PAYMENT TRANSACTIONS USING BIOMETRIC AUTHENTICATION

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College ***:*** *S.D.M. College of Engineering and Technology, Dharwad*
Branch ***:*** *Department of Information Science and Engineering*
Guide(s) ***:*** *Prof. Arati Nayak*
Prof. Varsha S. Jadhav
Student (S) ***:*** *Ms. Gayatri G. Shetti*
Ms. Isha Girish Shet
Mr. Jayganesh Nayak

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Payment, Bio-metric authentication, Transaction system, E-Biometric.

Introduction:

Biometrics is automated methods of recognizing a person based on a physiological or behavioral attribute. Along with the quality considered are; face, fingerprint, hand geometry, iris, retinal, signature, and voice. Biometric technologies are fetching the establishment of an extensive array of extremely safe recognition and personal authentication solutions. As the level of security breaches and transaction fraud increases, the need for highly secure identification and personal verification technologies is becoming apparent. Biometric-based solutions are proficient to offer for confidential financial transactions and personal data privacy. The need for biometrics can be found in federal, state and local governments, in the military, and in commercial applications.

Enterprise-wide network security infrastructures, government IDs, secure electronic banking, investing and other financial transactions, retail sales, law enforcement, and health and social services are already benefiting from these technologies. Biometric-based authentication applications include workstation, network, and domain access, single sign-on, application logon, data protection, remote access to resources, transaction security and Web security. Trust in these electronic transactions is essential to the healthy growth of the global economy.

Utilized alone or integrated with other technologies such as smart cards, encryption keys and digital signatures, biometrics are set to pervade nearly all aspects of the economy and our daily lives. Utilizing biometrics for personal authentication is becoming convenient and considerably

more accurate than current methods. This is because biometrics links the event to a particular individual is convenient accurate can provide an audit trail and is becoming socially acceptable and inexpensive.

Objectives:

- To study the technological practicability for biometric, enable transactions and customer preferences in choosing Biometric technology for banking.
- To study the factors that is affecting the choice of customers in selecting a biometric technology-based app/payment gateway.
- To provide safe and convenient identification and authentication with a human touch.
- To provide enhanced security of end user and faster payment experience.
- Faster user identification using biometrics can lead to quicker checkout times and reduced queues, improving overall transaction efficiency.
- To reduce Risk of Identity Theft.
- Biometric authentication can offer alternative payment methods for individuals who have difficulty remembering PINs or using traditional methods due to physical limitations.

