

**ROLE OF AI IN ENRICHING CULTURAL & SPIRITUAL TOURISM IN MAHAKUMBH 2025**

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**Abstract:**

*In the field of technology, Artificial Intelligence (AI) is a recent and rapidly expanding concept. It offers various advantages like less human errors, objective decision-making, round-the-clock availability, automation, increased productivity & efficiency, fraud detection and many more. It is a potential tool for smooth and fast paced functioning of a number of industries including healthcare, finance, retail, transportation, travel & tourism, manufacturing, education and entertainment etc. In the travel and tourism sector, it benefits through personalized travel planning, dynamic pricing, customer support, navigation and sustainable tourism. In the month of January and February 2025, the world's biggest religious tourism event, Mahakumbh, is taking place at Prayagraj in the Uttar Pradesh state of India. Despite being a spiritual event, this time's Mahakumbh is the ideal fusion of technology and spirituality. The Government has made arrangements for a multilingual digital lost-and-found centre for visitors, a dedicated website and app, an AI-powered chatbot in 11 languages and QR code-based passes for both people and cars. With an emphasis on Mahakumbh 2025, this research study examines the application of AI in a variety of business domains.*

**Key Words:** Artificial Intelligence, Travel and Tourism Sector, Mahakumbh 2025.

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**Introduction:**

Artificial Intelligence is a computer program that has the ability to think and learn on its own. It is a simulation of human intelligence into machines to do things that generally human beings do. It enables machines to learn from experience, adapt to new information, and perform tasks that require human intelligence. AI operates on different components such as data to analyse and make decisions. AI is rapidly advancing to the point where it can potentially create anything we imagine, blurring the lines between human and machine-made content. Another component is computing resources like graphic processing units (GPUs), to streamline these processes. AI provides multiple benefits:

1. It significantly reduces human errors and increases accuracy.
2. AI processes large amounts of data, identifies

patterns and trends and assists in decision making.

3. AI delivers content based on user requests.
4. AI provides unbiased decisions which are objective oriented.
5. It helps in automation of routine, monotonous and boring tasks.
6. It is not only used in business operations but also in daily life including Google Maps, Alexa, Siri, taking selfies, making calls, responding to emails, etc.
7. AI can be very useful in handling risky situations like any natural or man-made calamity, defusing a bomb, exploring the deep in the oceans or mining for coal and oil.
8. It has the ability to detect and prevent fraud by analysing transaction patterns and can identify irregularities that may indicate fraudulent activities.

9. AI can provide personalized recommendations based on individual preferences and behaviour as it can analyse past purchases, browsing history, and demographic information. (Duggal, 2025)

#### **Objectives of the Study:**

- To analyse the benefits of Artificial Intelligence
- To understand the implication of Artificial Intelligence in different sectors of business.
- To study various AI technologies and their applications in Mahakumbh 2025.

#### **Research Design and Methodology:**

The research methodology for this research paper is exploratory and has been conducted based on the Secondary sources of data. The data is gathered from relevant research papers, newspapers, journals, published and unpublished sources, etc.

#### **Limitation of the study:**

Focus being on the case of Mahakumbh 2025 only secondary data has been collected for this research paper.

#### **Application of Artificial Intelligence in Businesses:**

Considering the benefits that AI offers, it is a powerful tool used across various business domains.

**Healthcare** – AI can streamline administrative processes and improve patient outcomes. It can analyse medical images such as X-rays, MRIs and CT scans, to detect tumours, fractures and infections accurately. It can suggest tailor treatments to individual patients by analysing health history and schedule appointments. Robotic surgery is performed on a large scale by providing timely cure to the patients irrespective of geographical boundaries.

**Finance** – In the finance industry AI can detect frauds, analyse historical data and suggest investment strategies. It is very easy to calculate credit score more accurately with the help of AI.

