A COMPARITIVE REVIEW STUDY OF FLIPKART V/S SNAPDEAL

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Abstract

E-commerce or Electronic commerce is buying and selling of products and services by means of electronic communication. It has several advantages as it helps organizations, vendors, customers and society as it provides 24x7 services across the globe.

E-commerce in India has several barriers in its way to as people are resistant to change and experience digital n virtual marketing in which they have to make online payments and have place order without physically seeing and having personal experience of the goods.

Also E-commerce portals need to take care of major security concerns as they are susceptible to cyber-attacks in order to have trust from their customers.

Major security concerns include security breach to online authenticity of the users and their identity and security while making online transactions.

Online portals are using various measures for security which include encryption, digital signatures and certificates.

In this research project we are reviewing and comparing two big e-commerce giants i.e. Flipkart and Snapdeal and the basis of comparison are technology these sites use and security algorithm used by them.

Keyword- E-commerce, Flipkart, Security, Snapdeal

I. INTRODUCTION

E-Commerce means Electronic Commerce. It comprises of buying and selling of goods and services over Electronic Communication and digital information processing and technology. E-commerce portals are now trending in India. It is growing in every place and customers are showing interest in using these portals effectively. E-commerce provides platform by which retailer's sales and advertise their product and share information on the internet using the information technology and more customers can attract get to it. [1]
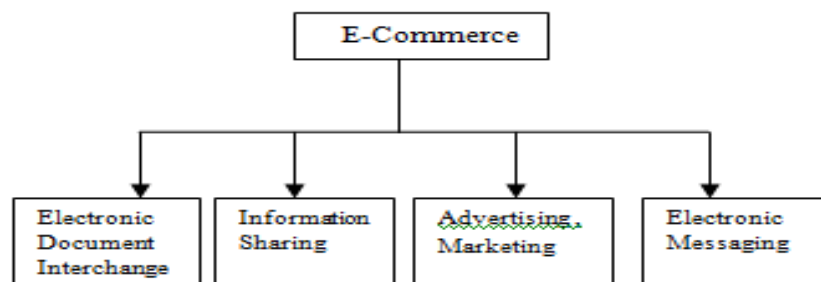

Fig1. E-Commerce workflow diagram

1. Evolution Of E-Commerce in India

E-commerce started in India with two in tow waves: its first wave started in 1996 in which Internet came into popularity and B2B portals came into existence. In second wave (after 2006) launch of online travel agencies and matrimonial sites and number of sites came into existence and first buying and selling portals came. Also social security sites became popular and a new age to digital marketing came into existence.
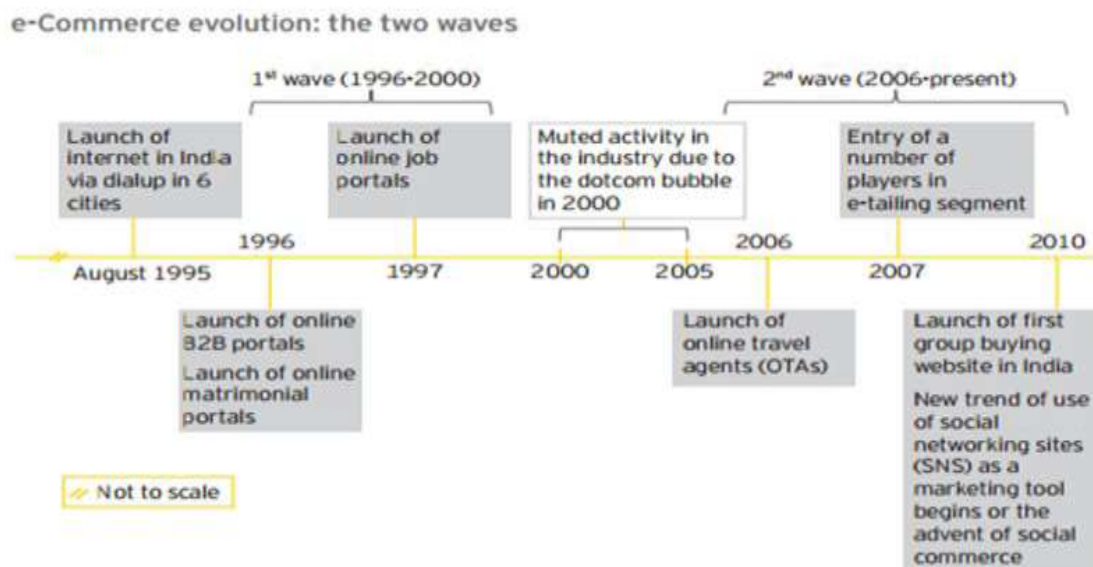
Fig 2: Evolution of E-commerce

Common E-commerce portals in India are Flipkart, Snapdeal and Shopclues these sites are of Indian origin. Other Online giants are Amazon, Alibaba that are of foreign origin.

