

(英文原版)

MCSD:

Analyzing Requirements and Defining Solution ARCHITECTURES

学习指南

*MCSD: Analyzing Requirements and Defining Solution
Architectures STUDY GUIDE*

微软认证的软件开发专家考试系列丛书之七

[美] Ben Ezzell 著



电子工业出版社

Publishing House of Electronics Industry

URL: <http://www.phei.com.cn>

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书 名: MCS D: Analyzing Requirements and Defining Solution Architectures

学习指南(英文原版)

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印 刷 者: 北京天竺颖华印刷厂

装 订 者: 三河金马印装有限公司

出版发行: 电子工业出版社出版、发行

北京市海淀区万寿路173信箱 邮编: 100036 发行部电话: 68279077

北京市海淀区翠微东里甲2号 邮编: 100036 发行部电话: 68207419

URL: <http://www.phei.com.cn>

经 销: 各地新华书店经销

开 本: 787×1092 1/16 印张: 33.125 字数: 840千字

版 次: 1999年8月第1版 1999年8月第1次印刷

书 号: ISBN 7-5053-4748-9/TP·2284

定 价: 55.00元

著作权合同登记号 图字: 01-1999-2148

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微软认证考试系列丛书出版说明

当前, 计算机系统的开发、管理、使用及维护需要大量不同层次的专业技术人员, 评价各种技术人员的水平是一件既复杂又必不可少的工作。为考查、评测有关人员对于微软操作系统、软件和网络系统的理解和熟练使用程度, Microsoft公司设计了如下几种认证考试方案:

Microsoft Certified Professional (MCP, 微软认证专业人员)

Microsoft Certified Professional+Internet (MCPI, 微软认证的MCP及Internet专业人员)

Microsoft Certified Solution Developer (MCSD, 微软认证软件开发专家)

Microsoft Certified System Engineer (MCSE, 微软认证系统工程师)

Microsoft Certified System Engineer+Internet (MCSEI, 微软认证MCSE及Internet工程师)

Microsoft Certified DataBase Administrator (MCDBA, 微软认证数据库管理员)

Microsoft Certified Trainer (MCT, 微软认证培训员)

为帮助国内的技术人员学好、用好微软的产品, 顺利通过有关的考试, 我们分别以翻译和英文原版重印的形式推出了“MCSE学习指南系列”(中文译本)、“MCSE考试指南系列”(英文原版)和“MCSD学习指南系列”(英文原版)三个系列书。

MCSE考试

MCSE是Microsoft Certified Systems Engineer (微软认证系统工程师)的缩写形式。MCSE证书意味着持有者具有较高层次的Windows NT、微软操作系统和相关产品的知识。获得MCSE证书需要有良好的计算机基础知识, 还需要对操作系统、网络系统和信息化产品有深刻全面的了解, 需要经过认真甚至是艰苦的学习和实践过程。由于该证书取之不易, 一旦获得便足以说明证书持有者的技术水平, 所以该证书得到了普遍的认可, 几乎成为许多国外大公司录用人员、提升职务, 甚至是提高薪金的依据, 所以MCSE考生人数逐年上升。

要获得MCSE证书, 需要通过四项必考科目和两项自选科目考试。具体情况如下:

表0.1 MCSE考试内容与可选科目

必考科目	考试内容	可选择科目
#1	网络操作系统	Windows NT Server 3.51或Windows NT 4.0
#2	企业网系统应用	Windows NT Server (3.51或4.0) in the Enterprise
#3	网络基础知识	Networking Essentials
#4	微软操作系统知识	Windows 3.1、Windows 3.11 for Workgroups Windows 95、Windows NT Workstation、Windows 98
自选科目	考试内容	可选择科目
#5	微软信息服务器产品	SQL Server、SNA Server、Exchange Server或 Internet Information Server等十余个科目
#6	微软公司有关TCP/IP 方面的产品	TCP/IP for NT Server 4

为配合国内读者学习掌握计算机基础知识、操作系统、网络系统及信息化产品，我们推出了两套MCSE系列丛书，即：

- MCSE学习指南系列（中文译本）
- MCSE考试指南系列（英文原版）

MCSE学习指南系列

由于MCSE考试的技术水平高，要求考生概念清晰、基础知识牢固、能灵活地运用所学知识，并具有丰富的实践经验。显而易见，MCSE的学习、考试用书也应具备上述特点，介绍MCSE的书籍不但适用于MCSE考生，同时也适用于希望学习、掌握相关知识的普通技术人员。为此我们翻译了本系列丛书，现已推出或将要推出（黑体标识者）的书籍如下：

