



HIT 400

PROJECT PROPOSAL

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Bachelor of Technology Honours Degree in Software Engineering
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SCHOOL OF INFORMATION SCIENCES AND TECHNOLOGY

Project Proposal

Title: Blockchain-Based System for Supply Chain Transparency and Anti-Corruption in Government Procurement in Zimbabwe

Abstract

This proposal outlines the development of a blockchain-based system designed to enhance transparency, traceability, and accountability in government procurement processes in Zimbabwe. The system aims to address corruption by recording all procurement and payment transactions on an immutable blockchain ledger. By integrating local currency payments and ensuring a transparent record of all tendering activities, the project seeks to provide a fair, auditable, and efficient solution to enhance public trust and improve procurement practices. This proposal details the problem statement, literature review, project rationale, objectives, scope, methodology, proposed solution, anticipated results, and a project schedule.

Background and Introduction of Problem Statement(s)

Corruption in government procurement processes is a pervasive issue in Zimbabwe, impacting the fairness and efficiency of public contracts. The procurement system is often criticized for its lack of transparency, leading to questionable pricing, award decisions, and misallocation of resources. This corruption undermines public trust and hinders economic development, particularly in critical sectors such as food and medicine.

Current systems for managing tenders and procurement are prone to manipulation and lack adequate mechanisms for oversight and accountability. The absence of a reliable and transparent record makes it difficult to audit and verify procurement activities, further exacerbating issues of corruption and mismanagement.

The proposed blockchain-based system seeks to address these issues by creating a tamper-proof, transparent, and accessible record of all procurement and payment transactions. This system will help ensure that the procurement process is fair, competitive, and free from corrupt practices.

Literature Review

Blockchain for Government Procurement and Anti-Corruption

Corruption in public procurement processes has been a significant concern globally, and blockchain technology offers a promising solution for enhancing transparency and accountability. Tapscott and Tapscott (2017) argue that blockchain's transparency features can be leveraged to combat corruption in government processes by creating an immutable record of transactions.

Zhao et al. (2019) proposed a blockchain-based system for public procurement that integrates local currency payments, emphasizing the importance of making blockchain technology accessible to local businesses. This integration is particularly relevant for Zimbabwe, where cryptocurrency adoption is limited. Their study supports the feasibility of combining blockchain with traditional financial systems to foster wider adoption.

Queiroz and Wamba (2019) examined the potential of blockchain to streamline public procurement and reduce corruption. Their findings highlight blockchain's capability to enhance accountability and reduce fraud by providing a transparent, decentralized record of all procurement activities.

Blockchain and Financial Transparency

Blockchain's role in financial transparency is crucial for reducing corruption in procurement processes. Wang, Han, and Beynon-Davies (2019) explored how blockchain technology can create an immutable financial ledger, which ensures that public sector payments are transparent and traceable. This feature is essential for preventing misappropriation of funds and ensuring compliance with contract terms.

Saberi et al. (2019) highlighted blockchain's potential to improve supply chain transparency by providing a tamper-proof record of transactions. Their study supports the idea that blockchain can similarly enhance financial transparency in government procurement by recording all transactions in a secure and accessible manner.

Real-Time Auditing and Monitoring

The ability to conduct real-time audits is a significant advantage of blockchain technology. Casino, Dasaklis, and Patsakis (2019) reviewed blockchain applications and found that its transparency facilitates real-time auditing, enabling immediate detection of discrepancies. This capability is crucial for government oversight bodies to monitor procurement activities effectively.

Tian (2017) demonstrated how blockchain technology can be used for real-time monitoring in supply chains, highlighting its applicability to government procurement. Real-time visibility into procurement transactions allows for prompt intervention in case of anomalies, enhancing overall accountability.

Practical Applications and Case Studies

Yadav and Singh (2020) reviewed blockchain's role in supply chain management, noting its ability to streamline processes and reduce costs. Their findings suggest that blockchain can similarly improve efficiency in government procurement by automating and recording transactions transparently.

Kshetri (2018) provided insights into blockchain's adaptation to specific industries, using the diamond supply chain as an example. This case study illustrates how blockchain can be tailored to address sector-specific challenges, supporting its application in government procurement to address corruption and inefficiency.

Project Rationale

The rationale for implementing a blockchain-based system in government procurement in Zimbabwe is to address the pervasive issues of corruption and inefficiency. By recording all procurement and payment transactions on a blockchain, the system creates an immutable and transparent ledger that prevents tampering and ensures accountability.

