

Security Aspects in E-Business Applications

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ARTICLE DETAILS

Article History

Published Online: 22 Dec 2018

Keywords

Electronic commerce, E-Business Applications, Security, Privacy, Consumer trust, E-Business Application security issue.

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ABSTRACT

E-Business applications are the major area of Electronic commerce. E-business is the process of buying and selling goods or services including information products and information retrieval services electronically rather than through conventional means. Major problem regarding seller and buyer is the security. Security of E-Business Applications is the protection of e-commerce assets from unauthorized access, use, alteration, or destruction along with the dimensions as Integrity, Privacy, Non-repudiation, Authenticity, Confidentiality, and Availability. This paper provides the E-Business Application security issues in technical and non-technical aspects and discusses the technologies and methods for providing security in E-Business Applications along with privacy, security, its purpose, different security issues and how consumer's trust and purchasing behaviour is affected by it. This paper discusses the security dimensions by referring some Traffic Management and Hospital Management Business applications.

1. Introduction

Electronic Commerce is the concept of use of Internet for the purpose of buying and selling of goods and services. Electronic Business which is known as E-Business is a part of Electronic Commerce which uses information and communication technology (ICT) for the management of business on the internet? This includes not only buying and selling but also providing services to the customers and suppliers along with making association with business partner through Internet. E-Business technologies and method helps industries to manage their internal and external data and information processing transactions more efficiently and effectively. Methods of E-Business applications enable to collaborate with suppliers and partners more closely and friendly and helps to resolve the customer's expectations easily. E-Business applications more focus on the satisfactions of needs from customer side. All business activities should be carried out on computer communication networks such as electronic retailing, electronic data interchange and electronic fund transfer.

E-Business application is a modern business methodology that speaks the requirements of organization merchant and consumers and enable to cut cost whereas improving the quality of goods and services and growing the speed of service delivery. It is the paperless and digital exchange of business information using electronic devices as electronic data interchange, electronic mail etc. It refers as interchanging data and information between business industry or individual person as buyer or seller and intra organizational or inter organizational activities mediated through communication networks.

There are some characteristics of E-Business applications as Sales which enables to generate the orders for the product, Payment which enabling credit card, smart card, e-money and other payments along with electronic funds transfer, Advertising and marketing which enable publicizing and

advertising product and services, Service Availability which enables automation of the conduct of business among enterprises, customers, suppliers and employers anytime, anywhere, Inventory Movement which enables the maintaining and reporting inventory status, Fulfilment which focus on the processing of order and delivering the product, Support which enables for providing pre and post-sale assistant to generate more sales, Secure communication which enables fast efficient, reliable communication with customers and partners and feedback which enables loyalty of customers and quality of product. Major success factor of E-Business application is the trust. [6]

Security helps to create a bond between customer and organization in business. This study focus on various security issues occurred in activities involved E-Business applications and summarizes the solutions which are available to resolve that issues.

2. Research Problem

There are various parameters of e-business application security such as Integrity, Non-repudiation, Authenticity, Confidentiality, Privacy and Availability.

- Integrity is nothing but which shows the anticipation against unofficial, unapproved data modification or exchange. Integrity factor is identified by the reliability and dependability of the particular asset in specific business process and the information stored or processed or services rendered by the asset in the business process have some low, medium or high integrity requirements.
- Nonrepudiation means interfering against anyone party from reneging on AN agreement when the actual fact.
- Authenticity is an authentication or validation of source of data.
- Confidentiality: Data or information should not be disclosing or accessible by unauthorized person.

- Privacy focus on the faculty provided on control of data and information to be release.
- Availability look upon the prevention against data delays or removal.

3. Objective of study

Objectives of this research are as follows:

- To Learn and study about E-business application.
- To Identify the security issues involved in E-business application.
- To Analyse the security issues regarding Traffic Management and Hospital Management Business applications.
- To discuss solutions to overcome security problems.

