

MCA : MANAGEMENT : SEMESTER-V

ADVANCED DEVELOPMENT TECHNOLOGY

MEENAKSHI THALOR



A Text Book of

ADVANCED DEVELOPMENT TECHNOLOGY

FOR
M.C.A. : MANAGEMENT : SEMESTER - V
SUBJECT CODE : IT54

AS PER NEW REVISED SYLLABUS OF PUNE UNIVERSITY

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Dedicated to my Daughter

स्वाहिश

*for bringing so much joy and happiness in
my life*

PREFACE

It gives me an immense pleasure in presenting this book, 'Advanced Development Technology. This book has been designed to serve as a text book for students of Master of Computer Application (MCA), Semester – V.

The goal of presenting this book is to introduce and explain the basic concepts of Advanced Development Technology. I have tried to incorporate a large volume of programs on all the chapters. This will surely help students to understand the practical aspect of this language along with theory.

This book has been written which reflects the newly revised syllabus of University of Pune. The book has its own features. I have tried to keep the language as simple and lucid as possible. It highlights important concepts by giving suitable examples wherever necessary. It comprises a wide collection of methods and constructors along with syntax and their appropriate explanation.

A special attention has been paid to develop the interest about today's most popular Advanced Development Technology in students. Throughout the book, I have taken all the efforts not to distract a student from his objective of learning this new language.

I sincerely thank Shri. Dineshbhai Furia and Shri. Jignesh Furia, the publishers for showing the confidence and giving me an opportunity to reach out to the students of management studies. We also thank to Mr. Mahesh Swami, Mr. Malik Shaikh and Mr. Vijay Shete of M/s Nirali Prakashan for their excellent co-operation.

Suggestions and positive criticism to improve this book are most welcome!!!

Author

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Chapter 1 ...

CREATING WEB FORMS APPLICATIONS

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1.1 Introduction

1.1.1 What is ASP.NET?

- ASP.NET is the modern form of ASP. ASP.NET was introduced with Microsoft .NET Framework 1.0 in 2001.
- ASP.NET is a complete makeover of ASP and introduces a new paradigm of Web development. ASP.NET covers the limitations of ASP and introduces several new features.
- ASP.NET is programmable using any .NET language such as VB.NET, C#, J#, JScript.NET, etc.
- The .NET Framework languages are object oriented languages, supporting the full capabilities of a programming language as compared to scripting languages which are a subset of the actual language.
- The ASP.NET pages are saved with the **.aspx** extension. The (**asp_net.dll**) component works along with IIS to parse, compile and respond to any requests for ASP.NET pages.
- ASP.NET is a technology for developing web applications.

