A Survey of E-Commerce of Bangladesh

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Abstract: *Electronic commerce or e-commerce is a term for any type of business, or commercial transaction that involves the transfer of information across the Internet. It is currently one of the most important aspects of the Internet to emerge. E-commerce has grown tremendously worldwide. The aim of our study was to identify impact of this growth on societies and businesses. Another objective of our study was to find out how we can implement e-commerce in Bangladesh and what problem we may face. We also study the technical perspective of e-commerce how it is build and what software and hardware are needed to run it. We used several methods to reach our goals which include group study, group discussion to collect suggestion on the survey of e-commerce system, internet search to collect data, e-commerce site visits as clients, Architecture and code review of e-commerce site and introducing intentional change to understand e-commerce engine. E-commerce has significant impact on societies and businesses. In the future e-commerce may become totally mobile based.*

Keywords: Electronic commerce, business-to-business exchange, banking on the Web, credit card transaction, meta-information.

1. Introduction

When Electronic commerce, commonly known as 'e-commerce', is the buying and selling of products or services over electronic systems such as the Internet and other computer networks. Electronic commerce draws on such technologies as electronic funds transfer, supply chain management, Internet marketing, online transaction processing, electronic data interchange (EDI), inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the at least at one point in the transaction's life-cycle, although it may encompass a wider range of technologies such as e-mail, mobile devices and telephones as well. Electronic commerce is generally considered to be the sales aspect of e-business [1]. It also consists of the exchange of data to facilitate the financing and payment aspects of business transactions.

E-commerce can be divided into:
i. E-tailing or "virtual storefronts" on Web sites with online catalogs, sometimes gathered into a "virtual mall"
ii. The gathering and use of demographic data through Web contacts
iii. Electronic Data Interchange (EDI), the business-to-business exchange of data
iv. E-mail and fax and their use as media for reaching prospects and established customers (for example, with newsletters)
v. Business-to-business buying and selling
vi. The security of business transactions
    The main areas of e-commerce are following:

i. Business to Business (B2B)
ii. Business to Consumer (B2C)
iii. Business to Government (B2G)
iv. Government to Business (G2B)

2. Objectives

Our objectives are following:

i. To define e-commerce and describe how it differs from e-business.
ii. To identify and describe the unique features of e-commerce technology and discuss their business significance.
iii. To describe the major types of e-commerce.
iv. To discuss the origins and growth of e-commerce.
v. To explain the evolution of e-commerce from its early years to today.
vi. To identify the factors that will define the future of e-commerce.
vii. To describe the major themes underlying the study of e-commerce.
viii. To identify the major academic disciplines contributing to e-commerce and understand design of an e-commerce engine
ix. To identify the opportunity and problem of e-commerce implementation in Bangladesh.
x. To identify the future of e-commerce.

3. E-Commerce in Bangladesh

In Bangladesh there is a limited application and use of B2C e-commerce .This field is not yet much developed in Bangladesh. There are many reasons behind it one simple reason this country is not so developed and most of its citizens are poor and uneducated. It is quit natural that there are few customers who is willing and can shop in internet. It will take years to be developed this sector in bd. The telecommunication infrastructure any country affect the Internet services directly, cause it is largely depended on it. In this chapter Define Need for e-commerce in Bangladesh, different sector in Bangladesh, overview of implementation stage of e-commerce in Bangladesh. And there is some problem such as: low internet speed, no payment gateway and internet range, and recommendation.

3.1 Need for E-commerce in Bangladesh

With the increasing diffusion of ICTs, more specifically the Internet, the global business community is rapidly moving towards Business-to-Business (B2B) e-commerce. The buyers/ importers gain a clear advantage when the Internet gives them access to the global market, by which they can compare prices across regions, find out whether prices vary by order fragmentation, get awareness about substitute/ alternative products. Consequently, the sellers/ exporters make sure that they are well portrayed in the cyber world through websites and portals. Like buyers, sellers also benefit from increased and more efficient access to the global market through the Internet. Bangladesh is pursuing an economic policy of export-led growth. With the rising forces of globalization, it is becoming increasingly important that the private sector, particularly the export sectors are well prepared to meet the requirements and expectations of the importers and also stand out in the competition against exporters in other countries. In such a scenario, two issues are becoming particularly important for Bangladeshi export sectors –one, whether businesses are automating their internal processes with these of ICTs to become increasingly efficient and competitive in a global context, and two, whether businesses have effective presence and participation in the cyber world. International organizations such as UNCTAD (United Nations Center for Trade and Development) and WTO (World Trade Organization) [2] have, over the last several years, put much emphasis on the importance of e-commerce for developing countries. UNCTAD has special programs to facilitate developing countries to transition into e-commerce. The WTO has also developed rules and guidelines for global e-commerce transactions.

