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# **Ai Driven Human Resource Optimization**

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### Abstract

AI-driven human resource optimization increases worker productivity and efficiency by strategically allocating talent and streamlining HR processes. By analysing employee capabilities, availability, and performance data, artificial intelligence (AI) systems can better schedule, match the best applicants to projects, and predict future employment needs. Businesses can use this method to adjust in real time to variations in demand, ensuring that tasks are completed with the least amount of downtime and boosting employee engagement. By automating the candidate screening process and finding outstanding talent more rapidly, AI enhances both hiring and staffing. It also encourages customized employee development by offering training and career paths that align with business goals and individual talents.

AI-driven HR optimization is a helpful tool for companies trying to remain competitive and adapt to shifting market conditions since it boosts worker adaptability, reduces turnover, and enhances operational efficiency. Through data-driven insights, AI promotes a more responsive, engaged, and productive staff, which contributes to long-term organizational success.

Keywords: AI-driven human resource optimization, HR process automation Workforce adaptability, Reduced turnover, Operational efficiency, Organizational success.

### **AI in Recruitment**

The literature from the human resources (HR) sector is worth mentioning while researching artificial intelligence (AI) in talent acquisition because it is a field that is extremely relevant to the recruiting and selection process. The most widely utilized literatures that integrate technology use in human resource functions are Parry and Tyson (2011) and Lepak and Snell (1998). In light of these two research, technology may undergo constant change in tandem with advancements in the field. Black and Van Esch (2020), who show the development of analog recruiting and digital recruiting 1.0, 2.0, and 3.0, provide a summary of this phenomenon. Numerous academic works acknowledge the advantages of using AI in the hiring process. For example, AI makes it possible to implement an automated system for recruitment and screening, which lowers costs and increases the effectiveness of the employment process (Buckley et al., 2004). Another application of AI is the use of AI to conduct interviews in place of expensive in-person interviews (Suen et al., 2019).

This paper contends that HR orientation toward its approach to recruitment methods need not change in light of the ongoing technological advancements in human resources, particularly in talent acquisition. It alludes to the potential trade-off that results from concentrating on technology at the expense of relationships (Stone et al., 2015). Thus, it's critical to consider AI as a communication tool as well as an



operational tool that increases efficacy and efficiency (Guzman and Lewis, 2019). Therefore, this study suggests taking a balanced approach to the social and technological aspects of this issue, while other studies concentrate on the technical aspects of AI technology. This study is unique since talent acquisition involves a variety of activities (Ordanini and Silvestri, 2008).

Due to the replacement of paper-based recruitment, talent acquisition has undergone a transition from analog to digital recruiting, which provides for cost efficiency (Black and van Esch, 2020). However, it makes it simpler for job searchers to find and apply for positions. Consequently, digital recruiting gives businesses access to a huge pool of job candidates to review (Black and van Esch, 2020; Stone et al., 2015; Stone et al., 2013). More administrative work is therefore required, and in order to address this issue, technological integration in hiring has been a key focus.

Artificial intelligence makes it possible to be more effective and efficient (Walford-Wright and Scott-Jackson, 2018). As AI handles administrative duties in the hiring process, it enables time savings for businesses (Hmoud, 2019). By lowering personnel costs, decreasing employee turnover, and increasing the effectiveness of the hiring process, the implementation of an automated recruiting and screening system results in further savings (Buckley et al., 2004). Even if the benefits listed above are similar to those seen from an operations perspective, they are insufficient to demonstrate a persistent competitive advantage. The literature focuses more on employee development or retention when discussing human resources for long-term competitive advantage (Benjamin A. Campbell et al., 2012; Heijde and Van Der Heijden, 2006; Lado and Wilson, 1994).

One-sided communication is the primary factor contributing to the impression that digital recruiting is impersonal (Stone et al., 2015). Artificial intelligence or chatbots, on the other hand, can be positioned in many social contexts as a manifestation of human intelligence (Stoeckli et al., 2019), which would improve favorable pre-employment relationships with job prospects (Van Esch, Black, and Ferolie, 2018). However, given the state of technology today, it is still difficult for AI to offer a more individualized touch (Canhoto and Clear, 2020). Thus, according to some research, the best hiring results can be obtained by balancing the roles of humans and AI (Tambe et al., 2019; Balachandar and Kulkarni, 2018; Altemeyer, 2019).