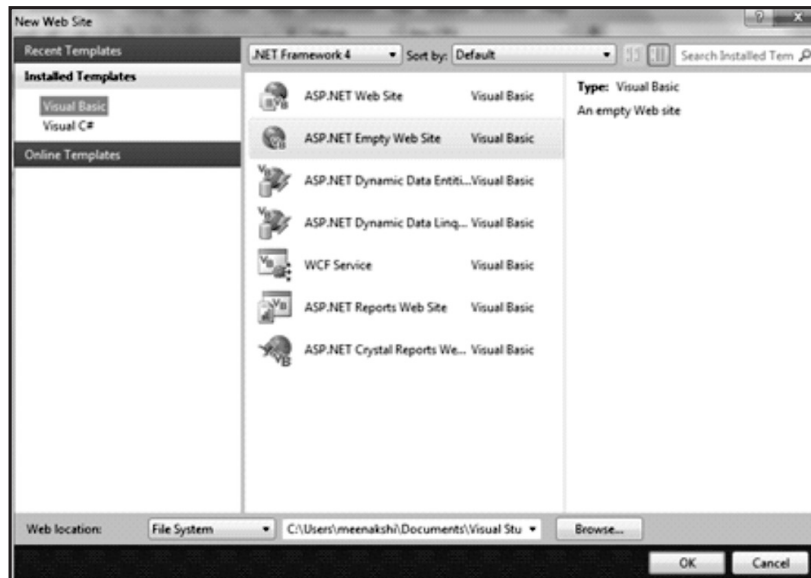
- A web application is just a fancy name for a dynamic website. A “website” can be thought of as a static page, where the content rarely changes or is purely informational only. Your local dentist or high school probably has a “website”. A web application is dynamic in nature, and often considered to be a web version of standard desktop software.
- **Features of ASP.NET are:**
 1. **Compiled Environment:** Since, ASP uses vb script, there is no compilation. All ASP pages are interpreted when the page is executed. ASP.NET uses modern .NET languages like C#, VB.NET etc. They can be compiled to efficient Microsoft Intermediate Language (MSIL). When you compile an ASP.NET application, the server side code is compiled to assemblies. These assemblies are loaded at run time which makes the ASP.NET pages perform better than classic ASP.
 2. **Based on the .NET Framework:** ASP.NET is an integral part of .NET and the .NET Framework. All the core pieces of ASP.NET are implemented as .NET Framework classes. Another advantage of the .NET platform is that it is completely language independent.
 3. **ADO and ADO.NET:** Classic ASP uses a technology called ADO to connect and work with databases. ASP.NET uses the ADO.NET technology, (which is the next generation of ADO).
 4. **Server Controls:** Microsoft has introduced the concept of server controls in ASP.NET to help simplify Web application development, specifically for Visual Basic programmers who are used to programmatically accessing controls such as labels and text boxes. Simply put, *server controls* allow programmatic access to HTML elements.
 5. **Event-Driven Programming:** This type of event driven programming was not available with classic ASP. You cannot drag and drop a button and write a ‘on click’ event handler with ASP. With ASP.NET, this is changed. It works pretty much like your Visual Basic program. You can write event handlers for several events like button click event, text changed event etc. However, there is big difference between the way event handling works in regular Visual basic and ASP.NET. In ASP.NET, a page is loaded in the client browser. And the server may be in another location, (may be in another country). When you click on the button in an ASP.NET page, the 'click event' handler has to be executed on the server, not on the client.
 6. **Separation of Code from Content:** A major drawback of ASP in certain instances is that there is no way to separate code from page content. In ASP.NET, due to the introduction of server controls and the event-driven model, the trend leans toward placing all the code in event handlers in one place in the file (normally at the top). It is also possible to totally separate code from content by placing all the code in a separate file, (VS.NET does this by default).

- 7. Session State Management:** ASP provides a special collection object where the programmer can store variables pertaining to a particular visitor's session.
- 8. User Input Validation:** ASP.NET provides a set of server controls that check whether the information users have entered is in the correct form. These controls are intelligent and produce client-side validation code for supporting browsers and server-side code for the rest.
- 9. Web Services:** Web Services are a large part of ASP.NET and .NET as a whole. Web Services are classes or objects, that expose certain methods and make them accessible over the Internet. Web Services are based entirely upon open standards such as Simple Object Access Protocol (SOAP), XML and HTTP.
- 10. Caching Services:** ASP.NET offers two primary caching techniques i.e. Data caching and Output caching. Data caching allows programmatic access to a cache store where objects and values can be stored. Output caching allows caching of the output of specific pages for specific periods of time.
- 11. Security:** In ASP, it was up to the developer to implement his or her own security mechanisms, especially in the area of user authorization. ASP.NET features built-in security configuration in its application settings files.
- 12. Debugging and Tracing:** ASP.NET and Visual Studio.NET aim to solve some of these developer worries by providing more advanced debugging tools. Tracing allows developers to inspect and gather important application performance information. Tracing also allows developers to check whether control flow is executing correctly.

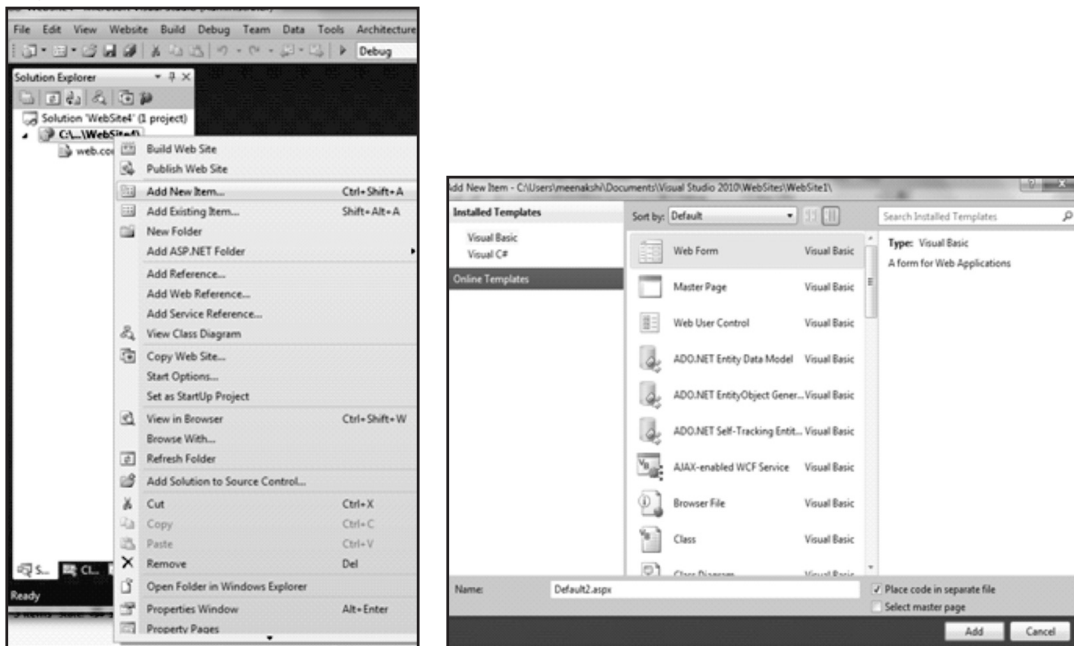
1.2 Creating an ASP.NET Web Application Project

