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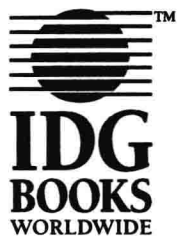
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BARRIE SOSINSKY

BUILDING VISUAL FOXPRO™ 5 APPLICATIONS

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BUILDING VISUAL FOXPRO™ 5 APPLICATIONS

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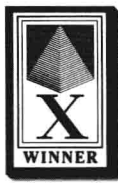
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URUGUAY: InfoWorld Uruguay. VENEZUELA: Computerworld Venezuela, PC World Venezuela; and VIETNAM: PC World Vietnam.

10/196

This book is dedicated with love to the memory of my father, Jack Sosinsky.

PREFACE

This book provides a methodology you can use to develop your first Visual FoxPro application. While most FoxPro application development books choose accounting systems as their representative project, I want you to learn more about Visual FoxPro, not accounting. Therefore, I've picked a topic that has a more general interest to the actual everyday business of a software developer — direct response mail and fulfillment. In this book I create a direct response mail campaign database management system (DBMS) for tracking mail, contracts, and invoices. Most database developers produce applications that can be sold through direct mail. It's often a great way for small developers to build an infrastructure as their applications start to sell.

I assume you have some idea of what you would like to design and build, and I take you through a process you can follow to create your own database management system. (If you don't have a specific application to build, by all means feel free to follow along and rebuild the application in this book as practice.) To make the ideas concrete, I will present a sample application called MailMan. The MailMan database lets you create prospect and customer tables, invoices and statements, and mail merges and sales reports without having to worry about setting up charts of accounts and adhering to double-entry accounting principles. Beyond that, the MailMan lets you work with large data sets, which is important when learning VFP.

The MailMan is the copyrighted material of the author. Feel free to use any part of this project for your own personal use. If you are creating a commercial product modify enough of this database so that it is not recognizable, and please do not market or sell a derivative work based upon the MailMan.

Performance is most likely the reason you are working in Visual FoxPro in the first place. In addition to developing a database management application, we'll also get to play with Rushmore and consider topics such as replication, distributed data, client-server technology, and the Upsizing Wizard, although these topics are not the main focus of this book.

Conventions Used in This Book

This book offers a specific method for creating a database application. I did not create this method; it is synthesized from the work of other developers whom I will duly note in the text of the book. This approach is not the only way to work, and it may not be the one you eventually adopt. But it should get you started, and it does have a certain logic to it that I will describe as we go along.

In the book, I will explain why you do something at a specific time and in a specific order using numbered lists, step-by-step instructions, and other conventions that will help you build your application. If you already know how to perform a task, the construct will be easy to spot and pass over.

This book also contains some conventions to clarify important points and break up that “wall of text” that programming books inevitably seem to have. These conventions make the book more fun to read and are as important to you the reader, as they are to me the writer. You’ll find four important icons sprinkled about in the book.



NOTE A Note contains information that relates to the current topic of discussion. You’ll find Notes throughout the book, but they are especially important in instruction lists.



TIP A Tip is something in Visual FoxPro that will make your job easier and more enjoyable. Tips also include real-world developing techniques that may or may not involve programming and are generally applicable to database development.



WARNING When you see a warning, something bad is about to happen to you. I’ll tell you what it is, why it happens, and how to avoid it.



The New to 5 icon introduces changes or features that are new to VFP Version 5.0.

This book also contains some sidebars.

MY FIRST SIDEBAR

Sprinkled throughout this book are a few sidebars. Set apart from the text, sidebars contain information that relates, but is not central, to the main discussion.

In addition to the icons indicated above, this book uses some standard Microsoft documentation techniques. A menu or menu command is shown with its hot key underlined, such as the Exit command on the File menu. Keystrokes such as Alt+F,X indicate that you press the Alt key and F key simultaneously, then the X key.

