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Role of Information Communication and Technology at Kumbha Mela – 2019 (Prayagraj)

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ABSTRACT- Adopting technology in every aspect of life is a major part of our development. Life cannot be possible without of use of technology, and in this technical world, information has a significant value. This information is then communicated through a proper channel to achieve and solved our daily life problems and make our life easier, so we can say that ICT plays a crucial role in our daily life [1]. The ICT is also not untouchable, especially when a large gathering for religious and spiritual have to handle. Administration and management for such a large gathering is a complicated task. Any single negligence in planning and management may result in an unfortunate incident. People may lose their life. The "Kumbha-2019" world largest gathering is managed and handled with the help of Information communication and technology. In this paper, the role of ICT in KUMBHA-19 is discussed to show how the crowd is managed. For the first time, such a large gathering that uses Artificial intelligence for the Security and surveillance, traffic management system including railways and buses, waste management, and sanitation are smoothly operated with the help of technology.

Keywords: ICT, Crowd Management, Spiritual Crowd, Kumbha, Mela

I. INTRODUCTION

Kumbh Mela is not just a mere festivity like Diwali and Holi but holds a lot of importance for people in India. People look up to Kumbh Mela with the highest regard, as this event gives them a golden opportunity to liberate themselves from the miseries and sufferings of life. It enables them to take a holy dip in the sacred water and wash away all the sins they have committed in the past. People come from different parts of the country to be a part of this sacred ceremony. It is believed that taking a holy dip in water paves the way for the attainment of Moksha. However, it is of paramount importance that the person who is performing the rituals has complete faith and trust in the power of divinity. Mentions have been made about the Kumbha Mela in the Brahma Purana and Vishnu Purana, which clearly states that a person who performs the bathing ceremony during the month of Magh at Prayag (Allahabad) derives manifold benefits, which surpasses the reward obtained by performing numerous Ashvamedha rituals. As Kumbha is faith, similarly, technology is an important aspect of human life. The emerging trend of technology has become life easier. We can't imagine a single day without the use of technology. In everyday life, it's playing a vital role, and Kumbha is not also untouched by ICT. At Kumbha, technology plays a vital role, such as crowd management, security and surveillance, garbage management, Lost and Found (khoyapaya Kendra), and conveyance management system.

The rest of the paper is structured as follows. In section 2, the literature survey related to crowd management has been discussed. Section 3 discusses the role and importance of ICT in crowd management, and section 4 finally concludes this paper.

Literature Survey: Planning and managing the event becomes a difficult task with mass gatherings including a large number of people. The Kumbh Mela is one that is an internationally renowned religious congregation [2]. This creates the substantial challenge of creating a temporary city in which millions of people can live for a defined period. This type of large gathering required adequate supplies of clean water, proper food, human waste disposal, and sanitation management, emergency medical services and transportation, etc. In Mahakhumb 2013, a report [3,] of a case study focused on planning and management for water, sanitation, and hygiene conditions. The fieldwork related to this was completed in just 21 days i.e. from January 21, 2013 to February 2, 2013, as shown in an observational cross-sectional study. In such a large gathering, there is a very high risk for failure of crowd management, and that leads to an accident like a stampede. On

February 3, 1954, at Allahabad [4], during the Kumbha Mela, in the presence of high profile delegates and politicians, a crowd management failure has occurred near about 800 pilgrims who lost their lives, and more than 2000 pilgrims suffer from non-fatal injuries. This incident happened at the main bathing ("shahi-snan") day of Mauni Amavasya (New Moon), where near about 4-5 million pilgrims has been participated in the "shahi-snan". This Kumbha was the first Kumbha after the Independence. Many researchers have been done for crowd-related disasters at crowded places collecting various aspects of crowd behavior. Many researchers [5, 6] explain the cause and required solution of rectification to handle such events. Abha Trivedi and Mayank Pandey [7] have proposed agent-based modeling for religious crowd gathering and simulated their work in the NetLogo simulator. In other research [8], they have done simulation for movement of pilgrim at Kumbha-19 at Allahabad railways station. In this section, the literature survey has been discussed, and in the next section role of information and communications technology will be discussed. Role of Information and Communications Technology (ICT): Information and communications technology (ICT) is an extensional term for information technology (IT). In daily life, we can't proceed a single step with the use of technology. It plays an important role in daily life. In Kumbha, it plays an important role. A few of them is discuses following:

A. Security surveillances: In a first, Kumbh Mela, the largest religious gathering on earth, is witnessing the use of artificial intelligence for better crowd management this year. The 2019 Kumbh Mela will commence in Prayagraj city of Uttar Pradesh from January 15 till March 4. This is the first time that Artificial Intelligence (AI) is used in Kumbh Mela. Over 1,100 CCTV cameras used to monitor various movements across the Mela area spread across 3,200 hectares," said UP Police at Mela [9]. Artificial Intelligence is used by the Integrated Command, and Control Centre of the police wherein the security personnel can see the visuals of crowd movement and assess the crowd size. At the same time, they can also monitor anything suspicious. Artificial Intelligence is a way of making a computer, a computer-controlled robot, or software think intelligently, in the similar manner humans think. In figure 1, CCTV cameras (Dome and Bullet) are installed at various points at Mela premises. The Bullet camera is used for long-distance coverage, whereas the dome camera (in round shape) is used for wide range coverage. In figure 2, a drone equipped with a digital camera keeping eyes on Mela in the air. Further, these data are then transferred to a centralized server where police personal, with the help of Mela management taking decision-related to the crowd.

