



## Pay-Cloak: Biometric

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### ABSTRACT

Continuous improvements in technology and quality of life have had a strong impact on the development of payment techniques. With the evolution of near-field communication (NFC) technology, contactless payment has received recent attention because of its short-range, conducive nature. As mobile computing made great leaps due to enormous development in the smart phone platform, companies like Google, Samsung, and Apple embedded NFC in smart phones to provide on-the-go payment capabilities, eliminating the need for payment cards. But due to interoperability and high cost, these technologies are not available to everyone.

**Keywords:** *Biometrics, mobile computing, near-field communication, telecommunication security*

### I. INTRODUCTION

The ideal technology would combine the best features of contactless payment with reliable security at an affordable cost. This article presents a prototype of a hardware module called Pay-Cloak, which could be used as a back cover for an NFC enabled smart phone. The module communicates via Bluetooth with an Android application installed in the smart phone after verifying the user's identity through a capacitive fingerprint sensor. The application processes both merchant point-of-sale (POS) payments using quick response (QR) codes and peer-to-peer (P2P) payment using NFC. The security of the transaction is further enhanced using the tokenization technique. The app can also be used as a virtual form of identification (ID).

Due to its very less communication range, NFC is preferred for payment-related needs. In 1995, Seoul Bus Transport first implemented contactless payment technology. In 2007, Barclay card first embedded NFC in its payment card to support contactless payment. Since then, NFC development took a huge leap, and contactless transaction is increasing every day. Many researchers are exploring the use cases of NFC for different payment-related issues.

In present days, the security of a system is critical question in every field as hacking is a big concern. As the payment technologies are being converted to internet based service, hacking has also become a major threat to crack a system. So, while developing a payment technology it is very much required to concentrate on the security. In the proposed methodology, we have tried to increase the security with the use of biometric trait of the user. This architecture mainly has two parts: App development for NFC enabled Smartphone and an external hardware part, which will be basically realized as a back cover of the phone. Here, in the proposed method an android application installed in the smart phone communicate with the external hardware through Bluetooth and also connected with a cloud server through GPRS. The system also incorporates the Tokenization technique to eliminate the need of sending sensitive information over the network. The functioning of the proposed mobile Application can be divided into three parts: QR Code Based Merchant Payment, Peer To Peer money transaction and ID virtualization.

### II. LITERATURE REVIEW

Advancement in payment technologies has an important impact on one's quality of life. Emerging payment technologies create both opportunities and challenges for the future. Being a quick and convenient process, contactless payment gained momentum, especially with merchants, with throughput being the main parameter.

Any combination of various smart components can make cities smart. Swing-pay: A digital card module using NFC and bio-metric authentication for peer-to-peer payment. Advancement in payment technologies has an important impact on one's quality of life.

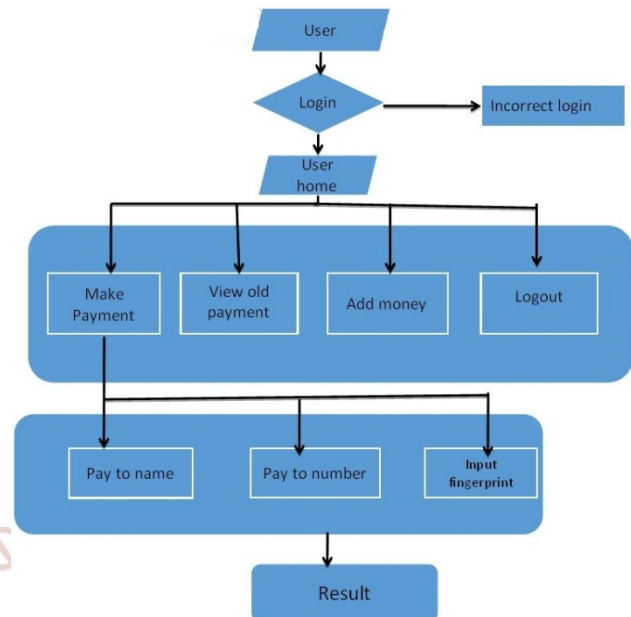
Emerging payment technologies create both opportunities and challenges for the future.

Portable radio frequency emitting identifier is based on automatic toll collection system wherein user doesn't have to pay toll by cash, user has to purchase etc tag from designated counters and get it fixed on vehicle, tag will act like a prepaid card wherein user has to recharge the same to ensure sufficient balance, as and when vehicle passes through the etc lane on toll plazas, the balance will be automatically deducted from card and user need not to stop his vehicle since after deduction of money from certain length, the traffic barrier will automatically open thus allowing user to avoid waiting in long queues which in turn saves the fuel as well as time of user.

### III. PROPOSED SYSTEM

In divergence to the existing system, in this paper we develop a web application where the key modules are user and viewing/login. Pay-Cloak uses fingerprint authentication and a tokenization scheme for verification and security. Swing-Pay and Pay-Cloak both have the same functioning and processes. The key difference is that Swing-Pay is a separate module that can handle all payment and identity needs, whereas Pay-Cloak can be attached with existing NFC-enabled smart phones to process the transactions and identity virtualization.

Fig.1 the architecture of the system shows how this application works.



**Fig. 1: Architecture of the system.**

In our proposed system, we are developing an Android Payment Application, using Biometric System instead of OTP, which can secure our payments more and more.

The main advantage of this application is it provides more security to our payment wallets than the existing system does.

### CONCLUSION

To the best of our understanding, in this paper, we presented a system incorporating a NFC enabled smart phone, which could be realized as an external smart phone cover consisting of a fingerprint sensor. The fingerprint sensor authenticates the user and sends appropriate data to the smart phone app. The process is very intuitive because the user does not have to put any information like card number, expiry date etc. like traditional systems. Also we have used the fingerprint sensor as our secure element, which verifies the biometric trait of the user. We have also integrated the Tokenization technique and QR code scanning feature in the application. The app securely stores the Token in the local database which can only be used if the Biometric data is matched. All the process runs in the background without the need of entering bank / card information manually. As the Token only stored in the Bank server and customer's mobile device, the chance of data breach is less compared to other existing solutions. The App can also be used to virtualize the identity information, eliminating the need of carrying all the ID cards like driving license, passport, voter ID card etc. The ID

information is displayed on a reader device with NFC antenna.

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