



CD-ROM

微软指定 MCSD 教材（影印第2版）

Microsoft Press

微软全球唯一指定的教材 高薪职位通行证
深入专业的编程技术 高级程序员必备

Microsoft

Visual InterDev® 6.0

Web 应用程序开发

（影印第2版）

Web
Applications with

Microsoft

Visual
InterDev® 6.0

MCSD
Training Kit

For Exam
70-152

Microsoft Certified

Professional

Solution Developer

Exam
Training

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微软指定 MCSD 教材(影印第 2 版)

Microsoft Visual InterDev 6.0 Web 应用程序开发

Microsoft 公司 著

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内 容 简 介

本书是《微软指定 MCSD 教材（影印第 2 版）》丛书中的一本，讲述使用 Visual InterDev 6.0 Web 开发系统创建动态的、数据驱动的 Web 应用程序，包括需求分析、模型设计、配置开发工具和服务器服务、开发用户服务、创建动态及交互性内容、ActiveX 数据对象和远程数据服务、COM 组件及 MTS、安全性等。

本书由微软公司专家编写，技术深入，内容详尽，示例丰富，是 Web 开发人员必备的一本权威参考书。

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前 言

微软认证是一项综合性认证计划，是对个人的与软件有关的技能的重要评测标准，其证书授予那些能够使用微软公司的产品完成特定任务和实施解决方案的人。微软认证被全世界的技术管理者视为质量的标志，是雇主聘用和考核职员的重要参考依据，又是个人求职和升迁的金钥匙。MCSD 即微软认证解决方案开发人员，获得此证书表明能够使用微软的开发工具、技术和平台（包括 Microsoft Office 和 Microsoft BackOffice）开发自定义商务解决方案。所以，这套面向 MCSD 认证考试的培训教材一经推出，就受到了广大读者的欢迎。针对这种情况，我们及时地推出了它的影印第 2 版，并为每本书附上了 Microsoft SQL Server 2000 的 120 天试用版或者 Microsoft Windows 2000 Advanced Server 的 120 天试用版。

本套影印丛书共分 6 册，分别是《Microsoft Visual Basic 6.0 桌面应用程序开发》、《Microsoft Visual Basic 6.0 分布式应用程序开发》、《Microsoft Visual C++ 6.0 桌面应用程序开发》、《Microsoft Visual C++ 6.0 分布式应用程序开发》、《需求分析和解决方案结构定义》和《Microsoft Visual InterDev 6.0 Web 应用程序开发》。6 册书分别针对不同的用户群体以及 MCSD 认证计划的不同考试，讲述不同的内容，各有侧重，互为补充。

本套丛书具有以下共同特点：

每一章一开始，首先对本章内容作以概括性介绍，让读者有一个总体性认识。然后说明在学习本章内容之前需要具有哪些预备知识，安装哪些软件。

书中提供了大量操作训练实例，让读者能够即时地对所学技能进行有效的练习。

配套光盘中提供了丰富的辅助资料，包括多媒体演示、示例数据和操作训练文件等。多媒体演示所涉及的是本书中的一些关键概念。操作训练文件则给了读者一个亲自动手的机会。可以直接在光盘上练习，也可以安装到硬盘上之后再使用。

为了进一步提高本丛书及其配套光盘的质量，希望广大读者把有关的意见或建议反馈给微软出版社。联系方法是：

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<http://mspress.microsoft.com/support/>

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2000 年 11 月

About This Book

Welcome to *Web Applications with Microsoft Visual InterDev 6.0 MCSD Training Kit*. By completing the lessons and associated exercises in this course, you will acquire the knowledge and skills necessary to develop Web bases solutions using Microsoft Visual InterDev 6.0.

This book also addresses the objectives of the Microsoft Designing and Implementing Distributed Applications for Microsoft Visual InterDev 6.0 (70-152) exam. This self-paced course provides content that supports the skills measured by this exam.