3.2 E-commerce in Different Sector in Bangladesh

Despite being a under developed country, selected segments of the Bangladeshi business community has embraced technology with reasonable success. Personal computers and the Internet are also emerging as day-to-day business tools. These positive indicators are favoring the prospects of e-commerce in Bangladesh.
i. RMG Sector
ii. Banking on the Web (Online Banking)
iii. Online Shopping
iv. Web Hosting, Domain
v. Online cards, gifts
vi. Pay Bill

3.3 The Existing Situation and Potential of E-commerce in Bangladesh

Internet services are presently available in Bangladesh. Its usage for e-commerce by the Bangladeshi producers to export as well as to access inputs will be dependent on their willingness and ability to use this medium as well as that of the buyers of final products and the sellers of intermediate goods and services. Figure 1 depicts the three dimensions of e-commerce. Business to-Consumers (B2C) e-commerce is practically non-existent within Bangladesh, while a very limited level of Business-to-Business (B2B) and Business-to-Government (B2G) transactions exists [3]. The potential for use of e-commerce by Bangladeshi consumers and businesses with foreign firms is much brighter, and can play an important role in boosting the country's exports. A significant volume of B2G is also possible, as the government remains the biggest spender.
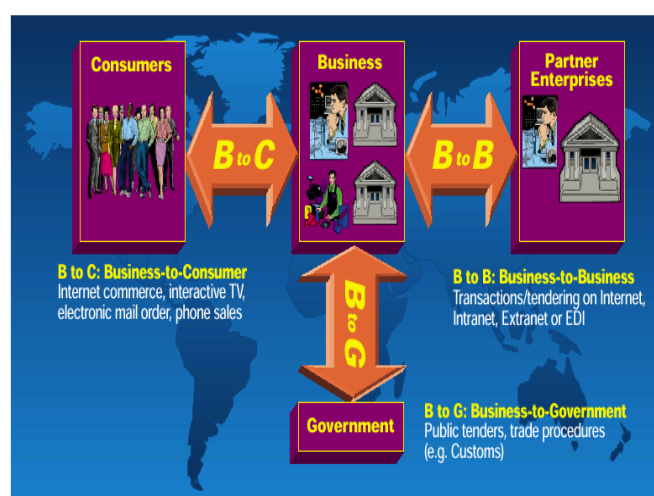

Figure 1. The Three Dimensions of E-commerce

3.4 E-commerce growth in Bangladesh

E-commerce growth in Bangladesh shown in figure 3.2 in the year of 2000 e-commerce business is 11440 million taka. In the years of 2001 business of e-commerce is 15840 million taka and increase year by year 2002 business is 18980 million taka 2002 to 2004 businesses is not very fast but in the year of 2005 business of e-commerce is 22480 and end the year of 2006 business of e-commerce growth is 252000 million taka.
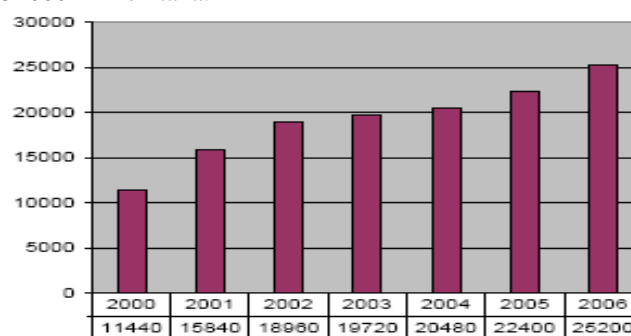

Figure 2. E-commerce growth in Bangladesh

4. Methodologies

The methodologies of our survey are given below:

4.1 Identification of scope of study

To accomplish the project objectives, a systematic process is followed. The project process begins with the identification of the project topic where studies was carried out to obtain enough information on the topic.

4.2 Group discussions to collect suggestions on the survey of e-commerce system

Discuss with group member about the topic and collect their suggestions on this topic. Also discuss impacts of e-commerce in our society and business and barriers e-commerce in different sectors in Bangladesh and the future of e-commerce system.

4.3 E-commerce site visits as clients

Some e-commerce websites visits were made as clients. We visited websites like www.ebay.com, browsed many products, added product to shopping cart, created user account and observed the check out process. We also examined their user interface, front end design and various category of product. We searched products by different types, the product names and the company name.

4.4 Internet search to collect data on e-commerce growth world wide

We searched the internet to collect data on e-commerce business growth based on time, data on e-commerce revenue based on geographic locations. We also collected data about e-commerce business growth and present situation of e-commerce in Bangladesh.

4.5 Architecture and code review of e-commerce site

We reviewed the main technologies involved in e-commerce site, which include php sessions, catalog technology, server technology (hardware and software). We also reviewed credit card transaction and shopping cart checkout process.

4.6 Interviews to find what people think about e-commerce

We interviewed people from various sections of the society to find out what they think about e-commerce and what changes they needed. We also discussed with them what the advantages and disadvantages of e-commerce systems are.

