

# **Reinventing for the Unknown: A Pivotal Approach to Maximize the Constantly Evolving Future of Work**

## **Abstract**

We live in a time when Artificial Intelligence (AI) is gradually becoming a conventional tool in various occupations, thereby causing a disruption to the labor market. Moreover, there is an increasing number of forecasts and studies to predict the future of work or the future beyond work, and almost none to guide individuals involved on how to harness these possibilities. It has become imperative to prioritize the need for a plan that engages individuals, businesses, and governments to handle an impending robotic future. The purpose of this essay is to bridge that gap by laying out a universal framework in form of a three-step approach to exploit the rise of AI for the benefit of mankind in a hybrid human-robot workplace. Since technology possesses a distinct nature of developing *ad infinitum*, so must the nature of work. The steps highlighted for maximizing this change include: Accept, utilize, and Prepare the next generation for the change.

## **Rise of the Robots**

In Čapek's 1920 science fiction play 'Rossum's Universal Robots (R.U.R.)',<sup>1</sup> Harry Domin, the General Manager of the robot factory, made a bold prediction about the future of man and work when he said: "...in ten years Rossum's Universal Robots will produce so much corn, so much cloth, so much everything, that things will be practically without price. There will be no poverty. All work will be done by living machines. Everybody will be free from worry and liberated from the degradation of labor. Everybody will live only to perfect himself."<sup>2</sup> This statement, though written almost a century ago, still resonates today not as mere fiction alone, but embodying the idea that technology threatens the relevance of human labor by giving higher productivity at a lower cost. From the 19<sup>th</sup> century weaving-machine-smashing Luddites' protest to the present-day onset of a robotic future, the universal response to this possibility is the fear associated with the uncertainty of the future of work.

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<sup>1</sup> Karel Čapek was the renowned Czech writer of the popularly acclaimed play *Rossumovi Univerzální Roboti* (Czech title) which first used the word 'robot' referring artificial persons, similar to the sense in which it is now being used in modern day science fiction.

<sup>2</sup> Čapek, 1920, Act 1, p.15

Technology has already begun, at a startling rate, to replace human labor in jobs that require repetitive physical activities. In fact, a McKinsey study shows that the technical feasibility of automating a predictable physical work is a huge 78%, but just a mere 25% for automating an unpredictable physical work.<sup>3</sup> However, as robots start to advance in mental capacities through machine learning, new concerns arise. While contemplating this fact, historian Yuval Noah Harari posed an important question: “What should we do with all the superfluous people, once we have highly intelligent non-conscious algorithms that can do almost everything better than humans?”<sup>4</sup> Despite the plethora of debates and conferences held on the subject, a conclusive answer continues to elude man. Although prediction models make it possible to suggest what kind of work will not be affected by the “robot apocalypse”, it does not necessarily translate that every person engaged in other ‘endangered’ occupations will escape being displaced by Artificial Intelligence (AI) by converting to these relatively ‘safe’ occupations. For instance, the probability that AI will replace a clergyman is 0.0081 while the probability that a telemarketer will be replaced is 0.99.<sup>5</sup> This doesn’t necessarily mean that every telemarketer will be saved by becoming a clergyman.

### **The Conspiracy Theory and a Different Point of View**

In contrast to the theme underlying Harari’s narrative, I aver that the prevalent worldview of robots rendering any human economic contribution of no use in a matter of years is a distraction proliferated by depressing science-fiction movie denouements and reinforced by pessimistic economic forecasts that keep a lot of working individuals in the fear of robots. Such reasoning, just like Domin’s in R.U.R., proceeds from the flawed premise that jobs will become useless and a form of degradation to mankind in the face of automation. It fails to acknowledge the fact that man has always and will continue to remain relevant in the face of technological growth. No doubt, the effects of artificial intelligence in the world of work will be far-reaching and revolutionary and must be given careful forethought and preparation. However, it is common knowledge that work forms an integral part of human identity and fulfillment, and humans have always found a way to evolve into new roles of work as others become mundane.<sup>6</sup>

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<sup>3</sup> Michael, C., Manyika, J., and Miremadi, M. (2016)

<sup>4</sup> Harari, N.Y. (2017).