Note For more information on becoming a Microsoft Certified Solutions Developer, see the section titled “The Microsoft Certified Professional Program” later in this chapter.

Each chapter in this book is divided into lessons. Most lessons include hands-on procedures that allow you to practice or demonstrate a particular concept or skill. The lessons in each chapter end with a short summary. Each chapter ends with a hands-on lab and a set of review questions to test your knowledge of the chapter material.

The “Getting Started” section of this chapter provides important setup instructions that describe the hardware and software requirements to complete the exercises and labs in this course. Read through this section thoroughly before you start the lessons.

Intended Audience

This course is designed for students interested in developing Visual InterDev solutions at an intermediate and advanced level, and will teach experienced developers how to create custom solutions and enterprise-level Web sites using Visual InterDev 6. More complex topics, such as creating Microsoft Transaction Server components, are included in this course.

Prerequisites

Before beginning this self-paced course, you should:

- Have a basic understanding of the Internet
- Be able to deploy Web sites using Microsoft Internet Information Server
- Define client/server application architecture
- Be able to write simple client-side script with Microsoft Visual Basic Scripting Edition (VBScript) or JavaScript
- Develop ActiveX DLLs and describe their use
- Create Web sites using programs such as Microsoft FrontPage
- Have a general understanding of the HTML programming language
- Have an understanding of Microsoft SQL Server and Structured Query Language syntax
- Have a basic understanding of Microsoft Windows NT Server and SQL Server

Getting Started

This self-paced training course contains hands-on procedures to help you learn Visual InterDev. To complete the exercises, your computer must meet the following hardware and software requirements.

Hardware Requirements

All hardware should be on the Microsoft Windows 98 or Microsoft Windows NT Hardware Compatibility List.

Computer/ Processor	PC with a Pentium-class processor; 166 MHz or higher processor recommended
Memory	32 MB of RAM for Windows 95 or later (48 MB recommended); 32 MB for Windows NT 4.0 (48 MB recommended)
Hard Disk	Visual InterDev 6.0: 81 MB typical, 98 MB maximum IE: 43MB typical; 59MB maximum MSDN: 57MB typical; 493MB maximum SQL Server 7.0 Enterprise Edition; 180MB maximum; 170MB typical Windows NT 4.0 Option Pack: 200MB Windows NT 4.0
Drive	CD-ROM drive
Display	VGA or higher-resolution monitor; Super VGA recommended

Operating System	Microsoft Windows 95, Windows 98, or Windows NT Workstation operating system to be used as a client computer. Microsoft Windows NT Server operating system version 4.0 with Service Pack 4 or later to be used as a Web and database server.
Peripheral/Miscellaneous	Microsoft Internet Explorer 5 Microsoft Mouse or compatible pointing device A sound card and speakers or headphones for the multimedia clips

Software Requirements

The following software is required to complete the procedures in this course:

- Visual InterDev 6.0
- Microsoft Visual Basic 6.0
- Microsoft Transaction Server 2.0
- SQL Server 7.0, Enterprise
- Windows NT 4.0 Option Pack
- Windows NT Server 4.0 with Service Pack 4 or later

Course Overview

This self-paced course combines text, graphics, hands-on procedures, multimedia presentations, and review questions to teach you Visual InterDev. The course is designed for you to work through the book from beginning to end, but you can choose a customized track and complete only the sections that interest you. If you choose to customize your study, see the “Before You Begin” section in each chapter for important information regarding prerequisites.

The self-paced training book is divided into the following chapters:

- “About This Book” contains a self-paced training overview and introduces the components of this book. Read this section thoroughly to get the greatest educational value from this self-paced training and to plan which lessons you will complete.
- Chapter 1, “Developing Web-Based Solutions,” discusses how to plan a Web site that uses a service-based application model. You will also learn about architectural concepts, various development models and resources, and available technologies and their implications. In preparation for the labs to be used in this course, you will be introduced to the members of a Web site development team and the development tools available to them.

