Chapter 12
Security Issues and Countermeasures of Online Transaction in E–Commerce

Harshita
Mody University of Science and Technology, India

Sarvesh Tanwar
Mody University of Science and Technology, India

ABSTRACT
Nowadays, e-commerce is one of the most growing sectors in the field of internet. It gives the flexibility to shop online, transact online, transfer money online and many more feature to its internet users. As the growth of e-commerce increases, e-commerce security also comes out a major concern to ensure its user a secure transaction without any fear over the network. Banking sector is one of the most prominent sectors of growth in world of e-commerce, but as its demand increases the security and risks along with it also increases. E-commerce security must ensure major security features of cryptography: privacy, authentication, access control, confidentiality and protect data from un-authorized access. In this chapter, all aspects regarding e-commerce describes from its introduction to its security, countermeasures and an example of doing secure payment from any website.

INTRODUCTION TO E-COMMERCE

Now days, e-commerce is a booming sector in the world of internet. E-commerce replaces the method of doing shopping traditionally by electronically over internet. E-commerce is stands for electronic commerce which involves the use of Information and Communication Technology (ICT) and Electronic Funds Transfer (EFT) in making commerce between consumers and organizations, organization and organization or consumer and consumer. With growing of internet Electronic data exchange (EDI) also increases which provides to do digital shopping in e-mall (electronic-mall). There are various types of business models for e-commerce which categorized as given below:

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1. **Business-to-Business (B2B):** B2B e-commerce, the commerce takes place between two business entities or two business organizations. For an example, main buyer (say any top company) first sales their product to any intermediate buyer (say any BPO or website owner) and then the intermediate buyers will send the product to their end customers (Figure 1).

2. **Business-to-Consumer (B2C):** In B2C model any business organization or a company directly deals with its customer. Customer places order by seeing product on their website and company supplies product directly to customer (Figure 2).

3. **Consumer-to-Consumer (C2C):** In C2C business model, one end customer directly deals with another end customer by giving some advertisement of goods which he/she wants to sell over some website and another customer who wants to purchase that goods directly deals with that customer. In India, the website named OLX, giving this facility to sell your old or new product by uploading its advertisement on the website along with your details (Figure 3).

4. **Customer-to-Business (C2B):** In C2B model, customer directly approaches to the business organization for its particular need. For an example, suppose a customer wants the loan from bank with limited interest than he/she visits each bank website and read all the terms and policy then decide from which bank he/she wants the loan (Figure 4).

5. **Business-to-Government (B2G):** In this B2G model, the website is a mediator to communicate between various business organization and government. Suppose if any business organization wants to submit an application to government, it can be done with the help of these websites.

6. **Government-to-Business (G2B):** In this G2B model, government will approach to various business organizations for various purposes like to pass a tender, some actions etc.

Before proceeding to security issues of e-commerce first we have to understand what exactly e-commerce is, by using e-commerce we can do online purchasing from the various websites over internet like Amazon, E-bay, Snapdeal, Flipkart etc. In Figure 5, it describes the e-commerce cycle in which at very first step customer visit the site and places some order than make online transaction by transferring money from his/her account to merchant account after making the transaction online. TTP like bank first checks whether all the information given by user is correct or not like his/her account no, id etc., after verification customer account debited and merchant account credited by respective amount of order.

**INTRODUCTION TO ONLINE TRANSACTION IN E-COMMERCE CYCLE**

Before proceeding to security issues and countermeasures of transactions we have to understand that what online transaction is. As the growth of electronic commerce increases e-payment is also increases. Basically there are two types of electronic payment: off-line and on-line. (Figure 5)

In off-line payment system the payer and payee are directly connected to each other there is no need to contact with third party where as in on-line payment system the bank acts as third parties who authenticate each and every transaction which occurs between payer and payee. There are many ways through which one can does electronic payment over network like: credit cards, debit card, smart card and net banking (Figure 6).