<sup>5</sup> Frey, C., and Osborne, M. (2013)

<sup>6</sup> Ishikura, Y. (WEF, 2017).

That established, I propose a three-step plan to avert the formation of economically redundant citizens and reinforce the resilience of human contribution to the work-force. These steps address the seemingly formidable threat in a fundamental way such that for decades to come, any active person in the working age would welcome AI as an aide and not a rival. They are: Accept, Utilize, and Prepare the next generation. That said, I must state emphatically that I do not intend to paint a picture of utopia or to even dispute the fact that significant short-term labor displacement will occur. I seek to establish that the advent of robots and AI should not be viewed as the harbingers of a hopeless situation but as a means to a more prosperous society.

### **Accept the change**

Handling a difficult change gets easier after accepting the facts of the situation, considering that these newly accepted facts are most likely to help in making progress in what has become the “new normal.” However, as simple as it may sound, it can be easily overlooked. For a person currently working in a job threatened by the onset of intelligent machines, this means realizing the need to plan for an upskilling or a retraining to prepare for a different position or a new sector entirely. According to the US Bureau of Labor Statistics, the common trend is such that when there is a decline in total employment in one sector, other sectors readily absorb workers. The most obvious sector exhibiting this trend is the professional services sector, which accommodated 3% of the total workforce in 1910 and now employs 28.9% because of the influx of computers and electronics. The increase in the professional services sector is accompanied by a decline in the workforce percentage in a few other sectors.<sup>7</sup>

The decision to include robots to replace human labor typically comes with more productivity and higher profits, a prospect too enticing for owners and managers of firms to overlook. Left unregulated, such incorporation will trigger unemployment on a massive unprecedented scale without a safety net for affected individuals, and lead to counter-productive and time-wasting outcomes rather than the more efficient society which AI is envisaged to create.<sup>8</sup> Therefore, it is important for governments and policymakers to accept the possibility of this drastic change and begin to implement ethical policies that will serve as protection for the economic well-being of the

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<sup>7</sup> US Bureau of Labor Statistics (2016).

<sup>8</sup> Bossman, J. (WEF 2016).

citizens in the interval where acceptance, and consequently, upskilling and transition occur. Such policies need not be extreme as to stifle the potential expansion a company could realize by exploring the benefits of intelligent robots but must be balanced to facilitate more efficient systems while preventing the extinction of a human labor force. For instance, if taxation of the purchase and usage of a robot by a company is put into effect, the emerging funds could be made available as grants for the advancement of a sector in need of more human labor input. A proactive attitude towards policy making will prove far more effective than a reactive one. Amendments can be made to increase efficiency when the policies have been successfully implemented to protect citizens.

As a mechanical engineer, the beauty of my career lies in the very fact that it thrives on technological advancement. From the steam engine to the electric car, mechanical engineering has reinvented itself to stay relevant and to serve the ever-changing needs of humanity. In an extremely AI-influenced world, technology enables us to focus on actually innovating because it will do the heavy-lifting, diagnostics and automation activities for engineers. It will also stand as a valid reason to transcend mundane activities. Acceptance of this truth makes me place more value on engaging in inventive learning that stirs my creativity instead of mastering routine tasks for a rigidly defined job position.