4. Literature Survey

Security in E-Business Application arise from customer's trust and customer's attention. The security of all the processes and transactions in business applications is the major key success factor of E-Business application. Some study focus on the various security tools available for data or information security, network security, infrastructure security, cyber security. [13] Some study enables the Digitalization by providing E-selling, E-Marketing, E-Retailing. Important conceptual elements of e-selling to be human interactivity, intentionality, persuasion, value creation and closing. E-marketing has been conceptualized to include the areas of sales activity, customer relationship management and research, analysis and planning. E-selling activity is an intentional act of selling, performed by a computer-mediated social or a computerized agent, aimed at engaging a targeted customer in a digital interactive exchange with the intention of triggering and ensuring the buying of a value-creating offering. With current technology, such professional e-sales work is still rudimentary. It can entail a salesperson answering product enthusiasts' discussion forum requests, targeting virtual customers. [12]. Some study discusses The three broad areas of E-commerce as solution provider for the issues of linking technical and commercial infrastructures along with social infrastructures which are essential to support E-commerce. It is necessary for each country to be able to build a statistical picture of the state of readiness of each infrastructure element to involve with e-commerce. Some issues talk about the importance and behavior of transactions along with usage and capacity of transactions are considered as E-commerce intensity. The statistical requirement is to outline abusing e-commerce possibilities and to identify leading sectors and applications. Other e-commerce issues related to beyond the boundary type issues which impacts on the expected effects and proposes some other value added effects additionally. Analysis has to be done to measure at what extend e-commerce works efficiently and effectively and is it required to assign new sources of capital. [4]. Traffic Management and Hospital Managements are such E-Business applications where live security is provided in government sector. Business-to-Business or B2B. B2B applications are applications which provides electronic commerce or business between two business parties. This is open to all interested parties or limited to private electronic market. Electronic business that is conducted between businesses and consumers, on the other

hand, is referred to as business-to consumer or B2C. In this type of business model one entity is business at other hand consumer is present. This is a platform where consumer can directly contact to organization or business personnel through digital media or communication network. [14]. The perspective of the consumer and the business and the Issues related to e-business adoption and performance outcomes identified broadly and analyzed in conceptual framework. The study on various Consumer Perspective, the Business Perspective which relate Business-related factors and Environment-related factors and the research on the antecedents and implications of technological opportunism, defined as an organization's ability to sense and respond to new technologies, in the context of e-business adoption. An intensity of e-business adoption is categorized in different processes as communications processes, Administrative processes, Order-taking processes and Procurement processes. This intensity is measured and a perspective on business process is stated with performance outcome of E-business adoption. [1] Consumer's perspective is studied separately with privacy and trust. the analyses show that trust in the internet is particularly influenced by the security perceived by consumers regarding the handling of their private data. Web browsers and Web sites should display visible security mechanisms such as statements about data protection and firewalls (protection), an unbroken lock/key (encryption), digital certificates (authentication) from trusted third parties and familiar and verifiable domain names (verification). [2]

5. E-Commerce and E-Business Application

E-Commerce relate the commerce transactions as buying, selling, information flow and funds transfer over the internet.

The main goal of e-commerce is:

- Reduce cost
- Lower product cycle time
- Faster customer response
- Improved service quality

The various activities as Marketing, Advertising, Electronic publishing sales, Customer support, Electronic Document interchange, Electronic Funds Transfer Electronic Data Interchange, Information sharing, Digital library, Collaborative work, Electronic mail and Tax, Digital media are work through E-commerce.