With these design principles in hand, you will begin planning and developing a Web site for a fictitious hotel named the Chateau St. Mark. Building this Web site with Visual InterDev will be the focus of the labs for each chapter.

- Chapter 2, “Creating a Web Site,” discusses how to create a site diagram, and how to add and organize the pages that will make up the site. You will create cascading style sheets to customize the look and feel of individual pages. You will then begin assembling a service based application model for their Visual InterDev project. This includes developing the conceptual and logistical design. Using the Visual InterDev tools, you will then construct an HTML page and an HTML form.
- Chapter 3, “Using Dynamic HTML,” discusses how to use the Chateau Web site created in Chapter 2 to begin incorporating dynamic HTML (DHTML) script. This includes incorporating browser objects, document objects, and scriptlets into the Web site. As a result, the Web site will be much more interactive.
- Chapter 4, “Using Active Server Pages,” discusses how to create active server pages (ASP) to further improve functionality. With ASP you will be able to design pages that will read requests and send responses. You will also be able to save state data and use COM components and page objects.
- Chapter 5, “Accessing Databases,” discusses how to add a data environment to a Visual InterDev project. You will learn how to view and use data from the database in the Data View window. Additionally, you will be introduced to Database Designer, a tool for creating and manipulating database tables, and Query Designer, a tool for creating SQL queries.
- Chapter 6, “Understanding Data Access Technologies,” discusses how to create Web pages that retrieve and update information in a database by using ActiveX Data Objects and the Remote Data Service. Specifically, you will be writing ADO code and using the Remote Data Service.
- Chapter 7, “Creating COM Components,” discusses the business service aspect of the Web site, which can run on a Web server. You will also learn how to use Microsoft Visual Basic 6.0 to build COM components that contain business rules, and how to call these COM components from a Web page.
- Chapter 8, “Using Microsoft Transaction Server,” discusses how to use the Microsoft Transaction Server (MTS), which provides transaction and resource management for COM components. You will also learn how to create MTS components, which are COM components that work within the MTS architecture.
- Chapter 9, “Implementing Security,” discusses how to implement controls and security on a Web site. To practice these concepts, you will authenticate users and control access to files and resources on the Chateau St. Mark Web site.
- Chapter 10, “Integrating Other Server-Side Technology,” discusses how to use the Simple Mail Transport Protocol (SMTP) service of IIS 4.0 to send e-mail from a Web site. You will learn how to enable custom search capabilities for a Web site. You will also add media delivery capabilities to the Web site, such as Java applets, Microsoft NetShow, and embedded MPEGs. You will also be able to deploy updated pages, graphics, sound, and ActiveX controls.

Features of This Book

- Each chapter opens with a “Before You Begin” section, which prepares you for the completion of the chapter.
- Each chapter is divided into lessons. Most lessons include hands-on exercises that allow you to practice an associated skill or procedure. Some lessons also contain references to animations included on the companion CD that further explain conceptual material.
- Most lessons contain procedures that give you an opportunity to use the skills presented or explore the part of the application described in the lesson. All procedures are identified with an arrow symbol at the left margin.
- Some lessons also contain Practices that allow you to try the new procedure on your own. The icon shown in the left margin identifies the Practices.
- Each lesson ends with a short Lesson Summary of the material presented.
- The Review section at the end of the chapter lets you test what you have learned in the lesson. The icon shown in the left margin identifies the Reviews.
- Appendix A, “Questions and Answers,” located at the end of this book, contains all of the book’s lab and review questions and corresponding answers.
- Appendix B, “Creating Client Script,” provides an overview of developing script that executes within an HTML page. Understanding basic scripting techniques is required before learning the concepts of Dynamic HTML.



Conventions Used in This Book

Before you start any of the lessons, it is important that you understand the terms and notational conventions used in this book.

