Future Proofing of Workforce Against Artificial Intelligence & Machine Learning Technologies

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This article presents a perspective on future of work and evaluates the impact of advancements in Artificial Intelligence and Machine Learning technologies on Strategic HRM for organizations. The authors used theoretical incremental logical argumentation to build up the perspective of harmony to be achieved with natural intelligence of organizational human resources. As this technology develops and matures, organizations will automate most of the rule based "do as directed" tasks. Personnel, who cannot think independently, solve unseen problems, make sense of data emanating from variety of sources and make context specific judgements will almost certainly become irrelevant. Organizations will employ fewer humans and shall have to hire those with new age skills.

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Emerging Narrative

Human resources have been seen as a strategic resource for firms (Wright & McMahan, 1992). According to the tenets of Resource Based View of firms, strategic resources were the source of sustainable competitive advantage for firms (Wright & Snell, 1991). This was because human resource could be valuable, rare, inimitable and non-substitutable (VRIN) (Barney & Wright, 1998). Any firm having a basket of resources (like technology) could provide a firm comparative advantage. However, a firm which employed superior human resources will be able to integrate diverse firm resources like technology, physical assets and others and steer all these sets of resources to attain and gain competitive advantage (Malik, 2018). Thus, it becomes imperative for a firm to develop a robust Strategic Human Resource Management (SHRM) system

(Wright & McMahan, 1992; Wright & Snell, 1991).

However, human resource managers in the present-day context confront a new reality. Machine based "Machine Learning" plus 'Artificial Intelligence' (ML + AI) as a combined technology has been in ascendence. This has been creating a new landscape wherein routine jobs are being performed by automated technologies that can also learn. Future has been becoming chaotic, novel and complex (Bhattacharyya, Rangarajan & Vyas, 2012). Take the case of a personal assistant. It was a mundane but an important job. Personal assistants would manage the meetings of the top-ranking executive at a large enterprise. Their task was to schedule meetings, make reservations, call cabs and help out the boss with anything she needed to get done. In the present-day context, the personal assistant cannot have that job because thanks to Alexa - Amazon's automated personal assistance (and its likes) available as cheap as about INR 3000 Echo dot 3rd generation (Amazon.co.in, 2020). The role of a personal assistant has become redundant at most new age workplaces. ML +AI based bots could perform this task better than the personal assistant. This has not been the only role that has come under threat because of AI and ML based automation. Call center jobs have been vanishing over the years. A large airline in South Asia (Air Asia) shut down all its call centers to go all in on a chatbot and an AI enabled voice assistant (Barbaschow, 2019). It has now been becoming evident that most of the 'do as directed' roles were being automated and might cease to exist in the near future. Even Microsoft in the summer of 2020 when the world was in the severe grip of COVID-19 pandemic replaced dozens of journalists with AI technologies (De Boss, 2020).

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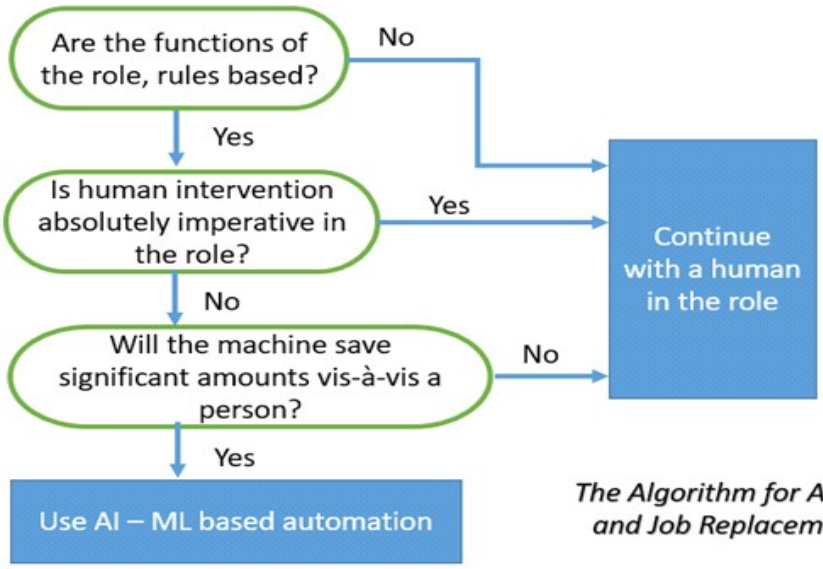
Why this has been happening was of common knowledge evident across thousands of years of civilization. Machines have been far better than human beings 'in do as directed tasks' where the course of action does not change because of the context. Human beings being human have their own frailties. A human being can fall sick, has to be paid minimum wage and is prone to errors. Contrast it with a machine that does the same task with more efficiency and zero errors and you have a sure shot winner. Even if the machine takes longer to complete the task, companies can have more machines and yet get the task done because machines cost a fraction of the cost of a human being (Bhattacharyya & Nair, 2019). 'Machine Learning' plus 'Artificial Intelligence' (ML + AI) technologies as a combined technology has been again a step in the same direction (Wang & Siau, 2019; Levy, 2018). Practicing human resource planning managers in most organizations across industries, must take cognizance of this and take steps in planning their HRM initiatives mindful of ML+AI technologies. One must remember that job creation and protection has been a sage goal of business firms

