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Optimizing the Human Resource Management Process with Artificial Intelligence Algorithmic Approach

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Abstract

The human resource management works closely with all the employees in the organization. An HRM must allow the employees to make constructive criticism when there is a need for it. The duty of organizing the company towards achieving their set goals lies in the hands of the HRM. A Human Resource management process can best be distinct as a tool which is utilized to collect, organize, present, keep and share applied information about the human resource of an organization. To this end, this research present a Throughput model framework that describes individuals' decision-making processes in an algorithmic HRM context. The model depicts how perceptions, judgments, and the use of information affect strategy selection, identifying how diverse strategies may be supported by the employment of certain decision-making algorithmic pathways. In focusing on concerns relating to the impact and acceptance of artificial intelligence (AI) integration in HRM, this research draws insights from multidisciplinary theoretical lenses, such as Al-augmented and HRM assimilation processes, AI-mediated social exchange, and the judgment and choice literature. Results highlight the use of algorithmic ethical positions in the adoption of AI for better HRM outcomes in terms of intelligibility and accountability of AI-generated HRM decision-making, which is often underexplored in existing research.

Keywords: *Human Resource Management Process, Throughput model, Perception, Judgment, Artificial intelligence*

Introduction

Every organization or company will always try to improve performance in the hope that what the company's goals will be achieved. According to Mangkunegara (2013: 67) performance is the result of quality and quantity of work achieved by an employee in carrying out their duties in accordance with the responsibilities given to him. Human resources are a very dominant factor in influencing employee performance. To achieve effectiveness, organizations should manage their human resources with long-term functions and using strategic human resource management in order for these human resources to perform the required behavior and competencies in accordance with the internal and external environment of the organization (Jaafari et al., 2021). Human Resource Management (HRM) modernization has experienced a grand evolution, as digitization infiltrates the tedious processes which exist within its respective operations. From earlier inventions like the computer and the internet, HRM has found a way to navigate these advancements to electronically increase productivity, cost effectiveness, and market competition (Hmoud and Várallyai, 2020). Like a trebuchet, advanced technology launched the rapid evolution of Human Resource Information Systems (HRIS) as newer capabilities like Artificial Intelligence began to infiltrate tactical practices within HR operations, other- wise known as tactical HRIS (T-HRIS). The amount of organizational, personnel, and task-orientated data HR is inherently responsible has led to the incorporation of AI in many tactical HR processes, as it enhances sustainable business models (Di Vaio et al., 2020). However, this evolution and growth in capabilities comes

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with a responsibility of under- standing the current state of AI within tactical HR processes, requiring both HR professionals and academics to dive into existing literature which highlights AI-enhanced HR capabilities and areas of growth within the HR discipline.

It is quite rare that human kind works and lives in seclusion. It is like humans to work together for a living and manage the available resources. This particular nature develops relationships between humans that partially depend upon the individual's capabilities to work and manage, which also prove fruitful for living. As Anbuoli (2016) also asserts in his work that humans always manage, develop and plan their relations and assists either consciously or unconsciously. This practice of planning, organizing and managing the system has gradually evolved. Throughout the beginning of the world, people make efforts to understand others through experiences and knowledge with a desire to behave accordingly in particular circumstances. Today the same practice is followed to manage and control the assets at the workplace. The idea of Human resources management is all about the planning, organizing, training and managing the assets of any organization. In human resources management, the key assets are human itself. In contemporary times, the field of Human Resources Management is the most fundamental tool in running any organization. It is a widely believed idea that human beings have a complex nature; hence managing them is also a complex process. Due to this complexity of human nature, and desire to manage them for economic purposes, the field of Human Resource Management (HRM) emerged as a vital source and practice. Human Resource Management has attained great impetus and popularity since the 1980s (Robert et al, 2020). Since then, the discipline has gained great significance in organizational as well as academic circles due to its interdisciplinary approach.

Artificial intelligence (AI) has the ability to make decisions in real time based on pre-installed algorithms and computing technologies constructed based on data analysis to learn and acclimate automatically to offer more refined responses to situations. Encompassing both the human element and the adoption of AI applications, human resource management (HRM) can offer an improved experience for an organization's employees (Pereira, Hadjielias, Christofi, & Vrontis, 2021). As AI technology has advanced, concerns with human control of the inherently opaque nature of AI systems have driven increasing interest regarding the ethics–AI interface. A limited understanding of the theoretical basis for AI assimilation in HRM decision-making functions has not impeded the replacement of HRM decision-making by AI systems (Prikshat, Malik, & Budhwar, 2021); however, the increased adoption of AI and advances in AI abilities have increased the focus on the ethical values and principals guiding AI development and use (Hermann, 2021). Past moral behaviors, new sets of agreed rules, or a mix of both, are framed by Loureiro, Guerreiro, and Tussyadiah (2021) under the trend of AI integration, law, and ethics. We propose that the interface of positions on AI and ethics with HRM is practically assimilated within organizational decision analyses of past and proposed systems. Decisions traditionally undertaken by HRM are increasingly being made by algorithms (Duggan et al, 2020). HRM has been encouraged to adopt data-driven predictive analytics to determine employee intentions and turnover (Haldorai, et al, 2019). To evaluate this potential, an understanding of an organization's ethical position and strategy—within a framework that allows for post-decision outcome analysis—is warranted. To contain ethical and societal risks associated with the adoption of AI for HRM, the values and practical insights of human resource (HR) decision makers need to be considered. With the changing nature of AI technologies, definitions of AI may not be static (Hermann, 2021). To "differentiate the use of AI in HRM from similar technology-enabled HRM terms," Prikshat et al. (2021, p. 2) introduced the concept of HRM and further proposed HRM practitioners consider all four stages of the assimilation processes of initiation,

