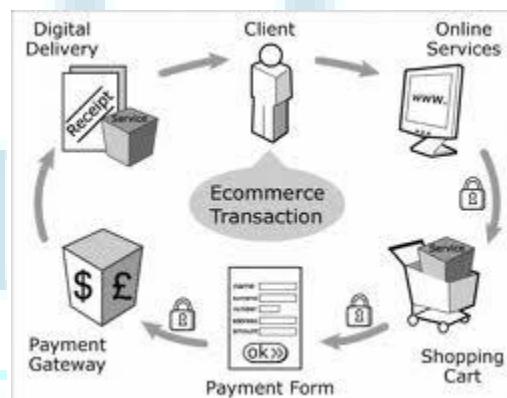


E-COMMERCE & E-BUSINESS

Module 1: E-Commerce-Introduction to E-Commerce

1.1 Definition of E-Commerce

- **Electronic commerce**, commonly written as **e-commerce**, is the trading in products or services using computer networks, such as the Internet. Electronic commerce draws on technologies such as mobile commerce, electronic funds transfer, supply chain management, Internet marketing, onlinetransactionprocessing, electronicdatainterchange (EDI), inventory management systems, and automated data collection systems. Modern electronic commerce typically uses the World Wide Web for at least one part of the transaction's life cycle, although it may also use other technologies such as e-mail



- The buying and selling of products and services by businesses and consumers through an electronic medium, without using any paper documents. 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. The benefits of

e-commerce include its around-the-clock availability, the speed of access, a wider selection of goods and services, accessibility, and international reach. Its perceived downsides include sometimes-limited customer service, not being able to see or touch a product prior to purchase, and the necessitated wait time for product shipping.

- To ensure the security, privacy and effectiveness of e-commerce, businesses should authenticate business transactions, control access to resources such as webpages for registered or selected users, encrypt communications and implement security technologies such as the Secure Sockets Layer.

1.2 Different types of E-Commerce:

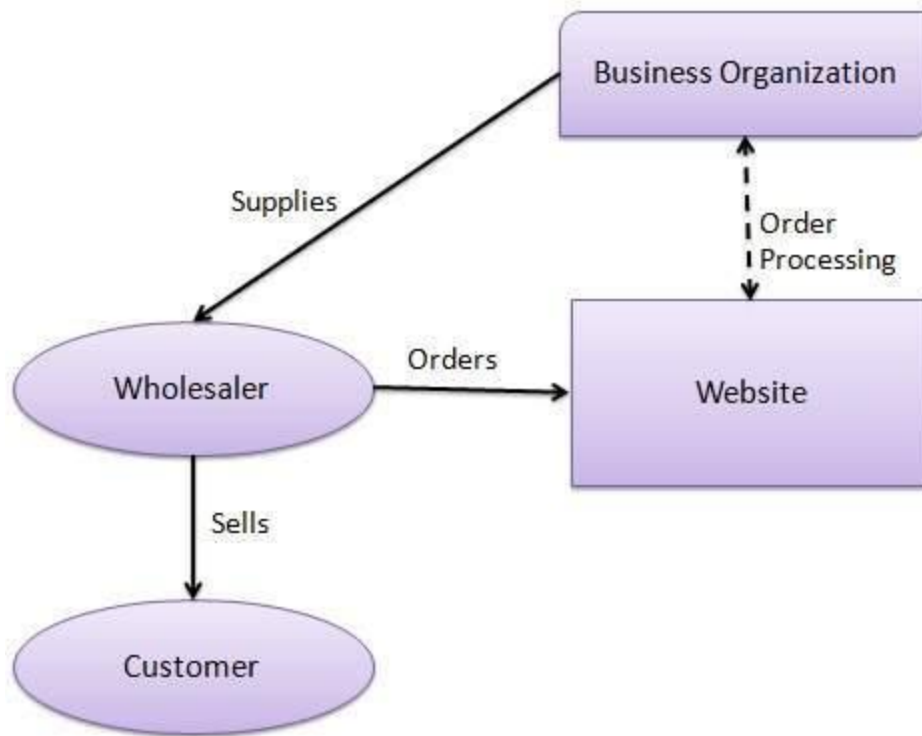
E-Commerce or Electronics Commerce business models can generally categorized in following categories.

- 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)

➤ **Business - to - Business (B2B)**

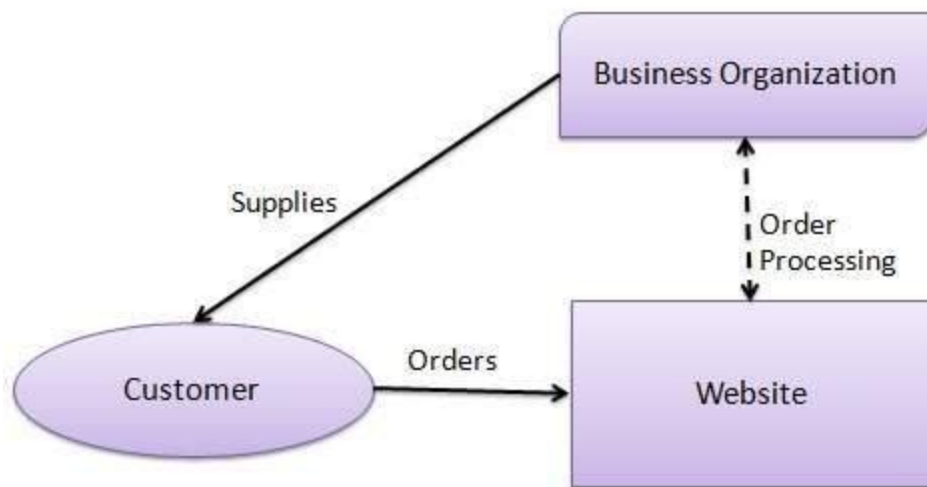
- Business-to-Business (B2B) e-commerce encompasses all electronic transactions of goods or services conducted between companies. Producers and traditional commerce wholesalers typically operate with this type of electronic commerce.
- Website following B2B business model sells its product to an intermediate buyer who then sells the product to the final customer.

As an example, a wholesaler places an order from a company's website and after receiving the consignment, sells the end product to final customer who comes to buy the product at wholesaler's retail outlet.



➤ **Business - to - Consumer(B2C)**

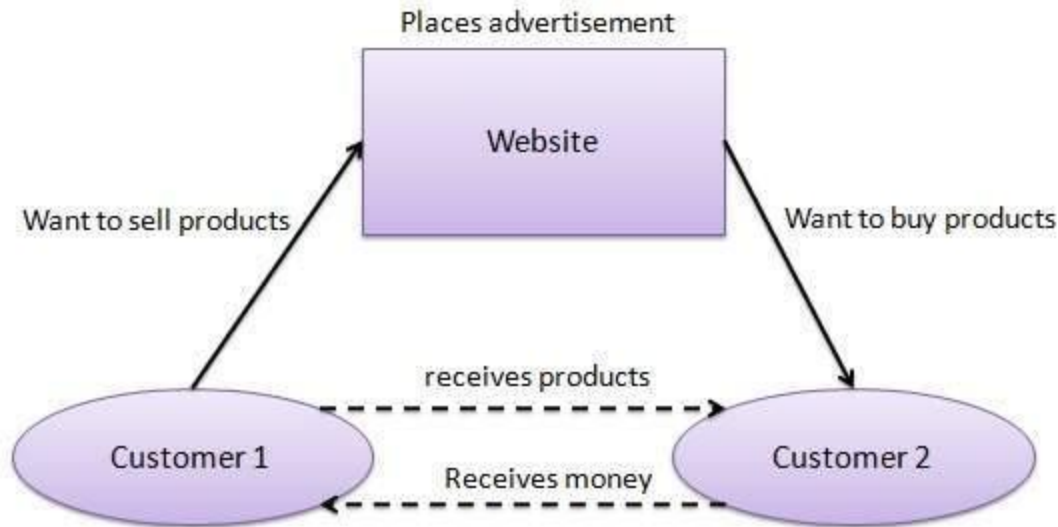
- The Business-to-Consumer type of e-commerce is distinguished by the establishment of electronic business relationships between businesses and final consumers. It corresponds to the retail section of e-commerce, where traditional retail trade normally operates.
- Website following B2C business model sells its product directly to a customer. A customer can view products shown on the website of business organization. The customer can choose a product and order the same. Website will send a notification to the business organization via email and organization will dispatch the product/goods to the customer.
- This type of commerce has developed greatly, due to the advent of the web, and there are already many virtual stores and malls on the Internet, which sell all kinds of consumer goods, such as computers, software, books, [shoes](#), cars, food, financial products, digital publications, etc.



➤ **Consumer - to - Consumer (C2C)**

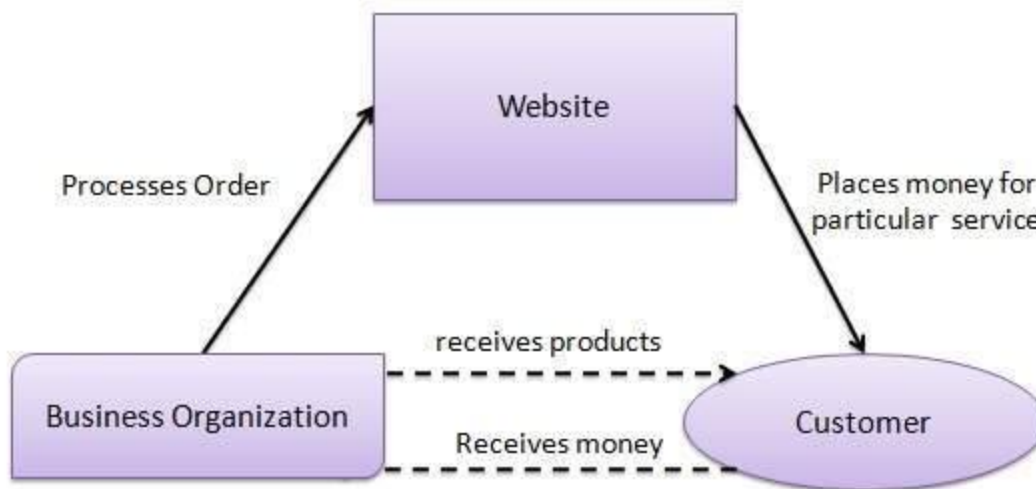
- Website following C2C business model helps consumer to sell their assets like residential property, cars, motorcycles etc. or rent a room by publishing their information on the website. Website may or may not charge the consumer for its services. Another consumer may opt to buy the product of the first customer by viewing the post/advertisement on the website.
- Consumer-to-Consumer (C2C) type e-commerce encompasses all electronic transactions of goods or services conducted between consumers. Generally, these transactions are conducted through a third party, which provides the online platform where the transactions are actually carried out.

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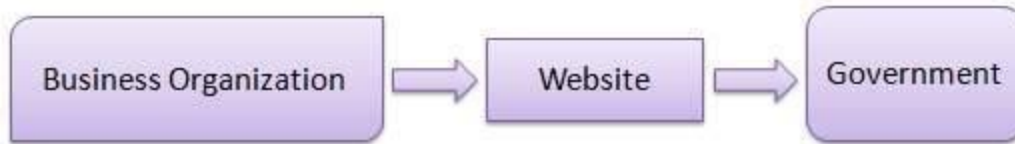
➤ **Consumer - to - Business (C2B)**

- In this model, a consumer approaches website showing multiple business organizations for a particular service. Consumer places an estimate of amount he/she wants to spend for a particular service. For example, comparison of interest rates of personal loan/ car loan provided by various banks via website. Business organization who fulfills the consumer's requirement within specified budget approaches the customer and provides its services.
- Examples of such practices are the sites where designers present several proposals for a company logo and where only one of them is selected and effectively purchased. Another platform that is very common in this type of commerce are the markets that sell royalty-free photographs, images, media and design elements,
- In C2B there is a complete reversal of the traditional sense of exchanging goods. This type of e-commerce is very common in crowdsourcing based projects. A large number of individuals make their services or products available for purchase for companies seeking precisely these types of services or products.



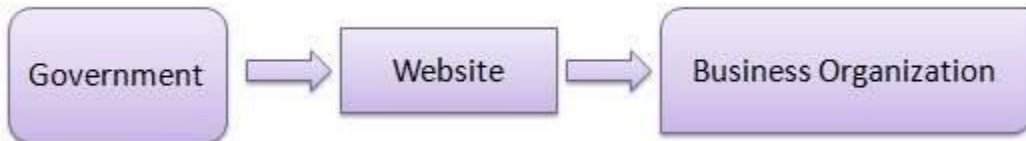
➤ **Business - to - Government (B2G)**

- B2G model is a variant of B2B model. Such websites are used by government to trade and exchange information with various business organizations. Such websites are accredited by the government and provide a medium to businesses to submit application forms to the government.
- On the Internet, B2G is business-to-government (a variation of the term [B2B](#) or business-to-business), the concept that businesses and government agencies can use central Web sites to exchange information and do business with each other more efficiently than they usually can off the Web. For example, a Web site offering B2G services could provide businesses with a single place to locate applications and tax forms for one or more levels of government (city, state or province, country, and so forth); provide the ability to send in filled-out forms and payments; update corporate information; request answers to specific questions; and so forth.
- B2G may also include [e-procurement](#) services, in which businesses learn about the purchasing needs of agencies and agencies request proposal responses.
- B2G may also support the idea of a virtual workplace in which a business and an agency could coordinate the work on a contracted project by sharing a common site to coordinate online meetings, review plans, and manage progress.
- B2G may also include the rental of online applications and databases designed especially for use by government agencies.



➤ **Government - to - Business (G2B)**

- Government uses B2G model website to approach business organizations. Such websites support auctions, tenders and application submission functionalities.



➤ **Government - to - Citizen (G2C)**

- Government uses G2C model website to approach citizen in general. Such websites support auctions of vehicles, machinery or any other material. Such website also provides services like registration for birth, marriage or death certificates. Main objectives of G2C website are to reduce average time for fulfilling people requests for various government services.
- This Model is also a part of e-governance.
- The objective of this model is to provide good and effective services to each citizen.
- The Government provides the following facilities to the citizens through website.
 - ✓ Information of all government departments,
 - ✓ Different welfare schemes,
 - ✓ Different application forms to be used by the citizens.



1.3 Examples of E-Commerce Trade Cycle:

The e-Commerce Trade Cycle

A trade cycle is the series of exchanges, between a customer and supplier, that take place when a commercial exchange is executed. A general trade cycle consists of:

Pre-Sales: Finding a supplier and agreeing the terms.

Execution: Selecting goods and taking delivery.

Settlement: Invoice (if any) and payment.

After-Sales: Following up complaints or providing maintenance.

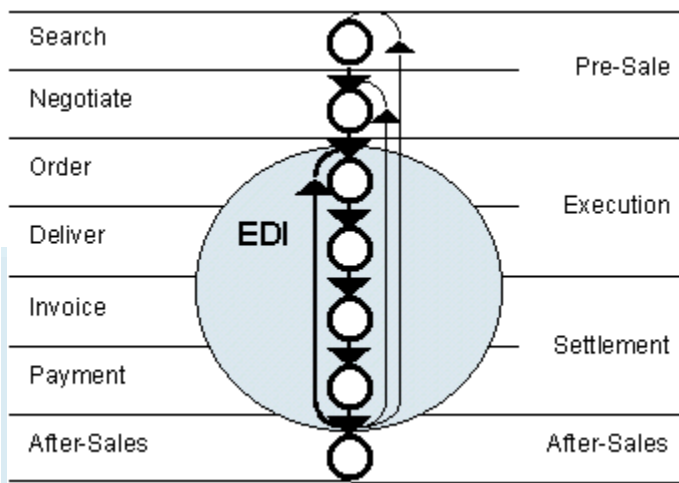
As with physical commerce, the trade cycle is more or less categorised into four areas.

- First is the identification of a supplier by a consumer, and the agreement of terms for supply.
- The second stage is selecting the goods and taking delivery.
- The traditional third stage, payment and invoicing, is usually executed along with the selection of goods, in e-commerce.
- The final stage is after-sales, in which complaints are addressed, support given, and any further involvement of the supplier with the product as specified in the terms of supply is engaged.

Example:

As an example of the trade cycle, a consumer will go to Amazon to find a specific product. This is the identification of a supplier. Once the product is added to the shopping basket, the consumer will check out using Amazon's specific e-commerce software, and pay for it while specifying an address at which to take delivery, combining the second and third phases. Once the product arrives, and if it is unsatisfactory, the customer returns it to Amazon, who then will provide a refund, a replacement or another service, thereby fulfilling the fourth phase of the e-commerce trade cycle as agreed through that country's laws and Amazon's own terms and conditions.

EDI TRADE CYCLE:



➤ Electronic Data Interchange (EDI)

- EDI is a product of the two most rapidly advancing technologies in modern times, namely computing and telecommunications.
- The convergence of these two technologies has made it possible for a structured string of data to be exchanged between business applications without human intervention.
- EDI revolutionizes business communications by removing a complete layer in business practices - the use and processing of paper documents. The rationalization of data flows within a company enhances the integration of business functions and hence facilitates the decision making process.
- EDI opens up potent strategies such as "just in time" manufacturing. In addition, it enables companies to forge closer and more effective links with their trading partners.
- Paperless trading is growing fast in many countries, in particular because "just in time" stock control usually means more, smaller shipments with very tight delivery schedules that paper documents cannot cope with, and also because EDI is a natural evolution in the international trade cycle. Indeed, one of the principal reasons for using

EDI is the mountain of paper documents produced, moved, handled, corrected, transcribed and copied in normal business transactions.

