Unit-4

Building E-Commerce System

Unit 4: Building E-commerce System (5 Hrs.) E-commerce Website/Software, Building Catalogs: Static, Dynamic, Building Shopping Cart, Transaction Processing, Development of E-commerce Website/Software: Databases, Application Programs, Integration with ERP Systems, Integration with Payment Gateways, Using Open Source CMS for Development of E-commerce Applications

(170, 174)

E-commerce Website/Software:

Ecommerce website/software is an online tool that drives all online store processes, helping owners manage inventory, add or remove products, process payments, compute taxes, and fulfill orders etc. It offers all the things needed to run a retail site, effectively simplifying online store management.

Trends of e-commerce website change over time. There are certain elements that every ecommerce site should have to stay relevant and competitive. A better website must have the following features:

- **User friendly**: Follow the KISS principle. The most important characteristics of a website is ease of use. It doesn't matter if you have millions of products and pages as long as it is kept simple.
- **Mobile friendly & responsive**: About 50% of online transaction occur through smart phones.
- **Dynamic product search/ Advance product filter.**
- **360 product preview**.
- **Compare products**
- **High resolution graphics (photos and videos)**
- **User generated reviews and ratings:** Even negative reviews are important. Depending on website functionality, ecommerce sites can use plugins from the most popular review platforms including Yelp, Foursquare, and Facebook.
- **Special offers**
- **SEO friendly**
- **Wish list/bookmarking for products/categories**
- **Find in store (brick & click)**
- **Related items**
- **Frequently asked questions (FAQ):** Complex purchases require confidence
- **Security** (SSL, two way authentication, firewall, privacy policy)
- **Advanced payment system**
- **Detailed shipping information**
- **Ease of contact**
- **Return policy**

Building Catalog:

A company that wants to sell products on the Web must have a list, or online catalog, of its products, available on its Web site. Product catalog includes the product details and description using text and

graphics. A better product catalog is the key to success in e-commerce. Merchant server software typically includes a database capability that will allow for construction of a customized online catalog. The complexity and sophistication of the catalog will vary depending on the size of the company and its product lines. Small companies, or companies with small product lines, may post a simple list with text descriptions and perhaps color photos. Larger site might decide to add sound, animations, or videos (useful for product demonstrations) to the catalog, or interactivity, such as customer service representatives available via instant messaging to answer questions.

Product catalog can be of two types:

- Static product catalog
- Dynamic product catalog

A static product catalog includes conventional details of the product. Such details include the information about:

- Title of the product
- Brand/manufacturer
- Area served
- Simple description
- Image of the product
- Cost
- Offer etc.

A preferred type of product catalog is a dynamic one. A dynamic product catalog includes auto-generated contents along with the static content. It also reflects the customer behavior analysis. Such dynamic content includes:

- User ratings
- User reviews
- Past sales records including total purchases etc.
- It reflects customer purchase behavior
- The product catalog can be shared in social platforms
- Catalog is interactive with the user
- Automatic marketing of popular products
- Helps merchant to know customer, high sales area and more

Dynamic catalog helps the customer to decide the right product based on the auto-generated content, which is also helpful for the merchants to make the business strategy.

Building Shopping Cart:

Every e-commerce website must include a shopping cart. An online shopping cart is similar to their physical equivalent. A shopping cart in an e-commerce website provides the customer a facility to collect the desired products for checkout.

A shopping in an e-commerce site may be as simple as including the list of products and a checkout button or may integrate advance features as well. Some of the features in shopping cart include:

- Check out button (to complete the purchase)
- Continue shopping (to add more products in the cart)

- Remove products from cart
- Edit the product (change product quality)
- Display the products added to cart and their total number and cost.
- Search product in the cart
- Edit the order detail etc.
- Login/signup option if user is not logged-in
- More recommended products based on users purchase behavior

Shoppers consider shopping carts as a place where they can see and place their desired products before actually paying it. They choose to purchase a product from your store. They need to determine whether the product is suitable for them or not.

A shopping cart is a medium for online store owners to maintain a customer's purchase journey and buying decision. Based on it, owners can come to know what attracts their customers and what is stopping them from buying a specific product. They can analyze many issues and propose a suitable solution for the customer.

