

Knock... Knock...

Online money is here



With e-commerce proliferating rapidly in all spheres of human life, need for a safe and secure system that can assure online customers of reliable service has been felt. Riding on the high wave of bits and bytes and powered by payment gateways, new age banks are ushering in a new era of e-commerce, and with it virtual money

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Alvin Toffler in his celebrated futuristic trilogy (*Future Shock*, *Third Wave* and *Powershift*) foresees the creation of virtual money in the information society. After barter and paper money in the agricultural and industrial economies respectively, he predicts a new economy that ushers in an era of intangible money.

Comprehending an economy based on bits and bytes is not only mind-boggling but also demeaning. Going virtual maybe the new age bizbuzz, but going virtual is not half as easy as building a real world entity. It is complex, technologically challenging and radically obtrusive for companies and if the company in question happens to be perfectly well entrenched in terra firma, the task becomes doubly difficult.

Net economy

Internet has opened up unlimited possibilities for the ever-hungry human mind. When Internet emerged on the scene, the excitement was more due to the novelty of the medium and its inflated expectations for the future. Once the concept sunk in and the novelty died down, people started exploring possibilities of doing business on the Net. In spite of the revolutionary character of the Net, the first experiments of converting physical world transactions into Net based ones began as a replication of physical world models.

Emergence of newer systems doesn't necessarily mean the elimination of the old. While technology enhances the performance of traditional systems in some cases, it co-exists with the time-tested ones in others. But the fact remains that Internet transaction models draw heavily from the established physical world models.

When the stage was set for e-commerce on the net the most natural thing to do for companies thinking virtual was to put up shops on the same line as physical shops. So came the storefronts, shopping carts, shelf lives

and shop-at-ease concepts. But little did many of these neo-virtual companies realise that setting up online shops and convincing customers to buy online wasn't all that simple. Perceptions had to change. For one, online shopping was nowhere near the experience of realworld shopping. A customer in the brick model could just walk into a superstore of his choice, select the items of his choice and pay for all of it in hard cash. There was no authorisation ordeal, no security risk and no complaints about defective stuff.

In comparison, buyers on the net had to have a credit card as opposed to cash, struggle with limited choices on the Netstore and be unsure of the quality of

the product. Moreover, a bank where the customer held his account, needed to be involved. This is where e-commerce turns into as much a banking problem as a technological problem.

Of plastic and smart money

The seeds of the full-scale e-commerce was in fact sown much before Internet made its presence. As hard currency started to weigh heavily on customer's pocket, newer instruments of financial transactions had to be explored. Cheques and drafts no doubt acted as logical extensions. But the risks associated with a cheque payment and the ordeal of getting a draft done had the financial thinkers look for other options. Thus

Online Banking: Some pointers

While transacting increases with experience of Netizens, only 17% of this trend is attributable to the consumer's time online. The remainder of this change in behavior exists because these are just different consumers. Net veterans are younger, wealthier, better-educated, and more optimistic about technology. These attributes, not tenure on-line, are driving on-line financial services adoption.

Complexity is still there. Most online consumers still prefer direct contact with their banker when shopping for financial products. Consumers' perception that many financial products are too risky or complex to select without expert advice.

Kill the complexity

Making complex products understandable for mainstream consumers may be a step toward commoditization, but it will also make them products that consumers can self-select. Sites like eAnnuity that take the mystery out of "basis points" and "tax-sheltered" while educating consumers to the point of preparedness to purchase will get first crack at their business.

Help the newbies

Online veterans have a higher tolerance for poor technology. But Internet newcomers will find sites with incomplete information and transaction links that lead to phone numbers and e-mail to agents frustrating and unusable. Walk through the decision process — information, comparison, product explanation, and transaction — and ask whether the visitor can completely fulfill these steps on the site.

