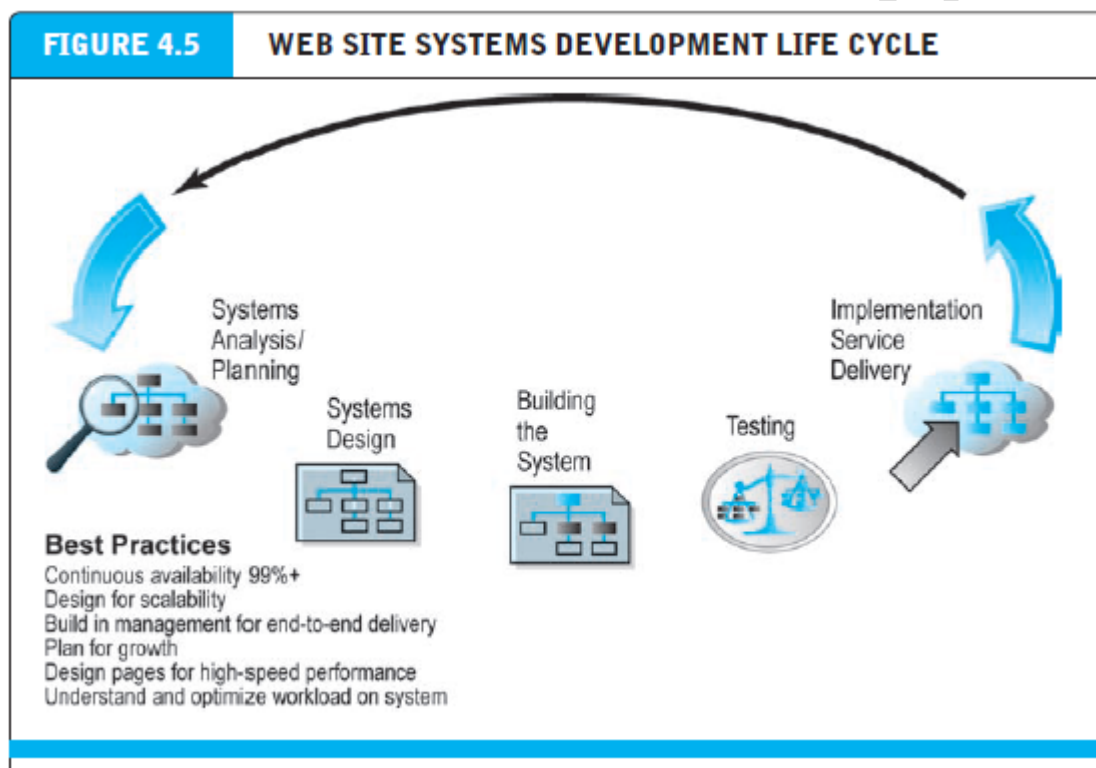


Chapter 04 Q/A for Students:

Define the systems development life cycle and discuss the various steps involved in creating an e-commerce site.

Systems development life cycle:

The systems development life cycle is a methodology for understanding the business objectives of a system and designing an appropriate solution. For building an e-commerce web site, there are five major steps:



1. **Planning/ System Analysis:** Identify the specific business objectives for the site, and then develop a list of system functionalities and information requirements.

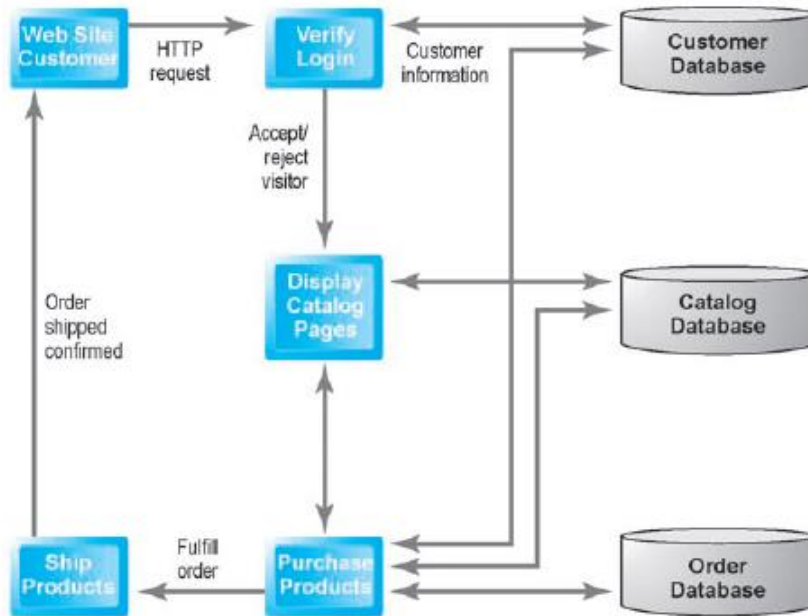
- **Business objectives** are simply capabilities you want your site to have.
- **System functionalities** are types of information systems capabilities you will need to achieve your business objectives.
- **Information Requirements** are the information elements that the system must produce in order to achieve the business objectives.

