# A Case Study of Artificial Intelligence is being used to Reshape Business

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*Abstract— AI is one of the emerging technologies with such a long record which is constantly changing and growing in the corporate world. We will explain the modern AI basics and various aspects, applications of AI, and its future in business throughout this paper. Many businesses benefit from AI technology by lowering operational expenses, improving efficiency, and expanding the customer base. AI is made up of a variety of tools that allow computers to process massive amounts of data using smart technologies such as machine learning and natural language processing. Many customers now value AI-powered everyday technologies such as credit card fraud detection, e-mail spam filters, and predictive traffic alerts. The field of artificial intelligence is shifting toward developing intelligent systems that can effectively collaborate with people, including innovative ways to develop interactive and scalable ways for people to teach robots. The Vehicle Integrated Artificial Intelligence System is the focus of this paper.*

*Keywords— Vehicle Integrated Artificial Intelligence System (VIAIS), Machine Learning (ML), Natural Language Processing (NLP), Expert System (ES), Robotic Process Automation (RPA)*

## I. INTRODUCTION

Artificial intelligence is a field of study that describes the ability of machines to learn like humans and to respond to specific behaviors, also known as (A.I.) The intelligence displayed by machines or software is referred to as artificial intelligence. McCarthy coined the term in 1956. Artificial intelligence is a method of teaching a computer, a computer- robot, or a piece of software to think intelligently in the same way that intelligent humans do. Intelligence is a non-tangible concept. It is made up of reasoning, learning, problem-solving abilities, perception, and linguistic intelligence [9]. AI can be viewed from several angles. (i) Intelligence- from the stand- point of intelligence, artificial intelligence is making machines "intelligent"-behaving as we would expect people to behave. (ii) Business -From a business standpoint, AI is a collection of extremely powerful tools and methodologies for applying those tools to solve business problems. (iii) Programming: AI includes the study of symbolic programming, problem solving, and search from a programming standpoint. The goals of AI are as follows: (i) to create an expert system—a system that exhibits intelligent behavior, learns, demonstrates, explains, and advises users. (ii) Embedding human intelligence in machines by developing systems that understand, think, learn, and behave like humans [8].

Artificial intelligence (AI) is a science and technology that is based on disciplines such as computer science, biology, psychology, mathematics, and engineering. The development of computer functions associated with human intelligence is a major focus of AI. Various AI-related fields- (i) Machine Learning (ML): Machine Learning is a system that can learn from data by continuously improving itself without the intervention of a programmer. Machine Learning provides algorithms, tools, data, and interfaces through which all learning occurs in the same way that humans learn from experience. Machine Learning can generate rules based on data and output [6]. (ii) Natural Language Processing (NLP) – this is an AI method for interacting with humans. We can communicate with the system using a natural language such as English. For example, a robot will only perform a task based on our guide- lines. With the help of NLP, a computer can perform useful tasks by using speech and written text as

input and output, respectively. (iii) Expert System (ES)- An expert system (ES) is a type of advanced human intelligence and expertise that solves complex problems and issues in a specific domain such as medicine, science, engineering, and so on. It uses facts and heuristics to solve complex decision-making problems and provides explanation and advice to users. To achieve the goals, ES employs serial processing and can be well-organized step by step. (iv) Image Recognition System (IRS): IRS is a vision technology that can recognize objects, people, and locations in images. Image recognition is used in a variety of machine-based visual tasks, such as image content search and guiding autonomous robots, self-driving cars, and accident-avoidance systems. Image recognition applications include smart photo libraries, targeted advertising, media interactivity, and enhanced research capabilities [15]. Robots are complex machines that must be modelled, designed, sensed, actuated, and controlled in order to move. Numerous tasks that do not require human intelligence have already been replaced by machines in many industries.

## II.    AI AND ITS APPLICATIONS

AI applications are useful in homes, schools, and hospitals. Most well-known research universities, such as IIT and IIM, as well as major corporations such as Google, Amazon, and Facebook, are implementing AI applications to improve the company's efficiency and consistency. Google is utilizing AI to improve the accuracy of its results and to provide a more personalized experience for each user.

### 2.1 Gaming with AI

Willy Higginbotham, a physicist, invented the first video game in 1958. The game was called "Tennis for Two," and it was played on an oscilloscope. The first game was played on a computer called "Space war" by Steve Russell of MIT. The most common application of AI is computer games. Although games are commonly associated with entertainment, they have a wide range of applications, including military, corporate, and advertising applications. In strategic games such as chess, poker, tic-tac-toe, and others, where the machine can think based on heuristic knowledge for a large number of possible positions, AI plays a critical role. Video games have advanced dramatically in the last ten years. In the recent past, artificial intelligence (AI) has in recent years, AI has enabled video game characters to learn our behaviors, respond to stimuli, and react in unexpected ways. The game 'Middle Earth: Shadow of Mordor' was released in 2014. It is the best illustration of the unique personalities assigned to each NPC (Non- Player Character), their past

interaction memories, and their varying objectives. Shooting games, such as 'AlphaGo' and 'Dark Forest,' for example, employ AI, with enemies capable of analyzing their surroundings in order to find objects or perform actions that will aid in their survival and increase their chances of victory. It is quite simple to use AI in video games [9].

