SMART HEALTH AND ATTENDANCE MANAGEMENT SYSTEM FOR CHILD DEVELOPMENT PROGRAMS

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ABSTRACT – In today's standard, children's health monitoring is a vital part of a child's growth.It has been getting increased attention ,particularly early childhood development programs.Recording a child's height, weight are like the basic data required to monitor a child's health.Recording a child's daily attendance contributesto its education results. This paper proposes a reasonable, scalable solution to digitize growth measurement monitoring, to track attendance without overburdening server space. It also introduces opportunities to promote public engagement towards Anganwadi centres. It allows the workers in Anganwadi centres to keep the growth record of the child updated regularly using the easy to use UI. The system we designed can be used in multiple languages to help workers across diverse populations and rural communities.

Keywords— Decentralized System

I INTRODUCTION

Child development programs such as ICDS are very crucial for monitoring a child's health while also increasing their educational focus and opportunities. It mainly faces challenges related to manual data entry either in physical means of digital which can lead to errors. At some level every project requires automation to reach the next level. The low level of community engagement produces a negative effect on the service delivery. Anganwadi centres are still relying on handwritten registers which is not only inefficient on workers but also prone to error and delay. It is difficult to monitor child growth consistently when services do not have connectivity at a consistent level leading to a need for a combination of offline and online systems. The availability and reliability of the internet greatly increases the odds of a digital system approach. This paper addresses the concerns of child growth and attendance measurement by introduction of BMI machines, decentralized local data storage, mobile apps to make it easier to track services and to improve public engagement for ICDS programs.

I. LITERATURE SURVEY

[1]   In this paper, AMMoC is introduced, which stands for Attendance Management using Crowdsensing. AMMoC is a completely new student attendance management tool directed towards enhanced efficiency and deduction of the risk of fraudulent check-ins in a classroom environment. Classes of standard attendance, for example, include roll call and used to be sometimes basis on RFID; but few limitations like inefficiency, expensive nature, and susceptibility to cheating plagued them.

The approach of AMMoC deals with these problems by mobile crowdsensing, where students upload their location data using mobile applications. The classroom is partitioned into tele regions, and the task assignment for student verification is optimized using Monte Carlo Tree Search (MCTS). Selected students shall dismantle and ascertain attendance in specific regions so that there should be a likelihood of mutual verification.

[2]   This study aims to improve the accuracy of predictions of adult height movement by the use of several machine learning models constrained by the parental height distribution. Growth charts and other traditional methods have often proved less adaptable to different populations and have depended on lengthy longitudinal studies in their analyses. To fill this void, data were obtained on the heights of 2,687 Korean men and women. They replicated Galton's 19th-century dataset, asking how parental heights affected children's heights. Results from the Korean data indicate maternal ties exerted much more impact upon daughters' heights, while Galton's work suggested the influence of fathers on growth. Using software featuring several machine learning core types including linear regression, support vector regression, XGBoost

[3]   The paper presents SCHOOLTHY-an automated menu planning system intended to create healthy and balanced meal choices for school canteens. Malnutrition resulting from nutrient deficiency or excessive consumption of processed foods is a growing concern, especially among children. Traditionally, school meal planning has been done manually by nutritionists-a painstaking, tortuous, and inefficient task.SCHOOLTHY transforms the labor-intensive manual method into an advanced automated menu generation process that is evolutionarily optimized to create a cost-efficient, nutritionally balanced, and varied menu. This system is capable of optimizing several objectives, including the minimization of costs, maximization of dietary diversity, and adherence to nutritional guidelines. SCHOOLTHY employs a multi-objective optimization strategy, ensuring that the meal plans meet energy and macronutrient requirements while reducing food repetition.

[4]   In her paper, she discusses the OCARIoT project, an initiative aimed at preventing childhood obesity through the establishment of healthy habits between ages 9 and 12. Childhood

[5] The paper presents a smart attendance system that employs Radio-Frequency Identification (RFID)

technology for attendance tracking in workplaces and minimizing fraudulent attendance.pare the two Hyperledger Fabric versions, v0.6 and v0.7.By adjusting each platform's workload up to 10,000 transactions, the two platforms' performance will be compared in terms of execution time, latency, and throughput. Second, by changing the number of nodes in each platform up to 20, we will examine the scalability of the two systems. Overall, the performance analysis results show that Hyperledger Fabric v1.0 regularly beats Hyperledger Fabric v0.6 in terms of scalability, throughput, execution time, and latency. However, under heavy workload circumstances, the performance of the Hyperledger Fabric v1.0 platform fell short of that of contemporary traditional database systems. Despite the obvious benefits of Blockchain, there are still a number of technical problems that need to be resolved before Blockchain platforms can be adopted.

