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Password Security Quantum Readiness Framework for IT Professionals

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The rise of quantum computing poses a serious threat to password-based security systems and could break the methods we currently use to keep data safe, putting sensitive information at risk. For example, Grover's algorithm, a well-known quantum algorithm can make bruteforce password attacks much faster by reducing the number of guesses needed roughly by the square root of the total number of possible passwords, which could result in attacks being thousands of times faster for large key spaces.

This research proposes a Password Security Quantum Readiness Framework to help IT professionals maintain business continuity in the face of sudden quantum-driven password security shifts. The study aims to assess the risk that quantum computing poses to password security, evaluate countermeasures including quantum-resistant hashing, multi-factor or password-less authentication, upgrading hashing protocols to post-quantum standards and other protections to mitigate these risks.-

A qualitative-methods design supports the study. First, a thorough literature review will be conducted to investigate the password security risk posed by quantum computing. Second, a systematic literature will be conducted to investigate possible counter measures for mitigating password security risk related to quantum computing. Third, Critical Reasoning will be used identify and extract key constructs for formulating the framework.

Businesses can protect sensitive information from emerging quantum technologies by developing a quantum readiness framework for password security. This framework will help IT professionals understand the risks posed by quantum computing and equip them to address password cybersecurity challenges, creating a business-continuity architecture to safeguard password infrastructure and ensure operational resilience in the evolving quantum landscape.

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