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**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING**

**PHASE 4**

**PROJECT TITTLE**

***E-COMMERCE APLLICATION ON IBM CLOUD FOUNDARY***

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**Abstract**

In today’s digital age, ecommerce apps have transformed the way we shop and interact with businesses. From personalized recommendations to virtual try-on experiences, these apps offer convenience, accessibility, and a seamless shopping experience. In this blog post, we will explore 10 innovative [ecommerce app ideas](https://www.wdptechnologies.com/top-ecommerce-app-ideas/) that have the potential to revolutionize online shopping. Let’s

dive in!

**1.Introduction**

E-commerce is fast gaining ground as an accepted and used business paradigm. More and more business houses are implementing web sites providing functionality for performing commercial transactions over the web. It is reasonable to say that the process of shopping on the web is becoming commonplace. The objective of this project is to develop a general purpose e-commerce store where any product (such as books, CDs, computers, mobile phones, electronic items, and home appliances) can be bought from the comfort of home through the Internet. However, for implementation purposes, this paper will deal with an online book store. An online store is a virtual store on the Internet where customers can browse the catalog and select products of interest. The selected items may be collected in a shopping cart. At checkout time, the items in the shopping cart will be presented as an order.

**2.Project Design**

In order to design a web site, the relational database must be designed first. Conceptual design can be divided into two parts: The data model and the process model. The data model focuses on what data should be stored in the database while the process model deals with how the data is processed. To put this in the context of the relational database, the data model is used to design the relational tables. The process model is used to design the queries that will access and perform operations on those tables.

**3.Implementation Technologies**

The objective of this project is to develop an online book store. When the user types in the URL of the Book Store in the address field of the browser, a Web Server is contacted to get the requested information. In the .NET Framework,IIS (Internet Information Service) acts as the Web Server. The sole task of a Web Server is to accept incoming HTTP requests and to return the requested resource in an HTTP response. The first thing IIS does when a request comes in is to decide how to handle the request. Its decision is based upon the requested file's extension. For example, if the requested file has the .asp extension, IIS will route the request to be handled by asp.dll. If it has the extension of .aspx, .ascx, etc, it will route the request to be handled by ASP.NET Engine.

The ASP.NET Engine then gets the requested file, and if necessary contacts the database through ADO.NET for the required file and then the information is sent back to the Client’s browser. how a client browser interacts with the Web server and how the Web server handles the request from client.

**4.Services**

**4.1. Internet Information Services (IIS)**

IIS is a set of Internet based services for Windows machines. Originally supplied as part of the Option Pack for Windows NT, they were subsequently integrated with Windows 2000 and Windows Server 2003). The current (Windows 2003) version is IIS 6.0 and includes servers for FTP (a software standard for transferring computer files between machines with widely different operating systems), SMTP (Simple Mail Transfer Protocol, is the de facto standard for email transmission across the Internet) and HTTP/HTTPS (is the secure version of HTTP, the communication protocol of the World Wide Web) .

Features: The web server itself cannot directly perform server side processing but can delegate the task to ISAPI (Application Programming Interface of IIS) applications on the server. Microsoft provides a number of these including ones for Active Server Page and ASP.NET. Compatibility: Internet Information Services is designed to run on Windows server operating systems. A restricted version that supports one web site and a limited number of connections is also supplied with Windows XP Professional. Microsoft has also changed the server account that IIS runs on. In versions of IIS before 6.0, all the features were run on the System account, allowing exploits to run wild on the system. Under 6.0 many of the processes have been brought under a Network Services account that has fewer privileges. In particular this means that if there were an exploit on that feature, it would not necessarily compromise the entire system.

**4.2 ASP.NET**

ASP.NET is a programming framework built on the common language runtime that can be used on a server to build powerful Web applications. ASP.NET has many advantages – both for programmers and for the end users because it is compatible with the .NET Framework. This compatibility allows the users to use the following features through ASP.NET:

a) Powerful database-driven functionality: ASP.NET allows programmers to develop web applications that interface with a database. The advantage of ASP.NET is that it is object-oriented and has many programming tools that allow for faster development and more functionality.

b) Faster web applications: Two aspects of ASP.NET make it fast -- compiled code and caching. In ASP.NET the code is compiled into "machine language" before a visitor ever comes to the website. Caching is the storage of information in memory for faster access in the future. ASP.NET allows programmers to set up pages or areas of pages that are commonly reused to be cached for a set period of time to improve the performance of web applications. In addition, ASP.NET allows the caching of data from a database so the website is not slowed down by frequent visits to a database when the data does not change very often.

c) Memory leak and crash protection: ASP.NET automatically recovers from memory leaks and errors to make sure that the website is always available to the visitors.

