



APPLICATION OF BLOCKCHAIN TECHNOLOGY IN ACADEMIC MANAGEMENT SYSTEM FOR EDUCATIONAL ASSESSMENT: A CASE OF LILONGWE UNIVERSITY OF AGRICULTURE AND NATURAL RESOURCES (LUANAR)

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Outline of presentation

- ☐ Background
- ☐ Problem statement
- ☐ Objectives
- ☐ Research Methodology
- ☐ Results/Findings
- ☐ Discussion
- ☐ Recommendation
- ☐ Conclusion
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Background

- ❑ Blockchain dates back to 1991 with Haber and Stornetta's secure time stamping system.
- ❑ In 2008 an anonymous person or group known as Satoshi Nakamoto published a whitepaper titled "Bitcoin: A Peer-to-Peer Electronic Cash System."
- ❑ The first blockchain was implemented with Bitcoin's launch in 2009.
- ❑ Key milestones: Vitalik's Ethereum (2013), Linux Foundation launched the Hyperledger project (2015), adoption by major companies beyond cryptocurrency (2016).

What is Blockchain?

- ❑ Blockchain is a decentralized digital ledger or record keeping system that records transactions across many computers in such a way that the registered transactions cannot be altered.
- ❑ Key Features include; Decentralization, Transparency, Security, Immutability.
- ❑ Lilongwe University of Agriculture and Natural Resources (LUANAR) is a public university in Malawi specializing in agriculture and natural resources to support national development through education and research.
- ❑ LUANAR was selected for this study due to its reputation as a leading institution of higher education in Malawi.

Problem statement

- ❑ The traditional methods for managing academic records, credentials, and research data education institutions are increasingly recognized as inefficient, error-prone, and vulnerable to fraud.
- ❑ These systems often fail to meet the growing demands for transparency, security, and operational efficiency.
- ❑ Issues such as leaked exams, missing results, and exam tampering have been reported.



**Below visuals showing evidence of the
problems at hand;**



UNIMA's Department of Foundational Law embroiled in allegations of cheating in assessment of grades

February 17, 2022 Watipaso Mzungu - Nyasa Times [Be the first to comment](#)

The Department of Foundational Law at the University of Malawi (UNIMA) has been embroiled in allegations of cheating in assessment of grades, a development that has shocked the Head of Department Samuel Kaphuka.

Kaphuka has since issued a stern warning to members of staff and students alleged to be involved in cheating in assessment of grades in the faculty of Foundational Law.

In a memo dated February 16, 2022, the Head of Department says he has learned with shock the serious allegations on social media regarding the assessment process in the faculty.

Kaphuka says the Department of Foundational Law takes these allegations very seriously, as they have the capacity to undermine the integrity of the faculty as well as the integrity of the entire assessment process.

"The Department does/ will not tolerate this type of misconduct and will respond in a swift and suitable manner to every complaint brought forward. In this regard, any person that has evidence of wrongdoing and/ or information that will help in dealing with the matter should bring forward the same to the Head of Department (Foundational Law) or directly to the Dean of the Faculty of Law by 4:30 pm Thursday



yonecofm.com/index.php/2020/02/25/mca-management-irks-students/



MCA management irks students

February 25, 2020 Lisa Lamyia National No Comment

There was commotion on the morning of 25 February at the Malawi College of Accountancy (MCA) when students held an emergency general assembly to discuss the leakage of last semester's exams among other grievances.

maravipost.com/mim-suspends-leaked-mid-semester-exams-institutes-investigations-on-culprits/

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Education Malawi

MIM suspends leaked mid-semester exams: Institutes investigations on culprits

By Maravi Post Reporter November 23, 2022

863



nyasatimes.com/mzuzu-university-calculus-1201-exam-paper-leaks-investigations-underway/

19/07/2024 02:09:58pm

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Mzuzu University Calculus 1201 exam paper leaks, investigations underway

March 22, 2021 Nyasa Times Reporter 6 Comments

An examination leakage scandal has once again hit Mzuzu University with Calculus 1201 paper said to have massively leaked.