2. Advantages Of E-commerce:-

2.1 Advantages to Organizations:-

- ✓ Using E-Commerce, organization can expand their market to national and international markets with minimum capital investment. An organization can easily locate more customers, best suppliers and suitable business partners across the globe.
- ✓ E-Commerce helps organization to reduce the cost to create process, distribute, retrieve and manage the paper based information by digitizing the information.
- ✓ E-commerce improves the brand image of the company.
- ✓ E-commerce helps organization to provide better customer services.
- ✓ E-Commerce helps to simplify the business processes and make them faster and efficient.
- ✓ E-Commerce reduces paper work a lot.
- ✓ E-Commerce increased the productivity of the organization. It supports "pull" type supply management. In "pull" type supply management, a business process starts when a request comes from a customer and it uses just-in-time manufacturing way.

2.2 Advantages to Customers:-

- ✓ Customer can do transactions for the product or enquiry about any product/services provided by a company anytime, anywhere from any location. Here 24x7 refers to 24 hours of each seven days of a week.
- ✓ E-Commerce application provides user more options and quicker delivery of products.
- ✓ E-Commerce application provides user more options to compare and select the cheaper and better option.
- ✓ A customer can put review comments about a product and can see what others are buying or see the review comments of other customers before making a final buy.
- ✓ E-Commerce provides option of virtual auctions.
- ✓ Readily available information. A customer can see the relevant detailed information within seconds rather than waiting for days or weeks.
- ✓ E-Commerce increases competition among the organizations and as result organizations provides substantial discounts to customers.

2.3 Advantages to Society:-
- ✓ Customers need not to travel to shop a product thus less traffic on road and low air pollution.
- ✓ E-Commerce helps reducing cost of products so less affluent people can also afford the products.
- ✓ E-Commerce has enabled access to services and products to rural areas as well which are otherwise not available to them.
- ✓ E-Commerce helps government to deliver public services like health care, education, social services at reduced cost and in improved way [4].

3. Challenges in E-commerce:-

There are few barriers for the slow growth of E-commerce in India. There is customer resistance in changing from a real to virtual store. People do not trust online paper less transactions.

3.1 Non-Technical Challenges:-
- o Initial cost: The cost of creating / building E-Commerce application in-house may be very high. There could be delay in launching the E-Commerce application due to mistakes, lack of experience.
- o Lack of touch or feel of products during online shopping.
- o E-Commerce applications are still evolving and changing rapidly.
- o Internet access is still not cheaper and is inconvenient to use for many potential customers like one living in remote villages [4].
- o Security Issues: Fear of making online payment is a universal psychological factor of Indian customers. 60% of the users do not trust the web as payment channel [2].Online Virtual transaction takes place through credit card, debit card but these cards are not safe. Customers are not sure about the salesman identity. Buyer is also not sure that card is not used for malicious purposes.
- o Less Awareness: Very few are aware of the online corruption and fraud and thus darkness still exists. A reliable survey reveals that 50% of Indian online users are unaware of solution of online security [3].
- o Indian customers are more comfortable in buying products comfortable [3]. They tend to choose the product by touching the product directly.
- o Majority of Indian rural population are unaware of internet and it uses. When it comes to ratio of internet consumers, scenario is not so admirable one.

3.2 Technical Challenges:-
- o There can be lack of system security, reliability or standards owing to poor implementation of e-Commerce.
- o Software development industry is still evolving and keeps changing rapidly.
- o In many countries, network bandwidth might cause an issue as there is insufficient telecommunication bandwidth available.
- o Special types of web server or other software might be required by the vendor setting the e-commerce environment apart from network servers.
- o Sometimes, it becomes difficult to integrate E-Commerce software or website with the existing application or databases.
- o There could be software/hardware compatibility issue as some E-Commerce software may be incompatible with some operating system or any other components [4].

Fig 4: Challenges in E-commerce

II. RESEARCH METHODOLOGY

In this research process of Comparative Study of Flipkart V/s Snapdeal the idea is to compare these two Indian E-commerce giants and the basis of comparison includes:

    a. The technologies used by these sites.
    b. The Cryptographic algorithm used by these sites.