adoption, reutilization, and extension, incorporating antecedents(technology, organization, people) and consequences (operational, relational, transformational) within a HRM Assimilation framework (Prikshat et al., 2021). While organizations have prioritized AI service quality, AI satisfaction, and AI job satisfaction in AI investments, there appears to be a lack of studies on ethics in AI-driven HRM system algorithms. Concerns regarding AI developers neglecting ethics in favor of technical and commercial priorities and the impact of this on HRM practitioners who are considering using or are using AI-driven HRM technology suggest a need for a practical framework for HRM practitioners to evaluate the incorporation of ethics into their algorithm-based decisions.

The focus of AI technology is precipitously changing from decision-making to strategies. As the increased use of AI technology is adopted within traditional professional roles, and not just in manufacturing and distribution, the trend of disintermediation (e.g., intermediary roles such as travel agents being replaced by websites) will continue to affect intermediary service providers. This may lead to AI technology challenging HRM when strategizing longer term employee development. HRM is faced with addressing trends toward more systemization, the widespread distribution of professional expertise, and cost–benefit challenges in the adoption of technology data management. As we observe a major increase in the management of transactions occurring over the Internet, the emergence and widespread adoption of the "gig economy" provides new challenges to HRM practitioners, since employment status ambiguity and legal challenges result in a reassessment of HRM practices in the management relationships between gig workers and organizations (Duggan et al., 2020). Duggan et al. (2020) highlight algorithm management facilitating work relationships via incentives, HRM access to online platforms, dispute mediation, and app-focused performance, challenging our understanding of HRM concepts and practices. Given that the impact of workplace connectivity is driven by physical and behavioral environmental components, the introduction of AI applications in HRM in isolation from the impact of the connectivity of workers to an organization raises questions of the role and accountability of HRM practitioners.

Furthermore, algorithms tend to drive the communication process between two entities, which is a subset within the AI system. Engineers, computer scientists, and programmers use algorithms when designing a learning machine, with the algorithm constituting the mechanism for the machine to process the data. Machine learning focuses on teaching machines to adapt to changes within the technology or to adapt additional information to a current problem and make rational decisions (Rodgers et al, 2017). Hence, in focusing on the under-investigated area of AI algorithms applied to HR decision choices (Prikshat et al., 2021), our study emphasizes algorithmic ethical positions incorporated into important HRM decision-making processes. Employees' perceptions of AI tools having high levels of accuracy and current information suggest the need to more fully explore the ethical implications of these perceptions in order for HRM practitioners to use these tools effectively. The opaque nature of algorithmic processing may obfuscate biased inputs and outputs. Predictions, classifications, and recommendations require explainable and interpretable AI. A lack of intelligibility may impede decisions as to how and where to delegate decisions to AI systems (Hermann, 2021). We propose a more systematic manner of depicting algorithms by providing a precise understanding of the kinds of ethical behaviors we want to introduce into the AI system. Further, operational guidelines are considered for AI algorithmic processes, as well as an understanding of how to employ ethical theories in decision-making

algorithms. The six dominant ethical theories that are implanted into algorithmic modeling are ethical egoism-preference based, deontology-rule based, utilitarianism (principle-based), relativism, virtue ethics, and the ethics of care (stakeholder's perspective) (Rodgers & Al Fayi, 2019). Therefore, the problem statement relates to a throughput (TP) modeling process that provides six dominant ethical algorithms addressing HRM issues, considering whether a better understanding of ethical algorithms would assist organizations in problem-Solving. As organizations increasingly depend on algorithm-based HRM decision-making to observe their employees, this movement is buttressed by the technology industry, maintaining that its decision-making apparatuses are efficient and objective, thereby down playing their potential biases.