The shopping cart must help the customer to decide their purchase with confidence.

A shopping cart in a simple language is the collection of orders ready to checkout.

Transaction Processing:

Transaction processing connected to the e-commerce site works in conjunction with the shopping cart. When the user verifies the cart and proceeds to checkout, the transaction processing starts. The transaction processing is an advance feature in e-commerce that allows customers to pay online using their card. It follows SET protocol to make the transaction more secure and reliable. Transaction procession verifies the customers credit/debit card and puts through the debit to the card and credit to the merchant's account after checkout. (You can discuss more about transaction processing, see in chapter-3).

Development of E-commerce Website:

Before we plan and actually build an e-commerce website, we need to have a vision of what to accomplish and how to do it. The vision includes not just a statement of mission, but also identification of the target audience, characterization of the market space, a strategic analysis, a marketing strategy and a development timeline. Two fundamentals of planning are the timeline and budget.

For the better web presence, one must build a better website. A better website will always tell from the homepage about the vision that inspire the website.

The first thing you need to have is the vision. Vision includes the following things:

- The statement of mission (Problem statement)
- Planning (System Development Life Cycle)

Even before starting the mission and planning, one should have clear concept about the following points regarding the business that has to be placed in the web.

- Niche
- Business and the revenue model
- Target audience

- The marketplace
- Content source
- SWOT analysis
- E-commerce presence map
- Development timeline
- Budget/cost

Once you have developed a vision of the e-commerce presence you want to build, it's time to start thinking about how to build and implement that presence. Building a successful e-commerce presence requires a keen understanding of business, technology, and social issues, as well as a systematic approach. E-commerce is just too important to be left totally to technologists and programmers.

The two most important management challenges are (1) developing a clear understanding of your business objectives and (2) knowing how to choose the right technology to achieve those objectives. The first challenge requires you to build a plan for developing your firm's presence. The second challenge requires you to understand some of the basic elements of e-commerce infrastructure. Let the business drive the technology.

Even if you decide to outsource the development effort and operation to a service provider, you will still need to have a development plan and some understanding of the basic e-commerce infrastructure issues such as cost, capability, and constraints. Without a plan and a knowledge base, you will not be able to make sound management decisions about e-commerce within your firm.

On the organizational and human resources fronts, you will have to bring together a team of individuals who possess the skill sets needed to build and manage a successful e-commerce presence. This team will make the key decisions about business objectives and strategy, technology, design, and social and information policies. The entire development effort must be closely managed if you hope to avoid the disasters that have occurred at some firms. For a better online presence, a single website is not enough. It also includes different aspects as shown in following diagram.

You will also need to make decisions about hardware, software, and telecommunications infrastructure. The demands of your customers should drive your choices of technology. Your customers will want technology that enables them to find what they want easily, view the product, purchase the product, and then receive the product from your warehouses quickly. You will also have to carefully consider design. Once you have identified the key decision areas, you will need to think about a plan for the project.