- EDI has none of the disadvantages of paper documents and brings substantial benefits and savings to companies which implement it, such as accuracy (data are received directly from computer files and are not re-entered manually), speed (data are processed by computer without manual intervention and are transmitted quicker than information sent by post or courier and re-entered manually) and savings (it saves on the cost of mailing, copying, filing, distributing and capturing data).

1.4 ADVANTAGES & DISADVANTAGES OF E-Commerce:

Advantages:

➤ Benefits to Organizations:

The benefits to organizations are as follows: .

- Electronic commerce expands the marketplace to national and international markets. With minimal capital outlay, a company can easily and quickly locate more customers, the best suppliers, and the most suitable business partners worldwide.
- Electronic commerce decreases the cost of creating, processing, distributing, storing, and retrieving paper-based information.
- Ability for creating highly specialized businesses. For example, dog toys which can be purchased only in pet shops or department and discount stores in the physical world, are sold now in a specialized www.dogtoys.com (also see www.cattoys.com).
- .Electronic commerce reduces the time between the outlay of capital and the receipt of products and services.
- Electronic commerce initiates business processes reengineering projects. By changing processes, productivity of salespeople, knowledge workers, and administrators can increase by 100 percent or more.

- Electronic commerce lowers telecommunications cost-the Internet is much cheaper than VANs. · Other benefits include improved image, improved customer service, newfound business partners, simplified processes, compressed cycle and delivery time, increased productivity, eliminating paper, expediting access to information, reduced transportation costs, and increased flexibility.

➤ **Benefits to Consumers :**

- The benefits of EC to consumers are as follows:
- Electronic commerce enables customers to shop or do other transactions 24 hours a day, all year round, from almost any location. ·
- Electronic commerce provides customers with more choices; they can select Electronic commerce frequently provides customers with less expensive products and services by allowing them to shop in many places and conduct quick comparisons.
- In some cases, especially with digitized products, EC allows quick delivery. ·Customers can receive relevant and detailed information in seconds, rather than days or weeks.
- Electronic commerce makes it possible to participate in virtual auctions.
- Electronic commerce allows customers to interact with other customers in electronic communities and exchange ideas as well as compare experiences.
- Electronic commerce facilitates competition, which results in substantial discounts.

➤ **Benefits to Society**

The benefits of EC to society are as follows: ·

- Electronic commerce enables more individuals to work at home and to do less traveling for shopping, resulting in less traffic on the roads and lower air pollution.
- Electronic commerce allows some merchandise to be sold at lower prices, so less affluent people can buy more and increase their standard of living.

- Electronic commerce enables people in Third World countries and rural areas to enjoy products and services that otherwise are not available to them. This includes opportunities to learn professions and earn college degrees.
- Electronic commerce facilitates delivery of public services, such as health care, education, and distribution of government social services at a reduced cost and/or improved quality. Health-care services, for example, can reach patients in rural areas.

DISADVANTAGS OF E-COMMERCE:

The Limitations of EC:

The limitations of EC can be grouped into technical and nontechnical categories.

➤ **Technical Limitations of EC :**

The technical limitations of EC are as follows:

- There is a lack of system security, reliability, standards, and some communication protocols.
- There is insufficient telecommunication bandwidth.
- The software development tools are still evolving and changing rapidly.
- It is difficult to integrate the Internet and EC software with some existing applications and databases.
- Vendors may need special Web servers and other infrastructures, in addition to the network servers.
- Some EC software might not fit with some hardware, or may be incompatible with some operating systems or other components.
- As time passes, these limitations will lessen or be overcome; appropriate planning can minimize their impact.

➤ **NonTechnical Limitations:**

Of the many nontechnical limitations that slow the spread of EC, the following are the major ones.

▪ **Cost and justification:**

- The cost of developing EC in-house can be very high, and mistakes due to lack of experience may result in delays.
- There are many opportunities for outsourcing, but where and how to do it is not a simple issue.
- Furthermore, to justify the system one must deal with some intangible benefits (such as improved customer service and the value of advertisement), which are difficult to quantify.

▪ **Security and privacy :**

- These issues are especially important in the B2C area, especially security issues which are perceived to be more serious than they really are when appropriate encryption is used. Privacy measures are constantly improved.
- Yet, the customers perceive these issues as very important, and, the EC industry has a very long and difficult task of convincing customers that online transactions and privacy are, in fact, very secure.

▪ **Lack of trust and user resistance :**

- Customers do not trust an unknown faceless seller (sometimes they do not trust even known ones), paperless transactions, and electronic money. So switching from physical to virtual stores may be difficult.

▪ **Other limiting factors:**

- Lack of touch and feel online. Some customers like to touch items such as clothes and like to know exactly what they are buying.
- Many legal issues are as yet unresolved, and government regulations and standards are not refined enough for many circumstances.
- Electronic commerce, as a discipline, is still evolving and changing rapidly. Many people are looking for a stable area before they enter into it.
- There are not enough support services. For example, copyright clearance centers for EC transactions do not exist, and high-quality evaluators, or qualified EC tax experts, are rare.
- In most applications there are not yet enough sellers and buyers for profitable EC operations.
- Electronic commerce could result in a breakdown of human relationships.
- Accessibility to the Internet is still expensive and/or inconvenient for many potential customers..)
- Despite these limitations, rapid progress in EC is taking place. For example, the number of people in the United States who buy and sell stocks electronically increased from 300,000 at the beginning of 1996 to about 10 million in fall 1999.
- As experience accumulates and technology improves, the ratio of EC benefits to costs will increase, resulting in a greater rate of EC adoption. The potential benefits may not be convincing enough reasons to start EC activities

1.5 TRADITIONAL COMMERCE VS E-COMMERCE

| Sr. No. | Traditional Commerce | E-Commerce |
|---------|--|--|
| 1 | Heavy dependency on information exchange from person to person. | Information sharing is made easy via electronic communication channels making little dependency on person to person information exchange. |
| 2 | Communication/ transaction are done in synchronous way. Manual intervention is required for each communication or transaction. | Communication or transaction can be done in asynchronous way. Electronics system automatically handles when to pass communication to required person or do the transactions. |
| 3 | It is difficult to establish and maintain standard practices in traditional commerce. | A uniform strategy can be easily established and maintain in e-commerce. |
| 4 | Communications of business depends upon individual skills. | In e-Commerce or Electronic Market, there is no human intervention. |
| 5 | Unavailability of a uniform platform as traditional commerce depends heavily on personal communication. | E-Commerce website provides user a platform where all information is available at one place. |
| 6 | No uniform platform for information sharing as it depends heavily on personal communication. | E-Commerce provides a universal platform to support commercial / business activities across the globe. |

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MODULE 2:OVERVIEW OF H/W & S/W TECHNOLOGIES FOR E-COMMERCE

2.1:CLIENT SIDE PROGRAMMING(DREAM WEAVER,FRONT PAGE):

➤ CLIENT SIDE SCRIPTING:

- **Client-side scripting** generally refers to the class of computer programs on the web that are executed *client-side*, by the user's web browser, instead of *server-side* (on the web server).
- This type of computer programming is an important part of the Dynamic HTML (DHTML) concept, enabling web pages to be scripted; that is, to have different and changing content depending on user input, environmental conditions (such as the time of day), or other variables.
- Client-side scripts are often embedded within an HTML or XHTML document (hence known as an "embedded script"), but they may also be contained in a separate file, to which the document (or documents) that use it make reference (hence known as an "external script"). Upon request, the necessary files are sent to the user's computer by the web server (or servers) on which they reside. The user's web browser executes the script, then displays the document, including any visible output from the script.
- Client-side scripts may also contain instructions for the browser to follow in response to certain user actions, (e.g., clicking a button). Often, these instructions can be followed without further communication with the server.
- By viewing the file that contains the script, users may be able to see its source code. Many web authors learn how to write client-side scripts partly by examining the source code for other authors' scripts.

2.2 SERVER SIDE PROGRAMMING:

➤ SERVER SIDE SCRIPTING

- **Server-side scripting** is a technique used in web development which involves employing scripts on a web server which produce a response customized for each user's (client's) request to the website. The alternative is for the web server itself to deliver a static web page.
- Scripts can be written in any of a number of server-side scripting languages that are available (see below). Server-side scripting is distinguished from client-side scripting where embedded scripts, such as JavaScript, are run client-side in a web browser, but both techniques are often used together.
- Server-side scripting is often used to provide a customized interface for the user.
- These scripts may assemble client characteristics for use in customizing the response based on those characteristics, the user's requirements, access rights, etc.
- Server-side scripting also enables the website owner to hide the source code that generates the interface, whereas with client-side scripting, the user has access to all the code received by the client.
- A down-side to the use of server-side scripting is that the client needs to make further requests over the network to the server in order to show new information to the user via the web browser. These requests can slow down the experience for the user, place more load on the server, and prevent use of the application when the user is disconnected from the server.

➤ *For Detailed understanding and clearing your concepts read below:*

- The **Server** - This party is responsible for **serving** pages.
- The **Client** - This party *requests* pages from the **Server**, and displays them to the user. In most cases, the client is a **web browser**.
- The **User** - The user *uses* the **Client** in order to surf the web, fill in forms, watch videos online, etc.

Each side's programming, refers to code which runs at the specific machine, the server's or the client's.

➤ Basic Example

1. The **User** opens his web browser (the **Client**).
2. The **User** browses to `http://google.com`.
3. The **Client** (on the behalf of the **User**), sends a request to `http://google.com` (the **Server**), for their home page.
4. The **Server** then acknowledges the request, and replies the client with some meta-data (called *headers*), followed by the page's source.
5. The **Client** then receives the page's source, and *renders* it into a human viewable website.
6. The **User** types `Stack Overflow` into the search bar, and presses `Enter`
7. The **Client** submits that data to the **Server**.
8. The **Server** processes that data, and replies with a page matching the search results.
9. The **Client**, once again, renders that page for the **User** to view.

➤ Programming

• Server-side Programming

- ✓ Server-side programming, is the general name for the kinds of programs which are run on the **Server**.

Uses

- Process user input.
- Display pages.
- Structure web applications.
- Interact with permanent storage (SQL, files).

Example Languages

- PHP
- ASP.Net in C#, C++, or Visual Basic.
- Nearly any language (C++, C#, Java). These were not designed specifically for the task, but are now often used for application-level web services.

• Client-side programming

Much like the server-side, Client-side programming is the name for all of the programs which are run on the **Client**.

Uses

- Make interactive webpages.
- Make stuff happen dynamically on the web page.
- Interact with temporary storage, and local storage (Cookies, localStorage).
- Send requests to the server, and retrieve data from it.
- Provide a remote service for client-side applications, such as software registration, content delivery, or remote multi-player gaming.

Example languages

- JavaScript (primarily)
- HTML*
- CSS*
- Any language running on a client device that interacts with a remote service is a client-side language.

➤ **Client-Side vs. Server-Side Code: What's the Difference?**

- In web applications, there is the client and the server. The “client” is a web browser, like Internet Explorer, Google Chrome, Firefox, etc.
- The “server” is a web application server at a remote location that will process web requests and send pages to the client.
- Web applications can contain code that is processed on the client's browser or on the web server.
- However, web applications have a disconnected architecture, which means that there is never a live, constant connection between the page displayed in the client's browser and a web or database server.

- The majority of the processing will be done at the server and not on the client's internet browser.
- When a database needs to be accessed on a server, the web application will post the page back to the web server and server-side code will process the request.
- In order to fully understand the web application's architecture, we must understand postback and the page life cycle, which I have discussed more extensively in previous articles.

➤ **Server-Side Code**

- There are several server-side technologies that can be used when developing web applications. The most popular is Microsoft's ASP.NET. In ASP.NET, server-side code uses the .NET Framework and is written in languages like C# and VB.NET. Server-side processing is used to interact with permanent storage like databases or files. The server will also render pages to the client and process user input. Server-side processing happens when a page is first requested and when pages are posted back to the server. Examples of server-side processing are user validation, saving and retrieving data, and navigating to other pages.
- The disadvantage of server-side processing is the page postback: it can introduce processing overhead that can decrease performance and force the user to wait for the page to be processed and recreated. Once the page is posted back to the server, the client must wait for the server to process the request and send the page back to the client.

➤ **Client-Side Code**

- The benefits of client-side processing in an ASP.NET web application are programming languages like C# and VB.NET along with the .NET Framework. Languages like C# and VB.NET sit on top of the .NET framework and have all the benefits of object oriented architectures like inheritance, implementing interfaces and polymorphism.
- In contrast to server-side code, client-side scripts are embedded on the client's web page and processed on the client's internet browser. Client-side

scripts are written in some type of scripting language like JavaScript and interact directly with the page's HTML elements like text boxes, buttons, list-boxes and tables. HTML and CSS (cascading style sheets) are also used in the client. In order for client-side code to work, the client's internet browser must support these languages.

- There are many advantages to client-side scripting including faster response times, a more interactive application, and less overhead on the web server. Client-side code is ideal for when the page elements need to be changed without the need to contact the database. A good example would be to dynamically show and hide elements based on user inputs. One of the most common examples is input validation and Microsoft's Visual Studio includes a set of client-side validation controls.

Ajax (Asynchronous JavaScript and XML)

The general rule is to use server-side processing and page postbacks when the client needs to interact with server-side objects like databases, files, etc. However, the concept of Ajax has changed the rules quite a bit. Ajax is the concept of the client calling the server directly to interact with server objects like a database, without a postback involved.

Ajax is a concept that involves a group of existing technologies such as server-side data, web services and client-side scripting. The client-side scripts will call a web service and the web service processes the database request. The request could be the retrieve and/or save data. Ajax calls are asynchronous, meaning that once the client makes an Ajax call to the web service, the client is not locked and waiting for a response. The web service will send a response back to the client when their task has completed. The client will intercept the response and process the response accordingly.

A significant breakthrough in client-side scripting is jQuery. To quote, jQuery is a fast, small, and feature-rich JavaScript library. It makes things like HTML document traversal and manipulation, event handling, animation, and Ajax much simpler with an easy-to-use API that works across a multitude of browsers. With a combination of versatility and extensibility, jQuery has changed the way that millions of people write JavaScript.

Starting with Visual Studio 2005, Microsoft has offered their Ajax Control Toolkit. This a set of ASP.NET controls that have plenty of built-in client-side processing. With Visual Studio 2008, they've offered AJAX-enabled WCF Services. These web services are streamlined for asynchronous Ajax callbacks and require little client-side scripting.

In conclusion, the amount of the client-side scripting used in web applications will continue to increase as its power, flexibility and simplicity continue to increase.



2.3 DATABASE CONNECTIVITY:

- A **database connection** is the means by which a **database server** and its **client** software communicate with each other. The term is used whether or not the client and the server are on different machines.
- The client uses a database connection to send **commands** to and receive replies from the server.
- A database is stored as a file or a set of files on magnetic disk or tape, optical disk, or some other secondary storage device. The information in these files may be broken down into records, each of which consists of one or more fields.
- Fields are the basic units of data storage, and each field typically contains information pertaining to one aspect or attribute of the entity described by the database. Records are also organized into tables that include information about relationships between its various fields. Although database is applied loosely to any collection of information in computer files, a database in the strict sense provides cross-referencing capabilities.
- Connections are a key concept in **data-centric** programming. Since some **DBMSs** require considerable time to connect, **connection pooling** is used to improve performance. No command can be performed against a database without an "open and available" connection to it.

- Connections are built by supplying an underlying **driver** or **provider** with a **connection string**, which is used to address a specific **database** or **server** and to provide instance and user authentication credentials (for example, `Server=sql_box;Database=Common;UserID=uid;Pwd=password;`).
- Once a connection has been built, it can be opened and closed at will, and properties (such as the command time-out length, or **transaction**, if one exists) can be set. The connection string consists of a set of **key-value** pairs, dictated by the data access interface of the data provider.

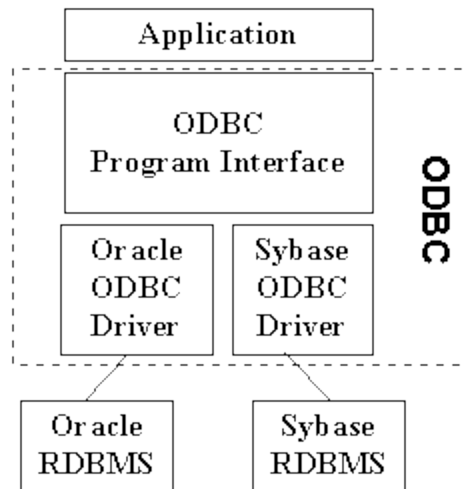
➤ Types Of Database Connectivity:

What is ODBC?

ODBC is (Open Database Connectivity):

- A standard or open application programming interface (API) for accessing a database.
- By using ODBC statements in a program, you can access files in a number of different databases, including Access, dBase, DB2, Excel, and Text. It allows programs to use SQL requests that will access databases without having to know the proprietary interfaces to the databases.
- ODBC handles the SQL request and converts it into a request the individual database system understands.
- More on ODBC You need: the ODBC software, and a separate module or driver for each database to be accessed. Library that is dynamically connected to the application. Driver masks the heterogeneity of DBMS operating system and network protocol. E.g. (Sybase, Windows/NT, Novell driver)

Open DataBase Connectivity (ODBC)



What is JDBC?

