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Payment bank framework for digital commerce

[1] Laxminath Gopisetty, [2] Vijaya Raju S

[1] Research, scholar Dept of Commerce and Bunissiness administration, Acharya Nagarjuna University, Guntur, Andhra Pradesh, India
[2] Professor, Dept of Commerce and Bunissiness administration, Acharya Nagarjuna University, Guntur, Andhra Pradesh, India

Abstract
Digital commerce (D-Commerce) is a business umbrella that integrates many business tasks for smooth functioning. In this research work new payment bank software is developed and demonstrated which happens to be a major component of the digital commerce domain. The same is evaluated against well-defined criterion to measure the said software and the same is found to be fulfilled by the developed application.

Keywords: WWW, e-mail, id commerce frame work, e-business, websites, EDI, EFT, machine learning, speech and language processing, data warehousing, data mining

1. Introduction

Standards of any country or society is determined by its current technology and state of its economy. In the past two decades the world has become a very small place to live in with the advent of sophisticated technologies like the internet and World Wide Web. After the advent of internet the world has become a very small place to live in as it has led to much collaboration and has created a digitally vibrant economy. However the said impact on economy by the internet has been faster in the developed countries compared to the developing countries. Prior to the advent of the internet people had very modest expectations from technology. But now people have stretched their imaginations and are thinking of a more connected world based on newer technological advancements like the internet of things [1].

Alibaba from Chinese businessman JackMa has create a benchmark when he listed his company on NYSE stock exchange and generated a valuation of 241 billion dollars. This has attracted huge investments into e-commerce space. In India e-commerce has grown at an exponential space and is expected to reach 20 billion dollars by 2020. Digital solutions are being used in various domains. The most prominent of them being digital wallets which has enabled cashless transactions a reality in today's competitive world. The advertising and marketing push has enable many e-commerce companies to reach remote parts of the world. Mobile connectivity has reached to even rural areas with more and more people getting hooked to the internet and the numbers are growing at an alarming space. From tooth brush to smart phone to literally anything gets sold on the e-commerce platforms [2].

Mergers and acquisitions that have been executed in the e-commerce space like Snapdeal, flipkart and ola has led to believe that the digital space is very heated up. But the worry is that all the mentioned companies are burning lot of cash to acquire market share and profitability is yet has yet to be achieved by any of these companies. The positive things Is that all this has benefited the end consumer whose life has become very easy due to the digital solutions being offered in various domains right from fashion space to travel space [3].

Multinational e-commerce companies like Amazon and Alibaba have lots of cash reserves and are giving very tough competition to Indian counterparts like flipkart and snapdeal. The homegrown players need to device innovative strategies to retain their customers. The global players like Amazon and Alibaba have deep pockets to rely on their parent companies for continuous funding support. The homegrown players would definitely need different metrics to preserve the customer base. Bigger players like Flipkart enjoy nearly a 50% market share in Indian e-commerce space. But all said and done there are other challenges as well. The supply chain and logistics which is a backbone for ecommerce players is very difficult to maintain in a divers culture like India. The taxation system in India is also not good enough to cover all aspects under digital space. It will take time to resolve all these challenges but the exponential growth in the digital space shall make sure that all these problems get resolved in time [4, 5].

The taxation system in India is also not able to cater to the needs of e-commerce space as the digital players transact goods from across states. Now after the advent of GST their might be some relief in this space. The other important challenge in this space is ensuring security while transacting online which is warding off few customers from transacting online. The newer technologies that can revolutionize this space is 3D printing, driverless cars, automation and internet of The Social analytics is another major approach in securing customers online by observing their behavior in various online forums. This data is used by the marketing tem in retaining customers online [6-8].

The future of e-commerce is surely very bright in India due to advent of social, mobile, analytics and cloud (SMAC) platform. The current exorbitant valuations of the e-commerce companies are perhaps giving insights into future growth opportunities [9, 10].

Indian Governments digital India push is another short in the arm for the digital players. Around 17 billion dollars investment by the government shall reduce social boundaries and might as well get the digital commerce solutions into the common man's daily landscape. Government is also trying to solve the issue of retrospective taxation that could actually magnify the digital growth story [11].

In this paper, we propose a classification methodology to classify various companies into groups and applying a different d-commerce software based on the category into which a particular company is classified into [12].

Our next section presents the background knowledge. Section III describes proposed methodology and in section IV results and analysis is discussed. Section V concludes this work and later acknowledgement is given to the data source followed by references.

2. Background Knowledge

One of the most popular activities on the Web is shopping. It has much allure in it — you can shop at your leisure, anytime, and in your pajamas. Literally anyone can have their pages built to display their specific goods and services.