In this context, the objective of this study pertains to the need for an HRM accountability framework for the implementation and use of AI in the workplace. Since algorithmic design can induce bias in the decision-making process, this research infuses a decision-making platform into the process that can guide HR. AI algorithms can incorporate considerations decision making processes, and managers' knowledge to determine the most appropriate HRM strategy in each situation. To assist HRM in taking full advantage of the power and potential that AI offers, this paper focuses on designing and developing HRM systems to eliminate AI design bias. Moreover, research aspire to enhance past literature by incorporating an AI algorithmic decision-making model into HRM concepts and practices. This AI approach can provide valuable insights into how different pathways may influence the strategies employed by HRM decision makers. Finally, the proposed model offers a framework for practitioners to frame and assess decisions, providing an audit trail and structure to frame the root-cause analysis (RCA) of post-decision outcomes, such as pay-gap analysis, the effectiveness of diversity and inclusion policies, and performance measurement and reward systems.

Literature Review

The changing organizational environment in the marketplace pushed managers to improve efficiency in the production and service delivery processes by increasing their ability to use the best practices of people management at the time. That is, employee management techniques or methods that would improve production, reduce service delivery costs, and at the same time ensure sustained availability of competent staff in the organization. Supporting human resources as the most important resource influencing unplanned change, can lead the organization to achieve a competitive advantage. Therefore, the most important advantage of most successful organizations is the presence of qualified people with appropriate competencies in key jobs that it is difficult for them to find manpower (Hatami Ghoushch et al. 2021). Any human resources manager is known to be in charge for determining the work-related needs of the staff, using temporary staff or hiring employees in order to fill such needs, recruiting and training the best employees, supervise their work, managing employees' relations, payrolls, benefits and compensations, preparing employees' personal policies and records, ensuring high performance, ensuring equal opportunities for all the employees, dealing with discrimination and other performance issues. Ensuring that human resources practices conform to the regulations and pushing the employees' motivation so they achieve more within their organization, human resources managers might find the concept draw pro software a useful tool for making the needed human resources related drawings(Chen, 2022).

Human Resource Management Process

In the recent years, the world has witnessed an upsurge in the globalization where the economies of many countries are interlinking

to promote foreign trade through technological advances and connectivity. This upsurge has also fuelled the increased rivalry in the national and foreign markets that has further encouraged the organizations in hiring and retaining highly talented workers. Several companies are dependent on their employees to gain advantage in the competitive market. Therefore, they are strongly related to the efficiency of their human resources and their human resources management (Collins et al, 2021). Human resource management (HRM) includes process like HR preparation, human resources management, strategic recruiting, employee training, growth compensation management, efficiency, worker relations, health care, employee satisfaction as well as provision of employee services. It includes policies and practices set to improve organizational efficiency, engagement of employees and work quality.

Artificial Intelligence Algorithmic Approach

Artificial Intelligence is a technology that attempts to simulate human reasoning in computers and other types of machines (Rodgers & Al Fayi, 2019). Algorithms used in AI are unambiguous specifications for performing calculations, data processing, automated reasoning, and other tasks. This conceptual study employs AI algorithmic pathways derived from TP model theory, which highlights six dominant algorithmic pathways by employing the four major concepts of (1) perception (i.e., framing of the problem), (2) information, (3) judgment (analysis of perception and information), and (4) decision choice(Rodgers et al, 2023).

The intent of an organization is influenced by the "environment" within the organization (natural, social, and economic), and the adoption of AI technology incorporating an organization's "environmental variables" within HRM algorithms allows the opportunity for post-decision evaluation via RCA. Nonetheless, Selbst et al. (2019) claimed that the elements of solutionism, the ripple effect, formalism, portability, and framing should be addressed when considering designing an AI-based machine-learning solution.

1. Solutionism is the failure to recognize the possibility that the best solution to a problem may not involve technology.
2. The ripple effect represents the failure to understand how technology incorporation into a prevailing social system changes the behaviors and embedded values of the former system.
3. Formalism indicates the breakdown to account for the overall connotation of social concepts, such as fairness, which can be procedural, contextual, and contestable, and cannot be reconciled through mathematical formalisms.
4. Portability implies the failure to comprehend how algorithmic solutions conceived for one social context may be misleading, erroneous, or otherwise cause impairment when harnessed to a dissimilar context.
5. Framing relates to the failure to model the complete system, whereby a social criterion, such as fairness, will be enforced (Tambe et al., 2019).

Moreover, ignorance of these issues may cause technical involvements to become ineffective, inaccurate, and perilously imprudent when they enter the societal context that surrounds decision-making systems. In this context, the current research focuses on three pillars. First, by identifying six distinct ethical approaches (solutionism) to HRM, the issue of framing in the AI algorithmic model that deduces formalism is addressed. Second, as social and technical approaches can be challenged to address ethical issues in HRM more critically, the issue of portability will be examined. Third, a stalwart and predictable forward-looking research agenda for the ethical analysis of HRM is offered (ripple effect) in view of the incorporation of AI technology (Leicht-Deobald et al., 2019).

