AI Driven HR Automation - A Boon for Industrial Relations: Empirical Evidence

Antarpreet Singh & Jatin Pandey

Artificial Intelligence (AI) has caused massive disruptions in the industrial ecosystems, in recent years. HR leaders are beginning to realize the benefits of AI-led HR automation, which can significantly enhance the performance of HRM function and alter the industrial relations (IR) landscape. This research focuses on examining the HRM-specific factors that facilitate HR automation, HRM benefits, and associated challenges and adopts a grounded theory approach and interviews CHROs, HR managers/executives. The findings provide empirical evidence that AI led HR automation is a boon for industrial relations. The study proposes a theoretical model of AI led HR automation and industrial relations.

Antarpreet Singh (E-mail: ef20antarpreets@iimidr.ac.in) and **Jatin Pandey** are from the Indian Institute of Management (Indore)

Introduction

The term 'Artificial Intelligence' (AI) refers to a broad class of new generation digital technologies. AI termed as smart technology, comprises algorithms that mimic the human brain and possess a self-learning capability (Huang et al., 2019; Krogh, 2018; Laurent, 2018). This makes AI a very powerful technology that can help in decision-making, address a broad range of problems, and transform businesses (Daugherty & Wilson, 2018; Han, 2022; Hellinger, 2022; Krogh, 2018). AI has found its way, to be at the core of enterprise-wide digital transformation projects (Holmstrom, 2022; Trenerry et al., 2021). At the same time the increasing use of AI, is creating new paradigms of employee-machine dynamics and redefining the industrial relations landscape. These developments are helping business leaders to increase productivity and create more business value. At the same time, there are concerns due to employees' complaints about losing the human touch and control over their jobs (Tambe et al., 2019; Trenerry et al., 2021; Raisch & Krakowski, 2021; Cortellazzo et al.,

2019). The continuous and rapid advancements in AI, hold a massive potential to significantly influence the industrial relations.

Chief Human Resource Officers (CHROs) are also beginning to realize the importance of AI, as a strategic lever, that can significantly enhance the performance of human resource management (HRM) function (Tambe et al., 2019; Qamar et al., 2019). HR leaders have begun to embrace a new view of HRM processes, which are adaptive and driven by AI (Basu et al., 2023). Further, AI can handle and analyze wide variety of data that enables HRM automation and helps leaders to tackle tough challenges related to talent acquisition, performance management, capability development, and superior employee experiences (Garg et al., 2021; Qamar et al., 2021). Fenech et al. (2019) argue that HRM is a strategic asset of any organization and its digital transformation helps with enhanced organizational performance.

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To leverage AI, HR leaders need to prepare workplaces for digital transformation. Trenerry et al. (2021:1) argue that the growth of advanced digital technologies, requires employees "to learn new set of skills & competencies, and a complete mind-shift". Holmstrom (2022) advocates that AI can have a significant impact on organization's workforce, required skills, and ways to communicate & collaborate. Automation of talent acquisition processes is one of the major HRM use cases (Kaushal et al., 2020). Further, online recruitment is helping talent acquisition managers to improve efficiency, cut down hiring time, and offer a superior candidate experience. Kabudi et al. (2021) present use case related to capability development through adaptive learning systems. Thus, advancements in AI are offering considerable benefits to HRM (Bhudwar et al., 2022). This helps in increasing HR productivity through integration of AI with various HR functions and processes (Garg et al., 2021).

At the same time, there are considerable challenges of HR automation. Tambe et al. (2019) state that HR data is often intertwined with human emotions. The authors add that algorithms neutrality is another complex issue, that could lead to major conflicts, as output of HR processes may be flawed due to algorithmic bias. Resseguier & Rodrigues (2020) caution industry leaders about AI implementation, without due diligence and considering potentially harmful impact on employees, the organization, and the society. As the automation takes the centre stage, employees tend to lose control over jobs. Employees may complain on loss of autonomy and lack of human touch (Raisch & Krakowski, 2021; Resseguier & Rodrigues, 2020). Deskilling is another major issue, as employees fear loss of jobs. Improper and indiscriminate use of AI in HRM, could lead to significant attrition (Budhwar et al., 2019; Basu et al., 2022). Budhwar et

al. (2019) suggest that HR leaders must initiate, effective change management training, to alleviate deskilling fears. The HR leaders need to have a holistic vision of HRM function and focus on leveraging AI for HRM, while mitigating the automation risks.

