

# INTERNATIONAL JOURNAL OF RESEARCH IN COMMERCE & MANAGEMENT

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**E-COMMERCE: TRANSACTION SECURITY ISSUE AND CHALLENGES****GAUTAM KOHLI****RESEARCH SCHOLAR****DEPARTMENT OF COMMERCE & BUSINESS ADMINISTRATION****UNIVERSITY OF ALLAHABAD****ALLAHABAD****ABSTRACT**

*E-commerce applications are becoming popular day by day as they are working like a virtual shop. Writing good E-commerce application is tedious task and complex also. The applications if made complex are very difficult to maintain. Usability is a very basic concept in the E-commerce application. User has to get the information at one click and with proper feedback. As these are web based applications efficiency matters a lot for this application. As transaction in e-commerce faces the problems such as database exploits, log data mining and sniffing attacks which can be resolved by using different security measure. Hence security is important issue and challenges in current e-commerce applications.*

**KEYWORDS**

sniffing attack, log data mining, dbms exploit.

**INTRODUCTION**

Electronic commerce lets companies integrate internal and external business processes through information and communication technologies. Companies conduct these business processes over intranets, extranets, and the Internet. E-commerce lets businesses reduce costs, attain greater market reach, and develop closer partner relationships. However, using the Internet as the underlying backbone network has led to new risks and concerns. Often, industry analysts cite trust and security as the main hurdles in growing e-commerce. A number of factors have hampered the growth of e-commerce in developing countries. Yet, the main perceived obstacle to increased Internet usage is very similar in companies from both developed and developing countries. Firms already using the Internet consider the lack of network security to be the primary problem, followed by slow and unstable connections.

Further to the fundamental maxims of e-Commerce above, e-Commerce providers must also protect against a number of different external security threats, most notably Denial of Service (DoS). These are where an attempt is made to make a computer resource unavailable to its intended users through a variety of mechanisms discussed below. The financial services sector still bears the brunt of e-crime, accounting for 72% of all attacks. But the sector that experienced the greatest increase in the number of attacks was e-Commerce. Attacks in this sector have risen by 15% from 2006 to 2007 (Symantec, 2007).

One of the key developments in e-commerce security and one which has led to the widespread growth of e-commerce is the introduction of digital signatures as a means of verification of data integrity and authentication. In 1995, Utah became the first jurisdiction in the world to enact an electronic signature law. An electronic signature may be defined as "any letters, characters, or symbols manifested by electronic or similar means and executed or adopted by a party with the intent to authenticate a writing".

The rapid increase in use of e-commerce is accompanied by rise in the number and kind of attacks against the security of online transactions. The vulnerabilities that these attacks exploit range from loopholes in third-party components utilized by websites, such as shopping cart software to different types of vulnerabilities such as SQL injection, cross-site scripting, information disclosure, path disclosure, price manipulation, and buffer overflows.

**RELATED WORKS**

Security is one of the principal and continuing concerns that restrict customers and organizations engaging with e-commerce. The aim of this paper is to explore the perception of security in e-commerce B2C and C2C websites from both customer and organizational perspectives.

With the rapid development of E-commerce, security issues are arising from people's attention. The security of the transaction is the core and key issues of the development of E-commerce. This paper about the security issues of E-commerce activities put forward solution strategy from two aspects that are technology and system, so as to improve the environment for the development of E-commerce and promote the further development of E-commerce.

Web applications increasingly integrate third-party services. The integration introduces new security challenges due to the complexity for an application to coordinate its internal states with those of the component services and the web client across the Internet.

E-commerce web site owners on one side are thinking of how to attract more customers and how to make the visitors feel secured when working on the site, on the other side how the end users should rate a e-commerce website and what they should do to protect themselves as one among the online community. Our objective of writing this research analysis journal is to make the readers to have clarity of thoughts on the technology which helps all of us to do secure transactions along with safety tips. And how e-commerce site owners, have to make their online visitors to be of much comfort or Trust an e-commerce site via Trust marks, and by their security strategies.

E-Commerce offers the banking industry great opportunity, but also creates a set of new risks and vulnerability such as security threats. Information security, therefore, is an essential management and technical requirement for any efficient and effective Payment transaction activities over the internet. Still, its definition is a complex endeavor due to the constant technological and business change and requires a coordinated match of algorithm and technical solutions.

