International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 4 | Apr 2019 www.irjet.net p-ISSN: 2395-0072

A Mobile Payment System Based On Face Recognition

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Abstract— *Along with the increasing market share of smartphone, more people are using mobile payment to pay for something in their day to day life. In this paper, a new mobile payment framework which is based on face recognition is proposed after studying existing mobile payment frameworks. On the basis of traditional password authentication technology, this new face recognition based framework applies biological characteristics to ensure users' identity. In technical terms, it uses face detection and facial feature extraction method which cope with 2D-PCA (two dimension principal component analysis) to verify users' face image and identity. Besides, this framework applies a third-party to ensure the authenticity of the transaction process.*

Key Words: *mobile payment, third-party authentication of payment, 2DPCA, face recognition.*

1.INTRODUCTION

On September 26, 2013, "User research report of China mobile banking, 2013" was released. The report indicates that people who favored mobile payment represented 46.97%, which is somewhat lower than the extent of the PC, and the number of user is increasing quickly. Hence, mobile payment is a big trend, but for now, users' habit of using mobile payment is still in training.

People have done numerous research on the factors that impact uses' acceptance of mobile payment, among numerous factors, security is chosen as it is the one that is worth most [3-4]. There are two major mobile payment hazards at present, one of them is network data of mobile communication being captured, and another is verified path being uploaded [5].

At present, mobile payment can be categorized into near-field payment and remote payment. Near-field payment comprises of RFID based mobile payment framework and NFC based mobile payment framework. Currently, near-field payment is not widely used because of its limited use. Their security measure for non-encrypted information in case of misconduct is not effective [6].

There are lightweight mobile payment protocols, third-party based mobile payment frameworks and biometrics based mobile payment frameworks in remote payment [7].

Some non-biometrics based frameworks always have a simple process, which easily causes data leakage or authentication errors. However, current biometric-based frameworks are not secure. It is difficult for an immature framework to protect users' identity. On the contrary, once safety and accuracy of a biometric-based framework can be ensured, the efficiency of payment will be immensely improved.

2. RELATED WORK

Currently, mobile payment can be divided into near-field payment and remote payment. When it comes to remote payment, it can be further divided into biometric based remote mobile payment framework and non-biometric based remote mobile payment

framework according to if it uses biological features to validate.

The following context will describe some related work from these three viewpoints.

1) Near-field payment. Reference [8] proposed RFID based mobile payment system. it moves RFID information card into mobile to make sure the authenticity of the registration information is maintained. However, RFID is not widely used and is expensive when is comes to the advancement of this framework.

2) Biometric based remote mobile payment framework. Reference [9] proposed a biometric based secure mobile payment framework. It collects fingerprint authentication technology, WPKI (Wireless Public Key Infrastructure) and UICC (Universal Integrated Circuit Card) to ensure the confidentiality of the transaction process. An android-based mobile payment system secured by 3-factor authentication is proposed in reference [10]. This system uses text authentication, card authentication and face authentication as its key factors to verify users' identity. But it requires the use of specific USIM card (USIM card) to authenticate users, which limits the promotion of this system.

3) Non-biometric based remote m-payment framework. A lightweight mobile payment system based on symmetric encryption is proposed in reference [2]. This system maintains the performance of the phone, and improves the enforceability of the system. However, it reduces the security of mobile payment.

Based on the above work, this paper proposes a secure mobile payment framework based on face recognition.

3. PROPOSED WORK

As now-a-days world is moving toward the cashless payment modes with different security systems (pins, passwords, etc.) as well as different platforms (paytm, phonepe, airtel wallet,etc), it is difficult for people to remember lots of payment modes credentials (usernames, passwords, emails, pins, etc.). So in this paper, we are going to propose idea with which we can make a payment system for the people where they can store all their credential once and generate a common password or pin with their face as the username.