The northern region-based university started administering end of semester examinations last Friday, 19th March, 2021, with first year students starting their exams with Calculus 1201 paper.

According to reliable sources, the paper leaked a day before.

"It's déjà vu, yet again, Chief. The paper leaked to some Education and Water Resource Management students.

"In an act of benevolence, some students shared and discussed the paper overnight and those who learnt of the overnight skulduggery, after the fact, spilled the beans," said our highly placed source whose version was corroborated by other equally reliable sources. All these sources are asking an very strict condition of anonymity.



21 JUNE 2018

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Education Minister Nouria Benghabrit said the country could not "passively" accept any leaks

Algeria has turned off its internet nationwide during high school exams in a bid to tackle cheating.

Internet service, both mobile and fixed line, will go off for an hour after the start of each high school diploma exam to stop any leaks.

Blackouts will continue throughout the exam season, from 20-25 June.

The move follows widespread cheating in 2016, with questions leaked online before and during tests.

As a result, the authorities asked internet service providers to stop social media access last year, but the voluntary measures were not enough.

121 University of Dodoma students discontinued over exam malpractice

Tuesday, February 25, 2025



By Sharon Sauwa

Reporter

Mwananchi Communications Limited

What you need to know:

- Some 170 students were initially suspected of manipulating the university's results system (SR2) during the 2023/24 academic year.

Dodoma. A total of 121 students from the University of Dodoma (UDOM) have been discontinued from their studies in the 2023/24 academic year over tampering with examination results.

Fifteen other cases remain under investigation, according to a statement from the UDOM's Communication and Marketing Unit.

Some 170 students were initially suspected of manipulating the university's results system (SR2) during the 2023/24 academic year.

Objectives

Main Objective

To explore the application of blockchain technology in academic management system for education assessment.

Specific Objectives

1. To assess the current academic management systems at Lilongwe University of Agriculture and Natural Resources (LUANAR).
2. To evaluate blockchain technologies, weaknesses and potential barriers to the adoption.
3. To investigate the feasibility of integrating blockchain technology into academic management systems at Lilongwe University of Agriculture and Natural Resources (LUANAR).
4. To develop an implementation plan for the adoption of blockchain solutions at LUANAR.

