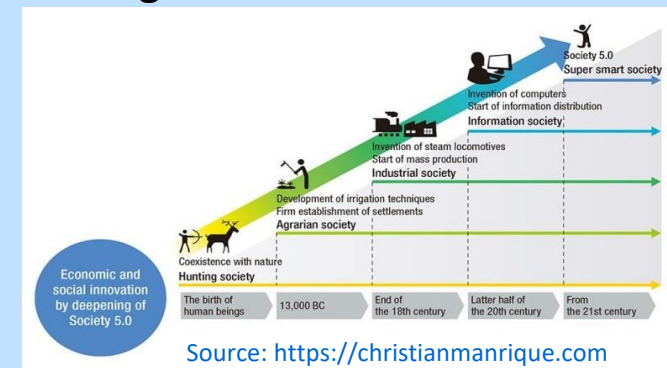
Industrial Revolution (IR) 4.0

- IR 4.0 is focusing more on the digital transformation of manufacturing (*i-Scoop, n.d*).

- *Yusoff (2018):*
  - IR 4.0 is emphasising on how to let the job done.
  - IR 4.0 is highlighting on the effectiveness of using the automated machines.
  - IR 4.0 is about computerised communications by all means.

Source: http://www.seekmomentum.com
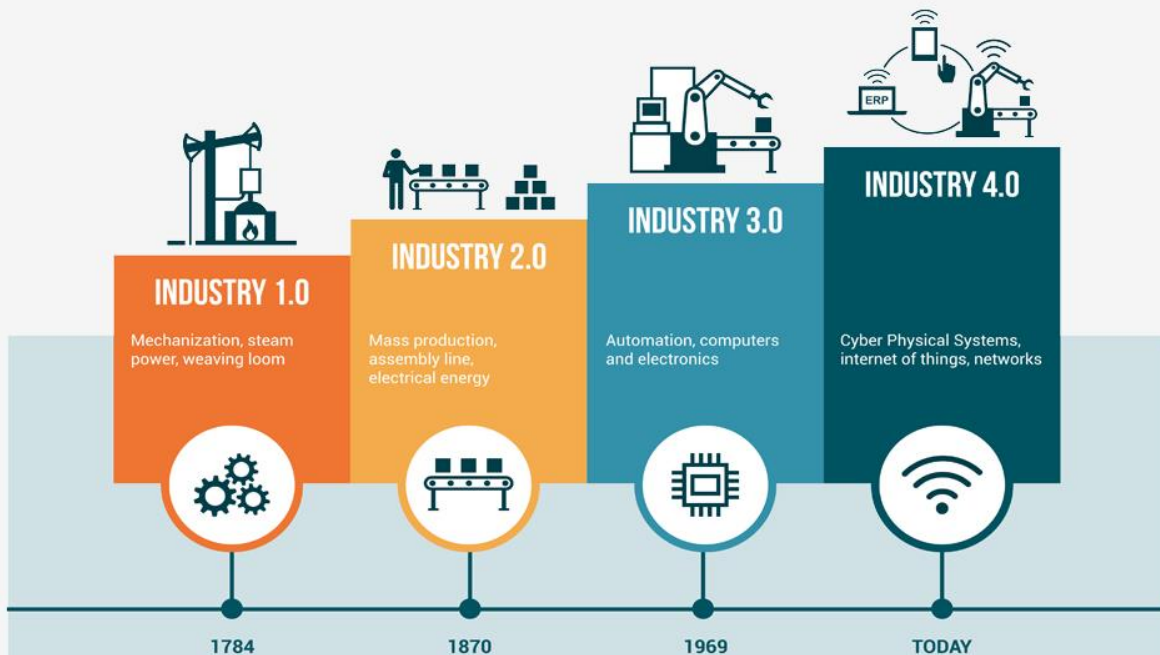
Society 5.0

- Society 5.0 aims to tackle several challenges by going far beyond just the digitalisation of the economy towards the digitalisation across all levels of the society and the digital transformation of society itself. IR 4.0 and organisations overall will be major components in Society 5.0. It is not about the industry alone but involves all stakeholders such as citizens and governments. (*i-Scoop, n.d*).
- *Yusoff (2018)*:
  - Society 5.0 is emphasising on how to optimise the man-hour responsibility to get the job done.
  - Society 5.0 is highlighting on the effectiveness of optimising the knowledge worker with the help of the intelligent machines.
  - Society 5.0 is meant for the harmonisation of work with the help of intelligent machines for the benefit of the workers.