Fig. 1. CCTV Camera deployed at Kumbha

Fig. 2. Drone for surveillance

B. Facial Recognition: In such a large gathering, there must be a system that detects the suspicious movement of the people. With the use of AI and image processing based method facial recognition is possible. Despite challenges -- with devotees walking with bags on their heads and dust due to continuous movement, the cameras could track suspicious individuals. After such faces were filtered, police teams would receive an alert. This was followed by the suspect's questioning by the police. The cameras were connected to the group's two Integrated Command and Control Centres (ICCC) - one at Kumbh and the other at Police Lines in Prayagraj. These centers provided the authorities with crucial information like Automatic Number Plate Recognition, Red Light Violation Detection System, and Face Recognition System.

C. Crowd management: Proper planning of Traffic management at Kumbh is also a part of ensuring coordination of traffic movement on multiple channels, which will be integrated with Google maps. To facilitate the visitors, deployment of new telecommunication services, banking services, and water ATMs are being carried out for the entire Mela area. The Kumbh Mela, or the festival of the sacred pitcher, is the largest public gathering as the event draws tens of millions of pilgrims over the course of approximately 48 days to bathe at the sacred confluence of the Ganga, Yamuna, and the mythical Saraswati. This year, the auspicious bathing dates are Makar Sankranti (January 15), Paush Poornima (January 21), Mauni Amavasya (February 4), Basant Panchami (February 10), Maghi Poornima (February 19), and Mahashivratri (March 4). The Mela area is lit by setting up more than 40,000 LED lights Crowd Control Management Techniques of Kumbh Mela using big data analytics: data collection process will involve three disparate data sources, wrist-bands, cell phone (CDRS analysis), and video recordings. Each of these raw data sources will require completely different methods of processing, and the resulting analysis will likely be at different spatial and temporal scales.

D. CCTV Equipped with sensors, these cameras would raise a soft alert when the crowd density exceeded three people per square meter and a stronger alert on recording five people or more.

E. Indian Railways: Indian Railways uses Artificial Intelligence-based technology for crowd control at stations. To tackle the massive rush of passengers during the upcoming Kumbh Mela, Indian Railways is all set to use technology, including Artificial Intelligence (AI), in a big way. The national transporter will deploy as many as 800 special trains. According to an IANS report, in a first of its kind initiative in Indian Railways, IBM Intelligent Video Analytics will be pressed into service. This is done to ensure crowd control at not only railway stations but also adjoining areas during the ArdhKumbhMela. Additionally, a new mobile app called Kumbh Rail Servais was launched by the national transporter to disseminate information to train users and others traveling to Kumbh Mela.

F. Sanitation: The Mela authorities will install GPS tracking devices in over 200 vehicles is deployed for garbage collection to maintaining sanitation at the venue during the Kumbh Mela. The GPS-fitted vehicles are transporting the garbage collected directly to the Basware garbage disposal plant in Naini from the Kumbha Mela venue. The Mela authority would also work for on-site sludge management to keep the ground clean. Moreover, around one lakh mobile toilets have been installed. Moreover, over 11,000 sanitary workers would be employed for swiping the premises and solid waste management. A total of 40 compactors 120 trippers are used for disposing of the trash. Figure 3 shows the toilets installed at Mela premises, and figure 4 depicts the water facilities provided to pilgrims.

G. Managing river transport: The Inland Waterways Authority of India (IWAI) has been working hard towards facilitating safe passenger movement for Kumbh Mela. It has set up four floating terminals, one each at, Kilaghat, SarasvatiGhat, Naini Bridge, and SujawanGhat, and deployed two vessels, CL Kasturba and SL Kamla, for pilgrim movement. The government also plans to start an airboat service from Varanasi to Prayagraj. The airboat will have an engine of a vehicle and carry 16 people at a time. It can cruise up to 80 kilometers per hour, even in shallow water.

Fig. 3 Toilet installed at Kumbha

Fig. 4. Water availability

H. Digital Lost and Found center: In such a large gathering, the chance of losing personal belongings and missing humans is common, and in many cinemas, people are separated and lost in Kumbha is shown. In the digital era, by using technology, this type of problem is reduced. Bhule Bhatke Kendra (Center to help people who are separated from their families). There are 15 digital BhuleBhatke Kendra are installed for the Mela premises, including the bus stand and airport, as shown in figure 5. People use a mobile phone to give the information of lost people to the lost and found center. The detail of the people is displaying on the large screen install at Mela, and this information is shared among different screen. The use of technology became easier.

Figure 5. Digital Lost and Found Center

Conclusion: Kumbha is a festival of faith and belief. Around 50 million people are taking a dip into the Ganga. During the 49-day In Kumbh Mela held in March 2019, on the 49th day of Mela, 24.01 crore people visited the Sangam city. It is said that not only has it seen the highest rung ever in its history, but between 2014 and 2017, Uttar Pradesh has also had more annual tourist hikes. Such a large gathering created many problems. To deals, these types of problems, ICT played an important role in handling these issues. This paper discussed the technique of such types of problems. Artificial intelligence uses to handle crowd management. The security surveillance is handled by CCTV. The drone is used for ariel surveillance. By the use of mobile, we can update about the people who lost in Mela. So in a simple world, it can be said that the use of information and technology made the Kumbha easy for the people. A beautiful event has been successfully executed without the single loss of human life, and this was possible only due to the help of Information technology.

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