History of ecommerce dates back to the invention of the very old notion of "sell and buy", electricity, cables, computers, modems, and the Internet. Ecommerce became possible in 1991 when the Internet was opened to commercial use. Since that date thousands of businesses have taken up residence at web sites [13].

At first, the term ecommerce meant the process of execution of commercial transactions electronically with the help of the leading technologies such as Electronic Data Interchange (EDI) and Electronic Funds Transfer (EFT) which gave an opportunity for users to exchange business information and do electronic transactions. The ability to use these technologies appeared in the late 1970s and allowed business companies and organizations to send commercial documentation electronically.

Although the Internet began to advance in popularity among the general public in 1994, it took approximately four years to develop the security protocols (for example, HTTP) and DSL which allowed rapid access and a persistent connection to the Internet. In 2000 a great number of business companies in the United States and Western Europe represented their services in the World Wide Web. At this time the meaning of the word ecommerce was changed. People began to define the term ecommerce as the process of purchasing of available goods and services over the Internet using secure connections and electronic payment services. Although the dot-com collapse in 2000 led to unfortunate results and many of ecommerce companies disappeared, the "brick and mortar" retailers recognized the advantages of electronic commerce and began to add such capabilities to their web sites (e.g., after the online grocery store Webvan came to ruin, two supermarket chains, Albertsons and Safeway, began to use ecommerce to enable their customers to buy groceries online). By the end of 2001, the largest form of ecommerce, Business-to-Business (B2B) model, had around $700 billion in transactions [14].

According to all available data, ecommerce sales continued to grow in the next few years and, by the end of 2007, ecommerce sales accounted for 3.4 percent of total sales.

Ecommerce has a great deal of advantages over "brick and mortar" stores and mail order catalogs. Consumers can easily search through a large database of products and services. They can see actual prices, build an order over several days and email it as a "wish list" hoping that someone will pay for their selected goods. Customers can compare prices with a click of the mouse and buy the selected product at best prices.

Online vendors, in their turn, also get distinct advantages. The web and its search engines provide a way to be found by customers without expensive advertising campaign. Even small online shops can reach global markets. Web technology also allows to track customer preferences and to deliver individually-tailored marketing.

Digital wallets is one of the methods used to pay money online for ecommerce firms. Mobile wallets are also known as digital wallets. Various examples of digital wallets are Paytm, Alipay, etc. These firms are giving huge discounts to attract customers use their wallets. Other vendors who are using the digital wallet concept are cab operators like Ola and telecom operators like airtel. Normal banks are also offering digital wallets which can be used for utiliy bull pay, emts. In addition to payment of bills digital wallets can be used for verifying credentials of the consumer and transferring money to near and dear ones. The credentials can be passed to a merchant's terminal wirelessly via near field communication (NFC). Increasingly, digital wallets are being made not just for basic financial transactions but to also authenticate the holder's credentials. For example, a digital-wallet could potentially verify the age of the buyer to the store while purchasing alcohol.

A digital wallet has two components. One component is the software component which is used to execute the transactions and secure the said transactions with encryption. The other compoents is information compoents which stores information about the end consumer like his billing address and other personal details. There are two types of digital wallets. The first one is a server side wallet which is used by vendors to offer mobile payment services to the consumer for utility payments etc. The other category is client side wallet which is used by the consumer and is not vendor specific.

The M-PESA mobile payments system is used widely in Kenya for payment of bills to retail vendors. Alipay is used widely in US to make such payments. Digital money is being encouraged by many countries and youngsters are preferring the same as it is convenient for everyone including consumers and tax authorities alike.

Reserve Banks of India recently has given in principle nod to many vendors like Aditya Birla Nuvvo Ltd, Department of Post etc… to start their digital wallet business.

It's a step to redefine banking in India. The Reserve Bank expects payment banks to target India's migrant labourers, low-income households and small businesses, offering savings accounts and remittance services with a low transaction cost. It hopes payments banks will enable poorer citizens who transact only in cash to take their first step into formal banking. It could be uneconomical for traditional banks to open branches in every village but the mobile phones coverage is a promising low-cost platform for quickly taking basic banking services to every rural citizen. The innovation is also expected to accelerate India's journey into a cashless economy.

History of ecommerce and digital payment via digital wallets is a history of a new, virtual world which is evolving according to the customer advantage. It is a world which we are all building together brick by brick, laying a secure foundation for the future generations.