表0.2 MCSE系列丛书（学习指南系列）

中文书名	丛书编号	适用的考试科目
MCSE: NT Server 4学习指南	MCSE系列丛书之一	表0.1 #1
MCSE: NT Server 4 in the Enterprise学习指南	MCSE系列丛书之二	表0.1 #2
MCSE: 网络基础学习指南	MCSE系列丛书之三	表0.1 #3
MCSE: Windows NT Workstation学习指南	MCSE系列丛书之四	表0.1 #4
MCSE: Windows 95学习指南	MCSE系列丛书之五	表0.1 #4
MCSE: TCP/IP学习指南	MCSE系列丛书之六	表0.1 #6
MCSE: Microsoft Internet Information Server学习指南	MCSE系列丛书之七	表0.1 #5
MCSE: Windows 98学习指南	MCSE系列丛书之十六	表0.1 #4
MCSE: SQL Server 7 Administration学习指南	MCSE系列丛书之十七	表0.1 #5
MCSE: Microsoft Internet Information Server 4学习指南	MCSE系列丛书之十八	表0.1 #5
MCSE: TCP/IP for NT Server 4学习指南	MCSE系列丛书之十九	表0.1 #6

MCSE考试指南系列

如果说学习指南系列的特点是，十分注重原理介绍、概念阐述和外沿知识的说明；那么，新的考试指南系列则注意了必须了解的知识、结论，强调了正确的操作方法和实际处理问题的能力，同时介绍了许多MCSE考试的经验和技巧，并附有考试例题。

考虑到考试指南系列书注重结论、致力于支持读者通过MCSE考试等特点，加之MCSE考生英语水平普遍很高（考试本身需用英语完成），我们以英文重印形式推出了如下的考试指南系列书，详见表0.3所示。

表0.3 MCSE系列丛书（考试指南系列）

中文书名	丛书编号	适用的考试科目
MCSE: NT Server 4考试指南	MCSE系列丛书之八	表0.1 #1
MCSE: NT Server 4 in the Enterprise考试指南	MCSE系列丛书之九	表0.1 #2
MCSE: Networking Essentials考试指南	MCSE系列丛书之十	表0.1 #3
MCSE: NT Workstation 4考试指南	MCSE系列丛书之十一	表0.1 #4
MCSE: TCP/IP for NT Server 4考试指南	MCSE系列丛书之十二	表0.1 #6
MCSE: Microsoft Internet Information Server 4考试指南	MCSE系列丛书之十三	表0.1 #5
MCSE: SQL Server 7 Administration考试指南	MCSE系列丛书之十四	表0.1 #5
MCSE: Windows 98考试指南	MCSE系列丛书之十五	表0.1 #4

MCSD考试

持有MCSD证书，说明持有者具有熟练使用微软操作系统、开发工具和相关技术的能力。因而许多MCSE考生把MCSD考试作为MCSE考试的准备阶段，或者在获取了MCSE证书后再考取MCSD证书。要获取MCSD证书，需要通过如下四种考试（见表0.4）：

表0.4 MCSD必考科目与自选科目

必考科目	考试内容
#1 系统分析及 解决方案	Analyzing Requirements and Defining Solution Architectures
#2 桌面应用程序开发 (二择其一)	Designing and Implementing Desktop Applications with Visual Basic 6.0 Designing and Implementing Desktop Applications with Visual C++ 6.0
#3 分布式应用程序开发 (二择其一)	Designing and Implementing Distributed Applications with Visual Basic 6.0 Designing and Implementing Distributed Applications with Visual C++ 6.0
自选科目	可选择内容
#4 具体应用科目 (任选其一)	Implementing a Database Design on Microsoft SQL Server 6.5 Designing and Implementing a Database Design with Microsoft SQL Server 7.0 Designing and Implementing Data Warehouses with Microsoft SQL Server 7.0 Developing Application with Visual C++ Using Microsoft Foundation Class Library Designing and Implementing Web Site with Microsoft FrontPage 98 Designing and Implementing Commerce Solutions with Microsoft Site Server 3.0 Designing and Implementing Web Solutions with Microsoft Visual InterDev 6.0

