

OperaCare: Real-Time Hospital Operations and Patient Monitoring Solution

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ABSTRACT

The rapid developments in the Internet of medical things (IoMT) help the smart healthcare systems to deliver more sophisticated real-time services. At the same time, IoMT also raises many privacy and security issues. Also, the heterogeneous nature of these devices makes it challenging to develop a common security standard solution. Furthermore, existing cloud centric IoMT healthcare systems depend on cloud computing for electrical health records (EHR) and medical services, which is not suggestible for a decentralized-IoMT healthcare systems. In this paper, we have proposed a Blockchain-based novel architecture that provides a decentralized EHR and smart-contract based service automation without compromising with the system security and privacy. In this architecture, we have introduced the hybrid computing paradigm with blockchain-based Distributed Data Storage System (DDSS) to overcome blockchain-based cloud centric IoMT healthcare system drawbacks like high latency, high storage cost and single point of failure. A decentralized Selective Ring based Access Control (SRAC) mechanism is introduced along with device authentication and patient records anonymity algorithms to improve the proposed systems security capabilities. We have evaluated the latency and cost effectiveness of data sharing on proposed system using Blockchain. Also, we conducted a logical system analysis, which reveals that our architecture-based security and privacy mechanisms are capable of fulfilling the requirements of decentralized IoMT smart healthcare systems. The implementation of this project draws upon key areas particularly database management (SQL) and cryptography and cyber security techniques like Attribute-Based Encryption (ABE) to ensure secure and authorized access to sensitive medical data.