- JDBC is: Java Database Connectivity is a Java API for connecting programs written in Java to the data in relational databases.
- Consists of a set of classes and interfaces written in the Java programming language. provides a standard API for tool/database developers and makes it possible to write database applications using a pure Java API. The standard defined by Sun Microsystems, allowing individual providers to implement and extend the standard with their own JDBC drivers.
- JDBC: establishes a connection with a database sends SQL statements processes the results.

JDBC vs ODBC

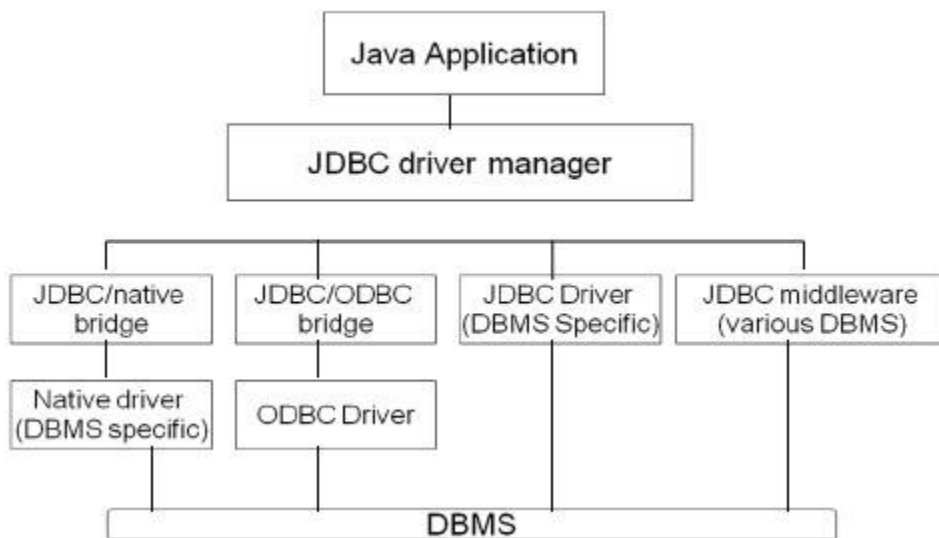
- ODBC is used between applications JDBC is used by Java programmers to connect to databases .
- With a small "bridge" program, you can use the JDBC interface to access ODBCaccessible databases.
- JDBC allows SQL-based database access for EJB persistence and for direct manipulation from CORBA, DJB or other server objects

JDBC API :

The JDBC API supports both two-tier and three-tier models for database access.

Two-tier model -- a Java applet or application interacts directly with the database.

Three-tier model -- introduces a middle-level server for execution of business logic: the middle tier to maintain control over data access. The user can employ an easy-to-use higher-level API which is translated by the middle tier into the appropriate low-level calls.



The JDBC Steps:

1. *Importing Packages*
2. *Registering the JDBC Drivers*
3. *Opening a Connection to a Database*
4. *Creating a Statement Object*
5. *Executing a Query and Returning a Result Set Object*
6. *Processing the Result Set*
7. *Closing the Result Set and Statement Objects*
8. *Closing the Connection*

1: Importing Packages

```
//  
  
// Program name: LecExample_1a.java  
  
// Purpose: Basic selection using prepared  
statement  
  
//  
//Import packages  
import java.sql.*; //JDBC packages  
import java.math.*;  
import java.io.*;  
import oracle.jdbc.driver.*;
```

2: Registering JDBC Drivers

```
class LecExample_1a {  
    public static void main (String args [])  
        throws SQLException {  
  
        // Load Oracle driver  
  
        DriverManager.registerDriver (new  
            oracle.jdbc.driver.OracleDriver());
```

3: Opening connection to a Database

```
//Prompt user for username and password  
  
String user;  
  
String password;  
  
user = readEntry("username: ");  
  
password = readEntry("password: ");
```

```
// Connect to the local database

Connection conn =

DriverManager.getConnection

("jdbc:oracle:thin:@aardvark:1526:teach

", user, password);
```

4. Creating a Statement Object

```
// Query the hotels table for resort =

'palma nova'

// Please notice the essential trim

PreparedStatement pstmt =

conn.prepareStatement ("SELECT

hotelname, rating FROM hotels WHERE

trim(resort) = ?");

pstmt.setString(1, "palma nova");
```

5. Executing a Query

Returning a Result Set Object &

6. Processing the Result Set

```
ResultSet rset = pstmt.executeQuery ();

// Print query results

while (rset.next ())

System.out.println (rset.getString

(1)+" "+ rset.getString(2));
```

7. Closing the Result Set and Statement Objects

8. Closing the Connection

```
// close the result set, statement, and the  
connection  
  
rset.close();  
  
pstmt.close();  
  
conn.close();  
  
}
```

What is SQLJ?

- SQLJ is a set of programming extensions that allow a programmer using the Java programming language to embed statements that provide SQL database requests.
- SQLJ is similar to existing extensions for SQL that are provided for C, FORTRAN, and other programming languages.
- IBM, Oracle, and several other companies are proposed SQLJ as a standard and as a simpler and easier-to-use alternative to JDBC.

SQLJ Specifications :

The SQLJ specifications are in several parts:

SQLJ: Embedded SQL...Specifications for embedding SQL statements in Java methods.

SQLJ: SQL Routines...Specifications for calling Java static methods as SQL stored procedures and user-defined functions.

SQLJ: SQL Types...Specifications for using Java classes as SQL user-defined data types.

SQLJ vs JDBC comparison

| | SQLJ | JDBC |
|-------------------------|-------------|----------------------|
| SQL statements | static | dynamic |
| Strong typing | yes | no |
| Checking static runtime | only Syntax | concise API Standard |
| ANSI Sun Portable | yes | yes |

Object support

yes*

yes*

SQLJ Example:

```
#sql { ... } ;
```

SQL can span multiple lines

Java host expressions in SQL statement

throws java.sql.SQLException

```
String bug = "spider";
```

```
#sql {
```

```
INSERT INTO bugs (name, numLegs)
```

```
VALUES (:bug, :(getNumLegs(bug)))
```

```
};
```

JDBC Example

```
PreparedStatement pstmt =
```

```
conn.createStatement
```

```
("INSERT INTO bugs (name, numLegs)
```

```
VALUES (?, ?)");
```

```
pstmt.setString(1,bug);
```

```
pstmt.setInt(2,getNumLegs(bug));
```

```
pstmt.executeUpdate();
```

```
pstmt.close();
```


JDBC needs:

- explicit statement handles
- explicit set binds
- explicit connection

2.4 SESSION TRACKING:

HTTP is a "stateless" protocol which means each time a client retrieves a Web page, the client opens a separate connection to the Web server and the server automatically does not keep any record of previous client request.

Still there are following three ways to maintain session between web client and web server:

➤ Cookies:

- A webserver can assign a unique session ID as a cookie to each web client and for subsequent requests from the client they can be recognized using the received cookie.
- This may not be an effective way because many times browser does not support a cookie, so I would not recommend to use this procedure to maintain the sessions.

➤ Hidden Form Fields:

- A web server can send a hidden HTML form field along with a unique session ID as follows:

```
<input type="hidden" name="sessionid" value="12345">
```

- This entry means that, when the form is submitted, the specified name and value are automatically included in the GET or POST data. Each time when web browser sends request back, then session_id value can be used to keep the track of different web browsers.

- This could be an effective way of keeping track of the session but clicking on a regular (<A HREF...>) hypertext link does not result in a form submission, so hidden form fields also cannot support general session tracking.

➤ **URL Rewriting:**

- You can append some extra data on the end of each URL that identifies the session, and the server can associate that session identifier with data it has stored about that session.
- For example, with `http://tutorialspoint.com/file.htm;sessionid=12345`, the session identifier is attached as `sessionid=12345` which can be accessed at the web server to identify the client.
- URL rewriting is a better way to maintain sessions and works for the browsers when they don't support cookies but here drawback is that you would have generate every URL dynamically to assign a session ID though page is simple static HTML page.

➤ **The HttpSession Object:**

- Apart from the above mentioned three ways, servlet provides HttpSession Interface which provides a way to identify a user across more than one page request or visit to a Web site and to store information about that user.
- The servlet container uses this interface to create a session between an HTTP client and an HTTP server. The session persists for a specified time period, across more than one connection or page request from the user.
- You would get HttpSession object by calling the public method **getSession()** of HttpServletRequest, as below:

```
HttpSession session = request.getSession();
```

- You need to call `request.getSession()` before you send any document content to the client. Here is a summary of the important methods available through HttpSession object:

| S.N. | Method & Description |
|------|--|
| 1 | public Object getAttribute(String name) |

| | |
|---|--|
| | <p>This method returns the object bound with the specified name in this session, or null if no object is bound under the name.</p> |
| 2 | <p>public Enumeration getAttributeNames()</p> <p>This method returns an Enumeration of String objects containing the names of all the objects bound to this session.</p> |
| 3 | <p>public long getCreationTime()</p> <p>This method returns the time when this session was created, measured in milliseconds since midnight January 1, 1970 GMT.</p> |
| 4 | <p>public String getId()</p> <p>This method returns a string containing the unique identifier assigned to this session.</p> |
| 5 | <p>public long getLastAccessedTime()</p> <p>This method returns the last time the client sent a request associated with this session, as the number of milliseconds since midnight January 1, 1970 GMT.</p> |
| 6 | <p>public int getMaxInactiveInterval()</p> <p>This method returns the maximum time interval, in seconds, that the servlet container will keep this session open between client accesses.</p> |
| 7 | <p>public void invalidate()</p> <p>This method invalidates this session and unbinds any objects bound to it.</p> |
| 8 | <p>public boolean isNew()</p> <p>This method returns true if the client does not yet know about the session or if the client</p> |

| | |
|----|---|
| | chooses not to join the session. |
| 9 | public void removeAttribute(String name) This method removes the object bound with the specified name from this session. |
| 10 | public void setAttribute(String name, Object value) This method binds an object to this session, using the name specified. |
| 11 | public void setMaxInactiveInterval(int interval) This method specifies the time, in seconds, between client requests before the servlet container will invalidate this session. |

2.5 MIDDLEWARE TECHNOLOGIES FROM E_COMMERCE PERSPECTIVE

- Evolution of Internet-based computing from local area networks (LANs), after transitioning from unconnected computers to networks, is the hallmark of all business models today. The technological backbone of this evolution is the middleware.
- First connecting, then communicating, and finally seamlessly integrating the distributed systems to external sites, customers, suppliers, and trading partners across the world is the real challenge for the business world.
- Also required is the talking between client and server over heterogeneous networks, systems architectures, databases, and other operating environment.
- All this is facilitated by the middleware technologies that offer undercover functions to seamlessly integrate various applications with information instantly to make it accessible across diverse architectures, protocols, and networks.
- Automation of back-end and front-end operations of business is also effected by the middleware. Middleware binds discrete applications, such as Web-based applications and older mainframe-based systems, to allow companies to hook up with latest systems and

developments that drive new applications without making their investments in legacy systems unyielding

➤ Functions of Middleware

Middleware functions are generally classified into:

- Application-specific functions to deliver services for different classes of applications such as distributed-database services, distributed-data/object-transaction processing, and specialized services for mobile computing and multimedia.
- Information-exchange functions to manage the flow of information across a network—for tasks like transferring data, issuing commands, receiving responses, checking status, and resolving standoffs.
- Management and support functions to locate resources, communicate with servers, handle security and failures, and monitor performance.

➤ Major Types of Middleware

- The selection of middleware technology is determined by what information is required to be communicated, for example, database middleware will be the choice if database is the main requirement.
- However, following are the major categories of middleware:

- ✓ *Database Middleware,*
- ✓ *Remote Procedure Calls (RPC)*
- ✓ *Object Request Broker (ORB),*
- ✓ *Application Server Middleware,*
- ✓ *Message Oriented Middleware (MOM),*
- ✓ *Transaction Processing Monitor (TP),*

Database Middleware:

- The most widely used, easy to install, and relatively economical middleware, *Database middleware*, is usually chosen to complement other types of middleware and facilitates

communication among applications and local or remote databases but cannot transfer calls or objects.

- However, database middleware does not allow the two-way communications between servers and clients.
- SQL type command is generally subjected to the middleware gateway, which would convey the command to the end database to collect and send the reply of the SQL query back.
- Synchronous point-to-point type of communications is the characteristic of database middleware and can pose problems when multiple demands from multiple users produce huge traffic and congestion.
- Database middleware is the most mature middleware technology.

Remote Procedure Calls (RPC)

- *Remote Procedure Calls* (RPC) permits a client program to call procedures located on a remote server program.
- Remote procedure calls is not isolated as distinct middleware level and is entrenched into the application with calls embedded into the client portion of the client/server application program.
- Stubs are developed for both the client and the server to call up synchronously when the client makes a call to the server.
- The intricacies of distributed processing are reduced by remote procedure calls by maintaining the semantics of a remote call no matter the client and server are located on the same system or not.
- The synchronous nature of the remote procedure calls makes it most appropriate for smaller applications where all communications are one-to-one and not asynchronous.

Object Request Broker (ORB):

- *Object Request Brokers* (ORB) are language-independent, object-oriented, synchronous remote procedure calls in which an affiliate function of an object can be brought into play remotely by means of the same essential notation.
- Asynchronous communication suitable to large applications can be made possible by extending the main standards as in CORBA and DCOM, the main competing standards.
- ORB technologies are based on the reliability of the transport layer, which is required for the functioning.
- The application programmer is secured from the details of the client/server approach by using IDL interfaces that allows the application code to call a remote object, as if it were locally supported.
- Thus, the maintainability is improved as the object communication details are concealed from the application and isolated on the ORB.
- Hence, ORB-based middleware applications are becoming standard for the multi-tier model.

Message Oriented Middleware:

- *Message Oriented Middleware* (MOM) or enterprise message technology (EMT), provides asynchronous message delivery.
- The messages are lined up, just as objects, permitting the application that sends messages, to carry out other tasks without getting blocked till it receives the response.
- Generally located at a higher level than that of remote procedure calls, MOM assembly provides Middleware Components for E-commerce Infrastructure more than simply passing information. MOM also offers provisions for translating data, security, broadcasting data to multiple program, error recovery, and prioritization of messages and requests.
- MOM enhances flexibility by allowing applications to switch messages without the requirement of knowing on which platform or processor the other application located.

Transaction Processing Monitor:

- *Transaction Processing Monitor* (TP) is over 25 years old technology that controls interactions between a requesting client and databases. It is a database independent technology.
- TP provides a three-tier client/server model and ensures an appropriate updating of the databases. This technology facilitates and controls the transport of data between numerous terminals and the application programs serving them.
- It can provide services to thousands of clients in distributed client/server environment by multiplexing client transaction requests by type on to a controlled number of processing routines that support particular services.

2.6 SECURITY ASPECTS w.r.t E-COMMERCE:

- *E-commerce* is defined as the buying and selling of products or services over electronic systems. A wide variety of commerce is conducted via e-commerce, including electronic funds transfer, supply chain management, online transaction processing, electronic data interchange (EDI) and automated data collection systems.
- Any secure e-commerce system must meet four integral requirements:
 - **privacy** – information exchanged must be kept from unauthorized parties,
 - **integrity** – the exchanged information must not be altered or tampered with,
 - **authentication** – both sender and recipient must prove their identities to each other and

- **non-repudiation** – proof is required that the exchanged information was indeed received.

➤ **Privacy**

- Privacy has become a major concern for consumers with the rise of identity theft and impersonation, and any concern for consumers must be treated as a major concern for eCommerce providers
- Privacy now forms an integral part of any e-commerce strategy and investment in privacy protection has been shown to increase consumer's spend, trustworthiness and loyalty.
- We can see that privacy is of major concern to users and in the event of their privacy being compromised users become very agitated and there is an overall negative effect on trust in e-commerce.

➤ **Integrity, Authentication & NonRepudiation**

- In any e-commerce system the factors of data integrity, customer & client authentication and non-repudiation are critical to the success of any online business.
- Data integrity is the assurance that data transmitted is consistent and correct, that is, it has not been tampered or altered in any way during transmission.
- Authentication is a means by which both parties in an online transaction can be confident that they are who they say they are and non-repudiation is the idea that no party can dispute that an actual event online took place.
- Proof of data integrity is typically the easiest of these factors to successfully accomplish.
- A data hash or checksum, such as MD5 or CRC, is usually sufficient to establish that the likelihood of data being undetectably changed is extremely low
- Notwithstanding these security measures, it is still possible to compromise data in transit through techniques such as phishing or man-in-the-middle attacks. These flaws have led to the need for the development of strong verification and security measurements such as digital signatures and public key infrastructures (PKI).
- 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 order for a digital signature to attain the same legal status as an ink-on-paper signature, asymmetric key cryptology must have been employed in its production
- Such a system employs double keys; one key is used to encrypt the message by the sender, and a different, albeit mathematically related, key is used by the recipient to decrypt the message.
- This is a very good system for electronic transactions, since two stranger-parties, perhaps living far apart, can confirm each other's identity and thereby reduce the likelihood of fraud in the transaction.
- Non-repudiation techniques prevent the sender of a message from subsequently denying that they sent the message. Digital Signatures using public-key cryptography and hash functions are the generally accepted means of providing nonrepudiation communications

➤ Technical Attacks

- Technical attacks are one of the most challenging types of security compromise an e-commerce provider must face.
- Perpetrators of technical attacks, and in particular Denial-of-Service attacks, typically target sites or services hosted on high-profile web servers such as banks, credit card payment gateways, large online retailers and popular social networking sites.

