# A study on Implementation of Artificial Intelligence in Automotive Industry towards Human Resources

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## Abstract

*AI is gaining huge traction and is having traits of smart manufacturing. Artificial Intelligence is progressing rapidly, mimicking cognitive skills of humans. In last few years, however, AI has made significant advancements and has attracted significant investment and research attention. Considering future of human resources function or tasks and their response to artificial intelligence, researcher has chosen this futuristic area of research. The new economy will thrive around prediction technology and applications, which make performing arithmetic cheap. Our economic framework and reforms need to be futuristic driven, more aggressive and create enough incentive for research in AI. As the advancement in AI has progressed, it has surely turned into an asset for many of the organizational functions, which either involved too much of human risks or were too routine and repetitive in nature. The study sheds light on the growing integration of AI in Human Resource Management (HRM). This is a conceptual paper based on descriptive research methods. The research draws on data collected from articles, and academic journals. Findings indicate that AI-based tools in automotive industries and most employees favour AI-driven in industries. However, some employees feel that these methods lack the personal touch of human interaction. The scope of this study is limited to automotive industries. The implementation of AI tools in automotive industry is shown to enhance efficiency in HR development. This paper provides valuable insights for researchers interested in understanding AI in automotive industry and also this study explores the impact of Artificial Intelligence (AI) on Human Resources Practices. By focusing on key outcomes such as accuracy, automation, computing power & capacity, real-time experience, personalization, and time-saving & cost saving.*

*Citation: Gayathri NM and Shobharani H. A study on Implementation of Artificial Intelligence in Automotive Industry towards Human Resources, International Journal of Business and Economics Research (IJBER) e-ISSN: 2455-3921; 11.1 (2025): 9-19*

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## Introduction

Artificial Intelligence (AI) has made a big impact, raising the question, "Is it real or artificial?" Industry 4.0 is growing rapidly, with AI playing a key role in intelligent manufacturing. Companies are eager to use AI to boost productivity and stay competitive globally. This is driving HR departments to focus on upgrading skills and improving efficiency, as in the AI era, those who are smart and adaptable will thrive. These changes are challenging experts to explore how AI compares to human intelligence, which is the foundation of AI's creation. AI is becoming more common and is increasingly used in everyday life. It's a technology that not only helps perform tasks like humans but also aims to think like humans. AI is advancing quickly and mimicking human cognitive abilities, but it is still far from being better than humans. Currently, AI provides predictions, not judgments. However, the day may come when AI will be able to make judgments too. In recent years, AI has made great progress, attracting significant investment and research. Big tech companies like Google, Microsoft, IBM, Amazon, Apple, and Facebook are heavily investing in AI and have dedicated research labs. Leading universities and governments are also investing in AI and machine learning research. While major companies are at the forefront of AI development, start-ups are also getting involved.

AI automation in support functions means using AI to improve tasks in areas like HR, Finance, Legal, Marketing, and Customer Support. For example, AI tools can automatically screen and hire candidates, AI bots can help employees, and AI bots can assist with customer support.

## Objectives of the Study

1. To study the role of Artificial Intelligence in Automotive Industry.
2. To study the stages and components of Artificial Intelligence on Human Resources in Automotive Industry.

## Research Methodology

The current study has been based on the conceptual data obtained from secondary source involved and engaged in automotive industry 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 automotive industries in Karnataka. The researcher has made an attempt to describe the current scenario in the Artificial intelligence techniques and HRM pattern, awareness, preference, and perception

## Discussion

### Automotive Industry

The automotive industry is the sector that designs, manufactures, sells, and maintains motor vehicles. It includes the production, distribution, and sale of automobiles, as well as the repair and modification of vehicles.

What the automotive industry includes

- *Design*: The process of creating the design of a vehicle

- *Development*: The process of developing the vehicle

- *Manufacturing*: The process of producing the vehicle

- *Marketing*: The process of promoting the vehicle

- *Selling*: The process of selling the vehicle

- *Repairing*: The process of fixing the vehicle

- *Modification*: The process of changing the vehicle

### Implementation of AI in Human Resource Practices in Automotive industry

**Talent Acquisition and Recruitment**: Talent acquisition is a vital HR function that drives company growth. AI has a significant impact on this area, helping to speed up processes like screening applicants, managing candidate data, scheduling interviews, and answering queries. This saves time and allows HR teams to focus on other important tasks like sourcing talent and promoting job opportunities. AI ensures that candidates match company requirements, making the hiring process quicker and more efficient. Chatbots help identify top candidates, manage their onboarding, and assign positions based on job profiles, streamlining the recruitment process.

