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Cyber Risk Intelligence Dashboard Framework for Regulatory Decision-Making in the Telecommunications Sector

The increasing digitalisation of telecommunications services has expanded the cyber threat landscape, exposing operators and consumers to cyberattacks, fraud, data breaches, and operational disruptions. In response to these challenges, this study develops a data-driven Cyber Risk Intelligence Dashboard framework to support real-time cyber risk monitoring, regulatory decision-making, and organisational resilience assessment, using Zimbabwe's telecommunications sector as a case study. The study aligns with the regulatory mandate of the Postal and Telecommunications Regulatory Authority of Zimbabwe (POTRAZ) under the Postal and Telecommunications Act (Chapter 12:05) and the Cyber and Data Protection Act (Chapter 12:07). The study sought to identify the major cyber risk indicators affecting telecommunications organisations, analyse temporal and operational cyber risk patterns across operators and service categories, evaluate relationships between cyber vulnerabilities and organisational resilience, and develop a dashboard framework suitable for regulatory oversight. Using a simulated Zimbabwe Telecommunications Cyber Risk Dataset comprising 365 daily observations for 2025, exploratory data analysis was conducted in R. The findings revealed that Zimbabwe's telecommunications sector operated under persistent medium-level cyber risk conditions, with 96.71% of observations classified as medium risk and an average cyber risk score of 50.91. Mobile Money/USSD and Mobile Broadband services recorded the highest intrusion attempts, fraud incidents, and SIM-swap attacks, confirming their vulnerability within the digital ecosystem. The study concludes that telecommunications cybersecurity governance in Zimbabwe requires continuous cyber intelligence monitoring rather than periodic compliance assessments.

Primary author: ZULU-MOYO, Isabel Linda (University of Eswatini)

Presenter: ZULU-MOYO, Isabel Linda (University of Eswatini)

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