(Bhattacharyya, Chaturvedi, & Chaturvedi, 2009). In fig. 1, the authors proposed a decision framework for choosing which jobs to be replaced by AI+ML technologies in organizations and which would not be.

Figure 1: Decision framework for choosing which jobs to be replaced by AI+ML technologies in organizations



The Algorithm for AI-ML and Job Replacement

As seen in fig. 1, if the functions of the job role were rule based with low or no need for human intervention, such roles should be automated – especially when there would be significant savings vis-à-vis a person doing that role. For example, a managerial role that required collation of status and creating a status report. However, if a role required human touch, for example on boarding new associates – such roles might not be automated. Thus, what are going to be the roles of scope for human resources in the future is required to be answered. This has been deliberated upon in the next section.

The Role of Human Resources Going into Future

It would be important to comprehend the imperatives of the advent of AI+ML technologies for organizations. Does it mean that value of human resources will diminish in future and machine will rule the roost? This has been a question that most human resource (HR) managers confront today. HR managers rather has to explore avenues wherein human resources will become even more valuable because of their natural intelligence. Natural Intelligence entailed the ability to think independently, to learn from ex-

perience, to solve complicated problems, and to adapt to new situations (Gottfredson, 1997; Sternberg, 2003). Psychologists term this as generalized intelligence factor that related to abstract thinking and that included the abilities to acquire knowledge, to reason abstractly, to adapt to novel situations, and to benefit from instruction and experience (Gottfredson, 1997; Sternberg, 2003). A simple example of natural intelligence was making a choice of a creative image to go with an advertising campaign or interacting with a customer to understand the precise reason why she was unhappy with the service level, without asking too many irrelevant questions.

In future, organizations would have lesser number of human resources normalized to the revenue level.

Organizations need to leverage its natural intelligence with AI+ML technologies. This would be the imperative for the HRM going into future. When organizations have less spots or openings for human resources, the choice of personnel becomes even more important. In a football team of eleven members one wrong choice may not be as bad a wrong choice in a basketball team of just five members. The essence is rooted in the relative numbers of human resources in an organization. For sure in future, organizations would have lesser number of human resources normalized to the revenue level. As more and more organizations move towards efficiencies driven by AI and ML, organizations will need to be mindful of the effectiveness brought in by the 'Natural Intelligence' of the ever decreasing number of human resources present in organizations (Grossberg, 1988; Cross ,1999). A 'ML+ AI' algorithm might make it easier to find fault with a process, but companies would continue to need human resources for creating a compelling marketing messaging or empathizing with customers for developing new product features and services. Creativity continues to be still mostly human even in this day and age. Netflix through in applying 'ML + AI' technologies to design its programing content, but its human resources have complementary natural intelligence to go along with the 'ML + AI' technologies. Like in an interview, Netflix Chief Executive Officer, Reed Hastings mentioned about first principle thinking, he emphasized regarding managerial thinking with options open rather than just following a set path (Pontefract, 2019).