Notational Conventions

- *Italic* in syntax statements indicates placeholders for variable information. *Italic* is also used for book titles and new terms.
- Names of files and folders appear in Title Caps. Unless otherwise indicated, you can use all lowercase letters when you type a file name in a dialog box or at a command prompt.
- File name extensions appear in all lowercase.
- Acronyms appear in all uppercase.
- MONOSPACE type represents code samples, examples of screen text, or entries that you might type at a command prompt or in initialization files.

- Square brackets [] are used in syntax statements to enclose optional items. For example, *[filename]* in command syntax indicates that you can choose to type a file name with the command. Type only the information within the brackets, not the brackets themselves.
- Braces { } are used in syntax statements to enclose required items. Type only the information within the braces, not the braces themselves.

Keyboard Conventions

- You can choose menu commands with the keyboard. Press the ALT key to activate the menu bar, and then sequentially press the keys that correspond to the highlighted or underlined letter of the menu name and the command name. For some commands, you can also press a key combination listed in the menu.
- You can select or clear check boxes or option buttons in dialogs with the keyboard. Press the ALT key, and then press the key that corresponds to the underlined letter of the option name. Or you can press TAB until the option is highlighted, and then press the spacebar to select or clear the check box or option button.
- You can cancel the display of a dialog by pressing the ESC key.

About the CD-ROM

The companion CD contains files required to perform the hands-on lab exercises for the Chateau St. Mark Hotel Web site. These files must first be copied onto your hard disk using the setup program located on the CD.

You can compare your work with the Lab solutions located on the companion CD in the \Labs\Solution folder.

Using the Multimedia Presentations

The multimedia presentations supplement some of the key concepts covered in the book. You should view these presentations when suggested, and then use them as a review tool while you work through the material. The animations are denoted with the icon that appears in the left margin.

To play the animation, open the Animations folder on the CD, and double-click the appropriate file. The animation contains controls that can start, pause, and stop the animations, control the volume, and toggle on or off the sound and associated text.



Using This Book to Prepare for Certification

Where to Find Specific Skills in This Book

The following tables provide a list of the skills measured on the certification exam 70-152: Designing and Implementing Web Solutions with Microsoft Visual InterDev 6.0. The tables provide the skill, and the location in this book where you will find the lesson relating to that skill.

Note Exam skills are subject to change without prior notice and at the sole discretion of Microsoft.

Skill Being Measured	Location in Book
Analyze the scope of a project	
Identify the purpose of a Web site.	Chapter 1 Lesson 2
Identify the target audience; for example, an audience on the Internet, an extranet, an intranet, or any combination of these three.	Chapter 1 Lesson 2
Review the functionality and design of existing applications.	Chapter 1 Lesson 3
Examine anticipated changes in the current environment.	Chapter 1 Lesson 2
Estimate an expected lifetime of the solution.	Chapter 1 Lesson 2
Estimate the scope of the solution.	Chapter 1 Lesson 3
Quantify tradeoffs among time, cost, budget, and benefits.	Chapter 1 Lesson 2
Analyze the extent of a business requirement	
Specify the planned platform and infrastructure.	Chapter 1 Lesson 3
	Chapter 2 Lesson 2
Identify business requirements based on customer input.	Chapter 1 Lesson 2
	Chapter 2 Lesson 2
Identify which type of business problem exists.	Chapter 1 Lesson 2
Analyze security requirements	
Identify the need for roles of specific types of users, including administrators, groups, guests, and clients.	Chapter 9 Lesson 4
Identify requirements for access to components on a Web site.	Chapter 9 Lesson 4
Specify auditing capabilities.	Chapter 9 Lesson 4
Specify logging capabilities.	Chapter 9 Lesson 4
Identify the level of security required.	Chapter 9 Lessons 2, 3

