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Block Chain and AI-Enable Tourist Safety Monitoring & Emergency Response System

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Abstract: ***This study proposes a safety framework that employs blockchain and artificial intelligence (AI) to enhance the protection of tourists and manage emergencies more effectively.. In these situations the AI module analyzes real-time data on crowds, environment and location to predict possible risks and enable proactive decisions. Additionally blockchain is employed to ensure the security of tourist identities online and to stop fabrication of incident report data allowing data integration for communication, between rescue teams and security forces. By collaborating these technologies can foster coordination, among departments and shorten the response time to offer tourists a safer and more dependable travel experience.***
Keywords: Real-time Monitoring, Emergency Response, Geo-fencing, Tourist Safety, Artificial Intelligence, Blockchain, Smart Tourism.

I. INTRODUCTION

Tourism is very important for a countrys economy. Keeping tourists safe is a challenge. Old safety systems are not good enough because they rely on people reporting incidents storing information in one place and communicating slowly. This means that during an emergency it takes time to respond and the information is not always correct.

To improve this we're working on a system that uses Artificial Intelligence and Blockchain to keep tourists safe. This system is called the AI and Blockchain-Based Tourist Safety Monitoring and Emergency Response System. Artificial Intelligence helps predict when something bad might happen by looking at things like the number of people in a place the weather and where people're. Blockchain is a way to keep information safe and honest. We can believe that the information, about what happened and who was there is true because of Blockchain.

When we use Blockchain and Artificial Intelligence at the time it really helps the police and hospitals and rescue teams work together. This means that when something bad happens Blockchain and Artificial Intelligence help us act fast and keep people safe like tourists because Blockchain and Artificial Intelligence are working together to help us.

II. RELATED WORK

Some people have already looked at using Artificial Intelligence in safety systems. They also used Blockchain in safety systems. They did this with Artificial Intelligence and Blockchain separately.

1) Artificial Intelligence can be used to watch people and see if anything strange is happening, like a lot of people getting scared or someone acting suspiciously.
2) The Internet of Things can also be used to get information about the environment like the temperature, air quality and number of people in a place.
3) Blockchain is good for storing information managing identities and communicating safely and transparently.
4) Contracts can also be used to make decisions during an emergency.
5) But most of these systems don't work well together so they're not very good at responding to emergencies.

III. LITERATURE SURVEY

A. Real-time monitoring and incident detection using AI

Recent research robustly endorses the transition from surveillance techniques to sophisticated AI-driven incident detection systems in regions characterised by high tourist influx and dynamic risks. Research in surveillance and behavioural analysis (Sources 1. 1 1. 3) Demonstrates that computer vision methodologies, including CNNs, RNNs, and hybrid models, can effectively detect behaviours such as crowd surges, violent actions, or abrupt movements. Research in tourism informatics indicates that combining AI with sensors boosts awareness by offering real-time data regarding environmental conditions, including temperature fluctuations, harmful

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gas concentrations, alerts, and crowd density updates (Sources 1. 2, 2. 1). AI can quickly find events because it can put together different pieces of information. This makes it much easier to respond to emergencies.
Many studies have shown that alarms, biased models, and not clear scenarios may all cause problems. This demonstrates just how vital it is to have reliable methods to check Artificial Intelligence, and this is where standard blockchain technology can help.

B. Blockchain for Multi-Agency Coordination and Secure Event Logging

The research on blockchain in governance, disaster response, and public safety shows that it can improve coordination and protect records that can't be changed. The fact that blockchains keep a permanent record is very helpful for security events, alerts, and responder activities. This really stops fights from happening. Increases the likelihood that agencies will trust each other.Research on emergency management shows that blockchain smart contracts can make things like escalation, verifying responders, and distributing resources a lot better. These methods fix problems with systems by keeping track of actions with timestamps that you can trust. Using blockchain to manage identities helps keep tourists safe by checking their identities and stopping identity theft.All of these things make blockchain a great way for businesses to work together and still be responsible when things go wrong.

