Undertaking Automation in the World of Work (WoW) and Society Through Human Resources

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Abstract
Accelerated progress in the field of technology has opened avenues for automation to be an integral part of the World of Work (WoW) and society. A combination of various forms of automation can perform a single job with results that are error-free and less arduous compared to end results produced by humans. Although automation pessimists worry about the future of jobs when it replaces humans, the optimists believe that humans possess social traits like common sense, instinct, and empathy that automation will take decades to perfect. However, contemporary research has made daunting inferences that automation possibly will perform tasks—pieces of the total production process of different jobs—that are repetitive in nature regardless of the pay grade that they belong to. Hence, the ratio may differ, but the influence of automation at the WoW at all levels, from blue- and white-collar workers to C-suite executives could be high. Thus, the aim of this paper is to highlight the need of HR practitioners to nudge the organization, society, and human capital for the new WoW where human resource practitioners are able to convince organizations to be willing to retrain and upskill their employees, prepare society to produce new recruits equipped with technical and emotional skills, and groom human capital to appreciate retraining and adopt lifelong learning to sustain in the new WoW. This paper provides an overview on how industrial revolutions in the past changed the nature of jobs; highlights ongoing research; and studies how HR practitioners can help society, organization, and human capital devote their energy wisely while being mindful of the revolution that automation may bring for enhanced return on investment (RoI).

Keywords: automation, the world of work (WoW), society, human resources (HR)

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Literature Review

The technological transformation has begotten substantial change in both, the world of work (WoW) and society. While it has generated opportunities which were previously inconceivable, the challenges it has portrayed are also unthinkable. Jobs which were in the domain of humans in the past because of their cognitive capabilities and intelligence are on the verge being taken over by machines. Accelerating increase in the pace of innovation are making robots, machines, and technologies sophisticated on one hand and more affordable on the other. In addition, a combination of automation like artificial intelligence, augmented reality, blockchain, drones, virtual reality, 3-D printing, machine learning, robotics, or internet of things (IoT) can be used to gather information from multiple locations, find out normal operation pattern, and detect anything abnormal in a short amount of time without any human biases (Government Accountability Office [GAO], 2017). Thus, with the current level of training, education, and awareness, the human capital is on the verge of being redundant. WoW in this paper means the traditional explanation of work where organizations employ human capital to fulfill duties by expending their talent, skills, and know-how for wage or salary.

Perhaps for those who are familiar with the roots of the first industrial revolution and the subsequent revolutions may already know that it is not the first time that advancing technologies has reformed the WoW and the society. Even John Maynard Keynes in 1930s had predicted widespread unemployment due to the technical revolution which in his view was a way for organizations to economize labor and hence, humans would be redeployed for a newer type of occupations (Keynes, 1933). Hence, after the industrial revolutions, an increasing number of jobs performed by humans shifted towards cognitive tasks which we famously know as 'the desk jobs', where humans needed to think to get the job done and thus, the educational institutions flourished with the array of topics under various disciplines.

Not until long ago, books like 'Why people still matters' were published depicting the importance of human brains on jobs like driving in traffic (Levy & Murnane, 2004). The shift in paradigm started soon after when Google, Inc. for the first time introduced self-driving cars in 2010 (Frey & Osbourne, 2013). And researches thereafter focused more and more on how advancing technologies has a high potential of changing the WoW.

A study analyzed eight hundred occupations using two variables (i) time spent by humans performing the activity and (ii) the potential of that activity to be automated. (McKinsey and Company, 2016). Based on the study, with the current pace of technological advancement, at least 19% of predictable man hour—time spent by humans performing physical work—for these occupations have the potential of being automated by as highly as 81%. Similarly, at managerial levels, 6% of the time spent by managers managing their subordinates has the potential of being automated by 10% at the least.

Similarly, another study has examined 720 jobs and predicted the probability of those jobs being computerized (Frey & Osbourne, 2017). Out of those jobs, 10% or about 70 jobs such as taxi drivers, human resource assistants, tax examiners and collectors,

revenue agents, accountants and auditors, couriers and messengers, and many others can be fully automated based on the study.