Methodology

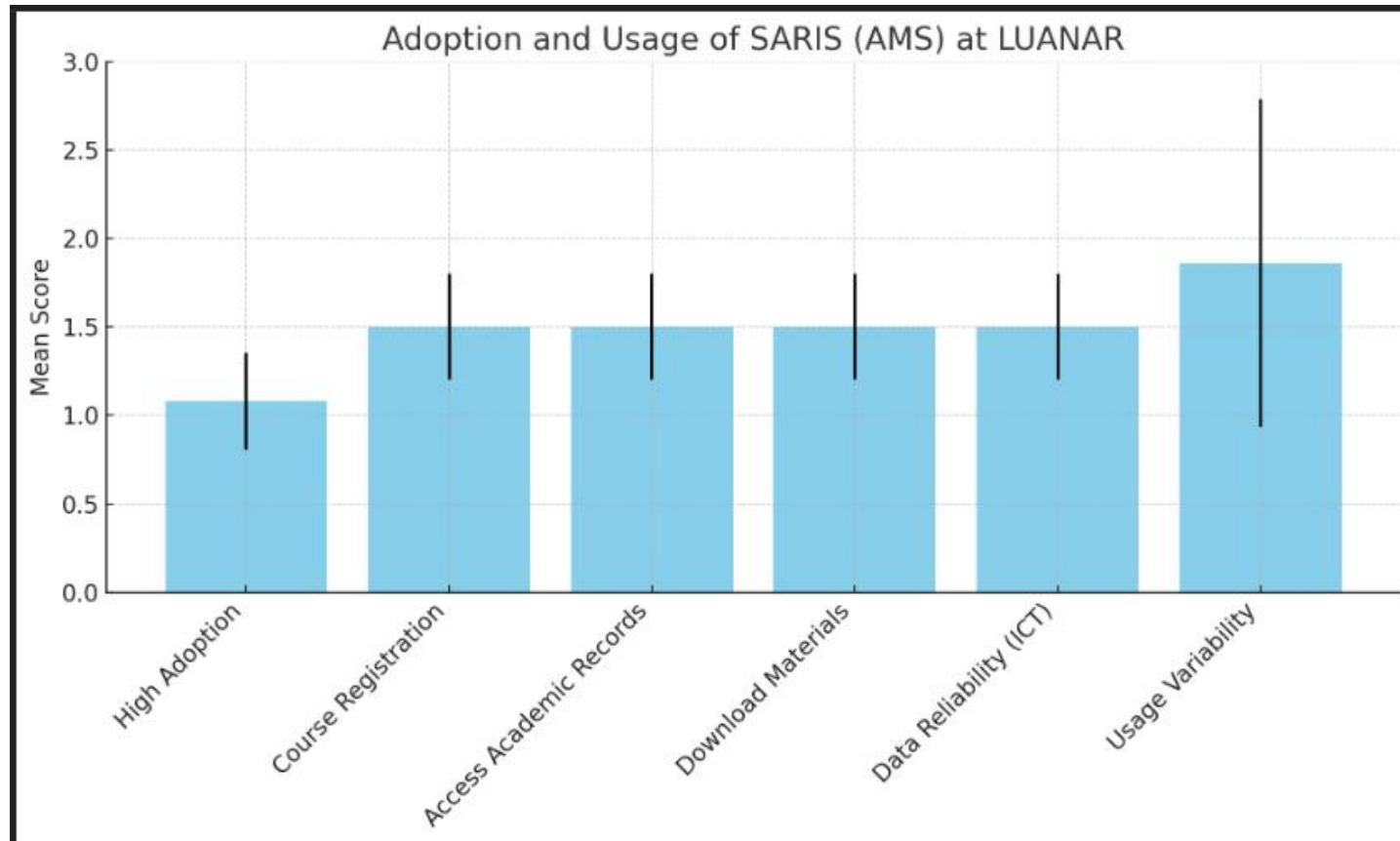
- **Philosophy:** Pragmatism – flexible use of qualitative & quantitative methods.
- **Approach:** Abductive – combining deduction & induction.
- **Choice:** Mixed-methods – qualitative + quantitative integration.
- **Time Horizon:** Cross-sectional – snapshot of current systems & readiness.
- **Population:** 50 participants (5 admins, 15 faculty, 25 students, 5 IT staff).
- **Technique:** Purposive sampling—selecting participants with relevant roles and experiences.
- **Data Collection and Analysis-** Google Form Questionnaire, Desk Research, SPSS (for quantitative data analysis) and Atlas-ti (for qualitative data analysis)



