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Revolutionizing ATM Security: The Implementation of OTP-Based Authentication Systems

Rohit Wasade[1], Anurag Page[2], Yash Thakare[3], Arvind Kashipaka[4], Piyush Dhandekar[5], Dr. Vanita Buradkar[6]
Students, Department of Computer Science and Engineering[1,2,3,4,5]
Assistant Professor, Department of Computer Science Engineering[6]
Rajiv Gandhi College of Engineering Research and Technology, Chandrapur, Maharashtra,
rohitwasade775@gmail.com, arvindkashipaka23@gmail.com,
anuragapage940513@gmail.com,piyushdandekar99@gmail.com, thakareyash79@gmail.com, vsburadkar@gmail.com

Abstract: *The rapid rise in cybercrime and ATM-related fraud has revealed critical vulnerabilities in traditional authentication methods, such as Personal Identification Numbers (PINs). These static security approaches are increasingly inadequate in protecting users from threats like skimming, card cloning, and shoulder surfing. This paper explores the implementation of One-Time Password (OTP)-based authentication systems as a dynamic and secure alternative to conventional PIN systems in ATM transactions. By leveraging the principles of time-sensitive and session-specific codes, OTPs significantly reduce the risk of unauthorized access and fraudulent withdrawals. The study outlines the architecture, advantages, challenges, and real-world case studies of OTP integration in ATM infrastructure. The paper concludes that OTP-based authentication, when combined with mobile networks and secure delivery mechanisms, has the potential to revolutionize ATM security and restore user trust in digital banking.*

Keywords: ATM Security, OTP Authentication, Cybersecurity, Banking Technology, TOTP, HOTP, Multi-Factor Authentication

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