PREFACE

All gratitude is owed to Allah SWT for His Grace and Gifts, enabling the completion of this thesis titled **"Sustainable Integration of Delay Tolerant Network and Blockchain on Ad Hoc Networks for Secure and Resilient Communication"** to fulfil the requirements for a Master's degree in Electrical Engineering. Research into DTNs has become crucial for ensuring effective emergency communication without conventional infrastructure. DTNs, distinguished by their resilience in hostile environments and ability to function under compromised conditions, are well-suited for military operations and disaster recovery efforts. Integrating blockchain technology further enhances DTN capabilities by addressing security, privacy, and communication reliability challenges during emergencies.

This thesis investigates blockchain integration within DTN frameworks to ensure secure and resilient communication. It evaluates DTN routing protocols like Epidemic, Spray-and-Wait, MaxProp, First Contact, and Direct Delivery under scenarios with and without blockchain. It analyses critical metrics such as delivery probability, overhead ratio, average latency, and average buffer time to gauge system efficiency. Additionally, the study assesses blockchain's security aspects, including data integrity and privacy, through simulations of Sybil, Insider, and DoS attacks.

The findings will offer valuable insights into developing more robust communication systems for emergency response and military applications. The author acknowledges that this work represents an initial contribution and encourages further exploration and refinement of proposed coding techniques and integration strategies. Feedback from readers is welcome to enhance the thesis, which aims to benefit those interested in blockchain-DTN integration.

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