The TP model is engaged in this study because it embraces several vital issues in organizational behavior, accounting and management, education, ethics/corporate social responsibility, consumer behavior, and

ethical dilemmas in auditing (Rodgers et al, 2023). Moreover, the TP model provides a broad conceptual framework for examining the interrelated processes influencing the decision choices that affect organizations. This model's unique contribution is that it illuminates essential pathways in HR decision-making. Finally, the model integrates the concepts of perception (framing situational conditions), information, judgment (analysis of information/situational conditions), and decision choice as it applies to organizations.

As Westerman, Edwards, Edwards, Luo, and Spence (2020) emphasize, with the rapid increase in the use of AI systems, interdisciplinary insights are required to understand interactions among people. In this context, the major contribution of our theoretical work is to enhance AI systems by highlighting ethical algorithms that can equip system designers, computer analysts, and HR practitioners with improved systems and accountability for their decisions. AI can be described as the theory and development of computer systems that can undertake assignments typically driven by algorithms (Rodgers et al, 2023). These algorithms are often supported by machine learning to add significant power to HRM concepts and practices. Since algorithmic bias can induce bias in the decision-making process, our research infuses an ethical decision-making platform into the process that can guide HR. AI algorithms can encompass ethics, decision-making, and managerial knowledge to identify appropriate HRM strategies.

To address an evident gap in the literature, this study explores the impact of dimensions of HRM strategies Employing TP model, which highlights dominant algorithmic pathways for decision-making processes, This AI approach can provide valuable insights into how different pathways may influence the strategies employed by HR decision makers.

Table 1.
Research Background

Author	Title	Findings
Haitao Chen, Xiaoning Cuib, 2022	Design and Implementation of Human Resource Management System Based on B/S Mode	The results show that the system meets the needs of enterprises, the system interface is beautiful and easy to use, the operation is fast and convenient, and the functions are complete and powerful, which is very conducive to improving the human resource management level of enterprises, and the economic benefit is relatively high. Hope to help small and medium-sized enterprises solve some problems in human resource management
Alexis Megan Votto∗, Rohit Valecha, Peyman Najafirad, H. Raghav Rao., 2021	Artificial Intelligence in Tactical Human Resource Management: A Systematic Literature Review	By utilizing a systematic literature review methodology, this paper identifies which tactical HRIS (T-HRIS) components are featured in literature and how each T-HRIS component is represented. This paper gives insight to which component of tactical HRM/HRIS receives attention and identifies gaps in research to give direction to future research agendas.
Duggan et al., 2020	Algorithmic management and app- work in the gig economy: A research agenda for employment relations and HRM	Algorithms are undertaking roles that were traditionally the role of HRM professionals raising questions about the HRM function, responsibility, ethical, appropriateness, and accountability of algorithmic processes.
Bekken, 2019	The Algorithmic governance of data driven-processing employment: Evidence-based management practices, artificial intelligence	Convergence of computer- based data science with the investigation of human behavior has defined the sphere of people-analytics. HRM departments are

Author	Title	Findings
	recruiting software, and automated hiring decisions.	Instrumental in detecting relevant external data, transferring significant external input into the organization.
Tambe, Cappelli, & Yakubovich, 2019	Artificial intelligence in human resources management: Challenges and a path forward	Covers the complexity of HR phenomena, constraints imposed by small data sets, accountability questions associated with fairness/ ethical/legal constraints, and employee reactions to HRM decisions. How data analytics managers decide which HR questions to investigate articulates the need for causation in AI use, and the ethical use of data
Leicht-Deobald et al., 2019	The challenges of algorithm-based HR decision-making for personal integrity	Algorithm-based HR decision making can ethically problematic, may harm employees' personal integrity, and marginalize human sense making decision-making processes. Emphasizes the importance of data literacy and ethical awareness and recommends participatory design methods and regulatory regimes.

According to their review of the state-of-the-art literature on the role of AI in business, Loureiro et al. (2021) observe that employment and decision-making constitute major areas in which Al's impact is prevalent. The adoption of AI is changing the strategic direction of the recruitment industry, impacting cost control and the volume of candidates for clients, and automating repetitive administrative tasks. Scalability of HRM processes can be achieved using AI technology to increase the number of recruitment candidates, not only dramatically reducing the timescale and cost of recruitment but also increasing the socioeconomic diversity of new hires.

Moreover, AI can play a role in HRM strategy and the analysis of organizational policies, such as by supporting organizational compliance. With the appropriate algorithms, AI-enabled systems can support management to recruit potential employees, to give prompt responses to candidates' queries and doubts, and to manage the submission and processing of applications. Furthermore, with the development of AI-enabled applications, HR-related cost savings and individualized employee experiences can be achieved, also promoting personalized talent management practices, which can increase job satisfaction and reduce turnover intentions (Malik, De Silva, Budhwar, & Srikanth, 2021).

The interdisciplinary literature highlighted in Table 1 illustrates an emerging pattern of concern with regard to the incorporation of AI into the workplace, which replicates human thought processes in a more efficient manner. Three themes emerge from the literature: employee detachment from decision-making, human understanding and perception of AI processes, and the impact of AI interpretation of datasets.