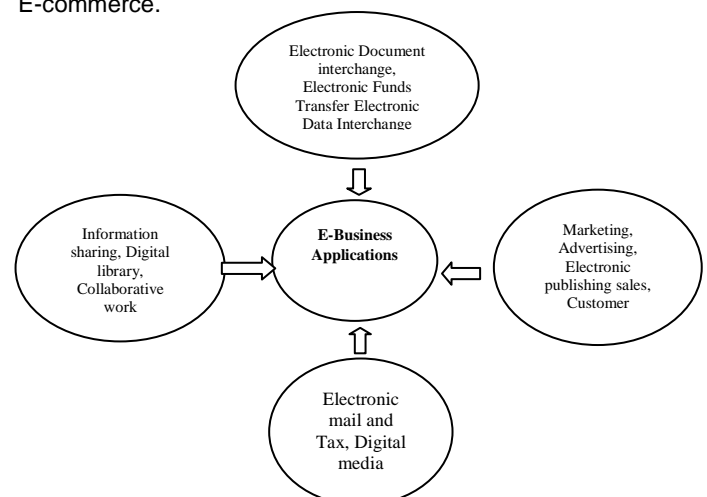


Figure 1.1

E-Business Applications work on the adoption of working of inter processes of business electronically. Within the business unit and outside the business unit how new technology and methods, systems, product, processes and services get adopted impacts on the working of any E-business applications. [1]

There are various Business Models are available.

- Business to Business (B2B)
- Business to Consumer(B2C)
- Consumer to Consumer(C2C)
- Consumer to Business(C2B)
- Business to Government(B2G)
- Government to Business(G2B)
- Government to Citizen(G2C)

E business on the other hand represents the transformation of organization business and functional process through the application of technologies, philosophies and computing paradigms of new digital economy.

Advantages of E- business application:

1. Advantages to organization:

It decreases the cost of making, processing, distributing, storing and retrieving documentary information. It reduces the time and better Impression of an organization. It enhanced consumer service. It helps in the expansion of suppliers and partners.

2. Advantages to consumer:

Customer can do perform the transaction anywhere and anytime. Customers can select large options for the transaction. It permits quick and fast delivery method. It offers customers with less expensive, quality based products and service. Consumers can relate with other consumer via electronic communication network. This is very effective method for consumers.

3. Benefits to society:

It decreases the time for wandering for shopping. It lets some trading or business to be sold at low or reasonable price. allows people in rural areas to adore products and services. [3] It helps transport of public services, such as health care, transport etc.

6. Security in e-business applications

Security in E-Business Application is the protections data, information, e-commerce resources from unapproved access, use, alteration, or obliteration. It is an information system with technological infrastructure in which major dimensions as people, software, hardware, procedures and data are interconnected. [4]

Customer confidentiality is becoming the most broadcasted security issue exchanging robbery and fraud as top concerns in E-Business application. The extinction of trust in Internet or E-Business applications may source judicious business people and clients to forgo use of the Internet for now

and revert back to traditional methods of performing the business.

E-selling and E-marketing relates e-business transactions.[11] This loss of faith is being fuelled by persistent stories of hacker attacks on E-Business application and consumer data privacy abuse. Hackers challenging a money from an E-Business application for not reproducing customer credit card information have increased the discernibility of the network security weaknesses in most business institutions. E-commerce security wants to be talked not only at the business site with its servers/network but also on the client side, which includes direct associated homebased computers. It is this group of computers that are the most vulnerable to attack because the lack of user security training or awareness is observed. [5]

6.1 Dimensions of Security and methods

Integrity, Privacy & Non-Repudiation

The key success factors of any E-Business applications are depends on data integrity, customer & client authentication and non-repudiation. Data integrity is the way of transmission of accurate data. Data has not been tampered or altered in any way during transmission over the communication network. Privacy means to keep data private or protect an information from unauthorized access. In each and every organization privacy policy has to maintain. Non-repudiation is the idea that no party can make rejection of order. 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 nor the recipient. For security propose one needs the to create strong verification and security measurements such as digital signatures and public key infrastructures. Digital signature plays very important role in data integrity and authentication. In this asymmetric key cryptology process is used where two keys were generated. One key is used for encrypting the message by the sender, and second key is used by the recipient for decrypting the message. Digital Signatures using public-key cryptography and hash functions. This helps to detect the fraud easily. Now a day's large number of business parties would prefer Digital Signature for E-Business transactions.

