A Systematic Literature Review of Chaos Engineering Implementation for Mean Time to Recovery Improvement in Nigerian Digital Banking Platforms

A, m, i, n, a, S, u, l, e, i, m, a, n, ,, C, h, i, n, w, e, O, k, o, n, k, w, o, ,, O, l, u, w, a, s, e, u, n, A, d, e, b, a, y, o

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Abstract

The resilience of digital banking platforms is crucial for financial stability in Nigeria. Chaos engineering, the discipline of deliberately injecting failures to test system robustness, is proposed as a method to improve operational metrics such as mean time to recovery (MTTR). Its specific application and effectiveness within the Nigerian digital banking sector are not well understood. This systematic literature review aims to identify, analyse, and synthesise documented practices, challenges, and outcomes of implementing chaos engineering to improve MTTR specifically for Nigerian digital banking platforms. The objective is to establish a foundational evidence base for practitioners and researchers in this domain. A systematic search was conducted across major academic databases and relevant grey literature sources. Identified studies were screened against predefined inclusion and exclusion criteria, focusing on chaos engineering implementations within digital financial services, with particular emphasis on the Nigerian context or analogous environments. Data from selected studies were extracted and synthesised thematically. The review revealed a scarcity of formally published case studies originating from Nigeria. The available literature indicates that successful implementations typically adopt an incremental approach, beginning with non-critical services. A dominant theme was the significant organisational and cultural challenge of fostering a ‘failure-as-learning’ mindset, which was frequently reported

as a greater barrier than technical obstacles. Commonly documented technical practices involved simulating API latency and failures in downstream dependencies. While chaos engineering is acknowledged as a valuable practice for enhancing resilience, its documented application within Nigerian digital banking remains at an emergent stage. The existing literature focuses primarily on establishing foundational cultural acceptance and defining safe experimentation protocols, rather than on reporting quantified improvements in MTTR. Future research should pursue detailed, empirical case studies from Nigerian financial institutions. Practitioners are advised to prioritise cultivating a blameless post-mortem culture and implementing rigorous fault tracking mechanisms alongside technical experiments. Greater collaboration between academia and industry is needed to develop context-specific frameworks and measurement approaches. Chaos engineering, mean time to recovery, MTTR, digital banking, Nigeria, system resilience, systematic review. This review synthesises the nascent body of knowledge on chaos engineering within a critical, under-studied regional context. It provides a structured analysis of reported implementation challenges and practices, offering a targeted foundation for future research and practical application in Nigerian digital banking and similar environments.