IMPACT OF THE FOURTH INDUSTRIAL REVOLUTION IN AFRICA FOR BETTER PORTS PERFORMANCE

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ABSTRACT

This research paper investigates the impact of the fourth industrial revolution in Africa focusing on ports and terminals performance. Port technology plays a critical role from planning, execution, reporting and continuous improvement. In the implementation of Industry 4.0, we are expected to encounter a number of challenges related to the skill level of the current workforce. This research looks at the model of functional, technical and leadership skill sets as critical determinants for the success of any *artificial intelligence, machine learning and deep learning* deployment in ports and terminals. Some new technologies can disrupt or radically change the established order in existing markets or even create new markets (Bower & Christensen, 1995). The main research question for this paper is: Are we ready for disruptive technology (in Learning and Development) as expected to cause rapid and major disruptions to the demand for occupations and skills?

As disruptive technology, particularly in the form of digital technology, becomes more widely deployed in workplaces, education and training providers will face the challenge of understanding the implications of this change for course offerings and delivery. This is not straightforward as it requires gathering evidence at the workplace level; nonetheless, education and training providers must decide which technologies to use in training ports and terminals employees. Trainers need to be exposed to current and emerging technologies by undertaking training and development to enable them to be competent *port* technology users as well as educators (Reeson *et al.*, 2016).

Science, Technology, Engineering and Mathematics (STEM) skill-values data analysis, computing skills, digital technology and lifelong learning are critical. That is particularly "*learning how to learn*" as STEM subjects have a huge influence on new research, development and innovation. Hence, African education system will need to create workers with the skills and competencies required to thrive in a continuously changing environment creating new knowledge infrastructure. One of the Maritime School of Excellence objectives as a school, is to develop an African comprehensive training model that could be used to increase knowledge, capacities and skills of port/terminal operators, port/terminal managers and decision-makers, who should then be able to successfully implement this model in their ports/terminals. The envisaged model alluded to earlier on, gives expression to the compelling discourse of an intertwined relationship in operational, tactical and strategic imperatives for better ports performance.

The literature review in this study tries to respond to the following focus questions: a) What is the relationship between disruptive technologies and demand for skills? b) To what extent are specialist skills versus generic skills relevant to the implementation of disruptive technologies? c) To what extent is there consensus between the technology innovators

and end-use employers when it comes to skills acquisition/development for disruptive technologies? and, d) What are the barriers to students' and graduates' skill acquisition and development in the next five to ten years in the context of disruptive technologies? These questions will be based on Grounded Theory methodology for purposes of the study.