The following methods were used for the research process:

1. Secondary data collection from the published papers and journals.
2. Secondary data collection from the e commerce websites.
3. Understand the scientific terms and jargon related to your research work.

III. REVIEW WORK :STUDIES AND FINDINGS

Flipkart

Origin of Flipkart

Flipkart was founded in 2007 by Sachin Bansal and Binny Bansal, both alumni of the IIT-Delhi. In this model, E-commerce player control end to end value chain i.e. right from procurement to delivery is controlled by service provider.

o Flipkart employs 4500+ people, 2 million sales units and 4 million visitors per month.11.5 million titles, Flip kart is India's the largest online book retailer. Registered user base of 4 million customers. Ships out as many as 45,000 items a day, clocking daily sales of approximate of Rs2.5cr. Flipkart is now investing in expanding its network of distribution centers, warehouses, procurement operations which is now in only 8 cities in country, so as to reach more & more Indian cities. The company is even setting up its own delivery network which is now in 37 cities, by which company can save up cost associated to the outsourced shipping & logistic function and is set to expand this even further by next year.[5]

o Study of the Consumer behavior In India there is hesitancy in using an online portal for purchase of goods because of various reasons.

o The most prominent of which is that an online payment gateway is not user friendly. However, Flipkart.com's most outstanding feature is its COD or Cash on Delivery pricing strategy, which gives the user the experience of online shopping and the security of physical shopping. Also, Flipkart.com has a 30-dayreplacement guarantee and an original product warranty, which dispels all doubts from an online shopper's mind.

- o Flipkart Success Factors the site is very easy to navigate, which helps users to easily search for the contents or products online, it even allows users to search by using various filters like by price range, search by brands, by age group, by hot-selling etc. If a certain product is not available or is out of stock it even ask users to input its details & then when the products is available the desired users are informed, this really helps one connected to the products they are seeking & leads sto repeat & frequent purchases. The Flipkart site is fast & powerful, i.e. if you Search any products in the Flipkart search bar and you'll find exactly what you looking in likes no time & it's very quick to process the payments & transactions by a very efficient & flexible

- o Payment mechanisms of the portals. Approximately 60% of orders are placed in cash on delivery system. So there is high possibility scams & frauds, so users have to have their email account linked & with verified details & receives a confirmation code message on their cell phones or email, after which the users confirms the unique code& the transaction is processed & usually get delivered in 2-3 business days on the confirmed mailing address. Flipkart manages to deliver the item in 2-3 business days. If the order placed is not delivered in the specified time, immediate enquiry goes to nearest supplier and the item becomes available. It will then be delivered within 24 hour depending on the cause of delay.

- o Flipkart is continuously aiming to bring down the delivery time of regular orders, in doing so its investing in its own delivery system & network, As the time to delivery is one of the important aspects of selling products online as users want a fast turn round time, it's An excellent marketing strategy by Flipkart marketing team to increase the sales revenues & to optimize the user shopping experience & increasing loyalty by repeat purchases. The portals offers a good pricing offers & deals to its users by the means of cash rewards, loyalty points, discounts, coupons, Frequent buyer rewards points. It even offers goods relatively cheaper pricing points than it is available in the physical market which in total helps users save money & at the same time get benefited by the means of rewards points [5].

3.1.1. Technologies used in Flipkart:-

1) Flipkart runs all its software on Linux – Debian
2) The website is primarily built on PHP
3) run on the JVM
4) The top NoSQL datastores have been evaluated at Flipkart
5) Memcached is the primary cahe layer used.

3.1.2. Software Products used by Flipkart:-

- ➢ Analytics: HP Vertica, Google Analytics, Adobe Analytics, Adobe Marketing Cloud
- ➢ HR: Capabiliti, Greenhouse, HackerEarth, Hiree
- ➢ Finance and Accounting: Cyber source, Cyber square
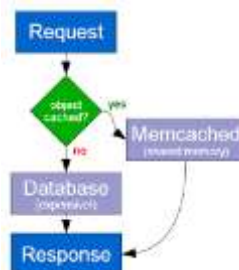
Flipkart Critical Analysis

Pros	Cons
Ecommerce portal	You cannot feel the product nor see the product
It provides Very good services	When the website is slow and takes a long time to load
Delivery on time	No overnight delivery
Good product quality	Storage facility is low compared to other sites
Fair rate compared to market rate	The transaction speed is low
User friendly website	
It offer wider range of products	

Fig: Critical Analysis of Flipkart

3.2.   Snapdeal

3.2.1. Origin of Snapdeal:-

1) It is one of the first and largest online marketplaces in India. It has recently launched its best mobile app for IOS. In this model the E-commerce player does not sell any goods/services on its own but offers discount coupons which can be used by buyers to avail discount at the time of buying or availing service from merchant.

