



4IR

HOW WILL IT AFFECT ME AND MY *future* CAREER?



by Prof Mike Davies-Coleman,
Dean of the Faculty of Natural
Sciences, UWC

We are well into the Fourth Industrial Revolution or, as it is commonly referred to, the 4IR.

What is the 4IR? What were the first three industrial revolutions? How will the 4IR affect my career choices? How can the academic programmes at UWC prepare me for the 4IR? These are four important questions for you to consider as you prepare yourself to enter the world of work.

What is the 4IR?

We all, mostly unknowingly, are changing our lifestyles to capitalize on rapid advances in a mind-blowing array of relatively new 4IR technologies. These 4IR technologies include 5G internet connectivity, artificial intelligence, block chain technologies, digital-logistics, machine learning, quantum computing, cloud computing, 3D-printing, augmented and virtual reality, big data, cybersecurity and “smart” factories, cities, homes and cars (made possible through the Internet of Things or IoT). As a young graduate entering the world of work, it would be wise to take some time to Google each of the above to get a better understanding of what the technological terms mean, and, most importantly, find out how they might impact on your life and career in the future. Thanks to the 4IR, gathering this information is extremely easy and it is accessible on your phone in a few seconds!

What were the first three industrial revolutions?

Industrial revolutions first began almost 250 years ago i.e.: 1IR in the 1780s (the beginning of steam driven mechanical production),

2IR in the 1870s (the advent of assembly lines and mass production accelerated by widespread harnessing of electrical power two decades later) and 3IR in the 1960s (the emergence of the first programmable logic controllers, IT systems and robotics which made automated production possible).

The technologies that have driven all the industrial revolutions are called disruptive technologies. Disruptive technologies disrupt or change dramatically the way we live, for example, going back in history, steam engines replaced horses, telephones replaced telegraphs, light bulbs replaced candles, and combustion engines replaced steam engines. Most recently, in your life time, regular quantum leaps in silicon chip technology that came through the 3IR have miniaturized computers, so that you can read this article on your phone.

All the technologies associated with the 4IR are disruptive and are changing the world of work and the career opportunities open to you. The reality is that our capacity to adapt to change is being stretched as never before in the history of humankind. >>

How will the 4IR affect my career choices?

As a child I am sure you were often asked “What do you want to be when you grow up?” This question is increasingly becoming redundant as “a job for life” seems to no longer be the future norm. All of us can expect to have multiple, probably even unrelated careers ahead of us. A more relevant question might be “what work do you really enjoy doing”. Making that choice and being prepared to accept the future changes associated with that type of work will be key to future success. Why we work, how we work and where we work are all destined to change in the next decade thanks to the 4IR.

The world of work is changing so fast that most traditional careers seem destined for massive changes. Throughout history where there is change there has been opportunity. The future is bright with rapid evolution of traditional careers in many new directions, and new career opportunities emerging over time that we can neither imagine nor accurately predict today.

A commitment to life-long learning, a willingness to seize new career opportunities as they arise and a determination to adapt quickly to take advantage of advances in technology, will be essential personal attributes. You will need to continually upgrade your skills to remain at the cutting edge of technological advances. In fact your ability to adapt and rapidly upgrade your skills may soon be regarded as more important than your experience. It is probable that traditional technical careers will in future require initiative and significant interpersonal skills,

while careers that are currently less technical will require very different technological skill sets in the future. How you work, and where you work, will be less important than what you contribute in terms of work deliverables. Disruptive technologies like machine learning, artificial intelligence and robotics may not create widespread joblessness as is increasingly feared across nearly all communities, but will rather free many to concentrate on new tasks.

The creation of new business models and niche opportunities from the analysis of huge digital data sets (now called data lakes) will be part of our future. Global digital connectivity will enable all of us to access opportunities, regardless of where we are situated. The continually evolving

FACING A FUTURE OF CAREER UNCERTAINTY AND CONSTANT CHANGE IS NOT EASY.



DR NALEDI PANDOR, FORMER MINISTER OF HIGHER EDUCATION AND TRAINING, IMMERSSES HERSELF IN A VIRTUAL REALITY WORLD AT THE OFFICIAL OPENING OF UWC'S REFURBISHED COMPUTATIONAL AND MATHEMATICAL SCIENCES BUILDING IN 2018.

levels of computational complexity, information overload and digital connectedness that we now face on a daily basis, could scarcely have been imagined even at the turn of this century. It is not going to slow down.

How can the academic programmes at UWC prepare me for the 4IR?

All the 4IR technologies mentioned in this article are currently part of the undergraduate and Honours curricula in the Department of Computer Science in the Faculty of Natural Sciences at UWC. The first graduates with an MSc Statistical Science (with a specialization in Big Data) graduated this year from the Department of Statistics and Population Studies. This structured Masters degree is presented in collaboration with the University of North West and the large international data analytics company, Statistical Analytical Systems (SAS). Enormous data sets emerging from the Square Kilometre Array (SKA) >>

Radio Telescope are being managed by the Inter-university Institute for Data Intensive Astronomy (IDIA) of which UWC is a member. Data streams of 1-2 terabytes per second are predicted for the SKA in the next ten years. Already multiple terabyte data sets generated by the MeerKAT telescope (the fore-runner of the SKA) are currently being analyzed by cosmologists in the Department of Physics and Astronomy at UWC.

In support of UWC's determination to embrace the challenges of big data, an e-research director has been appointed to coordinate the handling of, and access to, the large research data sets emerging from a number of sources across the university. Life-long learning openings in the form of post-graduate diplomas, to

upskill graduates so that they can exploit the new 4IR business niche opportunities in e-logistics, data analytics and immersive technologies (Augmented and Virtual Reality), were recently launched by the Faculty

THE FOURTH INDUSTRIAL REVOLUTION CAN COMPROMISE HUMANITY'S TRADITIONAL SOURCES OF MEANING: WORK, COMMUNITY, FAMILY, AND IDENTITY, OR IT CAN LIFT HUMANITY INTO A NEW COLLECTIVE AND MORAL CONSCIOUSNESS BASED ON A SENSE OF SHARED DESTINY. THE CHOICE IS OURS.

of Economic and Management Sciences (in collaboration with the Faculty of Natural Sciences). Check out the EMS website for details.

Conclusion

What the world will be like in the next two decades is very uncertain. Klaus Schwab (Founder of the World Economic Forum) suggests that how we embrace the impact of the 4IR in the future is in our hands; "The fourth industrial revolution can compromise humanity's traditional sources of meaning: work, community, family, and identity, or it can lift humanity into a new collective and moral consciousness based on a sense of shared destiny. The choice is ours."

THE SKA RADIO TELESCOPE NEAR CARNARVON IN THE NORTHERN CAPE WILL PRODUCE SOME OF THE LARGEST DIGITAL DATA SETS IN THE WORLD OVER THE NEXT DECADE.