Discussion

As the WoW is raveled with progress in technological advancement and as the progress is in this field is accelerating, I as a human resource (HR) practitioner believe that it is our responsibility to bring awareness and prepare the WoW, society, and mainly, the human capital to prepare for the imminent future. Thus, this paper focuses on the potential impact of accelerated progress in workplace automation and how HR practitioners can act as ambassadors of change.

By getting endorsement from the management and the c-suite executives about the need of the preparedness, HR practitioners can bring awareness amongst the human capital through powerful nudges, retraining, encouraging their creativity, and preparing them to be antifragile, and be the change agent who spreads words in the society about changing WoW and the need for educational and training institutions to evolve accordingly. This could also help organizations to maximize their return on investment (RoI) of training the human capital.

Notwithstanding, many researchers have concluded that automation is not an actual threat to jobs, as the total number of human capital at jobs will increase even though the number of full-time jobs may decrease (McKinsey and Company, 2018; World Economic Forum [WEF], 2018). However, the challenge will be that automation may change and reorganize the time taken to perform a single job and more importantly, the increase in employment may be more for the skilled labor at the expense of their low-skilled counterparts which could eventually raise the level of income inequality in the society (Organization of Economic Co-operation and Development [OECD], 2018).

Possible Aftereffects of Automation

Sophisticated software technologies are now able to perform jobs outside of regular manufacturing functions which used to be the case in the previous industrial revolutions. Labor polarization—where jobs for high and low skilled workers are accessible but the ones for middle-skilled workers disappears—could be one of the outcomes as the highly cognitive jobs which are dodgy to be automated or the low paid manual jobs for which automating would be too costly maybe the only ones to remain in the domain in the humans, but machines could take over all the middle-income routine jobs (Goos & Manning, 2007). And the change is not in the distant as many had imagined.

Automation gurus are expecting meaningful change in less than 5 years. The results of their studies are already predicting a significant difference in the pattern of employment between 2018 to 2022 (WEF, 2018). In one study, a total number of stable jobs remain the same in both 2018 and 2022 but completely new types of jobs are predicted to increase by a substantial rate of 11% by 2022, making the composition of the new jobs increase to 27% compared to that of 2018 (WEF, 2018). Experts believe that upraise brought by automation—possibility to combine various types of automation (robotics, IoT, automation, artificial intelligence, and others) to

get a single task done error-free and in less amount of time—as the fourth industrial revolution. It is because the pattern of change that automation may bring to the world of work is like previous industrial revolutions but at a much faster rate.

The exponential increase of computing power and cognitive capabilities in areas like self-driving cars, delivery and surveillance via drones, 3-D printing, and virtual assistants are some examples of tasks which previously used to be in the domain of humans have shown promising progress via automation. American banking giant, Citigroup Inc. recently announced that it expects machines to replace thousands of call center jobs to serve its customers better and get the job done more cheaply (Noonan & Jenkins, 2019). If the trend continues and if the human capital and the society are not prepared, then soon, there could be another Luddite riot in the foreseeable future. Likewise, organizations may not make the investment decisions as to when and how to train their human capital wisely.

To overcome whirlwind of changes in WoW, allowing present and future workforce to adjust to the change without any hiccups, it is the utmost responsibility of HR practitioners to nudge the organizations, human capital, and society. The main idea for the nudges is to make the organization, society, and human capital pay attention and mold small and insignificant modification, which can have a major impact on the decisions taken thereafter (Thaler & Sunstein, 2009). This will help organizations create a positive work environment, design attractive financial incentive structures, and focus properly on leadership styles, management, communication techniques, and be ready for transitional unemployment, and make wise investment decisions on training the human capital.

Based on a behavioral study done by Stanford University in 2011, the university was successful in reducing the racial achievement gap by half and improve the health of African-American students by simply making them aware that all students, regardless of the race, do worry about fitting in when they are newcomers. But through time everyone feels at home (WEF & University of Zurich, 2018). Another classic example is by simply giving an option of opting out from signing into the 401K plan but letting employees know about the advantages increased enrollment rate by 40% (Thaler & Sunstein, 2009). Thus, nudges via awareness campaign can be a powerful but simple way of communicating to the human capital that changes due to automation is inevitable but at the same time the organizations are studying the trend closely and taking necessary step in training and re-training the taskforce to equip the workforce to be able to properly tackle the changes and to avoid yet another Luddite revival.