I make every attempt to label all interface features described in the book. Therefore, you will find interface elements labeled as: window, dialog box, button, check box, and combo box. The actual feature is capitalized; the element is in lower case. An example would be the Page Setup dialog box. Please bear with me on this one.

You'll encounter programming code set off from the text by special type:

```
*****
* Comments are preceded by asterisks
* and ignored in program code.
*****
PROCEDURE YourProc (var1, var2,...)
If Exp1
    Step 1
    Step 2
Endif
Step 3
ENDPROC MyProc First
```

I'm a strong believer in heavily documenting code and in programming using clegic (indented) logic for clarity. Some poor fool may end up having to figure out what I've done wrong. Chances are, it will be me.

Other conventions include:

- Commands, keywords, acronyms, constants, and device names are capitalized and set in code, such as: BROWSE, ODBC, OLE, and PRN.
- Any coded word with parentheses represents a function, such as: DATE(). The variable value for a function is indicated by *italics*.
- Lowercase words are used to indicate tables and field names.

Visual FoxPro makes heavy use of address naming conventions for objects, properties, events, and methods. You'll see a lot of things like: frsFormset.frmForm.cntControl.Property = *value*. Tedious, to be sure. I will explain the methods used in context as we go along. Naming conventions are covered more fully in Chapter 2, including the ones for data types. Other conventions you might want to adopt from the FoxPro community are there, as well.

How This Book Is Organized

This book is divided into three parts covering design, construction, testing, and implementation. Each part teaches you about a related set of topics. As such, each part is self-contained. However, because we will develop an application sequentially, the book is sequential. Material in one part refers to information in the previous part.

In Part I, “The Grand Scheme,” I describe how you determine the language for the database you are trying to capture or measure. A great database is like a miniature world that people use to enter data and get information back in return. The actual style of the database should reflect your intended user base. The first four chapters describe the initial design of your application.

In Part II, “Building Blocks,” you blueprint your application and build it in modular fashion. You will complete your first build and run a miniature beta program. You’ll also learn how to construct menus, build object classes, analyze the results of data, and create online Help. After all, everyone needs help, some more than others. An application isn’t complete until the Help system is built. At the end of this part you’ll have something for your users to work with.

In Part III, “Wholly Rolling,” it’s time to check out your application’s progress in the hands of your testers. There are bugs to fix, some performance issues to address, and final features to add. Then, you’ll start to fine-tune your application using Rushmore, VFP’s data access optimization scheme. Finally, you’ll learn how to price and package your product. The end? No. Any good product is headed to Version 2.0. You’ll see some strategies for planning and implementing a next version release.

In Appendix A, “What’s on the Disk,” you’ll find the contents of the sample application, MailMan, along with instructions on how to use it.

The accompanying CD-ROM has a sample database of several hundred thousand records you can play with. Such a large data set lets you optimize the database’s performance toward the end of this book, something most VFP application books talk about but don’t really provide. You should also find this data set valuable as you work at optimizing whatever particular system you choose to build.

Things You Should Know

You should know how to use the Windows 95 and/or Windows NT operating system. The screen shots you see were captured with VFP 5.0 on a Pentium computer (133MHz, 32MB RAM) with a Windows NT 4 Workstation. When there is a difference between these two operating systems, or if the program’s performance is affected because of different hardware specifications (for example, programs run faster on a Power PC than on a 486), I’ll let you know.

This book doesn’t require you to be an accomplished developer; it assumes that this is your first VFP application. You should know basic database terminology: fields, data types, records, record pointers, indexes, tables, cursors, aliases, variables, arrays, and so

on. On a basic level, you should also be able to use the VFP interface contained in the *Visual FoxPro User's Guide* that came with the product. When a fuller discussion may be found in the *Visual FoxPro Developer's Guide* or in the online Help system, I'll refer you to the appropriate places.



