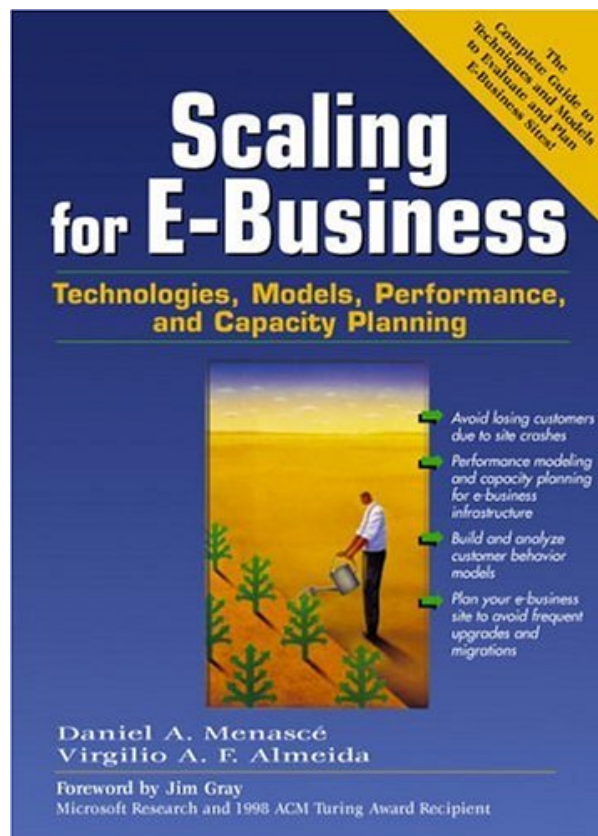
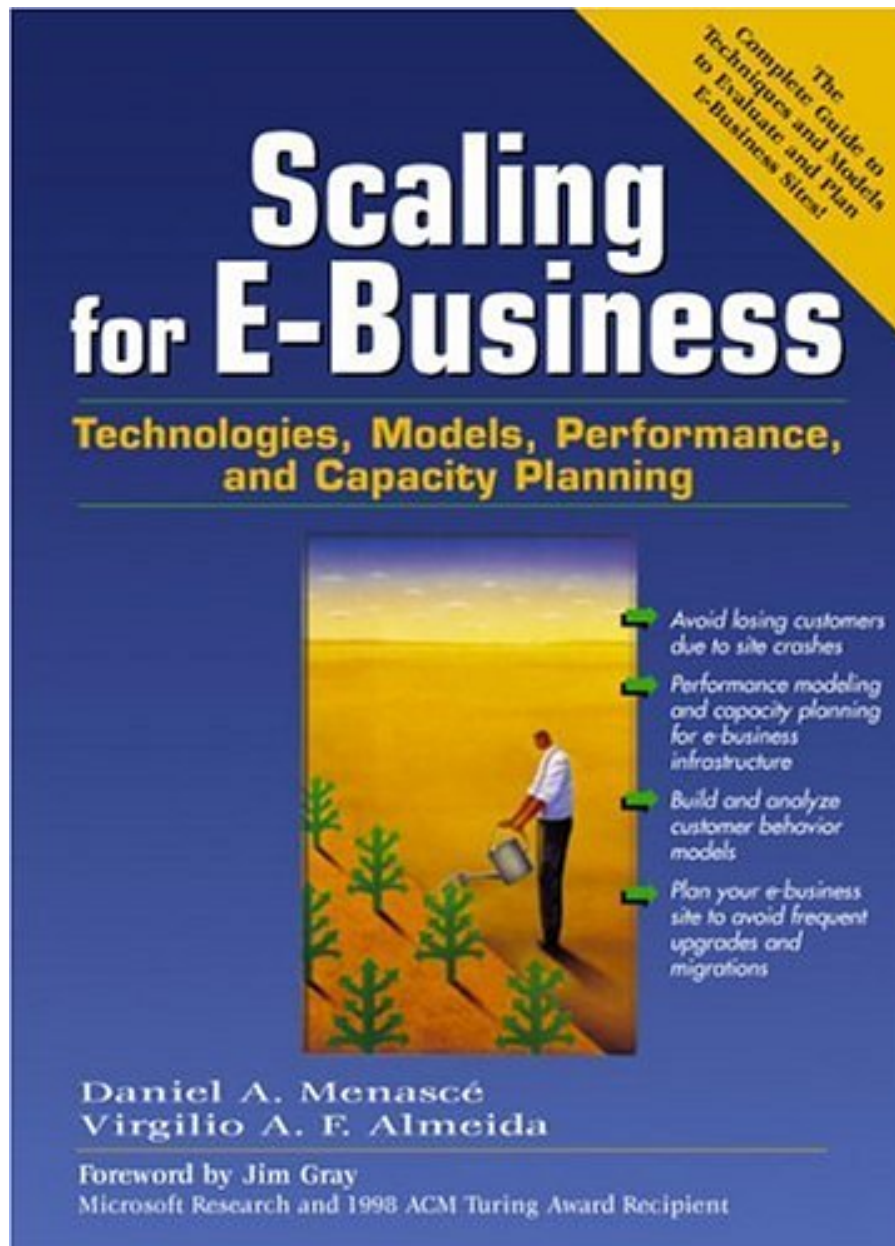