MCSD学习指南系列

为配合广大读者学习MCSD方面的知识，考取MCSD证书，我们以英文重印形式，首先推出如下MCSD学习指南系列书（黑体标识者为最新推出或近期推出），见表0.5。

表0.5 MCSD系列丛书（学习指南系列）

中文书名	丛书编号	适用的考试科目
MCSD: SQL Server 6.5 Database Design学习指南	MCSD系列丛书之四	表0.4 #4
MCSD: Visual Basic 6 Desktop Application学习指南	MCSD系列丛书之五	表0.4 #2
MCSD: Visual Basic 6 Distributed Application学习指南	MCSD系列丛书之六	表0.4 #3
MCSD: Analyzing Requirements and Defining Solution Architecture学习指南	MCSD系列丛书之七	表0.4 #1
MCSD: Visual C++ 6 Desktop Application学习指南	MCSD系列丛书之八	表0.4 #2
MCSD: Visual C++ 6 Distributed Application学习指南	MCSD系列丛书之九	表0.4 #3
MCSD: SQL Server 7 Database Design学习指南	MCSD系列丛书之十	表0.4 #4

由于采用“重印”方式，即从SYBEX公司购买版权，同时获取该书的文本文件和图形文件，在国内重新排版印刷，这样做的优势在于：

- 降低了图书价格，重印书比原版图书便宜许多。
- 缩短了制作周期，重印书与原版书的“出版时差”不足两个月。
- 提高了制作质量，使用原文件排版，印刷质量明显优于各种影印外文原版书。

综上所述，不难想象，重印系列书会受到广大读者的欢迎。

由于MCSE、MCSD及考试科目和软件版本在不断地增加或升级，因此我们推出的品种也会随之增加或调整。请读者留意书店内的销售广告或本系列书中的最新说明（恕不另行通知）。

最后，向支持和喜爱我们图书的广大读者表示感谢，并肯请读者对书中存在的问题提出批评和指正。

1999年·春

To all of those who try...and, I hope, succeed...

Acknowledgments

While the author receives the honor (or blame) for his efforts herein in the form of his name on the cover, the actual product between the covers is not a singular effort preformed by an individual. Instead, the value and readability of any book rests with the efforts of a number of individuals who receive less recognition than their labors deserve. Therefore, my very sincere thanks go to my editors, Tracy Brown, Linda Orlando, and Bronwyn Erickson, who have corrected, questioned, and smoothed my words; and to Richard Waymire, my technical editor, who has nit-picked his way through all of my text and questions very thoroughly and capably and whose comments, suggestions, and critique are always welcome.

Thanks also to the many people involved in the preparation of this book—including proofreaders Blythe Woolston and Dann McDorman; Electronic Publishing Specialists, Nila Nichols, Grey Magauran, and Maureen Forys; Tony Jonick for illustrations; and Production Coordinator, Catherine Morris.

Also and not least, I owe a special thank you to my old friend Charles Montgomery who was the first to read and critique the scenarios presented in this book and who authored the Midnight Pages scenario, which has its own singular (and very realistic) virtues.

Introduction

The new Microsoft Certified Solution Developer (MCS D) exam is a distinct departure from the MCSE exam series. In the MCSE exam series, questions are posed to determine your knowledge of programming, system performance, or network operations—whatever is core to the exam topic. In the MCS D exam, however, the emphasis is on solutions, as in Solution Developer (the title of the exam).

Here you are not being tested on your knowledge of the esoteric details of the Windows APIs; nor your fount of information relevant to network protocols; nor even your familiarity with the capabilities of the applications comprising Microsoft Back Office. Instead, the MCS D exam is designed to test something much less concrete and much harder to define: your ability to analyze a problem and to propose solutions satisfying both the technical aspects of the situation and the human (corporate) elements involved. *MCS D: Analyzing Requirements and Defining Solution Architectures Study Guide* will help you learn how to do just that.

Depending on your talents and your bent of mind, it is likely that the MCS D exam may be either the easiest exam in the series, or the hardest. How you will do on the exam is not something easily predicted, and this study guide will not attempt to forecast your success or your failure.

**NOTE**

In a sense, the MCS D exam is an intelligence test. Or perhaps it would be more appropriate to say that it is a common sense test, because so much depends on simply recognizing which information is important and which is not.