ASP.NET also supports code written in more than 25 .NET languages (including VB.NET, C#, and Jscript.Net). This is achieved by the Common Language Runtime (CLR) compiler that supports multiple languages.

**4.2.1. Authentication in ASP.NET**

There are two separate authentication layers in an ASP.NET application. All requests flow through IIS before they are handed to ASP.NET, and IIS can decide to deny access before ASP.NET even knows about the request. Here is how the process works [14]: 1. IIS checks to see if an incoming request is coming from an IP address that is allowed access to the domain. If not, the request is denied. 2. IIS performs its own user authentication, if it is configured to do so. By default, IIS allows anonymous access and requests are authenticated automatically. 3. When a request is passed from IIS to ASP.NET with an authenticated user, ASP.NET checks to see whether impersonation is enabled. If so, ASP.NET acts as though it were the authenticated user. If not, ASP.NET acts with its own configured account. 4. Finally, the identity is used to request resources from the operating system. If all the necessary resources can be obtained, the user's request is granted; otherwise the request is denied.

**4.3. MySQL Database**

In this project, MySQL is used as the backend database. MySQL is an opensource database management system. The features of MySQL are given below: • MySQL is a relational database management system. A relational database stores information in different tables, rather than in one giant table. These tables can be referenced to each other, to access and maintain data easily. • MySQL is open source database system. The database software can be used and modify by anyone according to their needs. • It is fast, reliable and easy to use. To improve the performance, MySQL is multithreaded database engine. A multithreaded application performs many tasks at the same time as if multiple instances of that application were running simultaneously.

In being multithreaded MySQL has many advantages. A separate thread handles each incoming connection with an extra thread that is always running to manage the connections. Multiple clients can perform read operations simultaneously, but while writing, only hold up another client that needs access to the data being updated. Even though the threads share the same process space, they execute individually and because of this separation, multiprocessor machines can spread the thread across many CPUs as long as the host operating system supports multiple CPUs. Multithreading is the key feature to support MySQL’s performance design goals. It is the core feature around which MySQL is built.

MySQL database is connected to ASP.NET using an ODBC driver. Open Database Connectivity (ODBC) is a widely accepted application-programming interface (API) for database access. The ODBC driver is a library that implements the functions supported by ODBC API. It processes ODBC function calls, submits SQL requests to MySQL server, and returns results back to the application. If necessary, the driver modifies an application's request so that the request conforms to syntax supported by MySQL.

**4.4. Integrating IIS and ASP.NET**

When a request comes into IIS Web server its extension is examined and, based on this extension, the request is either handled directly by IIS or routed to an ISAPI extension. An ISAPI extension is a compiled class that is installed on the Web server and whose responsibility is to return the markup for the requested file type. By default, IIS handles the request, and simply returns the contents of the requested file .

This makes sense for static files, like images, HTML pages, CSS files, external JavaScript files, and so on. For example, when a request is made for a .html file, IIS simply returns the contents of the requested HTML file.

For files whose content is dynamically generated, the ISAPI extension configured for the file extension is responsible for generating the content for the requested file. For example, a Web site that serves up classic ASP pages has the .asp extension mapped to the asp.dll ISAPI extension. The asp.dll ISAPI extension executes the requested ASP page and returns its generated HTML markup. If the Web site serves up ASP.NET Web pages, IIS has mapped the .aspx to aspnet\_isapi.dll, an ISAPI extension that starts off the process of generating the rendered HTML for the requested ASP.NET Web page.

The aspnet\_isapi.dll ISAPI extension is a piece of unmanaged code. That is, it is not code that runs in the .NET Framework. When IIS routes the request to the aspnet\_isapi.dll ISAPI extension, the ISAPI extension routes the request onto the ASP.NET engine, which is written in managed code - managed code is code that runs in the .NET Framework.

The ASP.NET engine is strikingly similar to IIS in many ways. Just like IIS has a directory mapping file extensions to ISAPI extensions, the ASP.NET engine maps file extensions to HTTP handlers. An HTTP handler is a piece of managed code that is responsible for generating the markup for a particular file type.

**4.5. Integrating the Website and Database**

Customers ordering from an e -commerce website need to be able to get information about a vendor’s products and services, ask questions, select items they wish to purchase, and submit payment information. Vendors need to be able to track customer inquiries and preferences and process their orders. So a well organized database is essential for the development and maintenance of an e-commerce site . In a static Web page, content is determined at the time when the page is created. As users access a static page, the page always displays the same information. Example of a static Web page is the page displaying company information. In a dynamic Web page, content varies based on user input and data received from external sources. We use the term “data-based Web pages” to refer to dynamic Web pages deriving some or all of their content from data files or databases.