Research Methodology

This section provides a description of the systematic literature review (SLR) process utilized within this study. Using the SLR method ology related literature were selected to analyze; seek to answer specific research questions; seek to extract relevant pieces of academic literature relating systematically to AI and HRMs. Following Collins et al. (2020) and Okoli (2015), current research conduct this review in 2 phases: The first phase of this process filters literature, while the second phase extensively focuses on the content of each research. The goal of this SLR is to understand the representation of HRMS in published literature.

Throughput Model Theory (TPM)

The question of the accountability of organizations for errors in the algorithms they

use is a real issue, resulting in ethical, legal, and philosophical challenges that need to be addressed. Rodgers (2023) developed a decision-making model that acknowledges that decision makers do not always act rationally. The model highlights discrepancies between how decision makers behave when compared with the intent and ethical position of their organization, and it portrays the importance of developing accurate descriptions of the algorithmic pathways used by decision makers. It thus identifies systematic pathways in which decision makers may depart from rationality, simultaneously allowing for an analysis of what can be expected if they follow a particular pathway. The TP model is a cognitive model explaining the role played by perception, information, and judgment in human decision-making incorporated in machine learning (Rodgers, 2023). Further, the model provides a broad conceptual framework for examining interrelated and parallel processes that impact decisions affecting individuals and organizations. Parallel processing depicts a knowledge representation displaying that perception and information can separately influence judgment, as well as perception and judgment independently influencing decision choice. Moreover, this model depicts a multi-stage, information-processing function in which cognitive, economic, and social processes are used to generate a set of outcomes via algorithmic pathways. Finally, the concept of a decision choice is a composite of mental or neural pathway activities that recognize and structure decision situations and then evaluate preferences to produce judgments and choices. The TP model offers insights from cognitive and social psychology into a descriptive model of how human constituents make decisions within organizations. It encompasses four components: perception (P), information (I), judgment (J), and decision choice (D). In the first stage, both perception and information influence judgment; then, in the second stage, perception and judgment influence decision choice (Rodgers, 2023).

The integration of AI into HRM can be depicted in four categories: (1) It is a system that thinks like a human, (2) It thinks rationally, (3) It acts like a human, and (4) It acts rationally. For example, the Turing test, formerly termed the imitation game by Alan Turing in 1950, is a test of an AI machine's capability to exhibit intelligent behavior comparable to or indistinguishable from that of a person. If the evaluator cannot certifiably indicate that the machine is different from the human, the machine is said to have passed the test. The incorporation of computer-mediated communication in lieu of human interaction in an organization's HRM practices may strategically be used to achieve an organization's objectives (Westerman et al., 2020). Smart chatbots, which are AI-based technologies that can support HRM decision-making (Rodgers, 2023), can assist the HRM team in relaying consistent organization• related information to employees, while simultaneously offering them a global view of the organization. This study proposes the adoption of an algorithmic pathway model to help determine the appropriate use and accountability of such technology.

Westerman et al. (2020) refer to human–machine communication (HMC) regarding the balance of privacy and disclosure, whereby people "balance their privacy concerns with the need to self-disclose in interpersonal relationships." As HMC is utilized, HRM practitioners will need to have a full understanding of any benefits of HMC over human–human contact. An example of HMC analysis is where data is obtained after human contact (e.g., post-phone call performance feedback via text), and although this is influenced by ethical positioning, feedback may be adjusted by perceptions of AI anonymity. Moreover, AI technology can benefit HRM in the following transaction areas:

1. Time pressure decisions: The cost of unhurried decisions is high (speed being essential).
2. Accuracy: The cost of wrong decision choices is minimized.

3. Allocation of resources: The data size is too large for manual analysis or traditional algorithms.
4. Decisions where prediction accuracy is more important than explanation or clarification.
5. Provision of information where regulatory requirements are slight (Rodgers, 2020).

The TP model, which is presented in Fig. 1, has four components: perception (P), information (I), judgment (J), and decision (D). According to the model, perception and information lead to judgment in the first stage, and then perception and judgment lead to a decision. The perception concept indicates that individuals frame situations according to their experience, training, and education. Further, based on the strengths or weaknesses of these elements, decision makers may employ heuristics and biases in the perception stage. This model proposes that information and perception are interrelated, as shown in Fig. 1 by the double-ended arrow, and that judgment is a joint product of information and perception.

P = perception, I = information, J = judgment, and D = decision choice.