NOTE If you worked with Visual FoxPro 3.0 in Windows 3.1, as I did, you should know that Microsoft no longer recommends running the program in that operating system. If you worked with version 3.0 on a 486 computer as I once did (a DX/2 66, to be exact), it is time to go out and buy yourself an overdrive chip or move to a Pentium class machine. It will save you a lot of time.

I don't expect you to know and recite the five normal forms, but I do expect you to understand the basic idea behind lookups, one-to-many and many-to-many relationships, and referential integrity. As best as I can within time and space limitations I will explain these concepts as we go along. Chapter 2 offers some information about database practices, and Chapter 4 offers a basic discussion of the theory of databases, with references to several useful resources contained therein.

At a programming level, you should how to use the Command window and have *some* knowledge of the important xBASE command set. You should understand looping and branching commands and their structures. I don't expect you to have fully mastered the language, and I will explain the programming concepts as the book progresses. For example, if I describe a variable by value or a variable by reference, I'll tell you which is which and why.

You should have VFP installed on your computer, preferably the Professional Edition. I won't explain basic installation issues, although there will be some discussion on network multiuser and optimization issues. These issues are briefly described in VFP's *Installation Guide and Master Index*. The online documentation re-creates all of the books that came with the product. I try and work in Visual FoxPro with the documentation open in memory all the time.

Most programming books take too much for granted. If I err, it will be on the side of doing too much explaining. You may get it, but someone else may not. Programming requires patience. So be patient.

How to Get the Most Out of This Book

Read the manuals first! (Gee, there must be a more elegant way of saying that!) As a developer, this is the first commandment. Plow through the *VFP User's Guide* and the *Developer's Guide*. Then it won't seem like you are in some alien world in which you need a codex to understand the language we discuss among ourselves.

Work with the examples provided in this book. Remember, your goal is to have a working application when this book is done. This is not an intellectual exercise, but a practical one. As a developer, especially a first-time developer, you will probably face clients, get involved in a sales cycle, deal with intellectual property issues, do project specifications, set milestones, create budgets, and dance the dance we all dance to make our clients happy and get paid on time. And you are going to get some bruises in the bump and grind. I know developers who get their clocks cleaned in their first database project, especially when they have switched into a new database where the true time and costs are unknown. This is not an easy business. So, prop this book right up there next to your Road Warrior or your Desktop mind machine and get started. Get a drink, close the door, and put on some earphones with your favorite music. Kick off your shoes and put on comfortable hoofies if you like.

ACKNOWLEDGMENTS

I seem to start off every book acknowledgment these days with a note of thanks to my family: my wife, Carol Westheimer, and my daughter Alexandra. These book projects are extremely time intensive, and they couldn't be done without the understanding of my family.

Several people contributed to the making of this book and deserve my thanks. I wish to thank the acquisitions team at IDG Books Worldwide for helping me bring the book to print. In particular, I would like to thank Walter Bruce, Publishing Director, and John Osborn, my acquisitions editor, for their wholehearted support. Others on the committee were particularly supportive, including Greg Croy, and to all of them I am appreciative.

Many other people worked on this project. Susannah Davidson was the development editor throughout the project. She kept the material on track and made the indefinite definite. Thanks also to the copy editor, Robert Campbell, and to Ben Schroeter in Production. Carolyn Welch shepherded the manuscript through the final stages.

This version of the book was fortunate in having a really fine technical editor, my friend Les Pinter. Les is a noted FoxPro author, with five books on the subject. Les publishes a newsletter called *The Pinter FoxPro Letter* and maintains a forum on CompuServe (type GO PINTER) to support it. Additionally, Les's company, Pinter Consulting, does major FoxPro projects for clients. So he brings considerable real-world experience to the task. As the project rolled toward completion, I called on Les to help chase down some of the obscure bugs in the application. His last-minute efforts helped us make our production deadline. For this he has my extra thanks.

INTRODUCTION

Visual FoxPro 5.0 (VFP) defines everything Microsoft has tried to achieve with its development tools over the last five years: power, ease of use, object packaging of procedural programming, interapplication communications, and structured visual application development — all with the speed of the Fox that developers have come to count on.