Skill Being Measured	Location in Book
Analyze performance requirements.	
Identify the impact of components that affect performance. Such components include bandwidth, which includes maximum page size and modem speed; multimedia; and browser capabilities.	Chapter 1 Lesson 2
Identify the impact of customer response-time expectations on an application.	Chapter 1 Lesson 2
Identify the impact of scalability on the solution.	Chapter 1 Lesson 2
Identify tradeoffs between performance requirements and available technology.	Chapter 1 Lesson 2
Identify tradeoffs between performance and portability in the selection of a Web browser and a Web server.	Chapter 1 Lesson 2
Analyze maintainability requirements.	
Identify the requirements for ongoing updates and distribution of the application.	Chapter 1 Lesson 2
Analyze extensibility requirements.	
Identify the impact of an increase in the number of end users, the growth of an organization, and an increase in the functionality of the application.	Chapter 1 Lesson 2
Identify the impact of an increase in data.	Chapter 5 Lesson 1
Analyze availability requirements.	
Identify the level of availability required.	Chapter 1 Lesson 2
Identify the geographic area to be covered.	Chapter 1 Lesson 3
Assess the impact of downtime on end users.	Chapter 1 Lesson 3
Analyze requirements that include such human factors as target audience, localization, accessibility, roaming users, online Help, and special needs.	
Identify localization requirements, including target languages.	Chapter 1 Lesson 2
Identify accessibility needs, including alternate text site, tab order, and text-only links.	Chapter 2 Lesson 2
Analyze documentation and online Help requirements	Chapter 2 Lesson 2
Identify the impact of various connectivity solutions on the application.	Chapter 2 Lesson 2
Identify constraints due to the environment; for example, 640 x 480 screen resolution and Internet versus intranet.	Chapter 1 Lesson 2

Skill Being Measured	Location in Book
Analyze the requirements for integrating a Microsoft Visual InterDev solution with existing applications.	
Identify the location of existing data.	Chapter 5 Lesson 6
Identify the format of existing data.	Chapter 5 Lesson 6
Identify all migration considerations.	Chapter 5 Lesson 6
Identify data conversion requirements.	Chapter 5 Lesson 6
Analyze Web site development requirements.	
Identify the number of Web developers and content authors needed to develop and initially implement the solution, and identify how the team will be staffed.	Chapter 1 Lesson 2
Identify the security levels needed for each type of development role.	Chapter 9 Lesson 2
Identify hardware and software needs for the development team	Chapter 1 Lesson 2
Given a business scenario, identify which solution type is appropriate. Solution types are single-tier, two-tier, and <i>n</i> -tier.	Chapter 1 Lesson 2
Identify which technologies are appropriate for implementation of a given business solution.	
Select the appropriate development tools to use.	Chapter 2 Lesson 1
Identify which products and technologies are appropriate for implementation.	Chapter 2 Lesson 1 Chapter 9 Lesson 1 Chapter 5 Lesson 1
Choose a data storage architecture. Considerations include volume; number of transactions per time slice; number of connections or sessions; scope of business requirements; extensibility requirements; reporting requirements; and number of users.	Chapter 8 Lesson 1
Test the feasibility of a proposed technical architecture.	
Demonstrate that business requirements are met.	Chapter 1 Lesson 2 Lab 1
Meet existing technology constraints.	Chapter 5 Lesson 1 Chapter 1 Lesson 2
Assess the impact and tradeoffs that result if a specific requirement is not met.	Chapter 1 Lesson 3
Construct a conceptual design that is based on a variety of scenarios and that includes context, workflow process, task sequence, and physical environment models.	Chapter 2 Lesson 2