Source: https://christianmanrique.com

Industrial Revolution 4.0 (I)

In the 1700s, mechanical looms were first introduced, driven by water and steam strength and steam on mechanical equipment and replaced the agricultural sector, thereby improving the economic structure.

The Second Industrial Revolution took place in the 1870s, where electricity was introduced, which formed the mass production system.
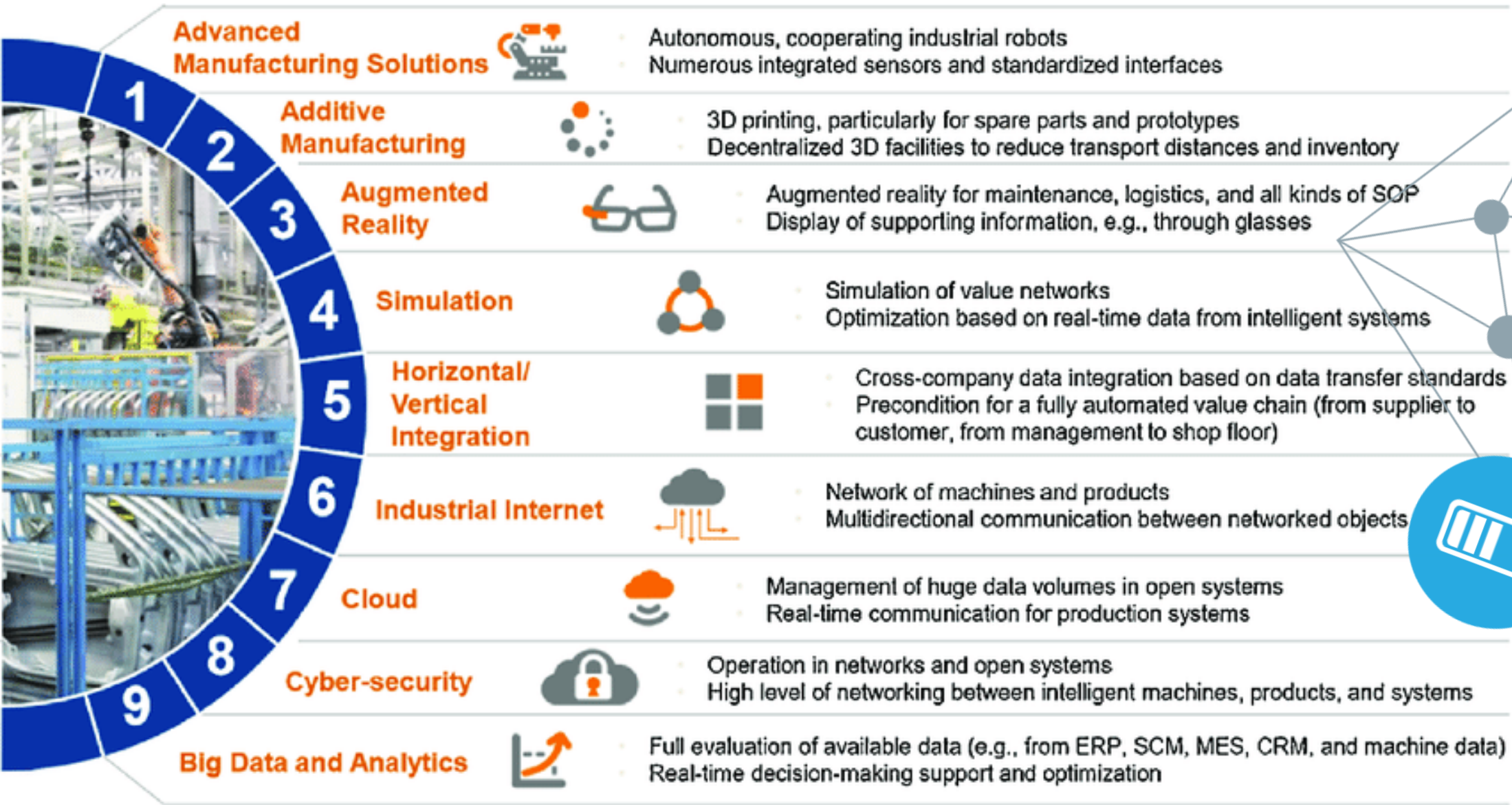
In the 1970s, the Third Industrial Revolution took place with the rise of electronics. Technological innovations from analog electronic and mechanical devices to the current digital technology available are referred to as the Digital Revolution.

