Available online @ https://jjem.jnnce.ac.in
https: www.doi.org/10.37314/JJEM.SP0420
Indexed in International Scientific Indexing (ISI)
Impact factor: 1.395 for 2021-22
Published on: 31 May 2025

A Conceptual Study on Artificial Intelligence in Insurance Sector

Gayathri N M[1*] , Dr. Shobharani H[2]

1*2 Kuvempu University

nmgayathri171@gmail.com, hsshobharani@gmail.com

Abstract

Information technology sector has embraced the era of digitalization. Artificial Intelligence (A.I.) is a multidisciplinary field aimed at automating tasks that currently require human intelligence. The aim of this study is to understand better the Use-cases of Artificial Intelligence (AI) in the Insurance Sector. Particularly, this study wants to explore the scope and human resource management of AI in insurance services to overcome ongoing problems. Based on the concepts of AI, a conceptual study was developed. The conceptual study intends to measure the relationship between AI & its use cases in the Insurance industry. Empirical quantitative research was used to verify the study, with a sample of international companies and Insure Techs implementing such studies. This research concludes some theoretical insights that are believed to be very useful for Insurance companies

Keywords: *Human Resource Management (HRM), Artificial Intelligence (AI), Industry 5.0, insurance sector, manufacturing sector and service sector*

1. Introduction

Artificial intelligence (AI) is revolutionizing industries and driving rapid advancements in consumer services across various sectors. Today, AI applications are essential in key industries such as healthcare, logistics, transportation, food technology, banking, financial services, travel, real estate, and entertainment. The impact of AI, machine learning (ML), and FinTech on financial decision-making and their role in enhancing investment efficiency and productivity are growing rapidly. In the insurance sector, the widespread adoption of AI applications highlights the industry's technological transformation. While AI helps balance pricing policies, operational costs, and claims, it also brings new risks and ethical concerns. Additionally, younger generations, as well as administrative and safety workers in the public sector, are increasingly embracing AI-driven technologies.

The growth of key sectors in both developed and emerging economies has stalled, and the insurance sector is no exception. With the rising number of claims and the ongoing post-COVID-19 recovery, it is crucial for the insurance industry to leverage AI applications that can handle vast amounts of data, offering significant cost-saving benefits. AI technologies, including machine learning (ML) and predictive analytics are designed to manage large volumes of claim settlements and policy enrollments. However, while AI-driven applications present potential risks for the insured, they also pose challenges for companies striving to keep up with the rapid pace of claims and customer demands. The pace of post-

COVID-19 recovery demands increased innovation within the insurance sector, prompting the introduction of InsurTech. InsurTech integrates technology into the insurance industry, driving cost and performance efficiencies. Companies in this space have developed AI- and ML-powered business models that enhance enrolment and claim settlement processes while helping customers better understand the structure and usage of their premiums. These technologies have also allowed insurance companies to cater to lower-income and underserved markets. InsurTech companies, leveraging AI and ML, are attracting a growing customer base. However, when introducing new technologies, these companies must ensure compliance with insurance industry regulations. Many countries have established regulatory sandbox frameworks, enabling InsurTech start-ups to grow and refine their business models while adhering to regulatory standards. For instance, India has implemented a microinsurance regulation policy since 2015, specifically targeting low-income populations. Despite the advantages of digital transformation, whether in InsurTech or FinTech, it is essential to strike a balance between fostering innovation and ensuring robust data security the pace of post-COVID-19 recovery demands increased innovation within the insurance sector, prompting the introduction of InsurTech. InsurTech integrates technology into the insurance industry, driving cost and performance efficiencies. Companies in this space have developed AI- and ML-powered business models that enhance enrolment and claim settlement processes while helping customers better understand the structure and usage of their premiums. These technologies have also allowed insurance companies to cater to lower-income and underserved markets. InsurTech companies, leveraging AI and ML, are attracting a growing customer base. However, when introducing new technologies, these companies must ensure compliance with insurance industry regulations. Many countries have established regulatory sandbox frameworks, enabling InsurTech start-ups to grow and refine their business models while adhering to regulatory standards. For instance, India has implemented a microinsurance regulation policy since 2015, specifically targeting low-income populations. Despite the advantages of digital transformation, whether in InsurTech or FinTech, it is essential to strike a balance between fostering innovation and ensuring robust data security

2. Objectives of the study.

- To study about the Artificial Intelligence in Insurance sector
- To study the impact of Artificial Intelligence on Human Resources in Insurance sector.