Skill Being Measured	Location in Book
Given a conceptual design, apply the principles of modular design to derive the components and services of the logical design.	Chapter 7 Lesson 3
Incorporate business rules into object design.	Chapter 7 Lesson 3
Identify an appropriate navigational scheme for a Web site that reflects the information flow.	Chapter 2 Lesson 2
Identify input validation procedures that should be integrated into the user interface.	
Identify which type of script to use: server-side or client-side.	Chapter 3 Lesson 1
Compare VBScript and JavaScript	Chapter 3 Lesson 1
Evaluate methods of providing user assistance.	Chapter 1 Lesson 2
Use the Visual InterDev WYSIWYG page editor to construct a prototype user interface that is based on business requirements, user interface guidelines, and the organization's standards.	Chapter 2 Lesson 1 Lab 1
Assess the potential impact of the logical design on performance, maintainability, extensibility, scalability, availability, and security.	Chapter 1 Lesson 2
Evaluate whether access to a database should be encapsulated in an object.	Chapter 5 Lesson 4 Chapter 6 Lesson 1 Chapter 7 Lesson 1
Design the properties, methods, and events of COM components and Microsoft Transaction Server (MTS) components on a server.	Chapter 7 Lesson 2 Chapter 8 Lesson 2
Install and integrate Microsoft Visual InterDev with Microsoft Visual SourceSafe.	Chapter 2 Lesson 1
Install Visual InterDev development tools. Development tools include Visual InterDev client components and Visual InterDev server components.	Chapter 2 Lesson 1
Install and configure server services. Services include Active Server Pages (ASP) on a Web server; the Microsoft FrontPage Server Extensions; Web servers; and other servers or services such as MTS, SMTP service, Microsoft Index Server, and NetShow.	Chapter 8 Lesson 2 Chapter 10 Lesson 3
Configure a client computer to use an MTS component.	Chapter 8 Lesson 2
Implement the sequence of flow for the user interface.	
Apply consistent site navigation within a page and between pages.	Chapter 2 Lesson 3
Use components such as HTML tags, text hyperlinks, graphics, tables, and frames.	Chapter 2 Lesson 3

Skill Being Measured	Location in Book
Create an HTML form.	Chapter 2 Lesson 3
Validate user input.	
Validate user input by using an HTML form.	Chapter 2 Lesson 3
Validate server-side code.	Chapter 2 Lesson 3
Process user input from an HTML form.	Chapter 2 Lesson 3
Add Microsoft ActiveX controls to a Web page.	Chapter 5 Lesson 2
Add a Java applet to a Web page.	Chapter 2 Lesson 3
Create dynamic Web pages by using Active Server Pages.	
Create server-side scripts.	Chapter 4 Lesson 1
Create client-side scripts.	Chapter 4 Lesson 1
Add a scriptlet to a Web page.	Chapter 3 Lesson 4
Use scripting and DHTML to create a Web page that dynamically changes attributes of elements, changes content, changes styles, positions elements, and uses visual filters and transitions.	Chapter 3 Lessons 2, 3, 4
Dynamically return different Web pages based on a user ID.	
Identify authentication methods.	Chapter 9 Lesson 3
Display data by using ActiveX Data Objects (ADO).	Chapter 6 Lesson 1
Add error handling to server-side and client-side scripts.	Chapter 6 Lesson 1
Implement a client-side solution or a server-side solution that enables users to send e-mail from a Web page.	Chapter 10 Lesson 1
Create a Web page that is dynamically constructed from data in a database.	Chapter 6 Lesson 3 Lab 6
Enable a Web page to author a channel.	Chapter 4 Lesson 1
Add search capabilities to a Web site.	Chapter 2 Lesson 1
Apply a consistent look and feel to a Web site.	
Apply linked cascading style sheets to Web pages.	Chapter 2 Lesson 1
Use themes.	Chapter 2 Lesson 3
Use layouts.	Chapter 2 Lesson 1
Add media delivery capabilities to a Web site. Components include animation, sound, push content, NetShow, Java applets, plug-ins, and embedded MPEG.	Chapter 10 Lesson 3
Create a Web page that includes tables, graphics, and animation.	Chapter 2 Lesson 3
Create a Web site that allows membership.	Chapter 4 Lesson 3
Use ODBC and ADO to access or manipulate a data source.	Chapter 6 Lesson 2
Write ADO code that accesses data by using the Execute Direct model.	Chapter 6 Lesson 2

