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BLESSWIN PAY: PAYMENT SYSTEM FOR BRAILLE READERS

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ABSTRACT

In the context of enhancing accessibility and security for visually impaired individuals during banking transactions, this study addresses the challenges faced by this demographic when using ATMs. Despite the presence of guided audio systems, their effectiveness is often limited, resulting in longer processing times compared to sighted users and potential security concerns. To mitigate these issues, our study proposes the implementation of an AI-driven payment system designed to activate upon detecting a visually impaired user approaching the ATM. This system incorporates iris and face detection for user identification and subsequent biometric verification through fingerprint recognition. To ensure security, the system suspends the transaction if interference is detected while a visually impaired person is using the ATM. Furthermore, this innovative approach enables visually impaired individuals to input transaction amounts through an audio system or a tactile keypad integrated into the ATM. The objective of this study is to provide visually impaired individuals with a safer and more efficient ATM experience, thereby enhancing their access to essential banking services.

1. INTRODUCTION

Accessibility and inclusivity in modern banking services are pivotal to ensuring financial independence and autonomy for all individuals, regardless of their physical capabilities. Visually impaired individuals, as an important part of this diverse user base, often encounter significant hurdles when engaging in everyday banking transactions, primarily due to the limited accessibility of Automated Teller Machines (ATMs). Traditional ATM interfaces, primarily designed for sighted users, pose challenges for those with visual impairments, leading to extended transaction times, privacy concerns, and potential security risks. In recognition of these challenges, this paper introduces a novel and inclusive solution: the "BlessWin Pay:Payment Machine for Visually Impaired". This innovative payment machine leverages cutting-edge technology, including artificial intelligence (AI) and biometric recognition, to enhance both the accessibility and security of ATM transactions for the visually impaired.

The primary aim of this paper is to elucidate the pressing need for such a payment machine, outline its core features and functionalities, and present the research and development efforts that have culminated in its creation. The BlessWin Pay represents a significant step towards creating an inclusive banking environment, where visually impaired individuals can confidently and independently conduct a wide range of transactions with ease and security.

By addressing these critical issues and providing a comprehensive understanding of the BlessWin Pay, this paper aims to contribute to the ongoing discourse on accessibility in banking services and foster a more inclusive financial landscape for all.

2. LITERATURE SURVEY

The challenges faced by visually impaired individuals in conducting ATM transactions have been the subject of extensive research, reflecting the growing recognition of the need for improved accessibility and security in financial services. Studies have consistently identified common challenges, including difficulties in locating and operating buttons, interpreting on-screen information, and safeguarding transaction privacy. To address these issues, guided audio systems have been introduced as an accessibility feature, but their effectiveness often falls short in terms of transaction efficiency and security, necessitating further research and innovation. The application of biometric authentication, particularly fingerprint recognition, in enhancing the security of financial transactions is a well-documented area of exploration. However, adapting biometrics to meet the unique needs and challenges of visually impaired users remains a relatively uncharted domain, presenting opportunities for innovative solutions. Similarly, studies have delved into the utility of facial recognition technology for accessibility and user identification, but its incorporation into ATM transactions for the visually impaired is a burgeoning field. Innovations in tactile keypads designed specifically for visually impaired users have garnered attention and have the potential to significantly simplify transaction inputs, thereby enhancing the overall user experience. Furthermore, a recurring theme in the literature pertains to the security and privacy concerns associated with ATM transactions for the visually impaired, underscoring the importance of protecting these users from potential fraud and interference. As of late, AI-driven solutions have been increasingly explored as potential remedies for the accessibility and security challenges faced by visually impaired ATM users, marking an exciting and evolving field of research. In summary, while significant strides have been made in addressing accessibility and security concerns for visually impaired individuals at ATMs,

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the prevailing literature suggests that there is a burgeoning need for innovative, comprehensive, and user-centric solutions, which aligns precisely with the focal point of this study.

3. COMPARATIVE ANALYSIS

In the quest to create an inclusive and accessible financial landscape, the challenges faced by visually impaired individuals during ATM transactions have come under the spotlight. A diverse body of research has sought to understand and address these challenges, resulting in the development of various technologies and methodologies. However, despite these advancements, existing solutions often fall short in terms of both accessibility and security. This comparative analysis seeks to shed light on the existing research and technologies that have paved the way for our proposed AI-driven payment system. Through a comprehensive review of the literature, we will explore the limitations and capabilities of current systems, drawing upon the work of previous researchers who have delved into aspects such as guided audio systems, biometric authentication, facial recognition, tactile keypads, and security and privacy concerns. As we navigate this landscape, we will uncover how the proposed system builds upon and complements these existing solutions, offering an integrated, efficient, and secure approach tailored specifically to the unique needs of visually impaired ATM users. This analysis, therefore, underscores the significance of our study in contributing to the creation of a more inclusive and user-centric banking environment.

ASPECT	EXISTING SYSTEM	PROPOSED SYSTEM
Challenges in ATM Accessibility	Difficulty in locating buttons and interpreting on-screen information	Addresses these challenges through an AI-driven payment system, significantly improving accessibility
Guided Audio Systems	Essential for providing auditory assistance to visually impaired users during ATM transactions, but often lacks efficiency and privacy	Enhances efficiency and security by integrating AI, biometrics, and audio interfaces
Biometric Authentication	Explores the use of fingerprint recognition for security in financial transactions.	Applies biometrics to the unique needs of visually impaired users, ensuring both security and accessibility
Facial Recognition Technology	Investigates facial recognition technology for accessibility and user identification	Innovatively applies facial recognition to ATM transactions for visually impaired individuals, improving both security and efficiency
Tactile Keypads	Presents innovations in tactile keypads designed to simplify transaction inputs for visually impaired users.	Integrates tactile keypads into the AI-driven system to further enhance accessibility and transaction efficiency
Security and Privacy Concerns	Highlights the need to protect visually impaired ATM users from potential fraud and interference.	Proactively addresses these concerns by implementing features like transaction suspension in case of interference.
AI-Driven Solutions	Identifies the potential of AI-driven solutions for ATM accessibility and security	Provides a comprehensive and user-centric AI-driven solution that significantly enhances accessibility, security, and efficiency for visually impaired ATM users

4. CONCLUSION

In this journal paper, we have explored the multifaceted challenges faced by visually impaired individuals during ATM transactions and proposed an innovative AI-driven payment system to address these issues. As our comparative analysis reveals, the existing research landscape has significantly contributed to our understanding of the complexities inherent to ATM accessibility and security. However, it has also underscored the limitations and gaps that persist in current systems, necessitating the development of a more comprehensive, user-centric solution. Our proposed AI-driven payment system represents a significant stride forward in the pursuit of inclusive banking services. It amalgamates the power of AI, biometric recognition, and user-centric design to offer an accessible, secure, and efficient means of conducting ATM transactions for visually impaired individuals. By integrating features such as iris and face detection, fingerprint verification, and transaction suspension in case of interference, our system bridges the accessibility and security divide that has long existed in this domain. Through this research, we have sought to not only provide a theoretical solution but also present a practical means of enhancing the everyday lives of visually

impaired individuals. Our system aims to empower this demographic with the ability to manage their financial transactions with independence and confidence, ultimately fostering financial inclusion.

In conclusion, this study underscores the critical need for technology to be harnessed as a means of empowering and facilitating financial independence for visually impaired ATM users. By addressing the limitations of existing systems, our research opens new avenues for innovation and, most importantly, promotes the creation of a more inclusive and equitable banking environment. The AI-driven payment system introduced herein offers a promising step toward this goal, aligning itself with the broader global effort to ensure equal access to essential financial services.

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