Authenticity, Confidentiality, and Availability

Authentication is a process of authenticate users involved in business transaction. It is a process of creating identity of each user separately by providing personal information (e.g. credit Card number, social security number, signature,..). User has to maintain or keep information while performing any transaction through network communication and information system has to check his identity and then only he/she can access the information and proceed for his transaction. Authentication in E-business application relate buyer, seller and product together. Confidentiality means not to disclose the user's information or business transaction data. Availability allows information to be access or available anywhere and anytime.[7] Authentication mechanisms are depends on the users information that he knows such as a password, a username, data that he has such as an Electronic Signature, a credit card number. Based on these combinations, there are many different technical solutions relates to

authentication. Security of the knowledge-method depends on two factors, the responsibility of the user and the security of information transferring systems (protocols).

6.2 Technical and Non-Technical Attacks and Security Tools

Some technical attacks talk about Denial-of-Service(DoS) attacks which attacks on high-profile web servers such as banks, credit card payment gateways, large online retailers and popular social networking sites. Phishing called as a Permanent denial-of-service (PDoS) is an attack that harms a hardware of a system such as printers, routers, etc. Similarly Distributed Denial-of-Service Attacks is very harmful attack which blocks the network traffic and Brute Force Attacks is present on the message send by the sender and attack decrypt a message. Under Non-Technical Attacks Phishing Attacks is one which is process of gaining confidential information as usernames, passwords and credit card details. Social Engineering talk about Interactive voice recording (IVR) or phone phishing. Major non-technical issue is a social awareness among the people which cause insecurity and loss of privacy.[8]

Security in E-business application can be provided by client software security, server software security, operating system security and network security.[13][14][15] Other than this some Cryptography, Virtual Private Network, Biometric Systems, Digital Signatures, Digital Certificate, encryption, decryption, Secure Socket Layer and Transaction layer security tools are available. Symmetric key encryption is used for converting simple text into cipher text form in encryption process. different algorithms are used for cryptography. Intellectual property may be most valuable assets for client.

7. Focus on E-Business Applications

Hospital Management is one of the health related application where the entire internal management of the hospital is carried out by a single application. This is used for keeping the tracks of all the activities and maintaining records of hospitals. Hospital owner can create multiple hospital admin for multiple hospitals. They should be able to keep track of the records of the doctors, patients, nurses, and other hospital staffs. But if these records are maintained on the paper. So it is difficult to maintain all record regarding hospital management. In hospital management system provide all the details regarding hospitals, whether it is small or big, will be computerized. It covers all the required modules rights from patient registration, ward management, shift management, Patient appointment, bill payment, discharge details of the patient. The Objective of Web Application for hospital management system is

- To automate processes of the hospital management system.
- To manage the all roles of the employee in hospital for the system.
- To maintained day by day state of admission /Discharge of patients.
- To computerized bill details of patient.
- To get detail information of appointment to patient through the SMS facility.

This Web Application for Hospital Management System enables Hospital Activity connect authorized super admin, hospital admin and receptionist at one platform. Also helps to keep a track of record of Patient with different doctors. It allows hospital admin to manage all the employee right form creation of hospital to managing for the access role of each employee.

Benefits of Web Application for Hospital Management System:

- Super Admin can create hospital admin into their hospital.
- Receptionist Rescheduling/Cancelling of appointment is also available as in case of any urgency.
- The report maintenance easier and it provides high security.
- Bed management and shift management details of hospital are also maintained by the corresponding admin of the hospital.

In this application Security is a major concern to study. This Web Application for Hospital Management System should support the strong security for data or information. Here module wise security is provided as for Super admin credentials are given for accessing the data at the different levels. As per the user's profile, he or she can access the data. In hospital module the registration of hospital along with authentication and authorization n is provided. In bill generation module through unique identity of patient and as per his treatment bill get generated.

