

# Evaluation and Analysis: Latest Internet Tools and Technology

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**Abstract:** This paper highlights the analysis of recent methods and payment gateways through internet after evaluation. Ever since digitization has taken place everything has become computerised and online, so is the complexity in getting awareness of and understanding the use of such new internet payment tools, gateways, methods, etc. Thus, there is a growing need to understand these online payment gateways to ensure safety, integrity, confidentiality and optimization of transaction. Not only this, various concerns like cyber crime, hacking and virus make it difficult to securely make online payment. Therefore, this paper is of immense use for today's gen-x and others who are in one way or the other associated with the use of internet. Thus, after reading this paper one can easily choose the best payment mechanism according to the requirement and security constraint.

**Keywords:** Electronic Money, E-Payment, Internet, Credit card laundering

## I. INTRODUCTION

Initially internet was used by scientists to keep in touch with one another and gradually used in armed forces. "Internet is a network of computer networks." It is fast, user friendly, latest technology, allows you to send messages to multiple people at the same time just like TV/radio broadcasting and Not only messages but graphics, videos, photos can be transmitted. Before internet EDI which was used to undertake commercial transactions electronically. But with increase in Inter- bank transactions across globe and direct deposit of salaries in employees account Electronic Data Interchange has become popular.

## II. ONLINE PAYMENT MECHANISM

Various payment mechanisms are used online for making payment as per the convenience, cost and ease.

### A. Credit card

Used for making payment for goods & services. You simply become liable to the organization who has issued the card, for the value of the merchandise/ amount withdrawn.

### B. Real – world cash (paper money)

Money is medium of exchange, a standard of value to facilitate saving. It is not very different from cash transactions.

#### Benefits are:

- Speedy.
- Ease of handling.
- Safety of not having to carry cash.

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Still, outside cash continues to be most widely used because of following benefits:

- Cash is more convenient.
- Wide acceptance.
- Anonymity/ secrecy.
- No hidden cost/ other cost of use.
- No audit trail (record).

But, cash has several limitations as against paper money:

- Easy to lose.
- Cumbersome to carry.
- Time consuming to count, organize & manage.
- Difficult to trace.



Fig. 1 The Types of Payment Mechanisms

### C. Electronic Money

It is the electronic medium for making payment. It includes credit card, debit card, smart card, EFT (Electronic Fund Transfer). It can be identified or anonymous, online or offline

#### Types of E-money

- (+I +L) Identified+ online. E.g. credit card, debit card.
- (+I-L) Identified + offline. E.g. American Express Traveller check, US Postal Money Order, payment by cheque
- (-I+L) Anonymous+ online. E.g. withdrawal from ATM, Purchase is made on spot for cash
- (-I-L) Anonymous+ offline E.g. deposit in ATM in one's own account, using credit card at merchant who doesn't have online connection to Visa/ Master card network.

Where,

ONLINE - Denoted by (L). Done with the help of internet. Requires user to interact with bank through modem/network to conduct a transaction with third party. With online option each transaction is verified and approved by issuing institution (such as bank) before payment is made.



OFFLINE - Denoted by (-L). User can conduct a transaction without directly involving with bank. Offline e-money requires no validation.

IDENTIFIED – Denoted by (I). Such transactions leave record which can be traced/ identified. You can identify the person who withdrew the cash. E.g. digital cash.

ANONYMOUS – Denoted by (-I). Such transactions leave no record thus they can't be traced/ identified. E.g. Paper money or cash.

**Properties to consider in e-money transfer**

**1) ACID test**

- Atomicity- transaction must occur completely/ not at all. E.g. transfer savings of Rs. 500 to current account.
- Consistency- all parties involved in the transaction must agree to the exchange. E.g. while purchasing & selling goods online buyer must agree to terms & conditions like price put by seller, similarly, seller must agree to quality, warranty & timely delivery of goods.
- Isolation- each transaction must be independent of any other transaction. E.g. 2 shirts purchased for Rs. 1500 each are entered independently and not as shirt bought for Rs. 3000
- Durability- means how long transaction should stay/ end if customer changes his mind. E.g. till when a customer can cancel the order upon payment

**2) ICES test**

- Interoperability - ability to move forth & back between different systems. E.g. if filled wrong details then press back button & rectify the entry and then click proceed/ confirm.
- Conservation- means for how long money will hold its value over time & how easy money is to store & access. E.g. transaction recorded after payment/ ordering of goods and can be used for future reference.
- Economy- processing a transaction should be inexpensive & affordable. E.g. processing charges are Rs 10 or Rs 100 for goods worth Rs 1000.
- Scalability – ability of system to handle multiple users at the same time. E.g. Once you have started with e-banking transaction and due to many users operating the same bank at same time website is hanged then your transaction will not proceed nor will you get confirmation for payment, so you are confused whether payment is successfully made or not.

