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**AI-ENABLED INNOVATION IN HUMAN RESOURCE MANAGEMENT IN THE  
DIGITAL AGE**

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**Abstract** — Artificial Intelligence is simulating human intelligence processes by machines and computer systems since the Digital Age beginning in 2002. This systematic review paper, examines Artificial Intelligence (AI) enabled innovations in Human Resource Management in the Digital Age, from existing literature. The review paper focuses on the meaning and evolution of AI, how AI works in HR, types of AI in HR, importance, advantages of disadvantages AI in HR. It also enumerates on artificial intelligence enabled innovation in human resource management including talent acquisition, talent management and talent transformation. While organizations are adopting AI into their human resource management and practices at differing rates, it is pertinent to see that this technology will have a lasting impact on the HR function as it becomes more broadly accepted.

**Index Terms** — Artificial Intelligence, Human Resource Management, Talent Acquisition, Talent Management, Talent Transformation

## **I. INTRODUCTION**

Artificial Intelligence is simulating human intelligence processes by machines and computer systems since the Digital Age beginning in 2002 and is winning more heads, hearts and hands in the workplace and particularly in Human Resource Management.

Combination of Artificial Intelligence and Human Resource Management practices is revolutionizing talent acquisition, talent management and talent transformation radically in organizations.

## II. MEANING OF ARTIFICIAL INTELLIGENCE

Oxford Dictionary, defines Artificial Intelligence (AI) as “The way in which computers can be made to copy the way humans think.”

In other words, Artificial Intelligence is the simulation of human intelligence processes by machines and computer systems.

The applications of AI include expert systems, machine vision, speech recognition and natural language processing.

### Evolution Of Artificial Intelligence

In 1950, Alan Turing creates Turing Test to find out machine’s human ability.

In 1956, Artificial Intelligence (AI) was born at a workshop organized by John McCarthy of Massachusetts Institute of Technology, at the Dartmouth Summer Research Project, which Marvin Minsky (Carnegie-Mellon University) defines as, *“the construction of computer programs that engage in tasks that are currently more satisfactorily performed by human beings because they require high-level mental processes such as, perceptual learning, memory organization and critical reasoning.”*

Between 1966 and 1972, Stanford Research Institute constructs the first robot with self-reasoning called ‘Shakey’.

Between 1973 and 1980, the Lighthill Report indicates about the first AI winter, and Symbolic Lisp Machines, commodified AI renaissance.

Between 1987 and 1993, the second AI winter occurred and the Lisp Machine market crumbled.

In 1997, IBM’s ‘Deep Blue’ defeats Garry Kasparov in Chess.

In 2008, Google’s speech-to-search iPhone application was released.

In 2011, IBM’s ‘Watson’ defeats Ken Jennings on ‘Jeopardy’.

In 2012, Apple introduces an intelligent personal assistant called ‘Siri’; Google Brain developed 75% accuracy identifying cats on YouTube.

In 2013, China National University of Defence Technology’s Tianhe-2 or Milky Way doubles world’s top supercomputing speed by 33.86 petaflops

In 2014, then Facebook, now Meta – creates ‘DeepFace’ near-human accuracy.

In 2015, Google open source TensorFlow software library for machine learning was released.

In 2016, Google DeepMind’s ‘AlphaGo’ conquers Lee Sedol at Go China’s Sunway TaihuLight Triples world’s top supercomputing speed by 93 petaflops.

In 2017, Uber pilots the self-driving car program in Pittsburgh and physicist Stephen Hawking cautions about the potential risks of AI.

In 2018, the first robot ‘CIMON’ is sent to space to help astronauts; OpenAI’s GPT (Generative Pre-trained Transformer) creates paths for LLMs (Large Language Models); and ‘Lovot’ a home-mini-robot starts sensing and affecting mood changes in humans.

In 2019, Microsoft launches Turing-NLG Transformer-based generative language model and GoogleAI deep learning algorithm outperforms radiologists in detecting potential lung cancers

In 2020, University of Oxford builds AI test Curial to rapidly identify COVID-19 in emergency room patients; OpenAI’s GPT3 LLM generates human-like text models; Nvidia’s ‘Omniverse’

platform creates 3D Models in the physical world; and Google DeepMind's 'AlphaFold' wins the CASP protein-folding contest.