Denial of Service Attacks:

- Denial of Service (DoS) attacks consist of overwhelming a server, a network or a website in order to paralyze its normal activity .
- Defending against DoS attacks is one of the most challenging security problems on the Internet today.
- A major difficulty in thwarting these attacks is to trace the source of the attack, as they often use incorrect or spoofed IP source addresses to disguise the true origin of the attack

➤ NonTechnical Attacks

Phishing Attacks

- Phishing is the criminally fraudulent process of attempting to acquire sensitive information such as usernames, passwords and credit card details, by masquerading as a trustworthy entity in an electronic communication.
- Phishing scams generally are carried out by emailing the victim with a 'fraudulent' email from what purports to be a legitimate organization requesting sensitive information.
- When the victim follows the link embedded within the email they are brought to an elaborate and sophisticated duplicate of the legitimate organizations website.
- Phishing attacks generally target bank customers, online auction sites (such as eBay), online retailers (such as amazon) and services providers (such as PayPal).
- According to community banker (Swann, 2008), in more recent times cybercriminals have got more sophisticated in the timing of their attacks with them posing as charities in times of natural disaster.

Social Engineering

- Social engineering is the art of manipulating people into performing actions or divulging confidential information.
- Social engineering techniques include pretexting (where the fraudster creates an invented scenario to get the victim to divulge information), Interactive voice recording (IVR) or phone phishing (where the fraudster gets the victim to divulge sensitive information over the phone) and baiting with
- Trojans horses (where the fraudster 'baits' the victim to load malware onto a system).

- Social engineering has become a serious threat to e-commerce security since it is difficult to detect and to combat as it involves 'human' factors which cannot be patched akin to hardware or software, albeit staff training and education can somewhat thwart the attack

2.7 WEB SERVICES:

➤ Web Services—A Standards-Based Framework for Integration

Web services are software components that can be accessed over the Web through standards-based protocols such as HTTP or SMTP for use in other applications. They provide a fundamentally new framework and set of standards for a computing environment that can include servers, workstations, desktop clients, and lightweight "pervasive" clients such as phones and PDAs. Web services are not limited to the Internet; they supply a powerful architecture for all types of distributed computing.



Web services standards are the glue that allows computers and devices to interact. UDDI allows clients to discover Web services.

Web services standards are the glue that allows computers and devices to interact, forming a greater computing whole that can be accessed from any device on the network.

In Web services, computing nodes have three roles—client, service, and broker.

- A client is any computer that accesses functions from one or more other computing nodes on the network. Typical clients include desktop computers, Web browsers, Java applets, and mobile devices. A client process makes a request for a computing service and receives results for that request.
- A service is a computing process that receives and responds to requests and returns a set of results.
- A broker is essentially a service metadata portal for registering and discovering services. Any network client can search the portal for an appropriate service.

Because Web services can support the integration of information and services that are maintained on a distributed network, they are appealing to local governments and other organizations that have departments that independently collect and manage spatial data but must integrate these datasets.

The use of a connecting technology (Web services) coupled with an integrating technology (GIS) can efficiently support this requirement. Various layers of information can be dynamically queried and integrated but will still be maintained independently in a distributed computing environment. Esri's Web services technology, ArcWeb Services, is built on top of ArcIMS. ArcWeb Services leverage core business logic in ArcGIS and support Internet-based distributed computing.

A series of protocols—eXtensible Markup Language (XML); Simple Object Access Protocol (SOAP); Web Service Description Language (WSDL); and Universal Description, Discovery, and Integration (UDDI)—provides the key standards for Web services and supports sophisticated communications between various nodes on a network. These protocols enable smarter communication and collaborative processing among nodes built within any Web services-compliant architecture.

UDDI allows clients to discover Web services. In a GIS context, the UDDI node plays the role of a metadata server for registered Web services. A user can search the UDDI directory and locate the distributed service providers or services that exist on a network.

Web services interoperate (i.e., communicate) through an XML-based protocol known as SOAP. This is an XML API for the functions provided by a Web service. Each Web service advertises its SOAP API using WSDL that allows easy discovery of any service's capabilities.

Web services provide an open, interoperable, and highly efficient framework for implementing systems. Software components communicate with each other via standard SOAP and XML protocols. A developer need only wrap an application with a SOAP API and it can talk (either calling or serving) with other applications. Web services are efficient because they build on the stateless (i.e., loosely coupled) environment of the Internet. A number of nodes can be dynamically connected only when needed to carry out a specific task such as updating a database or providing a particular service.

Although the basic computer components of a Web services system are still clients and servers, network connections are dynamically created "just in time" and, therefore, do not require the overhead of state-full (tightly coupled) networks. These networks can be implemented in open as well as secure environments. Loosely coupled architecture provides a new and promising solution for implementing complex collaborative applications such as a distributed GIS.

The integration of GIS and Web services means that GIS can be more extensively implemented. Mapping, data, and geoprocessing services are available from many servers and can be integrated into a common environment. However, the ability to not only connect and interoperate but also to integrate and fuse data based on geographic location, a capability that is inherent to GIS, makes GIS-based Web services unique. Web services can realize some of the grand visions for GIS that include fusing GIS applications and building a spatial data infrastructure through interoperability based on standardized interfaces. Esri has built OGC-compliant connectors for ArcIMS that support access to Web Map Services (WMS) and Web Feature Services (WFS).

Web services can use a geographic framework to fuse GIS applications. For example, a local government will be able to continuously maintain and update its land records while serving them to other organizations, both internal and external. A utility company could directly use that local government's basemap instead of maintaining its own and could serve its facilities data back to the local government for use in permitting and land use planning. This type of interorganizational synergy will dynamically accelerate the use of geographic information everywhere.



MAHAVIDYA

एवञ्च श्रयामः !!!

MODULE 3: PAYMENT SYSTEM FOR E-COMMERCE

2.1 SET PROTOCOL:

Electronic commerce, as exemplified by the popularity of the Internet, is going to have an enormous impact on the financial services industry.

No financial institution will be left unaffected by the explosion of electronic commerce

➤ SET protocol Overview :

- What we want here is a protocol very similar to credit card transactions at a local store, something SSL doesn't mimic in functionality.
- The purpose of the SET protocol is to establish payment transactions that
 - provide confidentiality of information;
 - ensure the integrity of payment instructions for goods and services order data,
 - authenticate both the cardholder and the merchant .

✚ Main Entities

There are four main entities in SET:

- Cardholder (customer)
- Merchant (web server)
- Merchant's Bank (payment gateway, acquirer): payment gateway is a device operated by an acquirer. Sometime, separate these two entities.
- Issuer (cardholder's bank)

✚ How it Works

- Both cardholders and merchants must register with CA (certificate authority) first, before they can buy or sell on the Internet, which we will talk about later.
- Once registration is done, cardholder and merchant can start to do transactions, which involve 9 basic steps in this protocol, which is simplified.

1. Customer browses website and decides on what to purchase
2. Customer sends order and payment information, which includes 2 parts in one message:
 - a. Purchase Order – this part is for merchant

- b. Card Information – this part is for merchant's bank only.
3. Merchant forwards card information (part b) to their bank
 4. Merchant's bank checks with Issuer for payment authorization
 5. Issuer send authorization to Merchant's bank
 6. Merchant's bank send authorization to merchant
 7. Merchant completes the order and sends confirmation to the customer
 8. Merchant captures the transaction from their bank
 9. Issuer prints credit card bill (invoice) to customer

➤ **Protocol Overview SET**

- Protocol Overview SET (Secure Electronic Transaction) is a very comprehensive security protocol, which utilizes cryptography to provide confidentiality of information, ensure payment integrity, and enable identity authentication.
- For authentication purposes, cardholders, merchants, and acquirers will be issued digital certificates by their sponsoring organizations.
- It relies on cryptography and digital certificate to ensure message confidentiality and security.
- Digital envelop is widely used in this protocol.
- Message data is encrypted using a randomly generated key that is further encrypted using the recipient's public key. This is referred to as the "digital envelope" of the message and is sent to the recipient with the encrypted message.
- The recipient decrypts the digital envelope using a private key and then uses the symmetric key to unlock the original message.
- Digital certificates, which are also called electronic credentials or digital IDs, are digital documents attesting to the binding of a public key to an individual or entity.
- Both cardholders and merchants must register with a certificate authority (CA) before they can engage in transactions.
- The cardholder thereby obtains electronic credentials to prove that he is trustworthy.
- The merchant similarly registers and obtains credentials. These credentials do not contain sensitive details such as credit card numbers.
- Later, when the customer wants to make purchases, he and the merchant exchange their credentials. If both parties are satisfied then they can proceed with the transaction.
- Credentials must be renewed every few years, and presumably are not available to known fraudsters.

➤ SET Cryptography

- Overview Secure Electronic Transactions (SET) relies on the science of cryptography – the encoding and decoding messages.
- There are two primary encryption methods in use today: secret-key cryptography and public-key cryptography. Secret-key cryptography is impractical for exchanging messages with a large group of previously unknown correspondents over a public network.
- For a merchant to conduct transactions securely with millions of subscribers, each consumer would need a distinct key assigned by that merchant and transmitted over a separate secure channel.
- However, by using public-key cryptography, that same merchant could create a public/private key pair and publish the public key, allowing any consumer to send a secure message to that merchant.
- This is why SET uses both methods in its encryption process. The secret-key cryptography used in SET is the well-known Data Encryption Standard (DES), which is used by financial institutions to encrypt PINs (personal identification numbers).
- And the public-key cryptography used in SET is RSA.

➤ Use of Symmetric Key

- In SET, message data is encrypted using a randomly generated symmetric key (a DES 56-bit key).
- This key, in turn, is encrypted using the message recipient's public key (RSA). The result is the so called "digital envelope" of the message. This combines the encryption speed of DES with the key management advantages of RSA public-key encryption.
- After encryption, the envelope and the encrypted message itself are sent to the recipient. After receiving the encrypted data, the recipient decrypts the digital envelope first using his or her private key to obtain the randomly generated symmetric key and then uses the symmetric key to unlock the original message.
- This level of encryption, using DES, can be easily cracked using modern hardware
- Use of Asymmetric Key – Digital Signature (Message Digests)
- In SET, the public key cryptography is only used to encrypt DES keys and for authentication (digital signature) but not for the main body of the transaction.
- In SET, the RSA modulus is 1024 bits in length
- SET uses a distinct public/private key. Each SET participant possesses two asymmetric key pairs: a "key exchange" pair, which is used in the process of session key encryption and decryption, and a "signature" pair for the creation and verification of digital

signatures (160-bit message digests). The algorithm is such that changing a single bit in the message will change, on average, half of the bits in the message digest.

➤ **Dual Signatures**

- A new application of digital signatures is introduced in SET, namely the concept of dual signatures.
- Dual signatures is needed when two messages are need to be linked securely but only one party is allowed to read each. The following picture shows the process of generating dual signatures.

3.2 Electronic Cash (Ecash)

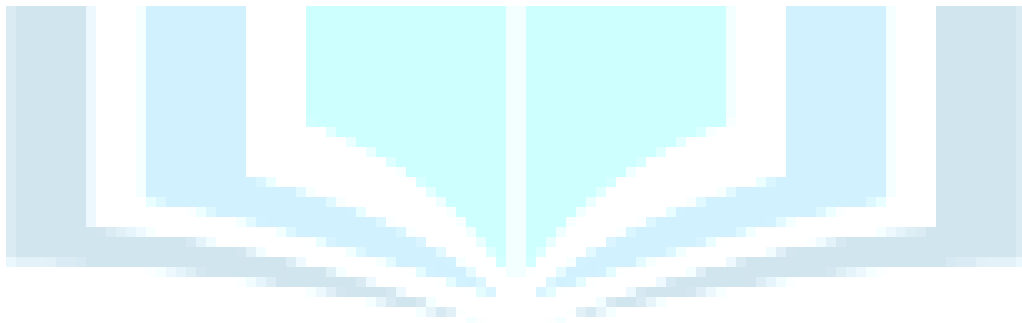
- An anonymous electronic cash system; equivalent to "cash" or "printed bank notes" except that it is transferred through networks with bits of information, in essence it is just another representation of monetary value; anonymity is preserved through public key cryptography, digital signatures, and blind signatures.

How it is used:

- Ecash is used over the Internet, email, or personal computer to other workstations in the form of secured payments of "cash" that is virtually untraceable to the user.
- It is backed by real currency from real banks.
- The way ecash works is similar to that of electronic fund transfers done between banks.
- The user first must have an ecash software program and an ecash bank account from which ecash can be withdrawn or deposited.
- The user withdraws the ecash from the account onto her computer and spends it in the Internet without being traced or having personal information available to other parties that are involved in the process.
- The recipients of the ecash send the money to their bank account as with depositing "real" cash.

E Cash

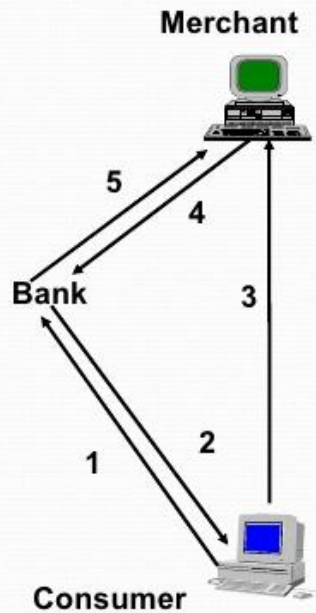
- A system that allows a person to pay for goods or services by transmitting a number from one computer to another.
- Like the serial numbers on real currency notes, the E-cash numbers are unique.
- This is issued by a bank and represents a specified sum of real money.
- It is anonymous and reusable



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E-Cash Processing



1. Consumer buys e-cash from Bank
2. Bank sends e-cash bits to consumer (after charging that amount plus fee)
3. Consumer sends e-cash to merchant
4. Merchant checks with Bank that e-cash is valid (check for forgery or fraud)
5. Bank verifies that e-cash is valid
6. Parties complete transaction

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How the e-cash system works:

- A customer or merchant signs up with one of the participating banks or financial institutions. The customer receives specific software to install on his or her computer.
- The software allows the customer to download “electronic coins” against the customer's bank account or against a credit card, to his or her desktop. The software manages the electronic coins.
- When buying goods or services from a web site that accepts e-cash, the customer simply clicks the “Pay with e-cash” button.
- When the customer accepts a payment, the software subtracts the payment amount from the balance and sends the payment to the bank or the financial institution of the seller.



3.3 Electronic Check

➤ DEFINITION of 'Electronic Check'

- A form of payment made via the internet that is designed to perform the same function as a conventional paper check.
- Because the check is in an electronic format, it can be processed in fewer steps and has more security features than a standard paper check.
- Security features provided by electronic [checks](#) include authentication, public key cryptography, digital signatures and [encryption](#), among others.
- An e-Cheque is an electronic document which substitutes the paper check for online transactions.
- Digital signatures (based on public key cryptography) replace handwritten signatures.
- The e-Cheque system is designed with message integrity, authentication and nonrepudiation features, strong enough to prevent fraud against the banks and their customers.
- The minimum security requirements supported by the e-Cheque system are as follows:

- Confidentiality: keeping information (e.g. e-mail message, payment order, etc) secret.
- Authentication: knowing and verifying the origin and/or destination of information
- Integrity: verifying that the data hasn't been tampered with.
- Non-repudiation: knowing that the data, once sent cannot be retracted or denied.
- The e-Cheque is compatible with interactive web transactions or with email and does not depend on real-time interactions or on third party authorizations.
- It is designed to work with paper cheque practices and systems, with minimum impact on payers, payees, banks and the financial system.

SYSTEM OPERATION

- The e-Cheque system manages the transfer of funds (represented by electronic cheques) between different clients, different banks, and clients and their banks.
- In order to send a cheque, the client simply fills out a standard e-cheque.
- The system allows clients to define common payees in order to speed the e-cheque creation process. When the cheque has been written it can be easily transferred from the payer to the payee over a secure e-cheque channel.
- This secure channel will be established between the payer and the payee before the transaction begins. The e-cheque is automatically signed by the user using his private key based on RSA algorithm and SHA-128; this ensures the authenticity and the integrity of the e-cheque.
- The signed cheque is then encrypted using a secret key of length 128 bit based on the AES (Advanced Encryption Standard) algorithm to prevent tampering by a third party.

➤ THE E-CHEQUE PROTOCOLS

- The majority of e-payment systems on the Internet today are based on three-party communication protocols involving a trusted third-party besides the payer and payee.
- The trusted third-party is needed to authenticate and verify the payment or the transaction process between the clients.
- Unfortunately this decreases the system performance because of the increased number of messages that must be exchanged.
- The e-Cheque system has been optimized so as to work with only two parties, namely the payee and payer.

The echeque operational scenarios are structured around five main protocols as follows:

- ✚ System Setup.
- ✚ Client Registration.
- ✚ Cheque Withdrawal.
- ✚ Cheque Payment.
- ✚ Cheque Deposit.

- ✚ **SYSTEM SETUP** :Each client that wishes to use the e-cheque system must obtain a digital identity. A digital identity is achieved by obtaining a valid digital certificate from a recognized certificate authority (CA)
- ✚ **CLIENT REGISTRATION** A client (payer/payee) must register his digital identity at an e-cheque bank provider. After the client has registered his identity he becomes an owner of an e-cheque account.
- ✚ **E-CHEQUE WITHDRAWALS** A client can withdraw an e-cheque from his e-cheque account. The e-cheque system supports two main types of e-cheque, namely, prepaid e-cheque and postpaid e-cheque.
- ✚ **E-CHEQUE PAYMENT** Any two clients can exchange any number of e-cheques
- ✚ **E-CHEQUE DEPOSIT** The client (customer/merchant) can deposit an e-cheque object into his e-cheque account at his e-cheque bank provider.