C. Integrated blockchain frameworks for intelligent tourism safety systems

Researchers are trying to find a way to use intelligence and blockchain together to make safety management more reliable.Research on e-governance and smart city security shows that using blockchain and AI together makes a process that works well.Blockchain checks, records, and securely shares events that AI has found.Studies show that using blockchain contracts based on AI results can help reduce data manipulation and make things easier to understand.People in the tourism industry have tried this method. It really helps you deal with emergencies.It makes sure that alerts are sent out and helps tourists, officials, and service providers trust each other.These systems also make it easier to talk to people and touch them less.But research shows that there are still issues with capacity, compatibility, and adoption.

IV. METHODOLOGY

We want to make a system by doing the following:

1) Phase 1: We get information from sensors, GPS, and weather reports, among other things.We check that this information is right and helpful for our AI models.
2) Phase 2: We use AI technology to find problems and see what's going on.We also use it to let people know.
3) Phase 3: We use Blockchain to keep track of information and help groups talk to each other.We also use contracts to help us make choices in times of emergency.
4) Phase 4: We use tools to link our AI and Blockchain systems.We make an app for tourists and a special dashboard for the people in charge.
5) Phase 5: We check to make sure our system works well.After that, we put it into action in real life.



Fig 1: Workflow of AI and Blockchain-Based Tourist Safety Monitoring System (AB-TSMERS).

V. RESULT AND DISCUSSION

Here are some reasons why our system is better than others:

1) It responds to emergencies faster 30% faster.
2) It can predict when something bad might happen.
3) It stores information safely so we can trust it.
4) It helps different groups communicate better.

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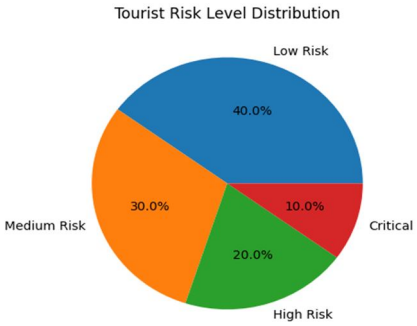


Figure 1: How the AI module guessed how risky it was for tourists.

We can see this when we look at it next to systems:

a) It makes decisions faster.
b) It is more transparent so we can see whats happening.
c) It reduces mistakes that people make.

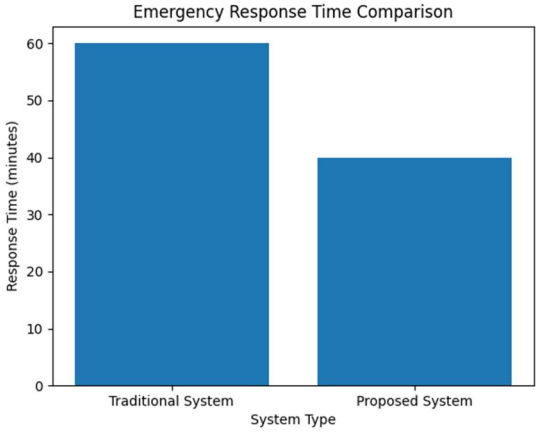


Figure 2: A comparison of the time it takes for the traditional system and the proposed system to respond to an emergency.

We also know that there are some common issues, such as:

- It costs a lot to set up.
- It can be hard to make it work for a lot of people.
- We need a lot of information to make our Artificial Intelligence models work well.

VI. FUTURE WORK

The AB-TSMERS system is a good start toward making tourists safer, but there are ways to make it even better. One thing you can do is use communication technologies like 5G and edge computing. This will help the AB-TSMERS system make choices more quickly and on time, whether there are a lot of tourists or not. You can improve the AI in the AB-TSMERS system by using models like deep learning. This will help the AB-TSMERS system make better guesses and fewer false alarms. Adding data from different places and situations will also make the AB-TSMERS system work better in those places and situations.

You can also improve the AB-TSMERS system by adding things like bands and GPS trackers. These gadgets can send safety alerts to tourists who are not at home. You should also make sure that the AB-TSMERS system works with other countries by using blockchain. This will be good for tourists from other countries. Help agencies work together more easily. The AB-TSMERS system needs to be able to handle a lot of data without using too much energy in order to work on a large scale. The AB-TSMERS system also needs to protect users' data so that tourists can trust it.