In the 2000s, IR 4.0 was built based on the digital revolution, where technology and the public are connected. The breakthrough of technology has found new ways to show its capabilities by blurring the line between physical, digital and biological entities.(Alaloul et al., 2020)

Industrial Revolution 4.0 (II)

#		
1	**Advanced Manufacturing Solutions**	Autonomous, cooperating industrial robots Numerous integrated sensors and standardized interfaces
2	**Additive Manufacturing**	3D printing, particularly for spare parts and prototypes Decentralized 3D facilities to reduce transport distances and inventory
3	**Augmented Reality**	Augmented reality for maintenance, logistics, and all kinds of SOP Display of supporting information, e.g., through glasses
4	**Simulation**	Simulation of value networks Optimization based on real-time data from intelligent systems
5	**Horizontal/ Vertical Integration**	Cross-company data integration based on data transfer standards Precondition for a fully automated value chain (from supplier to customer, from management to shop floor)
6	**Industrial Internet**	Network of machines and products Multidirectional communication between networked objects
7	**Cloud**	Management of huge data volumes in open systems Real-time communication for production systems
8	**Cyber-security**	Operation in networks and open systems High level of networking between intelligent machines, products, and systems
9	**Big Data and Analytics**	Full evaluation of available data (e.g., from ERP, SCM, MES, CRM, and machine data) Real-time decision-making support and optimization

Society 5.0

Using <u>remote sensing and oceanographic data</u> for monitoring and management of water quality, forests, land degradation, biodiversity, etc.

Resolving climate change issues with the simulation based on the analysis of <u>meteorological and other observation data</u> by using High Performance Computing

Creating <u>smart cities</u> where convenience, safety and economic efficiency are made compatible

Building <u>global innovation ecosystems</u> by connecting industries, academic institutions and other related stakeholders

Building resilient infrastructure and promoting sustainable industrialization by using <u>i-Construction</u>

Boosting food production by <u>smart agriculture</u> utilizing IoT, AI and Big Data
Improving nutritional status with <u>smart food</u> produced by cutting-edge biotechnology

Developing <u>early warning alert system</u> for the prevention of infectious diseases by combining different types of monitoring data

Make high quality education affordable for everyone on the earth with <u>e-learning systems</u> utilizing state-of-the-art technologies

Empowering women with access to education and information through the Internet
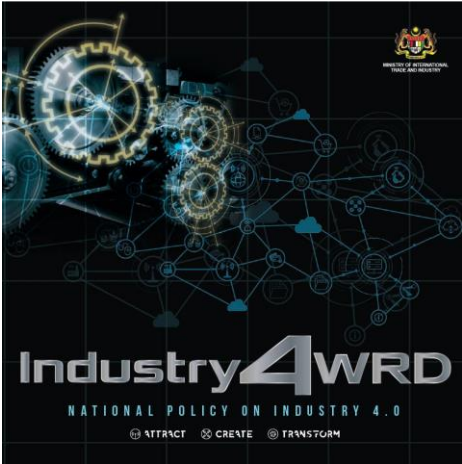Providing women with opportunities for startups by utilizing ICT

Managing electric power supply and demand in a sustainable way by constructing <u>smart grid systems</u>

Source: KeidanrenSDGs (2019)

Picture: https://www.jsa.net

Malaysia's Perspective (I)

To achieve the aspirations of a competitive country, the Malaysian government has launched the National Policy on Industry 4.0 (Industry4WRD) on 31st October 2018.