4.7 Introducing intentional change to understand e-commerce engine

We downloaded e-commerce site code and changed the catalog of product, banner, product detail, product image, and increase and decrease number of product show in the main page also changed the theme of e-commerce site. We entered new products and removed selling product and updated the products.

5. Technical Design of E-Commerce Site

The technical design of e-commerce site include database structure, database schema, table structure, php session, shopping cart, e-r diagram, and credit card transaction.

5.1 Architecture

This is the design of front-end design shown in Figure 3. There is a one home page, wish list, account, shopping cart, and product list and checkout option.
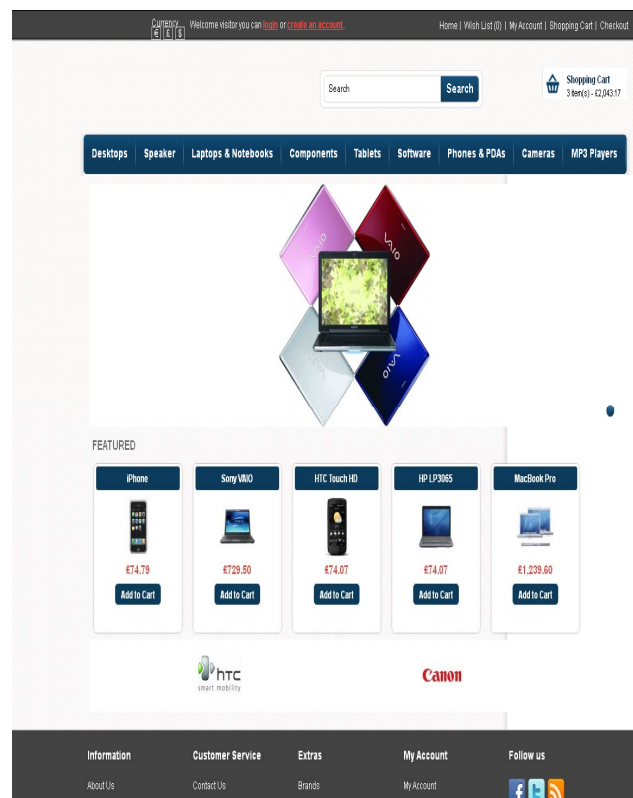

Figure 3. E-commerce site front end design

5.2 Database Structure
5.2.1 E-R Diagram
A sample entity–relationship diagram using Chen's notation is shown in Figure 4.
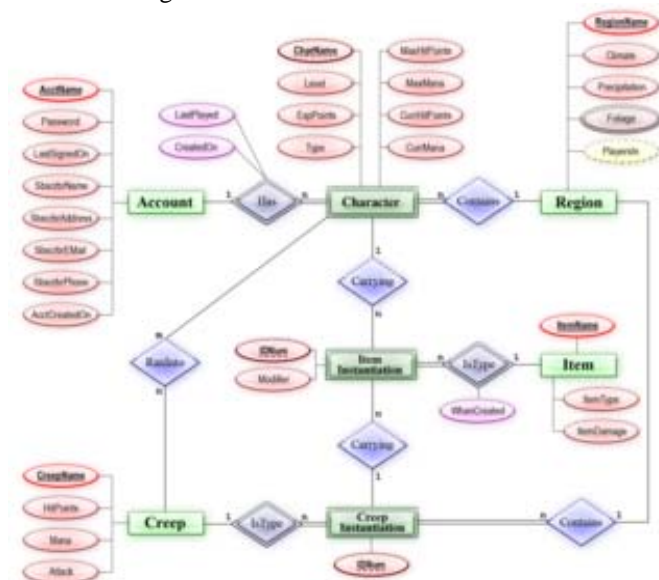

Figure 4. A sample entity–relationship diagram using Chen's notation

In software engineering, an entity–relationship model (ER model for short) is an abstract [4] and conceptual representation of data. Entity–relationship modeling is a database modeling method, used to produce a type of conceptual schema or semantic data model of a system, often

a relational database, and its requirements in a top-down fashion. Diagrams created by this process are called entity–relationship diagrams or ER diagrams.

Using the three schema approach to software engineering, there are three levels of ER models that may be developed. The conceptual data model is the highest level ER model in that it contains the least granular detail but establishes the overall scope of what is to be included within the model set. The conceptual ER model normally defines master reference data entities that are commonly used by the organization. Developing an enterprise-wide conceptual ER model is useful to support documenting the data architecture for an organization.

A conceptual ER model may be used as the foundation for one or more logical data models. The purpose of the conceptual ER model is then to establish structural metadata commonality for the master data entities between the set of logical ER models. The conceptual data model may be used to form commonality relationships between ER models as a basis for data model integration.

A logical ER model does not require a conceptual ER model especially if the scope of the logical ER model is to develop a single disparate information system. The logical ER model contains more detail than the conceptual ER model. In addition to master data entities, operational and transactional data entities are now defined [5]. The details of each data entity are developed and the entity relationships between these data entities are established. The logical ER model is however developed independent of technology into which it will be implemented.

