

## Electronic Payment Systems

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### Abstract

Electronic payment systems have revolutionized the business processing by reducing the paper work, transaction costs, labor cost. Being user friendly and less time consuming than manual processing's, helps business organizations to expand its market reach/ expansion. Current e payment technologies depend upon traditional methods that are common to non electronic systems. The ease of purchasing and selling products over the internet has helped the growth of electronic payments. But, apart from all the advantages it still has many drawbacks such as security vulnerability, flexibility, acceptance among people, trust issues etc. this paper provides the overview of e- payment architecture and their functionalities and also the enhancements that can be performed to manage the process in a well manner by eliminating the issues that may arise.

**Keywords** – E commerce, E payment systems, near field communication (NFC.)

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### Introduction

E payment is a subset of an e commerce transaction to include electronic payment for buying and selling goods or services offered. The basic requirements for e payments include

- **Atomicity** – Money is not lost or created during transaction or transfer.
- **Good Atomicity** - Money and goods are exchanged atomically.
- **Non repudiation** – no party can deny its role in the transaction.

Electronic payments involve a payer and a payee where a payer is referred to as a customer who is paying the amount and a payee is a person or entity who receives a payment. One of the main task of this system is to transfer this money from payer to payee by involving the bank or the financial institution. The bank is involved in two

types of roles i.e. issuer which is interacting with the payee. They are responsible for making the updates to the accounts of both the payer and the payee.

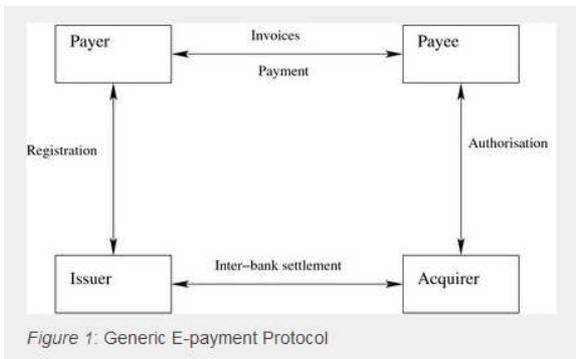


Fig 1.1 – Generic e payment protocol

All the above process takes place in phases. Starting with the registration phase followed by invoicing, processing and finally confirmation. In first phase of registration, payer and payee are registered with the issuer and acquirer respectively. Then the invoice of the payment is received followed by selection of the type of payment and authorization of the payment.

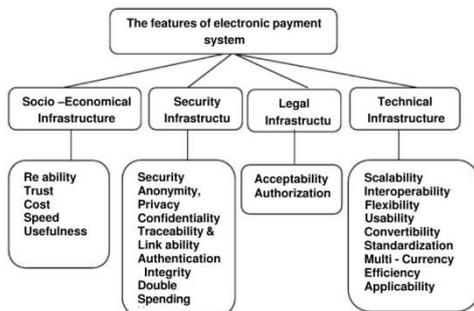


Fig 1.2 – Features of e payment system

Electronic payments despite its numerous benefits also comes with its challenges some of which are discussed below –

**Security** – the security of information and data is crucial in all the information systems. Unsecured e payment systems may not be trusted by the users and trust is very crucial to ensure acceptance from the customers or users.

**Infrastructure** – it is a neccasary for a successful implementation. Their exists need to have reliable and cost effective infrastructure that can e accessed by majority of population.

**Socio cultural challenges** – cultural and historical differences in attitude and the use of different forms of money complicate the task of developing an electronic payment system that is applicable at international level.



Consumers confidence and trust in the traditional payments systems has made customers less likely to adopt new technologies. New technologies will dominate the market until customers are confident that their privacy will be protected and adequate assurances of security is guaranteed. New technologies also require the test of time in order to earn the confidence of the people even if it is easier to use and cheaper than older methods.

## I. PROPOSED IDEAS

Various ideas have been proposed in order to enhance the process of e payment systems some of which are discussed below –

**Integrity and authorization** – its defined as accuracy of information with business values and expectations. Integrity means that no money is taken from a user unless a payment is authorized from him. The most common method of securing e payments is using cryptographic based technique such as encryption and digital signatures.

Some technological means –

- **Secure electronic transaction** – provides a solution to security problems for online credit card payment systems by providing digital certificate for both.
- **3D secure** - an alternative to SET and does not require certificate to authenticate.
- **Smart card security** – data stored on a smart card is encrypted and cannot be accessed without password/ pin and thus provides stronger security. A smart card could easily enable parents to block mobile app purchases by their kids, while permitting other purchases. Until then present day technology permits all your credit cars to be loaded on to one smartcard.
- **Biometric payments** – Biometric authentication can provide a high level of security, the money would automatically be taken from your credit card or bank account with just scanning finger prints.
- **Mobile payments** – instead of carrying a card, near fields communication technology can get you authenticated and money can be drawn from the account. If your digital wallet is an NFC enabled android phone, you can tap your smartphone at the card terminal at the checkout counter.



Figure 2.1 – Near field communications

- **Carrier or mobile billing** – the idea is to charge all your online purchases to your phone bill and clear that at the end of the month. In this method, we don't even need to own a smartphone to start making online purchases.
- **Smartphones as card readers** – a smart phone is a lot lighter to bring around and also a powerful alternative, given the right payment app and equipment. All it takes is a credit card reader device, plugged into their smart phone and they can start accepting credit cards payments straight away.



Figure 2.2 – Mobile phone as card reader

## Conclusion

Though e payment system has to face many challenges but there is a lot which can be expected to overcome these challenges. The security vulnerability in e payment systems can be overcome by introducing various features and by implementation of proposed idea therefore promoting the future of e payment systems helping the business organizations to expand and revolutionize the processes.

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