



## UNIVERSITY OF SRI JAYEWARDENEPURA

Faculty of Technology

Department of Information and Communication Technology

ITS 4202 - Emerging Technologies

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### Assignment 01

1. A hospital faces challenges in securing patient data shared across various IoT devices and systems. The management is considering blockchain and AI technologies to enhance security and efficiency.
  - a. Based on the article ***“Securing Healthcare Data in Industrial Cyber-Physical Systems Using Combining Deep Learning and Blockchain Technology”***, explain how blockchain and deep learning can work together to improve data security.
  - b. Suggest practical challenges the hospital might face when implementing this solution.
  - c. How would you convince the hospital’s management of the long-term benefits of this approach?
2. A research team is developing a healthcare IoT system that needs secure and efficient data transmission without centralizing the patient data.
  - a. From the article ***“A Blockchain-Based Federated Deep Learning Model for Secured Data Transmission in Healthcare IoT Networks”***, summarize how federated learning and blockchain can address this need.
  - b. Identify two risks associated with using IoT devices in healthcare and explain how the proposed model minimizes these risks.

- c. In your opinion, what additional features could make the system more user-friendly and secure?
- 3. A healthcare startup is hesitant to adopt blockchain due to concerns about scalability, interoperability, and regulatory compliance.
  - a. Using ***“Blockchain for Digital Healthcare: Case Studies and Adoption Challenges”***, identify three key challenges the startup might face and suggest ways to overcome them.
  - b. How could the government or healthcare organizations support startups in adopting blockchain technologies?
  - c. Reflect on one case study mentioned in the article and explain how it addresses these challenges.
- 4. During the COVID-19 pandemic, governments are looking for secure ways to track vaccination and immunity status. A global health organization is evaluating blockchain for a digital health passport.
  - a. Referring to ***“Blockchain in Healthcare: A Decentralized Platform for Digital Health Passport of COVID-19 Based on Vaccination and Immunity Certificates”***, describe how blockchain can be used for this purpose.
  - b. Discuss the ethical and privacy concerns associated with digital health passports and suggest solutions to address them.
  - c. Imagine you are designing a user interface for the digital health passport. What features would you prioritize to ensure usability and security?

Deadline: 28th of December 2024 (11.59pm)

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