One or more physical ER models may be developed from each logical ER model. The physical ER model is normally developed be instantiated as a database. Therefore, each physical ER model must contain enough detail to produce a database and each physical ER model is technology dependent since each database management system is somewhat different.

The physical model is normally forward engineered to instantiate the structural metadata into a database management system as relational database objects such as database tables, database indexes such as unique key indexes, and database constraints such as a foreign key constraint or a commonality constraint. The ER model is also normally used to design modifications to the relational database objects and to maintain the structural metadata of the database.

The first stage of information system design uses these models during the requirements analysis to describe information needs or the type of information that is to be stored in a database. The data modeling technique can be used to describe any ontology (i.e. an overview and classifications of used terms and their relationships) for a certain area of interest. In the case of the design of an information system that is based on a database, the conceptual data model is, at a later stage (usually called logical design), mapped to a logical data model, such as the relational model; this in turn is mapped to a physical model during physical design.

5.2.2 The Building Blocks: Entities, Relationships, and Attributes

The building blocks: entities, relationships, and attributes as shown in Figure 5, first here two related entities then an entity with an attribute next in this figure a relationship with and attribute and finally see primary key.
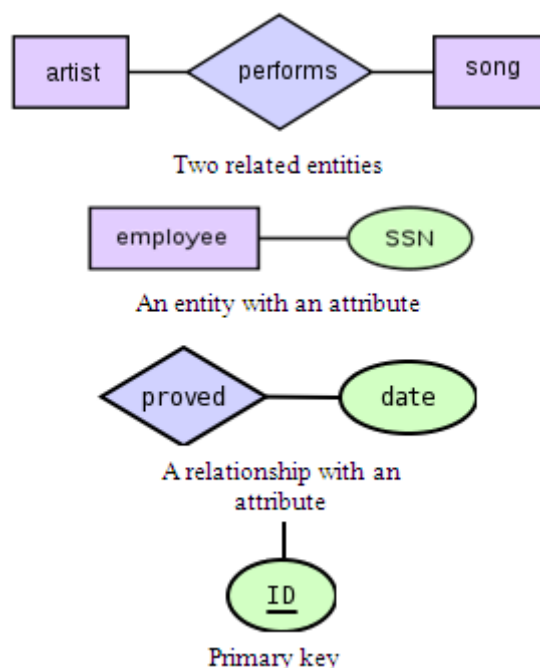

Figure 5. The building blocks: entities, relationships, and attributes

An entity may be defined as a thing which is recognized as being capable of an independent existence and which can be uniquely identified. An entity is an abstraction from the complexities of some domain. When we speak of an entity we normally speak of some aspect of the real world which can be distinguished from other aspects of the real world.

An entity may be a physical object such as a house or a car, an event such as a house sale or a car service, or a concept such as a customer transaction or order. Although the term entity is the one most commonly used, following Chen we should really distinguish between an entity and an entity-type. An entity-type is a category. An entity, strictly speaking, is an instance of a given entity-type. There are usually many instances of an entity-type. Because the term entity-type is somewhat cumbersome, most people tend to use the term entity as a synonym for this term.

Entities can be thought of as nouns. Examples: a computer, an employee, a song, a mathematical theorem.

A relationship captures how entities are related to one another. Relationships can be thought of as verbs, linking two or more nouns. Examples: owns relationship between a company and a computer, supervises relationship between an employee and a department [6], performs relationship between an artist and a song, a proved relationship between a mathematician and a theorem.

The model's linguistic aspect described above is utilized in

the declarative database query language ERROL, which mimics natural language, constructs. ERROL's semantics and implementation are based on Reshaped relational algebra (RRA), a relational algebra which is adapted to the entity–relationship model and captures its linguistic aspect.

Entities and relationships can both have attributes. Examples: an employee entity might have a Social Security Number (SSN) attribute; the proved relationship may have a date attribute.

Every entity (unless it is a weak entity) must have a minimal set of uniquely identifying attributes, which is called the entity's primary key.

Entity–relationship diagrams don't show single entities or single instances of relations. Rather, they show entity sets and relationship sets. Example: a particular song is an entity. The collection of all songs in a database is an entity set. The eaten relationship between a child and her lunch is a single relationship. The set of all such child-lunch relationships in a database is a relationship set. In other words, a relationship set corresponds to a relation in mathematics, while a relationship corresponds to a member of the relation.

5.2.3 Relationships, Roles and Cardinalities

In Chen's original paper he gives an example of a relationship and its roles. He describes a relationship "marriage" and its two roles "husband" and "wife".

A person plays the role of husband in a marriage (relationship) and another person plays the role of wife in the (same) marriage. These words are nouns. That is no surprise; naming things requires a noun.