3. Research Methodology

The current study has been based on the conceptual data obtained from secondary source involved and engaged in insurance sector industries in artificial intelligence implementation. In the light of increasing usage of AI in depth, current study work as a basis for studying the Penetration level of AI and impacted aspects of insurance sector industries in Karnataka. The study is descriptive in nature because the researcher has made an attempt to describe the current scenario in the Artificial intelligence techniques and HRM pattern, awareness, preference, and perception

4. Discussion

Bridging the AI technology gap with customers Customer engagement has become a key focus for insurers' AI initiatives, with many executives reporting progress in areas like AI assistants (chatbots or virtual assistants), enhanced customer service, direct customer support, and increased developer productivity. However, there is a disconnect: while insurers prioritize AI tools for customer service, generative AI in customer service is not a top priority for customers. Instead, customers emphasize the use of generative AI for personalized pricing, promotions, and products tailored to their specific needs. Additional concerns arise when considering customers' issues with generative AI, such as data privacy and the potential risks of inaccurate AI-generated information. While these gaps present challenges for insurers, they also create opportunities for forward-thinking companies to outpace their competitors

Conquering complexity Generative AI represents just the tip of a much larger issue in the insurance industry: a complex and aging technology landscape that is often resistant to new AI models and code. The technical debt in insurance core systems makes it challenging to adapt these systems to evolving AI capabilities, especially in the face of rapidly changing market conditions, customer expectations, and regulatory requirements. These complex systems also limit the adoption of generative AI by restricting access to the necessary training data for large language models. According to 52% of executives, data constraints—such as inadequate, inaccessible, incomplete, or otherwise unusable data—are slowing the speed at which new products are brought to market. For generative AI to be effective across the organization, insurers must adopt AI strategies that work within this complex environment while simultaneously addressing these challenges over time. A hybrid-by-design architecture can help insurers start reducing their technical debt, improving efficiency, and optimizing the balance between operational costs and system development...

Betting on a flexible operating model As insurance organizations invest in AI and customer data analytics, it is crucial that their operating model for generative AI enables the fast development and deployment of new products and services. The key question is whether this can be better achieved through a centralized, decentralized, or hybrid approach to AI development and services. While executives report varied strategies, those who have adopted a decentralized model tend to see greater success across several key metrics, including run/build ratio, speed to market, and customer retention. To unlock true generative AI value, it is vital to democratize AI decision-making across the organization, while still maintaining centralized governance and oversight to ensure consistency and alignment.

- **Increased productivity:** AI can increase labor productivity by up to 40% through more efficient time management. It can also increase the quantity and quality of capital stock, which enables businesses to produce more goods and services.
- **Improved decision-making**: AI can analyze large amounts of data to improve decision-making.
- **Global economic impact**: AI could contribute up to $15.7 trillion to the global economy by 2030, which is more than the current output of China and India combined.
- **Emerging market opportunities**: AI could enable emerging markets to leapfrog more

- Challenges, including: job market polarization, rising inequality, structural unemployment, and emergence of new undesirable industrial structures.

Recruitment is one of the first steps in creating a workplace, and traditionally, it can take up to 100 man-hours to complete the process, even in the best-case scenario. So, how will AI impact human resources in recruitment? AI will significantly reduce the man-hours required for various tasks. It can automate much of the recruitment process, including reaching out to potential candidates, scanning and selecting resumes, scheduling interviews, assessing competencies, answering basic applicant questions, and matching job requirements. With these tasks handled by AI, the HR team can shift their focus to other critical areas, such as employee engagement, sourcing, appraisals, rewards, and recognition.

On boarding can be an incredibly monotonous process, especially in large organizations that hire frequently. Artificial Intelligence can help HR teams streamline and automate the on boarding process, making it more organized, efficient, and personalized. Many on boarding steps can be automated by an AI system, including:

- Verifying documents
- Running induction programs
- Scheduling initial meetings for new employees
- Managing administrative tasks, such as printing ID cards, providing access, and handling device requests

Training and development AI's impact on HR will be particularly transformative in the area of training and development. In every industry, continuous skill upgrading is crucial for staying competitive, and training programs are essential for enhancing employee capabilities. AI can be used to create personalized training and development programs tailored to the specific needs of each employee. For example, AI can offer varying levels of training modules based on an employee's skill set, job role, and requirements. Additionally, AI tools can recommend the latest courses that address gaps in the employee's current skillset.