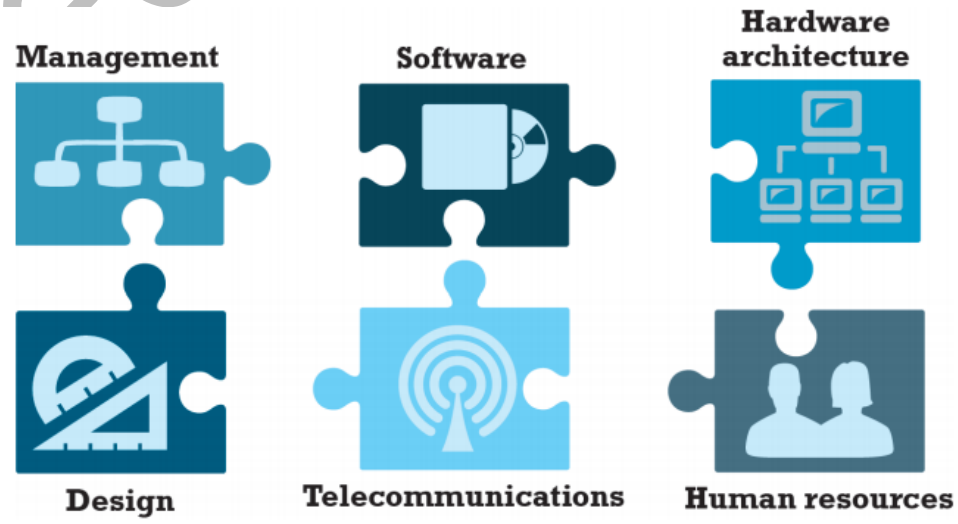

Fig: Factors to consider in developing E-commerce presence

Your second step in building an e-commerce website will be creating a plan document. In order to tackle a complex problem such as building an e-commerce site, you will have to proceed systematically through a series of steps. One methodology is the systems development life cycle. The systems development life cycle (SDLC) is a methodology for understanding the business objectives of any system and designing an appropriate solution. Adopting a life cycle methodology does not guarantee success, but it is far better than having no plan at all. The SDLC method also helps in creating documents that communicate objectives, important milestones, and the uses of resources to management.

The major steps involved in SDLC are:

- System analysis/Planning
- System Design
- Building the System
- Testing
- Implementation

Following figure illustrates the five major steps involved in the systems development life cycle for an e-commerce site:

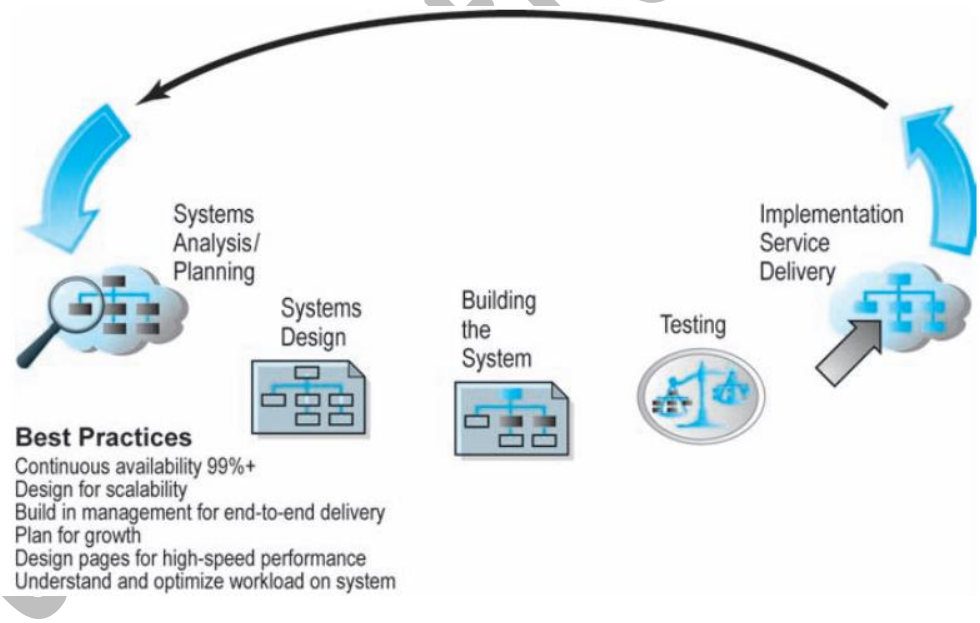

Fig: System Development Lifecycle for E-commerce website

System Analysis: n the systems analysis/planning step of the SDLC, you try to answer the question, "What do we want this e-commerce site to do for our business?" The key point is to let the business decisions drive the technology, not the reverse. This will ensure that your technology platform is aligned with your business.

The major points regarding system analysis and planning are:

- Identify the specific business objective (ie. Capabilities you want your site to have).

- Decide the system functionalities for each business objective.
- Information requirements that the functionalities must produce in order to achieve the business objectives.

You will need to provide these lists to system developers and programmers so they know what you as the manager expect them to do. Some general business objective, system functionality and information requirements are shown in the following table.