However as is quite usual with new ideas, many eagerly appropriated the new terminology but then applied it to their own old ideas. Thus the lines, arrows and crows-feet of their diagrams owed more to the earlier Bachman diagrams than to Chen's relationship diamonds. And they similarly misunderstood other important concepts.

In particular, it became fashionable (now almost to the point of exclusivity) to "name" relationships and roles as verbs or phrases.

5.2.4 Limitations

ER models assume information content that can readily be represented in a relational database. They describe only a relational structure for this information. Hence, they are inadequate for systems in which the information cannot readily be represented in relational form, such as with semi-structured data. Furthermore, for many systems, the possible changes to the information contained are nontrivial and important enough to warrant explicit specification. Some authors have extended ER modeling with constructs to represent change, an approach supported by the original author; an example is Anchor Modeling. An alternative is to model change separately, using a process modeling technique. Additional techniques can be used for other aspects of systems. For instance, ER models roughly

correspond to just 1 of the 14 different modeling techniques offered by UML.

Another limitation: ER modeling is aimed at specifying information from scratch. This suits the design of new, standalone information systems, but is of less help in integrating pre-existing information sources that already define their own data representations in detail. Even where it is suitable in principle, ER modeling is rarely used as a separate activity. One reason for this is today's abundance of tools to support diagramming and other design support directly on relational database management systems. These tools can readily extract database diagrams that are very close to ER diagrams from existing databases, and they provide alternative views on the information contained in such diagrams. In a survey, Brodie [7] and Liu could not find a single instance of entity–relationship modeling inside a sample of ten Fortune 100 companies. Badia and Lemire blame this lack of use on the lack of guidance but also on the lack of benefits, such as lack of support for data integration.

Also, the enhanced entity–relationship model (EER modeling) introduces several concepts which are not present in ER modeling. ER modeling as shown in Figure 6.
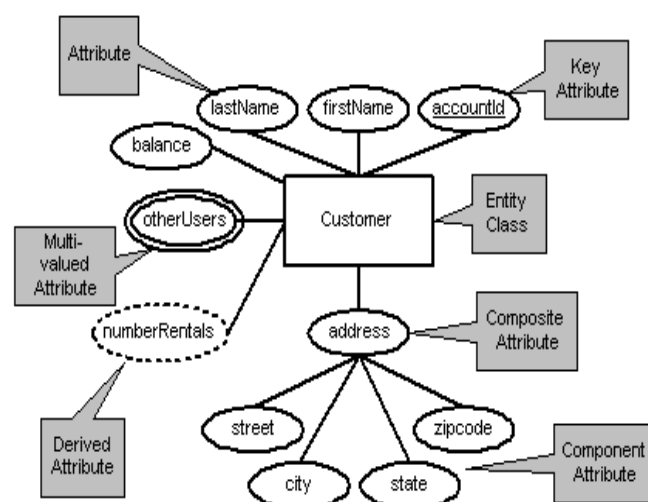

Figure 6. E-R modeling

5.3 Table Structure

In relational databases and flat file databases, a table is a set of data elements (values) that is organized using a model of vertical columns (which are identified by their name) and horizontal rows, the cell being the unit where a row and column intersect. A table has a specified number of columns, but can have any number of rows each row is identified by the values appearing in a particular column subset which has been identified as a unique key index.
Table is another term for relations; although there is the difference in that a table is usually a multi-set (bag) of rows whereas a relation is a set and does not allow duplicates. Besides the actual data rows, tables generally have associated with them some meta-information, such as constraints on the table or on the values within particular columns. The data in a table does not have to be physically stored in the database. Views are also relational tables, but

their data are calculated at query time. Another example is nicknames, which represent a pointer to a table in another database.

5.4 Database Schema

A database schema of a database system is its structure described in a formal language supported by the database management system (DBMS) and refers to the organization of data to create a blueprint of how a database will be constructed (divided into database tables). The formal definition of database schema is a set of formulas (sentences) called integrity constraints imposed on a database. These integrity constraints ensure compatibility between parts of the schema. All constraints are expressible in the same language. A database can be considered a structure in realization of the database language. The states of a created conceptual schema are transformed into an explicit mapping, the database schema. This describes how real world entities are modeled in the database.

"A database schema specifies, based on the database administrator's knowledge of possible applications, the facts that can enter the database, or those of interest to the possible end-users." The notion of a database schema plays the same role as the notion of theory in predicate calculus. A model of this "theory" closely corresponds to a database, which can be seen at any instant of time as a mathematical object. Thus a schema can contain formulas representing integrity constraints specifically for an application and the constraints specifically for a type of database, all expressed in the same database language. In a relational database [8], the schema defines the tables, fields, relationships, views, indexes, packages, procedures, functions, queues, triggers, types, sequences, materialized views, synonyms, database links, directories, Java, XML schemas, and other elements.