[6]   In this paper, we present the development of an attendance system based on face recognition that features real-time video processing for improved accuracy and efficiency. Traditional methods of taking attendance, such as fingerprint scanning or manual check-ins, suffer from inaccuracies, inefficient tendencies, and fraudulent acts such as proxy attendance. To alleviate this situation, artificial intelligence and computer vision are introduced in the attendance system in this system to automatically detect and authenticate the student identity for attendance taking. The study evaluated the system's recognition precision, stability status, and overall reduction in truancy based on the effectiveness of the interface among the users. The findings show an 82% recognition accuracy for the face recognition system, with marked improvement in attendance tracking when weighed against the manual method.

[7] This paper describes a smartphone-based system that detects signs of attendance problems early on. Attendance problems, related to sleep disorders and fewer indicators of academic engagement, can lead to course failures and dropouts. But students tend to delay help until problems develop, so it is imperative to intervene early. To this end, the researchers designed a mobile application that passively gathers data from commonly available sensors in smartphones and does not require additional wearable devices. The system uses machine learning models that analyze sleep and study engagement levels trained on data collected from 58 students over ten months. Their results show that the system could estimate how well a student is sleeping and how engaged the student is, providing reliable indicators of students who are at risk. The ability to monitor students on a larger scale, unobtrusively and without disruptions to normal routines, is contrary to the manner of traditional face-to-face counseling. The study emphasizes that the system is not meant to replace medical examination but helps to identify at-risk students for acquiring timely support. Future improvements will be focused on additional accuracy, wider applicability, and reinforcement of feedback mechanisms to maintain student feeling well and performing well.

[8]   The pace of technological advancement is accelerating, which causes life's demands to rise along with it. The demand for blockchain research has recently increased until this technology is implemented. In order to learn more about the present state of blockchain technology and research trends concentrating on contributions to traceability systems, a literature review was done. It is envisaged that additional researchers would fill the gap to advance the research and use this technology in a variety of industrial applications once they are aware of the most recent research advancements and trends. The literature review method is the method of choice in this essay. Scopus is utilised as a data source to track the evolution of blockchain research throughout time.

[9]   This study evaluates the likelihood of the pharmaceutical supply chain (PSC) being reconfigured as a result of new patient-centered delivery models and manufacturing technological advancements. A critical synthesis of academic and applied literature is used to locate, conceptualise, analyse, and categorise PSC models. A systems approach of operations research is employed from a theoretical perspective to provide insights on a larger range of OR activities, from conceptual through mathematical modelling and model solution, up to implementation. The study demonstrates that current definitions of the PSC are generally production-centric and inadequately account for patient consumption, with the result that healthcare outcomes are not conceptualised correctly in most PSC mathematical models.

[10]The pharmaceutical supply chain is the procedure by which the drug is distributed from the producer to pharmacies, hospitals, and patients in an economical manner and in ample amounts. The pharmaceutical sector has a complicated supply chain since, before reaching the consumer, medications pass through the hands of distributors, repackagers, and wholesalers. Manufacturers have minimal to no insight throughout the supply chain to monitor authenticity. The issue of fake drugs and pharmaceutical arbitrage potential are two of the main issues facing the pharmaceutical supply chain. Pharmaceutical products that are sold with the intention of falsely representing their source are known as counterfeit medications. Drugs that are counterfeit may have active chemicals in excessive amounts, compounds that are not labelled, or perhaps no active ingredients at all. The cost of counterfeit products is high and can lead to treatment failure, health problems, toxicity, mortality, financial loss, and a decline in public confidence in the healthcare system. According to the World Health Organization (W

[11]According to Benji Rogers, CEO and cofounder of Dotblockchain music, "the money being left on the table is dwarfing the money being made under the table," implying that altogether, a transparent system would produce significantly more income and opportunities than it would really destroy. In essence, inaccurate or missing ownership data results in entirely fragmented databases that make it difficult for platforms to pay artists and impossible for artists to receive payment. It frequently takes months or even years for royalties to enter the bank accounts of copyright holders for both the sound recording and the lyrics of a piece of music. This technique looks antiquated in light of the fact that fans may access songs with a mouse click.