**Retail** - AI algorithms can analyse customer behaviour, preferences and can recommend products to customers by increasing sales and customer loyalty. AI systems

can be very effective in inventory management as it can predict demand and optimize inventory levels, reducing waste and ensuring products are available when needed.

**Transportation** – Self-driving cars and trucks are a revolution in the transportation industry where sensors and machine learning can navigate and make driving decisions better by reducing accidents. It can also provide updates for maintenance of cars, suggest better routes for travel, reduce fuel consumption and save travelling time. It can monitor and manage traffic flow in real-time, reducing congestion.

**Manufacturing** - AI predicts equipment failures for example, allowing for proactive maintenance by detecting defects and ensuring product quality. It can perform repetitive and dangerous tasks by increasing productivity and worker safety.

**Education** – AI platforms can adapt to individual student needs, providing personalized learning paths and resources. It can grade assignments and exams, saving time for the teachers. It can also assist in administrative tasks of the educational institute.

**Entertainment** – AI algorithms are capable of analysing user preferences and behaviour to provide personalized content recommendations on streaming platforms. Video editing, music composition like cutting, filtering, and adding effects are possible with the help of AI.

**Agriculture** - AI applications help to optimize farming practices, increase crop yields and ensure sustainable resource use. AI-powered drones and sensors can monitor crop health, soil conditions and weather patterns, providing valuable insights to farmers. (Biswal, 2025)

#### **Use of Artificial Intelligence in Travel and Tourism Sector:**

The integration of artificial intelligence in the travel and tourism sector is revolutionizing how businesses

operate and how travellers plan, experience and share their journeys.

### 1. Personalized Recommendations

- **Tailored Experiences:** AI algorithms analyse customer data, preferences and behaviour to provide personalized travel recommendations such as destinations, accommodations and activities.
- **Dynamic Pricing:** AI can adjust pricing based on demand fluctuations, customer behaviour and market trends, optimizing revenue for airlines, hotels and travel agencies.

### 2. Travel Behaviour Analysis

- **Smart Personalization:** AI enhances customer interactions by aggregating data from multiple sources like social media, review sites, etc.
- **Dynamic Itinerary Planning:** AI can help travellers build dynamic itineraries based on real-time information of weather conditions, flight delays or local events.

### 3. Travel Safety & Security

- **Facial Recognition and Biometric Screening:** Many airports and hotels are using AI-driven facial recognition technology to enhance security and streamline processes such as check-in and boarding.
- **Risk Assessment:** AI systems can monitor global events (natural disasters, political unrest) and assess risks associated with travel to specific destinations by providing timely alerts to travellers and companies.

### 4. Augmented & Virtual Reality

- **Virtual Tours:** AI-driven augmented reality (AR) and virtual reality (VR) applications allow potential travellers to explore destinations and accommodations before making a decision enhancing engagement and interest.
- **Interactive Experiences:** AI can facilitate

immersive experiences at tourist sites through AR apps that provide information and entertainment based on the user's location. (Gupta, Modgil, Lee, & Sivarajah, 2023) (Koo, Xiang, Gretzel, & Sigala, 2021) (Ray, Dey, Chakraborty, & Bandyopadhyay, 2024)

**Application of Artificial Intelligence in Mahakumbh 2025:** The Kumbh Mela is the world's largest religious gathering celebrated in India. It is a belief that during the fight between Gods and demons the Amrit spilt at 4 places - Prayagraj in Uttar Pradesh, Haridwar in Uttarakhand, Nashik in Maharashtra and Ujjain in Madhya Pradesh. Therefore, the Kumbh Mela is hosted at these 4 places. Every 6 hours there is Ardh Kumbh, every 12 years there is Poorn Kumbh and every 144 years there is Maha Kumbh. The year 2025 has witnessed Maha Kumbh Mela from 13th January to 26th February in Prayagraj. More than 20 crore people attended the Kumbh Mela in 2019 in Prayagraj. Over 40 crore people were expected to attend the Maha Kumbh in 2025 at Prayagraj. There were 35 existing permanent ghats and the state Government of Uttar Pradesh constructed nine new ghats in Mahakumbh city to facilitate bathing for devotees. The Mahakumbh of 2025 is the perfect blend of culture, spirituality, faith and the latest technology. The world's biggest public gathering and collective act of faith used cutting-edge technology for excellent management during the 40 days event. The event is a massive economic opportunity, projected to generate \$23 billion this year Hindu 2025.

