Inter Smart Contract Communication for Smart Bag to Enhance Child Safety in Blockchain Environment

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Abstract—In today's world, the safety of children is of utmost importance due to numerous compelling factors, for example, accidents and injuries. In this fast-paced lifestyle of the new age parents, they might not always be able to accompany their children everywhere therefore the need for the tracking of the child including safety considerations and also the parent's desire to stay connected with their child and in the absence of the parents the guardian of the child can look up for the safety of the child. This paper presents an implementation of the smart bag for toddlers which is built using blockchain technology and language solidity that ensures the tracking facility of the child. blockchain is the decentralized ledger technology that provides transparency and security between the networks. Therefore we have created a digital contract known as the smart contract on blockchain technology named a smart bag for toddlers. A smart contract is a digital agreement that is signed and stored on the blockchain and executes automatically when its terms and conditions are met.

Index Terms—Blockchain, Smart Contract, Solidity

I. INTRODUCTION

Imagine a world where tracking anything, from a package on its delivery to a child on its way to school,[3] happens with absolute transparency and security. This is possible with the implementation of blockchain technology. Blockchain technology was first implemented by Satoshi Nakamoto in the year 2008. He introduced blockchain technology as the underlying technology powering the digital cryptocurrency. Bitcoin serves as the foundation technology behind digital cryptocurrencies. blockchain functionalities of the decentralized ledger and immutable system ensure the integrity and transparency of transactions, making it an ideal solution for tracking assets and information in various industries.

The relationship between tracking and blockchain, particularly regarding security, is closely connected. In the tracking context, blockchain ensures data integrity and immutability. this is particularly relevant in scenarios such as a child on their way to school, blockchains security features

assure that the location data is accurate and reliable, enhancing the safety and peace of mind of parents and caregivers. Moreover,[5] blockchain's cryptographic techniques and mechanism of security validate and secure transactions on the network, mitigating the risk of unauthorized access.

In an era marked by technological advancements despite the growing demand for child tracking solutions, traditional methods often fall short in addressing the complexities associated with toddler safety. Wearable devices, like bulky GPS can be uncomfortable for kids to wear all day. Secondly, the company stores all the tracking data in one central place,[9] which can make parents worry about who has access to it. Also the problem of fake tracing devices being sold, which can be unreliable and even dangerous. The tracking of the child gets even trickier because different tracking devices don't always talk to each other.[1] So if you have one device to track your child at school and another for when they are out with friends, you might not get all the information in one place. This might make it difficult for parents to keep track of their children and determine where they are at all times.

Our research offers an innovative method that combines blockchain technology and smart contracts to improve security and transparency in Child tracking systems, thereby addressing the aforementioned concerns. The "Blockchain-based Smart Bag for toddlers" keeps track of toddlers' whereabouts and gives parents real-time data. This creative method successfully ensures child safety by utilizing blockchain's safe and transparent data handling capabilities. By automating tracking procedures, smart contracts improve the dependability and security of the system. The technology keeps an eye on children's vital signs, whereabouts, and environment and notifies parents if there's any chance of danger. This system revolutionizes conventional child-tracking techniques by using blockchain technology with smart contracts, giving parents and caregivers peace of mind.