Industry4WRD focusses mainly on digitally transforming Malaysia's manufacturing sector and its related services to embrace Industry 4.0. The policy envisions Malaysia as a strategic partner for smart manufacturing, a primary destination for high-technology industries, and a total solutions provider for the manufacturing sector in the region.
(Ministry of International Trade & Industry, 2018)
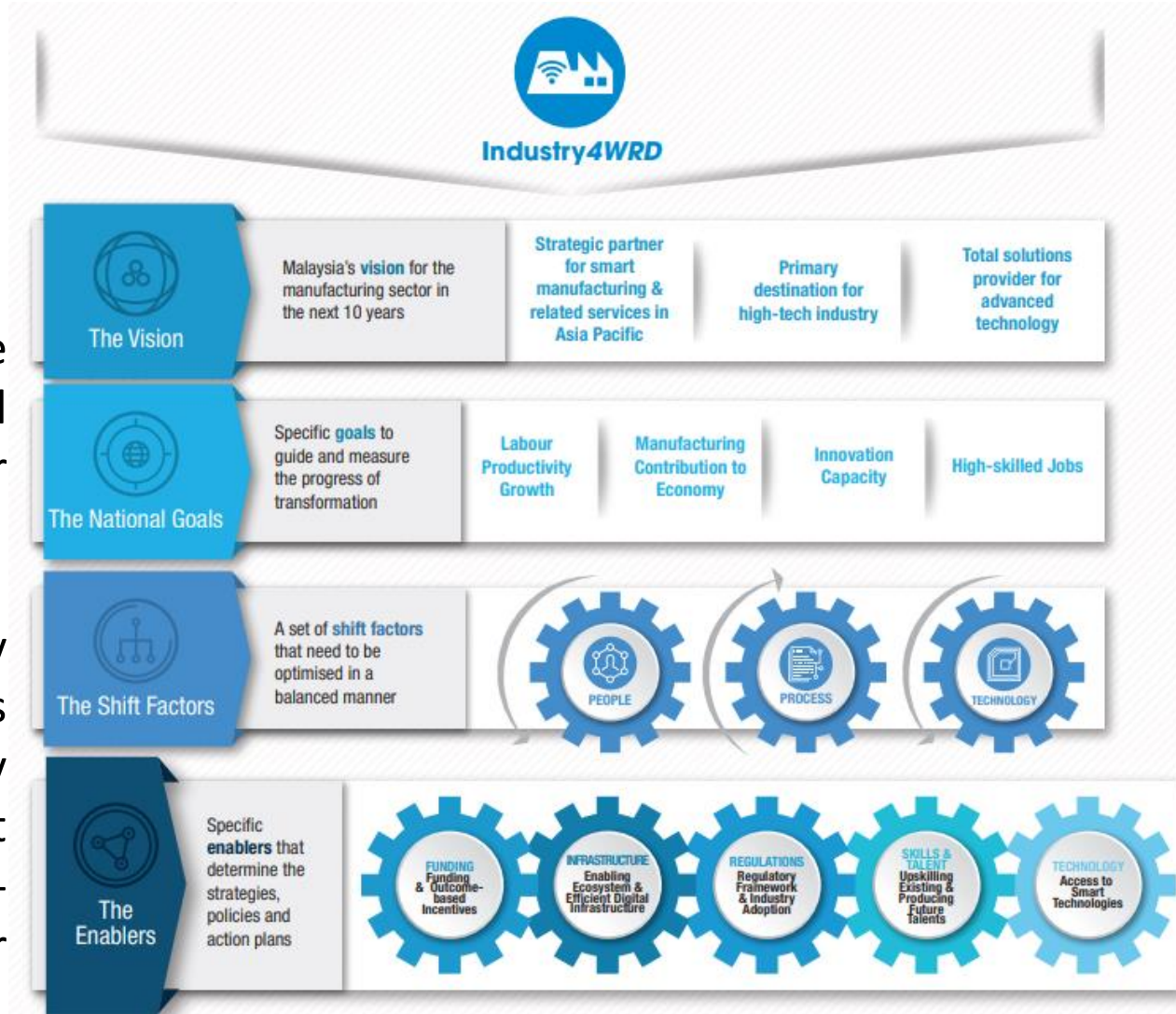
Malaysia's Perspective (II)