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Ordanini & Silvestri (2008) state that there are four primary phases in the hiring and selection process. Specifically the posting of a position, the screening procedure, the selection, and the fulfilment of the selection, as seen in Figure 1. Likewise, Hmoud (2019) proposed four comparable phases using distinct terminology, including sourcing, contracting, screening, and selection.

Sourcing-Multi-database candidate sourcing: The automated AI to scan from various databases or webs such as LinkedIn, Glassdoor, etc (Ibrahim and Hassan, 2019; Albert, 2019) Targeted job advertisement:

Screening-Using AI, ML, to accurately recommend job ads to the relevant candidates (Albert, 2019 CV Screening software, video screening interview, automated scheduling (Albert, 2019);

Selection-Selection tools on resume based through algorithm support (Heric, 2018); Customized prescreening questions, Chabot for candidate screening and engagement, automation in resumes screening (Ibrahim and Hassan, 2019) Selection Video Interview assessment with facial recognition, voice analysis, and word choice (Heric, 2018); AI-Powered psychometric testing (Albert, 2019)

#### Figure 2. Process Flowchart for AI in Recruitment (Source: Hubert.ai)

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	engagement, automation in resumes screening (Ibrahim and Hassan, 2019)
	Selection Video Interview assessment with facial recognition, voice
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Balachandar and Kulkarni (2018) state that in the context of hiring, chatbots are more efficient as it automates time-consuming procedures like sourcing, screening, and messaging, recruitment can be utilized to automate 80% of all "Top of Funnel" recruiting efforts. It is beneficial for screening applicants, qualifying applicants, setting up interviews, replying to rejected applicants, answering frequently asked questions, and evaluating experience feedback (Nawaz and Gomes, 2019; Vinyals and Le, 2018). Due to AI's nature, Chabot's make it possible to organize, evaluate, and display data in a way that HR professionals can quickly access, understand, and act upon. Thus, it makes sense that AI tools have become widely used to automate the screening process for resumes (Raviprolu, 2017).

### Automated Work Planning and Scheduling

Automated planning entails creating a series of steps to accomplish a set of objectives while accounting for the effects of actions and the status of the world at the moment. Typically, planning algorithms look for a series of activities that lead from the current state to the intended goal state using a formal description of the world, such as a logical representation or a state-transition model.

On the other hand, scheduling entails setting aside time and resources to carry out a series of tasks or



actions. Algorithms for scheduling seek to maximize the use of available resources, reduce completion times, or meet deadlines and resource availability. Depending on the certainty of task durations and the availability of resources, scheduling problems can be either deterministic or stochastic.

#### Planning and Scheduling using Robotics

Combining machine learning and constraint satisfaction with other AI methods can improve robot scheduling and planning. For instance, constraint satisfaction can be used to model and resolve complicated task restrictions, while machine learning can be used to develop motion models or forecast changes in the environment.

Planning and scheduling are essential for intelligent agents, such virtual assistants and driverless cars, to make decisions and act in their surroundings. While scheduling algorithms are used to provide resources and time for plan execution, planning algorithms are used to create plans or strategies for accomplishing objectives.

Intelligent agent planning and scheduling capabilities can be improved by integrating with other AI approaches, such as constraint satisfaction and machine learning. For instance, constraint satisfaction can be used to model and resolve complicated task restrictions, while machine learning can be used to learn user preferences or forecast future occurrences.

#### AI in Employee Development

Companies must keep innovating and increasing operational efficiency in the age of globalization and rapid technological progress in order to stay competitive in a market that is highly competitive (Moșteanu, 2020). Employees are one of the company's most significant assets. A competitive edge and the accomplishment of organizational goals depend heavily on effective employee performance. In many different industries, artificial intelligence (AI) has emerged as a game-changing invention. Compassing the development of human resources (Trocin et al., 2021). A crucial step in the human resource management process, employee performance evaluation seeks to quantify and comprehend each worker's contribution to the objectives of the company. However, subjective bias, inefficiency, and a lack of impartiality are frequently the limitations of traditional performance reviews.