3.4 SMART CARD:

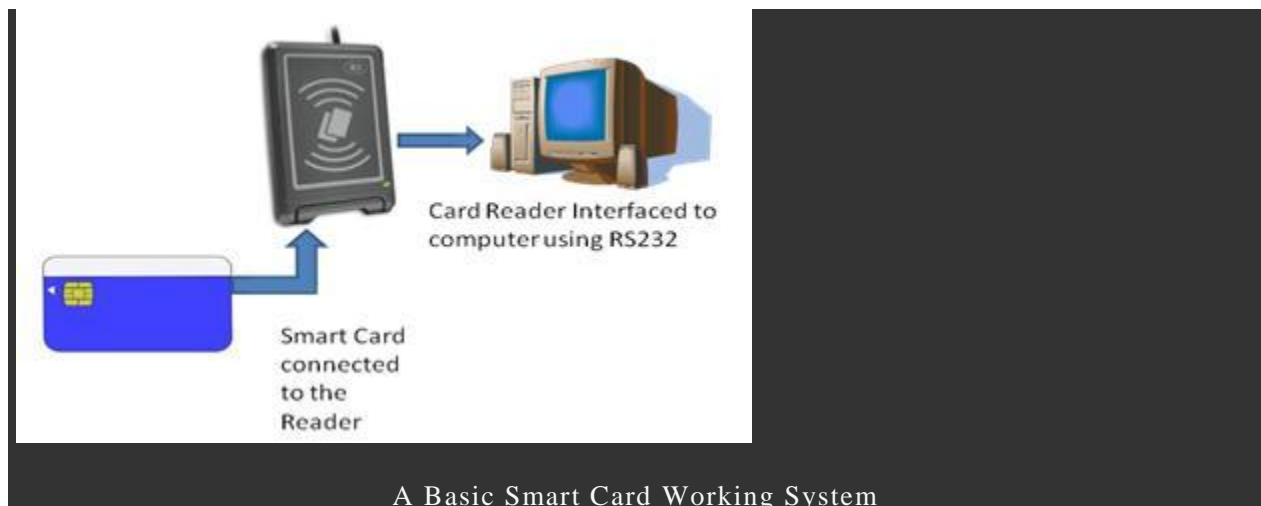
- A **smart card** is a device that includes an embedded integrated circuit that can be either a secure microcontroller or equivalent intelligence with internal memory or a memory chip alone.
- The **card** connects to a reader with direct physical contact or with a remote contactless radio frequency interface.

➤ **How Smart Cards Work**

- A smart card contains more information than a magnetic stripe card and it can be programmed for different applications.
- Some cards can contain programming and data to support multiple applications and some can be updated to add new applications after they are issued.

- Smart cards can be designed to be inserted into a slot and read by a special reader or to be read at a distance, such as at a toll booth.
- Cards can be disposable (as at a trade-show) or reloadable (for most applications).

A smart card is connected to the host computer or controller via a card reader which gets information from the smart card and accordingly passes the information to the host computer or controller.



➤ What is a Smart Card Reader?

- A smart card reader is a device to which the smart card is connected either directly or indirectly using RF communication.
- It interfaces with the PC or a microcontroller using USB port or RS232 serial ports. It can be a contact or contactless reader.



A Contactless Smart Card System



A Contact Smart Card System

2 Types of Smart Card based on Connection to the Smart Card Reader

- **Contact Smart Card:** This type of smart card consists of electrical contacts which are used to connect to the card reader where the card is inserted. The electrical contacts are deployed on a conductive gold plated coating on the card surface.



A Contact Smart Card with Electrical Connections

- **Contactless Smart Card:**
 - This type of smart card communicates with the reader without any physical contact.
 - Rather it consists of an antenna with which it is used to communicate using Radio Frequency band with the antenna on the reader.
 - It usually receives power from the reader via the electromagnetic signal.

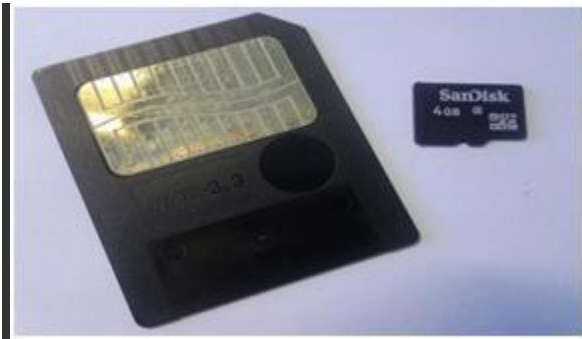


A Contactless Smart Card

2 Types of Smart Cards based on their Functionalities and Configuration

- **Memory Cards:**
 - These are cards which only consist of memory circuits. It can only store, read and write data to a particular location.

- The data cannot be processed or manipulated.
- It can be a straight memory card which is only used to store data or a protected memory card with a restricted access to the memory and which can be used to write data.
- It can also be a rechargeable or a disposable card which contains memory units which can be used only once.



A Memory Smart Card

- **Microprocessor Based Cards:** These cards consist of microprocessor embedded onto the chip in addition to the memory blocks. It also consists of specific sections of files with each file associated with a particular function. The data in files and the memory allocation is managed via an operating system which can be a fixed operating system or dynamic operating system. It allows for data processing and manipulations and can be used for multifunctioning.



Microprocessor Based Smart Card

4 Steps to Construct a Smart Card

- The first step involves **designing**. The designing involves specifying the chip for the memory size, clock speed, volatile memory types, type of operating system and specifying the application software, specifying the card type, size and functioning and additional features.
- The second step involves **chip fabrication**. This involves mounting the silicon chip on an epoxy glass substrate with gold plated connectors, using a die. The silicon chip is bonded to the connectors using

connecting wires (wire bonding technique) or using flip chip technology (using a solder). The chip on board substrate is then sealed using epoxy resin and glued to the card substrate. The card substrate can be PVC based plastic card or Polyester based card.

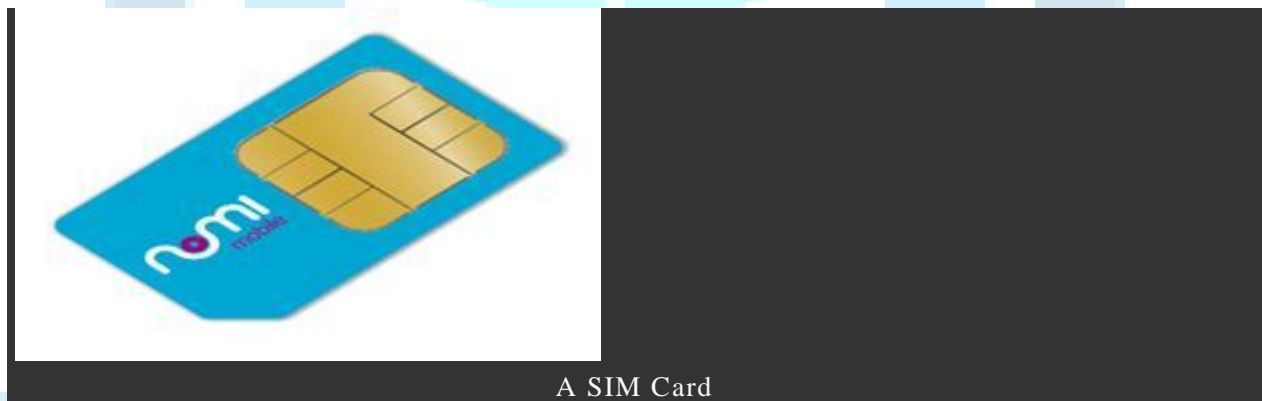
- The third step involves **loading the code** to the memory using special commands.
- The fourth step involves **data loading** into the PROM memory such that the data pertains to the single person.

Advantages of Smart Card:

- Might be promptly reconfigured
- Reusable
- Secure transactions
- Gives more security
- More tough and dependable
- Permit numerous provisions to be saved in one card

5 Areas of Smart Card Applications:

- **Telecommunications:** The most prominent use of smart card technology is in the development of **SIM card or Subscriber Identity Module**. A SIM card provides unique identification to each subscriber and provides network access to each subscriber and manages its authentication.



A SIM Card

- **Domestic:** The most frequently used smart card in domestic field is the DTH smart card. This card provides authorized access to the information coming from the satellites. In simple words the card with which we can get access to the Direct to Home TV services is nothing but a smart card. The information is encrypted and decrypted within a smart card.



A basic DTH System with the Smart Card

- **Ecommerce and Retail:** Smart card can be used to store information like a person's account details, the transaction details and can be used in purchasing goods online by acting as a credit card. Some retailers can also use smart cards to store points for a particular customer and provide necessary incentives to repeated customers.
- **Banking Application:** The most prominent use of smart card in banking application is the replacement of the traditional magnetic stripe based credit or debit card. An example is the MasterCard and VISA.



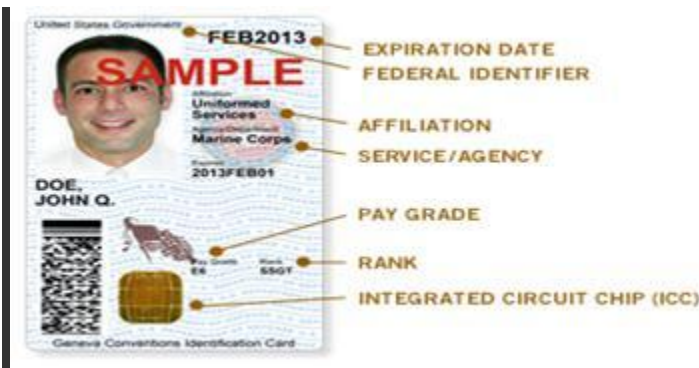
VISA Smart Card

- **Government Applications:** Smart cards are being used by Government to issue identity cards to individual, which contains all the details of the individual. An example is the recently started Adhar card scheme in India.



Adhar Card Model

- **Secured Physical access:** Smart cards can be used by Organizations or differed public areas to provide authorized access to the employees (members of the organization) or other persons to the secured areas. The smart card generally contains identity details of the individual which is scanned and checked.



A Sample ID Card for Organizations

A Working Application of a Smart Card System to provide Authorized Access to Secured Areas

As seen, one of the prominent applications of a smart card is storing the identity of an individual. When the person tries to enter a secured area, the data in his/her smart card is checked with the available data in the database and if matched, the person is allowed access, else not.

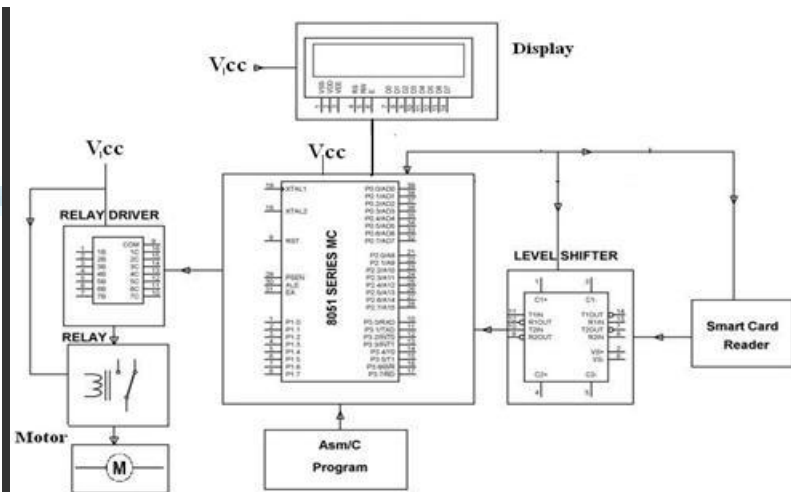


A Smart Card System by [Edgefx Kits](#)

The system consists of 4 main parts:

- A smart Card which is generally a contact memory smart card which contains the information about the individual.
- A smart card reader which is generally a contact smart card reader and is used to read information from the card.
- A controller which receives data from the smart card reader via the RS232 interface.
- A load which is a relay in this case, used to drive a motor and connected to the controller via the relay driver IC.

The Working of the System is as follows:



Block Diagram showing a Smart Card System to allow Authorized Access by [Edgefx Kits](#)

- The individual inserts his/her card in the card reader.

- The card reader sends the data to the MAX 232 IC through the DB9 connector.
- The Microcontroller receives the data from the MAX 232 and is accordingly programmed to compare the obtained information with the stored information in the database.
- If the data matches, the Microcontroller develops logic high at its output pin, connected to the input pin of the relay driver.
- The relay driver IC accordingly develops a low logic at its output and energizes the relay.
- The common contact of the relay is now connected to the normally open contact and the motor connected in series with the relay contacts is rotated such that the door is opened.
- In case the data doesn't match, the microcontroller is programmed to develop logic low at its output pin and the relay accordingly doesn't get energized, keeping the door shut.
- The obtained output is accordingly displayed on the LCD which shows whether the data is matched or not.



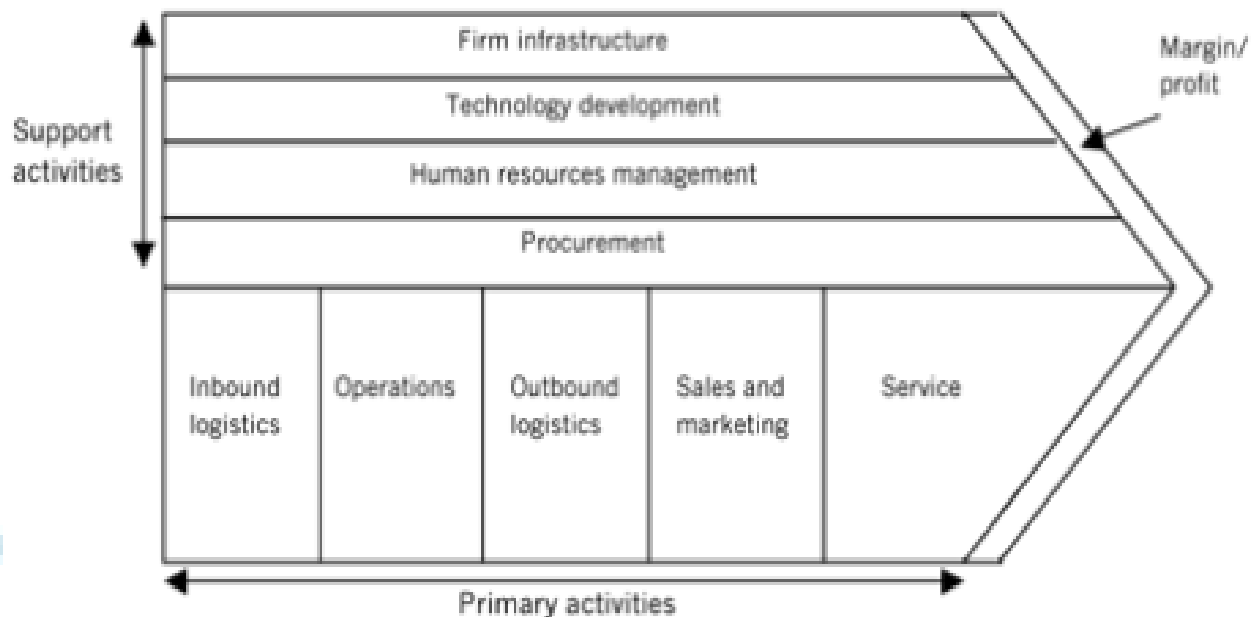
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MODULE 4:E-MARKETING STRATEGIES

4.1 Value Chain:

- All companies undertake series of activities in order to deliver a product to the customers.
- These series of activities like procurement of raw material, storage, production, distribution, etc. are referred as value chain activities.
- **The function of value chain activities is to add value to product at every stage before it is delivered to the customers.**
- There are two components, which make value chain - primary activities and secondary activities. The primary activities are directly associated with the manufacturing of products like supply management, plant operations, etc.
- The secondary activities are referred to as support functions such as finance, HR, information technology, etc.



$$V_p = \frac{Q_p \times S_p^{\circ}}{C \times T}$$

V = Value Q = Quality S = Service
C = Cost T = Time P = Perceived

- A value chain is the full range of activities — including design, production, marketing and distribution — businesses go through to bring a product or service from conception to delivery.
- For companies that produce goods, the value chain starts with the raw materials used to make their products, and consists of everything that is added to it before it is sold to consumers.
- The process of actually organizing all of these activities so they can be properly analyzed is called value chain management.
- The goal of value chain management is to ensure that those in charge of each stage of the value chain are communicating with one another, to help make sure the product is getting in the hands of customers as seamlessly and as quickly as possible.:

Porter said a business's activities could be split into two categories: primary activities and support activities. Primary activities include the following:

- **Inbound logistics:** This refers to everything involved in receiving, storing and distributing the raw materials used in the production process.
- **Operations:** This is the stage where raw products are turned into the final product.
- **Outbound logistics:** This is the distribution of the final product to consumers.
- **Marketing and sales:** This stage involves activities like advertising, promotions, sales-force organization, selecting distribution channels, pricing, and managing customer relationships of the final product to ensure it is targeted to the correct consumer groups.
- **Service:** This refers to the activities that are needed to maintain the product's performance after it has been produced. This stage includes things like installation, training, maintenance, repair, warranty and after-sales services.