In 2021, OpenAI's DALL-E multimodal AI System started generating images from text prompts and UC San Diego created a four-legged soft-robot that functions on pressurized air instead of electronics.

In 2022, Google Software Engineer Blake Lemoine was fired for revealing secrets of LaMDA (Language Model for Dialog Applications) and claiming it's sentient and that AI Chatbot is a person; Google's DeepMind unveils AlphaTensor for discovering, novel, efficient and provably correct algorithms; Intel claims it's 'FakeCatcher' real-time fake-detector is 96% accurate; and OpenAI releases ChatGPT to provide a chat-based interface to its GPT3.5 LLM.

In 2023, OpenAI's GPT4 Multimodal LLM gets both text and image prompts; Tech-Leaders request a 6 month break on training AI Systems more powerful than GPT4, which can create profound risks to humanity.

### **How Does Artificial Intelligence Work In HRM**

AI necessitates a specialized hardware and software for writing and training machine learning algorithms. Machine Learning uses historical data. Deep Learning uses artificial neural networks structure. Both are sub-sets of a super-set called Artificial Intelligence.

AI systems function by feeding enormous quantity of labelled training data, analyzing the data for correlations and patterns, to make predictions about future states.

Not one programming language is identical with AI, but Python, R, Java, C++ and Julia have features popular with AI developers.

AI focuses on cognitive skills that include the following:

- (1) Learning - Acquiring data and creating rules/algorithms to turn it into actionable information.
- (2) Reasoning - Focuses on choosing the right algorithm to reach a desired outcome.
- (3) Self-Correction - Designed to continually fine-tune algorithms to provide the most accurate results possible.
- (4) Creativity - Uses neural networks, rules-based systems, statistical methods and other AI techniques to generate new images, new text, new music and new ideas.

### **Types Of Artificial Intelligence In HRM**

There are four types of Artificial Intelligence in Human Resource Management namely,

- (1) Reactive Machines - AI systems have no memory & are task-specific
- (2) Limited Memory - AI systems have memory & use past experiences to inform future decisions
- (3) Theory of Mind - AI systems use social intelligence to understand emotions. They infer human intentions and predict behavior.
- (4) Self-Awareness - AI systems do not yet have a sense of self, consciousness & understanding of their own current state.

### **Importance Of Artificial Intelligence In HRM**

Artificial Intelligence in Human Resource Management helps to automate repetitive and detail-oriented tasks done by humans.

It helps to complete jobs quickly and with relatively few errors.

Artificial Intelligence provides insights for enterprises and leadership teams into their business operations.

### **Advantages Of Artificial Intelligence In HRM**

Artificial Intelligence is great for detail-oriented jobs, reduces time for data-heavy tasks, saves labor, increases productivity, delivers consistent results and improves customer satisfaction through personalization, since AI-powered virtual agents are 24/7.

### **Disadvantages Of Artificial Intelligence In HRM**

Artificial Intelligence is expensive, requires deep technical expertise and has limited talent-pool of engineers to build AI tools.

It reflects the biases of its training data, at scale, due to improperly trained algorithms and human bias, hence users need to be wary of AI tools that “do it all.”

Artificial Intelligence has a lack of ability to generalize from one task to another.

Unethical use of artificial intelligence paves way for legal concerns, copyright issues, data privacy and cybersecurity risks, since there are no robust AI regulations for governance.

Artificial Intelligence could eliminate human jobs, increase unemployment rates, lower originality, decrease human-touch, reduce the natural abilities of the human mind, creativity and innovation.

### **Artificial Intelligence Based Innovation In Talent Acquisition**

Common challenges in talent acquisition include large turnaround time than lean turnaround time, subjectivity than objectivity, and reactivity than proactivity.

To combat these challenges Artificial Intelligence enabled innovation in Talent Acquisition include finding the best resume through ML algorithms that learn synonymous words commonly used in resumes. AI also informs the right people with the right skill to right jobs prior to their posting.

AI determines a candidate’s probability to accept a job offer, project performance output, compare candidates to existing high performers, create individualized offers, analyses candidate’s verbal and non-verbal language, anticipate candidate behavior, personalized candidate experience and predict longevity in the organization.

AI helps the entire recruitment & selection process seamless through Robotic Process Automation (RPA) including easing the administrative complexity, allowing on boarding to happen 24/7 and shortening time to productivity by AI-driven digital assistants.