In Chapter 1, “Three Business Scenarios,” you will be presented with several scenarios similar to those you will encounter when taking the MCS D exams.

Next, in Chapters 2-13, you will find exam objectives together with background material. At the end of each of these chapters is a set of technical questions to help you review the material in each chapter.

Finally, in Chapter 14, the scenarios presented in Chapter 1 are revisited with answers and discussions of why various solutions are appropriate or inappropriate to the individual scenarios.

Ideally, you should begin by testing yourself. Answer the questions in Chapter 1 and review the material in Chapters 2-13 before referring to the answers and discussions in Chapter 14.



NOTE

While the actual MCSD exam is a timed and scored exam, the questions and exercises presented here have no time limits assigned and no scores are derived from your performance. Instead, the exercises in this volume are intended to familiarize you with the type of questions posed by the MCSD exam; to show you how to analyze situations; to teach you how to determine which factors should be considered as relevant to a solution; and, of course, to identify which factors may or may not be relevant.

The MCSD Exam

The MCSD exam is a computer-based exam that begins conventionally enough, with a series of multiple-choice questions on several topics. Similar questions are posed in Chapters 2 through 13 in this book with answers provided in Appendix A.

The bulk of the MCSD exam, however, is based on Case Study examples where you are presented with information about a situation requiring a solution and are then asked to solve a series of problems. The following sections contain illustrations taken from the Microsoft Case Study-based Exam Test Demonstration. A brief explanation is given for each type of problem. Also, Chapter 1 in this book offers a series of similar scenarios, although the book version is only paper and does not offer the interactive graphics found in the computer versions.

The Case Study-Based Exam Format

The exam begins by presenting scenario case studies (see Figure 1). Information is available either under individual categories such as Background, Problem Statement, Current System, and so on, or as a single continuous section of text.

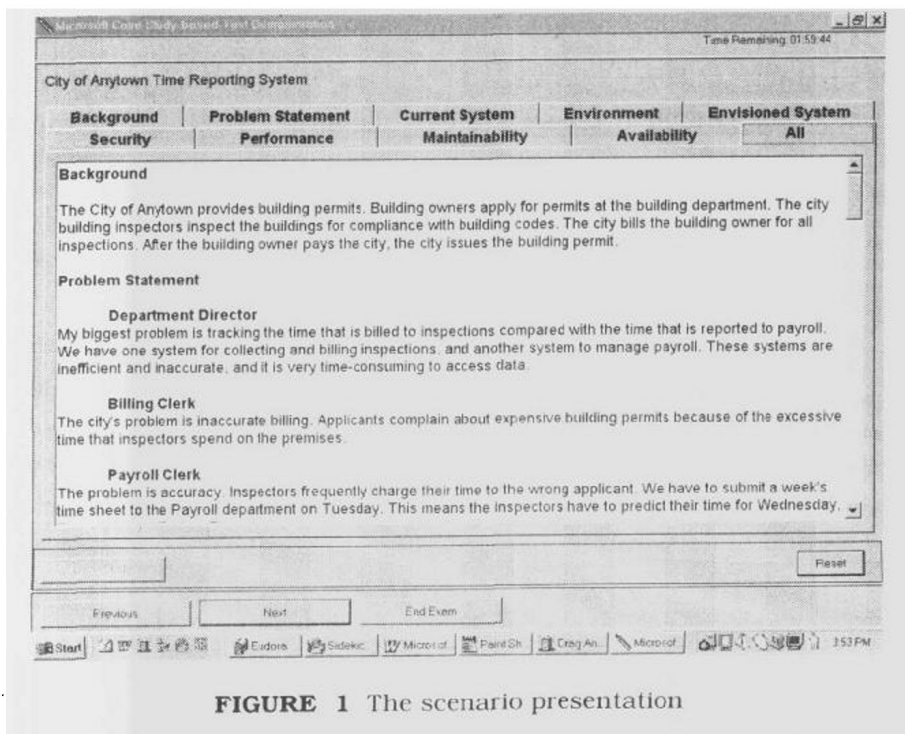


FIGURE 1 The scenario presentation

In any of these forms, you can scroll through the material, and you are able to review the material as desired.

Multiple Choice Questions

Each scenario also presents several questions in multiple choice format, as shown in Figure 2.