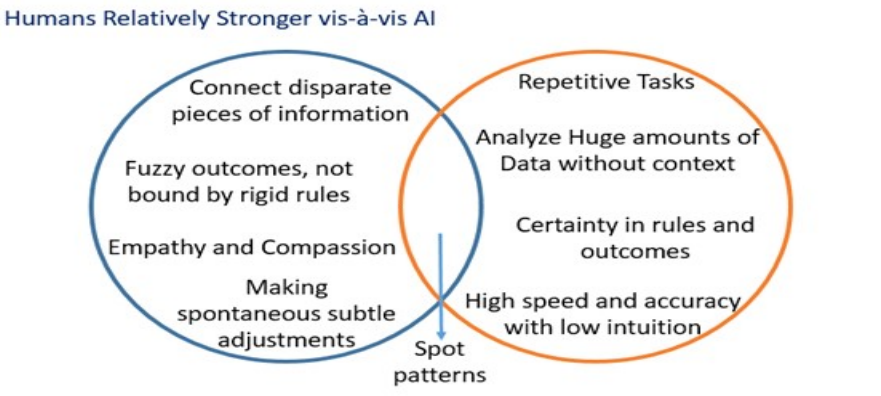
When it came to contexts where the outcomes are not rule bound and are dependent on multiple unknown variables, experienced humans do better.

'Artificial Intelligence' and 'Machine Learning' worked well in contexts where the rules and outcomes are certain. So, in organizations which dealt with patterns in large swathes of data, ML+AI technologies combo would do very well. However, when it came to contexts where the outcomes are not rule bound and are dependent on multiple unknown variables, experienced humans do better. In situa-

tions that required high tolerance for ambiguity ML+ AI technologies combo became a poor choice because there was no inherent extant rule for 'ML and AI' technologies to play with. Humans, in contrast, were conditioned to use their intuition in such cases. 'ML + AI' technologies combo could not integrate additional technical knowledge from peripheral domains while human beings could. Another facet where human beings would do better than machines was regarding the ability to connect disparate pieces of information in new ways and synthesizing information from many different sources. The new imperative was an expanded unit combo consisting of natural intelligence of human resources plus AI+ ML technologies in an organization.

Many have argued regarding this in an array of technologies. This has been advocated by Martin Ford in the book the '*Rise of the Robots'* (Ford, 2015) and Susskind & Susskind (2020) in their book *The future of the professions: How technology will transform the work of human experts.* Scholars have even written about specific professions. Graham Hawkins (2017) wrote in his book about 'The Future of the Sales Profession' for sales professionals specifically, while Rob Nixon (2015) wrote about accounting professionals in his book *Remaining Relevant* and Katvan, Silver, Ziv & Sherr (2018) in their book regarding the future of the legal profession *Too Many Lawyers?* The author of the book *Range: Why generalists triumph in a specialized world*, David Epstein (2019) wrote that humans do better than machines in 'wicked learning environments' where the outcomes were not bound by rigid rules. The challenge for managers would be finding personnel who would do well in such contexts. One can call these personnel – 'The new age

Figure 2: Human Individual Employee Strengths vs Organizational AI technology capabilities

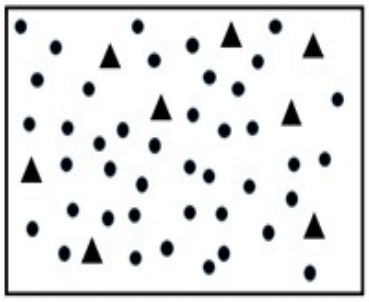


workforce unit' which organizational HRM planners required to accommodate in their organizations in future. As discussed, the new age workforce unit would be an expanded unit combo consisting of human resources plus AI+ ML technologies. The new age workforce needed to be versatile, with ability to learn significantly across multiple domains. This would be because, mundane repetitive tasks would be automated and only cross domain, complex problems would be left for humans. As against solving common problems effectively, the new age workforce would need to solve novel and complex problems. This has been presented in fig. 2.

The new age workforce unit would be an expanded unit combo consisting of human resources plus AI+ ML technologies.

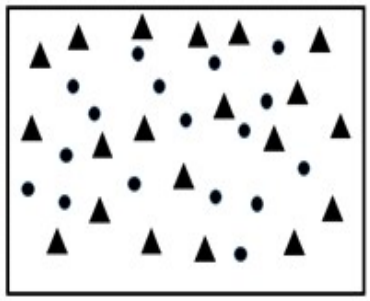
The ability of new age work force employees to learn new skills would differentiate the winners from the rest within an organization and between organizations. Human resources have been the most and still continue to be the most strategic resources in an organization and not technology as Bartlett & Ghoshal (2002) had written at the beginning of the information technology era a couple of decades earlier. Going into the future, empathy and emotional intelligence would gain importance as mundane customer service will be increasingly taken over by machines and humans would be required to intervene only in issues escalated beyond the machines. Haptic communication would become important (Miyashita et al., 2007; Chellali, Dumas & Milleville-Pennel, 2011). In fig. 3, the evolving composition of workforce in organizations has been depicted.