2) Snapdeal is an e-commerce company based in India. It is a daily deals website that features discount offers across lifestyle segments such as dining, health & beauty, entertainment and travel. It also offers discounts on products like electronics, perfumes, watches, bags, sunglasses, coaching classes, apparels and mobile phones.

3) Headquartered in Delhi, Snapdeal.com was launched in February 2010. The company was founded by Kunal Bahl, a Wharton graduate and Rohit Bansal, alumnus of IIT Delhi who were founders of Snapdeal.com serves as an advertising platform for merchants and a discount platform for customers.

4) For the merchants who partner with Snapdeal, it is a cost- effective channel for acquiring new customers. It also works as a risk-free alternate marketing channel. From the merchant's standpoint, they are passing on the customer acquisition cost in the form of a discount offer.

5) Snapdeal (SD) gets the best offer possible from the merchants from around 65 cities across India and then deducts a small amount of commission.SD aims at showing at least 40-90% off in the deals from what actually one has to pay. Depending upon how good the offer is, SD deducts their commission starting from Rs. 99 going up to Rs. 299.

6) For products, SD has a particular set of commission. The most ideal amount of commission SD charges with selling a product is 23%. More than 50-60 thousand products are available online for customers to choose from.

7) In June 2010, Snapdeal.com acquired Bangalore-based group buying site, Grabbon.com for an undisclosed amount. Snapdeal has been rated the #1 e-commerce site in India, in terms of traction by Dataquest/Sapient E- commerce Survey 2011[6].

3.2.2. Technologies in snapdeal:-

1) Server-side Programming Language: java
2) Traffic Analysis Tools: Google Analytics is a free service to get detailed statistics about the visitors of a website, provided by Google
3) Web Server: Apache Tomcat is an open source Java servlet container that functions as a web server, developed by the Apache Software Foundation.

Snapdeal Gold:-

Snapdeal Gold is the latest service offering that automatically enhances your online shopping experience for FREE when you pay using prepaid modes of payment.

Fig: Snapdeal Gold Features

Snapdeal Cirrus:-

1) Snapdeal launches its own cloud – Snapdeal Cirrus-Snapdeal was born in the cloud, but public clouds stop being cost efficient after a scale, which became the case for Snapdeal sometime last year.
2) *Snapdeal Cirrus will be one of the largest OpenStack based hybrid cloud deployments in the world*
3) Snapdeal cloud is built entirely on open source with OpenStack at the center.

Fig: Features of Snapdeal Cirrus

Image Spriting:-

- An image sprite is a collection of images put into a single image.
- The idea is the simple: Instead of loading multiple small images multiple times, group all the images into one single file and load the entire image once while only displaying parts of it. This saves valuable memory time off the server from constantly requesting to load images, thus making your website load faster.

How does it make Your Website Load Faster?

- It is all about decreasing the number HTTP requests that are needed to load a page. Web browsers can only do a few HTTP requests in concession. Every time there is an HTTP request it needs to communicate to the server and back to the browser again (also called a round trip) this takes a long period of time. We all now have "fast" internet downloading speeds. The speed of our bandwidth is not the issue, it's the time it takes to fulfill many HTTP requests for small images like icons, buttons etc…
- By using CSS sprites, you will minimize the number of round trips to the server thus making your store load faster.

Fig: An example of an image Sprite from Amazon in which they are loading multiple small icons.

Frauds in E-commerce:-

The fraud in Ecommerce environment would be different from the regular fraud which takes place in the regular business environment. There are several reasons for the same.
The exchange or the trading is not physical. The initial transaction are made through internet. There is no internally accepted method for verifying the integrity and accuracy of information that flows through internet.
In E-commerce the payment of money happens through the electronic mode. The money is generally transferred by the credit card / debit card or electronic online fund transfers.
If we want to categorize the fraud based on the method in which fraud can be committed, at each p rocess level can be analysed in the following manner:

a.) Order placement processing: Unauthorized fake orders, orders placed to block/ black entities in the s ystem in the absence of adequate vendor due diligence, fake documents for the registration of vendors, inadequate vendor background check resulting in third party fraud.

b.) Network Operations: Phishing fraud (change of customer & identity), system manipulation (redemption of coupon even on cancellation of order), execution of order without adherence to the payment terms

c.) Payment fraud: Payment gateway may be vulnerable to hacking, non-receipt of payment for cash on delivery, tampering of products in order to return it, charge back initiated without returning the product

d.) Logistics / Delivery fraud: Leakage/ misappropriation theft of goods from warehouse, product intentionally misplaced /replaced and not delivered delivery of defective / 　　　　counterfeit product [7].