To integrate distinctive technological solutions to transform the workforce and industries, the Malaysian government has already implemented several agendas (Malaysian Investment Development Authority, 2018).

- Ministry of International Trade and Industry together with the Malaysian Investment Development Authority is undertaking an industrial study titled 'Future of Manufacturing: Industry 3+2 Sectors'. The study is a deep-dive analysis on the future of manufacturing focusing on the 'industry 3+2' sectors which were identified to drive the growth of the manufacturing sector. It will highlight the way forward on issues related to technological and economic aspects of investments in Malaysia.
- Establishment of Industry 4.0 Taskforce with the purpose of discussion of the infrastructure and ecosystem, funding incentives, talent and human capital, technology and standards, and SMEs.
- A blueprint, Malaysia Production Blueprint to address productivity challenges holistically in order to boost economic growth.
- Establishment of Digital Free Zone to stimulate internet-based innovation.
- Malaysia Digital Economy - To implement programme including e-commerce systems, and digital maker movement including a new location for Malaysia Digital Hubs.
- Launching of National IoT Strategic Road Map.
- Building analytics capabilities - 20,000 data professionals and 2,000 data scientists by 2020.
- The government has launched two high-impact initiatives, the SME Technology Transformation Fund (STTF) and the SME Go scheme for liquidity support (Subramaniam, 2020).
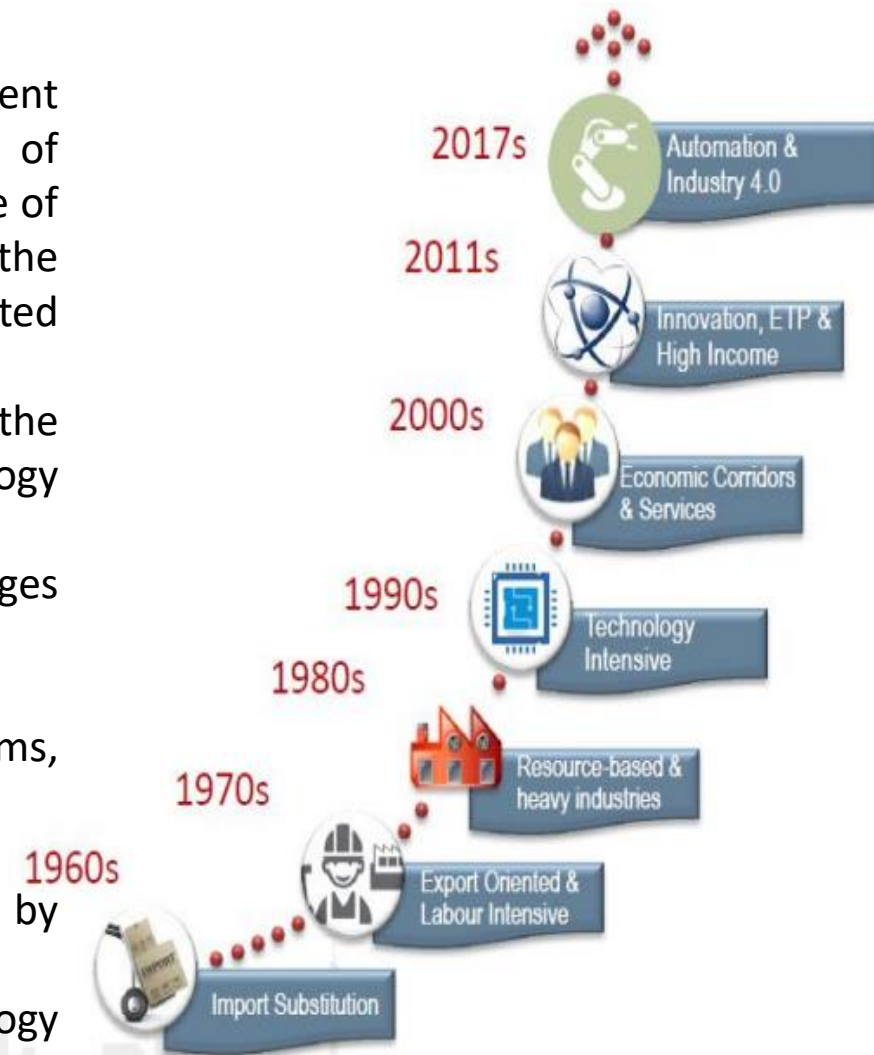
Malaysia's Perspective (III)