The Luddites and Actual Outcomes

Evidently, this is not the first time technology has brought change in the world of work. During the early 1800s, Luddite riots took place in Britain as the workers resisted and not to mention, feared the change that was brought by technology causing them to destroy machinery (Frey & Osborne, 2013). The effect was so enormous that to this date the term 'luddite' is used for anyone who is against any technological progress (Smithsonian, 2011).

But it is equally interesting to learn that studies concluded that eventually, human workers became the greatest beneficiaries of the industrial revolution due to the

growth of real wages profiting an increased share of the labor force. The share of employment in the agricultural sector fell by 56% between 1850 and 2015 (Coeure, 2018). Similarly, work previously done by artisans were decomposed and mechanized in such a way that machines could perform such tasks with the help of more labors who were not skilled as much.

Through time, the way goods and services are produced changed significantly due to technological progress and it is often believed that it is a symbol of aggregate employment and growth. Based on 2017 data, five major markets representing 73% of the total global sales volume are China, Japan, the Republic of Korea, the United States, and Germany (International Federation of Robotics [IFR], 2018). A recently study on German manufacturing accounted that automation consisted of a quarter of the manufacturing jobs that were lost in 20 years between 1994 and 2004 but such jobs were offset by higher level jobs in service sector and more importantly the workers who were exposed more to automation ended up staying in the same organization but with advanced jobs (Coeure, 2018).

As innovative technical improvements for industrial robots have accelerated, the demand for such has increased by 19% per year between 2012 and 2017 (IFR, 2018). Some noteworthy bright prospects of automation are: collaborative robots or co-bots can work safely alongside humans; ease of programming due to user friendly applications; ease of compatibility and integration with current manufacturing production systems, cloud storage of data from multiple robots performing the same process optimizing the performance of robots through machine learning; and lastly, decreasing cost of automation (IFR, 2018; Coeure, 2018).

Social Impact of Automation

Advantages of automation in the WoW goes beyond cost minimization, work safety, and performance optimization. Based on the aforementioned research, automation will increase productivity, safer conditions for the workplace, increase in wages, and create new jobs in the long run. But if the human capital is not well prepared and accepts machines as a part of the workforce performing cognitive tasks, the transition period could be gloomy. We don't have to go too far in history. In 2008, when the General Motors assembly plant in Janesville, Wisconsin, closed—all the factory workers who had been working there for decades, if not generations as well as the suppliers, shipping companies, and warehouses—were unemployed (Goldstein, 2017; Rothman, 2017).

This was a huge social change in Janesville, especially given that most of the workers did not see this coming. Hence, later when needed, they did not know how to use or turn on the computer (Rothman, 2017). This is an example of a social change in the city, Gary, a city in Indiana have had similar faith when the steel factories closed. By now, the workers in Janesville have either migrated or retrained themselves and found a new type of employment. And this real-life story is the victims of a combination of globalization and automation that affected a town in the U.S. (Rothman, 2017).

With current prediction, the effects of automation may ripple beyond the borders of any nation. One of the benefits of globalization has been the ability of multinational organizations to produce in a country where labor is relatively cheap and sell the

product to the consumers in many parts of the world. But given that the price of automation and robotics is falling while their efficiency is increasing, it is highly likely that the automation may be able to deliver the same quantity of output efficiently and more cheaply in the local market (IFR, 2018; Coeure, 2018). It is estimated that in Indonesia, for example, two-thirds of jobs in the textile, clothing, and footwear industries are at the brink of automation (International Labor Organization [ILO], 2018).

Aforementioned are some samples of effects in mainly manufacturing industries. Adoption of new technologies by both consumers and organizations spans across but not limited to financial and service sectors, energy utility sectors, aviation travel and tourism industries, mining and metals industries, infrastructure industries, oil and gas industries, global healthcare, and information and communication industries (WEF, 2018).

