



**INFORMATICS
INSTITUTE OF
TECHNOLOGY**

INFORMATICS INSTITUTE OF TECHNOLOGY
In Collaboration with
UNIVERSITY OF WESTMINSTER

**Using Software based Authentication through USB devices as an
alternative to Hardware tokens for SMEs**

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Submitted in partial fulfilment of the requirements for the BEng (Hons) Software
Engineering degree at the University of Westminster.

MAY 2023

DECLARATION

I hereby confirm that this dissertation and all its sections are my own work and that no part of this report has been submitted for any other degree or academic distinction. All sources of information utilized in this study have been appropriately acknowledged and cited, and facts derived from the work of others have been properly referenced.

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ABSTRACT

Cyber security is an important aspect of any organization, regardless of the organizational size and structure. In today's world, where the threat of cyber security exploitation increases daily, the importance of cyber security countermeasures has also increased. Authentication is an integral part of any cyber security solution, and hardware-based authentication is considered a strong security mechanism. However, many small and medium enterprises are unable to adopt such a security measure given the cost and complexity of implementing the solution.

The implemented solution will solve this problem by presenting a simple, cost-effective hardware-based authentication mechanism. The alternative that will be used is, instead of using a hardware-based token, or hardware-based authenticator, a software implementation will be put in place to mimic their behavior. The hardware device used will be a USB drive, which is considered inexpensive compared to other hardware-based authentication mechanisms.

This solution has been designed and developed using industry level standards and procedures. It has been evaluated by evaluators in various domains, including the technical, expert and user domains. The solution has a 97% accuracy, and the security presented by the authentication mechanism, considering the possible exploitable threats for such a security mechanism, is high.

Key Words: Cyber security, authentication mechanisms, hardware-based security, Small and Medium Enterprises