Current procurement processes lack transparency and are susceptible to manipulation, which undermines public trust and leads to resource misallocation. A blockchain-based system offers a practical solution by providing a clear and auditable record of all activities, from tendering to payment, thereby reducing opportunities for corruption.

Integrating local currency payments within the blockchain system ensures inclusivity for Zimbabwean businesses, particularly SMEs, and supports the mainstream adoption of the technology. This approach aligns with the goal of fostering a fair and competitive procurement environment.

Aim

Enhance Transparency and Accountability in Government Tenders and Procurement Processes

- Utilize blockchain technology to create a transparent, immutable, and auditable record of the entire government tendering and procurement process.

Objectives

Facilitate Local Currency Transactions within the Blockchain System

- To integrate local currency payments into the blockchain framework and support widespread adoption and inclusivity for local businesses.

Record All Procurement and Payment Transactions on the Blockchain

- To ensure that every transaction, from procurement processes to final payments, is securely recorded on the blockchain, creating a transparent and tamper-proof history.

Enable Real-Time Auditing and Monitoring

- To provide real-time visibility into procurement activities to enable prompt detection and resolution of discrepancies and anomalies.

Scope of the Project

The project encompasses the development and implementation of a blockchain-based system for government procurement processes in Zimbabwe. The scope includes:

1. Design and Development:

- Creating a blockchain framework that records all procurement and payment transactions.
- Integrating local currency payment systems with the blockchain.

2. Implementation:

- Deploying the blockchain system in government procurement departments.
- Training staff and stakeholders on using the system.

3. Monitoring and Evaluation:

- Providing real-time auditing and monitoring capabilities.
- Evaluating the effectiveness of the system in reducing corruption and improving transparency.

4. Exclusions:

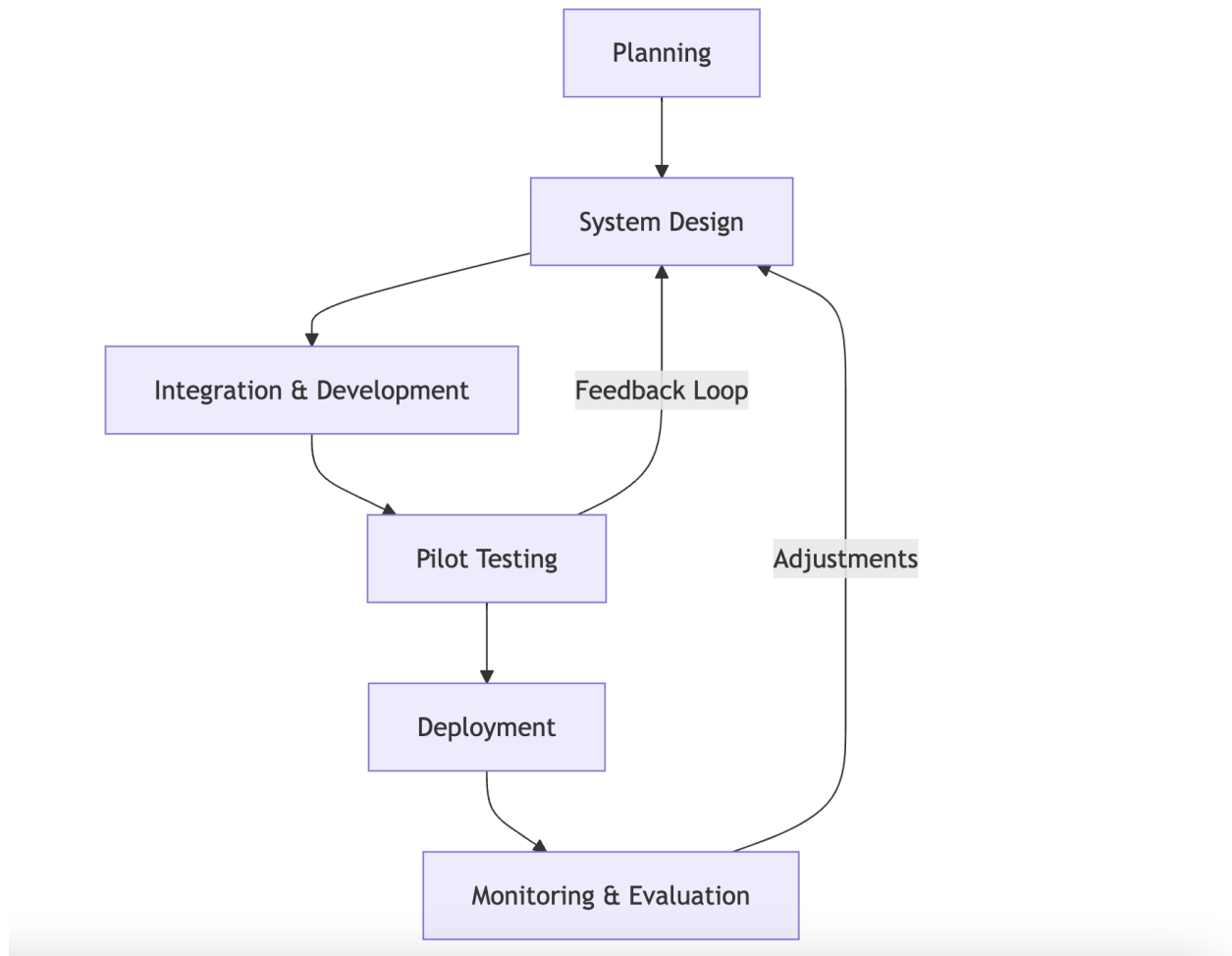
- The project does not include the development of blockchain infrastructure for sectors outside of government procurement.