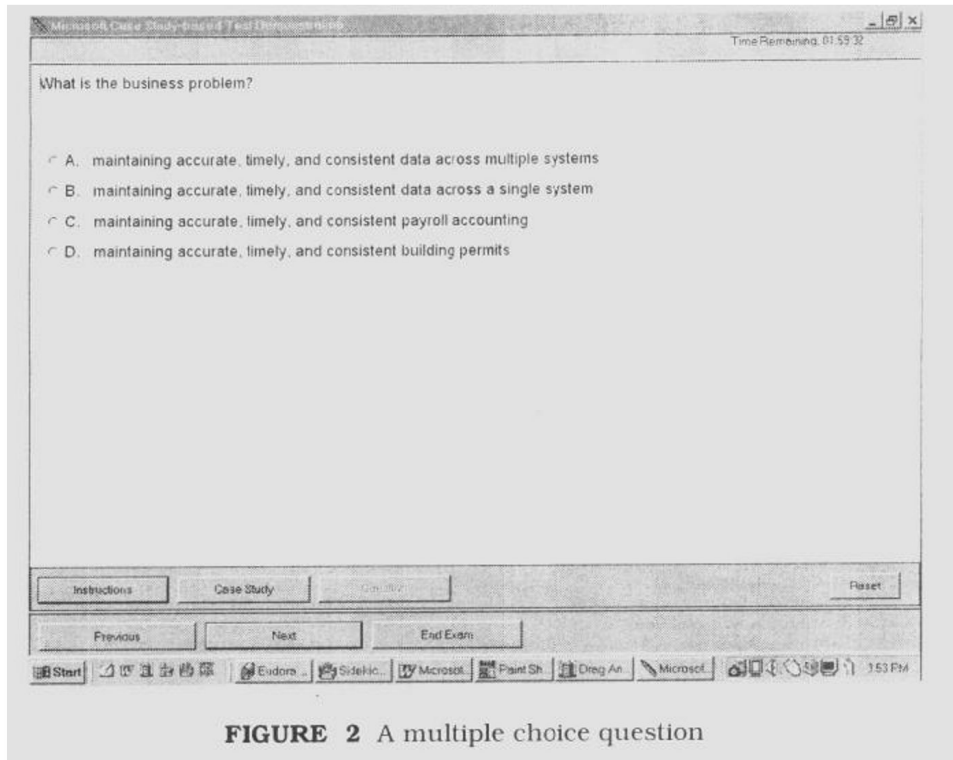


FIGURE 2 A multiple choice question

It seems reasonable to assume that you are familiar with multiple choice questions. You simply check the button for the most appropriate answer. You are also free to uncheck and change your answers if needed.

Ranking Access

In addition to multiple choice questions, a quite different type of question asks you to rank your answers according to parameters specified in the question. One example of this type of question is shown in Figure 3; in this case, you are asked to rank users by the level of access each requires to a database.

You are expected to drag user roles from the right pane to the left and to arrange them in the appropriate order. While doing so, you can go back and review the problem scenario as needed.

Requirements Documentation

The next problem presented is somewhat more complex. In Figure 4, the left pane presents a tree with branches for different elements of the time reporting system, as they would be stated in a requirements document. The right pane presents a list of possible requirements.