Schemas are generally stored in a data dictionary. Although a schema is defined in text database language, the term is often used to refer to a graphical depiction of the database structure. In other words, schema is the structure of the database that defines the objects in the database. In an Oracle Database system, the term "schema" has a slightly different connotation. For the interpretation used in an Oracle Database, see schema object.

5.5 Levels of Database Schema

A conceptual schema or conceptual data model is a map of concepts and their relationships. This describes the semantics of an organization and represents a series of assertions about its nature. Specifically, it describes the things of significance to an organization (entity classes), about which it is inclined to collect information, and characteristics of (attributes) and associations between pairs of those things of significance (relationships).
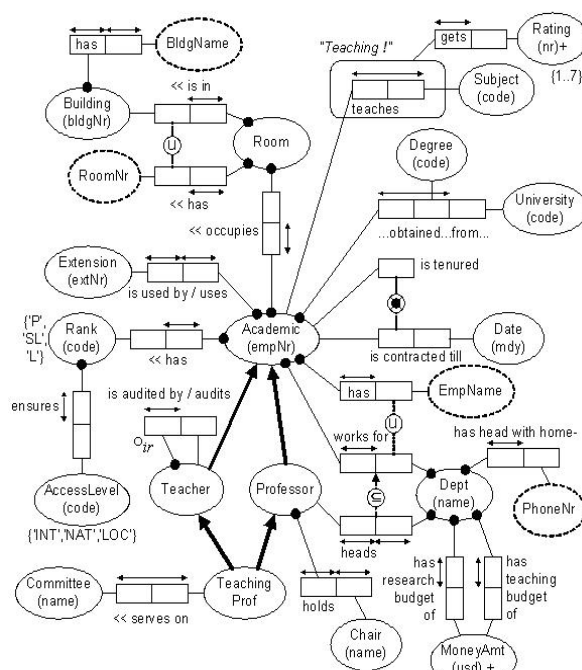

Figure 7. Conceptual schema or conceptual data model

A logical schema is an alias that allows a unique name to be given to all the physical schemas containing the same data store structures. The aim of the logical schema is to ensure the portability of the procedures and models on the different physical schemas. In this way, all developments in Designer are carried out exclusively on logical schemas. A logical schema can have one or more physical implementations on separate physical schemas, but they must be based on data servers of the same technology. A logical schema is always directly linked to a technology. To be usable, a logical schema must be declared in a context. Declaring a logical schema in a context consists of indicating which physical schema corresponds to the alias - logical schema - for this context. For example: The logical schema LEDGER is the set of Sybase tables required for the functioning of the accounting application. These tables are stored in a physical schema for each installation of the accounting application. Work in Designer or Operator is always done on the logical schema LEDGER. Only the context allows the physical schema on which the operations are actually done to be determined. Thus, the user can switch from one physical environment to another in a single action. A logical schema's example is shown in figure 8.

Table 1: Name of the logical schema

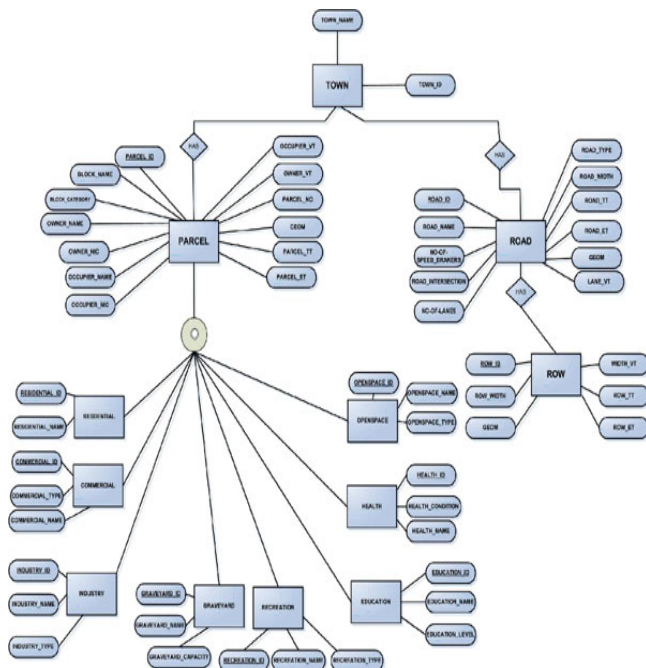| Name of the logical schema	Context	Physical Schema
LEDGER	Boston	Sybase Boston LDG
LEDGER	Seattle Production	Sybase SEATTLE PROD LDG
LEDGER	Seattle Test	Sybase SEATTLE TEST LDG

