

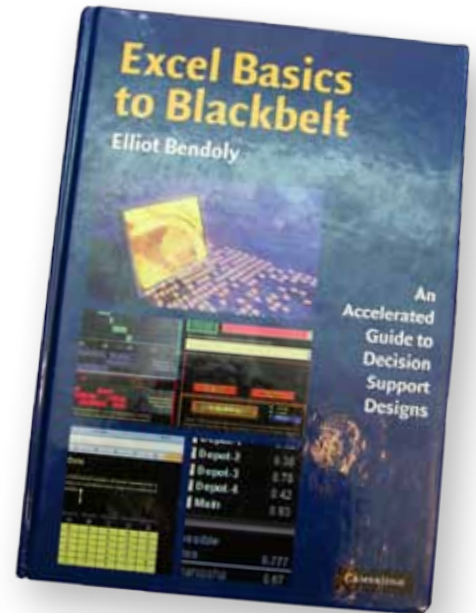
■ VIJAY R. KANNAN, Feature Editor, Utah State University

Book Review: *Excel Basics to Blackbelt—An Accelerated Guide to Decision Support Systems*

by Francis D. (Doug) Tuggle, Chapman University

Some books are meant to be read, while others are meant to be skimmed or to be kept on one's shelf as reference texts. Some books are meant for undergraduates, while others are for graduate students, doctoral students, executives, theoreticians, and/or practitioners. Some books invite you to scribble comments and rebuttals to the author in their margins. Some books, to paraphrase Groucho Marx, should not be put down; they should instead be thrown vigorously into the nearest fireplace. This book has a different use. I found it to be a book to be cradled in one's arms as one bangs away on a keyboard while at the same time referring to some new morsel described in the book. I have been teaching and using Excel (and some of its predecessors) for over a dozen years, and, while I am by no means a 'black belt' per the book's subtitle, I do not consider myself to be a basic user either. To contextualize my observations, I have an 800+ page reference book that I occasionally consult when I'm trying out some new to me feature of Excel. With this book, I learned something on many of its 300+ pages, and it has been useful learning.

The book starts slowly (but does not spend much time on the basics of decision support or the basics of Excel worksheets and workbooks) but quickly (page 24!) discusses 'add-ins.' These are convenient tools that are freely available but are not 'active' until the user specifies that they are to be added to the other Excel tools. Getting to the add-ins is well hidden in both Excel 2003 and Excel 2007. This book however shows how to acquire them in Excel 2007. A whole host of data analysis tools (e.g., ANOVA, correlations, histograms, moving averages, regression,



Excel Basics to Blackbelt—An Accelerated Guide to Decision Support Systems

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etc.) as well as the linear programming system Solver are available by activating the add-ins. The book also makes reference to other add-ins, while having to be purchased separately, bring considerable additional functionality to Excel. Having to acquire these extra add-ins can be seen either as a huge imposition (by, for example, poverty-stricken students) or as a necessary condition for anyone who harbors illusions of becoming a 'black belt' (i.e., a proficient expert) at Excel. However, while you do not absolutely 'need' the extra add-ins to be 'good' at Excel, my view is that if you wish to be 'great' at Excel, you will need to step up your toolkit.



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In addition, the author has made available a number of example spreadsheets illustrating important concepts covered in the chapters. These can be found by going online to a specified url, clicking on the Data Analysis and Visualization icon, and clicking on the Library of Support Material. From there, reference is made to files for each of the 12 'content' chapters of the book. One chapter just has one file, but most have multiple files, and one has as many as seven. These files are extremely useful, educational, and entertaining, and I enjoyed simply playing with many of the files that the author provides.

The book has 13 chapters. In all but chapters one and ten, there are one or more practice problems at the end of the chapter for the reader to play with. Any motivated reader will quickly go beyond the given practice problems to play with the features discussed in the chapter (especially to play with the provided Excel spreadsheet files!). Chapter 2 covers the basics of Excel through conditional expressions. In a classroom of true Excel novices, one would have to backfill students' exposure to the features and uses of Excel and play with the basics, for example, absolute and relative addressing, creating charts, use of basic Excel functions, and use of Excel decisional tools (such as goal seeking, scenario analysis, data tables, etc.). My experience is that students, even those with experience with Excel, find it eye-opening to learn what Excel is capable of. The material on conditional expressions will probably require a separate class day if your students are anything like mine. The practice problems will sufficiently exercise the students' mastery of the material in the chapter.

Chapter 3 concerns itself with acquiring data instead of merely typing it in. The author shows how to import text files and data in tabular structures such as SPSS. However, the bulk of the chapter is devoted to explaining how to import and export Geographic Information System data between Excel and Microsoft's MapPoint software (it sells for about \$300, but is extremely useful). The author clearly shows how to import data from a website, and discusses random numbers and how to use them to create

distributions—uniform, triangular, normal, Bernoulli, and custom distributions. The chapter closes with an exposition on creating iterations (i.e., formulas that can be updated each time an iteration is run). Chapter 4 is concerned with different techniques for visualizing options in a decision problem. The chapter begins by distinguishing among objectives, decision variables, and constraints. It goes on to note the power of data visualization (the aphorism "a picture is worth a thousand words" is not quoted, but is certainly suggested). Bar charts, scatter plots, and 3-D surface plots are all covered. Pivot tables are also introduced to communicate how to filter and present data effectively. The chapter closes with a discussion of visualizing constraints.

Chapter 5 discusses data simplification issues stemming from George Box's famous quote that "all models are wrong, some models are useful." Effective heuristics are examined including the recognition heuristic, the nearest next heuristic, and a couple of project management heuristics. A discussion then ensues about using data consolidation in place of trying to decide which data to include and which to exclude. Various data consolidation approaches and various data grouping approaches are described that focus on how to execute them in Excel. The XL Stat add-in is also introduced in the context of data consolidation using XL Stat's principle components analysis tool; other uses of XL Stat are discussed in Chapter 12. The chapter also includes a supplement that explores how to make heuristics automatic.