Tune messages to goals

Today's most profitable bank customers are generally older and reluctant to adopt technology-based offerings: Retention strategies must focus on usability and changing ingrained behavior. Acquisition strategies must tout efficiency benefits from eBanking: The next wave of profitable bank customers is younger. Having fewer bills per month and greater reliance on check and credit cards for purchases, real-time balance data, and PC-based funds transfer have far more appeal than bill payment for these additional product prospects.

emerged the plastic money in the form of credit cards. Credit cards reduced the buyer's burden of carrying heavy dough and also offered greater flexibility and security. As natural extensions of credit cards, we see debit cards and smart cards that offer unprecedented benefits to the customer while maintaining strict confidence.

Credit card and its numerous variants have no doubt been essential in initiating a full-scale e-commerce revolution. But it has proved to be unsuitable for e-commerce to accelerate into the next era of rapid proliferation. In the knowledge era, money has been replaced with information as the most valuable thing. That's where credit card in the present form under the present system poses a big threat to the higher growth of e-commerce.

Online transaction (as in online buying) calls for the entry of credit card number into a website. This information

is then used by the online store to obtain money from the issuing bank through an acquiring bank. But this entire transaction is prone to innumerable security risks. The first instance of security threat is when the number is entered by the user into the website when a third person can oversee your details without your knowledge. The second instance is the info-channels themselves being insecure and vulnerable for hacking. The third instance is when the details of customers get re-entered by the online merchant establishment for authorisation, approval and clearance by the acquiring bank [in conjunction with Visa/MasterCard (as the



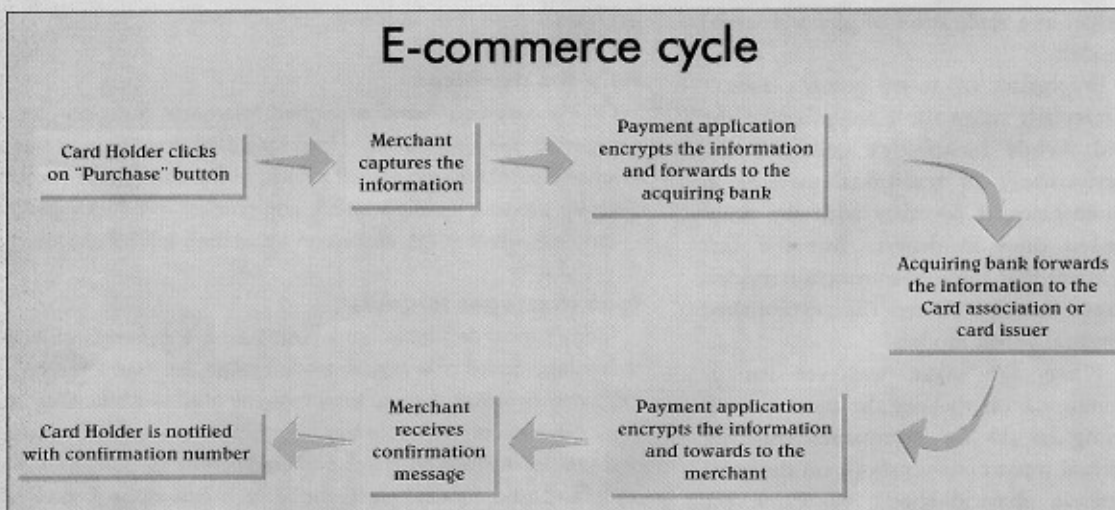
Payment Gateway loop

KIRAN S N

E-commerce process happens via three logical entities – the storefront, the payment mechanism and the supply. The storefront is nothing but a series of HTML web pages that display the products. The development of the same is quite simple and easy, with thousands of software available in the market. The third is more of a physical world operation which we're all familiar with – like supply chain, logistics etc.

However the second part, the payment mechanism, is very crucial, and the entire e-commerce depends on this.