Literature Review & Research Objectives

We review theories of technology acceptance, adoption, and use, to lay a theoretical foundation, as to how organizations and employees cope up with such strategic initiatives. Oliveira & Martins (2011) provide a comprehensive literature review of various theories of technology adoption, that include individual, organizational, and societal factors. The authors compare theory of diffusion of innovation (DOI) with theory of technology, organization, and environment (TEM). Theory of DOI advocated by Roger in 1995 links individual leader, internal and external organizational characteristics, to the innovativeness. Oliveira & Martins provide a detailed account of studies based on DOI theory that includes information technology adoption related to enterprise resource planning (ERP) and e-business systems. They argue that TEM model is holistic compared to DOI theory as it includes the environmental context. External task environment includes nature of business, technology support infrastructure, and the government regulations. Miller & Friesen (1980) provide a 3-stage theory of technology adoption which includes momentum (without change in strategy or structure), across the board momentum, and revolution marked by reversal in old strategy, as well as structure. Venkatesh et al. (2016) provide a unified theory and a multi-level theoretical framework, for technology acceptance and use (UTAUT). The model links behavioral intention of employees with technology use. Behavioral intention is governed by factors such as individual beliefs, habits, and facilitating conditions at a workplace. UTAUT framework includes higher level contextual factors such as environmental & organizational attributes and individual level factors (user, technology attributes etc.).

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Based on the review of various theories of technology acceptance, adoption, and use, it is evident that new generation digital technologies could prove to be a game changer as these significantly impact organizational productivity (Oliveira & Martins, 2011; Proksch et al., 2021; Verhoef et al., 2021). However digital transformation is not just a technological intervention; it requires sharp focus on employee factors, shifts in organizational strategy, and processes (Trenerry et al., 2021:2). AI driven HR automation is not a mere technological phenomenon, it requires a positive shift in employee mindset and their whole hearted support. In this context, Tambe et al. (2019) argue that deployment of AI in HRM is a completely different ball game compared to other

functions. They state that HR outcomes are quite complex and the HR data is quite different from the business data. It is typically characterized with low volumes and mixed with employees' emotions, aspirations, and attitudes. Fernandez (2019) advocates that these complexities require a center of excellence (COE) in a HR department, that specializes in digital technologies including AI.

HR automation has another challenge in the form of neutrality. Tambe et al. (2019:35) argue that AI algorithms at times could be biased and restrictive: that raises a fairness issue. They further state that "most machine learning-based algorithms excel in pattern recognition rather than causation". Causation as per authors, suffers from a drawback: it has a low predictive power. HR managers must thoroughly ascertain that algorithms for HR applications are neutral and fair. This makes the task of automating HR processes (using AI), as quite complex and challenging. Laurent (2018:741) debunks a myth that AI algorithms are neutral and can deal with "complex social issues better than human beings". He says that AI algorithms could overlook social and cultural differences. Thus, intervention of HR leaders is of critical importance to ensure fairness and neutrality at the workplace. In this context, Raisch & Krakowski (2021) argue that automation takes away all the control from an employee. They state that over emphasizing automation can have serious implications in terms of organizational performance and societal issues and recommend managers to augment the power of AI with the creativity and ingenuity of human beings, which they term as 'Augmentation'. They caution managers to maintain a good balance between automation and augmentation. In HRM context, employees and AI need to collaborate harmoniously, for superior HRM performance and conducive industrial relations.

Rampersad (2020) argues that robotic process automation is highly beneficial for productivity. The author cautions HR managers to execute skill transition well, otherwise robots will take away the jobs. Rampersad adds that the work will see higher levels of automation, as a result of industry transformation initiatives. The author argues that considering these disruptions, the new generation workers would need to understand technology and possess appropriate digital skills. These views are consistent with automation vs augmentation dynamics, highlighted by Raisch & Krakowski (2021). Basu et al. (2023) highlight the importance of leadership and human factors in the context of AI adoption and use in HRM. They caution that certain factors can prove to be show-stoppers, such as resistance from employees, fears of deskilling, and conflicts due to new skill demands. Such issues can lead to serious industrial relations problems. Thus, with a view to building harmonious industrial relations, employees must possess the required digital skill-set and create a harmonious environment of 'Employee-AI collaboration'.