Several developer friends of mine have remarked from time to time on how much they love Visual FoxPro. Their reason generally is that they can do just about anything with the product because Visual FoxPro is really a computer language dedicated to databases. VFP is a very rich product and one that is not particularly easy to learn. Fortunately, you can get by knowing just a fraction of the language and learn more as you go along.

Visual FoxPro Marches On

Ever since Microsoft purchased Fox three years ago, rumors about FoxPro's forthcoming demise continue to circulate in the trade press. But, they've been proven wrong. FoxPro version 2.5 turned into FoxPro 2.6. Visual FoxPro version 3.0 then appeared and now has turned into Visual FoxPro 5.0. Moreover, this latest version boasts ActiveX (nee OLE) support, Internet/intranet features, improvements to the programming tools like the debugger, a much better collection of wizards, and many incremental improvements to the various tools and designers in the program. Meanwhile, Visual FoxPro has become more consistent with Microsoft's line of Windows products — cleaner, more powerful, and easier to use.



For a complete list of new Visual FoxPro 5 features, see Chapter 2 in the *Installation Guide and Master Index* that comes with Visual FoxPro 5.

I doubt we have seen the last version of this product. The speed of VFP, its ability to access large data files, and the many large corporate clients (particularly in the financial communities) argue for its continued development.

Visual FoxPro continues to develop along the lines of Microsoft's other visual programming tools: Visual C++, Visual Basic, and Access. Version 3.0 saw the introduction of the Visual Basic PEM programming model (Properties, Events, and Methods) that was incorporated into FoxPro. This version represented a paradigm shift. Version 5.0 is really just a refinement of version 3.0.

If Microsoft's vision of application suites working together is to succeed, surely Visual FoxPro is a great platform on which to run the experiment. In Version 5.0 custom controls developed on one platform work on all the others, lending themselves to the creation of a powerful, easy-to-use toolkit for complex application development.

CONTENTS AT A GLANCE

PREFACE	IX
ACKNOWLEDGMENTS.....	XV
INTRODUCTION	XXIX
CHAPTER 1: NEEDS ANALYSIS	3
CHAPTER 2: PROJECT ORGANIZATION	39
CHAPTER 3: TABLES AND THE DATA ENVIRONMENT	61
CHAPTER 4: DATA MODELING.....	101
CHAPTER 5: MULTIUSER ISSUES	125
CHAPTER 6: APPLICATION DESIGN.....	183
CHAPTER 7: WHAT'S ON THE MENU?	243
CHAPTER 8: BEING OBJECTIVE.....	281
CHAPTER 9: SMOOTHING THOSE ROUGH EDGES	317
CHAPTER 10: MORE FUN WITH FORMS.....	357
CHAPTER 11: REPORTING IN	391
CHAPTER 12: SEARCH, SECURITY, AND A TASTE OF OLE	421
CHAPTER 13: HELP!	469
CHAPTER 14: TESTING AND DEBUGGING	509
CHAPTER 15: FINE-TUNING PERFORMANCE	539
CHAPTER 16: YOUR PRODUCT, THE FINAL FRONTIER.....	551
APPENDIX A: WHAT'S ON THE CD-ROM	565

TABLE OF CONTENTS

PREFACE IX

Conventions Used in This Book. x

How This Book Is Organized. xii

Things You Should Know. xii

How to Get the Most Out of This Book. xiii

ACKNOWLEDGMENTS XV

INTRODUCTION XXIX

Visual FoxPro Marches On xxix

PART ONE: THE GRAND SCHEME. I

CHAPTER I: NEEDS ANALYSIS. 3

Starting Out 4

Project Milestones. 5

Client Basics 6

 Making a presentation 7

 Establishing the budget 10

 The sales pitch 12

 The paper chase 14

The Project Specification 16

 Interviewing clients 17

 Forms collection 18