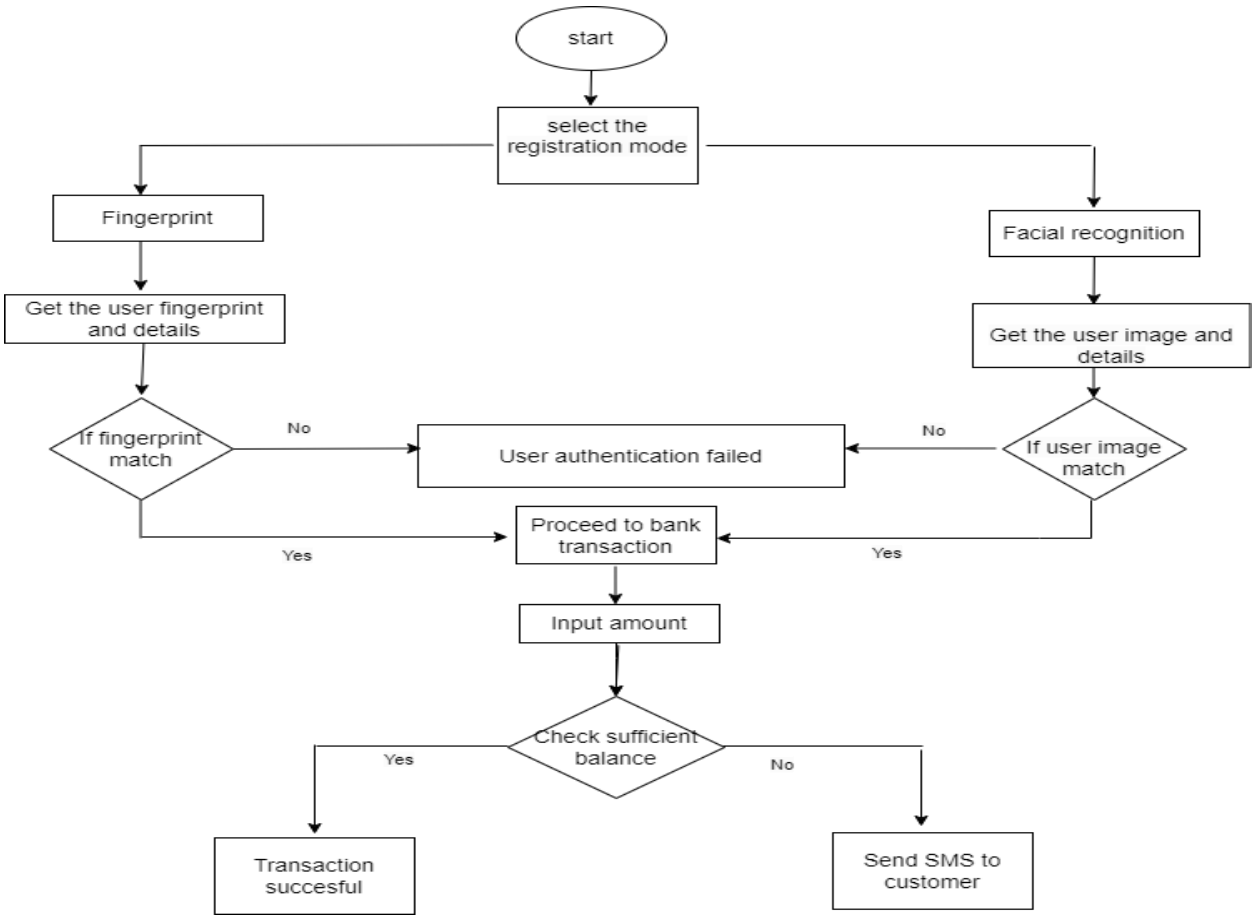
Methodology:

For biometric authentication. Upon initiating the authentication process, the device captures the user's biometric information again and performs a comparison with the stored template. Advanced algorithms are utilized to analyze and match the captured biometric data with the stored reference, ensuring a high level of accuracy and reliability. Throughout this process, robust encryption techniques are implemented to safeguard the biometric data during transmission and storage, preserving user privacy and preventing unauthorized access. By leveraging biometric authentication, payment transactions become not only more convenient but also significantly enhance security by providing a unique identifier tied directly to the user's physical characteristics. This approach offers a promising avenue for secure and frictionless payment experiences in an increasingly digitized world platform that prompts a promising avenue for secure and frictionless payment experiences in an increasingly digitized world. and knowledge base information, the system formulates a query to retrieve pertinent details. This information is then extracted, and the

dialogue management component crafts a response tailored enrollment process where they register their unique payment transaction, the user interacts with a compatible device or the technology payment transaction using biometric authentication encompasses several key steps to ensure seamless and secure authentication. Initially, users undergo an enrollment process where they register their unique payment transaction, the user interacts with a compatible device or platform that prompts a promising avenue for secure and frictionless payment experiences in an increasingly digitized world.

The proposed payment system is made secure through the use of secure E-payment via face recognition. As a result, only authentic customers can conduct transactions. This payment system is designed to be secure enough that any authorized customer can easily trust it and make payment over the Internet without fear or hesitation. In particular, the system first enters the user account details, then checks to see if the customer is authorized or not, and then the transaction is completed. Following the entry of the amount, the following conditions are checked: If the amount submitted by the user is larger than the account balance, the transaction will fail, and a notification alerting the user that he/she does not have enough balance will be shown. If the user's submitted amount is less than the account balance, the camera will be opened to detect the face image using the Haar cascade algorithm (detection phase). If the image of the face does not exist in the database, the system sends an error message.