The literature review thus indicates that HR automation provides significant

benefits and helps improve HRM performance. However, it also poses a huge challenge for HR leaders as automation could disrupt industrial relations. AI-driven automation is one of the key items in the digital transformation projects agenda. HR leaders must handle the change brought in by transformation, judiciously. The coexistence of automation and augmentation helps build a climate of trust and harmony: key to maintaining healthy industrial relations. In view of the theoretical review, we see an important research gap with respect to AI-driven HR automation, benefits, challenges, and the responsibility of HR leaders to navigate this change judiciously. We present our research question as follows:

Research Question (RQ): Is AI-driven HR automation a boon or a bane for Industrial Relations? Neri de Souza et al. (2016:7) state that starting with a sound research question is key to any research project as it helps determine the focus of research and "acts as a compass in the research process". We also present three research objectives linked to the above RQ:

a) To understand the HRM factors, in the context of industrial relations, that facilitate AI-driven HR automation

b) To understand the benefits, in the context of industrial relations, that are associated with AI-driven HR automation

c) To understand the challenges, in the context of industrial relations, that are associated with AI-driven HR automation and the ways to mitigate them

Research Methodology

We adopt a qualitative research design, to examine the RQ and satisfy three research objectives, through empirical evidence. Bansal, Smith & Vaara (2018) recommend a qualitative approach for areas that have been understudied empirically. The authors further state that grounded in the new data, inductive theorizing can yield completely novel ideas. Langley (1999) talks of significant interest among researchers in various dynamic phenomena. This study examines various interdependent phenomena in the context of AI-driven HR automation and industrial relations. Langley (1999:691) further provides support, to a process method of understanding events, how and why the events play out, plunging deeply into the processes and "extract the theory from the ground up". He outlines seven strategies of sensemaking and argues that different strategies lead to different types of process understanding, which the author terms as senses. Of the seven approaches, this research study has chosen a 'Grounded Theory' strategy. Langley says that the grounded theory approach involves a series of structured steps and progressive construction of categories, that further describe the phenomenon.

This study aims to build a theoretical model that describes the role of various HRM-related factors, in regulating the relationship between AI-powered HR automation and the HRM-related benefits/challenges. This is with a view to providing empirical evidence as to how industrial relations are impacted as a result of these benefits/challenges. Corbin and

Strauss (1990) say in relation to a grounded theory that various phenomena under qualitative research study must be seen as dynamic, as the conditions surrounding them are evolving. This research views AI-powered HR automation and its ultimate impact on industrial relations, as dynamic and evolving continually.

Boddy (2016) critically views sampling in qualitative research. The author says that qualitative research often lacks the rigor to choose sample sizes. The author supports the concept of data saturation in qualitative research but at the same time also has a view that saturation may be more useful conceptually. In practice, it may not prove to be highly beneficial, due to cost and timing issues associated with a given research. The author suggests that several researchers provide higher estimates like 30 or more interviews as a sample size. Boddy however provides an estimate of multiples of 12 in depth interviews as a good sample size. Gentles et al. (2016) suggest that for a grounded theory research, at least 25 interviews are necessary. This research aims to adopt a purposeful sampling strategy (with an A-Priori criteria) for interviews. Gentles et al. (2015) quote Charmaz who supports 'A Priori', criteria based purposeful sampling.

Guion et al. (2011) state that an in-depth interview, with open ended questions, is a good way to capture interviewee's feelings and perspectives. Boyce & Neale (2006) also stress upon the need to have in depth interviews, which the authors consider as a great tool to gather empirical evidence, especially when new issues are to be investigated or explored. Guion et al. further recommend that the interview questions should be structured in a way that the interviewees think deeply and shares their perspectives, rather than just saying yes or no. This study deploys open ended interview questions, that are centred around the research question and help in realizing the three research objectives.

Next, we provide details of our coding strategy. Coding is the key feature of grounded theory approach (Kvale, 2011). The author says that interview responses need to be analysed comprehensively. Several insights will be gained from the responses, as analysis is thoroughly done. Kvale also talks about coding in detail, which the author says is a process of attaching key words to a text segment. Corbin & Strauss (1990) say that coding is a process which includes various steps of breaking down, examining, comparing, conceptualizing, and categorizing. The authors mention that concepts which relate to same phenomenon need to be put under a category. Categories further help in the formation of themes that are used to theorize (Saldana, 2021).

Next in context of credibility or trustworthiness of research, Creswell & Miller (2000:124) mention that establishing credibility is quite challenging and researchers "need to demonstrate that their studies are credible". Connelly (2016), also states that trustworthiness of research is key to usefulness and integrity of the research findings. The qualitative study deals with results from the context of interviewees, interview-

ers, and reviewers. The validity in qualitative research is based on the fact that reality is perceived by participants.