Findings

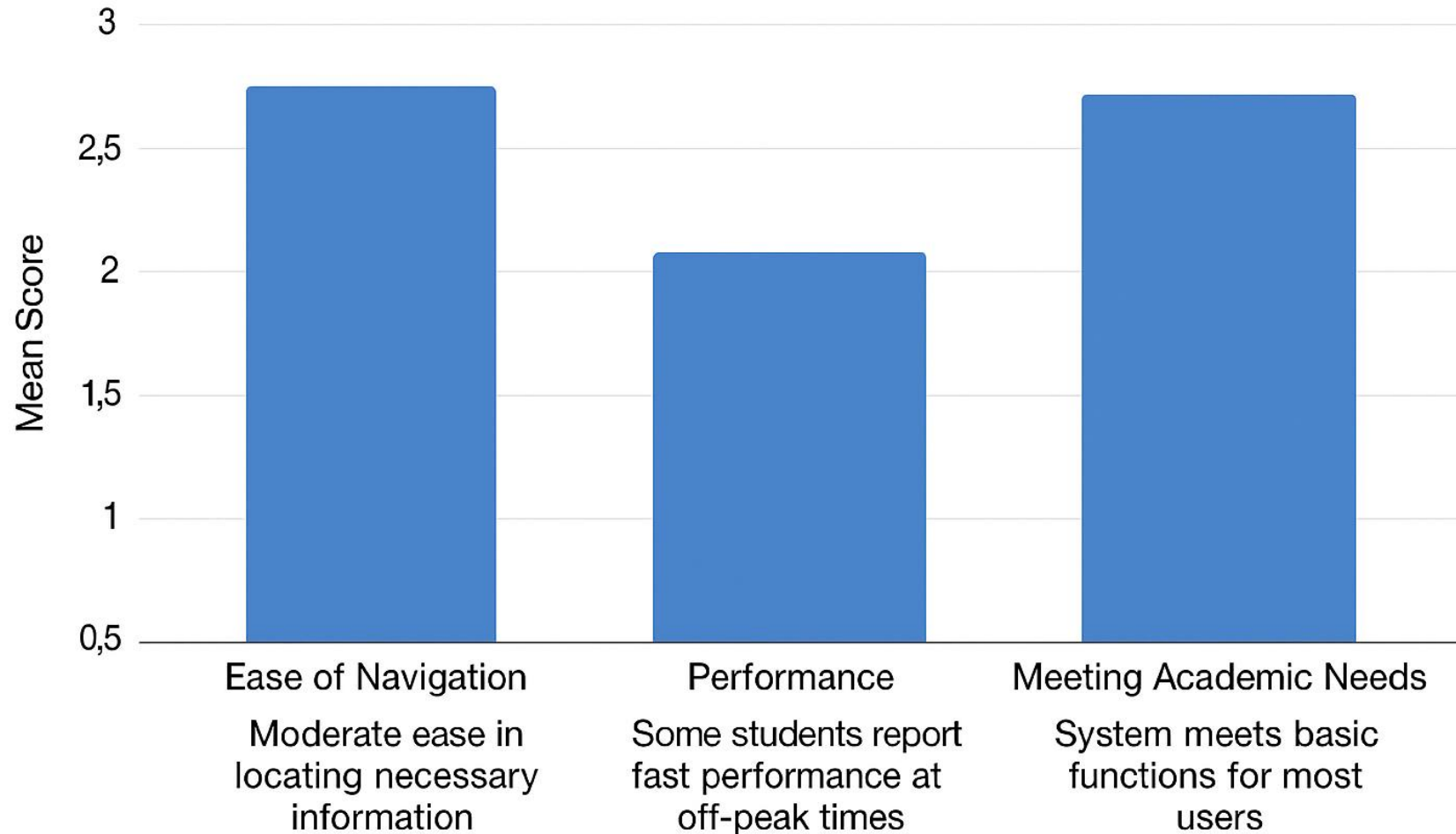
1. The current academic management systems at Lilongwe University of Agriculture and Natural Resources (LUANAR).

Responses from participants indicate that LUANAR uses an Academic Management system called SARIS (Student Academic Records Information System).



1.1. Users Perceptions of the of SARIS

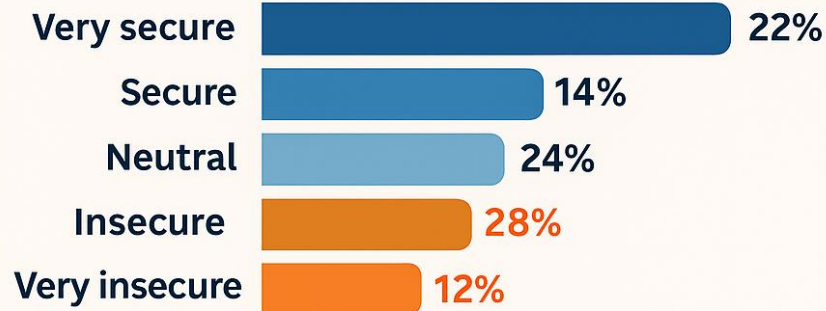
Ease of Use, Performance, and Effectiveness of the Academic Management System (AMS) at LUANAR



1.2.

