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This article looks to advance on the idea of levelling up to create a more nuanced view from the lens of the digital economy with a focus on Artificial Intelligence (AI) literacy. AI literacy is an ongoing gap between digital ideal and digital reality for the 21st-century workforce.

McKinsey research reports highlight the percentage of companies adopting at least one AI capability in their business processes more than doubled with nearly all the businesses reporting value-added benefits (Chui and Malhotra, 2018; Burkhardt et al., 2019). PwC 2017 Digital IQ survey supports this argument with 54% of companies already making substantial investments in AI. However, the workforce skills and organisational capabilities have not kept up pace with this new advancement with only 20% of the workforce possessing the required skill to work with technology (Rao, 2017). According to the Economist Intelligence unit, one of the main obstacles and hurdles for companies to adopt AI is a lack of skilled workers in technology and analytics. Yet, for a sustainable adoption to hold companies need to look beyond the technological and analytical job roles benchmarks (The Economist, 2020).

Sustainability also demands setting aside reasonable budgets for staff education, training, and development to advance in the field further and not merely securing capable talents alone (The Economist, 2022). It is also equally important to re-invent and re-imagine jobs for a better alignment and fit to pave the way for the new human-AI dynamics (Budhwar, et al. 2022).

Taking the banking industry as an example, Accenture's survey highlights that banks are only investing 3% to retrain their workers in preparation for an AI-embedded workplace (Crosman, 2018). The evidence so far suggests that there is a huge gap between digital ideal and digital reality. Although digital competency is becoming a mandatory prerequisite in many industries (including the banking industry), there is still a shortage of supply when it comes to knowledge of digital competency (Curran and Puthiyamadam, 2017).

What are colleges and universities doing to prepare, develop and enhance digital competencies for the new digital world of work? Computing and Engineering schools in most universities are championing efforts to increase programming and analytics workshops. So far, numerous "digital upskilling" efforts have been initiated mainly targeting work, self-employed, recently unemployed, or returning to work after break

employees who are working at private Small Medium Enterprises (SME) or public sector organizations. For example, digital skills academies, digital skills bootcamps, and digital skills for growth to name a few.

As the digital ideal entry-level jobs are in technology, practitioners in the field are calling colleges and universities to ensure their programs are placing more focus on technology skills and analytics requiring new graduates to be proficient in mathematics, science, and programming (Crosman, 2018). Practitioners in the field, on the other hand, are championing the other end of the bargain through facilitating workshops such as Google Digital Garage, Learning Curve Group, and Creative Fuse Northeast amongst others.

Although the evidence so far shows much has been done but is it “much ado about nothing”? Should digital upskilling solely be the responsibility of computing and engineering schools alone? The gap between digital ideal and digital reality goes beyond educating the future workforce to be AI literates. We need to see past this “hard” system thinking and go beyond to co-create new initiatives under the lens of Equality, Diversity, and Inclusion (EDI), public health, and social sciences.

Yet, all is not lost. Companies need to proactively redefine current job roles associated with AI and introduce new job roles (Salampasis et al., 2017). The Royal Bank of Canada calls for embedding “human skills” into curriculums. Active listening, social perceptiveness, and critical thinking skills will place the future workforce in an ideal environment that complements robots and machines rather than compete with them (Crosman, 2018). This breaks the widely held assumption that AI is replacing humans. Studies are working on the notion that AI should be designed to complement humans and not override humans ensuring humans precede machines in decision-making and are always in control. This will also ensure that all decisions that are made are compliant with human values and rights (Dignum, 2019).

Crossman (2018) views that humans have a competitive advantage compared to machines when it comes to creativity, improvisation, dexterity, judging, social, and leadership abilities. While machines' strengths rely on their speed, accuracy, repetition, predictive capabilities, and scalability. As such, it is logical to reimagine and redesign job roles along business processes in the light of human-machine dynamics to boost business performance.

