


# Chapter 9


## Data-Driven IT Audits in Higher Education: Leveraging Big Data and AI for Enhanced Governance and Compliance

**Tshepo Maota**

 <https://orcid.org/0009-0001-0475-5801>

*University of South Africa, South Africa*

**Audrey Legodi**

 <https://orcid.org/0000-0001-5311-7307>

*University of South Africa, South Africa*

### ABSTRACT

*This study examines the data-driven IT audit landscape within six South African higher education institutions (HEIs), focusing on IT governance, AI integration, big data analytics, digital transformation, data governance, and cybersecurity. It analyses publicly available reports to understand how these HEIs are leveraging data and AI in their IT audits, using specific frameworks to identify trends in technology adoption. Findings show that while some institutions demonstrate strong IT governance and strategic AI adoption, others are still building basic digital skills. Challenges remain in operating AI, fostering data-driven cultures, and mitigating cybersecurity risks, although external reports add objectivity. Practical implications include formalising governance structures, enhancing data literacy, and leveraging real-time audit insights to strengthen resilience. The study points out that it requires ongoing improvements, stakeholder engagement, and regionally relevant research to support sustainable digital transformation in South African HEIs.*

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## 1. INTRODUCTION

*“Digital transformation is not about technology – it’s about change.”*

— *Peter Weill and Stephanie Woerner.*

The global landscape of higher education institutions (HEIs) is undergoing significant changes due to swift digital transformation, emerging cybersecurity concerns, and increasing demands for accountability and compliance (Mah & Gross, 2024). Over the past twenty years, HEIs have evolved from traditional campus-based operations to sophisticated digital ecosystems that facilitate online learning, hybrid classrooms, virtual collaboration, and data-intensive research environments (Benavides et al., 2022; Divjak et al., 2022; Rojas et al., 2025). This evolution has broadened educational options while simultaneously increasing the complexity and risk landscape encountered by higher education institutions.

Historically, IT audits in higher education used manual, checklist-orientated, and compliance-centric approaches (Aliyu et al., 2020; Benavides et al., 2022). Nonetheless, these conventional audit methodologies have found it challenging to adapt to the rapidity of digital transformation and the extensive quantity of data produced in contemporary academic settings. In 2020, the COVID-19 epidemic precipitated a significant acceleration of digital adoption in the sector, as numerous universities transitioned rapidly to online learning and virtual administration (Maota, 2024). This transition revealed substantial deficiencies in digital governance, cybersecurity resilience, and IT risk management.

The digital expansion is exacerbated by the increasing hazards of data breaches and cyberattacks (Akacha & Awad, 2023; Lallie et al., 2023; Rojas et al., 2025). Recent worldwide education reports reveal a 30% increase in cybersecurity incidents within higher education from 2021 to 2023 (Gadhi et al., 2024; Lallie et al., 2023), indicating the susceptibility of university IT infrastructures to external threats and internal data governance deficiencies. The implementation of the Protection of Personal Information Act (POPIA) in South Africa in 2021 has heightened regulatory oversight on HEIs, necessitating a reassessment of their data governance and IT audit protocols. In 2025, cybercrime has become the predominant threat in South Africa, surpassing persistent problems like load shedding and political instability (Daily Investor, 2025). This transition highlights the increasing peril of cyber incidents, such as ransomware attacks, data breaches, and IT outages, which have emerged as the foremost worldwide business risk for the fourth consecutive year. Recent high-profile intrusions have heightened worries regarding cybersecurity preparedness and the potential for substantial disruptions across multiple sectors. A significant Malaysian institution experienced a substantial data breach, leading to the internet exposure of personal information belonging to over one million persons (Ganesen et al., 2022). The hack revealed confidential information, including student names,

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