Apart from above mentioned properties some more properties are also important:

- Acceptability- means technical ability of system to accept your payment tool (debit card, credit card, etc).

- Ease of integration- user & website must be effective i.e. proper communication must occur between seller & buyer for sale & purchase.
- Customer base- there must be enough customers to justify your investment. E.g if you have system which accepts credit card then you must have sufficient customers who pay using credit card, otherwise your cost of installation per system will increase.
- Ease of use & ease of access- payment gateway/ tool must be fast enough to make quick payment because customers don't like to wait.

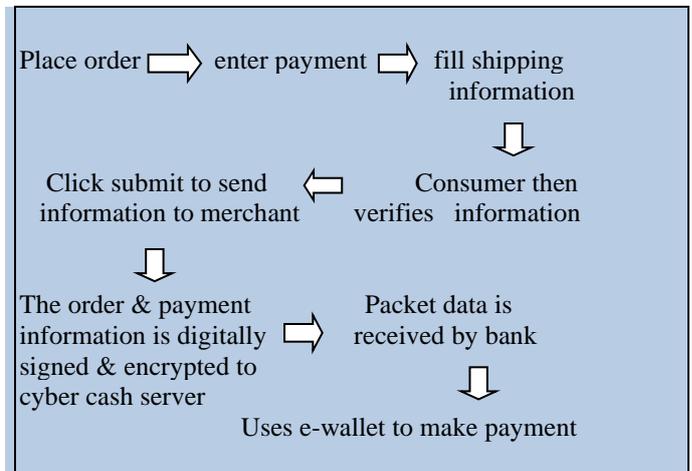
**III. PAYMENT GATEWAYS**

They are facilitators for payment to merchant account against customer's credit/ debit card, or we can say, payment gateway makes it possible to process transactions over the internet, whether customer uses Visa, master card, American Express, Discover, etc.

There are 4 payment gateways:

**A. CyberCash ([www.cybercash.com](http://www.cybercash.com))**

This server act as payment gateway between merchant & bank's network. The whole transaction in payment gateway takes less than 15 seconds.



**Fig. 2 The Payment Made through Cybercash**

**Advantages:**

- Prevents unauthorized payment through gateway.
- Customers are protected from thefts.
- All transactions can be easily traced with the help of cybercash.

**Disadvantages:**

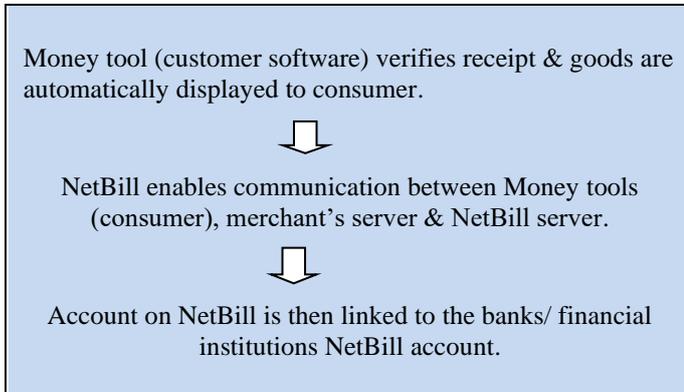
- No privacy for customers.
- Cost of transaction is high, since, customers are charged on per transaction basis.

**B. NetBill (www.netbill.com)**

This type of payment gateway is useful for purchasing digital goods & services.

**Advantages:**

- Secure
- Economical
- Ensures all transactions are completely successful.
- Maintains both merchant & customer account.
- Goods are delivered in encrypted form on consumer's machine.



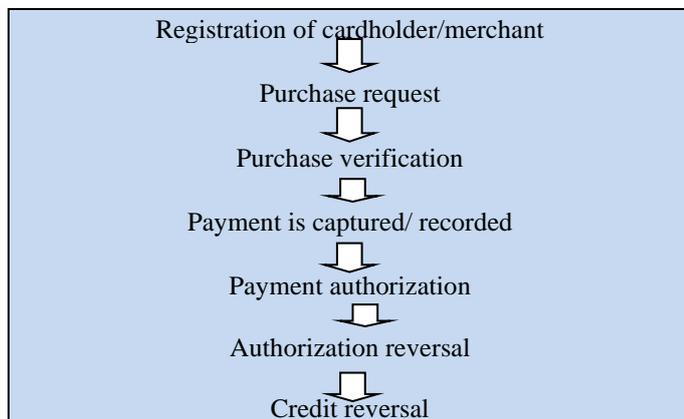
**Fig. 3 The payment made through NetBill**

**C. First Virtual Holdings & Virtual PIN (www.fv.com)**

It relies on E-Mail to confirm purchases.