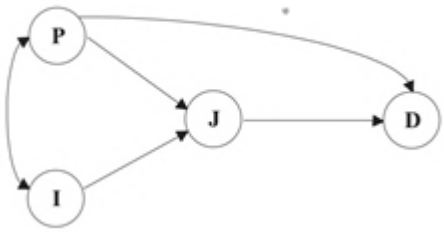

Figure 1. *Decision process diagram (Rodgers et al, 2023)*

Findings

Forming decisions is the process of assessing how a particular action was initiated, with an evaluation of anticipated results versus measured results. Evaluating decision results is framed by the intent of the decision maker and is a measured variable that can be defined by the decision maker's priorities (e.g., profit or performance). Individuals have a "legitimate interest in knowing who to hold accountable" for AI-based decision-making (Hermann, 2021), which requires an understanding of the hierarchy levels of decision-making in organizations. The organizational culture may direct the ethical positionality of decision-making and influence accountability in the use of AI decision-making. Understanding the context and characteristics of the organization's decision makers (Prikshat et al., 2021) will help HRM practitioners to assess the interface of ethics in AI-generated HRM decisions. Incorporation of the TP model in AI system analysis with variables weighted in qualitative and quantitative data can provide an opportunity for HRM practitioners to account for decision outcomes.

Due to the opacity of algorithms in AI systems, HRM practitioners need to mediate between "both low and high levels of human involvement in decision-making" to fully account for HRM decisions. Processes organizing the interactions between people and their organizations are integral when considering AI (Hermann, 2021), and we develop research to further address this by proposing the use of the TP model to look at the organizational level of AI decision-making and the organizational environment generating decision-making pathways. This level of human involvement is dependent on the decision maker's understanding of their objectives and anticipated outcomes, framed by the organizational decision hierarchy, and originating from the social, economic, and natural environment of the organization and the decision maker. The decision-making process in organizations can be split into a hierarchy of three layers:

1. Strategic (to achieve an overall objective).
2. Tactical (to modify to align with changes in the environment).
3. Operational (programmed decisions to control activity).

Within an AI deep neural network, decision outcomes are continually fed back to the organizational environment and decision pathway in a continuous loop of reinforcement learning, with the flexibility of decision processing being dependent on experience from previous decisions. Adoption of the TP

model ethical pathways in AI decision processing is represented by the neural network diagram illustrated in Fig. 2, with the "learning" component illustrated by the arrow direction. An AI algorithmic ethics framework must be the foundation on which any AI technology is fashioned and implemented. Nonetheless, even in its presence, it may be a while before bias can be entirely addressed in the execution of AI-powered solutions for HRM. In addition, such a framework can assist organizations in creating AI technologies to minimize, if not eliminate, bias in their algorithms. Combined with human intervention, AI applications can spearhead unbiased recruitment, merits, promotions, and quality hiring.

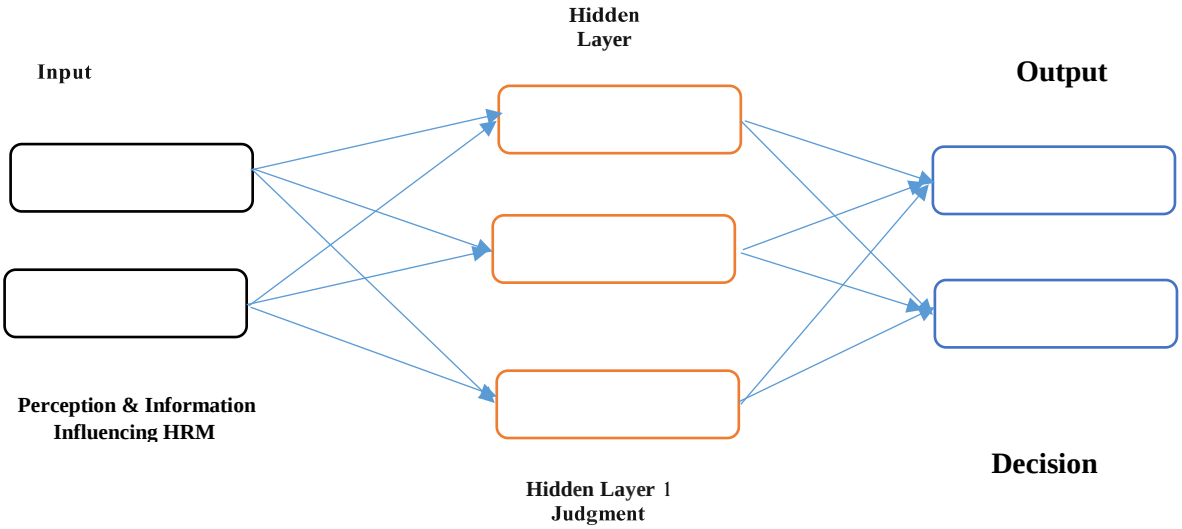

Figure 2. *Artificial single-layer neural network for HRM decision algorithms*
Source: Rodgers et al. (2022).