**OBJECTIVES OF STUDY**

1. Study the Overview of E-commerce security.
2. Understand the purpose of Security in E-commerce.

**E-COMMERCE SECURITY TOOLS**

- Firewalls – Software and Hardware
- Public Key infrastructure
- Encryption software
- Digital certificates
- Digital Signatures
- Biometrics – retinal scan, fingerprints, voice etc
- Passwords
- Locks and bars – network operations centers



## SECURITY ISSUES

E-commerce security is the protection of e-commerce assets from unauthorized access, use, alteration, or destruction. While security features do not guarantee a secure system, they are necessary to build a secure system. Security features have four categories.

- Authentication: Verifies who you say you are. It enforces that you are the only one allowed to logon to your Internet banking account.
- Authorization: Allows only you to manipulate your resources in specific ways. This prevents you from increasing the balance of your account or deleting a bill.
- Encryption: Deals with information hiding. It ensures you cannot spy on others during Internet banking transactions.
- Auditing: Keeps a record of operations. Merchants use auditing to prove that you bought a specific merchandise.
- Integrity: prevention against unauthorized data modification
- Nonrepudiation: prevention against any one party from reneging on an agreement after the fact
- Availability: prevention against data delays or removal.

## SECURITY ISSUES IN E-COMMERCE APPLICATION

There are following types of security issues in any e-commerce application which needs to be addressed

### 1. MALICIOUS CODE

- Viruses: They have ability to replicate and spread to other files; most also deliver a "payload" of some sort (destructive or benign); include macro viruses, file-infecting viruses, and script viruses
- Worms: They are designed to spread from computer to computer
- Trojan horse: They appears to be benign, but then does something other than expected
- Bots: It can be covertly installed on computer; responds to external commands sent by the attacker

### 2. UNWANTED PROGRAMS

These are installed without the user's informed consent. Following are its types. Browser parasites: It can monitor and change settings of a user's browser  
Adware: It calls for unwanted pop-up ads

- Spyware: It can be used to obtain information, such as a user's keystrokes, e-mail, IMs, etc.

### 3. PHISHING AND IDENTITY THEFT

Any deceptive, online attempt by a third party to obtain confidential information for financial gain – Most popular type: e-mail scam letter – It is one of fastest growing forms of e-commerce crime.

### 4. HACKING AND CYBER VANDALISM

Hacker: Individual who intends to gain unauthorized access to computer systems

- Cracker: Hacker with criminal intent (two terms often used interchangeably)
  - Cyber vandalism: Intentionally disrupting, defacing or destroying a Web site.
5. Credit Card Fraud: Fear that credit card information will be stolen deters online purchases. Hackers target credit card files and other customer information files on merchant servers; use stolen data to establish credit under false identity. One solution: New identity verification mechanisms.

## TRANSACTION SECURITY FOR E-COMMERCE APPLICATION

### 1. ENCRYPTION APPROACH

Encryption is the process of transforming plain text or data into cipher text that cannot be read by anyone other than the sender and the receiver. The purpose of encryption is:

- To secure stored information and
- To secure information transmission.

There are several types of encryption that differs in the context of its functionalities.

In Symmetric Key Encryption, both the sender and the receiver use the same key to encrypt and decrypt messages while Public Key Encryption used two mathematically related digital keys which are public key and private key.

### 2. SECURE SOCKET LAYER

The most common form of securing channels is through the Secure Sockets Layer (SSL) of TCP/IP. The SSL protocol provides data encryption, server authentication, optional client authentication, and message integrity for TCP/IP connections. Secure Socket Layer (SSL) is a security protocol, first developed by Netscape Communications Corporation and now taken over by the transport layer security working groups. The design goal of the protocol is to prevent eavesdropping, tampering or message forgery when a data is transported over the Internet between two communicating applications.

### 3. SECURE HYPERTEXT TRANSFER PROTOCOL (S-HTTP)

S-HTTP is a secure message-oriented communications protocol designed for use in conjunction with HTTP. It is designed to coexist with HTTP and to be easily integrated with HTTP applications. Whereas SSL is designed to establish a secure connection between two computers, S-HTTP is designed to send individual messages securely. Using S-HTTP, any message may be signed, authenticated, encrypted or any combination of these. Generally, S-HTTP attempts to make HTTP more secure.

### 4. TRUST SEALS PROGRAMS

A number of Trustmark seals have been developed to provide assurance about Web business practices and policies through the Web interface. One example is TRUSTe, which audit a site's stated privacy policies and allows sites to display the TRUSTe seal if privacy policies and disclosure meet specific standards. Cheskin and Sapient (1999) found that where trust mark seals were recognized, they increase consumer perceptions of a site's trustworthiness. Seal programs such as TRUSTe, BBBOnline, MultiCheck and WebTrust allow licensees who abide by posted privacy policies and/or allow compliance monitoring to display means for addressing consumer privacy concerns.

