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A Study on Biometric Authentication in Banking Trends and Security Analysis with Special Reference to Tirunelveli City

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Abstract: *The banking sector has undergone a remarkable transformation in recent decades due to rapid technological advancements and digitalization. As financial institutions focus on security, efficiency, and inclusion, biometric authentication has emerged as a reliable and innovative method for verifying customer identity. Unlike traditional systems that rely on passwords, PINs, or tokens, biometric authentication uses unique physiological and behavioral traits such as fingerprints, facial recognition, and iris scans to provide a higher level of accuracy and protection. In India, the introduction of Aadhaar-based biometric authentication by the Unique Identification Authority of India (UIDAI) has been a major step toward strengthening digital banking infrastructure and ensuring secure financial access for all citizens. This system has enhanced convenience while reducing risks of fraud and identity theft. The present study, titled "A Study on Biometric Authentication Recent Trends and Analysis with Special Reference to Tirunelveli City," examines the level of adoption, awareness, and effectiveness of biometric authentication in the banking sector. The main objectives of the study the current trends in the adoption of biometric authentication in the banking sector with special reference to Tirunelveli city and to examine customer awareness and perception towards biometric authentication as a secure mode of banking. The research specifically focuses on customers and staff members of selected public, private, and co-operative banks in Tirunelveli City. It explores users' perceptions of security, ease of use, reliability, and satisfaction, while also identifying the challenges and barriers banks face in implementing these technologies. The study adopts a descriptive research design, using both primary and secondary data. Primary data were gathered from 136 respondents through structured questionnaires, most of which utilized a five-point Likert scale to measure satisfaction levels. Secondary data were collected from journals, articles, books, and official websites. The analysis employed statistical tools such as Percentage Analysis, Likert Scale, and Garrett Ranking to interpret responses effectively. Overall, the study aims to highlight the growing significance of biometric authentication in promoting secure, user-friendly, and efficient banking operations. It also provides insights for policymakers, banks, and technology providers to enhance digital security frameworks, strengthen customer trust, and encourage broader adoption of biometric technologies, especially in semi-urban regions like Tirunelveli.*

Keywords: Biometric Authentication, Digital Banking, Security, Convenience, Fingerprint Recognition, Financial Inclusion

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