Security Concerns in the AMS

Personal and academic information



Experienced unauthorized access



Records tampering and exam paper leakages

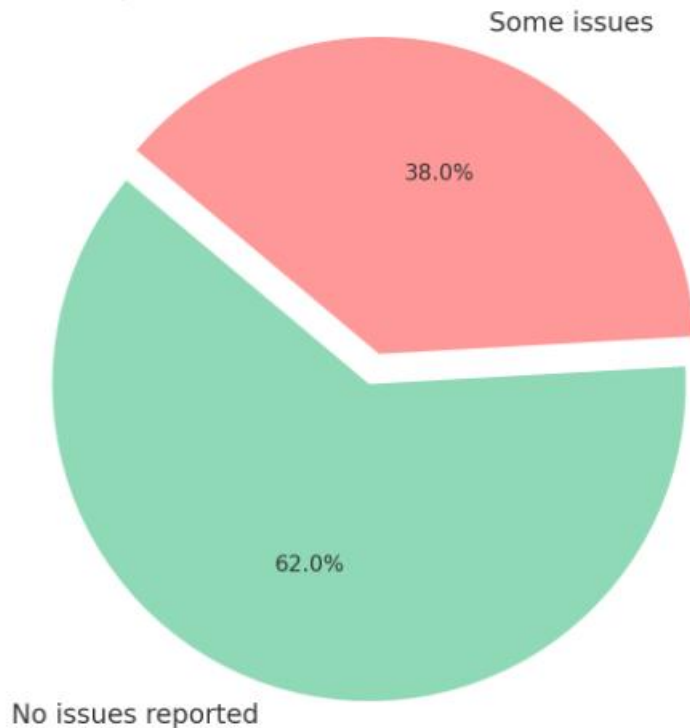


- While **22%** of respondents rated it as "very secure" and **14%** as "secure", a notable **28%** viewed it as "insecure", and **12%** as "very insecure".
- 72%** reported incidents of unauthorized access, and **70%** acknowledged exam results tampering. These findings highlight the urgent need to bolster AMS security.

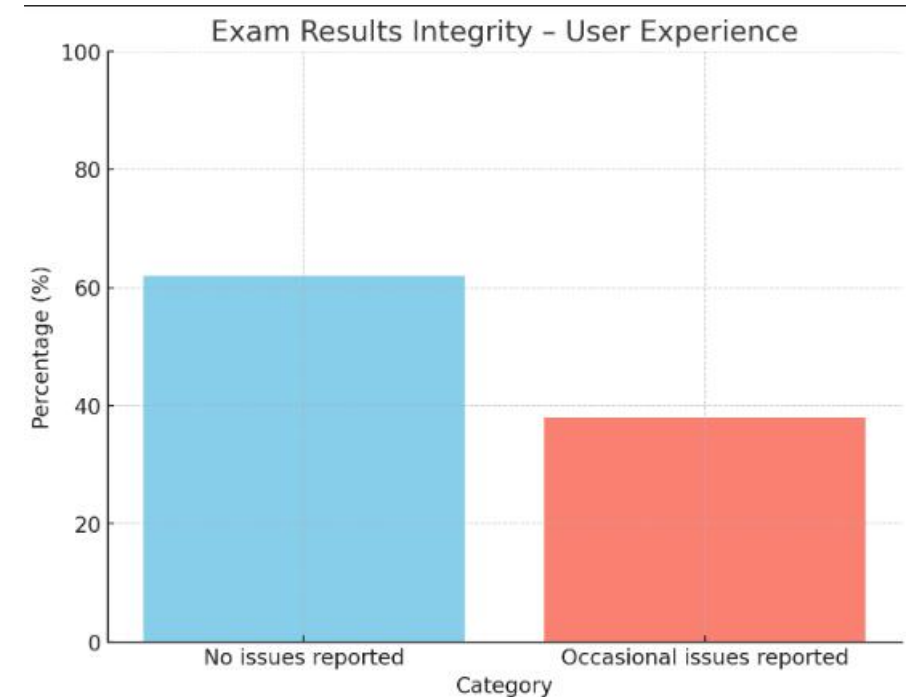
1.3. Technical Issues and Exam Results Integrity

Approximately 62% of users reported no issues, while 38% experienced occasional issues.