3. Proposed Methodology

Digital commerce software has many components. The payment bank software of the digital commerce suite is proposed in this section. The block diagram for the same is mentioned below:

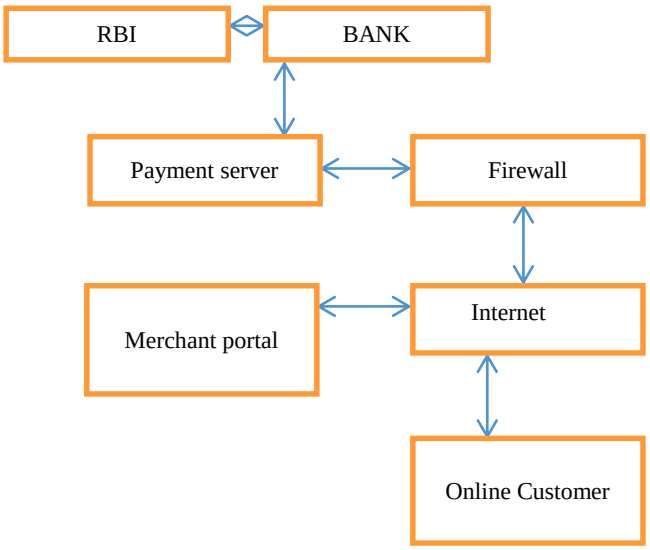

Fig 1

Players Involved in Electronic Payment Systems Below we look at the most important service providers / stakeholders in the ecosystem of electronic payment systems, and identify the most prominent legal issues based on the regulations governing the same.

A. Payment Processors Payment processing functions typically involve clearing, payment and settlement, which constitutes the core functions of a payment system as per the definition under the PSS Act. These functions are highly regulated by the RBI as well as various statutes, and the PSS Act provides that only banks and financial institutions / entities that have specific authorization of the RBI can undertake such activities [16].

B. Intermediaries are defined by the RBI as "entities that collect monies received from customers for payment to merchants using any electronic/online payment mode, for goods and services availed by them and subsequently facilitate the transfer of these monies to the merchants in final settlement of the obligations of the paying customers". Keeping in mind the growth in the use of electronic payment methods across India, the RBI issued certain 'Directions for opening and operation of Accounts and settlement of payments for electronic payment transactions involving intermediaries'32 ("RBI Directions on Intermediaries"), which regulate the operations of accounts for the receipt and payment of funds by such intermediaries. Among other things, the RBI Directions on Intermediaries regulate the nature of accounts that intermediaries can operate i.e. internal accounts, the permitted credits and debits that can be made from such accounts and also provide for specific time limits within which funds must be remitted to a merchant upon receipt of funds from a customer.

C. Technology Providers Technology providers typically provide technology or solutions to facilitate transmission of customer/merchant data, instructions, approvals, denials etc. that are comprised within a payment system. Such technology could either be in the form of software or hardware. Often we see that the payment gateways/intermediaries themselves double up and play the role of a technology provider as well. Typically technology providers are not regulated.

III. Payment Instruments A payment instrument is any type of instrument, physical/electronic which has certain monetary value, and allows for payments equally all/part of such monetary value to be made using the instrument. Traditional payment instruments are cheques, drafts, money orders etc. With the growth of technology, we have also seen a large growth in the types of payment instruments available for use, and in today's technology driven world, it is key to ensure that such payment instruments allow for easy access to e-commerce transactions. Some common payment instruments which are used for e-commerce transactions are:

A. Credit / Debit cards Although credit and debit cards are not new technology by any means, credit card use has seen a spur of growth in India over the past two decades. With increasing disposable income, and the ease of simply carrying one card that allows a user to make payments, whether at a store around the corner or an online shopping site – these cards which were once novelties, have now almost become a necessity. The issue and of both credit cards and debit cards are regulated by the RBI, and currently only banking and non-banking financial institutions are permitted to issue such cards, subject to guidelines issued by the RBI. B. Pre – Paid Instruments the RBI in its guidelines define pre-paid instruments as '…payment instruments that facilitate purchase of goods and services, including funds transfer, against the value stored on such instruments.

B. Pre-paid instruments can include smart cards, magnetic stripe cards, internet accounts, internet wallets, mobile accounts, mobile wallets, paper vouchers and any such instrument which can be used to access the pre-paid amount. Pre-paid instruments can be of 3 types (as classified by the RBI guidelines

- Closed system payment instruments – which are issued by a person for facilitating purchase of certain specific and limited goods / services, from the issuing person only and do not permit the withdrawal of cash / redemption.
- Semi-closed system payment instruments – which can be used for purchase of goods and services from a group of clearly identified merchant locations/ establishments which have a specific contract with the issuer, only. Cash withdrawal / redemption is not permitted for such systems either.
- Open system payment instruments - which can be used for purchase of goods and services, including financial services like funds transfer, and can also be used for withdrawal of cash. The RBI regulates the issue of pre-paid instruments, providing for the nature of entities that can issue such systems, capital requirements, safeguards against money laundering, the purposes for which pre-paid instruments can be issued etc.