Security in E-commerce:-

Security is a very important part of any online transaction. Customers will lose their faith in e-commerce if its security is compromised.

Following are the essential requirements for safe e-payments:-

- Confidential − Information should not be accessible to unauthorized person. It should not be intercepted during transmission.
- Integrity − Information should not be altered during its transmission over the network.
- Availability − Information should be available wherever and whenever requirement within time limit specified.
- Authenticity − There should be a mechanism to authenticate user before giving him/her access to required information.
- Non-Repudiabity − It is protection against denial of order or denial of payment. Once a sender sends a message, the sender should not able to deny sending the message. Similary the receipient of message should not be able to deny receipt.
- Encryption − Information should be encrypted and decrypted only by authorized user.
- Auditability − Data should be recorded in such a way that it can be audited for integrity requirements [4].

Major security measures are following:

- Encryption − It is a very effective and practical way to safeguard the data being transmitted over the network. Senders of the information encrypt the data using a secret code and specified receiver only can decrypt the data using the same or different secret code.

  ➢ Triple DES was designed to replace the original Data Encryption Standard (DES) algorithm, which hackers eventually learned to defeat with relative ease. At one time, Triple DES was the recommended standard and the most widely used symmetric algorithm in the industry.

    Triple DES uses three individual keys with 56 bits each. The total key length adds up to 168 bits, but experts would argue that 112-bits in key strength is more like it. Despite slowly being phased out, Triple DES still manages to make a dependable hardware encryption solution for financial services and other industries.

  ➢ RSA: is a public-key encryption algorithm and the standard for encrypting data sent over the internet. It also happens to be one of the methods used in our PGP and GPG programs. Unlike Triple DES, RSA is considered an asymmetric algorithm due to its use of a pair of keys. You've got your public key, which is what we use to encrypt our message, and a private key to decrypt it. The result of RSA encryption is a huge batch of mumbo jumbo that takes attackers quite a bit of time and processing power to break.

  ➢ Blowfish is yet another algorithm designed to replace DES. This symmetric cipher splits messages into blocks of 64 bits and encrypts them individually.
    Blowfish is known for both its tremendous speed and overall effectiveness as many claim that it has never been defeated. Meanwhile, vendors have taken full advantage of its free availability in the public domain.

Blowfish can be found in software categories ranging from e-commerce platforms for securing payments to password management tools, where it used to protect passwords. It's definitely one of the more flexible encryption methods available.
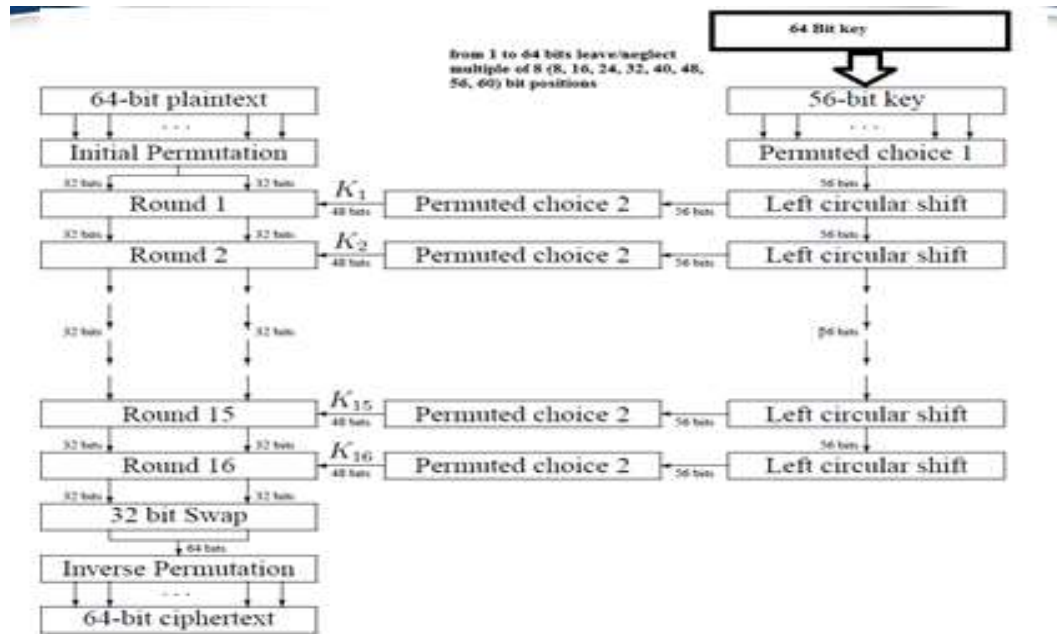