Furthermore, AI can match employees who have completed relevant training courses with new projects, ensuring that the right people are assigned to tasks based on their updated skills. This makes it easier to identify internal resources and optimize talent within the organization. There are endless possibilities for using AI to enhance training and development in the workplace.

Rewards and recognition Rewards and recognition (R&R) are crucial for boosting employee engagement, as engaged employees tend to be more productive and work more independently. For rewards and recognition to be effective, they need to be:

- Timely
- Holistic
- Consistent

AI is an excellent tool for developing effective R&R systems. For example, Possible Works' R&R tool is designed to promote appreciation and recognition among employees through virtual platforms. This tool automates milestone awards and regular recognition processes, reducing the burden on HR teams. Additionally, it automates the nomination process with approvals, ensuring transparency and simplicity. The tool fosters a social, interactive workplace environment, making the recognition process more engaging and seamless.

4.8 Queries handling HR personnel often spend a significant portion of their day

addressing queries from employees—whether from new hires seeking to understand workplace processes, employees inquiring about benefits, or those filling out review forms and performance appraisal grievances. As the volume of these queries grows, it becomes increasingly difficult to manage.

An AI tool designed to handle basic queries is a game-changer for HR teams. One of the key benefits of AI in HR is the reduction in the number of emails and chat messages that HR personnel need to manage each day. An AI-powered chatbot can be developed to guide employees through common questions and provide immediate answers. The tool can also offer intelligent follow-up suggestions, further streamlining communication and freeing up HR professionals to focus on more complex tasks.

Business administrative tasks HR personnel often have to manage a range of entry-level administrative tasks that while monotonous and time-consuming, are essential for maintaining smooth operations. Some of these tasks include:

- Updating employee details in the internal database
- Managing employee documents
- Creating and updating organizational terms and conditions
- Performing data entry work
- Ensuring legal compliance

These tasks, though important, can be repetitive and take up valuable time. Automating these administrative duties with AI tools can significantly reduce the workload on HR teams, allowing them to focus on more strategic, value-added activities.

Decision making While AI may not fully replace decision-making, a well-implemented AI system can provide HR teams with the right information and analytics to make informed, data-driven decisions. HR can leverage AI to conduct surveys, gather employee feedback, and analyze key business data such as productivity levels, engagement, performance, and areas for improvement. With access to comprehensive, valuable, and specific data, HR leaders can make more effective decisions that drive organizational success and enhance employee satisfaction

5 The ethical impact of AI on HR

While the impact of AI on HR is undoubtedly transformative, there are important ethical considerations to be aware of. The ethical implications of using AI in HR need to be consistently discussed, clarified, and reassessed each time AI is implemented in the department.

HR handles vast amounts of personal information about employees, making data security a critical concern. Employees must be reassured that their sensitive information is safe, protected from hackers, and inaccessible to individuals who don't need to see it Additionally, if the AI algorithm is altered, either intentionally or unintentionally, it can shift from being a fair and unbiased tool to one that perpetuates inequalities and biases within the workplace. To prevent this, HR should collaborate with software developers who understand the industry and can provide an AI framework that is:

- Transparent
- Highly secure
- Accountable
- Fair

By choosing the right partners and ensuring robust ethical standards, HR can harness the

power of AI while safeguarding both employee trust and organizational integrity.

6. Artificial intelligence on Insurance Companies

AI is transforming the insurance industry in several key ways:

- Faster claims processing: AI can automate routine customer inquiries and claims processing, enabling insurers to deliver quicker and more efficient service to customers.
- Legacy system solutions: AI can extract logic and data from outdated legacy systems and integrate them with modern AI-driven solutions through APIs, ensuring seamless functionality.
- Fraud detection: AI algorithms can be trained to recognize patterns of fraud in insurance claims, helping insurers detect fraudulent activities early and prevent significant financial losses.
- Personalization for customers: By leveraging customer data, insurers can use AI to create tailored products and services that better meet the specific needs of individual customers.

By applying AI across these areas, insurance companies can improve efficiency, security, and customer satisfaction.

7. Impact of Artificial Intelligence on Human Resources in Insurance sector

The future of Learning and Development (L&D) with AI is centered on continuous reskilling, helping employees stay adaptable and responsive to changes in industry and organizational needs. AI is revolutionizing various aspects of the insurance sector, improving insurers' ability to analyze risks, detect fraud, and reduce human errors. Additionally, AI enhances customer service and streamlines claims processing, while underwriting procedures can be optimized with less human involvement.