BUSINESS OBJECTIVE	SYSTEM FUNCTIONALITY	INFORMATION REQUIREMENTS
Display goods	Digital catalog	Dynamic text and graphics catalog
Provide product information (content)	Product database	Product description, stocking numbers, inventory levels
Personalize/customize product	Customer on-site tracking	Site log for every customer visit; data mining capability to identify common customer paths and appropriate responses
Engage customers in conversations	On-site blog; user forums	Software with blogging and community forum functionality
Execute a transaction	Shopping cart/payment system	Secure credit card clearing; multiple payment options
Accumulate customer information	Customer database	Name, address, phone, and e-mail for all customers; online customer registration
Provide after-sale customer support	Sales database	Customer ID, product, date, payment, shipment date
Coordinate marketing/advertising	Ad server, e-mail server, e-mail, campaign manager, ad banner manager	Site behavior log of prospects and customers linked to e-mail and banner ad campaigns
Understand marketing effectiveness	Site tracking and reporting system	Number of unique visitors, pages visited, products purchased, identified by marketing campaign
Provide production and supplier links	Inventory management system	Product and inventory levels, supplier ID and contact, order quantity data by product

System Design: Once you have identified the business objectives and system functionalities, and have developed a list of precise information requirements, you can begin to consider just how all this functionality will be delivered. You must come up with a system design specification—a description of the main components in the system and their relationship to one another. The system design can be broken down into two components; logical design and the physical design.

A logical design includes a data flow diagram that describes the flow of information at your e-commerce site, the processing functions that must be performed, and the databases that will be used. The logical design also includes a description of the security and emergency backup procedures that will be instituted, and the controls that will be used in the system.

A physical design translates the logical design into physical components. For instance, the physical design details the specific model of server to be purchased, the software to be used, the size of the telecommunications link that will be required, the way the system will be backed up and protected from outsiders, and so on.

Following diagram illustrates the general logical design and the corresponding physical design.