Fig. 3 Evolving Composition of workforce in Organizations:



Current Workforce

Circles – Humans, (many)
Triangles Machines/Algorithms (few)



New Age Workforce

Circles – Humans, (few)
Triangles Machines/Algorithms (many)

There would be only one or two human beings for a role ably assisted by AI+ML technologies.

As can be noticed in fig. 3, new age organizational workforce would continue to employ human beings, but the relative proportions of human beings would go down in organizations going into the future. This would also mean that the human beings would become more important than in the current scenario wherein there were multiple human beings employed for a specific role. In future, there would be only one or two human beings for a role ably assisted by AI+ML technologies.

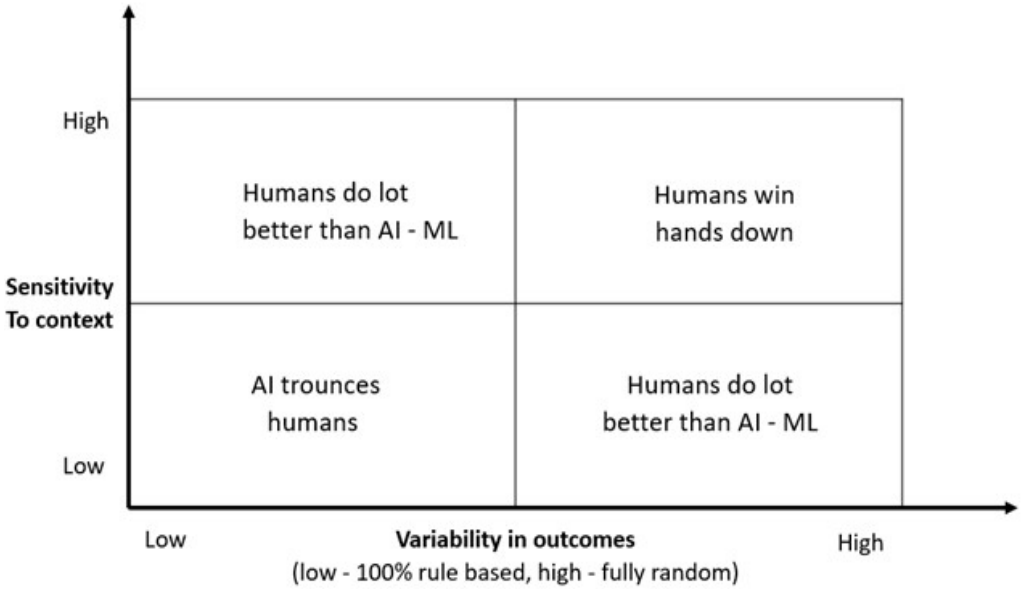
Agenda for the Future

HRM mangers' agenda for the future would be towards helping employees develop new age skills. While most HRM managers understood what new age, skills were and how these were important the real problems would be regarding how to assess personnel for new age skills and more importantly how to develop these new age skills. Developing new age skills would consume time and conscious efforts - just like it is challenging to train a left handed person to be right handed, it would be very difficult to train "do as directed" order takers into "context sensitive creative problem solvers". To add to the challenge most education systems are a legacy which dominantly focused on the ability to solve seen explicit problems. Typical curriculum exposed students to several types of problems with a specific methodology to solve the problems. During assessments few of these several problems appear in question papers and the candidates who knew which approach to apply to the problem did well. This would not work in future because AI+ML technologies would do a much better job of finding a documented solution for an existing explicit problem in a given context. Human beings were required when there was a change of context or when the 'do as directed' or 'algorithmic method' did not work. Such problems would be novel and complex (Hagendorff & Wezel, 2019). More importantly creating tacit knowledge would be the role of human resources employed in organizations of future. Firm HRM managers needed to device training and leadership development programs to ensure that their workforce develops these hard to acquire skills.