I.

II.

4. Result Analysis

The screenshot of the application developed for processing payments in digital commerce world is shown below:

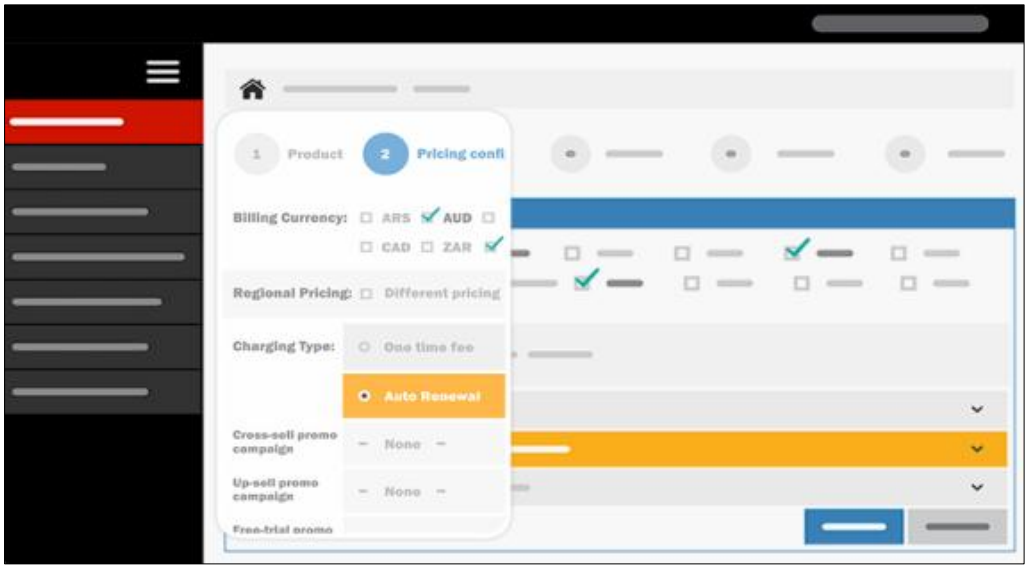

Fig 2: The criteria for evaluating the said application is as follows [17]:

4.1 History of the gateway

Its a good idea to evaluate how long the payment gateway has been around for and the clientele list of the payment gateway. A payment gateway that has been around for a while is most unlikely to shutdown anytime soon (hopefully). The clientele list also would give you a good insight on the reliability and integrity of the payment gateway. A list of reputed companies on their client list would show more confidence in the payment gateway.

4.2 Payment Methods

The nature of your site would determine what are the various payment methods that you would like your customers to pay on the site. Popular payment methods are credit / debit cards, online / paper direct debit (via internet accounts) and echecks which are currently gaining popularity. Echecks however like normal checks have a high probability of bouncing.

4.3 Processing Speed

It can get rather frustrating for an end user if they had to wait long periods to have their payments processed. Ideally a payment method should process your transactions in seconds rather than minutes.

4.4 Price

Price has been and will always be one of the most important factors while making your selection. It would be a good idea to compare prices with other payment gateways that offer similar solutions. Also keep an idea out for per transaction costs and any other hidden costs that may be charged. These could add up to large amounts.

4.5 Multi-Currency

Choosing a payment gateway that offers multi-currency support for your customers to able to pay through is very essential. Customers would prefer to pay in the currency of their choice rather than being forced to pay in a default currency adds tremendous value.

4.6 Bounce Rates

Bounce rates can lead to unhappy customers and a loss in many orders. It would be a good option to evaluate what is bounce rate percentage of a payment gateway. The lower the percentage the better the payment gateway.

4.7 Test Account

This would be essential before the launch of your product. Being able to simulate live orders on a test environment that would behave the same was as a live account can come quite handy while deciding your workflows.

In the case of the application developed although the application is not very old it had a very less bounce rate in the test environment. And also it was built using open source code like PHP/MySQL which is easier to modify and the application is also secure.

5. Conclusions

The research work discussed here demonstrates the payment bank application with a live system in a test environment. The same also fits in the evaluation criteria for successful payment bank software's. In the future the same can be integrated with other components of the digital commerce domain. We are planning to develop a comprehensive and more elaborative frame work suit for businesses by combining various state of the art computer software tools and techniques that can deliver Just in time delivery of required software to meet digital commerce needs.

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