Fig: Blowfish Algorithm Working

➢ TwoFish: Computer security expert Bruce Schneier is the mastermind behind Blowfish and its successor Twofish. Keys used in this algorithm may be up to 256 bits in length and as a symmetric technique, only one key is needed.
Twofish is regarded as one of the fastest of its kind, and ideal for use in both hardware and software environments. Like Blowfish, Twofish is freely available to anyone who wants to use it. As a result, you'll find it bundled in encryption programs such as PhotoEncrypt, GPG, and the popular open source software TrueCrypt.

➢ Advance Data Standards (AES): is the algorithm trusted as the standard by the U.S. Government and numerous organizations. Although it is extremely efficient in 128-bit form, AES also uses keys of 192 and 256 bits for heavy duty encryption purposes. AES is largely considered impervious to all attacks, with the exception of brute force, which attempts to decipher messages using all possible combinations in the 128, 192, or 256-bit cipher. Still, security experts believe that AES will eventually be hailed the de facto standard for encrypting data in the private sector.

▪ Digital Signature − Digital signature ensures the authenticity of the information. A digital signature is an e-signature authentic authenticated through encryption and password.
▪ Security Certificates − Security certificate is unique digital id used to verify identity of an individual website or user.

Security Protocols in Internet:
Following are the popular protocols used over the internet which ensures security of transactions made over the internet.

- **Secure Socket Layer (SSL)**

   It is the most commonly used protocol and is widely used across the industry. It meets following security requirements −