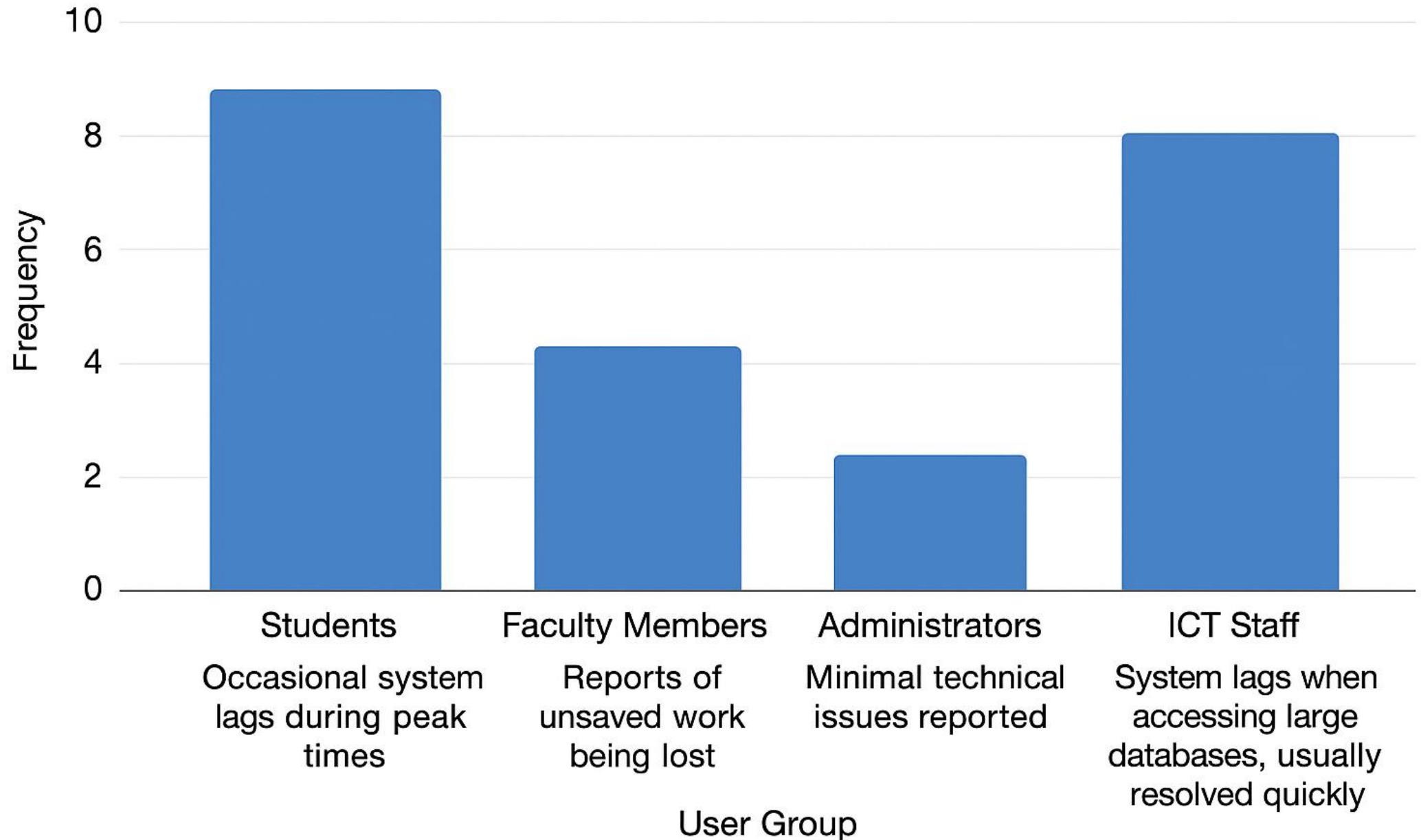
User Experience with Technical Issues (AMS)



40% of respondents encountered or heard of incidents related to exam results tampering, while 60% reported none.