Flow Chart:



Results And Conclusion:

Seamless transactions: Shopping will be done with seamless transactions with a glance in the camera or just with your fingerprint to authorize the payment. This will significantly reduce the waiting line or slow pace use of the cards, PIN entry, etc.

User Comfortability: The system we proposed here gives user a choice on which type of payment authorization does the user want. User can either select Face or Fingerprint for payment transaction so that which he chooses can be used to authorize for the final payment.

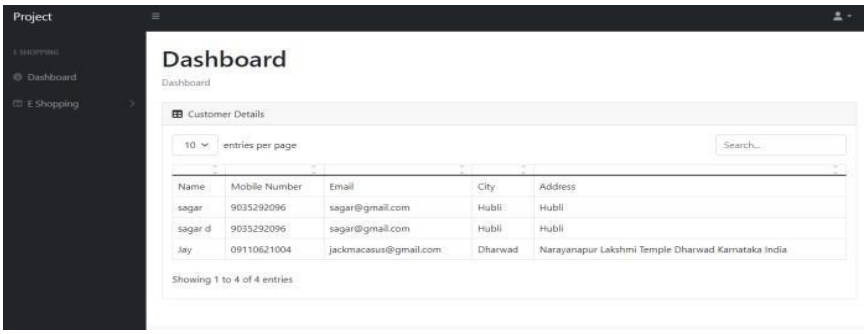
Secure and Safe: Enhanced security can be done as the user's biometric data cannot be replicated or faked that easily and the system will detect easily if there are any changes in the authorization and declines the payment. The Biometric payment system will be more secure and

faster as the use of Raspberry Pi and the both face and fingerprint detection will be integrated in it. As the Figures 5.1, 5.2, 5.3, 5.4 below shown these are the dashboard and completion of payment transaction using the biometric system via web host.

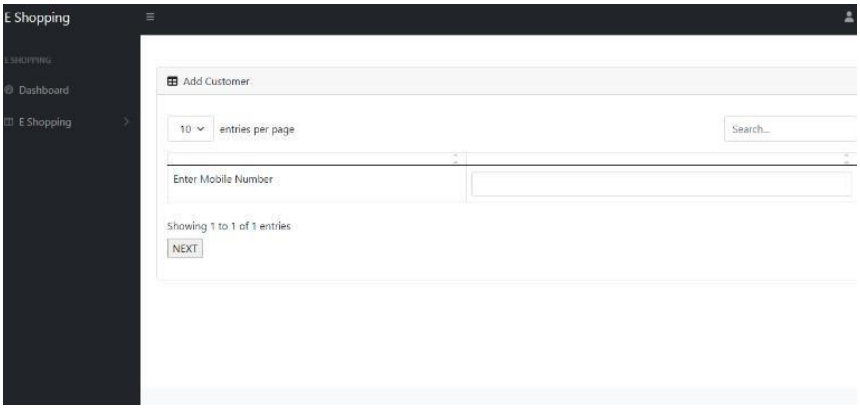
User Details: In this, we can see the User details who are register with their details such as Name, Mobile Number, Email, City and address. Add User: We can add User's here using their mobile and then after the user adds their mobile number next, they'll give their other details like email, address, etc.

Product Details: The products can be seen here after the user takes them for checkout and the product details are shown such as name, quantity, amount or price of the product. Here, after the product is finalized, the user will be able to pay via face or bio-metric (Face) and the transaction processes and authorizes the user.