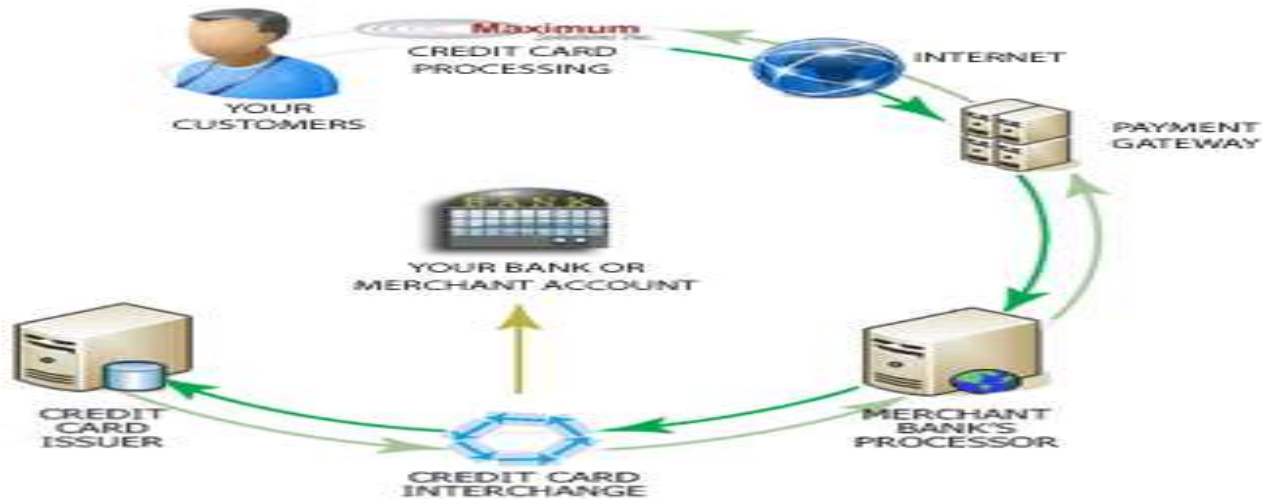- Authentication

- Encryption

- Integrity

- Non-reputability

Fig: Process of E-payment

- **SSL** creates an encrypted connection between your web server and your visitors' web browser
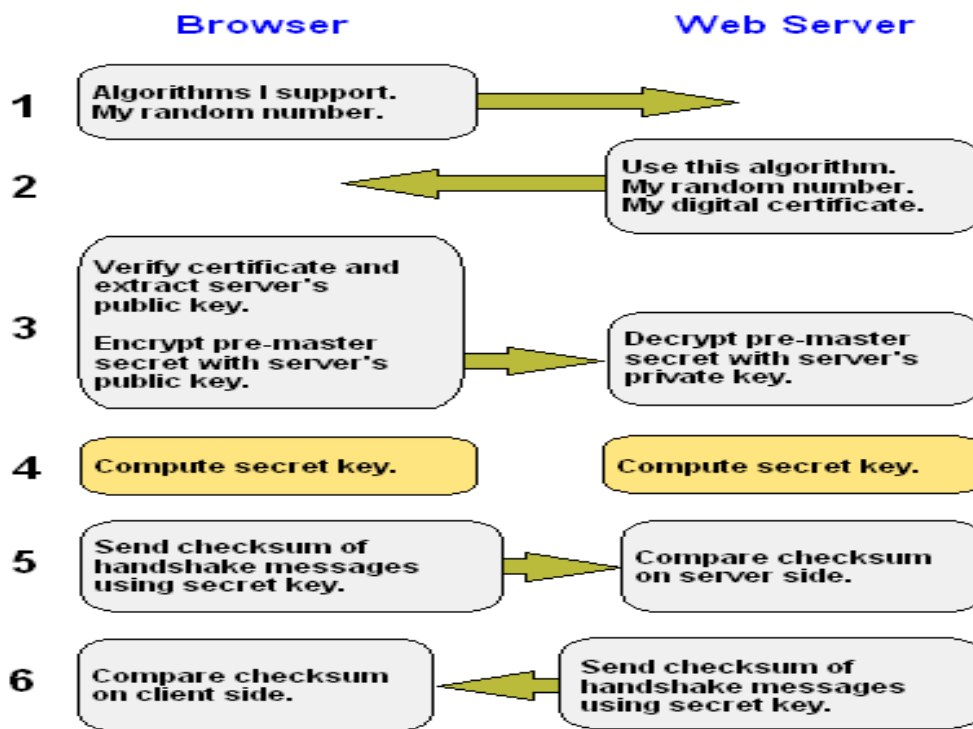

Fig: Demonstrating Handshaking in SSL

- **Secure Hypertext Transfer Protocol (SHTTP)**
  SHTTP extends the HTTP internet protocol with public key encryption, authentication and digital signature over the internet. Secure HTTP supports multiple security mechanism providing security to end users. SHTTP works by negotiating encryption scheme types used between client and server.

- **Secure Electronic Transaction**
  It is a secure protocol developed by MasterCard and Visa in collaboration. It is the best security protocol. It has following components:
  1) Card Holder's Digital Wallet Software: Digital Wallet allows card holder to make secure purchases online via point and click interface.
  2) Merchant Software: This software helps merchants to communicate with potential customers and financial institutions in secure manner.
  3) Payment Gateway Server Software: Payment gateway provides automatic and standard payment process. It supports the process for merchant's certificate request.
  4) Certificate Authority Software: this software is used by financial institutions to issue digital certificates to card holders and merchants and to enable them to register their account agreements for secure electronic commerce [8].