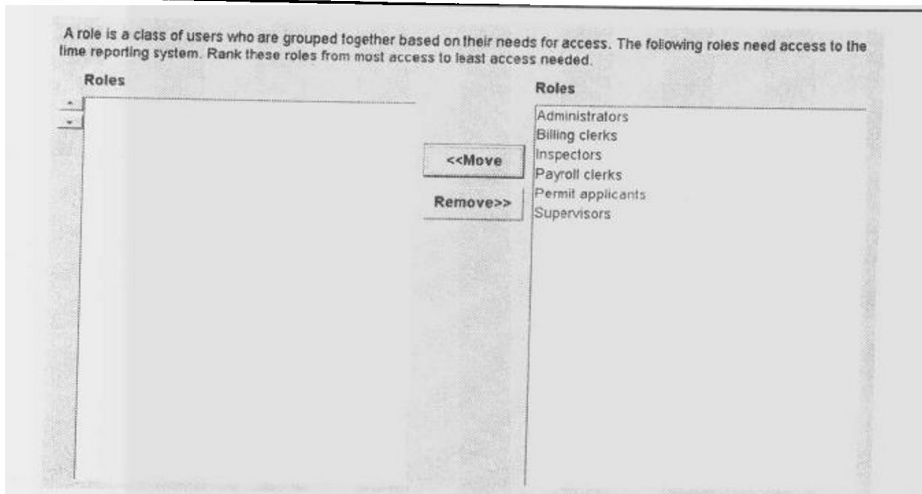


FIGURE 3 Ranking users by access requirements

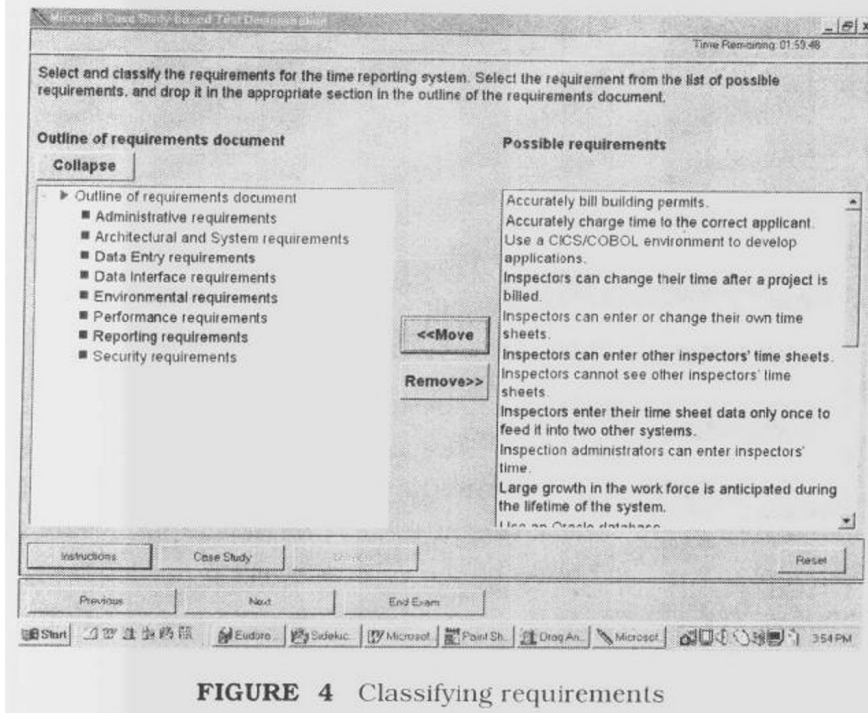


FIGURE 4 Classifying requirements

Not all of the possible requirements listed in the right pane actually belong in the requirements document. Your task here has two parts: first, determine which requirements are actually relevant, and second, place these under the correct headings. Again, you will be able to go back and review the problem scenario as needed.

Data Flow Diagrams

Another type of problem presented asks you to construct a high-level system diagram (see Figure 5). The example in Figure 5 shows a system diagram for a time reporting system. The diagram is required to show the principal components and the data flow elements.