E-payments are central to the whole e-business cycle, as they would allow the companies to service customers faster,

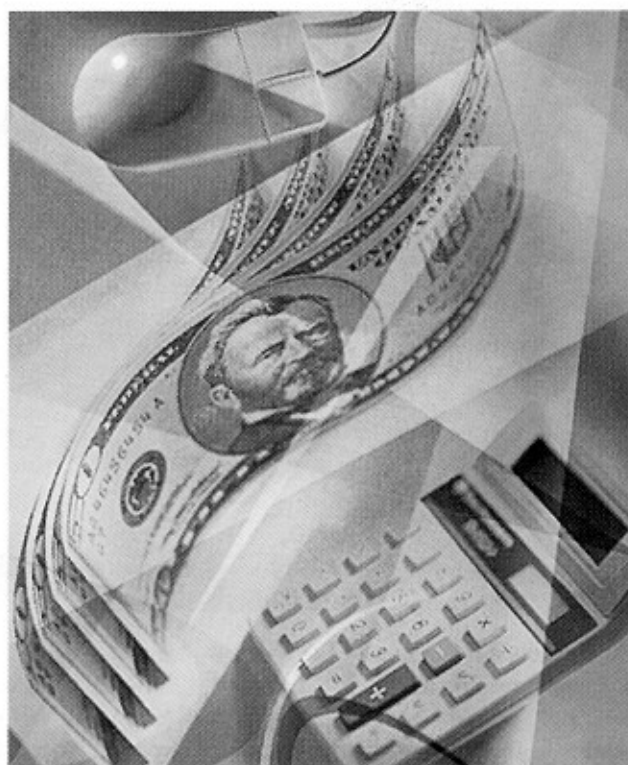


case maybe) gateways] and the issuing bank where the customer is issued a card.

Payment gateways

To eliminate a major portion of the loopholes in the e-commerce cycle if not all, payment gateways were introduced. What's a payment gateway? A payment gateway is a software solution that supports multiple payment models simultaneously in a safe and secure manner. Funds can be transferred through credit, debit and smart cards, cheques, electronic payment wallets and even direct debits through a central payment switch (*see box on payment gateway loop for more details*). The greatest advantage of a payment channel is that it is completely secure from the point a card holder enters his data into the Website. There is no physical intervention anywhere after this and the channels are all secure and carry encrypted information. The role of

payment gateway is that of an online non-interfering intermediary that helps in the online authentication of user information in the most secure manner. It is an intermediary that acts as a bridge between the merchant and the acquiring bank before the normal authorization cycle takes over. The chances of leakage of information therefore is minimal and online buyer gets a confirmation on his purchase in real time which is not the case with a non-payment gateway system. When



innovatively and at lower costs. This is also the crucial part, because if the claims and debits of the various participating companies – customer, servicing company, and the bank – are not balanced, because of payment delays, or even worse payment defaults – then the whole process is disrupted. Hence the central to the problem is prompt and secure payment, clearing and settlement of credit and debit claims.

Having understood how crucial they are to the system as such, let us look into the various instruments that would allow us to do the same, and where they stand. The companies, world over the utilizing credit cards for payments. This is a time-tested solution for all the problems. There is nothing new in the process, it's very basic - the consumer who buys a service from a merchant pays by entering his credit card details, and the credit card organization will handle the payment.

The elements that go into the payment mechanism are-

- **CardHolder** – The individual who is making the purchase (either good or services) using the credit card (you and me)
- **Merchants** – the Company that is selling goods and services to cardholders.
- **Issuing Bank** – The bank that has issued the credit card to the cardholder. The issuing bank provides the monthly billing statements to the cardholder.
- **Acquiring Bank** – The bank that enables the merchants to accept the credit card payments. This works in conjunction with the payment gateway (usually third party) to accept or decline the cardholders purchase request. After getting the amount from the issuing bank, the acquiring bank deposits it into the merchant account.