TABLE 4.2 SYSTEM ANALYSIS: BUSINESS OBJECTIVES, SYSTEM FUNCTIONALITIES, AND INFORMATION REQUIREMENTS FOR A TYPICAL E-COMMERCE SITE		
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	Software with blogging and community response 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

2. **System Design:** Develop a system design specification (both logical design and 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.

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.

FIGURE 4.6**A LOGICAL AND A PHYSICAL DESIGN FOR A SIMPLE WEB SITE****(a) Simple Data Flow Diagram.**

This data flow diagram describes the flow of information requests and responses for a simple Web site.

3. **Building the Site:** In-House or Outsourced: Build the site, either by in-house personnel or by outsourcing all or part of the responsibility to outside contractors. Developers use programming language to create interactivity, automating etc. and complete all functionalities of business objectives required by the client.

Outsourcing: Hiring an outside vendor to provide the services you cannot perform with in-house personnel.

4. **Test the system (unit testing, system testing, and regression testing).**

A complex e-commerce site can have thousands of pathways through the site, each of which must be documented and then tested.

Unit testing involves testing the site's every unit one at a time.

Example – Amazon cart, one unit.

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.

Regression Testing: Regression testing conducts rerunning all functional and non functional testing to ensure that recent changes applied to the system did not alter the previous functionalities of the system.

Why is testing important? Testing is very vital. For example, if one business object such as “the cart” at amazon.com stops working for even few minutes, Amazon will lose thousands of dollars worth of order, if not more. Thus it is imperative that testing plan is developed of each possible objects, pathways etc and continuous testing is always performed.

5. Implement and maintain the site.

After testing is completed, the site implementation is completed and the site goes live which means going public. However it is important to remember that e-commerce sites are never finished: they are always in the process of being built and rebuilt. They are dynamic.

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 maintenance.

2. Discuss the differences between a simple logical and a simple physical Web site design.

- Answered in Question 1

3. Why is system testing important? Define Unit, system and acceptance testing.

- Answered in Question 1

4. Compare the costs for system development and system maintenance. Which is more expensive, and why?

The maintenance of a site almost parallels the development of a site on a yearly basis. Since maintenance is continuous and more often, maintenance is expensive than development. There could be more development even after a site is live, but usually such developments comes on a lesser frequency than continuous maintenance. This is why maintenance is forever and more expensive than one time or occasional development.

5. What are the three main factors to consider when choosing the best hardware platform for your Web site?

Speed, capacity, and scalability are three of the most important factors when selecting an operating system, and therefore the hardware that it runs on. These 3 factors are affected by

number of simultaneous users the site expects to see, the nature of their requests, the type of information requested, and the bandwidth available to the site. Based on data collected, you can scale your hardware components vertically, horizontally or specifically your servers or processing power as needed.

6. Compare and contrast the various scaling methods, I/O-intensive vs. CPU-intensive operations.

Different types of scaling methods:

- *Vertical scaling*—improving the processing power of individual hardware component, but maintaining the same number of servers

You can scale your site vertically by upgrading the servers from single processor to multiple processors. The drawbacks are that this can become expensive with each growth cycle and that the site becomes overly dependent on just a small number of powerful machines.

- *Horizontal scaling*—employing multiple computer/servers to share the load. It is adding more of the same processing hardware.

You can scale your site horizontally by adding multiple single processor servers and balancing the load among many servers. This can be less expensive as you can use older PCs that would otherwise be discarded, but you will have to purchase special load-balancing software. The main drawbacks are that the size of the physical facility will have to increase and that there is added management complexity.

- *Improving processing architecture*—identifying operations with similar workloads and using dedicated, tuned servers for each type of load

Perhaps the best method for meeting the demands for service on your site is to improve the processing architecture of your site by splitting the workload up into I/O-intensive and CPU-intensive operations. Then you can fine-tune the servers to handle each type of workload.