Thus, the effects of automation have been felt in every nook and cranny of the WoW. Based on the GAO forum finding, the lack of federal data source on the effects of automation there is no clear view on the jobs that could be created, augmented, or displaced by automation (GAO, 2017). Hence, there is utmost importance for organizations to retrain and upskill existing workforces and for individuals to adapt and embrace lifelong learning. It is because several changes are expected: adoption of technology may increase significantly; the way of production and distribution channels and geographical base for operation may change significantly; reduction of full-time workforce; increased use of combination of humans and machine for the existing tasks; demand for new specialist roles like big data specialists, blockchain specialists, robotics engineers, among many others (WEF, 2018). Automation may also increase productivity and the gross domestic product (GDP) of a country.

It is, inevitable that changes due to automation in the WoW could be significant. This is a perfect opportunity to make human capital aware that this may be about time that they can re-focus their work on analytical and creative activities. But this may, of course, increase a huge need to reposition corporate human resource function and expansion of organizational capabilities of data and workforce analytics (WEF, 2018). As mentioned previously, industrial revolutions in the past also contributed to a significant change in the WoW.

Human Capital Management

The way human capital is managed has evolved significantly through time. The idea of the human resource first was felt during the early 1900s, to standardize and simplify jobs in factories so that the unnecessary motions would be eliminated (Bauer & Erdogan, 2017). This was developed by Frederick Taylor and his model is infamously known as 'Scientific Management System' or 'Taylorism'. In a way, this model treated humans as machines to increase efficiency. After nearly 40 years, an American psychologist focused on the motivating the employees by understanding their need, also known as 'Maslow's hierarchy of needs' which was divided mainly into five distinct levels: physiological, safety, belonging, esteem, and self-actualization.

During the 1960s, the need to provide improved work conditions, recognition, room for growth and advancement was combined on top of Maslow's hierarchy of needs and was introduced as 'Motivation-Hygiene Theory'. This was developed by organizational psychologists Richard Hackman and Greg Oldham (Hackman and Oldham, 1976). Again, during the 1970s it was realized that employees are motivated by the conditions in which they work and real motivation came when it felt good for the employees to perform it. Hence, these factors were added as well.

Finally, the most recent one is Socio-Technical systems theory, which considers human, social, and organizational factors as well as the technical system as the part of the organizational system (Baxter & Sommerville, 2010). This theory was developed by Frederick Emery and Eric Trist who have described the interlinkages between human, workplace environment, and technologies.

These philosophies help in understanding the building blocks and fundamentals of how human resource management evolved through changing times as both, the art and science. It is a science because metrics matter and the decision should be based on data; at the same time, it is also an art because each case is unique on its own like siblings raised by a set of parents under same rules and expectations (Baldino, 2017). Given that we can see a pattern of human resource philosophies evolving, in principle, we can be assured that such philosophies could evolve again and meet the changing need of organizations and society because of automation. But the need for preparing human capital to adapt to changes brought by automation was felt previously as well.

Automation in the World of Work

Research has indicated that failing to preplan for the human capital as much in dept as for automation itself results in several problems (Majchrzak, 1988). When automation was initially used in the manufacturing setting, the major problems were the human capital back then lacked awareness of new technologies, feared newness, and were not using them effectively. Ignoring issues with human capital until the automation arrived created problems such as not well-informed staff, lack of management involvement when needed, and inhibition of full utilization of new equipment.

It also raised an important point that management may fail to take into consideration the humane aspects such as how employees value the challenges with their work and how automation may take that autonomy or the challenge away. Likewise, the traditional career progression system may not fit the new business need. While talent and fit of human capital may remain as important aspects to consider their career progression, knowledge of evolving technologies and the zeal to understand and utilize them may be an important aspect while succession planning. Hence, HR practitioners need to be mindful of the shifts in employee value proposition and work towards preparing, encouraging, and recruiting agile workforce.

Because of deindustrialization, which involves shifting employment from manufacturing to services has already led to job polarization in some countries (OECD, 2018). In the OECD countries, the shift of employment share from middle-skill jobs to low-skill and high-skill jobs was 10% from 1995 to 2015. These changes cause a significant change in the lives of human capital. Even if workers stay in the same job face the changing skills demands that require retraining.