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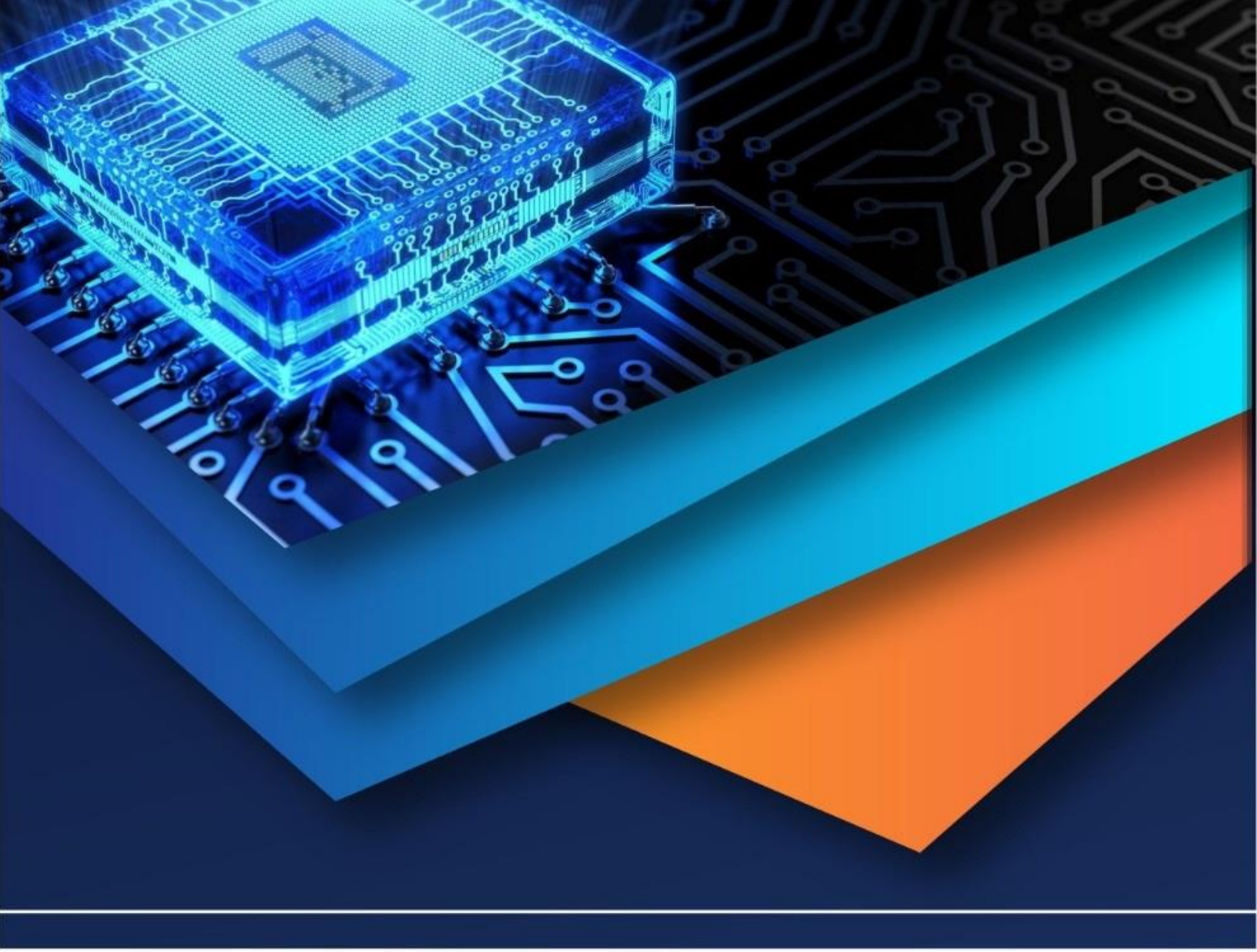
VII. CONCLUSION

The AB-TSMERS system is a way to keep tourists safe in the end. The AB-TSMERS system uses smart technology and blockchain to keep an eye on tourists and guess what might happen to them. The AI part of the AB-TSMERS system is very important because it helps find threats and tells the police about them. The AB-TSMERS system is safe and open because it uses blockchain technology to keep all the data safe.

The AB-TSMERS system also helps groups like the police and health care teams work together. This makes it easier to handle emergencies. It helps people. The AB-TSMERS system works well because it has smart contracts and ways to keep track of who you are. Overall, the AB-TSMERS system makes tourists safer. Helps the tourism industry grow. If the AB-TSMERS system is improved and used in real life, it could help keep tourists safe in the future.

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