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May the Bots Be With You! Opportunities and Challenges of Artificial Intelligence for Rethinking Human Resource Management Practices

The overarching aim of this developmental paper is to discuss the opportunities and challenges for HR leaders and executives in the adoption and implementation of artificial intelligence (AI) applications for human resource management (HRM). A related aim of this paper is to develop a guiding theoretical framework, employing the theoretical lenses of job replacement and transformational learning theories to identify the opportunities that lie in harvesting some of the 'low hanging fruits' as well as understanding the challenges associated with adopting a 'moon shot' approach[i] for implementing AI in the field of HRM. We flags risks that need to be carefully managed in order to realise the value AI can offer for business in general and for HRM in particular. Our theoretical framework for understanding the relationship between levels of learning and job replacement through AI using industry examples and practice leaders' cutting-edge ideas for developing AI focused applications for HRM. By providing a clear line of path for leaders and managers we identify areas where they need to focus their energies and investments for HRM-focused AI applications. We also note how this new knowledge and advice sets the tone for prudent knowledge application by HR leaders and mangers as they navigate through the maze of opportunities and challenges that AI presents for HRM.

Artificial Intelligence: A Dialectic Phenomenon

Recent years have witnessed considerable debate on the topic of AI and its impact on potential job losses as well as value creation. The discourse focusing on contemporary developments in the field of AI and its impact on managing people and work is dialectic in nature. At the sharp end of the debate, there are doomsday prophesies highlighting the adverse impacts AI and its applications will have on people, work and employment; whereas at the other end, there is considerable optimism about the opportunities and value AI can create for business, society and people in organisations. The increased proliferation of AI has been due to the declining costs of IT hardware, processing speed and storage capacity as well as emergence of a number of open-source licenses for AI tools and methods[ii]. AI can be seen as a phenomenon for solving, on a continuum of simple to complex, business problems, with little or no human interactions[iii]. Artificial intelligence and humans' interface are similar to ideas discussed about complex adaptive processes[iv]. One way to understand AI and its applications is to think of AI as system of computer-aided solutions for performing tasks using text, data, numbers, images or sound as inputs for such tasks and complex mathematical algorithms as processes for delivering task outputs in the form of solutions such as decisions or problems solved[v]. Central to these concepts is learning by (human) agents to facilitate adaptation[vi]. Whether the learning is by agents or machines, learning is a concept central to AI and its applications.

This paper is timely as there exists a very limited understanding of how AI impacts the world of work or the management of human resources. Managers and leaders are often left to rely on technological trends and developments in AI in a rather ad-hoc manner. There is no theoretical basis within HRM literature for understanding how, and to what extent, will AI impact on business and employment. At best, we have opinion polls capturing the actual or potential adoption of AI as well as perceptions of its impact on people and HRM. To address this theoretical and managerial problem, we offer a framework for understanding the impact of AI on job replacement and how it impacts the world of work in general, and HRM practices, in particular. Through our review of studies focusing on AI-based applications for HRM and interactions with senior HR and technology leaders in the industry, the paper provides recommendations for three key questions that HR managers need answers for: 1) How can managers unlock the business value potential in HRM function's employment life

cycle using AI? 2) What safeguards should managers have in place to deal with ethical HRM issues in AI implementation? And, 3) from an employee's perspective, what should they do to deal with AI-induced change? We traverse through each aspect of the employment life cycle spanning from recruitment and selection, through training and development to performance management and rewards, highlighting for each sub-functional area of HRM, providing examples from both the literature and practice of what is *doable* and where the *limits* of AI lie.