■ **Card Association** – An association such as VISA International and MasterCard, which issues credit card through its members (the issuing banks) to the cardholder. (American Express and Discover are not Card Associations, as they are not issued by any bank, and are offered directly to the cardholder. They are referred to as Card Issuer.)

■ **Payment Application** – An application used by the merchants to request credit card authorization and settlement of funds between the merchant and the acquiring bank.

There are two types of process that are utilised by the payment mechanism:

- **Authorization Process** – The credit card details as entered by the cardholder are verified and confirmed with the issuing banks and
- **Settlement Process** – The transfer of funds between the issuing banks and the acquiring banks

Electronic vs. traditional commerce/business systems

- connectedness (connectivity)
- significant reduction in transmission time
- improved accessibility
- concurrent, multiple-party access
- concurrent, multiple-item access
- anytime accessibility
- anywhere accessibility <-> mobility
- any channel accessibility
- any device accessibility

virtual marketplace -> availability, convenience, flexibility, ubiquity

transactions are routed through a payment gateway, the merchant portal does not get to see the credit card number as the process of authentication

and payment confirmation is routed through a secured socket layer tunnel (SSL), by far the most secure online system. That's because of the 128-bit

encryption that is being used by most banks. Hence, commercial transactions have become relatively safer on the Net as cracking this could take the time equivalent of 10,000 years. But even SSL has its loopholes. We'll talk about it later.

Indian scenario

Currently, in India - HDFC Bank and ICICI - have launched payment gateways for online transactions. Payments can be effected through credit cards or through directly debiting the accounts of the customers of the respective banks. The more technologically competent banks have taken lead in launching their own payment gateways. HDFC bank claims it was the first to launch a payment gateway on May 1st 2000. Interestingly, even ICICI bank claims to be the first one to have a payment gateway, which it flagged off on 15 July 2000.

Authorisation process

When making purchases over the web, the cardholder uses a web browser to procure product information from the merchant. The merchant captures the product information as well as credit card information and then communicates the credit card information to the acquiring bank through the payment application. The acquiring bank works with the appropriate card association (or card issuer) to execute the transaction.

The figure shows the authorisation process in a typical ecommerce cycle. Note that there are two cycles - Authorization (credit card authorization) and settlement (settlement of payments to the merchant)

Using a web browser (Microsoft Internet Explorer or Netscape Navigator), the cardholder visits the website of the merchant, where goods or service are displayed.

E-commerce payment mechanism

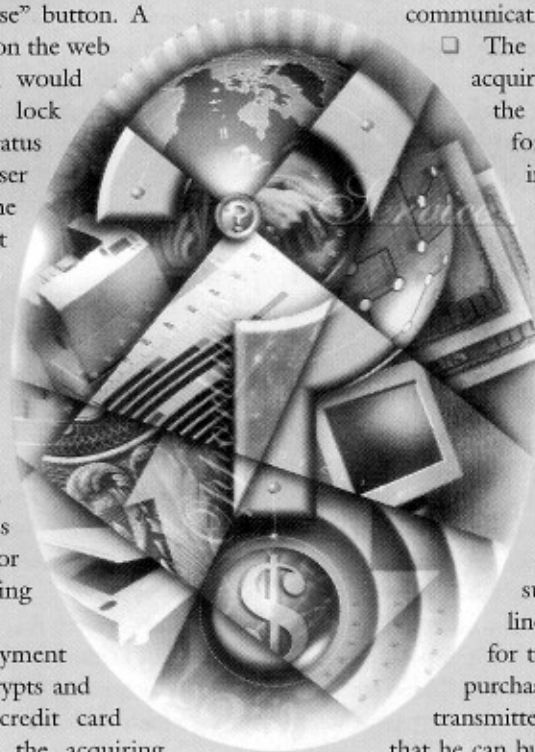
He selects the product, which he

intends to make a purchase and clicks on the "Purchase" button. A form opens up on the web browser, which would be secure. (A lock symbol in the status bar of the browser indicates that the site from that point on is secure and encrypted), in which the card-holder enters his credit card information. Some websites would prompt for the shipping address as well.