A web application in ASP.NET is a collection of pages, controls, code modules, and services all running under a single web server application directory (usually IIS).

- ASP.NET makes it really easy to build the types of dynamic web applications that exist everywhere on the Internet today.
- ASP.NET applications at their simplest are much like classic ASP applications.
- The elements of a simple ASP.NET application are:
 1. One or more **.aspx** files.
 2. A **Global.asax** file (analogous to the **Global.asa** file in classic ASP) to deal with Session and Application startup and clean-up logic. This file is optional.
 3. A **web.config** file used to store configuration settings.
- To create a web application Select file menu and then New Website option. Following Fig. 1.1 will appear.

**Fig. 1.1**

- Select “ASP.NET Empty WebSite” and click OK. Solution explorer will look like as shown in Fig. 1.2.

**Fig. 1.2**

- Right click on website in solution explorer, select “Add New Item” and select web form from “Add New Item Window”. This step will add a new file name as “Default.aspx in to solution explorer. Now you can open this default.aspx file whose design layout will be blank. Now Drag a button on design page of Default.aspx. In ASP.Net, by default it uses

flow layout which puts controls next to each other. To move the control freely, select the control and select format menu → set position and then absolute positioning style.

- Now double click on the button; You will see a code in the background window. Add your logic to then button click event as follows.

```
Partial Class _Default
    Inherits System.Web.UI.Page
    Protected Sub Button1_Click(ByVal sender As Object, ByVal e As
        System.EventArgs)
Handles Button1.Click
        Response.Write("Welcome everyone!!!!")
    End Sub
End Class
```

- Response.write statement will print the message on the web page. Now press F5 to run the application. The output is shown in Fig. 1.3.

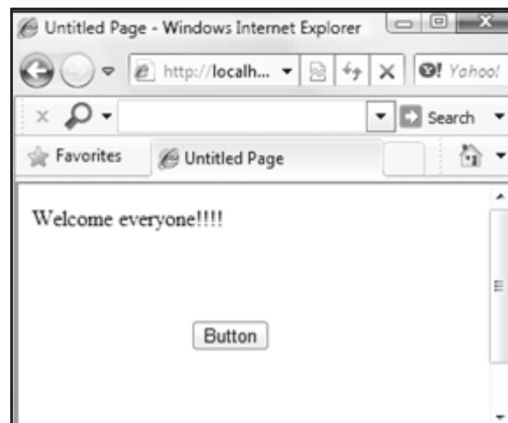


Fig. 1.3

- When you click on the Source tab button at the bottom of the Web Form Designer, you will see the following HTML code.

```
<%@ Page Language="VB" AutoEventWireup="false" CodeFile="Default.
aspx.vb" Inherits="_Default" %>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head runat="server">
<title>Untitled Page</title>
```

```
</head>
<body>
<form id="form1" runat="server">
<div style="position: absolute">
</div>
  <%-- This is a comment--%>
<p>
<asp:Button ID="Button1" runat="server"
  style="top: 97px; left: 124px; position: absolute;
  height: 22px; width: 56px" Text="Button" />
</p>
</form>
</body>
</html>
```

1.2.1 Structure of ASP.NET Page

- ASP.NET page consists of the following page elements.
 1. Directives
 2. Code declaration block
 3. Code render block
 4. ASP.NET controls
 5. Server side comments and
 6. Server side include directives.

