Chapter 15
Impact of Blockchain and IoT Drone Technology Used in Mega Events

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ABSTRACT

Mega events like the Olympics, World Cups, and global expos bring together millions of people, vast infrastructures, and complex logistics. Managing such large-scale gatherings safely, efficiently, and transparently has always been a challenge. Today, technologies like Blockchain and IoT-powered drone systems are not just futuristic ideas they are actively reshaping how these massive events are planned, operated, and experienced. The study will explores the transformative impact of blockchain and drone-based Internet of Things (IoT) systems in the context of mega events, with a focus on security, crowd management, real-time monitoring, data integrity, and sustainability. Blockchain offers a decentralized and tamper-proof solution to ticketing, identity verification, and supply chain transparency helping organizers combat fraud and build trust. Meanwhile, smart drones equipped with sensors and AI are being used to monitor crowds, manage traffic, inspect venues, and respond swiftly to emergencies, all while transmitting real-time data.

INTRODUCTION

Nowadays, in the modern world, mega events (Olympic Games, World Cup, big music festivals or conferences) are undergoing a very swift development. In every event thousands of people are now mind-blowing experiences that use both technology and human interaction. An important aspect of this transition is the arrival of Blockchain, Internet of Things (IoT) and Drone Technology. Not only are these technological innovations helping these events to be planned and executed better, but are also making them safer, more secure and more interesting to the audience that were considered impossible. Most popularly recognized as the basis of cryptocurrencies such as Bitcoin, the blockchain technology is creating a buzz in the event industry(Garg et al., 2024). The use of blockchain technology basically entails a decentralized transparent ledger that keeps track of transactions and data in a very secure man-

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ner. This technology can help when extending to mega events, as it can help handle some pain points of the organizers. Ticketing is one of the most important ways through which blockchain can affect mega events(A. A. Khan et al., 2022). It has never been a process that is not prone to fraud when purchasing, reselling and validating tickets. There are a long-life problem with fake tickets and scalpers. Blockchain overcomes this deficiency by offering tamper resistant, digital tickets, which are logged on to a blockchain ledger. These are non-forgeable and cannot be duplicated in any way besides the fact that they can be resold on established and credible platforms, making them transparent enough to both the organizers and consumers. As a matter of fact, the technology will guarantee that all deals will be documented and exposed, thus not only tightening the securing of the ticketing system but possibly offering information indicating audience conduct(Wasim Ahmad et al., 2021).Down to paying the sponsors, paying the vendors, or making the purchases by the customers, blockchain facilitates flow of money in the most effective and safe way possible. As a case example, crypto currency can be transferred in real-time without the intervention of a banking system. It is an enormous benefit in case of international mega events, where the transaction of money takes place in terms of varied currencies and time zones(M. P. Singh et al., 2021).

Internet of Things (IoT): It is an interconnected network of the various devices which chat with one another through the internet. The era of the mega event is being transformed by IoT devices to bring a different experience to those who are participating in the event or to the event planners. Advancing technology is reshaping the face of crowds' management, security, and even their comfort by using the power of smart sensors, wearable's, and real-time data analysis. Just consider a big festival where you can follow the movements of your friends using an application or get immediate messages about the differences in the program or incidents. All this can be achieved due to the IoT(Madakam et al., 2015). Sensor-based IoT deployed to the venue of the event can measure the density of the crowd, and this way, there will be no possibility that people are too dense in a particular place thus enhancing safety. In case the sensors reveal that people are many in a particular area, the organizers can send messages to the attendees encouraging them to relocate to less crowded places. These real time strategies in crowd controls would assist in eliminating accidents and providing an excellent experience of the people together. As well, IoT equipment can enhance access and guest experience. Other technologies, like smart bracelets or wristbands, will enable the attendees to register payments, access VIP zones, and enter hotel rooms, all paying a single tap. They also give useful information regarding the movements of the people attending the event, the attraction that they are most interactive in and when they are most active using the devices(Gubbi et al., 2013). Based on this data event organizers can make adjustments as they go, ultimately refining the flow and improving on the experience of the guests.

DRONES PUTTING MEGA EVENTS TO A NEW PERSPECTIVE

Drones have rapidly entered the scene of mega-event industries that were initially common in the military and recreational vales. Their capability of presenting real-time aerial videos and carrying out complicated operations has revolutionized security, entertainment and logistics in large events(Cureton et al., 2023).The role that drones can play in security is one of the greatest. High-definition camera-loaded drones can hover over the crowd in order to conduct live surveillance of the crowd and effectively detect any form of threats. Its application is especially helpful in highly populated places such as stadiums or concert halls that greatly benefit in having a bird-eye perspective for any problems that would otherwise be overlooked on the ground(Campana, 2017). The crowd control and camera surveillance to observe