AI and Job Replacement Theory

Huang and Rust developed the theory of AI job replacement focusing on the value creation potential and adverse outcomes that AI presents for different types of jobs.[vii] The focus of AI, in the context of changing nature of work has been mostly on a 'task' level, especially in relation to service sector jobs. These authors propose a 'four intelligences' theoretical framework comprising of: mechanical, analytical, intuitive and empathetic intelligences, which have correspondence to levels of tasks complexity. The progression of job replacement is expected to be first for mechanical tasks, such as simple and repetitive tasks (e.g. scanning of food items at a checkout), followed by analytical (e.g. data scientists solving a complex problem involving single or multiple datasets and information using set rules and logical thinking), intuitive (e.g. lawyers and medical professionals undertaking complex, chaotic, and context-specific tasks) and empathetic tasks (e.g. negotiators, psychiatrists performing tasks that have high levels of emotions and empathy). The key implication of this theory is that job replacement will first occur at a task level rather than at a job level, wherein the lower and less complex tasks of a job will most likely be replaced by AI. The greater the ease of knowledge transfer and codification at a 'task level', the easier it will be for AI to propose AI-based solutions for such jobs. The overarching logic of this theory is that initially AI will take over the less complex tasks followed by greater replacement of entire tasks of a job. As and when AI is fully ready, the entire job will be replaced. Eventually, AI will have the capability to perform not just mechanical and routine tasks of a job, but also in its entirety, even jobs that have high intuitive and empathetic content.

AI and Transformational Adult Learning Theory

Applying Mezirow's theory of transformational adult learning[viii] as a general framework for understanding various levels of learning to AI's theory of job replacement, which focuses on three domains of learning that workers must become competent in for fulfilling their tasks at different stages of their careers. We argue that progressive mastery over these three domains of learning: *instrumental; communicative*; and *emancipatory* should be the focus of AI for developing AI-based applications for HRM. Our framework combines Mezirow's adult learning theory with Huang and Rust's AI job replacement theory to demonstrate the conceptual overlap between the two theories and how opportunities for value creation through AI can be harnessed.

In line with Mezirow's work, we note that *instrumental learning* corresponds to Huang and Rust's *mechanical intelligence* in the AI theory of job replacement. Mechanical intelligence is similar to programmed knowledge, wherein individuals have the ability to control and influence the factors that affect their outputs. Such learning is largely programmatic and procedural in nature. It focuses on replicability (e.g. an assembly line task), transference (e.g. ability to emulate actions through observance and structured steps) and transportability (such as codifying these forms of learning in manuals or digital forms) as the natural home for most AI-based applications (e.g. simple automations such as notifications and interactive Chatbots autonomously completing tasks[ix].

In the *communicative domain* of learning, which corresponds to *analytical and intuitive intelligence* in the AI theory of job replacement, this is concerned with developing an understanding of relationship between tasks and humans communicating with each other.

Performing simple and complex diagnostic analysis[x], AI applications such as marketing and data analytics, smart machines leveraging customer interactions and machines replacing knowledge workers[xi] are some examples for this level of task complexity and learning domain.[xii] The complex forms of communicative domain focusses on relationships such as a focus on values and beliefs of people towards each other matters. Skills such as communicating, listening, inter- and intrapersonal skills are the focus here for AI applications including robots performing key managerial tasks for complex data interpretation such as in medicinal applications[xiii] . Finally, for emancipatory learning domain, focuses on two levels of complexity[xiv] - critical thinking and meta-abilities. This type of learning requires individuals to question the very premise and assumptions with which they are most familiar with. Applications in this learning domain for AI are still in infancy. We argue that aspects of meta-abilities are still not fully developed for AI applications, but there are AI applications for this level such as humanoid robots and advanced chatbots like *Sophia and Replika.* These applications, respectively are interacting with customers as if they were co-workers providing light psychological comfort[xv].

Summary

The above theoretical underpinnings offers a comprehensive coverage of a vast range of tasks that humans perform at the workplace and the extent to which leaders and managers can plan for realizing 'low hanging' fruit from AI applications and gradually progress towards developing more complex applications and avoid a much riskier 'moon shot' approach.

In answering the above questions, the paper offers a strategic roadmap with examples from our review and insights from a global IT major – Accenture of how managers can unlock value for the HRM function using AI. The paper also offers a discussion of ethical challenges and safeguards leaders and managers to avoid pitfalls and implications for employees about where and how should they undertake self-development and reimagine their careers in the brave new world of AI.

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See Attachment of a Power Point File containing for Figures 1 and 2 and Table 1