□ The payment application encrypts and transmits the credit card information to the acquiring

bank through secure communications with SSL.

□ The system in the acquiring bank received the information and forwards this information to the card associations for verification as well as authorization. The card association (or issuer) verifies the card information and determines whether the cardholder has sufficient credit line available to pay for the purchases (the purchase amount is also transmitted). The amount that he can buy is referred to as



Three Generations of Online Sales

Not long ago merchants figured a total with an adding machine, and then wrote out the receipt on a carbon-duplicate pad. No more. The old mechanical "Ka-ching" cash registers gave way to computers with a drawer. Now they've been augmented with UPC codes and scanners to support a sophisticated system which tracks inventory. You only use handwritten receipts these days if you don't expect to sell much. The short history of sales over the Web reveals three generations of commerce-enabling software:

Simple HTML form

Forms would take an order, but when you had more than a few products to choose from, the simple form got clumsy, since the order form was on a different page from the product description.

Shopping cart

Now when you saw an item that interested you as you browsed through a site, you could place it in a "shopping cart" or "shopping basket," which would remember what you had seen, and even kept a running total for you, and probably calculated simple taxes and shipping. These days, "shopping cart" is only one of the important functions.

Storefront or Store-building

These stores include the shopping cart, and now allow the storeowner — with just a Web browser — to add, delete, or temporarily hide products, change prices, set up sales and promotions, pick up orders securely, manipulate graphics, and integrate the online operation with existing accounting and inventory systems.

ICICI says that it was the first one to launch a payment gateway, with QSI and Compaq as its technology partners for implementation and product upgrades. The payment gateway branded as Payseal is an independent solution available for whoever wishes to buy it and not only to ICICI. HDFC Bank however says that even though they do not own a payment gateway they were the first one to launch one.

The attraction of having a payment gateway is very simple. The payment gateway actually means greater profits for the gateway provider what with a percentage of every online purchase going to the gateway operator.

Besides HDFC Bank and ICICI, Global Telesystems, LG Software and a few other non-bank companies are toying the idea of launching payment gateways for interbank and B2B transactions.

"open to buy". A confirmation number is generated and the "open to buy" amount is blocked.

If the card information is incorrect or if the credit card number is invalid, then a message declining the transaction is generated and transmitted to the customer through the merchant.

Apart from the verification of credit card, the acquiring bank also verifies the address whereby the shipping details provided by the cardholder at the time of sale is compared to the billing information stored in the database of the cardholder.

The information is encrypted and sent to the merchant through the payment application, and then on to the cardholder.

This whole end-to-end process (from the moment the cardholder clicks on "purchase" to the receipt of the authorization message) takes only a few seconds based on the payment

application, traffic, internet connection on the client and others.

After successful authorization of the credit card, the merchant initiates the fulfilment process of the product or services as requested by the cardholder.

According to general rules, the merchant can initiate a settlement process; only after the cardholders order has been fulfilled. Sometimes the fulfilment can take days — say physical goods like computers, while some may take a few seconds — like subscription based services or software downloads.

Settlement process

The above figure indicates the settlement process of the orders fulfilled by the merchant.

□ The merchant on a periodic basis compiles a list of fulfilled orders and transmits the details to the acquiring bank. This is a typical batch process.

□ The merchants payment application encrypts the purchase information and transmits the encrypted information to the acquiring bank.

□ The acquiring bank sends settlement instructions to the appropriate card association for verification. The credit amount is debited and the cardholders statement is updated.

□ The acquiring bank receives the amount from the issuing bank and makes the deposit to the merchant account.

□ The merchant receives a notification with the fund transfer.

While the authorization process takes only few seconds, the settlement process may take several days, depending on the funds availability with the issuing bank, as well as other procedures and policies.

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