1. Directives:

Directives control the compilation of an ASP.NET page. The beginning of a directive is marked with the characters `<%@` and the end with `%>` character. A directive can appear anywhere in the page but by convention, a directive appears typically at the top of an ASP.NET page. There are two types of directives:

(i) Page Directives: This directive appears on the top of an ASP.NET page. It specifies which programming language is being used to write an ASP.NET page. For example, if we want to use VB as our page language, we will use the following directive:

```
<%@Page Language="VB"%>
```

(ii) Import Directives: By default, only certain namespaces are automatically imported into an ASP.NET page. If you want to refer to a class that is not a member of one of the default namespaces, then you must explicitly import the namespace of the class or you must use the fully qualified name of the class.

```
<%@Import Namespace="System.Web.Mail"%>
```

This line imports all the classes of the **System.Web.Mail** namespace, to send the mail through the `SmtpMail` class.

2. Code Declaration Block:

It contains all the application logic for your ASP.NET page and all the global variable declarations, subroutines and functions. It must appear within a `<Script Runat="Server">` tag.

3. Code Render Block:

If you need to execute code within the HTML or text content of your ASP.NET page, you can do so within *code render blocks*. The two types of code render blocks are:

(i) **Inline code:** Inline code executes a statement or series of statements. This type of code begins with the characters `<%` and ends with the characters `%>`.

(ii) **Inline expressions:** Inline expressions begin with the characters `<%=` and end with the characters `%>`.

4. ASP.NET Controls:

ASP.NET controls can be freely interspersed with the text of HTML content of a page. The only requirement is that, the controls should appear within a `<form Runat="Server">` tag. One significant limitation of ASP.NET page is that it contains only one `<form Runat="Server">` tag. This means that you can not group ASP.NET into multiple forms on a page. If you try this you will get an error.

5. Server side Comments:

To add comments to your ASP.NET pages one can use server-side comment blocks. The beginning of a server-side comment is marked with the characters `<%--` and the end of the comment is marked with the characters `--%>`. It can be added to a ASP.net page for the purposes of documentation.

6. Server-side Include Directives:

You can include a file in an ASP.NET page by using one of the two forms of the server-side include directive. If you want to include a file that is located in the same directory or in a subdirectory of the page including the file, you can use the following directive:

```
<!-- #INCLUDE file="default2.aspx" -->
```

OR

```
<!-- #INCLUDE virtual="/Directory/default2.aspx" -->
```

1.3 Responding to Events

- Event is an action or occurrence .For example in windows mouse click, key press, mouse move, or any system generated notification are called as events.
- One process communicates with others through events. For example, Interrupts are system generated events. When events occur the application should be able to respond to it.

- In ASP.Net an event is raised on the client, and handled in the server. When user clicks on a button which is placed over the browser. A Click event is raised and browser handles this client-side event by posting it to the server.
- Corresponding to each system events some procedures are defined, which describes what to do when the event is raised; this procedure is called as event-handler.
- When the event message is transmitted to the server, it checks whether the Click event has an associated event handler, and if it has, the event handler is executed.
- The general syntax of an event is:

```
Access_Specifier void EventName(object sender,EventArgs e);
```

- Access specifier can be Private, Public or Protected. ASP.Net event handlers generally take two parameters and return void. The first parameter represents the object raising the event and the second parameter is called the event argument.

The most commonly used events in a web application are listed below with their senders:

Event	Attribute	Controls
Click	OnClick	Button, image button, link button, image map
Command	OnCommand	Button, image button, link button
TextChanged	OnTextChanged	Text box
SelectedIndexChanged	OnSelectedIndexChanged	Drop-down list, list box, radio button list, check box list.
CheckedChanged	OnCheckedChanged	Check box, radio button

- A page of ASP.NET application consists of several server controls. The page object is represented by the .aspx file in ASP.NET 2.0. Asp.net Page also support automatic event wire-up, meaning that ASP.NET looks for methods with particular names and automatically runs those methods when certain events are raised. E.g. Page_Load and Page_Init events are automatically invoked during life cycle of a page.
- The default event for the Page object is the Load event. Similarly every control has a default event. For example, default event for the button control is the Click event.
- Some of the events of a page object are listed below
 - **Init** raised when the page or the control is initialized.
 - **Load** raised when the page or a control is loaded.
 - **PreRender** raised when the page or the control is to be rendered.
 - **Unload** raised when the page or control is unloaded from memory.

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