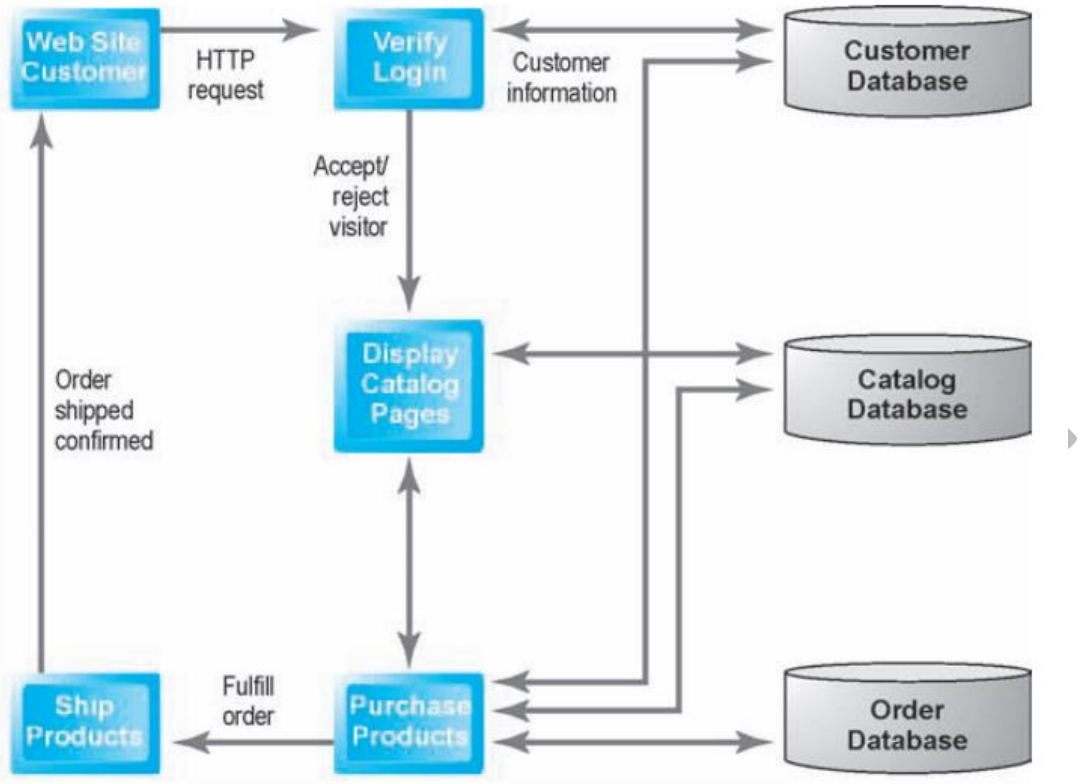

Fig: A simple logical design for an e-commerce website

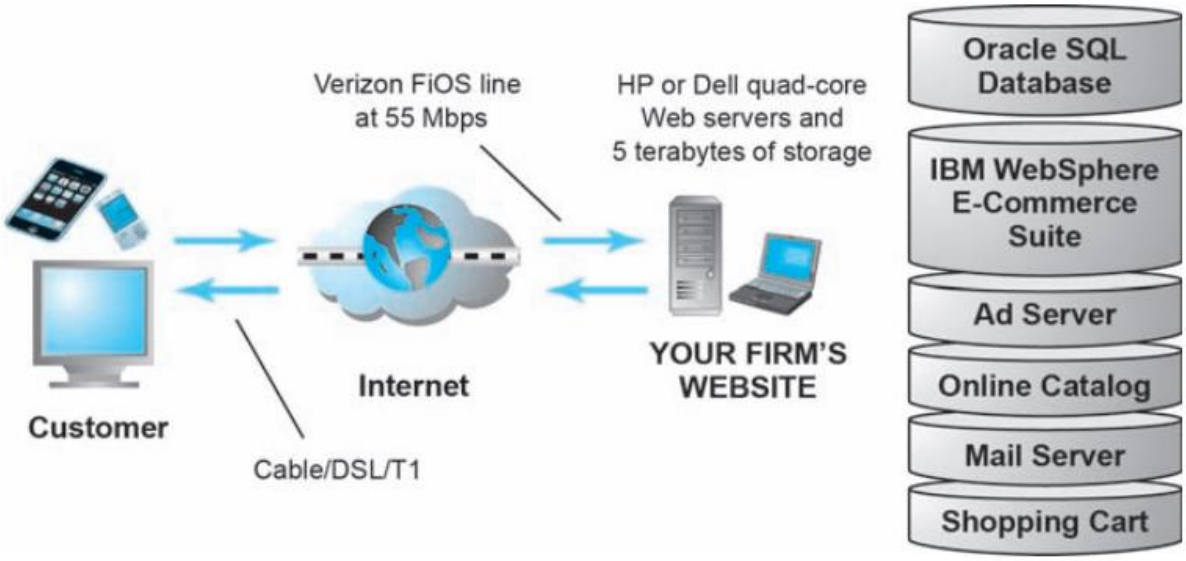

Fig: A simple physical design to realize the above logical design

Building the system: Now that you have a clear idea of both the logical and physical designs for your site, you can begin considering how to actually build the site. You have many choices on building and hosting. The choice may purely depend on the amount of money you are willing to pay.

Following are the four choices regarding the building of an e-commerce site.

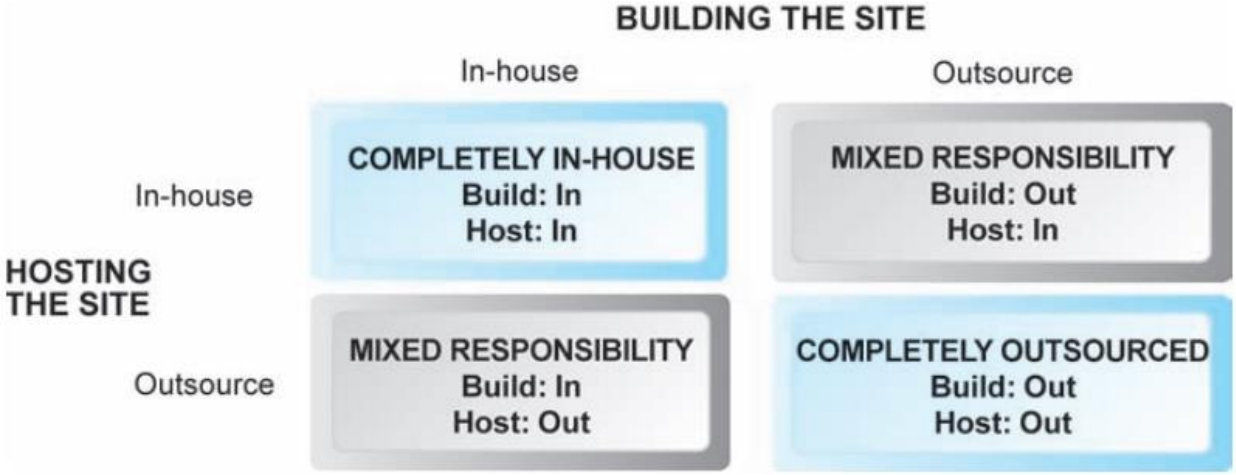

Fig: Choices on building and hosting

Following are the features of building the site in-house from scratch:

- You can build the exact system as you need.
- Cost will be less.
- Any change in the system can be made rapidly according to the changing business environment.