**Orientation of New Recruits**: After recruitment, AI systems assist in onboarding new employees by providing essential company information such as job roles, policies, and team details via apps or laptops. This improves HR efficiency and helps new hires adjust

smoothly to their roles. A structured onboarding process also boosts employee retention. AI can automatically answer common questions, verify documents, and customize tasks based on individual roles, ensuring a smoother integration process.

**Training the Recruits**: AI helps employees learn and adapt to their roles by keeping them informed about the latest technologies and skills. It analyzes documents and tests to determine individual training needs and offers personalized skill development based on job descriptions. AI also alerts HR to training requirements, enhancing employee productivity and learning. It supports tailored training programs, allowing employees to develop the skills they need to meet company goals.

**Enhancement of Employee Experience**: Employees now expect a personalized and supportive experience, thanks to automation and a strong focus on customer experience. AI is integrated into every part of the employee journey, from recruitment to career development. It helps HR departments assess job satisfaction and engagement more accurately through customized feedback surveys, ensuring a better overall employee experience

**Stages of Artificial Intelligence**

Industrial Revolution 4.0 has heralded itself silently – moving through the stages of Mechanized Production (1.0), Mass Production (2.0), Automation (3.0) – Connectivity (4.0) will drive the future, where Prediction will be force behind Machine Intelligence. AI is the fourth stage of automation in technological development. As it is shown in *figure no.1.1*, it is known fact that the third stage of technology development i.e., automation has already impacted on job losses of the workers at shop floor in manufacturing industry. And now AI is using cognitive skills and power to perform the human execution task.
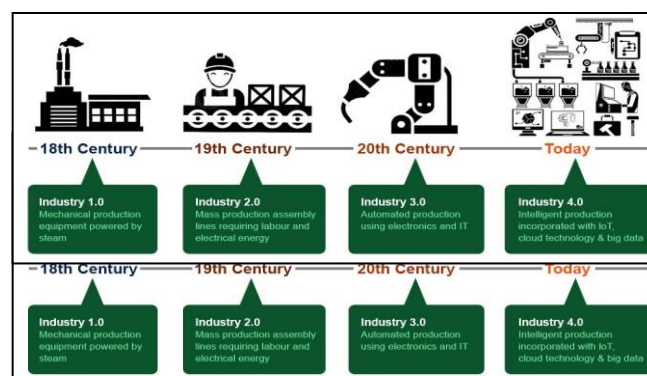


*Figure 1.1* Stages of Automation and Technology

*Source: Techutzpah.com, 2019/qtera.co.id)*

| Centuries | Types of Industry | Components |
|---|---|---|
| 18th century | Industry 1.0 | Mechanical production equipment powered by steam |
| 19th century | Industry 2.0 | Mass production assembly lines requiring labour and electrical energy |
| 20th century | Industry 3.0 | Automated Production using electronics and IT |
| 21st century | Industry 4.0 | Intelligent production incorporated with IoT cloud technology and big data |

*Source: Techutzpah.com, 2019/qtera.co.id)*

**18th Century - Industry 1.0**: This stage refers to the **mechanical production equipment powered by steam**. It represents the beginning of the industrial revolution, where manual labor started being replaced by machines powered by steam engines. This shift was foundational, introducing mechanization in industries like textiles and manufacturing.

**19th Century - Industry 2.0**: During this period, **mass production assembly lines requiring labor and electrical energy** became the norm. The introduction of electrical energy and more complex assembly line methods, especially with figures like Henry Ford, allowed for greater efficiency and the rise of mass consumer goods. This also marked the expansion of factories and the beginning of industrial-scale production.

**20th Century - Industry 3.0**: In this stage, **automated production using electronics and IT** was implemented. Electronics, computers, and later, robotics, allowed for automation of many manufacturing tasks, reducing the need for manual labor in many areas. The use of computer-aided design (CAD) and automation technologies like robotics began in this period, greatly improving production precision and speed.

**21st Century - Industry 4.0**: The current era, marked by **intelligent production incorporated with IoT (Internet of Things), cloud technology, and big data**, brings about the concept of the smart factory. This stage focuses on connectivity and digital transformation, where machines and systems communicate with each other autonomously, leveraging data analysis for optimization. It's characterized by cyber-physical systems, AI-driven decision-making, and more sustainable, flexible, and customized manufacturing processes.

This timeline highlights how automation has evolved from simple mechanical systems in the 18$^{th}$ century to today's advanced, interconnected, and intelligent manufacturing processes. It demonstrates how industrial capabilities have continuously improved, leading to greater efficiency, innovation, and transformation in global industries. The ongoing shift toward Industry 4.0 suggests that we are moving toward highly automated, data-driven systems that can adapt and evolve in real-time.