Key areas where AI is transforming HR and the workplace include:

- Automating tasks: AI can handle repetitive tasks, such as answering employee questions, drafting job descriptions, and reviewing resumes. This allows HR professionals to focus on more strategic and high-value activities.
- Improving employee experience: AI can provide personalized learning plans, gather performance data, and enhance the on boarding process, making the overall employee experience more efficient and engaging.
- Improving workplace safety: AI can analyze data from sensors and cameras to identify potential hazards, as well as monitor employee health data to detect early signs of health issues, ensuring a safer work environment.
- Enhancing people analytics: AI can process vast datasets to uncover insights that help HR professionals make informed, data-driven decisions about employee performance, engagement, and retention.
- Automating benefits management: AI can automate the entire benefits management process, from enrolment to claims processing, ensuring accuracy and reducing administrative workload.
- Reshaping the labour context: AI is changing both the form and content of work, influencing how tasks are performed and how employees interact with technology, thereby reshaping the overall labour environment.

By leveraging AI in these areas, organizations can improve operational efficiency, employee satisfaction, and safety, while also positioning them to adapt

to future changes in the workforce and industry

8. Statistical data of Insurance companies which are using Artificial Intelligence in India and Karnataka

As per IRDAI, India had 67 insurers, including 24 life insurers, 26 general insurers, and 5 standalone health insurers. There were also 12 re-insurers, including foreign reinsurer branches
As per IRDAI, Karnataka had 12 insurance companies which are using Artificial Intelligence

9. Findings

- The current study explored the impacts of artificial intelligence technologies and robotics, machine learning
- The study revealed that AI has positive effects, including time and cost savings, unbiased evaluation, reduced workload, increased productivity, and the analysis
- Collection of data in various human resources management functions such as selection and placement, orientation and integration, wage management, performance management, career management, and training and development management.
- AI technologies are recognized as crucial tools for integrating artificial intelligence into human resources activities within organizations, particularly in the identification of suitable employee candidates.
- The study revealed that manual processes in many organizations have undergone transformation through the adoption of technologies such as chat bots, machine learning, deep learning, robotics, automation, expert systems, and autonomous systems.
- While the known effects of artificial intelligence on HR and processes are currently limited
- The optimal integration of big data, Artificial Intelligence, internet of things (IoT), cloud computing, COBOTSs, innovation and creativity in MNCs reflects a holistic and synergistic approach to manufacturing and production, aiming to achieve unprecedented levels of efficiency, collaboration, and technological advancement.
- AI is anticipated to revolutionize production systems and processes by fostering greater collaboration between humans and robot
- By combining the unique strengths of both humans and robots, AI seeks to optimize production efficiency, enhance product customization
- The use of AI could also boost labor productivity growth and increase global gross domestic product (GDP) by 7% per year over a 10-year period. AI is considered to be one of the driving forces behind the revolution in technologies, organizations and society at the start of the 21st century
- However, AI can also have negative implications, such as replacing human workers and negatively impacting established norms and expectations in the workplace
- Many insurance companies use artificial intelligence (AI) in a variety of ways, including Car insurance, Health insurance, Renters and homeowners' insurance, Pay-per-mile auto insurance, Customer service and Sentiment analysis
- Other insurance companies that use AI include CCC Intelligent Solutions: Clear cover, Gradient AI, Nayya, Hi Marley and Snapsheet
- Insurance companies provide financial protection to individuals and businesses by using AI in terms of

underwriting, premium collection, risk pooling and claim processing

- AI adoption is present in all insurance companies, with varying degrees depending on the type of insurance company.
- The overall dataset shows 100% AI adoption across the insurance sectors in Karnataka

10. Suggestions

The growing prevalence and rapid advancement of technology, particularly in artificial intelligence, are set to drive significant changes and transformations in information management, processing systems, and technology within human resources management. As a result, the importance of AI and e-HRM (electronic human resources management) is expected to increase and expand. These technologies, whose full potential is still unfolding, could potentially serve as the foundation for the concept of unmanned human resources in the future, where automation and AI play a central role in managing HR functions

.

11. Conclusion

AI has established a significant presence across various sectors, including human resource management (HRM), insurance, manufacturing, and services. In HRM, AI plays a crucial role in reducing administrative workloads by efficiently identifying the most suitable candidates for specific positions. Additionally, AI systems can recommend relevant training programs to support skill development, helping HR units create accurate career plans for employees. Furthermore, AI minimizes errors, prevents disruptions in workflows, and enhances overall employee engagement and productivity.