### 2.2 Healthcare with AI

Hospitals are implementing machine learning for better diagnoses of the patients. IBM's Watson is one of the best-known technologies applying artificial intelligence. The system collects data from various available sources to form a hypothesis and on the basis of this provides a confidence scoring schema [6]. There are numerous common ways in which AI is changing and will continue to change healthcare today and in the future. I Management of Various Medical Records- Data management is a critical aspect of AI. This step entails analyzing the patients' medical records and past history, as well as storing, reformatting, collecting, and tracing data for faster access. (ii) Job Repetition- Robots can per- form X-rays, CT scans, data entry, and other repetitive tasks more accurately and quickly than humans. (iii) Customized Treatment - By analyzing data, reports from patient files, and clinical expertise, AI systems assist in selecting the best and most customized treatment procedure. (iv) Health Monitoring-Wearable health trackers, such as those made by Fitbit, Apple, Garmin, and others [8].

### 2.3 Business with AI

Artificial intelligence has numerous applications in business. Most of us interact with artificial intelligence in some way on a daily basis. AI can assist a business by doing three things: I Improve Business Processes- AI has the potential to improve business processes by promoting greater efficiency, output, and less interruption across businesses of all sizes. (ii) Reduce Costs- Several businesses use Robotic Process Automation (RPA), which reduces operational costs and related expenses by up to 65 percent. (iii) Revenue Maximization- The majority of businesses are increasing their revenue by utilizing AI tools with embedded AI capabilities to improve sales productivity and customer interaction [1].

### 2.4 Transportation with AI

Artificial intelligence has numerous applications in business. Most of us interact with artificial intelligence in some way on a daily basis. AI can assist a business by doing three things: I Improve Business Processes- AI has the potential to improve business processes by promoting greater efficiency, output, and less interruption across businesses of all sizes. (ii) Reduce Costs- Several businesses use Robotic Process Automation (RPA), which

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## 2.5 Fraud Detection

Nowadays, the risk of fraud in financial services is becoming a major concern. As fraud detection tools and machine learning become more powerful, AI aids in the reduction of financial fraud. Credit card fraud is one of the most widespread types of cybercrime, and it is being exacerbated by the rise in online transactions. Because of the speed with which financial losses can occur when credit card fraud occurs, intelligent fraud detection techniques are becoming increasingly important. According to a recent survey conducted by security firm McAfee, the current cost of cybercrime is estimated to be 0.8 percent of global GDP. Machine learning technology reduces fraudulent activities by collecting massive amounts of data related to them [4].

## III.     AI IMPACT ON TRANSPORT

Transportation is a physical means of communicating with the rest of the world. It allows a person to travel to various locations on or off the planet. Its journey began with the invention of the wheel. Then various modes of transportation such as land, air, and sea were discovered. People used to travel from one location to another using bullock carts, horse carts, bicycles, and so on. As time passed, new technology emerged that allowed humans to travel using vehicles that ran on fuel. Karl Benz, a German inventor, patented his Benz Patent-Motorwagen in 1886, and thus this year is regarded as the birth year of the modern car. In the year 1908, the Ford Motor Company produced the first car, the Model T, which was well received by the general public. However, as with any positive step, there are some dark clouds in the transportation industry. Today's transportation industry is confronted with a slew of issues that arise when system behavior is too difficult to model in a predictable pattern, as a result of factors such as traffic, human error, or accidents. In such cases, AI can help with the unpredictability [16].

## 3.1 AI Applications in Transport

• Railway: The majority of train accidents are caused by derailment. Train operators can obtain situational intelligence by analyzing real-time operational data in three dimensions: spatial, temporal, and nodal. Fleet management and asset maintenance with remote condition monitoring using non-intrusive sensors for monitoring

signals, track circuits, axle counters and their interlocking subsystems, power supply systems including voltage and current levels, relays, and timers have all contributed significantly to the reduction of accidents [11].

• Parking system: Parking availability is a major issue in Indian cities. AI can help optimize parking by reducing vehicle downtime and increasing driving time. Parking guidance systems assist drivers in locating available parking spaces while on the road network and close to their destination. Furthermore, the parking sensors alert the driver to the presence of other vehicles while the vehicle is parked [16].