We have to deal a lot with our payment modes during the payment or checking out from stores like waiting in long queues, waiting for the change money, which is quiet delay in the process. Our proposed work solves the problem of managing multiple payment modes by replacing all of

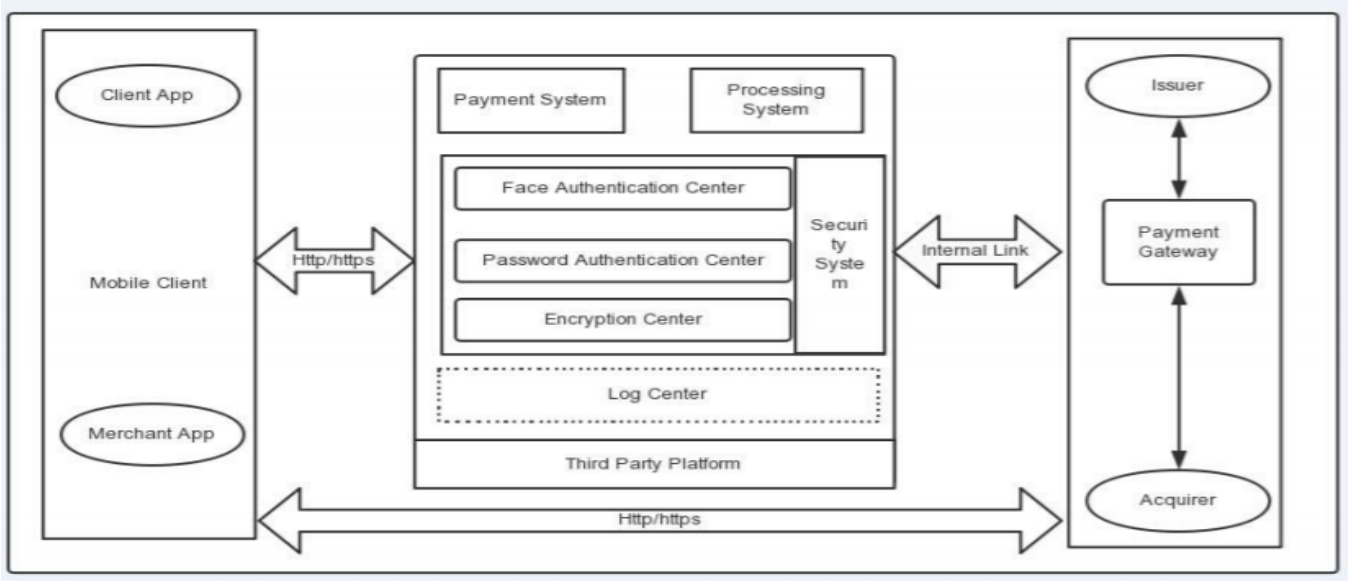

Fig 1. System Framework

them by one which makes the transaction process fast, secure and more convenient.

It is a hassle-free payment system. We decided not just to enable people to walk without wallets – but to travel wallet free.
This new system enables your wallet to be anywhere you need in an instance of a second. Pay by simply being in the store.

4. METHODOLOGY

AT MERCHANT END:-

i. Visit a place where they already got face payment system installed.

vii. .

AT CLIENT END:

i. You first have to make an account providing basic information about you and your preferred payment method.

ii. Come in front of the camera, and press Sign In.

iii. A glance in the camera, and your account is ready to use.

iv. Now you can credit balance as per your choice, be it banking card or cash.

v. You can carry on with the transaction process.

vi. You can go online, and set up your existing bank account to load your app account automatically

ii. The application will ask the user to click some pictures for future verification and also enter the required personal details.

iii. After this you will be able to pay using this mode of payment.

CONCLUSION

This mobile payment framework has high-level security and efficiency. However, due to the complication in the technology and the influences from circumstance, the accuracy and efficiency will be affected to an extent when users take photos at different angle or under different lights. Thus, after the construction of the proposed framework, our group will further explore the face recognition algorithm in order to increase the framework's stability and accuracy.

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