Research Findings & Discussion

We conducted 25 interviews (CHROs, senior HR leaders and HR executives, at different hierarchical levels in HR departments). The interviewees were selected from 7 diverse and well-known companies in India. The interview transcripts were coded following a rigorous coding analysis, grounded in the theory. The diverse data through successive refining leads to theoretical constructs or themes (Saldana, 2021). The study followed a 'process coding' approach, at the first level of coding, that resulted in 447 codes. The process coding method is particularly suitable for grounded theory research. Further, Saldana (2021:302) states that process coding is useful at the beginning stages of data analysis that splits the data into coded segments. The second level coding used axial coding method, which helped re-assemble the first level codes, yielding 110 second level codes. Siguake & Swansi (2020:17) state that process coding makes it easier for axial coding (in the second stage) as "processes, activities and actions that characterize data would have been illuminated". This approach is in complete alignment with the research question and research objectives. Our analysis of second level codes, yielded 59 categories that resulted in a formation of 9 distinct themes. The study has also developed a theoretical model that highlights the relationship between AI-driven HR automation, the facilitating factors, and the resultant HRM benefits, that lead to harmonious industrial relations. The 9 themes and the key categories are shown in the Table 1.

Table 1 Themes & Key Categories

S. No.	Themes	Key Categories
1	AI Ethics	Ethical guidelines, Employee privacy & security, Selective deskilling, Public-Scrutiny
2	Digital Skills	Learning Agility, Upgrading job designs, AI Skills
3	Human Touch	Empathy, Loss of control, Inspiration, Selective delegation to AI
4	New Generation Trade Unions	Changing industrial landscape, Smart in negotiations, Well educated, Digital natives, Knowledge workers
5	Transparency & Fairness	Compliances automation, Data driven decisions, Eliminating human bias, Visibility to HRBPs
6	Employee Experience	Simplification, Employee care, Harmonious collaboration with AI
7	Future Readiness	Strategizing, Digital transformation of HR, Business alignment, Human capital
8	Productivity	Efficiency, Flawless execution, Accuracy, Business impact
9	Management-Union Relations	Trust, Counselling Unions, Human touch in wage negotiations, Sense of belongingness, Unions as business partners

Rapid advancements in AI over the last few years, have generated a significant interest among HR leaders, to leverage the power of AI (e.g., chatbots, robots, models, and algorithms). AI today is being used for automating several processes in the HR ecosystem (Basu et al., 2023: Henderikx & Stoffers, 2022; Garg et al., 2021). This study has examined HRM specific factors that facilitate the HR automation and include: AI ethics, digital skills, human touch, transparency & fairness, and the new generation trade unions.

AI Ethics

AI ethics is emerging as a key driver for regulating the use of AI technologies for HR automation. A well-rounded, AI ethics guidelines, will go a long way in ensuring harmonious collaboration between HR employees and AI (Franzke, 2021; Hagendorff, 2020; Heilinger, 2022). Franzke (2021) calls AI ethics as having soft regulative power that guides leaders to resolve various ethical dilemmas. We examined that digital natives are quite optimistic about the use of AI in HR, but have serious concerns regarding deskilling of jobs, that could put their careers in jeopardy. In addition, employees are concerned about their privacy and information security. The study also examined whether the self-adoption of ethical guidelines by enterprises would not be enough. Organizations need to put up ethical guidelines for public scrutiny and invite suggestions, from various stakeholders including trade unions. The domain of AI ethics is still at a nascent stage and in the process of acquiring a distinct form and shape (Franzke, 2021).

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Human Touch

While HR automation is helping CHROs to deliver superior performance, it is also raising serious concerns, as employees complain of loss of human touch and control over jobs. In this context, Raisch & Krakowski (2021) provide a clear view that automation means AI completely taking over a task, whereas augmentation means sharing it with AI. Empathy is another category linked to this theme. Empathetic leadership, keeps human connection at the center stage, as the new generation information technologies are adopted (Raman & McClelland, 2019). We also examined trust. A climate of trust is key to having mutual respect, open communication, and honesty that fosters superior employer-employee relations (Sahoo & Sahoo, 2019): key to building harmonious industrial relations.