- **What happens when user logins?**
- In that case we have two major algorithms that are working
  1) **MD-5:** MD5 is an algorithm that is used to verify data integrity through the creation of a 128-bit message digest from data input (which may be a message of any length) that is claimed to be as unique to that specific data as a fingerprint is to the specific individual. MD5, which was developed by Professor Ronald L. Rivets of MIT, is intended for use with digital signature applications, which require that large files must be compressed by a secure method before being encrypted with a secret key, under a public key crsyptosystem.
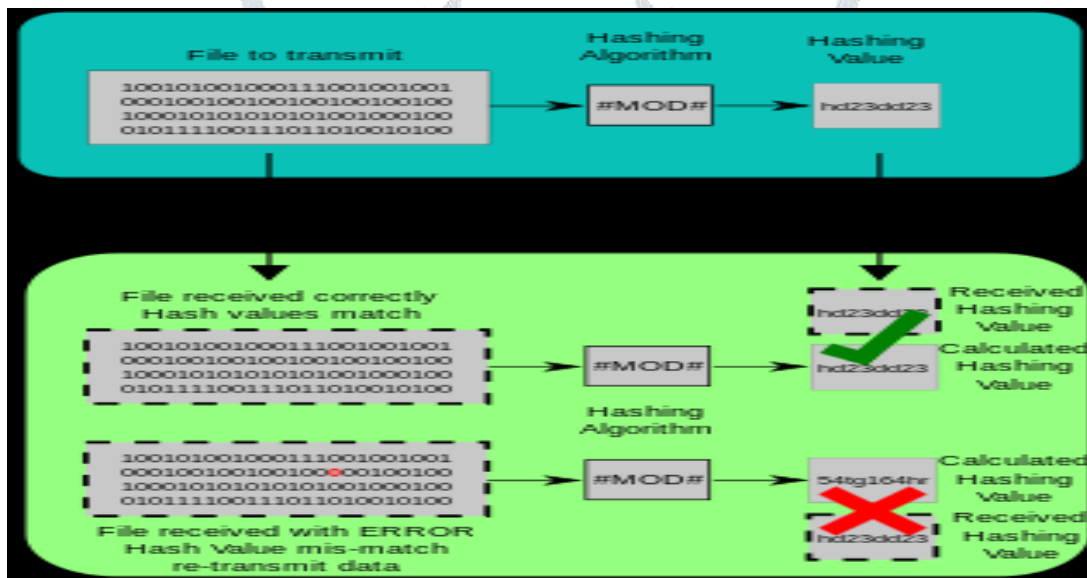

Fig: working of MD-5

- Passwords never stored in text
  - login + password + salt
- **MD5MD5(login + "zo5pro$1pvkhj6*cz4a8ùtvb#ui4oeuio" + password)**

2.) **SHA-256:** The SHA (Secure Hash Algorithm) is one of a number of cryptographic hash functions. A cryptographic hash is like a signature for a text or a data file. SHA-256 algorithm generates an almost-unique, fixed size 256-bit (32-byte) hash. Hash is a one way function – it cannot be decrypted back. This makes it suitable for password validation, challenge hash authentication, anti-tamper, digital signatures.

The blue components perform the following operations:

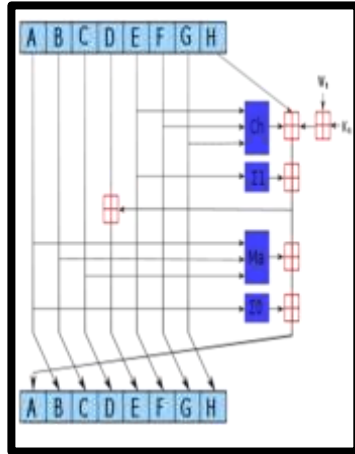$Ch(E,F,G) = (E \wedge F) \text{ EXOR } (-E \wedge G)$

$Ma(A,B,C) = (A \wedge B) \text{ EXOR } (A \wedge C) \text{ EXOR } (B \wedge C)$

$E0 = (A>>>2) \text{ EXOR } (A>>>13) \text{ EXOR } (A>>>22)$

$E1(A>>>6) \text{ EXOR } (A>>>11) \text{ EXOR } (A>>>5)$

The red box is addition modulo 2^{32} for SHA-256.
Fig: Working of SHA-256

4. CONCLUSION

After reviewing E-commerce and its advantages to organizations, customers and society, challenges to E-commerce and doing a comparative study of two Indian E-commerce giants i.e. Flipkart and Snapdeal we have concluded that both these sites are having differences in their technology and security measures that they implement to have safe and secure transaction. Flipkart runs all its software on Linux – Debian, the website is primarily built on PHP and runs on the JVM. The top NoSQL datastores have been evaluated at Flipkart and Memcached is the primary cahe layer used. The software products used for analytics are HP Vertica, Google Analytics, Adobe Analytics, Adobe Marketing Cloud. For HR: Capabiliti, Greenhouse, HackerEarth, HireeFinance and for accounting Cyber source, Cyber square are used.

In case of Snapdeal uses java, the traffic analysis tools are Google Analytics is a free service to get detailed statistics about the visitors of a website, provided by Google. The web server is Apache Tomcat is an open source Java servlet container that functions as a web server, developed by the Apache Software Foundation. Snapdeal has snapdeal gold as its feature and Snapdeal cirrus is its own hybrid cloud

In case of security there are various algorithms used to provide security but the common ones for secured identity of customer are SHA-256 (secured hash algorithm) and MD-5. Algorithms used in case to provide save transaction are SSL and Blowfish which don't have efficient cryptanalysis.

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