The support activities help the primary functions and comprise the following:

- **Procurement:** This is how the raw materials for the product are obtained.
- **Technology development:** Technology can be used across the board in the development of a product, including in the research and development stage, in how new products are developed and designed, and process automation.

- **Human resource management:** These are the activities involved in hiring and retaining the proper employees to help design, build and market the product.
- **Firm infrastructure:** This refers to an organization's structure and its management, planning, accounting, finance and quality-control mechanisms.

4.2 Working Of E-Market

➤ Auctions

- In an auction, a specific product or a specific quantity of products is being placed for sale.
- The auction starts and ends at a pre-set time.
- Buyers can then submit bids during that period of time.
- Auctions help sellers get the right price for products ranging from fish and flowers to chemicals and patents.
- Auctions can also be used to get rid of surplus assets and offer buyers the opportunity to find a bargain.
- Sometimes they are a combination of online and offline auctions, where traditional auction houses also make their auctions available online, either by themselves or in cooperation with Internet platforms.
- Most of these services are more than just a B2B Internet platform. They should rather be regarded as auction full service providers.

➤ Catalogue

- A list of products and services offered by the sellers.
- Some catalogues list product information on a general level, others are very detailed. Some are quite informative while others are more promotional.
- Some carry pictures and others do not.
- Catalogues facilitate the search for products and suppliers in industries with a wide range of products and producers.
- Prices published in a catalogue are generally fixed and often not disclosed to customers prior to registration since different buyers might have agreed on different prices.

➤ **Classified ads**

- Classified ads display offers of specific products for sale or wanted by a buyer. The ads are sorted by the type of product, brand or company.
- They very much resemble the "for sale" sections in newspapers or trade magazines and are often focused on an industry or a certain range of products.
- This function can also be called a bulletin board, where buyers and sellers post things they would like to buy or sell.

➤ **Online order**

- When an order can be placed online for the articles listed for sale in a catalogue or classified ad.
- Orders to various sellers can in this way be placed directly on an e-marketplace.

➤ **Reverse auctions**

- Also called sourcing auctions or buyers' auctions, help users to find the cheapest supplier for a contract.
- Within the auction the potential suppliers submit offers, lowering the selling price for each submitted bid.
- They underbid each other until the supplier with the lowest bid wins the contract.
- Reverse auctions often take place on dedicated Internet platforms, but they can also be found as part of larger B2B Internet platforms or as an element within enterprise software for supply management.

➤ **Request for Quotation/Proposal/Bid (RFQ, RFP, RFB)**

- Usually an on-line form where the seller or buyer sends a request to sell or buy a product.
- The RFQ/RFP/RFB function can be used to request a price or proposal on a product in a classified ad, a product listed in a catalogue or products expected to be supplied by a company in a supplier directory.
- The request is then typically sent to the trading partners by email to be answered.

➤ **Supplier directories**

- Supplier directories are databases of companies.
- Buyers can find new suppliers and suppliers can get leads.
- You can search by products or services, by region or by company.
- The benefit for buyers is a clearer view of potential suppliers for industries and regions they are not familiar with.
- Directories typically include a brief description of the product area of the company and contact details.
-

➤ System integration

- A further step is if the e-marketplace offers companies (buyers and / or sellers) the ability to integrate the order process with their Enterprise Resource Planning (ERP) systems (from companies like IFS, SAP, Intenia, Baan, and IBS).
- **Internet platforms with such system integration are sometimes called trading networks.**

4.3 Strategies for marketing for selling on the Web

- It is important to use proven **online advertising strategies** in order to bring targeted traffic to your work from home website.
- You will need this traffic in order to be able to convert it into paying customers. With this in mind, here are some strategies to help get you started:

Strategy #1: Pay Per Click Advertising

This proven online marketing strategy allows you to have control over your marketing campaign as you target specific traffic based upon the keywords that you choose. Google is the top traffic source for this form of marketing. However, you should know that you are going to have to pay for every time that someone clicks on your ad.

Strategy #2: Blog Posting

By creating an informative blog about your product or service, you will be able to target specific customers. In order for this to work, you will need to make sure that you update your blog on a regular basis.

Strategy #3: Video Marketing

This is a relatively new online advertising strategy. Whenever you choose to use it as a part of your marketing campaign, you will want to make sure that the video is either entertaining or informative (so that people will continue to pass the video on to other people).

Strategy #4: Article Marketing

By writing and submitting informative articles to different online article directories, you will be able to attract traffic to your website through the resource box at the end of your article. This can have a positive long-term effect upon your business. By writing about your products or services, you will be able to establish yourself as an authority. Furthermore, these articles will also be able to draw search engine traffic to your website.

Strategy #5: Forum Marketing and Social Networking

Whenever you are at a forum or a social networking site, make sure that you have a link to your website in your signature. As an active participant in the community, people will begin seeing that you are sharing valuable information. They will then want to see what you have available at your website, and thus click through your signature to check it out.

Strategy #6: Viral Marketing

Through viral marketing, you can drive targeted traffic to your website. You will either want to hold a contest or make sure that you have valuable information available. Whenever this is the case, people will tell others about your website, and word-of-mouth advertising will kick in.

Strategy #7: Traffic Trading

Take some time to find relevant websites, directories and forums where you can list your URL. This will help to increase your visibility. However, you must understand that the links' quality is more important than quantity here.

Strategy #8: Press Releases

Every time that you launch something new, make major changes, or update your business, you should write a press release to send out.

By using these marketing tips to promote your work from home website, you will be able to increase the amount of targeted traffic it receives. While this will take some work, over time your website will be successful.

➤ Advertising Subscription Mixed Model:

- In an advertising-subscription mixed revenue model, which has been used for many years by traditional print newspapers and magazines, subscribers pay a fee and accept some level of advertising.
- On websites that use the advertising subscription revenue model, subscribers are typically subjected to much less advertising than they are on advertising-supported sites.
- Firms have had varying levels of success in applying this model and a number of companies have moved to or from this model over their lifetimes.

➤ Transaction Fee Revenue Model

- A company receives commissions based on volume for enabling or executing transactions.
- The revenue is generated through transaction fees by the customer paying a fee for a transaction to the operator of a platform.

- The company is a market place operator providing the customer with a platform to place his transactions. During this process the customer may be presented as a buyer as well as a seller.
- To actively participate in this e-market, customers must register, so both parties of a transaction taking place are identified.
- From a business perspective, the offer is determined by others as customers offer their goods online and are acting as sellers. The amount of the transaction fee can be both – fixed and percentage calculated.

Examples

- [eBay](https://www.eBay.com)
- [Amazon](https://www.amazon.com)



MODULE 5: E-Business Introduction to E-Business

5.1 E-BUSINESS:

Define E-Business:

- Electronic business (e-business) can be defined as the use of the internet to network and empower business processes, electronic commerce, organizational communication and collaboration within a company and with its customers, suppliers, and other stakeholders.
- E-businesses utilise the internet, intranets, extranets and other networks to support their commercial processes.
- Electronic commerce (e-commerce) is the buying and selling, marketing and servicing of products and services via computer networks.
- Since e-business includes the process of transacting with suppliers and customers there is an overlap in activities with e-commerce.
- Although the terms 'e-business' and 'e-commerce' are often used synonymously, the distinction between them lies in the broader range of processes in e-business that incorporates internal transactions within an organisation.
- These include transactions relating to procurement, logistics, supply chain management, payments, stock control and order tracking.

5.2 E-Business Characteristics:

- An e-business network is one that allows businesses to communicate via electronic means, but the term is most often used to denote business networks that use the Internet to conduct e-commerce and related activities.
- E-business networks allow businesses to communicate with each other and transmit information quickly and efficiently at cheaper costs than using a traditional electronic data interchange, resulting in lower prices for consumers while also facilitating collaborations between companies.
- This leads to innovative new products, knowledge exchange and reduced time-to-market.

➤ E-business Network

- E-business networks vary in their setups and topologies, but generally are Internet-based networks that allow many businesses to access repositories of data and information, such as a shared database or a trade board with many listed suppliers.
- An e-business network allows its members to communicate with each other via electronic media, primarily using the Internet.
- Businesses typically use e-business networks to facilitate and support their supply chains, conduct e-commerce, trade, pay taxes and obtain and disseminate information.
- E-business networks allow users to share knowledge bases, data and files, and often have groupware and collaborative elements.

➤ **Barriers**

- E-business networks powered by the Internet leverage existing Web technologies and are therefore cheaper to implement than traditional electronic data interchanges, or EDIs, that big corporations used to require their partners to use in order to join their supply and distribution chains.
- This has lowered or eliminated the barriers to trade that small businesses once faced, which has opened trade and supply markets to greater competition.
- E-business networks are now often used alongside EDIs, allowing small businesses to access trade opportunities that were previously closed to them.

➤ **Prices**

- E-business networks leverage the Internet, so they have opened the door to global competition.
- As suppliers from cheaper markets compete with local suppliers, the competition tends to push prices down.
- This results in lower prices for consumers and can have stimulating effects on the wider economy.
- Greater competition often forces companies to innovate in order to succeed, which also creates improved products and more convenient services for customers while keeping prices down.

➤ **Collaboration**

- Businesses can use e-business networks to share data, knowledge and pricing information.
- This allows them to collaborate on projects as well as reduce their research and development budgets and other resource costs, as they can eliminate redundancies and inefficiencies in their processes while honing their core competencies.
- Consumers benefit from faster technological advances and lower prices.
- This is especially true in the information technology and aviation industries, where products are usually the result of collaborative efforts.

5.3 Elements of E-Business:

➤ **Functional Elements of an E-Business**

- An e-business is a business that carries out its operations primarily or exclusively through the Internet.
- Most of the same basic functional elements of a successful conventional business also apply to an e-business -- they just do so in different ways.

- Online entrepreneurs can prepare themselves for success by understanding these e-business fundamentals and applying them effectively.

➤ **Product Development and Sourcing**

- E-businesses may sell the same types of products that other businesses sell, whether they be consumer goods, financial products, information or intellectual property.
- If your company produces its own items to sell, you must address the logistical issues regarding the development and manufacturing of your product just as any other business does.
- This includes renting or purchasing an area specifically for manufacturing or production, as well as hiring employees to work there.
- If you plan to use an online store to sell products made by other companies, you must get in touch with manufacturers and sign purchasing deals with them.

➤ **Warehousing and Drop Shipping**

- Even though an e-business does not require the rental or maintenance of retail space, it does require you or someone else to store your inventory somewhere.
- To get started with e-business, you may be able to get by with a small storage space that you can rent by the month without signing a contract.
- You may then move to a larger storage space as you become more successful.
- Your warehousing efforts must incorporate order fulfillment procedures, in which you or your employees find products and package and ship them to buyers.
- To avoid these costs altogether, you may resort to drop shipping instead.
- Drop shipping is a business arrangement in which a drop shipping company purchases and stores large amounts of product.
- Clients like your company display the drop shipping company's product on their websites, and they do not actually purchase the product until someone actually buys it.
- When they do, the client company contacts the drop shipper, and the drop shipper sends the product directly to the end buyer. The drawback to drop shipping is that, by adding an extra step in the process, it reduces profit margins.

➤ **Marketing**

- E-business marketing incorporates an array of approaches, but the most important goal of most of these approaches is to drive website traffic.

- High levels of website traffic usually mean high revenue.
- To this end, one of the most cost-effective ways of driving website traffic is through search engine optimization. Search engine optimization is the act of constructing a website in such a way that it appeals to the algorithms of popular search engines, landing the site on the first page of Internet searches for key words.
- Advertising is another important aspect of e-business marketing. One of the simplest and most effective methods of advertising an e-business is by using pay-per-click advertisements on search engines.

➤ **Customer Service**

- Customer service is one of the main functional elements that separate upper-tier and lower-tier e-businesses.
- Your e-business may provide customer service through telephone, live chat or email.
- Lay out a plan of how to deal with issues that may occur, such as buyers who are dissatisfied with their products and want a refund or who order their products and never receive them.
- Some companies provide third-party customer service help, employing professionals who can answer telephones and emails and carry out online chats on their behalf.

➤ **Payment Gateway**

- The ability to receive payment through the Internet is vital for an e-business.
- Pay for merchant account services that allow you to directly receive payment from major credit card companies. Also provide a button for a specialized online payment gateway such as PayPal, Payoneer or WorldPay.

➤ **Information Technology**

- As your website is the hub of your entire business, you must make sure that it is an attractive and effective tool that conveys a sense of confidence as a storefront would for a traditional business.
- To ensure that your website accomplishes this purpose, you need help from information technology professionals to build, maintain and update it.

5.4 Roles of E-Business:

- **"E-business" refers to any business that uses the Internet and related technologies. It applies to both large and small businesses in electronic commerce for buying, selling, marketing, as well as customer relations and management services. E-business breaks geographical barriers and is cost-efficient, thereby improving a business' productivity and increasing revenue.**

➤ **Electronic Commerce**

- Electronic commerce, or "e-commerce," is the financial side of e-business conducted over the Internet for businesses working with businesses, also known as "B2B," or businesses working with consumers, "B2C."
- Its main purpose is to conduct transactions without geographical barriers. E-commerce forms worldwide business relationships with distributors, resellers, buyers and consumers. Amazon.com is an example of a U.S. multinational e-commerce company selling directly to consumers over the Internet. The consortium of DaimlerChrysler, Ford and General Motors uses the B2B function of e-commerce for an efficient procurement process to ensure uniform pricing.

➤ **Internet Marketing**

- Internet marketing is the component of electronic business that deals with the planning, pricing, promotion and distribution of products and services.
- It provides businesses with an inexpensive way of connecting with customers globally through interactive websites, email newsletters, online surveys and forms, blogs and discussion groups. To succeed online, a business needs a marketing plan with an effectively designed website with advertisements. On-line advertising may be through banners, pop-ups or search engines, such as Google's Adwords.

➤ Customer Relations

- E-businesses engage in customer relationship management to strive to provide customer value superior to their competition.
- For example, American Airlines personalized its Web pages and publishing company to reach its market. Golden Books used online sampling to develop its new series of print and Internet research guides as a part of their e-business initiative to nurture its customers.

➤ Human Resources

- Businesses are implementing human resources as part of their e-business management strategy. E-business simplifies the human resources service with one management source.
- It ensures that you are working with the most current information. For example, you may have rewards for an executive group and rewards for non-executives, or benefits for union and non-union employees.
- E-business allows you to provide the related compensation to specific groups, accurately and efficiently.

5.5 IMPACT OF E-BUSINESS:

➤ Retail sector

Retailing is one of the most important industry sector in the world.

In the retail sector, e-business has had great impact on the value chain.

It has made a great difference in terms of shelf life of products and stock rotation time.

It also highlighted the relevance of inter-business exchanges. In fact, retailers, beside their relationship with suppliers and consumers, have significant impact on intercompany exchanges through CEDI (centre of distribution).

In essence, retail companies will want to rationalize and reduce costs of supply and management of the supply chain, starting with purchasing cost.

They will also want to differentiate their own offers from the competitors, exploiting customer relation management techniques as to communication, sales and customers' loyalty (e-business Watch 2000).

➤ Banking Industry

- The introduction of E-business (ICT) in the European banking system has had a significant impact on banks operating system and their operations within physical branches.
- The most important form of e-business used by banks is the online banking which has help cut down cost.
- E-business has enabled banks to redefine their boundaries and also gained competitive advantage through it. Internet banking is nowadays supported by advanced ICT solutions which enable most everyday banking services to be conducted online (www.ebusiness-watch.org).
- Studies also shows productivity growth rose in the EU from year 2000 onwards, while average working hours per employee has decreased subsequently, this study tells use e-business investment is largely substituting labour particularly in retail banking.

➤ Travel and tourism Industry

- In the last few years travel pattern has changed in the EU.
- The travel sector in the EU is so large that even a small share of it produces a major online market.
- Taking the internet for example, it has had a very high impact on the air travel industry.
- It can provide a direct connection between airlines and customers without the need to use travel agents or Computer Reservation Systems (CRS), thereby leading to cost savings in the distribution of air tickets (Law and Leug, 2000) the internet has become very extensive in the travel industries and its impact has been particularly significant on the distribution channel for air travels and the use of the Internet for searching and purchasing airline tickets has become common in travel markets.
- The introduction of e-business to the airline industry has enabled most travellers to bypass travel agents altogether, with most agreeing that the most current air market will shift form traditional travel agents to internet based agents like www.opodo.com.
- Recent studies shows that firms that have reinforced their e-business strategy in the airline industry has had an increase in sales volume for airlines' website. The internet has contributed strongly to the growth of most budget airlines taking easy jet as an example. Easy jet has never used the travel agent network, they rely on the internet because all their flights are booked online by customers. ([Journal of Air Transport Management](#))

➤ Impact of E-Business on the economy

- Over the past decades e-business has helped and provided various methods in which buyers and sellers can transact. In the decades to come, exploiting the full potential of developments could have profound impacts in individual sectors of the economy as well as for macroeconomic performance and economic policies.
- At the aggregate level, productivity and economic growth could rise, at least for some time, as a result of more efficient management of supply and distribution, lower transaction costs, low barriers to entry and improved access to information.
- In the business-to-business context, higher efficiency can be gained from B2B e-commerce and B2B exchanges via lower procurement cost and better supply chain management.
- Many companies claim that putting their supply chains online has led, or will lead, to major cost savings. According to Goldman Sachs (2000) study these gains range from between 2 and 40 percent of total input cost depending on the industry which may subsequently reduce the price in the overall economy.