I/O-intensive vs. CPU-intensive operations:

Processing HTTP requests for static sites is an I/O or input/output intensive operation, meaning that it does not require heavy-duty processing power.

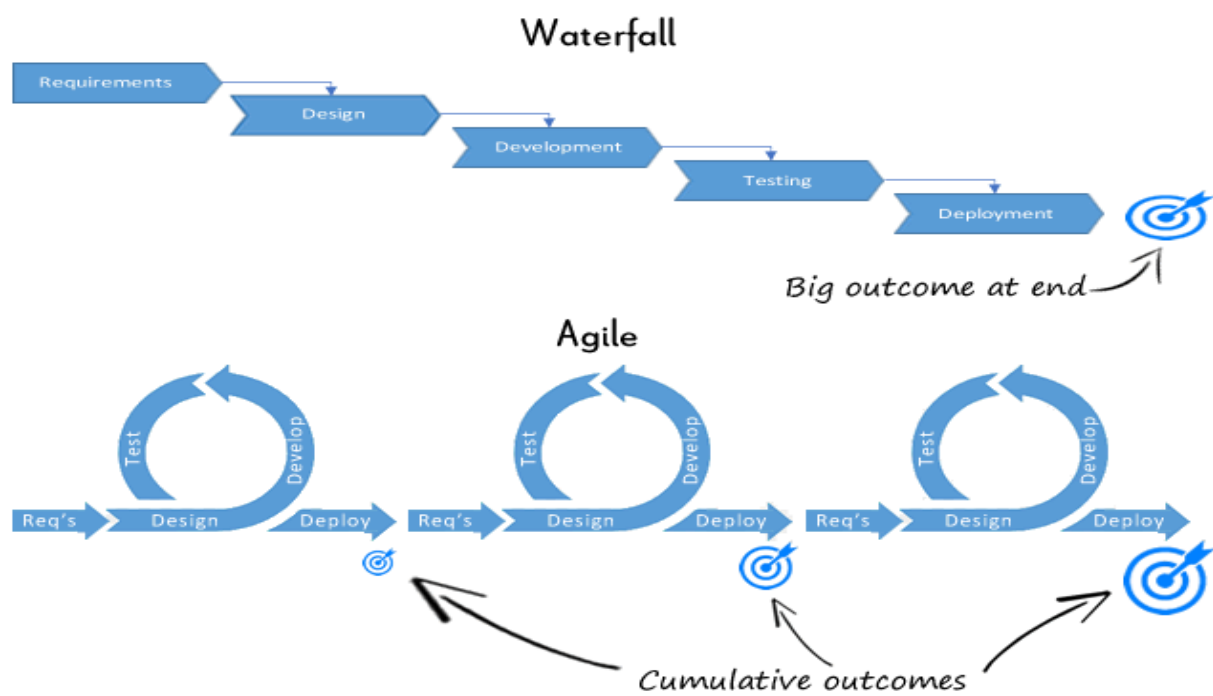
However, as customers request more advanced services such as searching the site, registering with the site, filling a shopping cart and checking out, and particularly downloading large multimedia files, much more processing power is required. If your site uses dynamic page generation and business logic, as does the shopping cart, the load on the processor increases rapidly. Any user interactions that require interfacing with a database, such as filling out forms, adding items to the shopping cart, making purchases, or filling out customer questionnaires,

require lots of processing power. These types of requests are CPU (Central Power Unit)-intensive operations, meaning that they require a great deal of processing power.

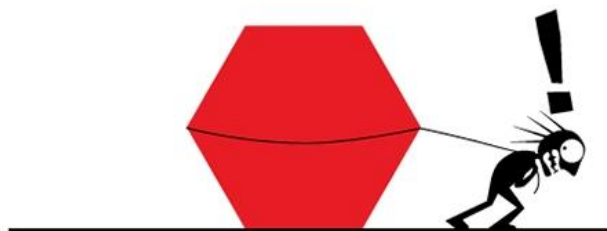
7.

Differences between Waterfall & Agile way of conducting SDLC?

The main difference between waterfall and agile methodology is that the agile methodology is more flexible and open to changes requested or updates needed. In waterfall, the SDLC process is followed one after another without the flexibility of accommodating changes. In Agile, work progresses in one spring after another, allowing flexibility while building and maintaining the site.