A data-based Web page is requested when a user clicks a hyperlink or the submit button on a Web page form. If the request comes from clicking a hyperlink, the link specifies either a Web server program or a Web page that calls a Web server program. In some cases, the program performs a static query, such as “Display all items from the Inventory”. Although this query requires no user input, the results vary depending on when the query is made. If the request is generated when the user clicks a form’s submit button, instead of a hyperlink, the Web server program typically uses the form inputs to create a query. For example, the user might select five books to be purchased and then submit the input to the Web server program. The Web server program then services the order, generating a dynamic Web page response to confirm the transaction. In either case, the Web server is responsible for formatting the query results by adding HTML tags. The Web server program then sends the program’s output back to the client’s browser as a Web page.

**5. Web Page Programming Options**

An e-commerce organization can create data-based Web pages by usingserverside and cient-side processing technologies or a hybrid of the two. With server-side processing, the Web server receives the dynamic Web page request, performs all processing necessary to create the page, and then sends it to the client for display in the client’s browser. Client-side processing is done on the client workstation by having the client browser execute a program that interacts directly with the database.

It outlines commonly used server-side, client-side, and hybrid Web and data processing technologies; client-side scripts are in dashed lines to indicate they are unable to interact directly with a database or file but are used to validate user input on the client, then send the validated inputs to the server for further processing.

**5.1. Server-side processing.**

Generally dynamic or data-driven Web pages use HTML forms to collect user inputs, submitting them to a Web server. A program running on the server processes the form inputs, dynamically composing a Web page reply. This program, which is called, servicing program, can be either a compiled executable program or a script interpreted into machine language each time it is run.

Compiled server programs. When a user submits HTML-form data for processing by a compiled server program, the Web Server invokes the servicing program. The servicing program is not part of the Web server but it is an independent executable program running on the Web server; it processes the user input, determines the action which must be taken, interacts with any external sources (Eg: database) and finally produces an HTML document and terminates. The Web server then sends the HTML document back to the user’s browser where it is displayed. the flow of HTTP request from the client to the Web server, which is sent to the servicing program. The program creates an HTML document to be sent to the client browser. Popular languages for creating compiled server programs are Java, Visual Basic, and C++, but almost any language that can create executable programs can be used, provided that it supports commands used by one of the protocols that establish guidelines for communication between Web servers and servicing programs. The first such protocol, introduced in 1993, for use with HTML forms was the Common Gateway Interface (CGI); many servicing programs on Web sites still use CGI programs. However, a disadvantage of using CGI-based servicing programs is that each form submitted to a Web server starts its own copy of the servicing program on the Web server.

A busy Web server is likely to run out of memory when it services many forms simultaneously; thus, as interactive Web sites have gained popularity, Web server vendors have developed new technologies to process form inputs without starting a new copy of the servicing program for each browser input. Examples of these technologies for communicating with Web servers include Java Servlets and Microsoft’s ASP.NET; they allow a single copy of the servicing program to service multiple users without starting multiple instances of the program. ASP.NET has introduced many new capabilities to server-side Web programming, including a new category of elements called server controls that generate as many as 200 HTML tags and one or more JavaScript functions from a single server control tag. Server controls support the processing of user events, such as clicking a mouse or entering text at either the client browser or the Web server. Server controls also encourage the separation of programming code into different files and/or areas from the HTML tags and text of a Web page, thus allowing HTML designers and programmers to work together more effectively. Server-side scripts. Web-based applications can also use server-side scripts to create dynamic Web pages that are able to retrieve and display information from a backend database and modify data records. The processing architecture is the same as the processing architecture used for compiled server programs , except the Web server processing is performed through and interpreted script rather than a compiled program.

If needed, a developer can have a single Web server process a variety of scripts written with any or all of these technologies. The Web server knows which script interpreter to invoke by taking note of the requesting script’s file extension.

**6.Conclusion**

The Internet has become a major resource in modern business, thus electronic

shopping has gained significance not only from the entrepreneur’s but also from thecustomer’s point of view. For the entrepreneur, electronic shopping generates newbusiness opportunities and for the customer, it makes comparative shopping possible. Asper a survey, most consumers of online stores are impulsive and usually make a decisionto stay on a site within the first few seconds. “Website design is like a shop interior. If theshop looks poor or like hundreds of other shops the customer is most likely to skip to the other site”. Hence we have designed the project to provide the user with easynavigation, retrieval of data and necessary feedback as much as possible.