- Cryptocurrency trading or investments are not part of the project scope.

Proposed Methodology

Methodology Diagram Structure:

- **Planning**
 - Define Scope & Objectives
 - Develop Project Plan & Timeline
- **System Design**
 - Design Blockchain Architecture
 - Develop System Specifications
- **Integration & Development**
 - Implement Payment Solutions
 - Build and Test Blockchain Platform
- **Pilot Testing**
 - Conduct Pilot Tests
 - Feedback & Adjustments
- **Deployment**
 - Rollout to Procurement Departments
 - Provide Training & Support
- **Monitoring & Evaluation**
 - Monitor System Performance
 - Evaluate Impact



Proposed Solution and Anticipated Results

The proposed blockchain-based system will provide a transparent, immutable record of all procurement and payment transactions. This solution aims to:

5. Enhance Transparency:

- Provide a clear and accessible record of all procurement activities, making it difficult to manipulate or hide transactions.

6. Reduce Corruption:

- Prevent tampering and unauthorized changes to procurement records, reducing opportunities for corrupt practices.

7. Improve Efficiency:

- Streamline procurement processes and automate contract enforcement, leading to faster and more efficient transactions.

8. Increase Public Trust:

- Build confidence in the procurement process by providing a fair and accountable system.

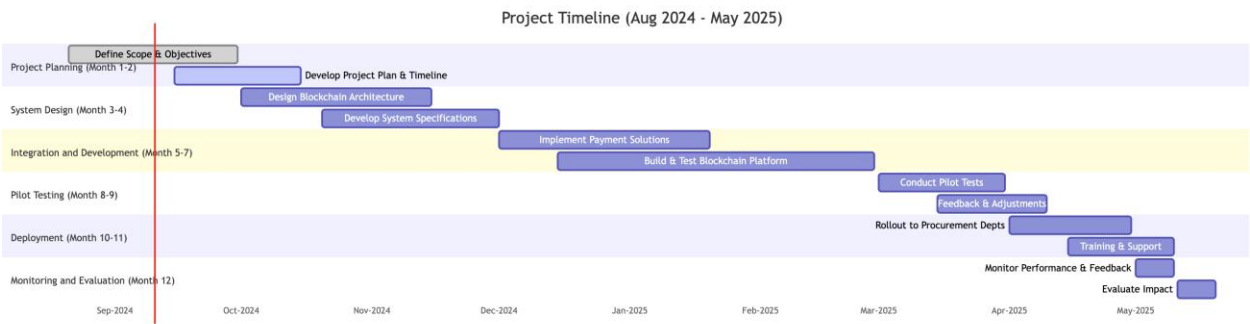
Anticipated Results:

- Reduced instances of corruption and fraud in government procurement.
- Improved transparency and accountability in tendering and payment processes.
- Enhanced stakeholder confidence and trust in government procurement practices.

Schedule of Activities and Gantt Chart

1. Project Planning: Begins on 21 August 2024 and ends on 15 October 2024.
2. System Design: Starts on 1 October 2024 and overlaps into December 2024.
3. Integration and Development: Runs from December 2024 to February 2025, with parallel tasks for implementing payment solutions and building/testing the blockchain platform.
4. Pilot Testing: Conducts tests and adjustments throughout March and early April 2025.
5. Deployment: The system is deployed in April 2025, with training and support extending into early May 2025.
6. Monitoring and Evaluation: Concludes by mid-May 2025.

Gantt Chart:



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