It is also important to note that dexterity can also be found in ethnic minority groups and local communities in deprived areas such as in the Northeast of England if we genuinely want to help with the levelling up agenda. As such it is important to move away from designing courses and trainings that evolve around the “hard” lens of engineering and move towards digital upskilling from the lens of humanities, feminism, and EDI to equip the 21st-century workforce to thrive in their future fields.

Going back to our example in the banking industry, banks for example need to explain to borrowers why their loan application has been unsuccessful. As most loan decisions are conducted by machine learning which is a “black box” it is difficult to understand how the system makes decisions. As such, humans play a key role in explaining the processes taken by the machine to arrive at the decision. In certain

industries such as the medical and legal professions, human presence is a mandatory requirement where decisions are concerned.

Brüggen et al. (2017) calls for humans to hold “interventionist” positions such as in financial education and counselling positions. Humans trained in emotional intelligence would be of better assistance to bank customers who are going through life events such as divorce, death of a parent or spouse, losing one’s job, etc than an AI.

To enable the human-machine collaboration to materialise with levelling up efforts both businesses and universities need to show they have a duty of care towards society by employing/enrolling a diverse set of workforce/students that include minorities, people with disabilities, and local communities in deprived areas in the Northeast. Businesses that are either at the beginning of their learning curve with AI or have already established experiences with AI should start moving away from perceiving Responsible Artificial Intelligence (RAI) as an abstract knowledge and start applying it in the world of work. One way forward is to identify skill gaps and design new roles accordingly. For example, who’s to say that bank CSR (Corporate Social Responsibility) could not be improved by training caring people from local communities to explain algorithm decisions to lay customers? Who’s to say educating keen digital youngsters in rural areas who are equally talented in socialising will not benefit banks as RAI programmers in the future?

The inevitable human and machine revolution has already begun. There is no doubt that some jobs will be lost to machine competencies. Yet, there are many more new jobs that will be created because of machine incompetence. As such, the 21st-century workforce will be part human, part machine. To realize this vision, collaborative efforts are required from both ends of the demand and supply chains. Businesses, colleges, and universities need to work together to create the 21st-century workforce.

A more thoughtful and nuanced approach is slowly taking place. We have already been to digital roundtables that discuss digital means without restricting discussions to the design, development, and implementation of digital technologies. We have also seen universities developing courses and programs in digital humanities showing the focus is beyond technology per se. Companies are also recruiting anthropologists and Chief Ethical Officers stepping beyond the digital revolution branding.

It is also important to raise difficult questions i.e. When we focus on upskilling with the lens of technology, only a certain percentage of society will fall into this category. What about the rest? What about someone whose talent lies in analysing ethical or environmental issues? What have we designed for them to grow and flourish? Can they be trained to analyse ethical or environmental issues around digital initiatives? How will the older generation, who might have difficulties shifting to an AI-assisted workplace continue their work? What are universities and colleges doing to support the part machine, part human workforce? How are EDI, humanity, and feminism values are embedded in the course and program design and as company values?

The job-ready graduates who own the right skills and expertise to take advantage of the 21st-century employment opportunities that the new economy is creating are not solely technological and data analytics experts alone but those who have acquired talents to be caring individuals, effective communicators, and challengers of ethical issues around digital initiatives. Educating and training society for such roles requires collaborations between business schools, social sciences, and humanities, consulted by computing schools and the industry. The industry should also be open to putting aside quick wins and profit makings to focus on employing a diverse set of workforce from minorities, people with disabilities, and local communities in deprived areas such as in the Northeast.

There is a wide range of talents and potentials in our society to turn a blind eye to. More efforts in harnessing soft skills and virtuous talents are required and necessary to build the new 21st-century workforce of work. The 21st-century new workforce will be a combination of both humans and machines, equipped with the necessary core skills (digital, humanity, EDI, and critical thinking amongst others) to thrive in the future world of work. This will in return safeguard the robustness of business processes to withstand economic shocks and technology changes. Thus, growing the economy in the Northeast of England through levelling up efforts.

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