- This application involves web security, network security as well. Authentication, authorization, and encryption are used in this application. Encryption is used when a patient pays the bill online. Here patient's credit card and personal information is protected while sending data over the Internet. The application encrypts the patient's data so that it will be safer from interception in transit.
- Authentication is used when a patient shows his or her hospital card at the receptionist counter after registration.
- Authorization is used when a patient shows his or her hospital card at the receptionist counter Receptionist need to authorize that the person is who he or she says she is and has already visited hospital and his or her history is present in the database which is benefits the doctor while diagnosis. For maintaining security of database an application

Traffic Management is one of the E-Business Application which involves number plate recognition which is sensor-based image processing technology which uses number plate to identify the vehicle. The objective is to design an efficient automatic vehicle identification system by using the vehicle number plate recognition. This system will assist the driver while driver wants to overtake the other vehicle or other vehicle is trying to overtake. The application will also detect the obstacles on the road so that driver can have safe journey. It is very challenging problem, due to the diversity of plate formats, different scales, rotations and non-uniform illumination condition. The developed system will first recognize the

number plate and then captures the vehicle image. Based on the distance between vehicles, it will notify to the driver whether it is safe to overtake or not. Vehicle number plate region is extracted using the image segmentation in an image. Optical character recognition technique is used for the character recognition. The resulting data is then used to compare with the records on a database so as to come up with the specific information like the vehicle owner, place of registration, address, etc.

There are seven primary algorithms that the software requires for identifying a license plate:

1. Plate localization –It is responsible for finding and isolating the plate on the picture.
2. Plate orientation and sizing –It compensates for the skew of the plate and adjusts the dimensions to the required size.
3. Normalization –It adjusts the brightness and contrast of the image.
4. Character segmentation–It finds the individual characters on the plates.
5. Optical character recognition.
6. Syntactical/Geometrical analysis –It check characters and positions against country-specific rules.
7. The averaging of the recognized value over multiple fields/images to produce a more reliable or confident result. Especially since any single image may contain a reflected light flare, be partially obscured or other temporary effect. This application involves Detection of vehicle, Capture of images and Process of recognition. This application would help in improving road safety, reduces a crime, gives officers better information to work with, deterring terrorism, giving a greater police presence, increasing the percentage of stop/searches that lead to an arrest, and pre-paid parking members can be easily differentiated from non-members.

This application also enlists the security as Authentication, authorization, and encryption. [9] Encryption is used when a characters on the number plate are recognized character by character and stored in the database. Encryption is used to protect a person's vehicle and personal information when it is sent over the Internet. Authentication is used when number plate is recognized and unique identity of the vehicle is identified. Authorization is used when the application will detect

the obstacles on the road by matching characters present on number plate or data present in database. This system will assist the driver while driver wants to overtake the other vehicle or other vehicle is trying to overtake. Authentication and Authorization are often used together Encryption should be used whenever people are giving out private information to register for something or buy a product. At that time ensures the person's privacy during the communication. Client and server's data should be protected in Encryption. Authentication should be used whenever you want to know exactly who is using or viewing your site. Authorization should be used whenever you want to control viewer access of certain pages.

8. Conclusion

E-Commerce is mainly benefits to organization, consumers and society. This can help in E-Business Applications where that applications perform the transactions electronically. Organizations can grow up their business at National and International level. E-business application uses electronic payment, where electronic payment refers to paperless monetary transactions. Electronic payment has revolutionized the business processing by reducing the paperwork, transaction costs, and labor cost. Being user friendly and less time-consuming than manual processing, it helps business organization to expand its market reach/expansion. Using Credit Card, Debit Card, Smart Card, E-Money and Electronic Fund Transfer (EFT) one can easily do the payment online.[9][10]

As online transactions are increased security becomes mandatory. This paper presented the review of E-Business applications along with security issues. Various technical and non-technical attacks are discussed. This paper discussed the various dimensions for security in E-business applications.

Hospital Management application and Traffic control application is presented with the current scenario and how security can be provided with these application are discussed.

Currently e-business applications can be generated with security aspects. Authorization, Encryption and Authentication are major security aspects present in e-business applications along with Integrity, privacy and non-repudiation which is supported by e-business application transactions.

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