Digital Skills

We examined the role of digital upskilling in terms of facilitating automation. Trenerry et al. (2021) state that advanced digital technologies like AI require employees to regularly upskill themselves. They say that it is not just an acquisition of new skills and competencies, but also a change in the mindsets. Our study found that it is quite important for HR leaders to

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continuously upgrade job designs and facilitate the acquisition of digital skills by employees, for effective employee-AI collaboration. Wilkens (2020) states that AI at the workplace enhances employee competencies and augments employee performance. Cortellazzo et al. (2018:12) also highlight the importance of worker learning and found that the rapid digitalization of workplaces is causing "worker alienation, weak social bonding, and poor accountability". They advise leaders to facilitate the acquisition of new skills by workers and assist in handling tasks in a digitalized world.

Transparency & Fairness HR

Analytics is helping CHROs to take decisions that are supported by thorough analysis (Fenech et al., 2019; Fernandez & Gallardo, 2021; Kaushal et al., 2023; Qamar et al., 2021). This helps in creating an environment that facilitates high-quality decisions and promotes transparency. Our research found evidence that HR automation provides good visibility to HRBPs (Human Resources Business Partners) due to transparency in HR operations. AI also promotes fairness as human bias in the context of decision-making is eliminated. However, AI may not be neutral all the time (Tambe et al., 2019; Laurent, 2018). Kirkwood (2023, ibm.com) raises the issue of algorithmic bias and the need for labor laws to secure the rights of employees, in the United States of America. Kirkwood stresses on the need to have a regular audit of AI models and the automated processes to ensure that employee rights are not infringed. AI-driven HR automation thus has to be ethical, transparent, and fair: this will go a long way in building harmonious industrial relations.

New Generation Trade Unions

The term new generation refers to digital natives who are well-educated and digital savvy. Schoemann (2018), mentions about new models of trade unions operations. These leverage digital technologies for member enrollments and are beginning to have presence on social media platforms. The new generation trade unions are supportive of digital agenda including automation by the management. At the same time, Akhtar and Moore (2016:117) say that modern trade unions are quite concerned about increasing pressure on workers due to the "constant-on nature of work, rise of algorithmic distribution, threat of automation, and use of wearable tracking devices". Our study also identified four key benefits of AI-powered HR automation.

Future Readiness

Future readiness in today's digital age is one of the major benefits as it helps

CHROs to build strong human capital (Winne & Sels, 2010). Digital transformation of HR is not just about use of AI; it is also related to the shift in an organizational strategy (Trenerry et al., 2021; Holmstrom, 2022). HR automation frees up employees from routine, repetitive tasks so that they can strategize and focus on HR-Business alignment (Agustin et al., 2021). In line with this Garg et al. (2021) state that AI not only increases efficiency, but also the effectiveness of HRM function. The increased speed of work helps organizations deliver superior performance and retain competitive advantage (Fenech, 2019).

Productivity

Digitization of processes increases accuracy, requires fewer resources to do the same task, and helps in flawless execution (Verhoef et al., 2021; Khin & Ho, 2018). The increased HRM productivity positively impacts the firm's business and builds business-centricity within HRM (Fenech et al., 2019). Enhanced productivity simplifies work routines, that facilitate employees to focus more on creative solutions.

Superior Employee Experience (EX)

One of the major drivers of superior EX is harmonious Employee-AI collaboration (Raisch & Krakowski, 2021), which augments employee capabilities with the power of AI. The fear of AI is thus significantly reduced and there are positive feelings to collaborate with AI. The experience of employees at the workplace is also bolstered by responsive employee care systems that facilitate quick redressal of their grievances. Positive employee experience goes a long way in delivering superior customer experience and creating business value. Sharma & Bhalkikar, (2022) found that HR leaders must proactively support the transition, as technology is adopted and used. A smooth transition to a digitalized work environment is thus key to the superior EX.

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Management - Union Relations

