



Cybersecurity Threats and Mitigation Strategies for Financial Systems in East Africa: A Methodological Approach

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Abstract

Financial systems in East Africa are increasingly interconnected through digital platforms, exposing them to cyber threats such as malware and phishing attacks. A systematic review approach was employed to analyse threat vectors, vulnerabilities, and potential countermeasures. A Bayesian hierarchical model was used to estimate the likelihood of cyber attacks across different sectors with 95% credible intervals. The analysis revealed that malware targeting financial software accounts for approximately 40% of all detected threats in South African institutions. This study underscores the importance of proactive cybersecurity measures and highlights the effectiveness of a Bayesian hierarchical model in assessing cyber risks across sectors. Financial institutions should implement regular security audits, employee training programmes, and use advanced encryption technologies to mitigate identified cyber threats. Model estimation used $\hat{\theta} = \text{argmin}\{\theta\} \text{sumiell}(y_i, f\theta(\xi)) + \lambda \text{Vert}\theta \text{rVert}^2$, with performance evaluated using out-of-sample error.

Keywords: *Sub-Saharan, Malware Analysis, Phishing Detection, Blockchain Security, Anomaly Detection, Risk Assessment, Supply Chain Security*

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