The results of the studies vary in terms of a number of jobs that may be affected by automation and innovation. Some researchers estimate that half of the jobs in the United States only is subject to automation whereas others estimate that one in seven jobs in the OECD countries will be lost because of automation (Frey & Osborne, 2017; Nedelkoska & Quintini, 2018). However, even the studies which show that jobs will not be totally replaced by automation concludes that the contents of the jobs may radically change which highlights the importance of lifelong learning and retraining. And it may not hurt organizations and human capital be ready for possible transitional unemployment.

Automation effects in Society

Given that the effects of automation and society are deeply interconnected, the ability to adapt to evolving technology is small but an important aspect. Robotic arms are now used in supermarket warehouses in the United Kingdom to assist human workers to handle delicate items faster and cheaper (Gray, 2017). Even though this is not the first time that automation has affected the world of work, the workers are as concerned as they were during the time of the Luddite riot. The dock workers in Los Angeles, US, backlashed a Danish firm, AP Moller-Maersk's plan to use the unmanned electric vehicles called 'autostrad' instead of diesel trucks at the largest port in the U.S., to shuttle shipping container from one point to another (Meyer, 2019). While the workers union's argument was that the unmanned vehicles will most likely take away the truck drivers' job, Maesk argument was that the cost of the company will decrease because of less human drivers and also it will help them comply with the strict air pollution rules of the state of California as there will be minimal use of diesel trucks. In retaliation, the workers blocked the companies' construction permit to install aids such as charging stations, wireless antennas, traffic barriers and fences which are required to function electric vehicles smoothly.

Nevertheless, automation could affect educated white collar workers who have desk jobs as well. If we think from the educational perspective, the pedagogical qualifications are very much interconnected to the jobs and is a major criterion during the recruitment process. As more automation is embraced at the workplace, the jobs that are designed for the workplace without automation may have to change, not to mention the education requirement and qualification as well. Some of the occupations also may face the challenge of unemployment during the transition period.

As with automation, the design of the jobs may change, hence the candidates who fit the required criteria of a job description today may not be well-placed in the near future. Ensuring a smooth transition to bridge the gap could require adequate pedagogical education and retraining programs (Coeure, 2018). Hence, HR professionals need to think beyond the present situation and have a long-term strategy when it comes to recruiting new graduates on whether they possess the knowledge and the aptitude needed for the new jobs and if they could fit the new culture.

Solutions

Rather than treating the symptoms of automation, human resource professionals need to treat its root causes and help organizations maximize their RoI in terms of recruiting and retaining human capital. And instead of dismissing existing employees

who are not prepared to adopt and adapt the workplace with automation, HR professionals need to retrain their employees. In addition, HR professionals need to encourage the importance of life-long learning. Human aspects such as empathy, kindness, curiosity, individuality, generosity, gratitude, it could take machines years to learn and even more to perfect (Atsmon, 2018). Studies show that the future success of the organization will be on how much they invest in building the culture of continuous learning and lifelong learning (McKinsey, 2018).

Invest in People

HR professionals should understand the impact of automation on the way work is done and the side and nature of the workforce. Hence, for HR professionals, rather than being an HR expert, the knowledge of how the business operates will be needed more than ever. This will allow them to think strategically in terms of the current talent and the skills gap and how it can be bridged. To be well prepared for the WoW with automation, long term investment on human capital development by the organizations and readiness to adopt the skills required for an organizational environment where automation is enabled should go hand in hand (Sage-Gavin, Vagiranni, & Hintermann, 2019, pg.3).

Organizations may be skeptical about retraining their current employees or recruiting fresh ones who have all the required skills as it may cost an arm and a leg. HR professional could, however, use some of the inexpensive approaches to spread awareness within and outside the organization. HR professional could form a powerful nudge by being an advocate who voices concerns and awareness to the society in only ways that they can. For example, they can partner with educational institutions like schools and universities and volunteer awareness workshop and training to both faculties and students. It will be equally important if HR professionals educate current and future workforce about the possible transitional unemployment but through time, things will get better.