[12]As obtaining traceability is known to be difficult, the pharmaceutical business has tried a number of different approaches to discover solutions. Despite these issues, a thorough implementation of blockchain technology for drug tracking has certain prospects, according to a critical examination of the literature. The key contributions of this essay in this context can be summed up as follows: We suggest a blockchain-based system that offers pharmaceutical medications in the pharmaceutical supply chain data provenance security, traceability, immutability, and accessibility. We create a smart contract to enable numerous transactions between parties involved in the pharmaceutical supply chain. We outline, put into action, and test the smart contract that outlines the essential features of the suggested fix

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[13]A number of partners make up the pharmaceutical supply chain (PSC), including distributors, producers, raw material suppliers, regulators, pharmacies, hospitals, and patients. Due to the complexity of the product and transaction processes, PSC requires an effective traceability system to identify the current and all previous product owners. The regulatory monitoring and product quality are both considerably improved by digitising the track and trace process. Blockchain-based medication traceability is a practical method for creating a distributed platform for shared data in the PSC that is irreversible, reliable, responsible, and transparent. In this paper, we explore the PSC's issues with product traceability and talk about how blockchain technology can help to lessen the occurrence of fraudulent medications.

[14]By applying self-critical sequence training (SCST) for optimization and incorporating topic information into the convolutional sequence-to-sequence (ConvS2S) model, they offer a deep learning strategy for solving automatic summarization issues. By combining focusing on topics and aligning words using a biassed probability generation process, our approach can improve the coherence, diversity, and informativeness of generated summaries. Extractive summarising approaches have taken the place of the traditional paradigm for text summarization because they are user-friendly and straightforward. This post will discuss the sentence scoring method, a key component of extractive summarization.

[15]The pharmaceutical supply chain (PSC) is made up of a number of parties, including retailers, manufacturers, suppliers of raw materials, authorities, hospitals, and patients. PSC needs a strong traceability system to identify the present and all prior product owners due to the complexity of the product and transaction activities. By digitising the track and trace process, both regulatory oversight and product quality are greatly enhanced. A practical approach to developing a distributed platform for shared data in the PSC that is irreversible, trustworthy, accountable, and transparent is blockchain-based drug traceability. In this essay, we examine the PSC's challenges with product traceability and discuss how blockchain technology can reduce the prevalence of fake pharmaceuticals.

[16]   Pressure to make supply chains more open and traceable has intensified in response to growing worries about medication safety. To control medicine quality and increase levels of transparency, many pharmaceutical organisations commonly adopt distributed/centralized database-based traceability technology. Yet, it is currently challenging to link the numerous participants in the pharma business into a chain of information sharing because of the potential for data manipulation and conflicting interests. In order to provide a decentralised traceability solution in the

medicine supply chain, this study proposes a unified five-layer platform for smart tracking and tracing based on the Internet of Things and Blockchain (referred to as "BIoT3"). The five-layer blockchain platform is used to establish a practical strategy for the pharmaceutical industry's blockchain design, development, implementation, and assessment.

[17]The current pharmaceutical supply chain is a complicated process in which studies are conducted to generate pharmaceuticals, the drugs are manufactured in accordance with the findings of the studies, and the drugs are transported from the manufacturer to the pharmacies. Several parties are involved in this process, including the producer, wholesaler, distributor, pharmacies, and ultimately the end users, the patients. Inventory must be controlled based on pharmaceutical product demand at each step. A pharmacy's inventory management system is essential since having too much stock could result in financial losses, and it is more difficult because it must keep track of the lot numbers and expiration dates of the medications. The pharmaceutical supply chain experiences a number of problems, including drug shortages, drug temperature control, lack of sight during transportation and storage, and inventory.