Malaysia 5.0: Unity Alliance

Malaysia 5.0 vision builds digital infrastructure with a unified alliance of stakeholders both within government and private enterprise. This "Unity Alliance" is an economic coalition that will serve the society in its migration into the digital age.

Malaysia 5.0 is inspired by Japan's Society 5.0 initiative, a concept that proposes to put society at the centre of technology to serve society and not the other way around. It also allows for the management of disruptive new systems, such as fintech, to ensure that benefits accrue fairly across society without bias.

To achieve this, Malaysia 5.0 needs to intermediate digital marketplaces, banks and fintech companies and make them interoperable for public services and commercial counter-parties. This omni-channel access creates the connectivity, services and relationships needed to build the kind of digital economy that supports all society members.

(Hussin, 2020)

Picture: http://www.businesstoday.com.my

- 70% of companies believed that the opportunity to operate is better with the implementation of IR 4.0. However, the readiness amongst companies was relatively low to moderate. It wass expected to change only moderately in the next five years. Out of all technologies, cloud computing, big data analytics, and IoT have the highest ranking (Solidiance, 2017).

- The SME Association of Malaysia (SME Malaysia) and BIZSPHERE Brand & Marketing Group jointly conducted an online "SME Industry 4.0 Quick Survey". 74% of the respondents understood IR 4.0 as the initiative to leverage on data collected from operation to reinvent processes and workflow to make production and processes smarter, while 12% believed that Industry 4.0 was an effort to automate the production processes (Business Today, 2019). However, SMEs in Malaysia were not quite ready for the IR4.0 (Tan, 2019). The low rate of adoption among SMEs is attributed to the lack of sufficient structure and collaboration between the public and private sectors in driving the country's Industry 4.0 agenda (Tech Wire Asia, 2019).

Picture: Solidiance (2017)

Malaysia's Perspective (V)

- Kylasapathy et al (2018) revealed that Malaysia was classified as an adopter of IR 4.0 and the economy still lags behind forerunners such as Japan and Singapore.

- Even, a study conducted by Idris (2019) indicates that 90% of the respondents have heard about IR4.0, however a study commissioned by INTI International University & Colleges (INTI) and International Data Corporation (IDC) on Graduate Readiness for the IR4.0 workplace found that graduates and parents lack clarity on IR4.0; students feel unprepared to join the IR4.0 workforce; and that tertiary education may not be doing enough to prepare students for the workplace (Sani, 2019).

Picture: https://orquidea.de


Picture: https://trunovate.com

Conclusion

Although the development in technology is encouraging, with the implementation of some plans and policies by the government, the society and even companies are still not fully prepared. There is still a lot of awareness about the importance of IR4.0 and Society 5.0 that needs to be inculcated and nurtured among the society in Malaysia.

"Malaysia is working towards an end-to-end Industry 4.0 ecosystem within the country. The formation of this ecosystem is vital in guiding the development of the new Industry 4.0 policy framework and its four goals comprising GDP contribution, national productivity, higher skilled employment and innovation capabilities" (Malaysia Productivity Corporation, 2018). Also, as discussed by Abdul Hamid (2018), "We need to have a deeper discourse on such critical issues before crowing [IR 4.0] as the panacea of the future", with additional of "Society 5.0).