The features of outsource development are:

- Development time will be too short as the prebuild systems are used.
- Well tested and trusted packages can be used with confidence.
- Cost will be high because, you may have to modify the existing system in order to satisfy your business environment.

The features of in-house hosting are:

- System will be highly secure.
- Cost will be high.
- Extra manpower needed.

The features of outsourced hosting:

- Trusted systems from experienced vendors can be used.
- Cost will be very less.
- No extra hardware and manpower needed.
- No extra hazard of security and protection needed.

Testing the system: Once the system has been built and programmed, you will have to engage in a testing process. Depending on the size of the system, this could be fairly difficult and lengthy. Testing is required whether the system is outsourced or built in-house. A complex e-commerce site can have thousands of pathways through the site, each of which must be documented and then tested. It is important to note that testing is generally underbudgeted.

As much as 50% of the budget can be consumed by testing and rebuilding (usually depending on the quality of the initial design). Unit testing involves testing the site's program modules one at a time. System testing involves testing the site as a whole, in the same way a typical user would when using the site. Because there is no truly "typical" user, system testing requires that every conceivable path be tested. Final acceptance testing requires that the firm's key personnel and managers in marketing, production, sales, and general management actually use the system as installed on a test Internet or intranet server. This acceptance test verifies that the business objectives of the system as originally conceived are in fact working.

Another form of testing is called A/B testing (or split testing). This form of testing involves showing two versions (A and B) of a web page or website to different users to see which one performs better. A template test compares the same general page content using two different layouts and or design treatments. A new concept test compares a control page with one that is very different. A funnel test compares the flow through a series of pages (such as a product page, to a registration page, to shopping cart page, versus skipping the registration page) to see which one results in a higher percentage of conversions. Multivariate testing is a much more sophisticated form of testing than A/B testing. Multivariate testing involves identifying specific elements, or variables, on a web page, such as a headline, image, button and text, creating versions for each element, and then creating a unique combination of each element and version to test. So for example, if there are three elements and two versions of each, there will be eight possible combinations (2*2*2 = 8) to test. When used correctly, multivariate testing enables designers to identify the most optimal layout, color, content and format.

Implementation and maintenance: Most people unfamiliar with systems erroneously think that once an information system is installed, the process is over. In fact, while the beginning of the process is over, the operational life of a system is just beginning. Systems break down for a variety of reasons—most of them unpredictable. Therefore, they need continual checking, testing, and repair. Systems maintenance is vital, but sometimes not budgeted for. In general, the annual system maintenance cost will roughly parallel the development cost. An e-commerce site that cost €40,000 to develop is likely to require a €40,000 annual expenditure to maintain.

Why does it cost so much to maintain an e-commerce site? Unlike payroll systems, for example, e-commerce sites are always in a process of change, improvement, and correction. Studies of traditional systems maintenance have found 20% of the time.

The long-term success of an e-commerce site will depend on a dedicated team of employees (the web team) whose sole job is to monitor and adapt the site to changing market conditions. The web team must be multi-skilled; it will typically include programmers, designers, and business managers drawn from marketing, production, and sales support. One of the first tasks of the web team is to listen to customers' feedback on the site and respond to that feedback as necessary. A second task is to develop a systematic monitoring and testing plan to be followed weekly to ensure all the links are operating, prices are correct, and pages are updated. A large business may have thousands of webpages, many of them linked, that require systematic monitoring. Other important tasks of the web team include benchmarking (a process

in which the site is compared with those of competitors in terms of response speed, quality of layout, and design) and keeping the site current on pricing and promotions. The Web is a competitive environment where you can very rapidly frustrate and lose customers with a dysfunctional site.