**Components of Artificial Intelligence**

Artificial intelligence is a technology that self-learns; it consists of multiple technological components that support AI. This is explained in *figure 1.2* through AI Topography.
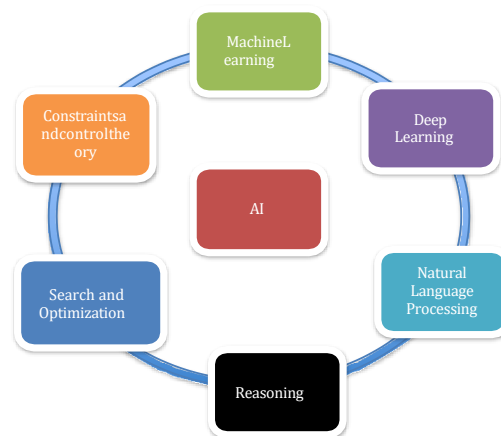


*Figure 1.2* AI Topography (*Source: Allegis Group Report, 2017*)

| Sl. no | AI Components |
|--------|---------------|
| 1 | Machine learning |
| 2 | Deep Learning |
| 3 | Natural Learning Processing |
| 4 | Reasoning |
| 5 | Search and optimization' |
| 6 | Constraint and Control Theory |

*Source: AI Topography (Source-Allegis Group Report, 2017)*

**Machine Learning (ML)**: This is a core part of AI, where algorithms learn from data to make predictions or decisions without being explicitly programmed. It's used in various applications, from recommendation systems to image recognition.

**Deep Learning**: A subset of machine learning that involves neural networks with many layers (hence "deep"). Deep learning has powered significant advancements in fields like computer vision, natural language processing, and speech recognition.

**Natural Language Processing (NLP)**: This branch of AI focuses on the interaction between computers and human languages. NLP enables machines to understand, interpret, and generate human language, which is seen in virtual assistants, chatbots, and translation tools.

**Reasoning**: In AI, reasoning refers to the ability of machines to solve problems or make decisions based on a set of rules or logical inferences. This is central to tasks like decision-making and expert systems.

**Search and Optimization**: AI uses search algorithms to explore possible solutions to a problem and optimize processes for better outcomes. Examples include path finding in robotics and optimizing resource allocation in complex systems.

**Constraint and Control Theory**: This component deals with managing systems subject to constraints (like limited resources) and controlling dynamic systems. It's important in areas like robotics, automation, and operational research, where systems need to adapt to changing environments while maintaining specific conditions.

This list represents a set of foundational AI components that are often used together to build intelligent systems. Each plays a critical role in enabling machines to perform tasks that require learning, understanding, decision-making, and optimization. When combined, these components help in creating more efficient, adaptable, and autonomous systems in various fields, from manufacturing to healthcare and beyond

There are 71 automotive industries using AI in Karnataka, out of which top 12 industries are given below

| Rank | Automotive industry name |
|------|--------------------------|
| 1 | Toyota |
| 2 | Volkswagen Group |
| 3 | Hyundai Motor Group |
| 4 | Stellantis |
| 5 | General Motors |
| 6 | SAIC |

| 7 | Ford Motor Company |
|---|---|
| 8 | Honda |
| 9 | Nissan |
| 10 | Suzuki |
| 11 | BYD Auto |
| 12 | BMW |

*Source*: https://en.wikipedia.org/wiki/List_of_automotive_manufacturers_by_production

**Toyota** holds the top position, indicating it is likely the largest or most influential player in the automotive industry, possibly in terms of production, sales, or global market presence.

**Volkswagen Group** and **Hyundai Motor Group** are also strong contenders, ranking second and third, showing their significant role in the global market.

**Stellantis** (which merged Fiat Chrysler and PSA Group) appears fourth, meaning the brand is competitive despite being relatively new.

**General Motors (GM)** continues to be a major force, ranking fifth, suggesting a long-standing and robust presence in the industry.

Companies like **SAIC** (China's largest automaker) and **Ford Motor Company** rank 6$^{th}$ and 7$^{th}$, highlighting the importance of both Chinese and American automakers in global production.

**Honda**, **Nissan**, and **Suzuki** fall in the 8$^{th}$ to 10$^{th}$ positions, showing a stable presence in the global market but slightly behind in scale compared to the top companies.

**BYD Auto** (a leading Chinese EV manufacturer) at 11$^{th}$ indicates the rise of electric vehicles and China's growing influence in the automotive industry.

**BMW**, at 12$^{th}$, is still among the top players, particularly known for luxury vehicles and strong global appeal.

Overall, the automotive industry is dominated by a few major global players, with Toyota continuing to hold a strong position at the top, while there is also growing competition from both traditional manufacturers (like Ford, Honda, and General Motors) and emerging ones, particularly from China (BYD Auto, SAIC).

## Findings

1) AI technology provides HR leaders Artificial Intelligence is going to play a very major role in formulating strategies and decisions making, due to its power in enabling people analytics.