Figure 8. Logical schemas

Physical schema is a term used in data management to describe how data is to be represented and stored (files, indices, et al.) in secondary storage using a particular database management system (DBMS) (e.g., Oracle RDBMS, Sybase SQL Server, etc.). The logical schema was the way data were represented to conform to the constraints of a particular approach to database management. At that time the choices were hierarchical and network. Describing the logical schema, however, still did not describe how physically data would be stored on disk drives. That is the domain of the physical schema. Now logical schemas describe data in terms of relational tables and columns, object-oriented classes, and XML tags. A single set of tables, for example, can be implemented in numerous ways, up to and including an architecture where table rows are maintained on computers in different countries.
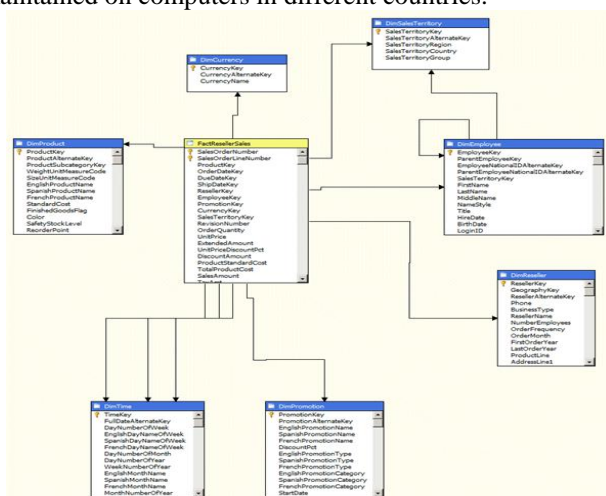

Figure 9. Physical schema

In Database lore, a schema object is a logical data storage structure. This possibly originates from the use of the term in the context of Oracle databases. The term "schema" can have other meanings when talking about non-Oracle databases.

This article discusses the Oracle use of the term. For other uses of "schema" in a database context, such as a graphical representation of tables and other objects in a database, see database schema. In an Oracle database, associated with each database user is a schema. A schema comprises a collection of schema objects. Examples of schema objects include: tables, views, sequences, synonyms, indexes, clusters, database links, snapshots, procedures, functions and packages.
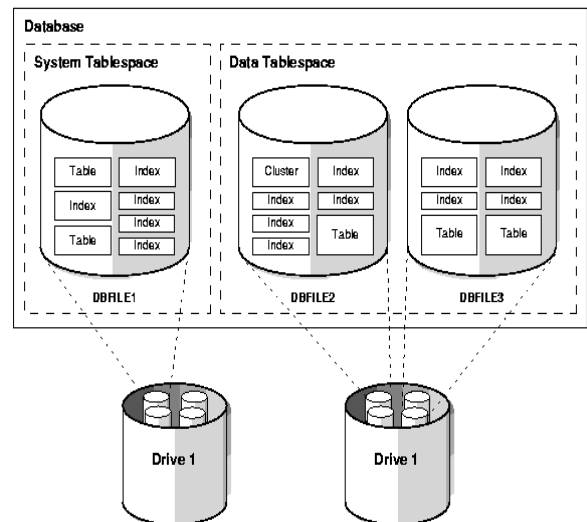

Figure 10. Schema objects

5.6 Php Sessions

A PHP session variable is used to store information about, or change settings for a user session. Session variables hold information about one single user, and are available to all pages in one application [9]. When you are working with an application, you open it, do some changes and then you close it. This is much like a Session. The computer knows who you are. It knows when you start the application and when you end. But on the internet there is one problem: the web server does not know who you are and what you do because the HTTP address doesn't maintain state.

A PHP session solves this problem by allowing you to store user information on the server for later use (i.e. username, shopping items, etc). However, session information is temporary and will be deleted after the user has left the website. If you need a permanent storage you may want to store the data in a database. Sessions work by creating a unique id (UID) for each visitor and store variables based on this UID. The UID is either stored in a cookie or is propagated in the URL. In PHP, sessions can keep track of authenticated in users. They are an essential building block in today's websites with big communities and a lot of user activity. Without sessions, everyone would be an anonymous visitor. In system terms, PHP sessions are little files, stored on the server's disk. But on high traffic sites, the disk I/O involved, and not being able to share sessions between multiple web servers make this default system far from ideal. This is how to enhance PHP session management in terms of performance and share ability.

If you have multiple web servers all serving the same site, sessions should be shared among those servers, and not

reside on each server's individual disk. Because once a user gets load-balanced to a different server, the session cannot be found, effectively logging the user out. A common way around this is to use custom session handlers.

5.7 Shopping Card

A shopping cart is a software application that typically runs on the computer where your Web site is located (the Web server), and allows your customers to do things such as searching for a product in your store catalog, adding a selected product to a basket, and placing an order for it. The shopping cart "integrates" with the rest of your Web site. In other words, there are typically links on your Web pages that customers can click on, and which allow them to perform some of the functions described above. For example, many e-commerce Web sites have a "search" link appearing on every Web page, as part of the navigation area

Shopping carts are written in a variety of different programming languages. Some of them provide full access to the "source code", thus allowing experienced programmers to make modifications to the system features, some others don't. Some shopping carts run on Windows Web servers, some on Unix, others on both. In most cases, you can place the shopping cart on your Web server simply by transferring its files there using any FTP [10] software, where FTP stands for File Transfer Protocol. For example, our shopping cart software - called Product Card is a collection of files written in a programming language called Classic ASP, and that you host on a Windows server. Experienced programmers can customize the system as they wish as the source code is included.