[18] Many technologies have been developed as a result of the digital transformation of various sectors, helping organisations increase their levels of performance, transparency, and security. One of them is the advancement of blockchain technology. More than 10 years after its conception, it is still in use, but not just for cryptocurrency platforms. It has developed into something more substantial that is able to alter the rules, encourage novel types of collaboration, and bring about efficiency that increases output

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[20] Blockchain technology can be used to address these concerns with health and the economy as well as challenges in the pharmaceutical supply chain (Bamakan et al., 2021; Plotnikov and Kuznetsova, 2018; Schöner et al., 2017). The pharmaceutical supply chain may benefit from the usage of blockchain technology by receiving timely data and increasing the authenticity, integrity, and invariability of shared data (Cole, Stevenson, and Aitken, 2019)

II. PROPOSED SYSTEM

The proposed system focuses on addressing the challenges faced by Anganwadi centres in monitoring child growth and attendance in a more efficient way. Instead of using manual physical entries ,complex IoT devices, the solution uses a BMI machine to record children's height and weight, with a data transfer to the software platform. Attendance is managed through the software along with the BMI of each child on a daily basis. The new data is updated in bulk to minimize the server load. A mobile application for parents, guardians to provide child engagement by providing access to growth reports, attendance history, reminders and educational content. Additionally it promotes regular check-ups and participation through a system.The system also supports multiple languages, offline functionality and security. Even in remote areas the data can be collected reliably and synchronized in connectivity. Through modular, scalable decentralized systems and user-friendly interface, the system aims to improve child health and attendance monitoring and increase community involvement in Anganwadi centres.

Fig. 1. Architecture Diagram
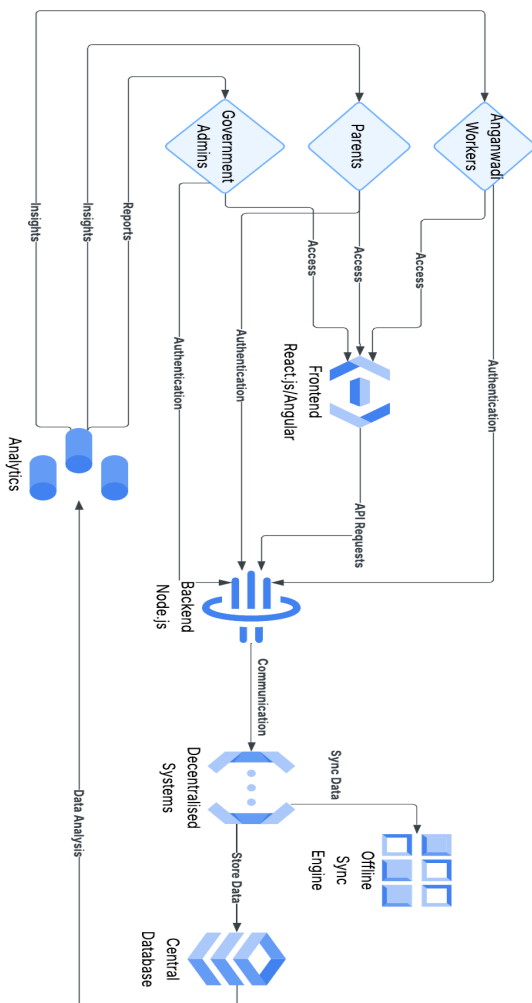
III. CONCLUSION

The problems faced in traditional methods of monitoring child growth and attendance have been discussed. Several papers and journals related to child development monitoring and programs were studied and objectives were proposed. The system architecture and flow for the proposed solution were provided. The security issues, limitations with the existing physical, manual methods and the lack of public engagement have been highlighted in Phase I. Various articles and journals were examined, and goals were given. The suggested work's system architecture and flow were designed and completed.

IV. METHODOLOGY

4.1. ANGANWADI WORKER LOGIN MODULE

The Anganwadi worker module allows users to enter their credentials. Once logged in, workers can manage the children's growth data obtained from the BMI machine and the daily attendance records. The entered information will be validated by the workers and stored securely for further processing.

4.2. GROWTH MONITORING MODULE

With the height and weight data the BMI machine will calculate the BMI, and the children will be categorized into underweight, normal, overweight or obese based on the standard BMI thresholds used across the world. Growth trends will be visualized using interactive growth charts and alerts will be generated for the children with abnormal growth patterns.

4.3. PARENT ACCESS MODULE

A mobile application and web portal will allow parents to log in using their registered mobile number or Aadhaar number. Parents can view their child's growth charts, download growth reports in PDF format and receive health recommendations. Parents will also get notification a bout the upcoming checkups and vaccination dates and receive alerts if any abnormal growth trends are detected.

4.4. ATTENDANCE TRACKING MODULE

Daily attendance marked by the Anganwadi workers in the portal will be processed and stored securely. Monthly a summarized report will be generated to minimize storage space. Parents will receive SMS alerts if the child is consecutively absent.

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