### 5. DIGITAL SIGNATURE

Digital signature means a digital method executed by a party with the intent to authenticate a record, which is a unique to the person using it and is capable of verification. It is linked to the data in such a manner that if the data is changed, the electronic signature is invalidated. A digital signature is normally a hash of the message which is encrypted with the owner's private key.

### 6. SECURE ELECTRONIC TRANSACTION (SET)

A SET specification for credit/payment card transactions is required for the safety of all involved in e-commerce. It is designed to meet three main objectives. First, it will enable payment security for all involved, authenticate card holders and merchants, provide confidentiality for payment data and define protocols and potential electronic security service providers. It will also enable interoperability among applications developed by various vendors and among different operating systems and platform.

### 7. PRIVACY POLICY STATEMENTS

A privacy policy statement is a contractual commitment to consumers outlining how their personal information will be treated. The evidence suggests that posting a self-reported guarantee of compliance with e-commerce standards is an effective means of increasing consumer trust. Privacy policy statements appear to be most beneficial to the web merchants that have the greatest need to increase consumer trust. Privacy is the willingness of consumers to share information over the Internet that allows purchases to be conducted.

**8. DIGITAL CERTIFICATE**

A digital certificate is a digital document issued by a trusted third party institution known as a certification authority that contains the name of the subject or company, the subject's public key, a digital certificate serial number, an expiration date, an issuance date, the digital signature of the certification authority and other identifying information. The Certification Authority (CA) is a trusted third party that hands out certificates and publishes identities and public keys in a directory. The certificate is signed with the private key of the Certification Authority; therefore, its authenticity can be confirmed by using the known public key of the CA.

**RECOMMENDATIONS**

The rapid pace at which technology is changing has provided large opportunities for organizations to develop new business models, services, and products. While the digital revolution has transformed the way we do business, it has also created complex and sophisticated security issues. Assets and Information that were once protected within the organization are now accessible online; customer channels are vulnerable to disruption; criminals have new opportunities for theft and fraud. With organizations growing organically and inorganically, complexity of managing businesses & security operations are also becoming complex.

Organizations today thus face a continuously evolving threat landscape where the speed and intensity of attack is incrementing and response time is subsiding. As a result, organizations need to have rapid detection and response capabilities that allow for the synthesis of external and internal threat intelligence in a timely manner. This "situational awareness" is a required component of an organization's overall security posture and critical to maintaining the confidentiality, integrity, and availability of its information assets. Some of the key recommendations for an organization to step towards an effective security equation include:

- Set risk appetite and drive focus on what matters. Establish purpose and direction. Clearly articulate your cyber risk appetite and strategy. Support it by requisite action through funding and resourcing.
- Define the right balance between threat-centric vs. compliance-centric programs. Fully integrate cyber risk management into IT disciplines.
- Break down silos. Cyber risk is an enterprise-level issue. Lack of information-sharing is a top inhibitor for effective risk management.
- Be creative about cyber risk awareness. Your weakest link is the human factor. There is not enough talent to do everything in-house, so take a strategic approach to sourcing decisions.
- Incentivize openness and collaboration. Build strong relationships with partners, law enforcement, regulators, and vendors.
- Prepare for cyber-attacks by conducting war games, penetration tests, and exercising the cyber incident response plans.
- Have a threat intelligence mechanism in place. Focus on restructuring the diverse unstructured security data and information gathered from all the security entities and devices (recent and past events) to consolidate intelligent feeds, advice or a product, which could be used to make informed decisions in order to mitigate dynamic threats as per the environment.

**CONCLUSION**

E-commerce is widely considered the buying and selling of products over the internet, but any transaction that is completed solely through electronic measures can be considered e-commerce. Day by day E-commerce and M-commerce playing very good role in online retail marketing and peoples using this technology day by day increasing all over the world.

E-commerce security is the protection of e-commerce assets from unauthorized access, use, alteration, or destruction. Dimensions of e-commerce security; Integrity: prevention against unauthorized data modification, No repudiation: prevention against any one party from reneging on an agreement after the fact. Authenticity: authentication of data source. Confidentiality: protection against unauthorized data disclosure. Privacy: provision of data control and disclosure.

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