Figure 11. Google Checkout shopping cart

5.8 Credit Card Transaction

From the information presented in the preceding sections, we can start to piece together what is occurring during a credit card transaction. We know that merchants have a relationship with either an acquiring bank or independent sales organization, through which they have their credit card transactions processed. The section on industry terminology shows us some of the fees involved in this process. Merchants must pay the acquiring bank or ISO a discount fee based on the total amount of the sale. Likewise, the acquiring bank or ISO must pay the card issuer an interchange fee when they process the sales draft from the merchant. Steps involved in a normal credit card transaction:
i. Merchant calculates the amount of purchase and asks buyer for payment
ii. Buyer presents merchant with a credit card.

iii. Merchant runs credit card through the point of sale unit. The amount of the sale is either hand-entered or transmitted by the cash register.
iv. Merchant transmits the credit card data and sales amount with a request for authorization of the sale to their acquiring bank. .
v. The acquiring bank that processes the transaction, routes the authorization request to the card-issuing bank. The credit card number identifies type of card, issuing bank, and the cardholder's account.
vi. If the cardholder has enough credit in their account to cover the sale, the issuing bank authorizes the transaction and generates an authorization code. This code is sent back to the acquiring bank.
vii. The acquiring bank processing the transaction, and then sends the approval or denial code to the merchant's point of sale unit. Each point of sale device has a separate terminal ID for credit card processors to be able to route data back to that particular unit.
viii. A sale draft, or slip, is printed out by the point of sale unit or cash register. The merchant asks the buyer to sign the sale draft, which obligates them to reimburse the card-issuing bank for the amount of the sale.
ix. At a later time, probably that night when the store is closing up, the merchant reviews all the authorizations stored in the point of sale unit against the signed sales drafts. When all the credit card authorizations have been verified to match the actual sales drafts, the merchant will capture, or transmit, the data on each authorized credit card transaction to the acquiring bank for deposit. This is in lieu of depositing the actual signed paper drafts with the bank.
x. The acquiring bank performs what is called an interchange for each sales draft, with the appropriate card-issuing bank. The card-issuing bank transfers the amount of the sales draft, minus an interchange fee to the acquiring bank.
xi. The acquiring bank then deposits the amount of the all the sales drafts submitted by the merchant, less a discount fee, into the merchant's bank account. Credit card transaction is shown in Figure 12.
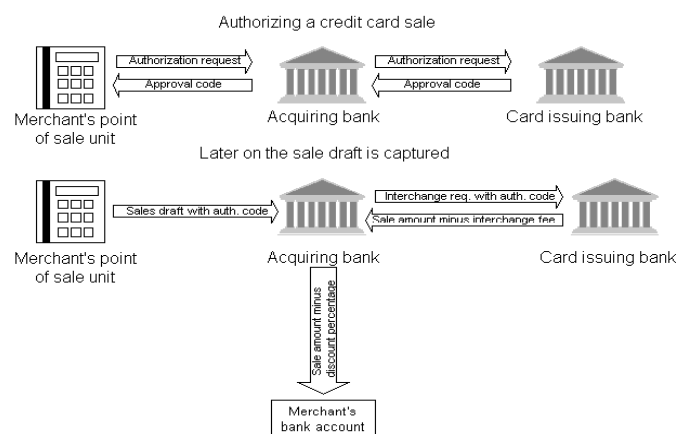

Figure 12. Credit card transaction

6. Conclusion

Electronic commerce or e-commerce is a term for any type of business, or commercial transaction that involves the transfer of information across the Internet. It is currently one of the most important aspects of the Internet to emerge. E-

commerce has grown tremendously worldwide. In the future e-commerce may become totally mobile based. In Bangladesh E-commerce also become a very powerful business mechanism but Bangladesh will have to overcome the problems with poor network connectivity and electronic payment issues. The problems identified in this Project are: Security problem, Confusing checkout process, Customers can't find products, Customers can't touch and fell a product, No sales staff means any chance of up-selling, Language barrier. Regarding the identified problems the following solutions have been proposed: Merchant needs to ensure the platform employs strong encryption for payment processing and customer data retention. E-commerce platform should always have a visible running total of purchases prominently displayed during the customer experience. E-commerce platform must support the ability to present the customer with nested categories as well as a search box. An e-commerce platform should also support the ability to attach multiple pictures to a product catalog page, allowing the consumer to view the product from multiple angles. E-commerce platform needs to be able to associate products with related and complimentary products. The system should allow all translation to be done centrally.

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