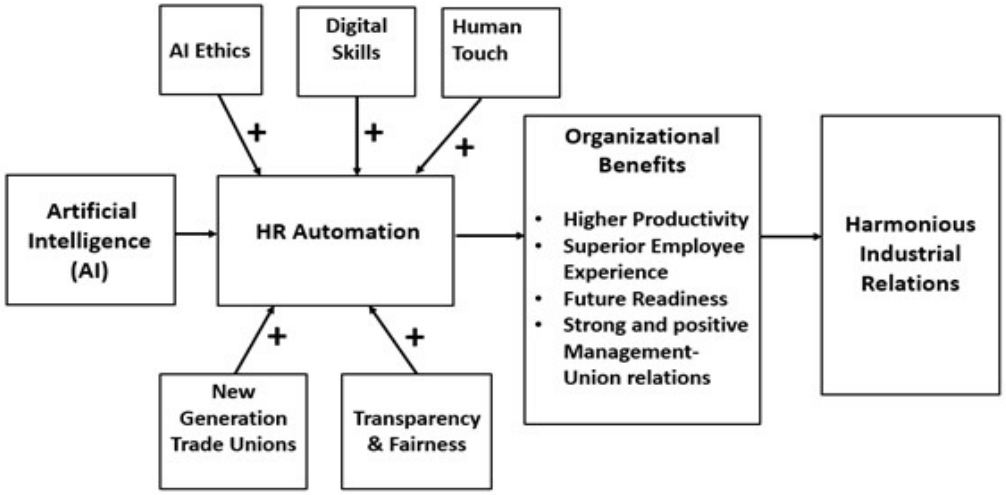
Our study provides evidence that communication is a game changer in the context of right messaging (unions, employees) related to HR automation. Raju and Prasad (2018) in a case study related to alloy and jute industries in Andhra Pradesh (India), characterize management-union relations as a process of continuous change. A comprehensive communication strategy helps unions to understand the automation benefits and plays down the deskilling fears. The authors suggest a communication strategy that focuses on measured communication. This resonates well with our research findings. Union-management relations have also undergone a paradigm shift, mainly due to electronic performance monitoring (EPM). Akhtar & Moore (2016) say that EPM in automated work environments needs to be used judiciously; otherwise, it can lead to objections from workers, regarding micromanagement and privacy. Prabhakar

(1996: 507) says that not all technology is welcome. It is the responsibility of management to build a climate of trust and assure employees about the benefits as well as potential risks of automation. In this context, Bissel (2022) takes a positive view advocating that automation will create jobs requiring new skills, thus creating opportunities for workers.

Implications

The AI is a fast-emerging phenomenon of organizational significance (Krogh, 2018). We differentiate AI from other digital innovations and state that its adoption in organizations is creating several challenges and opportunities. AI in HRM has generated significant interest among researchers as well as practitioners. Budhwar et al. (2022) advocate that recent developments in AI-driven automation technologies are offering significant benefits for HRM. In this context, our study contributes to the theory development by proposing a model as presented as in Fig. 1.

Fig. 1 Theoretical Model for AI-led HR Automation & Industrial Relations



Rampersad (2020) has an important message for HR practitioners. He says that in today's AI era, HR leaders need to equip the workforce with innovative skills including working with robots. Tambe et al. (2019:15) also highlight a significant gap that exists in relation to a narrative in different organizations and reality. Our study aims to provide significant insights to HR practitioners in terms of leveraging AI-powered HR automation. We provide empirical evidence regarding 5 HRM-related factors (facilitators) and 4 benefits, that accrue to an organization and help build harmonious industrial relations. At the same time, HR leaders need to address challenges such as employee privacy, deskilling fears, algorithmic bias, electronic monitoring, loss of human touch and control, acquisition of digital skills etc.

We advocate that HR leaders augment AI capabilities (Raisch & Krakowski, 2021), with human capabilities, of creativity and ingenuity. AI cannot inspire employees: inspiration must come from HR leaders. We require humanized AI (Haenlin & Kaplan, 2019) that enables HR employees and provides harmonious employee-AI collaboration. Our research also provides key insights to policymakers in the field of labor relations. Industrial relations code (2020) (labour.gov.in) can further be updated in the context of AI-driven automation at workplaces. The new policy revisions in the industrial code need to consider the rapid AI-driven digitalization of industrial ecosystems and their impact on the overall industrial relations landscape.

Limitations, Future Directions & Conclusion

We have collected data from Indian companies only. There can be significant cultural differences with respect to employee and trade union perceptions related to HR automation in other countries. We reached out to interviewees once only. A longitudinal research study could provide better insights as views, perceptions, and opinions of employees as well as trade union members, would change over a longer period. In addition, positive experiences in collaborating with AI will have a direct impact on perceptions and attitudes. Conversely, negative experiences will make unions and employees more susceptible to AI-led automation.

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AI-powered HR automation and its impact on industrial relations are an under-researched area and there are tremendous opportunities for research, such as changing landscape of industrial relations due to AI adoption, humanized AI, algorithmic bias in HR, Adaptive learning for digital skills acquisition, AI ethics etc. To conclude, there has been a paradigm shift in the industrial landscape, as a result of massive AI disruptions. There is a significant interest among HR leaders to embrace AI and automate several HR processes. A sharp focus on key HRM-related factors would help CHROs and their teams to reap the rewards of AI-led automation. This would further make the overall industrial climate progressive, productive, collaborative, ethical, and future ready.

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