The application of AI as a tool for employee performance evaluation has been the subject of several earlier research. Among these studies is the first one, which was carried out by Kshetri in 2021 at a number of top tech companies that use AI technology to assess employee performance. According to this study, using AI expedited the assessment process and increased evaluation's objectivity and fairness. Subsequently, Abdulmajeed (2021) carried out a comparison analysis of the effectiveness and precision of performance evaluation utilizing AI and conventional techniques. The findings demonstrated that compared to manual techniques, AI generated evaluation results that were more accurate and consistent.

There are numerous noteworthy benefits to using artificial intelligence (AI) in performance reviews. First, by eliminating subjectivity and biases that may exist in human judgment, AI makes it possible for assessments to be more accurate and objective (Huang & Rust, 2018). AI can generate assessments that are more objective and accurate by depending on data and analysis. Additionally, using AI in the performance review process can reduce time and increase efficiency. AI can lessen the amount of manual labor that managers and HR teams must do by automating the majority of appraisal procedures. This saves a significant amount of time that may be used for other important tasks. AI also facilitates data-driven decision-making.



## AI and Workers Adaptability

The current trend in automation and computing technologies, such as cloud computing, IOT, and cyberphysical systems (CPS), is known as Industry 4.0. These technologies are used by organizations to change their daily operations (Antony et al., Citation2021; Liao et al., Citation2017; Sony, Citation2018). "Autonomous robots, system integration, the internet of things (IOT), simulation, additive manufacturing, cloud computing, augmented reality, big data, and cybersecurity" are the nine technologies that form the core of Industry 4.0 (Kaur et al., Citation2020). Organizations will use these nine technologies to produce intelligent goods and services, and staff members will need to get used to using them.

An essential component of Industry 4.0 success will be the employee's capacity to handle such changing work environments. According to earlier research on employee adaptability, each employee's ability to adjust to such changing work environments varies. A key component of employee adaptability is the ability to change behaviour in response to new circumstances, events, or surroundings (Charbonnier-Voirin & Roussel, Citation2012; Ilgen & Pulakos, Citation1999; Pulakos et al., Citation2000; Sony & Mekoth, Citation2014).

Initiatives for digital transformation within a company have a success rate of less than 30%. Having the proper digitally knowledgeable leaders, expanding the workforce, empowering people to work in new ways, and improving daily tools and communication are the five essential components of a successful digital transformation (Hortense et al., Citation 2018). Three factors are associated to humans, according to an analysis of these factors. Thus, it illustrates how crucial human factors, particularly employees are to the success of the digital revolution. The meta-skill that will enable employees to manage digital transformations like Industry 4.0 is employee flexibility.

### Lower Labour Turnover through AI

Unlocking AI's potential in the workplace is about more than just increasing productivity or saving money. AI is altering the employee experience, increasing engagement and, ultimately, lowering attrition on production floors.

By analysing applicant data, AI guarantees that positions and employees' abilities and preferences are better aligned, decreasing misalignment that leads to churn. It tailors on boarding experiences to individual learning styles and needs, allowing new recruits to adjust quickly and feel valued right away. AI systems identify turnover risks by assessing employee data and external circumstances, allowing for proactive actions to keep valued people. AI-powered technologies deliver tailored feedback, recognition, and development opportunities, building an engaging culture and lowering attrition due to disengagement. AI automates monotonous work and optimizes resource allocation, minimizing fatigue and enhancing job satisfaction.

### AI Methods for Foreseeing Employee Attrition

- The following are some of the most popular AI methods and techniques that companies are using today to anticipate employee turnover:
- Machine learning models are created utilizing previous employee data.
- Natural Language Processing (NLP) enables businesses to assess employee feedback and sentiment.
- Predictive analytics algorithms can uncover patterns and trends.
- Data mining tools reveal hidden characteristics impacting employee turnover.
- Social network research can assist businesses identify important employees and their potential impact



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on attrition.

- Sentiment analysis of employee communication channels such as emails and chat logs assists firms in measuring employee work satisfaction.
- Deep learning algorithms for predicting staff attrition.
- Chabot's that allow firms to monitor employee sentiment at work.
- Explainable artificial intelligence (XAI) tools (e.g., LIME, PDP) assist businesses in understanding the outcomes of complex personnel data.
- Recommendation systems give focused retention techniques.