➤ The Effect of E-Business on Customer Service

- Online e-business has completely changed the way companies sell their products.
- The movement that began in the waning years of the 20th century with books, music and specialty items soon became a torrent of transactions that cover every imaginable good from coffee to exotic cars.
- Although no authoritative study can say how much is transacted online, it is thought to be measured in the trillions of dollars, as more companies seek ways to join the e-commerce revolution. Along the way, savvy companies have sought to create a customer experience that married this new technology with good, solid customer service.

✓ Changing Definition of Service

One major outcome of the shift to e-commerce has been a radical redefinition of what customer service is and how it is judged. Twenty years ago, most highly-regarded customer service interactions involved a face-to-face meeting, usually at a supplier's place of business. Quality of service was determined by how long a customer had to wait in line, how courteous the sales associate was, the hours the provider was open and how well they could respond to your needs. In the Internet age, most service relates to the ease-of-use of a website, how simple it is to navigate, shipping options and the ability to track your purchase. People assume every e-commerce site is open 24/7 and that we can shop on our timetable and on their terms.

✓ Knowledge Base

When a customer has a question or problem with an online supplier, the first line of support often involves visiting an online customer support center that provides the customer with additional information. This center can be as simple as a Q&A page that covers the most common questions, or as complex as the knowledge-bases of companies that include Dell, Microsoft or Apple. The goal from a customer service standpoint is to guide the customer to the right information as quickly and easily as possible. In less than a decade, Internet savvy customers have taken to this self-serve approach with aplomb, happily performing the task themselves if the knowledge-base is well planned and designed.

✓ Customer Relationship Management

In the old economy, a regular customer would visit a store and the proprietor would steer them toward new products she thought the customer might like. This personal service could save the customer time and build a long-term relationship. In the e-commerce economy, that task is now handled by a customer relationship management tool. CRM tracks every interaction a company has with a customer and uses that to enhance the relationship and increase the likelihood of a sale. Amazon pioneered this trend with its cross-selling engine that makes suggestions based on previous purchases. Many would argue that your relationship with Amazon is stronger and more enriching than most offline relationships.

✓ Mass Customization

CRM and customer data can also be used to provide a highly customized user experience. Information about a customer stored in a CRM system or customer database can be enhanced by asking the customer for their input regarding interests, preferences and hobbies. This aggregate data can be used to customize the individual's homepage, email relevant offers and enhance the customer's experience by delivering only information the customer is likely to enjoy. The result is less clutter for the individual and more highly targeted marketing opportunities for the company.

✓ Exception Service

Regardless how effectively a company embraces online customer service tools, there will still be some customers, and some circumstances, that require individual customer service. For many smaller companies, these may be handled in-house, during normal business hours. For larger organizations, this may involve a call center that can respond 24/7. Regardless the platform, exception service demands that the interaction be highly personalized, efficient and simple.

5.6 Challenges in E-Business:

1. Implementing a content marketing strategy.

- ✓ Although content marketing has been a buzzword in recent years, not many online businesses know how to implement it effectively. In fact, only [42 percent](#) of B2B marketers believe they are effective with their content marketing efforts.
- ✓ Content marketing includes a variety of tactics such as social media, blogging, e-newsletters, videos, mobile content, and so much more. In order to be at effective content marketing, e-commerce businesses must understand which tactics work best for them, their customers, and brand.

2. Building trust through your website.

- ✓ Especially for e-commerce businesses, your website is the very first impression customers have of your product. If you have a poorly designed website, there's a high chance you'll lose traffic and even customers.
- ✓ To build trust through your website, make sure it's easy to navigate, include contact information, create a clean layout, and provide clear descriptions of your product. These basic design elements will drastically increase the trust between your website and your customers.
- ✓ In addition to website design, you should also focus on how you build trust with you customers. [Google recently updated its quality ranking guide](#), which emphasises the concept of E-A-T (Expertise, Authority, and Trustworthiness). This concept helps businesses make sure they're creating content that positions their brand as a trusting expert in their industry.

3. Using big data to gain insights on customers.

- ✓ Big data is a growing trend in e-commerce and online marketing. Big data enables businesses to gather insights about their customers through monitoring their purchasing habits and decisions.

- ✓ By using big data, businesses can focus more on customization and personalization for their customers' shopping experience. This can be done by tracking customer browsing patterns and monitoring loyalty programs.
- ✓ Big data is also very beneficial for creating sales forecasts. E-commerce businesses should pay attention to sales, website performance, and customer behaviors to determine what they need to improve in the future.

4. Integrating mobile into your website.

- ✓ [Research shows](#) mobile shopping accounts for nearly one-fourth of online purchases. Last year, mobile commerce sales reached [\\$4.7 billion](#) in the second quarter.
- ✓ Although mobile commerce is growing, there are not enough online retailers who are adapting to these trends. For those who fail to optimize their shopping experience, they will fall behind in online sales.
- ✓ To attract customers and increase sales, e-commerce businesses must continue optimizing their shopping experience for the mobile web. This means your business must ensure your website is optimized for mobile devices and even launch a mobile application for your store. These tactics will improve the shopping experience for your customers and increase sales.
- ✓ Every e-commerce business has its unique challenges, however, these are some many face. By taking note of these challenges, even the smallest online business can become successful and continue to grow in the upcoming years.

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5.7 Difference between E-Business & E-Commerce:



| <i>ECommerce</i> | <i>EBusiness</i> |
|--|---|
| Ecommerce involves commercial transactions done over internet. | Ebusiness is conduct of business processes on the internet. |
| Ecommerce is subset of Ebusiness. | Ebusiness is superset of Ecommerce. |
| Ecommerce is use of electronic transmission medium that caters for buying and selling of products and services. | In addition, Ebusiness also includes the exchange of information directly related to buying and selling of products. |
| Thus, Those activities which essentially involve monetary transactions are termed as “e-commerce”. | In addition it includes activities like procurement of raw materials or goods, customer education, looking for suppliers etc. |
| Ecommerce usually requires the use of just a Website . | Ebusiness involves the use of CRM’s , ERP’s that connect different business processes. |
| Ecommerce covers outward facing | E-business covers internal processes such as |

| | |
|---|--|
| processes that touch customers,suppliers and external partners. | production, inventory management, product development, risk management, finance etc. |
| Ecommerce just involves Buying and selling of products and services. | Ebusiness includes all kinds of pre-sale and post-sale efforts. |
| Ecommerce is narrower concept and restricted to buying and selling. | It is a broader concept that involves market surveying, supply chain and logistic management and using Datamining. |
| It is more appropriate in B2C context. | It is used in the context of B2B transactions. |
| Ecommerce involves the mandatory use of internet . | Ebusiness can involve the use of internet, intranet or extranet . |
| Example- Buying of pendrive from Amazon.com is considered Ecommerce. | Example- Using of Internet by Dell, Amazon for maintaing business processes like Online customer support, email marketing, suplly chain management. |



Module 6: DEVELOPING E-BUSINESS MODELS

6.1 E-Business Models

➤ E-Business Models are of the following types:

• B2C

- ✓ The business-to-consumer, or B2C, model of e-business sells products directly to retail consumers online.
- ✓ Amazon.com is an example of a B2C model. The e-business has only an online identity through which it offers a range of products to customers.
- ✓ Other B2C enterprises include bestbookbuys.com and gartner.com. Most B2C models generate revenue from direct sales and processing fees. B2C also is known as electronic retail or e-tail.

• B2B

- ✓ The business-to-business, or B2B, model involves companies using the Internet to conduct transactions with one other.
- ✓ B2B e-business accounts for more than 90 percent of all electronic commerce, according to the U.S. Census Bureau. The main reason for this is the complexity of B2B transactions.
- ✓ Unlike B2C transactions that involve sellers offering products and services and buyers purchasing them, B2B transactions are multifaceted and often involve multiple transactions at each step of the supply chain.
- ✓ B2B businesses generate revenue from direct sales.

• C2B

- ✓ Consumer-to-business, or C2B, is a unique e-business model in which consumers create value and demand for products.
- ✓ Reverse auctions are a common characteristic of C2B models, in which consumers drive transactions and offer their own prices for products.
- ✓ The airline ticket website Priceline.com is an example of a C2B e-business model. The website allows customers to bid for tickets and offer their own prices.

- ✓ Shopping sites such as cheap.com, gilt.com and ruelala.com also are C2B.

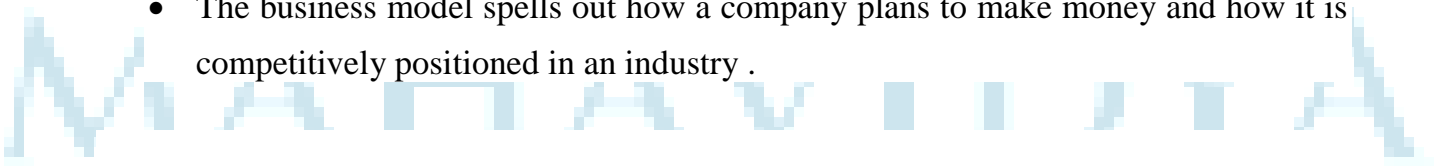
- **C2C**

- ✓ Consumer-to-consumer, or C2C, e-business models enable consumers to behave as buyers and sellers in third-party-facilitated online marketplaces.
- ✓ Craigslist is an example of a third-party marketplace. The company brings together disparate buyers and sellers to conduct business.
- ✓ Other examples of C2C websites include eBay and PayPal. A C2C model generates revenues in several ways, including personal ad fees, membership or subscription fees, sales commissions and transaction fees.

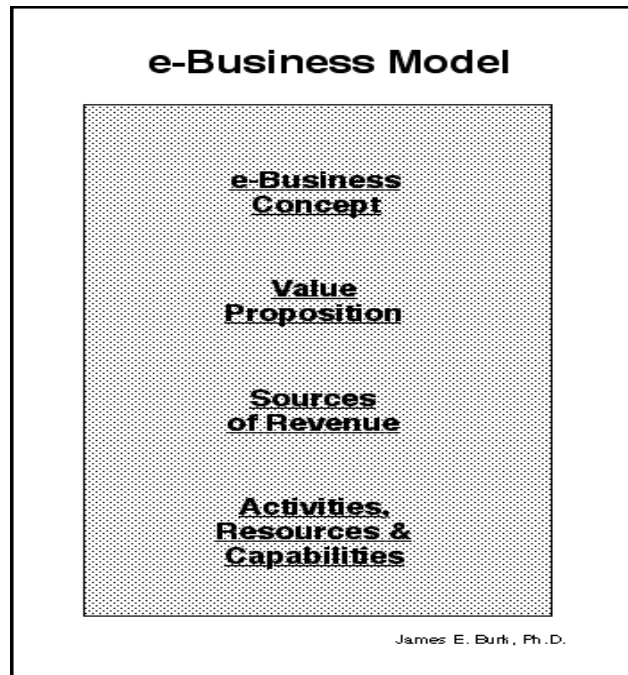


➤ **6.2 E-Business Model/Structure**

- An e-business model is simply the approach a company takes to become a profitable business on the Internet.
- There are many buzzwords that define aspects of electronic business, and there are subgroups as well, such as content providers, auction sites and pure-play Internet retailers in the business-to-consumer space.
- The business model spells out how a company plans to make money and how it is competitively positioned in an industry .



A Typical E-Business Model/Structure



- **E-Business Concept**

- ✓ The *e-business concept* describes the rationale of the business, its goals and vision, and products or offerings from which it will earn revenue. A successful concept is based on a market analysis that identifies customers likely to purchase the product and how much they are willing to pay for it.

- ✓ **Goals And Objectives**

- The e-Business concept should be based, in part, on **goals** such as "become a major car seller, bank, or other commercial enterprise", and "to become a competitor to some of the well-known firms in each of these industries."
- Objectives are more specific and measurable, such as "capture 10% of the market", or "have \$100 million in revenues in five years."
- Whether these goals and objectives are realistic or not, and whether the company is prepared to achieve these goals is addressed in the **business plan** process for startup firms and in the **implementation plan** for an existing firm that is considering a significant change.
- In looking at the business model it is sufficient to know what the goals and objectives are, and whether they are being pursued.

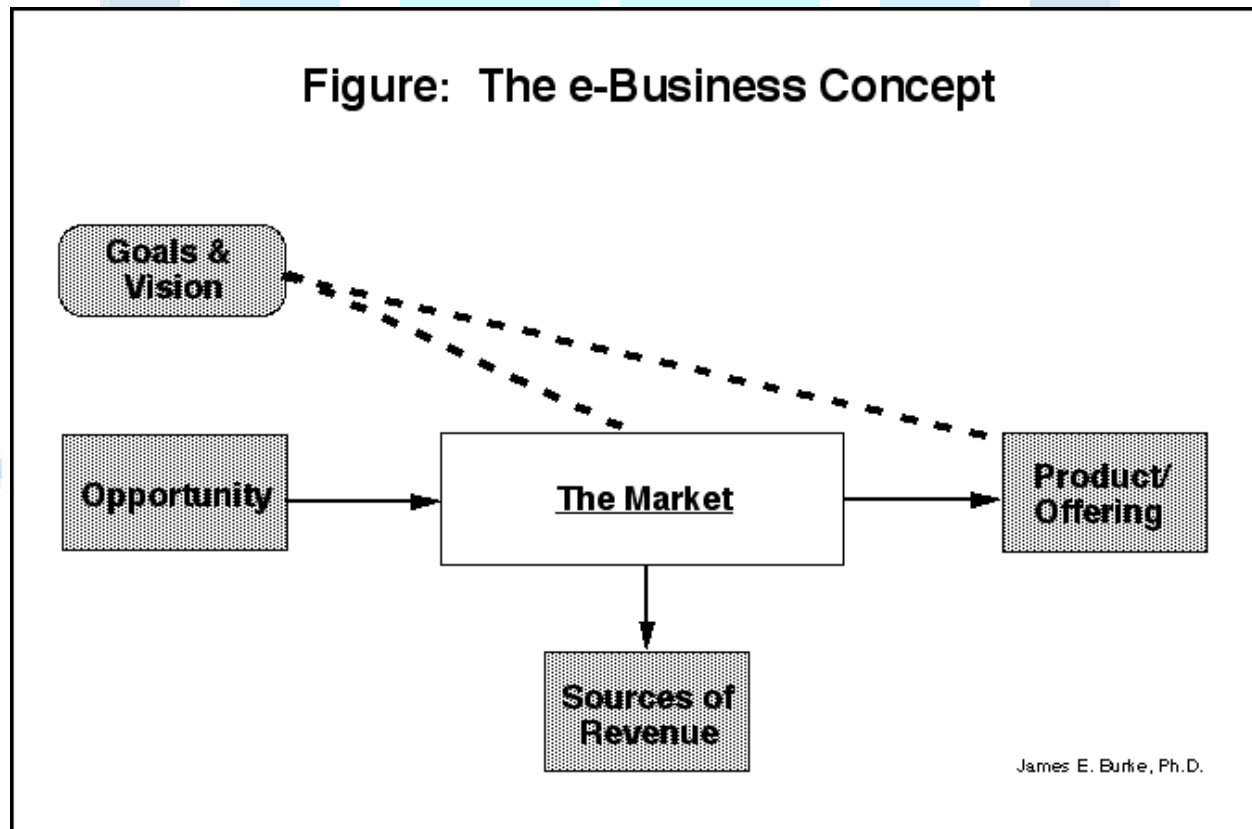
✓ **Corporate Strategies**

- Embedded in the e-Business concept are strategies that describe how the business concept will be implemented.
- These are known as *corporate strategies* because they establish how the business is intended to function.
- These strategies can be modified to improve the performance of the business.
- Environmental strategies, discussed in a following section, describe how the company will address external environmental factors, over which it has no control.

✓ **The E-Business Concept And Market Research**

- The selection and refinement of the business concept should be integrally tied into knowledge of the market it serves.
- In performing **market research** care must be taken to account for the global reach of the Internet for both customers and competitors.
- It is also important to remember that markets shift, and can shift rapidly under certain conditions. But most important is to truly understand what the market is, who comprises it, and what do they want.

Figure: The E-Business Concept



- **Value Proposition**

- ✓ The *value proposition* describes the value that the company will provide to its customers and, sometimes, to others as well.
- ✓ With a value proposition the company attempts to offer better value than competitors so that the buyer will benefit most with this product.

A value proposition may include one or more of the following points:

- Reduced price
- Improved service or convenience such as the "1 click" checkout
- Speed of delivery and assistance
- Products that lead to increased efficiency and productivity
- Access to a large and available inventory that presents options for the buyer

Providing value in an e-business uses the same approach as providing value in any business, although it may require different capabilities. But common to both are the customers who seek out value in a business transaction. The value proposition helps focus the business on the well-being of the customer, where it remains in successful companies.

- **Sources Of Revenue**

Depending on the business model, several revenue sources may be available to an e-business.

Many online businesses will have a three or four of these sources. A mix of revenue sources is often referred to as a *revenue model* but may be mistakenly called a business model. Some of these sources of revenue are:

- Advertising
- Affiliation
- Agent commissions
- Licensing
- Sales commissions
- Sales profits
- Sponsorship
- Subscription
- Syndication
- Use Fees

For large public-private or government projects revenue sources might also include:

- Bonds, usually for large capital expenditures
- Taxes, primarily income, property and sales taxes
- Use fees and tolls

With small fast-growing companies such as e-Business startups, investors often track expected revenues and revenue growth and may make changes to increase revenue. However, after the **Dot-Com** boom ended, more traditional measures such as cash flow and earnings have come back into favor as means of evaluation.