**D. Secure Electronic Transactions (SET)**

These are emerging standards for online transactions. It is administered jointly by Visa & Master Card.



**Fig. 4 The Payment made through SET**

**Advantage or Goals of SET (Why SET)**

- (confidentiality) Ensures reliability.
- (integrity) Secure transaction.
- (interoperability) Covers all aspects from initial registration of cardholder.
- (authentication) Identification of parties involved using cryptography i.e. digital signature.

**Disadvantage**

- Complexity in this payment gateway
- Not economical

**IV. MODELS OF INTERNET BASED PAYMENT SYSTEM**

- 1) Electronic currency (EFT)
- 2) Debit card
- 3) Credit card
- 4) Smart card

**V. ELECTRONIC PAYMENT MEDIA**

There are 3 types of e-payment media depending upon information transferred online.

**A. Trusted Third Party Type**

All sensitive/ financial information is maintained/ updated offline. E.g. First Virtual

**B. Notional Fund Transfer-Related type**

Transactions are done online; therefore information needs to be encrypted for security. Such as:

➤ **Credit card**

**Disadvantages:**

- Leaves complete record/audit trail
- Insecure
- No signature to verify the cardholder
- Difficult to get merchant account for accepting credit card by bank upon customer's/ merchant's financial records & history of business.

**Advantages:**

However, with credit card purchases, you can contest the charge & put hold on payment within 60 days

Still, credit card holder might overspend before anyone finds out & retailers do not have verification machines to see your bank account balance before the sale.

**Credit card laundering**

Extend unsecured line of credit to another merchant i.e. agree to deposit another seller's credit card sales into your merchant account, you are taking more risk. Although you are charging fees, but it is regarded as violation of merchant agreement with bank/ credit card company. Mostly bad marketers opt for credit card processing merchants to bill their customers for sales. And once receive payment, they (bad marketers) run away without sending any goods to customer.

➤ **Debit card**

It looks exactly like credit card. Debit card is upgraded ATM card branded with Visa/ Master card.

**Advantages:**

- Easier than credit card
- More convenient
- Less burdensome
- Greater access to your money than ATM/ credit card (It's different because transaction is processed through issuing bank's credit card network.).
- Transaction is offline (so wait for 2-3 days for final processing).

**Note:** Using debit card with PIN (Personal Identification Number) just similar to PIN used in ATM machines is called online transaction.

➤ **Smart card**

- Introduced in 1977 by Motorola.
- Is thin.
- It is credit card sized piece of plastic.
- With 1/2" square area that serves as input/output system.
- Contains programmable chip (with RAM & ROM storage).
- It encrypts digital cash on programmable chip & can be refilled by connecting to a bank
- The chip's capability to store information in its memory makes card smart. E.g. Mondex

**Advantages:**

- Provides users with ability to make purchases.
- Holds ID/ cash/ key to house (purchases) / office.
- Provides identification of cardholder e.g. capturing finger prints for improved identification.
- Encryption & decryption of message to ensure security/ integrity/ confidentiality.
- It is similar electronic purse.

**C. Digital cash/ e-money**

- Leaves no audit trail(record)
- To use this open account with bank that handles e-cash
- You make withdrawl in form of e-cash coins stored in digital wallet on your PC.

**Advantages**

You can spend e-cash at any merchant that has e-cash account at bank.

**VI. CONCLUSION**

All the latest mechanisms of online payment discussed above serve the very purpose of households, businesses and society at large as per their requirement and security concerns. It is evident from the above evaluation that all mechanisms and tools are good in one way or the other and they are used as per user's convenience and preference. With the increase in number of payment options the consumers have become confused as to which is the best option, but through the evaluation done above alternatives can be ranked easily. Various options are available in the form of card, website, e- payment which has further advanced the pace with which digitization is taking place.

Thus, no single payment method or gateway is perfect in all cases, and it always has pros and cons that have to be evaluated each time a different transaction is made. So, the choice of gateway depends on maximum benefits that can be derived from it.

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