#### **Forecast Future Staffing Requirement**

Workforce forecasting is a strategic strategy that matches future personnel with company objectives, ensuring that businesses stay up to date on market trends and new technology. This forward-thinking strategy is critical for remaining competitive in the fast-paced technology industry, ensuring that organizations have the proper talent for new projects and market shifts

Excellent workforce management forecasts can have a substantial impact on engineering managers' success. It's about more than just filling positions; it's about anticipating changes and outperforming competition. Managers can guarantee their teams are nimble, capable of overcoming problems, and ready to capitalize on new opportunities when they master workforce forecasting.

AI can accurately forecast personnel requirements by applying machine learning algorithms and predictive analytics. AI systems can analyze massive volumes of historical data to detect patterns and trends that human analysts may not notice right away. This includes a review of previous recruiting data, employee attrition rates, seasonal fluctuations, and the impact of external factors such as economic downturns or booms. Businesses that understand these patterns can better estimate when they will need to hire more people or reduce their workforce.

AI does more than just look inward; it also keeps track on exterior market changes that may have an impact on staffing requirements. This includes changes in consumer behaviour, adjustments in industry demand, and developing technology that may have an impact on how labor is conducted. For example, if AI identifies a rising demand for a particular skill set in the industry, it can alert businesses to start recruiting candidates with those skills before the competition.

Unlike traditional workforce planning methods, which are generally static and rely on periodic evaluations, AI enables real-time adjustments. As market conditions change, AI may continuously update workforce projections and make suggestions. This guarantees that firms are always working with the most up-to-date data, resulting in more responsive and proactive staffing plans.

#### **Evaluating Employee Capability and Performance**

AI can be used to evaluate employee capability and performance in different ways. One of the primary uses of AI in performance evaluation is to develop and track performance indicators that are relevant, trustworthy, and consistent. AI may analyze data from a variety of sources, including productivity tools, customer feedback, sales statistics, and online behaviour, to assess the quantity and quality of staff output, as well as its influence on corporate objectives. AI can also use natural language processing (NLP) to evaluate the tone, sentiment, and clarity of employees' communication abilities. Employers may decrease human bias, inaccuracies, and subjectivity by implementing AI-based performance metrics, resulting in a more comprehensive and equitable picture of employee performance.



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Another way for AI to evaluate employee performance is to deliver timely and individualized feedback. AI may use performance metrics data to provide reports, insights, and recommendations for employees to help them improve their skills, behavior, and results. Chatbots, voice assistants, and virtual coaches can also be used by AI to provide conversational and interactive feedback to employees, as well as to answer their queries and concerns. Employers may increase employee engagement, motivation, and learning by adopting AI-based performance feedback, as well as build a culture of continuous development. Using AI for performance appraisal can help both businesses and employees. It has the potential to improve the accuracy, objectivity, and consistency of performance measurement and feedback while lowering the time, cost, and effort required for evaluation and feedback. This can also boost staff engagement, motivation, and learning, enabling an environment of continual development and innovation. Furthermore, AI may assist connect employee performance with business goals and strategies, as well as improve employee accountability, satisfaction and retention.

#### **Improve Target Achievements**

Utilizing AI has the advantage of providing the business with additional value through the knowledge it generates (Goel et al., 2022).

As a goal-setting framework that helps organizations to coordinate their efforts across all departments and achieve notable progress, OKR has become extremely popular. Businesses now have a strong ally in their quest to master OKRs thanks to the recent hype surrounding artificial intelligence (AI) (Yigitcanlar et al., 2020).

A goal-setting technique called "Objective and Key Results" assists organizations in concentrating on the important things and directing their efforts toward obtaining measurable outcomes. OKRs are ambitious goals that are in line with the desired outcome. They are composed of two primary components: objectives that specify the desired outcome and key results that track progress toward the objective.

OKRs are ambitious goals that are in line with the organization's overarching vision. They consist of objectives that specify the intended outcome and key results that track progress towards accomplishing the objective. While Key Results are quantifiable, quantitative indicators that monitor progress, objectives are qualitative assertions that provide a clear direction (Wamba Taguimdje et al., 2020).

**AI-driven goal-setting:** AI is capable of analysing performance metrics and historical data to generate data-driven suggestions for reasonable OKRs. Algorithms using artificial intelligence are able to spot possibilities, trends, and patterns that people would miss. (Chen and Lee, 2022).