Optimal framework for HRM with artificial intelligence algorithmic approach

HRM practitioners can evaluate the extent of their attachment and detachment from AI-generated decisions (Bader & Kaiser, 2019) by giving weight to the influencing variables to a decision. Mechanisms depicting the flow of data and the use of AI techniques (Prikshat et al., 2021) help HRM practitioners not only in terms of intelligibility, but also in terms of communicating accountability. The awareness and evaluation stage of the HRM framework proposed by Prikshat et al. (2021) can initiate an HRM analysis of intentions with anticipated outcomes utilizing AI systems prior to any commitment regarding adoption. Using the TP model, post-decision outcomes can be analyzed to determine which ethical pathways are to be taken, and whether these pathways support the delivery of the organization's goals. HRM practitioners can help in interpreting and contextualizing different HR activities (Prikshat et al., 2021). Evaluating decision- making by employees as a consequence of algorithm-driven decision-making and contextualizing the environmental antecedents (social, economic, physical) within the organizational decision hierarchy will help HRM practitioners assist management in interpreting decision outcomes. This research propose that organizations should identify their position on specific HRM activities first (with a focus on agility and scenario planning), and then analyze whether this is reflected in AI-driven HRM activities. Reflecting on accountability, the decision level within the organization, and the organization's goals and objectives will guide HRM practitioners as to whether a specific decision path is to be taken or not, raising questions as to the decision-making impact of AI-driven HRM decisions on

the organization. Recent research suggests that practical guidance on how to address incorporating principals into AI practice is required (Hermann, 2021). The development of the TP model within a framework to incorporate influencing components, such as the environment, time, or the organizational level impacting decision choice, will help HRM practitioners to more fully account for the incorporation of ethical principles into AI decision outcomes. The positioning of the organization and the decision maker when determining the intention and anticipation of an HRM decision outcome is framed by components that are both static and fluid, requiring an understanding of relationships with other disciplines. Each of the economic, social, and physical environments of the organization or decision maker may be impacted by changes, impacting the quality or perception of the information available. Decision intent is framed by the anticipation of potential decision outcomes. In addition, the intent requiring a decision is influenced by the environment of the organization and the decision maker (social, economic, physical environment). The quality and weight given to the data of this environmental variable trigger the perception of, and information available to, the decision maker. As discussed earlier, the decision maker's decision pathway is a result of their priorities and ethical position; however, assessment by the decision maker of their decision pathway is also impacted by a time-based variable, that is, "time pressure" and "time restoration" impact decision choice. Deadlines for a decision may influence the decision maker to follow a particular HRM pathway; however, a restoration in time may allow the decision maker to reflect on and adopt an alternative pathway dependent on the decision to be made. As AI is incorporated into the decision process, the journey from the weighting of data through to the decision choice evolutionary algorithms, from machine learning through to deep learning in a deep neural network, requires a framework in order for HRM practitioners to more fully understand and account for the ethical pathway to a decision choice. Organizational leaders and HRM practitioners who are considering adopting AI or who are in the process of evaluating or implementing existing solutions can follow the sequential process in Table 2 as an analytical guideline for evaluating HRM incorporation into algorithmic decision-making.

Table 2.
The decision making dashboard for optimal framework of HRM (Prikshat et al., 2021)

Decision questions process:
1. What is the organizational intent? What are the strategic decisions to achieve the overall objectives? What are the tactical and operational decisions required to react to changes in environmental data?
2. What is the time pressure on the decision, and is there time restoration to revisit the decision analysis?
3. What is the status of the economic, social, and physical environments affecting each level of decision to achieve the anticipated decision outcomes? These may not be static and will have consequences on the quality of information and perception.
4. Which ethical pathway (preferences, rules, and principles) influences the decision-making organization and actors?
5. Decision is chosen and implemented.
6. Root-cause analysis of the decision outcome.
7. Repeat, incorporating changes in environmental data for incorporation into a deep neural network

The adoption of some AI technologies may challenge HRM in developing talent and career paths while achieving an organization's Goals and objectives. It is reasonable for one of the organization's objectives to be to maintain cash flow and productivity by incorporating new AI technology; however, the use of the technology may reduce the workforce (World Economic Forum, 2018) and prohibit career development options (e.g., company accountant replaced with cloud-based accounting subscription service). Recent research by Nguyen and Malik

(2021a, p. 21) reports how "reliability, flexibility and timeliness are the three dimensions of an AI system that frequently need to be checked to support the knowledge sharing process among employees." The time component affecting decision-making is reflected in the TP model's Decision Dashboard, allowing HRM practitioners to help determine if time is a factor affecting whether one decision pathway is chosen over another.