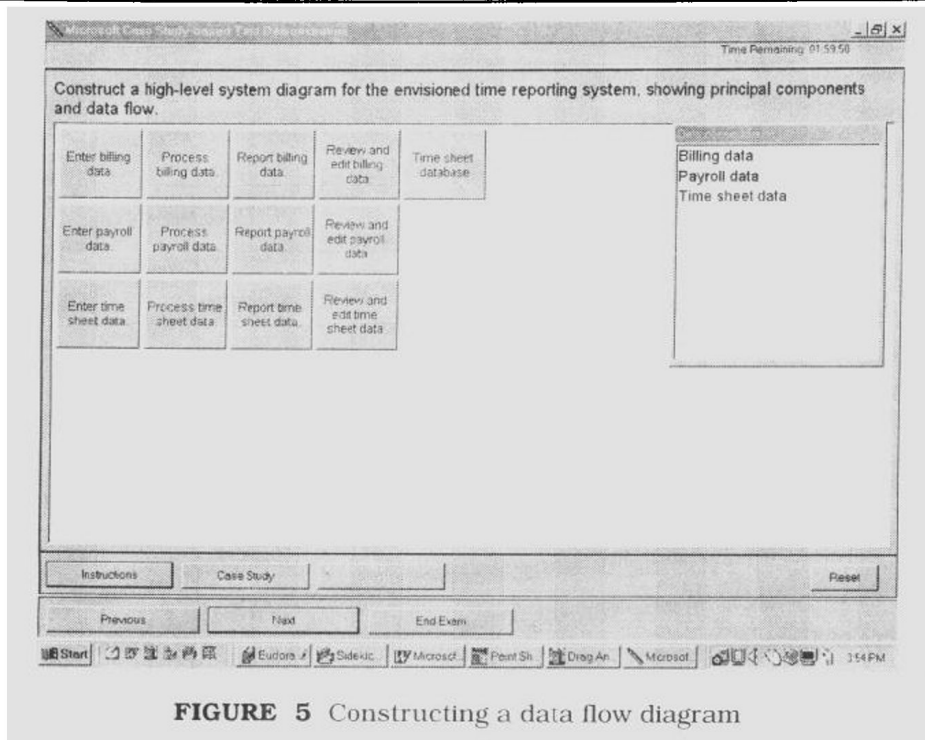


FIGURE 5 Constructing a data flow diagram

Here a series of components are presented as boxes that can be dragged around the screen as desired. By selecting two of the components and a data flow element, the selected components are connected, with arrows showing the flow direction. Connections can be removed as desired or the direction of flow reversed.

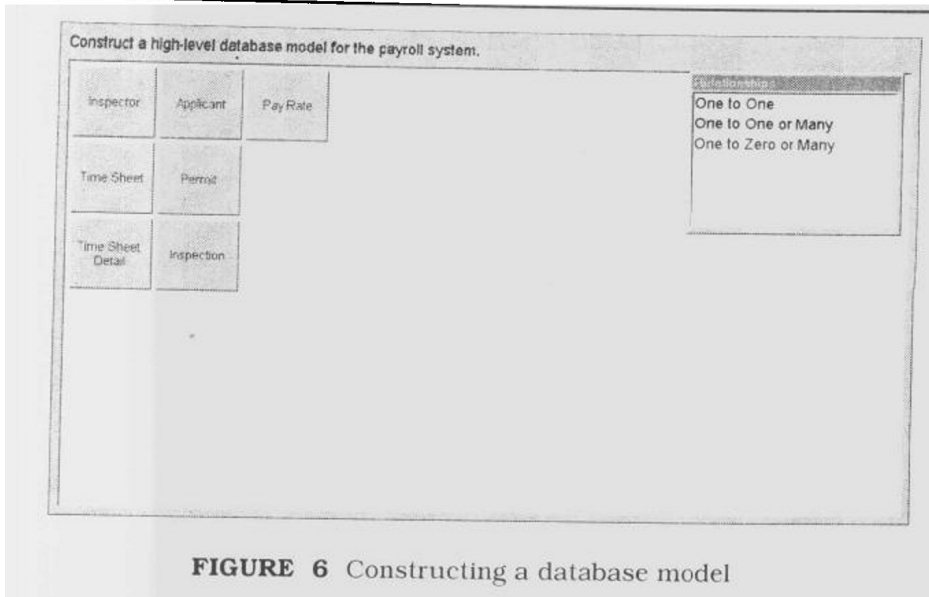
The solution is not judged on elegance of arrangement, which is just as well since the space provided is minimal and the chart you produce is not going to be one you'd care to frame and hang on the wall. Instead, the objective is simply to define the appropriate relationships and show the flow of data between the components.

Database Models

A final type of problem, as shown in Figure 6, is constructing a high-level database model for a payroll (or other) system.

Here database tables appear in boxes while you are given a choice of three relationships between table entries—one-to-one, one-to-one-or-many, or one-to-zero-or-many.

Most of this requires nothing more than common sense. For example, one inspector handles multiple inspections but each inspector has only one pay rate. The other relationships, of course, may not be quite as obvious, and you may need to refer to the scenarios to decide what relationships are appropriate.



Don't forget that one-to-zero-or-many is every bit as likely as one-to-one-or-many if there is no stated requirement demanding a minimum requirement of one.

A Few Tips

Unlike many other exams, the questions and problems presented on the MCSD exam rely more on thinking than on memorizing facts. In many respects, this is much more a test of intelligence and common sense than a test of fact and detail.

This is not to suggest that facts and details will not be needed, only that clear and logical thinking will be of far more importance than a store of details about the intricacies of any particular product or system.

It is said that a clear statement of a problem contains within itself the solution. In solving the scenarios in the MCSD exam, and those in Chapter 1 of this book, the first step will always be to make the statement of the problem clear.