Skill Being Measured	Location in Book
Write ADO code that accesses data by using the Prepare and Execute model.	Chapter 6 Lesson 2
Write ADO code that accesses data by using the Stored Procedure model.	Chapter 5 Lesson 4
Manipulate data by using client-side cursors.	Chapter 5 Lesson 4
Manipulate data by using server-side cursors.	Chapter 5 Lesson 4
Given a database error, handle the error.	Chapter 6 Lesson 1
Manage transactions to ensure data consistency and recoverability.	Chapter 6 Lesson 1
Write SQL statements that retrieve and modify data.	Chapter 6 Lesson 1
Write SQL statements that use joins to combine data from multiple tables.	Chapter 6 Lesson 1
Create a stored procedure that returns information.	Chapter 5 Lesson 3
Create triggers that implement rules.	Chapter 6 Lesson 1
Create a test plan.	Chapter 1 Lesson 3
Debug a Web application by using Visual InterDev debugging tools.	
Set breakpoints on client-side and server-side scripts.	Chapter 4 Lesson 1
Inspect and manipulate variables.	Chapter 4 Lesson 1
Create a connection to remote server processes.	Chapter 4 Lesson 1
Use the MTS Explorer to track availability and performance of MTS middle-tier components.	Chapter 8 Lesson 2
Publish and distribute Web content and components across multiple servers.	Chapter 2 Lesson 1 Chapter 8 Lesson 3
Replicate Web content and components across multiple servers.	Chapter 9 Lesson 3 Chapter 8 Lesson 3
Establish mechanisms for posting content on a Web site.	Chapter 1 Lesson 2 Chapter 4 Lesson 2
Deploy updated pages, graphics, sound, ActiveX controls, and COM components on a Web site.	Chapter 7 Lesson 3
Verify hyperlinks.	Chapter 2 Lesson 1
Maintain streaming media on a Web site.	Chapter 10 Lesson 3

The Microsoft Certified Professional Program

The Microsoft Certified Professional (MCP) program provides the best method for proving your command of current Microsoft products and technologies. Microsoft, an industry leader in certification, is on the forefront of testing methodology. Our exams and corresponding certifications are developed to validate your mastery of critical competencies as you design and develop, or implement and support, solutions with Microsoft products and technologies. Computer professionals who become Microsoft certified are recognized as experts and are sought after industry-wide.

The Microsoft Certified Professional program offers five certifications, based on specific areas of technical expertise:

- *Microsoft Certified Professional (MCP)*. Demonstrated in-depth knowledge of at least one Microsoft operating system. Candidates may pass additional Microsoft certification exams to further qualify their skills with Microsoft BackOffice products, development tools, or desktop programs.
- *Microsoft Certified Professional - Specialist: Internet*. MCPs with a specialty in the Internet are qualified to plan security, install and configure server products, manage server resources, extend servers to run CGI scripts or ISAPI scripts, monitor and analyze performance, and troubleshoot problems.
- *Microsoft Certified Systems Engineer (MCSE)*. Qualified to effectively plan, implement, maintain, and support information systems in a wide range of computing environments with Microsoft Windows 98, Microsoft Windows NT, and the Microsoft BackOffice integrated family of server software.
- *Microsoft Certified Solution Developer (MCSD)*. Qualified to design and develop custom business solutions with Microsoft development tools, technologies, and platforms, including Microsoft Office and Microsoft BackOffice.
- *Microsoft Certified Trainer (MCT)*. Instructionally and technically qualified to deliver Microsoft Official Curriculum through a Microsoft Authorized Technical Education Center (ATEC).

Microsoft Certification Benefits

Microsoft certification, one of the most comprehensive certification programs available for assessing and maintaining software-related skills, is a valuable measure of an individual's knowledge and expertise. Microsoft certification is awarded to individuals who have successfully demonstrated their ability to perform specific tasks and implement solutions with Microsoft products. Not only does this provide an objective measure for employers to consider; it also provides guidance for what an individual should know to be proficient. And as with any skills-assessment and benchmarking measure, certification brings a variety of benefits: to the individual, and to employers and organizations.