Activities, Resources And Capabilities

- The activities, resources and capabilities of a business are sometimes known as its requirements.
- In order to perform the activities required to carry out the **mission** of the business, certain resources are needed; for example, employees with certain skills, or capabilities, are needed to perform activities correctly and efficiently.
- Also, inventions, processes and other **intellectual property** may add to the individual knowledge of an employee to develop a competence in the performance of the required activities.

Activities

- Activities are specific business processes or groups of processes such as design, production and sales that implement the business concept. The operational business model identifies the costs and outputs of each activity.
- Activities drive the need for resources. Existing activities should be carefully scrutinized in order to conserve resources and reduce costs. Activities left over from previous initiatives, but not currently necessary should be curtailed. This may sound elementary but businesses start many activities over time, especially if its business concept changes. But one doesn't often hear of a large business curtailing its activities in order to focus on its current mission.
- Also, proposed activities should be carefully reviewed before a commitment is made to develop them. Not only should they be aligned with the goals of the organization and contribute to offerings in demand in the market, but the required resources and capabilities should be considered. The implementation of some activities, such as production or manufacturing, have high costs that must be incurred before a product can be sold and revenues begin to flow.

Resources

- In order to perform activities an organization requires human, tangible, intangible and supporting resources. Human resources, in particular the skills and knowledge of employees are important, as are the programs (e.g. incentives, training) and institutions that support them. Of related importance is the "corporate culture" that shapes how employees work together and which may also be instrumental in determining how a company works with its partners, or whether a merger between two companies can be successful.
- Tangible, or physical and financial, resources include facilities, equipment, and cash reserves. Intangible resources include intellectual property, business processes that can be

patented, brands, customer profiles and personalization data in databases, and customized software. Supporting systems include organizational structure, information systems or communications processes that may have little value as stand-alone resources.

Capacity

- The total resources of the organization represent its *capacity*. When resources are underutilized, the company has resources that aren't used, or *idle capacity*. Idle capacity in manufacturing tends to be measured in terms of additional output that could be produced. In service organizations the measure for idle capacity is usually a number of employees. Resource capacity can also be measured in job-hours, machine-hours, sales per employee, or square feet. Often these are compared with industry standards to assess the efficiency of the organization.
- Resources may also be misallocated. Processes may be successively introduced over time that result in an overall inefficiency. This may be a significant potential problem in e-Business since activities are accumulated based on market demand and there are few if any other companies available for a comparison.
- Capacity also represents a constraint to growth. Demand for product or services may exceed capacity and managers may take a variety of steps to temporarily resolve the problem: overtime for existing employees, additional shifts to increase the utilization of equipment, contracting to outside entities, even competitors! For example, a software company may outsource code writing, which is standard fare - almost a routine activity, in order to increase its design capacity. Of importance here is to be able to distinguish between real growth in demand versus periodic spikes in activity, which frequently occur in some industries such as printing. Real growth would merit the expansion of capacity. However, this should take place only after careful analyses of the current and future market, relevant technologies, and resource and financial requirements. And it should be executed based on an implementation plan.

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MODULE 7:E-Business Strategies

STRATEGIC PLANNING PROCESS :

➤ E-business Strategic Planning

- *Developing an e-business requires extensive research and planning in order to be successful in cyberspace. This planning involves the development of a solid and concise business plan, and a focused marketing plan well before a website is created. An e-business plan must have clearly defined goals as it is difficult for any business organization to stay on track if there are no goals in place for guidance.*
- Developing an e-business requires extensive research and planning in order to be successful in cyberspace. This planning involves the development of a solid and concise business plan, and a focused marketing plan well before a website is created. An e-business plan must have clearly defined goals as it is difficult for any business organization to stay on track if there are no goals in place for guidance.
- Strategic planning determines where an organization is headed over the next year or more, how it's going to get there and how it will know if the results are successful. There are a variety of perspectives, models and approaches used in strategic planning. The way that a strategic plan is developed is dependent on the nature of the organization's leadership, culture of the organization, size of the organization, complexity of the organization's environment and expertise of planners. Goals-based planning is perhaps the most common strategic planning model and begins with focus on the organization's mission and vision and strategies to achieve these goals.
- **Vision and Mission Statements**
A successful organization understands that it takes more than a good plan to succeed in business. It takes an empowered organization with impassioned leadership, focused on realistic goals. It takes vision, consensus and a sense of purpose. According to Jack Welch, previous Chairman for General Electric, "Good business leaders create a vision, articulate the vision, passionately own the vision, and relentlessly drive it to completion." The vision statement describes what the leaders of an organization want it to look like in ideal terms in the future - the results they seek to achieve and characteristics needed to possess in order to achieve those results. The strategic vision statement provides direction and motivation for organizational goal setting.

A mission statement is an organization's declaration of its principles, purposes, and objectives that can be used to initiate, evaluate, and refine all life activities. It is an enduring statement of purpose for an organization that identifies the scope of its operations in product and market terms, and reflects its values and priorities. Every company no matter how big or small, needs a mission statement as a source of direction,

a kind of compass, that lets its employees, its customers, and even its stockholders know what it stands for and where it's headed. A mission statement gives everyone the opportunity to know what the organization is about.

- **Environmental Analysis**

Environmental analysis plays a central role in strategic management. For a company to gain or maintain a sustainable competitive advantage in the e-commerce marketplace, it must be ever attentive, watching and preparing for shifts in the business environment and must be prepared to alter its strategies and plans when the need arises. Companies conduct environmental analysis to identify market opportunities and threats and also to anticipate changes in highly complex and dynamic environments. By anticipating changes accurately, companies can gain competitive advantage through quick action. Environmental analysis assesses current environmental circumstances and projects, forecasts, and monitors their future situation. According to eSocrates.com, a knowledge, management and eLearning company, Environmental analysis also helps the firm to position itself in a continually evolving environment by matching its characteristics to the environment's demands.

- **Competitive Factors**

In formulating an e-business strategy, a company must consider the strategies of their competitors. A competitive analysis allows them to identify the competition within the same market in order to analyze their strengths and weaknesses. This will help a company develop strategies that will provide them with a definite advantage and barriers that can be established in order to prevent competition from taking over the market. A competitive analysis can also identify any weaknesses that can be improved within the business development cycle.

- **Economic Factors**

The economic environment consists of factors that affect consumer purchasing power and spending patterns. The environment in which an organization operates is very much determined by macro-economic factors. A recession can dramatically reduce total income and expenditure levels in the economy, in turn affecting consumer demand. Higher taxes, interest rates and inflation similarly serve as disincentives to consumer confidence (and therefore spending), while economic growth and prosperity can generate spending and an overall "feel-good factor." The importance of the economic environment - the broad trends in employment, inflation and growth that shape regions, nations and the world - to the growth of e-business in the U.S. should not be underestimated.

- **Social / Demographic Factors**

Demography is the study of human populations in terms of size, density, location, age, ethnicity, income, occupation and other statistics, as well as those variables bringing about change in that population. The demographic environment consists of the customers who form the marketplace. These customers may be demographic environment shifts as

customers enter the market, mature, and leave the market.

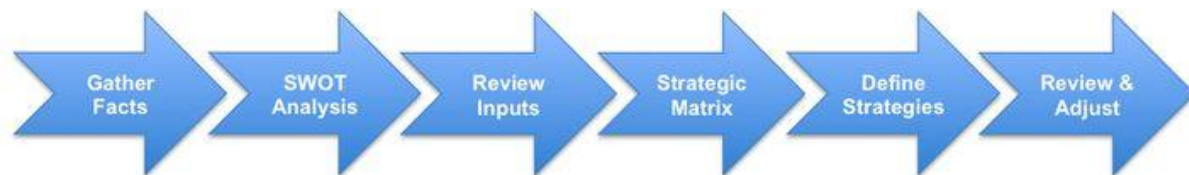
As the consumer's level of comfort with online functions such as e-mail and research continues to increase, so too will their level of participation in e-commerce. A growing online consumer base, increases in new product categories, and efforts by online retailers to optimize online shopping experiences will spark significant growth in e-commerce in years to come.

- **Long Term Objectives**

One of the key purposes of a comprehensive planning process is to establish a set of long-term objectives and recommend a series of strategies and policies to ensure that these goals are attained in the most effective way. The established goals combined represent an organization's vision or desire for a future condition that will enhance its overall image and quality of life. It is important to understand that these objectives serve as the backbone of the strategic plan. That means that any planning element included in this plan should function as reinforcement to these objectives.

The achievements of an organization are based on the combined efforts of each individual within the organization working toward common objectives. These objectives should be practical, should be clearly understood by everyone within the organization and should mirror the organization's basic personality and character.

Strategic Plan Process



Gather Inputs

- From all Stakeholders
- Customer analysis
- Competitor analysis
- Industry analysis
- Environmental
- Company performance
- Company strategies

SWOT Analysis

- External Analysis
 - Opportunities
 - Threats
- Internal Analysis
 - Strengths
 - Weaknesses
- Strategic Questions
- Strategic Issues

Review Inputs

- All Stakeholders
- Review Inputs
- Review SWOT Analysis
- Define 3-4 key statements

Strategic Matrix

- All Stakeholders
- Define Strategies to address SWOT combinations:
 - Opportunities vs Strengths
 - Opportunities vs Weaknesses
 - Threats vs Strengths
 - Threats vs Weaknesses

Define Strategies

- Objectives
- Key Strategies
- Short and Long Term Goals
- Operational Plans

Final Reviews

- All Stakeholders
- Review Strategies
- Review Goals
- Review Plans
- Adjust as necessary

- Explain SCM, CRM & ERP Procurement in detail

SCM:

A Supply Chain Management (SCM) system is an application system for planning, optimizing and controlling of volumes, due dates and capacities along the whole Supply Chain.¹⁾

The term Supply Chain Management can also be used as a synonym for Operations Management.²⁾

SCM systems illustrate the processes within a company as well as processes between different companies along the supply chain. Thereby processes of the company and processes of suppliers, distributors, logistic service providers and customers could be monitored. Moreover, with planning scenarios bottlenecks within the supply chain could be identified early.³⁾

An important pre-condition for a successful application of SCM tools are interfaces to the existing Enterprise Resource Planning (ERP) and Production Planning and Control (PPC) systems. SCM tools source master and transaction data from external ERP systems, process them and return the results to the external systems.

Benefits of SCM Systems

- Improvement of delivery dependability and customer orientation
- Reduction of stocks
- Cost reduction within the procurement, production and distribution network
- Decrease of processing time⁵⁾
- Avoidance of the bullwhip-effect

Types of SCM Systems

The SCM market could be classified into five categories:

1. Integrated SCM and eBusiness Suites:

Software vendors who started with “Advanced Planning & Scheduling Functionalities” and developed their modular products to almost complete SCM tool suites. Vendors: e.g. i2 Technologies, Manugistics and SAP.

2. Specialized SCM-Suites:

These software suites offer specialized solutions in different fields of task scheduling. These solutions are less extensive than those of the first category. Vendors: e.g. Adexa, Aspentech and DynaSys.

3. Functional Extended ERP Systems:

Vendors of this category develop SCM functionalities as an extension of their Production Planning and Control (PPC) and Enterprise Resource Planning (ERP) systems but their core business are still traditional systems. Vendors: e.g. Infor Global Solutions and Oracle.

4. Niche Vendors:

These software solutions are customized for special subtasks of SCM or for particular target groups. The vendors don't offer complete SCM systems or tool suites. Vendors: e.g. flexis and SupplySolutions.

5. Chain Execution-Suites/-Software:

This category contains vendors whose software solutions enable and support the management, execution and controlling of supply chain activities. Vendors: e.g. Descartes.⁶⁾



Use of SCM Systems in eCommerce

eCommerce is the electronic trade with goods and services.⁷⁾ eCommerce means an electronic integration of processes across companies using information- and communication technologies in order to eliminate media disruptions.⁸⁾ In eCommerce business processes and information transfers are conducted electronically in order to improve the efficiency of processes and to accelerate them.⁹⁾ For instance, Chain Execution-Suites/-Software is an efficient support for eCommerce solutions.¹⁰⁾

CRM:

What is CRM? How can it affect on e-business?

The market had changed very dramatically during these past decades and we are now reaching to the consumer power era. Couple decades ago, customers will not mind to purchase any car as long as it had four wheels and could operate well. In this era, however, customers have hundreds to thousands choices of vehicles available in market varying in models, quality, color and price. Customers therefore possess the more powerful position in the market today.

“CRM (Customer Relationship Management) is an approach that recognizes that customers are the core of the business and that the company’s success depends on effectively managing relationships with them” ^[1].

CRM perceives customers as an important asset of the organization and maintaining customer relationship is the core process of a business. A business that succeeded in retaining its customers is five

times more profitable on average^[2]. Some techniques for maintaining good relationship with customers are recommended below.

A good website design

What will be more frustrating to a customer other than complicated, un-user friendly websites? A customer may arrive to your website directed by search engines or led by links from other websites. Once customers disappointed with your site and could not find what they were expecting for, it is very likely that they will not return again in the future. For more information on how to design a good website, please refer to What makes a good website.

Permission marketing

To build a good relationship with customers, it is recommended that we should firstly ask for their permission before we offer more information about our products. One good example is by using opt-in email. In opt-in email, interested customers give permission to the company before the company sends them emails consisting information on certain products.

Database marketing

Every customer likes to feel being respected or valued by the organization. This kind of service can be provided by e-business by using a technology called database marketing. In database marketing, the company collects data from customers and profiled them under the company's database^[2]. This information will then be used for building a good relationship with customers. For example, Amazon.com uses its customer profile to recommend books that are considered suitable for its customers. The recommendations are made based on the information provided by its customers suggesting what their book preferences are.



Online community^[3]

Relationship is a two way communications^[2], customers like to be heard as much as they have heard from the company. Online community, such as web blog or forums, allows customer to freely share their

opinions and suggestions that are very critical for business improvement. When customers feel being heard and respected, they will be more likely to return to your site again in the future.

ERP:

ERP is short for *enterpriseresource planning*.

Enterprise resource planning (ERP) is business processmanagement software that allows an organization to use a system of integrated applications to manage the business and automate many back office functions related to technology, services and human resources. ERP software integrates all facets of an operation, including product planning, development, manufacturing, sales and marketing.

ERP software is considered an enterprise application as it is designed to be used by larger businesses and often requires dedicated teams to customize and analyze the data and to handle upgrades and deployment. In contrast, Small business ERP applications are lightweight business management software solutions, customized for the business industry you work in.



ERP Software Modules

ERP software typically consists of multiple enterprise software modules that are individually purchased, based on what best meets the specific needs and technical capabilities of the organization. Each ERP module is focused on one area of business processes, such as product development or marketing. A business can use ERP software to manage back-office activities and tasks including the following:

Distribution process management, supply chain management, services knowledge base, configure, prices, improve accuracy of financial data, facilitate better project planning, automate employee life-cycle, standardize critical business procedures, reduce redundant tasks, assess business needs, accounting and financial applications, lower purchasing costs, manage human resources and payroll.

Some of the most common ERP modules include those for product planning, material purchasing, inventory control, distribution, accounting, marketing, finance and HR.

As the ERP methodology has become more popular, software applications have emerged to help business managers implement ERP in to other business activities and may incorporate modules for CRM and business intelligence, presenting it as a single unified package.

The basic goal of using an enterprise resource planning system is to provide one central repository for all information that is shared by all the various ERP facets to improve the flow of data across the organization.

Top ERP Trends

The ERP field can be slow to change, but the last couple of years have unleashed forces which are fundamentally shifting the entire area. According to Enterprise Apps Today, the following new and continuing trends affect enterprise ERP software:

1. Mobile ERP

Executives and employees want real-time access to information, regardless of where they are. It is expected that businesses will embrace mobile ERP for the reports, dashboards and to conduct key business processes.

2. Cloud ERP

The cloud has been advancing steadily into the enterprise for some time, but many ERP users have been reluctant to place data cloud. Those reservations have gradually been evaporating, however, as the advantages of the cloud become apparent.

3. Social ERP

There has been much hype around social media and how important – or not -- it is to add to ERP systems. Certainly, vendors have been quick to seize the initiative, adding social media packages to their ERP systems with much fanfare. But some wonder if there is really much gain to be had by integrating social media with ERP.

4. Two-tier ERP

Enterprises once attempted to build an all-encompassing ERP system to take care of every aspect of organizational systems. But some expensive failures have gradually brought about a change in strategy – adopting two tiers of ERP.

ERP Vendors

Depending on your organization's size and needs there are a number of enterprise resource planning software vendors to choose from in the large enterprise, mid-market and the small business ERP market.

Large Enterprise ERP (ERP Tier I)

- The ERP market for large enterprises is dominated by three companies: SAP, Oracle and Microsoft. (Source: [EnterpriseAppsToday](#); Enterprise ERP Buyer's Guide: SAP, Oracle and Microsoft; Drew Robb)

Mid Market ERP (ERP Tier II)

- For the midmarket vendors include Infor, QAD, Lawson, Epicor, Sage and IFS. (Source: [EnterpriseAppsToday](#); Midmarket ERP Buyer's Guide; Drew Robb)

Small Business ERP (ERP Tier III)

- Exact Globe, Syspro, NetSuite, Visibility, Consona, CDC Software and Activant Solutions round out the ERP vendors for small businesses. (Source: [EnterpriseAppsToday](#); ERP Buyer's Guide for Small Businesses; Drew Robb)



MAHAVIDYA

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