**Data driven Key results:** OKRs are used to precisely track and monitor team performance and progress. Often, a lot of effort is put into developing the strategy and setting ideal OKRs that would help the company go closer to realising its goal, but less attention is paid to actual execution. But everything hinges on the plan being carried out successfully. The OKR software solution includes an AI-powered OKR Plan Generator that analyses the entered vision statement and suggests appropriate actions for three objectives and five key results for each objective. Although human interaction is still necessary to improve these suggestions, users are no longer forced to sit in front of a blank screen and try to come up with their OKRs from start thanks to AI. This technology shortens the time needed to develop the plan, allowing attention to shift quickly to the crucial execution.

Artificial intelligence algorithms offer tailored suggestions on how people might help realise any certain goal. This advice can be for developing one's skills, working with other team members, or even finding chances for cross functional projects. Such personalised guidance can enhance employee engagement and



drive a stronger sense of ownership and commitment towards achieving the desired outcomes (Foundation et al.,2019)

A game changer in the business: While our real-time automated OKR solution allows data gathering and analysis to promote accurate tracking of important results, AI-driven insights can assist businesses in setting ambitious yet attainable objectives. Businesses may understand the OKR framework, realise their full potential, and succeed spectacularly in the competitive and dynamic business environment of today by integrating AI (Mikalef and Gupta, 2021).

#### AI tools in Business to Incorporate

AI in Data Processing: An AI algorithm can process a wide variety of inputs and learn rapidly. If you wish to examine your databases or identify a pattern of behaviour, this may be crucial. Since software completes this task, there is very little likelihood of error and the procedure may be completed considerably more quickly. Employee productivity is increased since AI tools make it easier to do monotonous tasks and focus on more productive, creative aspects using AI tools do routine tasks.

In order to accurately forecast future trends and market situations, AI algorithms may examine firm data. AI-powered predictive analysis can assist in developing new company plans and preparing for upcoming obstacles.

Chat-GPT is an AI-powered assistant that can offer businesses a range of services. It can help with employee training, analysis, and content creation. Through language translation, it enables companies to interact with people on social media platforms and communicate with a worldwide audience.

Midjourney is a well-known AI technology that helps businesses expand by producing beautiful text visuals. It can create distinctive and innovative images in a matter of seconds, putting the brand's merchandise front and centre. Midjourney is capable of producing outstanding photographs that may make the products to have life and increase the efficiency of the employee.

Jasper is a platform driven by artificial intelligence that assists companies in producing marketing material in a variety of formats, including blog posts, sales emails, and website text. By using the current referencing style as a guide, it guarantees that all team members produce content that is in line with the appropriate tone of voice.

Otter.ai, an AI-powered solution for business productivity and voice transcription. By working together on a live transcript, it enables staff members to take notes and recap sessions more quickly. Otter assists with email summarisation, removing the need to go over the complete transcript.(Aljibour and others, 2021). (Goel and others, 2022).

#### Better Employee Engagement through AI

AI's function in employee engagement is becoming more and more important in the present business environment. By automating repetitive processes and supplying insightful data for individualised employee experiences, artificial intelligence (AI) improves employee engagement. It can encourage a culture of ongoing education and growth.AI is able to assess employee activity data to determine strengths, weaknesses, and preferences as well as forecast future performance. Additionally, real-time data is essential to the process of customized interaction. Insightful decisions are made by decision makers using predictive and reflective data. Employee motivation and productivity are increased by personalized interaction, and they are more likely to feel appreciated.AI has the ability to personalize each employee's training and development plans. Continuous training of a targeted workforce is made possible by AI





analytics with unique skills and interests.

Through persistent use of AI analytics, targeted workforces with specialized skills and interests can receive ongoing training and development. Gaining a deeper understanding of the employee is beneficial. Businesses may transition to a future with higher productivity and more engaged workers thanks to AI.

Investigating AI's effects in the workplace can be aided by Chabot's and virtual assistants. They can simplify repetitive processes and free up time for more worthwhile pursuits. Virtual assistants can greatly increase an employee's productivity. AI-powered technologies are made to aid employees with their daily chores, such as prioritizing assignments or managing an overflowing inbox. By creating a more connected and effective workplace, AI can help organizations close the engagement gap between employers and employees.