### **Utilize the change**

Contrary to the widespread depiction of artificially intelligent machines as an army of humanoid job guzzlers, the real concern where jobs are concerned is as regards the Internet of Things (IoT) – the networked interconnection of everyday objects, which are often equipped with ubiquitous intelligence.<sup>9</sup> This high-level communication mode between several interconnected devices on a single internet ecosystem results in a high efficiency that inadvertently leads to a decrease in the need for human involvement. This is the technology that must be fiercely manipulated and maximized in my field and many others to prevent the rise of a useless class of human workers. It is through the IoT that driverless cars – the bane of the future of driving jobs – will sense other cars, traffic signals and relevant devices to make roads safer through their interconnectivity.<sup>10</sup> Significantly, the IoT finds its relevance in diverse industries and an evident example is IBM

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<sup>9</sup> Xia, F., Laurence T. Y., Wang, L., and Vinel A. (2012)

<sup>10</sup> Macauley, M. (2016)

Watson which functions at an unprecedented speed and scale with cognitive computing to make evidence-based decisions using big data. The insurmountable combination of machine learning and big data has the potential to replace top professionals such as doctors and lawyers.<sup>11</sup>

As a mechanical engineer focused on building services, I find it exciting that the possibilities and opportunities that Artificial Intelligence will produce in my specific field – design, installation, operation, and maintenance of mechanical systems in buildings – are boundless. That is the reality of the future of many fields of study also. However, the unpredictability accompanied with constant development is an indicator that the best way to keep up with change is to stay informed and educated about the novelties associated with one’s field of study, and this is a task which I have consistently embraced. I employ the use of globally available online learning platforms such as edX and Udacity whose technological courses are updated regularly in harmony with novel technology. I also keep abreast of the latest developments and products incorporated into the industry by volunteering or attending conferences related to my field. I actively participated in Greenbuild 2017 – the world’s largest conference and expo dedicated to green building – and learned more about building automation systems, a prime use of the IoT. To utilize the changes that come with the influence of the IoT, we must work with artificially intelligent machines to make more productive decisions at work. AI augments the effort of human intelligence; thereby unleashing the capacity for more creative work to be carried out.

### **Prepare the next generation for the change**

Higher education plays a vital role in career choice and early adulthood development. Therefore, the curricula being taught must consistently evolve to inculcate skills that prepare the next generation for the hybrid human-robot work system. Joseph Aoun<sup>12</sup> believes that a learning model for the future should include technology literacy, data literacy, and human literacy in order to develop the cognitive capacities required to function productively in the age of artificial intelligence – critical thinking, systems thinking, entrepreneurship, and cultural agility. Implementing this model of higher education involves the close interaction of companies and

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<sup>11</sup> Marr, B. (2016)

<sup>12</sup> Aoun, J. (2017)

higher institutions of learning to create targeted learning programs for trending and future industry needs.

A learning model I experienced which illustrates how institutions of higher learning can prepare for a new generation was a course on Sustainable Engineering Systems for Buildings taught by Chris Schaffner – President of The Green Engineer, a sustainable design consulting firm – who serves as a part-time faculty member at Northeastern University. Drawing from a proficient knowledge of the industry, he effectively trained his students for the future of their industrial practice. Infusing this close interaction between students and leading practitioners in their field of study who understand the likely future of the nature of their work, coupled with experiential learning, are essential for building confidence and competence in the future generation. This is a key area where business leaders and policymakers can effectively make positive changes by ensuring easy access to updated higher education systems.

### **The Future of Work**

From the moment the early man discovered stone tools and fire, work has been evolving. The persistent drive embedded in us to consistently advance the nature and tools of our work has led us to this moment and will keep us going farther to a future whose dimensions of technological progress we have not even started to imagine. Science, technology, and innovation will perpetually remain key pillars for economic growth and competitiveness at the firm, industry, and national levels.<sup>13</sup> Nevertheless, a common trend persists: work will get less tedious, working hours will reduce, and leisure time will increase. As individuals upskill and shift from sector to sector, a new balance will be created to give new opportunities to people displaced by technology.

Ultimately, beyond the end of work as we know it lies the reinvention of work for man.

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<sup>13</sup> Lundvall, Bengt-Åke, and Borrás, S. (2006)

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