

Industrial Revolution 4.0: Role of Universities

Urban John Arnold D'Souza¹, D. Kamarudin D. Mudin²

¹Department of Biomedical Sciences and Therapeutics, Faculty of Medicine and Health Sciences, Universiti Malaysia Sabah, Kota Kinabalu, Sabah Malaysia

²Vice Chancellor Office, Universiti Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia

Industrial Revolution 4.0 has dawned with a new challenge wherein information technology, internet and cyber-physical systems are going to take a priority with global human life. Indeed it will be a revolution that may change the way human beings think, live and work with access to any corner virtually, whereas industry and business will leap higher with a stronger impact on economic developments. Universities need to prepare both academicians and students to upgrade to the present scenario. Academicians should leverage their knowledge and skills and upgrade themselves to the present and future generation Z (gen-Z). Academicians and students need to adapt to the changing trend and new knowledge and skills based on cyber-physical system as part of everyone's life. Developments and revolutions are part of existence but there is also an urgent call to the world population, wherein human values, ethics and responsibilities of sustaining a good society and planet are everyone's responsibility.

World is preparing for a step forward with the advent of Industrial Revolution 4.0 which needs challenging efforts to prepare our gen-Z with up-to-date skills and knowledge to face the future reality. Higher education and universities need to set their goal in achieving the new Industrial Revolution 4.0 as the world is leaping forward with an utmost speed. Industrial Revolution 4.0 revolves around internet of things, internet of systems and a coupling of cyber-physical systems that are going to rule the world and human system in the future. The First Industrial Revolution started at the late 18th Century which focused on mechanization. James Watt invented the first steam engine in the year 1775 that enabled the locomotive connectivity further new additions such as power-loom, telegraph, telephone,

etc. The Second Industrial Revolution or Technological Revolution which started around the mid-19th Century was focused on faster industrialization and manufacturing, machine tools which spanned up to the start of World War I. A wave of globalization was initiated which enabled the migration and movement of people across different regions in the world. Henry Ford contributed to moving assembly lines as a result mass production and mobility took a greater pace contributing to the welfare of mankind. It extended with a revolution in industry and continued to progress in the 20th Century. These two industrial revolutions, helped people to become wealthier with urban living. Mid-1970's to year 2015 was named as the Third Industrial Revolution also called Digital Revolution. It was the era of internet with the first consumer computer made its presence in the year 1976 – 1977 and digital technology grew exponentially with control of mechanization by electronics and computers. Economic transformations started to grow across the boundaries of globe with digital communications, internet and renewable energy. Hydrogen and other storage technologies were developed to store intermittent energies and the entire world was able to connect with living spaces and work spaces with the biosphere. New business models were emerged and the GDP as well as economy of the world showed good signs.

Prof. Klaus Schwab, in his latest book 'The fourth industrial revolution' who is also the chairman of World Economic Forum describes that; fourth revolution enables the technology to be embedded within human body and society¹. There will be a breakthrough in robotics, nanotechnology, quantum computing, biotechnology, The Internet of

Things, autonomous transport system, Three Dimensional Printing and artificial intelligence. Billions of people will be connected on the digital web with doors open for improving human communication and interaction². Dawn of Industrial Revolution 4.0 has increased the responsibility and delivery of cutting edge knowledge in academia, as higher education institutions and universities need to get equipped with a change in trend towards their approach in educating the emerging Gen-Z. Mobile supercomputing, robotic approach in human functionalities, neuro-technological human brain intelligence and genetic editing and many more advancements need to be focused at an exponential speed and the new generation need to get a thorough knowledge for the application as there will be a change in the way human being will live, interact and work. A fusion of physical, digital and biological systems with industries and world economy is needed that may be the futuristic development. “Universities have to change their curriculum and delivery to ensure that their graduates have jobs”, said Datuk Seri Idris Jusoh, Higher Education Minister of Malaysia³. Young generation needs to be prepared for a relevant future that is going to be impacted by Industrial Revolution 4.0 and universities need to prepare the platform in academia. The Internet of Things (IoT), is a trend of real time which is focusing on combination of sensor actuators embedded in physical objects and these sensors that generate the data will be used in cyber-physical systems in the production line and automation technology.

Universities must prepare a blueprint that addresses the University-Industry Revolution 4.0 approach to address the present needs and keep up-to-date realistic projects that make our young generation to emulate in their educational scenarios and emerge as competitive leaders and work force for the future⁴. Fourth Industrial Revolution is challenging which is based on information computer technology (ICT) and advancement in robots, cloud technology, artificial intelligence, big data, internet of things (IoT) and virtual reality; all these are playing

a greater role in community, economy and people. Unless universities tailor their academic and research blueprint in line with these advancement, there is a dearth of knowledge and those without adapting to this change may end up as islands in the middle of oceans afar and the graduates’ employability for the global workforce may not match. Every university and centre of higher education needs to prepare the background for educating the present and new generation to keep pace with the rest of the world. Along these developments and revolutions, there is also an urgent call to the world population, amalgamation of human values, ethics and responsibilities of sustaining a good society is pressing. Human-human interaction may be at a crossroads, instead a human-robot interaction and gradually an evolution in human-robot relationship may adversely affect the family fabric wherein human may end up with a robotic relationship and run away from the responsibility of procreation? Universities have to take a greater responsibility along the lines and our youngsters need to be aware of saving this planet for the future.

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