BLOOD BANK MANAGEMENT SYSTEM AND SUPPPLYCHAIN TRANSPERENCY USING BLOCK CHAIN

Introduction:

The efficient management of the blood supply chain is of paramount importance to ensure the availability of safe and timely blood transfusions. Over the years, various challenges in blood supply management, including transparency, traceability, and donor empowerment, have been addressed through the utilization of blockchain technology. This literature review aims to explore how blockchain can enhance blood bank supply chain management, empower donors, prevent fraud, improve efficiency, ensure compliance, enhance user experience, and promote educational outreach.

1. Blockchain in blood bank supply management.

Findings:

1. Blockchain technology has the potential to enhance transparency and traceability in blood donation management: This paper highlights that blockchain can offer transparency and traceability in blood donation processes. It can provide a secure and unchangeable record of every step in the blood supply chain, from donation to distribution.

2. Smart contracts can automate and streamline the donation process, improving efficiency: The use of smart contracts can automate various aspects of blood donation, making the process more efficient. These self-executing contracts can trigger actions, such as scheduling donation appointments, sending notifications, and managing donor records.

Limitations:

1. Scalability challenges may hinder the system's ability to handle a large-scale network of blood donation effectively: The paper doesn't fully address the scalability of the blockchain system, which could be a concern in managing a large-scale blood donation network.

2. The system relies on a centralized donor database, compromising the decentralization objective: The use of a centralized donor database contradicts the decentralization goal of blockchain-based systems.

3. Integration complexities with existing healthcare infrastructure are not thoroughly discussed: The challenges related to integrating blockchain-based blood donation systems with existing healthcare infrastructure remain insufficiently explained.

2. Blockchain based management of blood donation.

Findings:

1. Blockchain can facilitate real-time tracking of blood donations, reducing the risk of shortages: This paper suggests that blockchain can enable real-time tracking of blood donations and their availability. By having a clear, up-to-date view of blood supplies, healthcare providers can better manage and prevent shortages.

2. Implementing decentralized applications (DApps) for donors and healthcare providers can enhance user engagement: The introduction of decentralized applications (DApps) can engage donors and healthcare providers more effectively in the blood donation ecosystem. These user-friendly interfaces can simplify interactions and encourage participation.

Limitations:

1. Ensuring reliable and secure donor identity verification remains a challenge: The paper doesn't delve deeply into how to ensure reliable and secure donor identity verification, a critical aspect of blood donation systems.

2. The absence of real-world data and case studies raises questions about practical implementation and scalability: The lack of real-world data and case studies makes it challenging to assess the practical implementation and scalability of the proposed system.

3. Decentralized based blood supply chain management.

Findings:

1. Interplanetary File System (IPFS) can be leveraged for decentralized storage in the blood supply chain, enabling efficient data distribution: The utilization of IPFS for decentralized storage in the blood supply chain allows for efficient and secure data distribution. IPFS can help ensure that important information is readily accessible to stakeholders.

2. Blockchain technology can promote transparency and trust among participants in the blood donation ecosystem: Blockchain's inherent transparency and immutability can foster trust among the various entities involved in blood donation, including donors, healthcare providers, and regulatory bodies.

Limitations:

1. Limited discussion on data privacy and security measures raises concerns about the protection of sensitive medical data: The paper doesn't provide an extensive overview of data privacy and security measures, potentially jeopardizing the protection of sensitive medical information.

2. Scalability challenges may emerge as the system grows, potentially hindering its effectiveness: The potential scalability challenges are not fully addressed, which could pose obstacles as the system expands.

3. Dependency on Interplanetary Record System (IPFS) adoption is not thoroughly addressed: The paper doesn't thoroughly discuss the adoption and feasibility of IPFS, which is a crucial component of the proposed system.

4. Ethereum powered automated blood management system.

Findings:

1. Private Ethereum networks offer enhanced privacy and authorization controls for blood donation management: Private Ethereum networks provide increased privacy and strict authorization controls, making them suitable for managing sensitive health data in the context of blood donation.

2. Smart contracts enable secure and automated interactions between various stakeholders in the blood donation process: The use of smart contracts streamlines interactions between different stakeholders, ensuring secure and automated processes in blood donation management.

Limitations:

1. Dependency on a private Ethereum network may not achieve full decentralization, as some nodes may not be connected to the main network: The reliance on a private Ethereum network might limit the achievement of full decentralization, as not all nodes may be connected to the main network.

2. The paper provides insufficient information on the real-world implementation and scalability of the proposed system: Detailed information regarding real-world implementation and scalability is lacking, making it challenging to evaluate the system's practicality.

3. Limited discussion on privacy and access controls leaves questions about the protection of sensitive medical information: The paper doesn't thoroughly discuss privacy and access controls, raising concerns about the safeguarding of sensitive medical data.

5. Blood donation registry by integrating.

Findings:

1. Integration of National Health Records (NHR) and National Blood Donation Registry (NBDR) can improve donor eligibility verification and tracking: Integrating NHR and NBDR enhances the ability to verify donor eligibility and track donations efficiently. This integration ensures that donors' medical history is readily available.

2. Notification mechanisms can enhance donor retention and provide gratification to blood donors: Notifying donors when their blood has been used or if issues are found during inspection can improve donor retention and create a sense of gratification among donors.

Limitations:

1. The system relies on the existence of a National Health Records (NHR) Registry and National Blood Donation Registry (NBDR), which may not be universally available: Depending on the existence of these registries may limit the system's applicability in regions where such infrastructure is lacking.

2. Implementing a national-scale Electronic Health Records (EHR) system is a complex endeavor, and this paper does not provide in-depth insights: The complexity of implementing a national-scale EHR system is not extensively explored, leaving questions about practicality.

3. The absence of information on the real-world deployment of the system makes it challenging to assess its practicality: The lack of information regarding the real-world deployment of the system hinders the assessment of its practicality in healthcare settings.