Chapter 6 focuses upon optimization using the Solver add-in. Without mentioning linear programming or digressing into math (this is, after all, a book on using Excel!), the author illustrates the use of Solver through six examples, with each example gone into in a fair amount of depth (e.g., structuring the decision problem, obtaining a solution, graphing results, interpreting results, etc.). The examples span a nice range of problem domains, for example staffing, inventory, restaurant layout, and financial services. The four practice problems at the end of this chapter will further exercise the reader's knowledge of the use of Solver. Chapter 7 builds upon Chapter

6 and extends the discussion of optimization. The notion of local optima and global optima, separated by conditions of non-linearity and discontinuity, are illustrated and discussed. The travelling salesman/vehicle routing problem introduced in Chapter 5 (heuristics) is revisited, and the remainder of this chapter is devoted to the use of another tool, RISKOptimizer. The chapter illustrates how RISKOptimizer can be applied to a number of different decision problems (e.g., vehicle routing, clustering, and schedule development). A supplement to the chapter also examines genetic algorithms.

Chapter 8 moves one step closer to messy, real-world management problems by considering the effects of non-linear relationships and non-linear constraints using simulation. A flow chart illustrating the general approach to simulation is specified for two of the problems addressed in the previous chapter, the restaurant reservations problem and the inventory system problem. The author shows how the astute use of Excel's data table tool can facilitate the restaurant simulation. He also shows how to set up a macro to repeat a set of actions for the inventory system simulation model. An introduction to stochastic simulation is also presented. The chapter closes with an illustration of ActiveX controls "to add elements such as check boxes, option buttons, drop-down menus, and so on to their spreadsheets as alternatives to changing values in cells." The versatility and greater range of development options presented are useful for serious Excel aficionados. Although there are only two practice problems at the end of this chapter, they will exercise the user's ability to apply the tools discussed in the chapter.

Chapter 9 covers scenario generation and optimization. This chapter revisits the RISKOptimizer add-in to provide "a more in-depth and nuanced discussion of the various features of RISKOptimizer . . ." that addresses head-on the follow-up question: "How can we integrate the techniques associated with simulation and optimization in a single solid mechanism for meaningful decision support?" The chapter addresses optimization stopping conditions, simulation

stopping conditions, optimization of simulated variants, using averages from data tables in RISKOptimizer, optimization of system simulations, and using RISKOptimizer with calls to a reset macro and with calls to a recalculation macro. There is but one practice problem; more would have been beneficial. Chapter 10 deals with visualizing complex analytical dynamics. Random walks, frictionless boxes, and path-directed flows are all covered. The restaurant floor plan problem of Chapter 6 is revisited, visualized, and flows in the floor plan illustrated. This is the only advanced chapter where there are no explicit practice problems, but the six available spreadsheets available from the companion website are expected to serve as the basis for users to play independently and familiarize themselves with the range of possibilities.

Chapter 11 takes up the topic of developing and using Visual Basic (VB) and macros. In particular, it covers illustrations of code, checking for bugs, manipulating objects, syntax, variables and types, basic operators, date/time functionality, iteration structures, and user-defined functions. By the end, the reader will not be a VB expert but should know enough to get by. Although the author does not refer to this, there are many books on VB that will give the reader a high level of expertise and comfort in this domain. Chapter 12 looks at the process of automating calls to MS MapPoint, Solver, RISKOptimizer, and XL Stat software using VB. The inventory system simulation is revisited yet again. Chapter 13 brings the book to a conclusion, noting that by this point, the careful reader will have probably built up a pretty complicated decision model. A useful way a manager can confront the decision system and its results is by constructing a dashboard that summarizes and provides graphical insight into germane issues. VB subroutines to assist in the process are provided, described, and demonstrated. The book includes a glossary of key terms along with a chapter and section reference to where terms are used in the book. An appendix also provides a useful two page reference sheet regarding shortcuts and hot keys

(e.g., what happens when F6 is pressed twice? What does CTRL-5 do?). There is an index to names, important concepts, tools, software systems, etc.

So, does this book deliver on its promise of turning you into a 'black belt' Excel expert? Let me contextualize my answer: I have a friend who runs a successful firm that finds permanent and temporary employees for firms of all sizes who need a CFO, controller, or other accounting or finance professional. One of the distinct characteristics of this firm is that everyone they recommend goes through extensive Excel training, and the firm guarantees the expertise of each individual and provides all necessary support, further training, and Excel consulting to its clients. One of the reasons the firm does this is that it has discovered that expertly trained Excel users can shave many hours off of projects, in some cases literally dozens of hours. Given rates of pay and the ubiquity and recurrence of these projects, the time savings often add up to substantial sums of money to the client firms (I could comfortably retire on the amount just one firm has saved!). Will the Bendoly book produce such experts? No, expertise to this placement firm has a completely different meaning. For them, Excel expertise means the ability to structure finance/accounting projects quickly and the ability to devise Excel routines and macros so solutions are found quickly. There are other books that teach such Excel 'tricks.' The Bendoly book offers a completely different meaning of the word expertise—the ability to develop non-obvious, insightful, and useful business intelligence for a wide range of organizations. For that meaning of Excel expertise, the book succeeds. (One must be cautioned that although the book starts with the basics, it does not dwell on them, accelerating like a rocket to significant projects.) It is certainly suitable for an advanced graduate course in business intelligence modeling. It has earned a respected place on my bookshelf in as much as I am able to find it quickly and move it closer to my computer so I can readily refer to it as I develop my own business intelligence models. ■

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