Picture: https://www.freepik.com

Future Research

For future research, the study focuses on the impact of IR 4.0 and Society 5.0 on building a smart society.
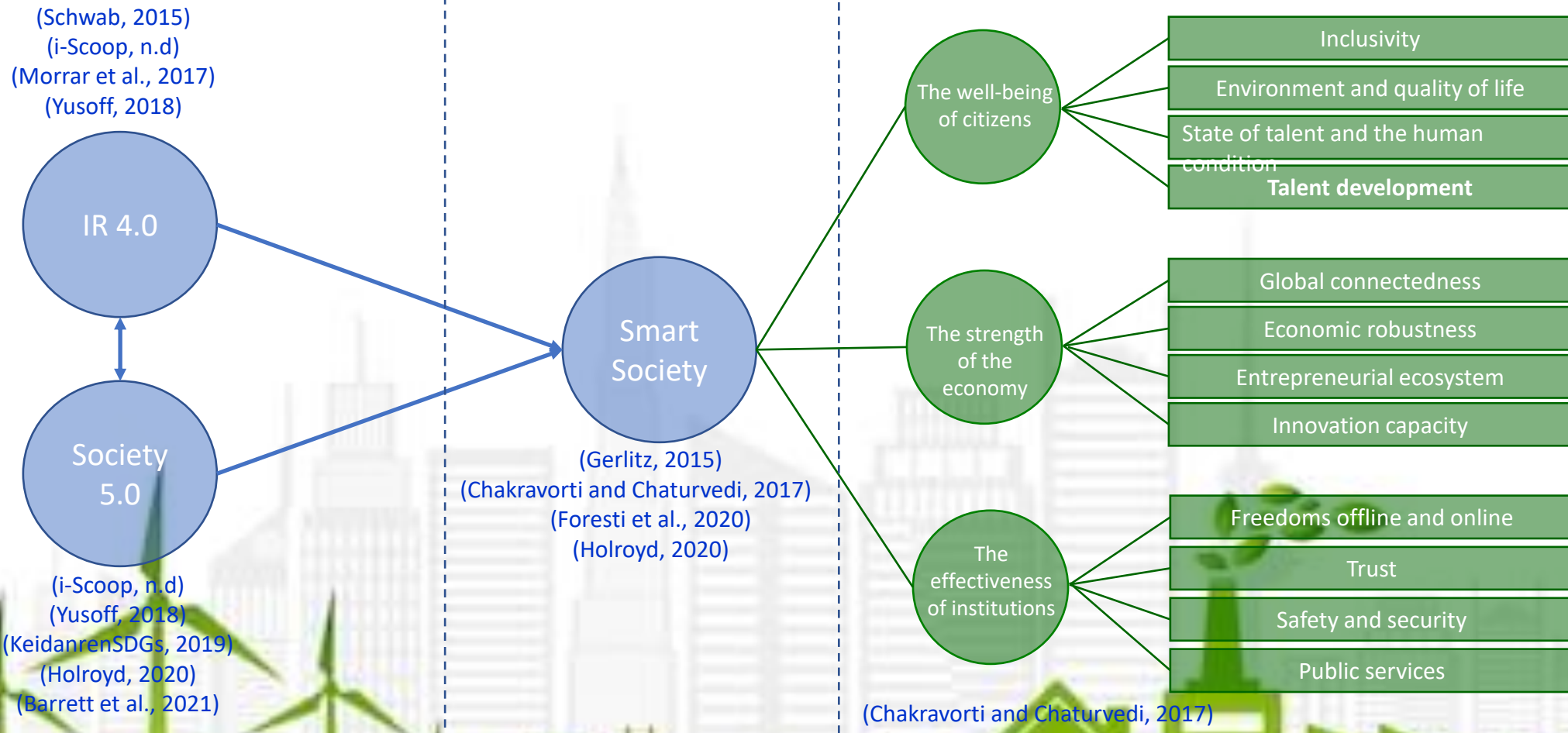
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