• Route Optimization: With network-level access to traffic data, AI can assist in making smart predictions for public transportation journeys by optimizing total journey time, which includes access time, waiting time, and travel time. It can direct the individual to his or her destination by indicating the various turns and movements made on the road [10].

• Intelligent System: Real-time dynamic decisions on traffic flows such as lane monitoring, access to exits, toll pricing, allocating right of way to public transportation can be made using an intelligent traffic management system that includes sensors, CCTV cameras, automatic number plate recognition cameras, speed detection cameras, signalized pedestrian crossings, and stop line violation detection systems, as well as AI.

## IV.     MAJOR ISSUES IN TRANSPORT

Because of their interconnections with other sectors and importance in both domestic and foreign trade, mobility and transportation are the backbone of the global economy. The majority of passenger and freight traffic in India is transported through roads and railways. Managing the whole system manually is cumbersome and costs are high. As of now, the Indian public is facing an acute shortage of road and railway connectivity which results in poor performance at various levels.

• Congestion: Despite having the world's largest transportation networks, India suffers from traffic congestion due to human error and poor traffic flow management. Nobody wants to be in this predicament. It is stressful, causing those unfortunate enough to get caught in it to arrive later than intended at their destinations and making travel time longer. [13].

• Infrastructure: The creation of public transportation infrastructure has lagged behind in the overall debate of transportation policy design, both at the national and regional levels, with the emphasis on promoting and

expanding the private car and its associated infrastructure [8].

• Deaths: According to a PIB released in March 2017 by the Ministry of Road Transport and Highways (MORTH), there were 501,423 road accidents in the country in 2015, with 146,133 fatalities.

## V. IMPACT ON TRANSPORTATION NETWORK STRUCTURES USING AI

The goal of planning is to recognize community needs and determine the best way to address them while taking into account social, environmental, and economic factors in transportation. Automotive manufacturers have been working on adding a variety of new technology to existing car management systems over the past few years. They are primarily concerned with boosting safety, fuel efficiency, and driver and passenger comfort. The Network Design Problem includes developing an effective road method for transportation planning [2]. It can be a Continuous problem as existing infrastructure capacity changes (expanding lane width, median, and shoulder area), a Discrete problem when more infrastructure is added, or a Mixed of Continuous and Discrete problems. NNs for road planning, architecture, and modelling were the subject of previous research in the 1990s.For example, reference used a parallel neural network method to model the spatial relation- ship between transportation and land-use planning. Following that, the focus of research shifted to raster algorithms, which are better for urban planning because they don't depend on existing ties and nodes to find the best direction [12]. Today, the emergence of massive amounts of data combined with sophisticated algorithms has piqued the interest of most re- searchers machine learning is being used to construct patterns in the data. On a virtual network, the GA and SA algorithms were tested and their efficiency was compared. When demand is tiny, SA uses less computing power than GA to find the best value. However, if GA performs further computations, it will be able to find a better optimal solution [17]. In addition, vehicle route planning is necessary to avoid traffic congestion and travel time delays. The ant colony algorithm, according to many writers, is a promising solution for the vehicle routing problem [3]. While concentrating on using the BCO Algorithm to solve a routing and wavelength problem. Intelligent Transportation Systems is another field where AI implementations have seen rapid growth (ITS). Using a range of technology and communication systems, these systems seen to reduce traffic congestion and increase driving experience. They collect vital information that can be used to train machine learning algorithms. A deep learning framework has also been proposed to equip ITS computers with signal processing and fast computing analytics functions [5]. As ITS evolves, data complexity will increase, necessitating the use of deep learning techniques to find patterns and features in these data in order to achieve a more connected transportation system. Signal traffic control may also benefit from ANNs based on microscopic simulated data, two NNs systems were developed to handle the road more efficiently [7]. The first system regulates traffic signals, while the second forecasts potential traffic congestion. Furthermore, as the flow varies regularly, reinforcement learning NNs are used to adjust the system's parameters and cycle duration. AI is a dynamic research field that is constantly evolving, and new approaches and applications are implemented on a regular basis to take advantage of AI's strengths to enhance road planning, decision-making, and management [14].

## VI. FUTURE SCOPE

Looking ahead to the long term, much research is required to create more cognitive systems and achieve a higher level of autonomy. Autonomous vehicles will become more sophisticated in a more abstract, human-like manner, that is, in comparison to other objects. Follow this road to the red church, turn right, and come to a halt in front of the bakery with a large tree. More work will also be required to improve the difficult interaction between autonomous vehicles and other traffic participants, both robots and humans. Information about the behavior and intentions of other traffic participants must be gathered for this purpose.

Overall, much more work is needed before autonomous vehicles and well designed and an intelligent system can participate in real-world urban traffic as well as complex off-road scenarios safely and robustly.

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