An AI-powered Chabot is faster and more accurate than a human at gathering and analysing large amounts of data. Sentimental analysis, which is carried out by AI, monitors warning indicators and emotional hints that the conventional survey approach might miss. It can track stress levels, spot burnout, and quickly flag any issues, enabling companies to provide employees with appropriate help.

Employee well-being: AI creates the groundwork for promoting employee well-being in addition to increasing productivity and efficiency. Incorporating employee mental health programs into the workplace is made easier by artificial intelligence. It offers a setting free from judgment that encourages anonymity.AI-based wellness initiatives can also monitor employees' emotional well-being and assist organizations in spotting possible problems with their workforce. It serves as a system of early warning allowing workplaces to provide support before situation spirals downward. The role of AI in employee engagement also extends to boost staff morale and promote their holistic well-being.

#### Better employee efficiency through AI

Maintaining a high-performance culture inside an organization requires a dynamic and strategic approach to employee performance management. Its objective is to maximize each worker's potential and ensure that they contribute to the organization's long-term objectives. Managers must typically assign a numerical value to an employee's performance as part of standard annual reviews, which is impossible without the proper data. Opinion-based evaluations can lead to unpleasant experiences for managers and staff alike. Since AI bases every conclusion it makes about the process. Data is the foundation of performance management driven by AI. There are no personal preferences about it. Since it collects data from a wide range of sources, the data itself cannot contain errors. Thus, AI can assist managers in providing unbiased feedback that benefits the company and its employees. This is an essential step in determining an employee's potential and establishing appropriate goals for them. It can assist the management in more precisely calculating incentives and identifying promotions.

AI's contribution to employee engagement has an impact on workers' general contentment and output. Routine jobs like data entry and administrative labour are now automated by Chabot's driven by artificial intelligence, freeing up staff members to concentrate on higher-level duties that encourage creativity and individual fulfilment.AI facilitates open and honest team communication. Since it is open around-the-clock, it can answer questions instantly and keep staff member's updated.AI-based incentive programs may access each worker's accomplishments, preferences, and the context of their work, resulting in highly customized awards and recognitions. It enables you to continuously gather information from a range of sources, such as calendars and written correspondence between staff members. As a result, managers may



make prompt decisions and provide prompt feedback thanks to the system's ability to provide real-time information regarding employees' performance.

AI assists managers in verifying their choices and ensuring the accuracy of their comments. The managers will be able to obtain additional data and information about the employees they are reviewing, which will help them develop. During an ongoing performance evaluation, AI is able to gather input in real time and send out sophisticated surveys on a regular basis. Based on the findings of these surveys or even their own self-evaluations, it can also provide employees with individualized insights. By examining each employee's career trajectory utilizing information from previous performance assessments, interests, and skill sets, it assists managers in identifying gaps in the talent pool and providing tailored training recommendations. Finding out what employees are strong at and where they may improve is a major component of performance management.

UiPath or Blue Prism can manage data input jobs by simulating how humans interact with digital systems, while AI tools like x.ai or Clara can automate meeting scheduling by engaging with email correspondents to discover ideal times, avoiding the back-and-forth often required thereby speeding up processes and freeing human resources for higher-value work.

AI-powered solutions, such as IBM Watson, give businesses insights into consumer behaviour trends and enable them to efficiently customize their marketing campaigns. Based on tests and data analytics, human resources solutions like Pymetrics employ AI to forecast a candidate's success in a variety of professions. AI is integrated into software such as Tableau or Microsoft Power BI to analyse performance metrics from multiple data sources inside an organization. This can draw attention to inefficiencies and productivity patterns, enabling managers to resolve problems or reassign work more quickly to better balance workloads. Slack's AI-powered search and organization tools, which enable users to locate information quickly and effectively among massive volumes of communication data, are an example of artificial intelligence in action. Multinational teams can collaborate more easily in manufacturing thanks to Microsoft Teams, another tool that incorporates AI to provide real-time translation and transcription services during meetings. AI-powered visual inspection systems, such as those from IBM or Google Cloud Vision, can detect product flaws far more quickly and accurately than human inspectors. Deep Code and other software development tools employ artificial intelligence (AI) to analyse code and identify possible errors or provide suggestions for improvements, which speeds up the development process and improves the quality of the finished output.

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