## **Artificial Intelligence Based Innovation In Talent Management**

Common challenges in talent management include passive career pathing, slow career development, conventional succession planning, undifferentiated learning and compensation expectations.

To combat these challenges Artificial Intelligence enabled innovation in Talent Management include faster paperwork during joining process, personalized employee on-boarding, immersive induction, personalized career-development recommendations, individualized career progression & pathing map, identify flight risk, ascertain capable successors, provide market insights on compensation, increase recruiting efficacy, goal setting, anytime feedback and assisted performance evaluations.

HR Chabots help schedule appointments, understand and complete administrative HR processes.

Text, Image and Audio Generation for HR Communication using Generative AI Techniques, helps to create photorealistic art, HR posters, auto email responses and screenplays for storytelling.

Online virtual health assistants and chatbots ensure employee health and wellness.

AI-backed Chatbots keep engagement conversation continuous and helps in higher employee retention.

ChatGPT and Bard help craft course work and other teaching materials for learning and development teams in HR.

Artificial Intelligence helps in leveraging transactional workforce data, data quality, data sanity, internal mobility, powering workforce analytics and cognitive decision-making.

Legal HR Chatbot automates labor-intensive processes.

Intuit Mint or TurboTax are used to collect personal data, provide financial advice and planning.

Machine Vision helps in signature identification and Natural language processing (NLP) helps in text translation, sentiment analysis in HR and speech recognition during discussions.

## **Artificial Intelligence Based Innovation In Talent Transformation**

Common challenges in talent transformation include a learning curricula to drive compliance than workforce agility, future ready workforce and continuous learning.

To combat these challenges Artificial Intelligence enabled innovation in Talent Transformation include offering personalized learning, promoting collaborative learning, optimizing learning administration, learning recommendations, smart learning nudges, personalized coaching and insights for executives.

## **Conclusion**

While organizations are adopting AI into their human resource management and practices at differing rates, it is pertinent to see that this technology will have a lasting impact on the HR function as it becomes more broadly accepted.

For this reason, it is imperative that HR professionals equip themselves for these changes by understanding what artificial intelligence is and how it can be applied across areas in human resource management.

## REFERENCES

- [1] Sebastian Schuchmann (2019), History of the first AI Winter, pp 1, May 12, 2019, <https://towardsdatascience.com/history-of-the-first-ai-winter-6f8c2186f80b>
- [2] Sebastian Schuchmann (2019), History of the second AI Winter, pp 1, May 12, 2019, <https://towardsdatascience.com/history-of-the-second-ai-winter-406f18789d45>
- [3] Ed Burns (2023), artificial intelligence (AI), TechTarget, pp 1, 2023, <https://www.techtarget.com/searchenterpriseai/definition/AI-Artificial-Intelligence>
- [4] Elon Musk, Steve Wozniak and other Tech Leaders (2023), Pause Giant AI Experiments: An Open Letter, pp 1, March 22, 2023, <https://futureoflife.org/open-letter/pause-giant-ai-experiments/>
- [5] Oracle Human Capital Management Cloud (2019), Oracle and Future Workplace AI at Work Global Study 2019, pp 1-19, 2019, <https://www.oracle.com/a/ocom/docs/applications/hcm/oracle-ai-in-hr-wp.pdf>
- [6] Chevalier F (2023), “Artificial Intelligence and Human Resources Management: Practices and Questions” in Monod E, Buono AF, Yuewei Jiang (ed) Digital Transformation: Organizational Challenges and Management Transformation Methods, Research in Management, Information Age Publishing.
- [7] AOM Academy of Management Conference (2022) , AI and Human Resources Management: Practices, Questions and Challenges, AOM Academy of Management Conference, August 5-9, 2022, Seattle, USA.
- [8] Michael Shirer (2021), IDC FutureScape: Top 10 Predictions for the Future of Work, pp 1, November 18, 2021, <https://www.idc.com/getdoc.jsp?containerId=prUS48395221>
- [9] Gem Siocon (2023), Ways AI is Changing HR Departments, pp 1, March 21, 2023, <https://www.businessnewsdaily.com/how-ai-is-changing-hr>
- [10] Dom Nicastro (2020), 7 Ways Artificial Intelligence Is Reinventing Human Resources, pp 1, May 18, 2020, <https://www.cmswire.com/digital-workplace/7-ways-artificial-intelligence-is-reinventing-human-resources/>