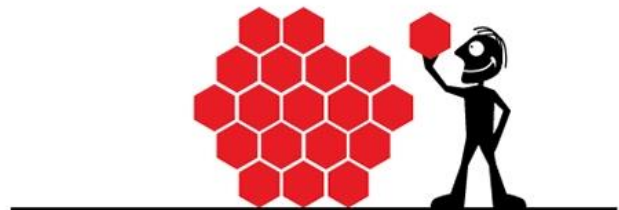


THE WATERFALL PROCESS



*'This project has got so big,
I'm not sure I'll be able to deliver it!'*

THE AGILE PROCESS



*'It's so much better delivering this
project in bite-sized sections'*

8.

Discuss advantages & Disadvantages of Outsourcing.

Advantages of outsourcing

There are many reasons why a business may choose to outsource a particular task, job or a process. For example, some of the recognized benefits of outsourcing include:

- **Increased efficiency** - Choosing an outsourcing company that specializes in the process or service you want them to carry out for you can help you achieve a more productive, efficient service, often of greater quality.
- **Controlled costs** - Cost-savings achieved by outsourcing can help you release capital for investment in other areas of your business.
- **Improved focus on core business activities** - Outsourcing can free up your business to focus on its core functions, allowing your staff to concentrate on their main tasks and on the future strategy
- **Risk Sharing:** One of the most crucial factors in running any website is risk-analysis. Since the outsourced vendor is a specialist, they plan your risk-mitigating factors better.
- **Reduced Operational and Recruitment costs:** Outsourcing eludes the need to hire individuals in-house; hence recruitment and operational costs can be minimized to a great extent. In house developers, testers, designers, analyst could be a costly proposition for a business. This is one of the prime advantages of offshore outsourcing.

Disadvantages of outsourcing

Outsourcing involves handing over direct control over a business function or process to a third party. As such, it comes with certain risks. For example, when outsourcing, you may experience problems with:

- **Service delivery** – Service delivery may fall behind time or below expectation
- **Confidentiality and security** – HR, payroll, order details, customer information hence massive amount of data may be at risk at this age of data protection.
- **Lack of flexibility (Less Agile)** - Contract could prove too rigid to accommodate change
- **Hidden Costs:** Although outsourcing most of the times is cost-effective, at times, the hidden costs involved in a contract may pose a financial threat.
- **Management difficulties** - Changes in management at the outsourcing company could lead to difficulties.

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- **Instability** - The outsourcing company could go out of business and instable your site.
- **Public Backlash** : If you're taking work overseas (even just to write a blog or two), your business very well may run into ill will from consumers that have taken a moral stance against outsourcing.
- **Time issue**: If the outsourcing company is overseas, it might be difficult to synchronize schedules in order to ensure your customers receive what's promised to them on a reliable timeline.

12. What are the eight most important factors impacting Web site design, and how do they affect a site's operation?

The take away from this question is that it is not always about making it look fancy. It's more about how user friendly and resourceful a site is.

TABLE 4.11 THE EIGHT MOST IMPORTANT FACTORS IN SUCCESSFUL E-COMMERCE SITE DESIGN	
FACTOR	DESCRIPTION
Functionality	Pages that work, load quickly, and point the customer toward your product offerings
Informational	Links that customers can easily find to discover more about you and your products
Ease of use	Simple foolproof navigation
Redundant navigation	Alternative navigation to the same content
Ease of purchase	One or two clicks to purchase
Multi-browser functionality	Site works with the most popular browsers
Simple graphics	Avoids distracting, obnoxious graphics and sounds that the user cannot control
Legible text	Avoids backgrounds that distort text or make it illegible

<https://www.youtube.com/watch?v=ebDvqPNIZO4>

13. What are Java and JavaScript? What role do they play in Web site design?

- **Java**: A programming language that allows programmers to create interactivity and active content on the client computer, thereby saving considerable load on the server.

Java able user to play games, upload photos, chat online, online banking, interactive maps etc. .

<https://www.youtube.com/watch?v=yfcyeY-jQbl>

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- **JavaScript**— A programming language invented by Netscape that is used to control the objects on an HTML page and handle interactions with the browser. Together with HTML & CSS, JavaScript creates better user experience.

JavaScript adds automation, animations and interactivity to Web pages such as allowing developers to automate simple tasks, add interactive features, opening up a message in a bigger window, letting server know about user activity such as liking messages on facebook or confirming favorite tweets on twitter etc.

<https://www.youtube.com/watch?v=nItSSTwBvSU>