



## Assessing the Effectiveness of Two-Factor Authentication in Preventing Cybersecurity Threats

### RESEARCH PROPOSAL TITLE

#### Rationale/ Introduction

Cybersecurity threats such as phishing attacks, credential stuffing, and brute-force hacking have led to an increased reliance on two-factor authentication (2FA) as an added layer of security. While 2FA is widely adopted across industries, its effectiveness in preventing unauthorized access varies depending on implementation, user behavior, and attack sophistication. Some studies suggest that while 2FA enhances security, it may also introduce usability concerns, leading to user resistance or workarounds. This research aims to assess the effectiveness of 2FA in preventing cybersecurity threats, examining both its security benefits and its impact on user experience. <Insert content; In-text citations are needed>

#### Significance of the Study

This study is significant as it evaluates the real-world effectiveness of 2FA, providing insights for businesses, cybersecurity professionals, and software developers. By assessing its strengths and weaknesses, the research will help organizations implement better authentication strategies and balance security with usability. The findings will contribute to cybersecurity best practices, aiding both individuals and enterprises in safeguarding sensitive information. Additionally, the study will explore potential improvements to authentication mechanisms to enhance both security and user convenience. — <Insert content>

#### Scope and Limitations of the Study

This study will focus on assessing 2FA methods such as SMS-based authentication, authentication apps, and biometric authentication in preventing cybersecurity threats. It will analyze security effectiveness, user adoption, and vulnerabilities. However, the study will not include an in-depth technical analysis of cryptographic mechanisms behind authentication systems or evaluate non-2FA authentication methods like hardware tokens or password managers.

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A4 size, Arial 11  
Academic Writing Style (good writing style should be considered)  
APA formatting (referencing and in-text citation)  
Always make sure that your proposal falls under any 3 prioritized CS research tracks  
Avoid plagiarism  
Always make sure that your proposed study is specific and attainable.

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First paragraph: Introduce ang yung problem or yung research gap. It is something that you want to address. Not because it is called problem ay direct problem na ito. It can be the gap, weaknesses, issues, or based on recommendations from existing literature.

Second paragraph: In few sentences, describe how you'll be able to solve the research gap or solve ang weaknesses nito.

Third paragraph: Potential impact. Dito nyo na ihighlight yung expected outcomes or benefits nito.

Fourth paragraph: Conclusion. Just a summary of this rationale and conviction na maipush ang proposal nyo. This highlights yung value ng proposal nyo to contribute sa field ng CS.

NOTE: ACADEMIC WRITING STYLE should be followed. No to ChatGPT :)

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Dito rin dapat ilagay yung "possible" contribution nito sa U.N. SDG. Basahin po muna ang <https://www.un.org/sustainabledevelopment/sustainable-development-goals/> bago maglagay ng content. Wag magassume dahil may focus ang bawat goal.

Dito rin ilagay po ang involvement ng proposal nyo sa CvSU Thematic Area. If one or more involved areas, okay lang po basta maijustify nyo po sa section na ito.

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## Objectives of the Study

This research aims to assess the effectiveness of two-factor authentication in mitigating cybersecurity threats while considering its impact on usability. Specifically, it will:

1. Evaluate the success rate of 2FA in preventing unauthorized access and cyberattacks.
2. Analyze user adoption challenges and usability concerns associated with 2FA.
3. Identify potential improvements to existing 2FA implementations for enhanced security and convenience.

## Expected Outputs

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The research is expected to provide a detailed assessment of two-factor authentication's role in cybersecurity. Findings will include an evaluation of 2FA's security effectiveness, usability challenges, and recommendations for improving authentication methods. Additionally, the study will contribute to discussions on balancing security and user experience in authentication systems.

## References

- Bonneau, J., Herley, C., Oorschot, P. C. V., & Stajano, F. (2012). *The quest to replace passwords: A framework for comparative evaluation of web authentication schemes*. *IEEE Symposium on Security and Privacy*, 553-567.
- Das, A., Bonneau, J., Caesar, M., Borisov, N., & Wang, X. (2014). *The tangled web of password reuse*. *NDSS Symposium*, 1-15.
- Krol, K., Philippou, E., De Cristofaro, E., & Sasse, M. A. (2015). *User authentication: Replacing passwords with biometrics?* *IEEE Security & Privacy*, 13(1), 37-43.

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Description of outputs (specifications, datasets, algorithms, prototypes, etc.)  
Description of materials to use

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