Developing new age skills in organizations would be challenging. To develop these abilities from scratch needs serious commitment both from organizational HR managers as well as from the candidates. It would entail developing an entirely new set of problem-solving organizational ethos and culture. In the absence of assessments and testing capabilities it would become challenging to figure out which employee is doing better and which employee needs improvement. HR managers need to address this issue towards building a sustainable new age workforce. Specialized learning and development capabilities are required for achieving this and unfortunately there are not many options. HR managers are

required to consciously develop natural intelligence-based learning programs and assessments focused on learnability and application of natural intelligence-based knowledge. While a large number of organizations were focused on developing AI+ML technology capabilities to drive efficiencies, what firm HR managers must not miss is the point of leveraging natural intelligence of its human resources to effectively compliment these AI+ML technologies led efficiencies. The winners of the next wave of technological advancement would not be the companies that best leverage its ML + AI technologies, instead the winners will be those organizations which leveraged its human resources natural intelligence to its best capability to complement the ML + AI technologies . In fig. 4, a matrix has been presented which presents this aspect.

Fig. 4 2x2 Matrix Context Versus Variability in Outcomes



As depicted in fig. 4, in 'contexts with high sensitivity' it would necessitate very context specific interpretations. It would involve managerial discretions, subjective interpretation, and decision-making. However, in a 'low sensitivity context', the outcomes and variables would be generic. Thus, managerial decision making would be convergent unlike in a high sensitivity context in which it could be divergent. To summarize the authors have presented just five points what organizational HR managers must do and must not do so that the organizational human resources with natural intelligence could co-create value for their organizations with ML+AI based technologies in a combined harmonious manner. This has been tabulated in Table 1.

Table 1 Dos and Don'ts for Organizations for HR Proofing Against AI+ ML Technologies

S.No	What to do?	What not to do?
1	Focus on ML+AI proof workforce – train current associates to do well at capabilities humans are better at than AI	Do not hire anyone who cannot solve unseen problems and only excels at doing as directed \jobs.
2	Incentivize adaptability and learnability – promote versatile talent that can adjust to rapidly changing environment as against those with only unidimensional set of capabilities	Do not over promote super specialization especially when the firm is competing in a highly dynamic marketplace.
3	Focus on improving creativity and adaptability in the workforce. The workforce of today is very likely to get obsolete sooner rather than later.	Do not underestimate the importance of human touch, empathy, and compassion. While ML+AI is great at many things this one is the biggest lacuna in MI+AI technologies in the present-day context.
4	Invest in creating a future ready, AI+ML proof workforce that can use the power of AI+ML to ensure firm profitability. A future ready workforce does not mean someone who can implement AI+ML algorithms. It means personnel who can think independently, solve unseen problems, analyze data from multiple perspectives and synthesize information.	Do not over emphasize on technological prowess. While this may sound counter intuitive, AI+ML experts are most likely to suffer from the curse of 'unidimensionality'. Implementing AI+ML algorithms would be important but more important would be to be able to find out the best use cases to implement AI+ML.
5	Change hiring strategies and processes to hire ML + AI technologies proof talent that qualifies as a "Future Ready" workforce.	Do not get swayed by all the noise and hype around AI+ML. Evaluate your specific business context before jumping on to the AI+ML technologies bandwagon.

Thus, to summarize, AI+ML based technologies have been becoming the mainstream. Such technologies are going to automate more and more tasks. Thus, the composition of workforce in organizations will have to change. As could be noted from fig. 1, organizations would increasingly automate mundane 'do as directed' tasks that do not require independent thinking. As depicted in fig. 2, there are a specific set of skills where AI+ML based technologies are significantly better than human efforts. Organizations in future would gradually automate all such job functions where AI+ML based technologies are stronger than human resources in action. This would result in change in the proportion of human resources required in a firm in future as compared to the present-day numbers. As can be noted from fig. 3, number of human contributors in a firm would gradually reduce to make way for automated technologies-based processes and functions. For human beings to be relevant in the workforce, they ought to develop what 'new age skills' as can be noted from fig. 4. In situations where sensitivity to context would be of great importance coupled with uncertainty in outcomes - that cannot be easily modelled in a rule-based scenario, human intuitive

feelings coupled with natural intelligence will continue to be important and prevail in future. The authors proposed a set of dos and don'ts for organizational HR managers in table 1. TO conclude the advent of AI+ML based technologies will be altering the global business context faster than a lot of us could realize it presently. Lot fewer human resources would be required in organizations in future. The employees who would be a part of this narrative need to possess natural intelligence to complement the organizational AI+ ML technology capabilities. Thus, there would be a strong case for AI+ ML proofing of organizational workforce to keep human resources relevant in the AI+ML driven technology era. This treatise is just the first step in this evolving script.

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