And of course, as a solution developer in the real world, this is precisely the type of problem you will be faced with: winnowing the wheat of fact from the chaff of verbiage and exposition, and cleanly defining the real problem behind the presentation.

Scheduling an Exam

Once you think you are ready to take an exam, call Prometric Testing Centers at (800) 755-EXAM (755-3926). They'll tell you where to find the closest testing center. Before you call, get out your credit card—each exam costs \$100. (If you use this book to prepare yourself thoroughly, chances are you'll have to shell out that \$100 only once!)

You can schedule the exam for a time that is convenient for you. The exams are downloaded from Prometric to the testing center, and you show up at your scheduled time and take the exam on a computer.

Once you complete the exam, you will know right away whether or not you have passed. At the end of the exam, you will receive a score report. It will list the six areas that you were tested on and how you performed. If you pass the exam, you don't need to do anything else—Prometric uploads the test results to Microsoft. If you don't pass, it's another \$100 to schedule the exam again. But at least you will know from the score report where you did poorly, so you can study that particular information more carefully.

Test-Taking Hints

If you know what to expect, your chances of passing the exam will be much greater. Following are some tips that can help you achieve success.

Get There Early and Be Prepared This is your last chance to review. Bring your book and review any areas about which you feel unsure. If you need a quick drink of water or a visit to the restroom, take the time to do so before the exam. Once your exam starts, it will not be paused for these needs.

When you arrive for your exam, you will be asked to present two forms of ID. You will also be asked to sign a piece of paper verifying that you understand the testing rules and that you will not disclose the content of the exam to others.

Before you start the exam, you will have an opportunity to take a practice exam. It is not related to Windows NT and is simply offered so that you will become comfortable with the exam-taking process.

What You Can and Can't Take In with You These are closed-book exams. The only thing you can take in is scratch paper provided by the testing center. Use this paper as much as possible to diagram the questions. Many times diagramming questions will help make the answer clear. You will have to give this paper back to the test administrator at the end of the exam.

Many testing centers are very strict about what you can take into the testing room. Some centers will not even allow you to bring in items like a zipped purse. If you feel tempted to take in any outside material, be aware that many testing centers use monitoring devices such as video and audio equipment (so don't swear, even if you are alone in the room!).

Prometric Testing Centers consider the test-taking process and the test validation to be a very serious matter.

Test Approach As you take the test, if you know the answer to a question, fill it in and move on. If you're not sure of the answer, mark your best guess and then make a note of the question so you can come back to it.

At the end of the exam, you can review the questions. Depending on the

amount of time remaining, you can then view all of the questions again, or you can view only the questions about which you were unsure. Double-check your answers, just in case you misread any of the questions on the first pass. (Sometimes half of the battle is trying to figure out exactly what the question is asking you.) You may find that a related question provides a clue for a troublesome question.

Be sure to answer all questions. Unanswered questions are scored as incorrect and will count against you. There is no penalty for guessing, and your guess might just be the correct answer. Be sure you keep an eye on the remaining time so that you can pace yourself accordingly.

If you do not pass the exam, make mental notes of everything that you can remember while the exam is still fresh in your mind. This will help you prepare for your next try. Although the next exam will not be exactly the same, the questions will be similar, and you don't want to make the same mistakes.

After You Become Certified

Once you become an MCSD, Microsoft kicks in some goodies, including:

- A one-year subscription to the Microsoft Beta Evaluation program, which is a great way to get your hands on new software. Be the first kid on the block to play with new and upcoming software.
- Access to a secured area of the Microsoft Web site that provides technical support and product information. This certification benefit is also available for MCP certification.
- Permission to use the Microsoft Certified Professional logos (each certification has its own logo), which look great on letterhead and business cards.
- An MCP certificate (you will get a certificate for each level of certification you reach), suitable for framing or sending copies to Mom.
- A one-year subscription to *Microsoft Certified Professional Magazine*, which provides information on professional and career development.

How to Use This Book

The Windows Architecture exams are mostly conceptual, rather than applied—or theory as opposed to practice. As you work through this book, you may want to follow these general procedures:

1. Review the exam objectives as you work through the chapter. (You may want to check the Microsoft Training and Certification Web site to make sure the objectives haven't changed.)



Exam objectives are subject to change at any time without prior notice and at Microsoft's sole discretion. Please visit Microsoft's Training & Certification Web site (www.microsoft.com/mcp/certstep/mcsd.htm) for the most current listing of exam objectives.