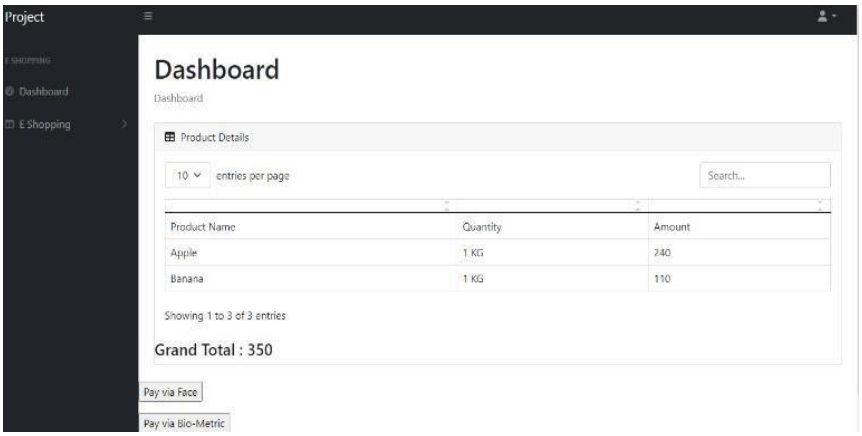
Payment Successful: Once the user's transactions is completed the dashboard will be redirected and shows that payment successful and can procced with the checkout.



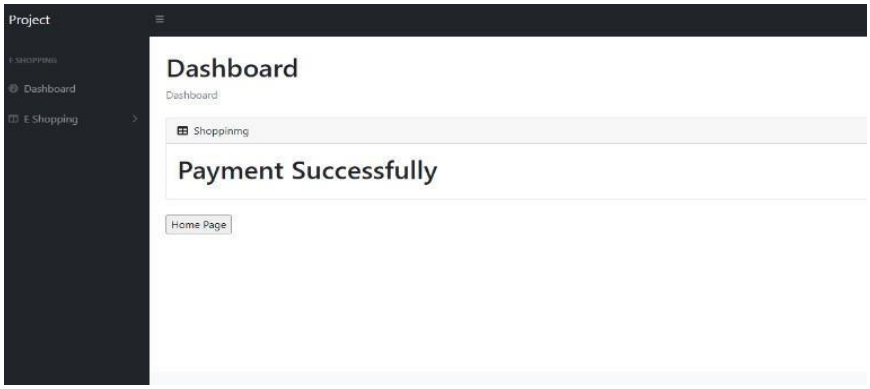
Dashboard Output of User Details



Dashboard Output of Adding User



Dashboard Output of Product Details and Payment Selection



Innovation for the Project:

The innovation in this project lies in pushing the boundaries of biometric payment systems. This project can also involve in exploring novel authentication methods like iris scans or voice recognition, implementing advanced security measures like multi-factor authentication and liveness detection, or focusing on user experience through seamless integration with wearables and context-aware authentication. Additionally, exploring decentralized data storage for user privacy and innovative integration with existing payment systems can further revolutionize the way we pay.

Future Scope:

In the future this system Firstly, the integration of biometric authentication is expected to become more ubiquitous across various industries, including retail, banking, healthcare, and government services. As consumers increasingly prioritize security and convenience, businesses will leverage biometric technology to offer seamless and secure payment experiences across different channels, such as online, mobile, and in-store transactions. Moreover, advancements in biometric

sensor technology, such as improved accuracy, faster processing speeds, and enhanced usability, will drive the development of more sophisticated biometric authentication solutions. Emerging modalities, such as vain pattern recognition, palm print recognition, and behavioral biometrics, hold promise for augmenting existing biometric authentication methods, providing additional layers of security and personalization. Furthermore, the proliferation of Internet of Things (IoT) devices and wearable technology presents new opportunities for biometric authentication in payment transactions. Smartwatches, fitness trackers, and other wearable devices equipped with biometric sensors can serve as convenient and secure authentication tools, allowing users to authorize payments with a simple gesture or touch.