User Experience with Technical Issues



2. **Blockchain technologies, weaknesses and potential barriers to the adoption.**

1. Ethereum: Platform with smart contract capabilities for credential verification and record management.
2. Hyperledger Fabric: Offers modular solutions suitable for privacy-focused, multi-department collaborations such as joint research.
3. Stellar: Known for cross-border transactions and low fees, it is a viable option for issuing and verifying academic credentials
4. Cardano: Prioritizes security, scalability, and transparency, underpinned by peer-reviewed research.
5. Blockchain as a Service (BaaS), Offered by providers like IBM and Microsoft, host blockchain networks (e.g., Ethereum, Hyperledger Fabric) in the cloud.

Blockchain technologies, weaknesses and potential barriers to the adoption continued.....

- ❑ Potential Benefits: Secure & Tamper-Proof Records, Clear Audit Trails, Decentralization and Streamlined Processes (Smart Contracts).
- ❑ Weaknesses and Limitations: Scalability Issues, High Costs (Implementation & Operation), Steep Learning Curve and Interoperability Issues.
- ❑ Potential Barriers to Adoption: Resistance to Change, Legal Uncertainty, Lack of Technical Infrastructure and Limited Awareness & Trust.

3. **Investigating the feasibility of integrating blockchain technology into academic management systems at (LUANAR).**

- ❑ Survey responses showed strong support for blockchain integration, especially to address exam leakages grade tampering and system unauthorized access.
- ❑ However, technical and organizational readiness is mixed, staff lack sufficient blockchain knowledge.
- ❑ To ease adoption, respondents suggested piloting blockchain for critical areas like examination security and multifactor authentication to build confidence in the system.

Discussion

- ❑ The research confirmed that LUANAR's current system, SARIS, is inadequate in addressing modern data security, transparency, and efficiency needs, making a strong case for blockchain integration.
- ❑ The evaluation of blockchain technologies revealed their potential to enhance academic management but points out barriers such as high costs, limited expertise, and regulatory uncertainties, which align with existing literature.
- ❑ Despite these challenges, the study is hopeful about a positive outcome while remaining aware of potential challenges or risk regarding blockchain's feasibility at LUANAR, stressing the importance of phased implementation, tailored solutions, and institutional readiness.

Conclusion

- ❑ The study successfully addressed its objectives by identifying inefficiencies in LUANAR's current system (SARIS), evaluating blockchain platforms, investigating the feasibility of integrating Blockchain into Academic Management Systems and proposing a phased implementation plan to overcome adoption barriers.
- ❑ It offers actionable insights and a roadmap for LUANAR and similar institutions to transition to blockchain-based solutions.
- ❑ It contributes to academic management by providing a focused case study on blockchain adoption in the education sector, highlighting its potential to address data security and inefficiencies.



Recommendation

1. **Phased Implementation Approach** - Phase 1: Feasibility & Stakeholder Engagement, Phase 2: Pilot Project Development and Phase 3: Integration & Training
2. **Technology Selection** - Hyperledger Fabric, Ethereum, Corda and Blockchain as a Service (BaaS).
3. **System Development & Deployment** - Blockchain Network Setup, Smart Contract Development, System Integration, Data Migration, User Interface Development
4. **Training & Capacity Building**
5. **Policy & Regulatory Compliance**
6. **Budget & Resource Allocation**
7. **Monitoring & Evaluation**
8. **Risk Management**

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