An example of an HRM-based decision focused on staff training and development is that of an architectural firm required to use Building information modeling (BIM) software in order for the firm to be retained on procurement consortiums. This investment, requiring staff development to operate it, may result in unanticipated outcomes due to a time pressure variable driven by a senior management-level decision for software adoption, raising questions about the awareness and skills at every level of the organization. Unanticipated outcomes may manifest only when the design project is on site (e.g., overly complex construction details relative to current market resources) as a result of the experience and knowledge of older management not being incorporated into the AI algorithms incorporated within the software operated by more junior staff.. The strategic decision intent in this scenario was driven by the economic environmental variable to retain contract opportunities and it was taken under time pressure, with management not fully aware of the time restoration required to develop staff training. The decision by management may be based on an anthropomorphized perception of AI processes, as opposed to an information-based decision. Operational-based judgment may have followed an analytical utilitarianism pathway driven by a peer-restricted social environment within the office, with outcome decisions replicated with consequential damage to the organization's reputation. In this scenario, HRM's use of the TP model within the Decision Dashboard would positively help this organization to develop the office social environment demographics, analyze perceptions held by the organizational hierarchy and their sharing of information to develop junior career training, and coordinate time management to implement change.

Conclusion

Employee career development and training based on their empowerment in line with the mission and organizational goals will lead to better performance and more motivation to accept more positive and constructive individual and organizational changes (Sabet et al, 2021). AI has impacted and changed a variety of aspects of our everyday lives. Opportunities to address ethical, legal, and strategic challenges in HRM practice and research exist. AI software has influenced the HRM process by reducing the inefficiencies and time required to complete tasks, yet questions of trust from employees and management remain. If organizations' HRM teams do not keep up to speed with the forthcoming advances in AI technology, their organizations may not be able to compete effectively in attracting and recruiting employees in effective roles (Chen, 2022). To succeed, organizations will need to commit resources based on AI-impacted cost projections, rather than financing HRM development based purely on previous organizational income. A framework for accountability in this investment decision will be required. To assist management to take full advantage of the power and potential that AI offers, this paper focuses on optimizing the human resource management process with artificial intelligence algorithmic approach.

The application of analytics and algorithmic decision-making has delivered practical and conceptual problems to HRM, raising questions about accountability, which proves critical when biases may be inputted at the data-generation stage (Tambe et al., 2019). Issues with accuracy, reliability, and bias within the data can also generate additional problems for HRM practitioners, where organizational priorities differ from the algorithm-based decision outcomes. Current research indicates that the integration of AI-driven HRM decisions may de-bias human recruiting which is aligned with (Loureiro et

al., 2021)research. Though algorithms may de-bias human judgments, increasing privacy concerns for both companies and individuals regarding sharing data online may not only skew data and drive biases in algorithmic processing but may also raise privacy concerns with regards to transparency in communicating accountability (Hermann, 2021). While there have been few interdisciplinary exchanges in advances in AI research (Loureiro et al., 2021), a multidisciplinary perspective provides insights into the adoption of an HRM framework in decision analysis. Using the TP model is "useful in uncovering algorithmic pathways management accountants use before arriving at a decision" (Rodgers, 2020). Multidisciplinary knowledge sharing and encouraging collaboration for effective AI-mediated knowledge sharing suggest that the insertion of considerations (such as monitoring and privacy) into AI processes by HRM practitioners will have a positive impact on decision- making. As AI algorithms continue to evolve and grow, so do the associated risks. As data scientists, system designers, and programmers form an integral role within the core organizational strategy for HRM, responsibility for the design and development of HRM processes within the adoption of such inherently opaque AI technology needs to be clearly defined. Critical and legal questions arise when accountability for AI decisions is raised. A clear pathway for understanding the position of organizations and their decision makers can help HRM practitioners interpret AI-generated HRM decisions. The traditional employment relationship based on reciprocity has eroded with the increasing reliance on AI algorithm-based technology (Duggan et al., 2020).

In recent years, we have witnessed an increasingly wide range of workplace flexibility practices, such as part-time work, flextime, and telecommuting. This trend may become more challenging from an HRM perspective as more organizations have been compelled to change from a traditional workplace environment to adopting "working from home" due to the Covid-19 global pandemic, raising new questions and areas of research on the future role of HRM. The adoption of AI technology has enabled this trend, bringing additional challenges for HRM practitioners. As employee satisfaction is critical to the retention of talent and key staff (Hermann, 2021), the impact of physical environmental factors has been seen to influence job satisfaction and productivity. Since HRM practitioners may have no input into the newly imposed work environments of an organization's employees, questions are raised regarding the framework of accountability for decision outcomes resulting from the adoption of workplace AI technology in the home environment. HRM decisions based on AI data analyzing employee performance in home environments may challenge data patterns established from traditional work environments, raising questions around performance accountability, and new challenges regarding teamwork, employee satisfaction, and employee development. Increased use of algorithm-based decision-making through remote access raises questions regarding perceptions of monitoring and privacy, suggesting that future research on employee perceptions of HRM practitioners accessing AI technology within organizations may assist in the development of practical guidelines in the HRM use of Al. A clearly accountable decision model supports organizations in terms of corporate disclosure and corporate social responsibility, and not only provides regulators and educators with a framework for evaluating decisions, but it also equips HRM leaders and practitioners with a framework to account for AI decisions.

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