1. **AI-powered facial recognition** - It also assists authorities in identifying missing persons or tracking individuals with criminal backgrounds. Face-level cameras have been placed strategically to help prevent stampedes by sending real-time notifications to officials on crowd build-up and sudden mass surges.

2. **AI-powered Chatbot** – It provides navigation, parking, staying places and other necessary information to the devotees quickly. The devotees can also get information about the historical, cultural and religious significance of Mahakumbh on portals and applications with chatbots assistance which is available in 11 languages.
3. **AI-enabled cameras** – Over 2,750 CCTV and AI cameras have been installed to track movements, marking a significant surveillance effort. The event is continuously monitored by sophisticated cameras that are equipped with facial recognition and anomaly detection software. These devices have improved the safety by significantly lowering emergency response times.
4. **AI-Powered Crowd Management** – AI powered surveillance systems detect congested locations using heat maps and facial recognition. Early indications of possible crowding are provided by predictive analytics by enabling authorities to take preventative action. The risk of stampedes is greatly decreased by these technologies.
5. **Use of drones** - Drones equipped with high-definition cameras and AI capabilities were patrolling the skies during Mahakumbh. They record live videos which are then examined to identify odd activity or crises. There are underwater drones also that can dive 100 meters in the river to provide round-the-clock surveillance at the Sangam area. It helps in tracking any kind of tragedy while the devotees are taking bath in the rivers.
6. **RFID Wristbands** – The pilgrims will be provided with RFID wristbands that allow tracking of location in real time. This will help to locate lost members in the huge crowd.
7. **AI-Enabled Healthcare Services** – Real-time medical consultations and treatments are offered via mobile healthcare units outfitted with AI diagnostic technologies. AI analyses data from wearable devices and environmental factors to predict potential health issues by enabling proactive care. These innovations ensure that pilgrims in need regardless of how far away they are receive medical assistance.
8. **IoT for Smart Infrastructure** – Internet of Things (IOT) can be very handy in Smart Water Management and Waste Management. It can monitor water quality in the rivers and ensure the timely distribution of clean water for the devotees. Sensors in trash bins alert authorities when they need to be emptied by maintaining cleanliness across the event.
9. **Virtual Reality for Spiritual Engagement** – Those who cannot physically visit Prayagraj virtual reality is a boon for them. Anyone across the globe can participate in rituals and experience in the mega event virtually.
10. **AI-Driven Decision Making** – AI assists authorities in making informed decisions that enhance the overall event experience. From optimizing traffic flow to ensuring food quality, AI models analyse vast amounts of data to provide actionable insights. These systems enable real-time decision-making, ensuring that the event runs smoothly despite its massive scale. (Jeelani, 2025) (Bora, 2025)

**Conclusion and Future Scope:** As technology continues to evolve its role in several sectors, it will likely to expand offering even more innovative solutions to enhance both operational effectiveness and customer satisfaction. As AI continues to advance across various fields, distinguishing between human-created and AI-created content will become increasingly challenging. From ensuring a safe and enjoyable experience, the integration of AI technologies has the potential to transform Mahakumbh 2025 into a more inclusive, efficient, and enriching event for all. By offering information on

facilities like ramps, seating areas and rest zones, AI can ensure that all visitors regardless of their physical abilities can participate in the event comfortably. The drones, the CCTVs installed at the event have ensured more safety and quick response of the concerned authorities. Thus, it can concluded that Mahakumbh 2025 is the perfect blend of spirituality and technology.

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