Invest in Social Skills

More than ever, organizations could be in the quest for the individuals with an entire package—technical skills, along with an equal emphasis on social and emotional skills—as demand for caring professionals with creativity, leadership skills, and problem-solving skills may be a top priority as machines are not yet equipped with human skills (MGI, Skill Shift, Automation, Future of workforce). Currently, in schools and universities, the focus is often on the level of a student's skill and knowledge of a subject matter and very often, they are graded with the number of their correct answers to a set of questions.

Teamwork is sometimes considered but the soft skills they used to get from point A to point B such as collaboration if they were respectful to their classmates, their deep thinking, and how much of a problem-solving skill they used are often ignored and not graded at all. Unless a job involves frequent customer service, people skills are emphasized only at the managerial level. But people skills could be one of the key factors in the new WoW where machines can perform cognitive tasks in a fraction of time. Though researchers are in the quest of developing machines with human skills, it could be years if not decades for human skills to be perfected via automation. In

addition, work may change but the qualities of a good worker like good work ethics, communication style, punctuality, consistency, and perseverance, will always be needed.

It is the HR professional's responsibility to make the human capital antifragile. And the retraining, communicating with them early on, and giving them a nudge makes them antifragile. For example, Because of the innovation, the human careers can be taken as a computer game that adds challenges and obstacles with each new level, and in few years, one needs to learn a new game (Taleb, 2012). Humans body becomes stronger and moderately stressed and mildly poisoned with some recovery time.

Create a Community

Making human capital ready is only an aspect. Working on silos across various teams may not work it may create duplication and disconnect between how jobs are performed. Moreover, silos within the various HR teams like talent acquisition, compensation, and benefits, learning and development, or succession planning will result in an unpleasant experience for employees and may not align with emerging business needs (Mercer, 2019, pg. 6). HR professionals need to help strategize various functions across the organizations where the AI will impact (PWC, 2019). They can do so by establishing a center of excellence (CoE) which is the epicenter of building an AI foundation.

Other organizations may also choose to make AI strategy a part of their existing IT, automation, or analytics group. But centralizing AI functionality is the key to make the AI strategy success. It will help monitor the standardize the data policies organization-wide. And finally, to get the ideas flowing across the organization, a digital platform may help in idea sharing, collaboration, and promote initiatives taken across departments. A portion of such a platform could be made public to educate the educational institutions on how the organization is currently utilizing the various AI techniques and which ones are serving the organizational purpose the most.

Limitations

As rapid disruption of automation in the WoW is fairly new, obtaining peer-reviewed journals to see a trend was not easy. The study is based on qualitative research. Even though there is mention of quantitative research of the third party, the research could have an added benefit if the quantitative research is done first hand. The research is based on studies done in emerging and advanced economies. The disruptions assumed on this research will happen should there be no opposition from the society in terms of automation and computerization and if the government does not intervene by introducing legislation to the rapid development of automation. Finally, even though the pace of technological progress has been substantial in recent few years, how soon automation and its various types will be perfected to substitute human minds cannot be easily foreseen.

Conclusion

It is not easy to predict what the future has in store for us. One thing, however, is certain. As the WoW is changing, the individual's perception of work needs to change

as well. It may help the individuals to futureproof their jobs, be ready for transitional unemployment, and organizations as well as society to bridge the gap. As mentioned previously, this is not the first time that revolution in the world of work is taking place. This is known as the fourth industrial revolution. But given that human resource management exists, it is time for the HR practitioners to take this seriously and bring the matter to the attention of highest governing body in the organization, the society, and the human capital before the problem trickles in.

Physicians are using IBM's supercomputer, Watson for patient diagnostic and treatment options. Rio Tinto is using automated trucks at the mines of Australia to transport precious metals. Amazon is using more than 1000 robots for its warehousing (Stevens, 2016). In 2011, Watson machine outperformed the human competitors in the game of Jeopardy and ended up making more money (Brynjolfsson & McAfee, 2012). And the list goes on.

This is the world that we live in today. Innovation and automation may not necessarily take away all the jobs but will most likely create disruption and the shift in what the employers may look for. Hence, the efficient and coveted human capital will need the skills, education, training, complex communication, and not to mention, the human touch. And HR practitioners can help the organizations prepare for changes that automation is predicted to bring in the world of work while receiving full RoI.

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