As technology rapidly evolves, its impact extends to every aspect of the human environment, requiring organizations to adapt in order to remain competitive and relevant. This adaptability must encompass not only products and services but also the organization's most important asset: its employees. Recognizing the value of employees, alongside customers, products, and services, is essential for organizations aiming to thrive in an ever-changing technological landscape. By prioritizing employee well-being, skill development, and engagement, organizations can position themselves for sustained success in the face of constant change.

The impact of AI on HR is poised to be both concrete and sustainable. Given the rapid pace of technological advancements, it is crucial for AI frameworks to remain flexible and adaptable to change. AI can be leveraged to eliminate monotonous HR tasks, analyze large data sets to make informed decisions, and generate a holistic impact that enhances the overall performance of both the organization and its employees.

Reference

1. Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., ... & Williams, M. D. (2021). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, *57*, 101994.
2. Erem Ceylan, I. (2022). The Effects of Artificial Intelligence on the Insurance Sector: Emergence, Applications, Challenges, and Opportunities. *The Impact of Artificial Intelligence on Governance, Economics and Finance,*

Volume 2, 225-241.

3. Gupta, S., Ghardallou, W., Pandey, D. K., & Sahu, G. P. (2022). Artificial intelligence adoption in the insurance industry: Evidence using the technology–organization–environment framework. *Research in International Business and Finance*, *63*, 101757.
4. Irfan,M.,Elmogy,M.,&El-Sappagh,S.(Eds.).(2023). *TheimpactofAIinnovationonfinancialsectorsinthe era of industry 5.0*. IGI Global.
5. Jagatheesaperumal, S. K., Rahouti, M., Ahmad, K., Al-Fuqaha, A., & Guizani, M. (2021).The duo of artificial intelligenceandbigdataforindustry4.0:Applications,techniques,challenges,andfutureresearch directions. *IEEE Internet of Things Journal*, *9*(15), 12861-12885.
6. Kar, S., Kar, A. K., & Gupta, M. P. (2021). Modeling drivers and barriers of artificial intelligence adoption: Insights from a strategic management perspective. *Intelligent Systems in Accounting, Finance and Management*, *28*(4), 217-238.
7. Kumar, S., Sharma, D., Rao, S., Lim, W. M., & Mangla, S. K. (2022). Past, present, and future of sustainable finance: insights from big data analytics through machine learning of scholarly research. *Annals of Operations Research*, 1-44.
8. Larsson,S., Anneroth,M.,Felländer,A.,Felländer-Tsai, L.,Heintz, F., & Ångström,R.C.(2019).Sustainable AI: An inventory of the state of knowledge of ethical, social, and legal challenges related to artificial intelligence.
9. Lior,A.(2022).Insuring AI:Therole of insurancein artificialintelligence regulation. *Harvard JournalofLaw and Technology*, *1*.
10. Mishra, H., & Maheshwari, P. (2020). Achieving sustainable development goals through Fourth Industrial Revolution: an Indian perspective. *Indian Journal of Commerce and Management Studies*, *11*(2), 63-75.
11. Misra, S. K., Sharma, S. K., Gupta, S., & Das, S. (2023). A framework to overcome challenges to the adoption ofartificialintelligenceinIndianGovernmentOrganizations. *TechnologicalForecastingandSocial Change*, *194*, 122721.
12. Sharma,L.,&Garg,P.K.(Eds.).(2021).Artificialintelligence:technologies,applications,andchallenges.
13. Sharma,V.,&Sood,D.(2022).Theroleofartificialintelligenceintheinsuranceindustryofindia.In *Bigdata analytics in the insurance market* (pp. 287-297). Emerald Publishing Limited.
14. Strusani, D., & Houngbonon, G. V. (2019). The role of artificial intelligence in supporting development in emerging markets.
15. Thayyib, P. V., Mamilla, R., Khan, M., Fatima, H., Asim, M., Anwar, I., ... & Khan, M. A. (2023). State-of- the-Art of Artificial Intelligence and Big Data Analytics Reviews in Five Different Domains: A Bibliometric Summary. *Sustainability*, *15*(5), 4026.
16. Tyagi, A. K., Aswathy, S. U., & Abraham, A. (2020). Integrating blockchain technology and artificial intelligence: Synergies perspectives challenges and research directions. *Journal of Information Assurance and Security*, *15*(5), 1554