2) Managers play a crucial role in attracting, retaining, and inspiring top talent within an organization.

3) AI plays a transformative role in improving business performance within organizations.

4) AI powered technologies combined with human experience and insights are key to building today's effective human resources organization.

5) Because of AI implementation new start-ups are coming up.(Basically, AI is fuelling start-up activities).

6) AI can process vast amounts of data and generate insights; it doesn't have the same kind of curiosity that humans possess.

7) Automation has already created lot of unrest in union in shop floors and now AI is creating awareness to enhance skills as per need of job at all levels.

8) Organizations are trying to strike the balance between human resources and AI and making employee's mindset ready to accept the change.

9) Very few employees work on AI in the organization however many will be follower.

10) The job structure or hierarchy may spread horizontally and managerial level however what kind of employment will need depend on the project and organization work culture.

11) The preparedness of organization in terms of strategy to develop their people and the spectrum of implementation of AI is need based because of the nature of demand of the product by customer and climatic conditions.

12) The table demonstrates the strong competition in the automotive sector, with a blend of traditional giants like Toyota and Volkswagen and emerging forces, particularly from China (BYD, SAIC). It also shows a shift towards electric and sustainable vehicles, especially with BYD's rank.

## Suggestions

1) Passenger vehicle manufacturers need to begin their AI transformations now by implementing pilots to gain knowledge and capture short-term value. They should

then establish the AI core to develop an integrated view on AI across the organization. Finally, this will enable Passenger vehicle manufacturers to scale up and roll out an end-to-end AI transformation to systematically capture the full value potential from AI and build up capabilities for their long-term ACES strategies. (Mahindra)

2) Business leaders to be careful and ensure to understand AI well before making a part of organizational strategy in a manner that it benefits all human resources.

3) Organizations should provide opportunities for everyone to thrive.

4) The outcome of the Research will help to create more awareness and enlightenment about the great potentials of AI in developing human talent and organizational growth.

5) Organizations need to stand against competition but at the same time must think how we as organization can utilize the human resources especially in India. Organizations can think of grouping the people in 2 groups: -

   a. Developers-who will create the AI

   b. Input providers and users–Who will collect the data required for AI and use the developed model. (TML)

6) HR /Employee Competency to be mapped not with respect to routine job but Ability of bringing positive change by data driven improvement projects.

## Conclusions

Innovation and advancement have always been key to organizational development. From Industry 1.0 to 4.0, and with Industry 5.0 on the horizon, there has been continuous progress in collaboration between human resources and artificial intelligence. Industry 1.0 aimed to improve production processes and push humans to increase output. Industry 2.0 focused on easing human effort and further increasing production. Industry 3.0 introduced computers to simplify tasks and connect people globally, aiming to compete in a globalized world with greater accuracy and time efficiency. Industry 4.0 brought artificial intelligence, highlighting the cognitive abilities of machines and their ability to handle real-time situations. This shift reduces human involvement in routine tasks and enhances collaboration, allowing humans to work alongside AI to improve outcomes in their respective fields.

Despite the technical studies focused on developing AI algorithms and models, there is still a need for research that examines the impact of AI on human resources,

particularly in terms of employee behavior. Researchers must understand how disruptive technologies like AI are used and how prepared organizations are to adopt them.

## References

Allegis Group. (2017). AI and the World of Work: Embracing the promises and realities: Whitepaper. Retrieved from: www.AllegisGroup.com

Bajpai,H. et al working paper The future of work in the Automotive Sector in India, retrieved from Centre for internet and society, India

http://carnegieindia.org/2016/08/11/india-and-artificial-intelligence-revolution-pub-64299

Digital Transformation Institute, Capgemini Consulting. (2017). Turning AI into concrete value: the successful implementers' toolkit. Retrieved from https://www.capgemini.com/resources/artificial-intelligence-where-and-how-to-invest

European Automobile Manufacturers Association (2020), ACEA Position Paper: Artificial Intelligence in the automobile industry – November 2020.

Faggella, D. (2016). Exploring the risks of Artificial Intelligence. Retrieved from https://techcrunch.com/2016/03/21/exploring-the-risks-of-artificial-intelligence/

Forbes India blog, Artificial Intelligence–key-challenges and opportunities.

Jarrahi, M. H. (2018). Artificial intelligence and the future of work: Human - AI symbiosis in organizational decision making. *Business Horizons*, 61(4), 577-586.

Khatri,S., Pandey,D.K., Penkar,D., & Ramani,J. (2020). Impact of Artificial Intelligence on Human Resources. In Data Management, Analytics and Innovation (pp. 365-376). *Springer, Singapore*.

https://www.forbes.com/sites/theyec/2018/01/10/23-trends-that-will-shake-the-business-world-in-2018/#385f4b5d583