**SCALING FOR E-BUSINESS:
TECHNOLOGIES, MODELS,
PERFORMANCE, AND CAPACITY
PLANNING BY DANIEL A. MENASCE,
VIRGILIO A.F. ALMEIDA**



**DOWNLOAD EBOOK : SCALING FOR E-BUSINESS: TECHNOLOGIES,
MODELS, PERFORMANCE, AND CAPACITY PLANNING BY DANIEL A.
MENASCE, VIRGILIO A.F. ALMEIDA PDF**





Click link bellow and free register to download ebook:

**SCALING FOR E-BUSINESS: TECHNOLOGIES, MODELS, PERFORMANCE, AND CAPACITY
PLANNING BY DANIEL A. MENASCE, VIRGILIO A.F. ALMEIDA**

[DOWNLOAD FROM OUR ONLINE LIBRARY](#)

SCALING FOR E-BUSINESS: TECHNOLOGIES, MODELS, PERFORMANCE, AND CAPACITY PLANNING BY DANIEL A. MENASCE, VIRGILIO A.F. ALMEIDA PDF

Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida When writing can transform your life, when creating can enrich you by offering much money, why don't you try it? Are you still really baffled of where getting the ideas? Do you still have no idea with just what you are visiting write? Currently, you will require reading *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida* An excellent writer is a great reader simultaneously. You could specify exactly how you create depending upon what books to check out. This *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida* can help you to solve the issue. It can be one of the ideal resources to develop your composing ability.

From the Back Cover

Foreword by Jim Gray
Microsoft Research and 1998 ACM Turing Award Recipient

The Complete Guide to Techniques and Models to Evaluate and Plan E-Business Sites!

- Avoid losing customers due to site crashes
- Performance modeling and capacity planning for e-business infrastructure
- Build and analyze customer behavior models
- Plan your e-business site to avoid frequent upgrades and migrations

"E-business is transforming every element of business in many unknown ways. This book will give its readers a headstart in understanding the quantitative underpinnings of the new environment."

— Howard Frank, Dean, Robert H. Smith School of Business
University of Maryland at College Park

Solid analysis of performance modeling and capacity planning for your e-business site! S low e-commerce sites cost their owners billions and embarrass and degrade their owners' brands. Don't let it happen to you!

Scaling for E-Business presents analysis techniques for quantifying and projecting every element of your e-business site's performance-and planning for the capacity you need, no matter what! Discover how to...

- Characterize e-commerce workloads more accurately
- Analyze the performance of authentication and payment services
- Model contention for software servers, and ensure scalability
- Model and plan for communications infrastructure

- Forecast and cope with peak demand
- Project the impact of agent technologies and non-PC devices

You can't turn to your vendors for these state-of-the-art techniques. But you can turn to *Scaling for E-Business*-and if you plan to succeed, you'd better!

About the Author

DANIEL A. MENASCÉ is Professor of Computer Science at George Mason University, and a fellow of the Association for Computing Machinery.

VIRGILIO A. F. ALMEIDA is Professor of Computer Science at the Federal University of Minas Gerais, Brazil, and formerly held visiting positions at Xerox PARC and Boston University.

The authors' interests include performance modeling and capacity planning for large-scale Web and e-commerce environments.

Excerpt. © Reprinted by permission. All rights reserved.

Preface Goal, Theme, and Approach

The Internet is profoundly affecting almost all businesses and commerce paradigms. Global competition, industry traditions, laws, and consumer preferences are among the many issues being impacted by e-business. Weekly magazines and newspapers have dedicated large amounts of space to discuss e-business and the new economy. Newspapers publish news about e-business almost every day. However, there is good news and bad news. The good news is many innovative people are constantly creating new and exciting ways to use the Internet to provide novel, efficient, and convenient shopping paradigms as well as streamlining ways for businesses to do business with their partners. The bad news is the most successful e-business sites are at greater risks of being overwhelmed by large numbers of customers who can potentially bring the site operation to a halt. Scalability is then a challenge to the success of e-business. Our primary goal in writing this book was to create a framework in which e-business scalability could be discussed and evaluated.

This book presents a quantitative approach to understanding and analyzing e-business scalability based on a four-level reference model. The four-level model is composed of a business model, a functional model, a customer behavior model, and an IT resource model. This framework is used throughout the book to explain how e-business technologies work and how they impact performance, to characterize and forecast the workload of e-business sites, and to plan their capacity with the use of performance models.

New performance metrics for e-business are presented in the book. Models at the various levels of the reference model are used to represent and understand problems in e-business. These models include customer behavior models (e.g., Customer Behavior Model Graphs and Customer Visit Models), Client/Server Interaction Diagrams, and analytic (e.g., state transition diagrams and queuing networks) and simulation performance models. The combined use of these models provides a framework for assessing and evaluating the scalability of e-business sites.

Many examples derived from real e-business situations are used to illustrate the concepts presented in the book.

Who Should Read This Book

This book can be used by graduate and senior-level computer science students as well as students in e-commerce programs offered by business schools. Students of MBA programs with a concentration in information technology will also benefit from the concepts presented in this book. Many professionals can use this book as a reference or as a way to learn about e-commerce technologies and the quantitative methods used to evaluate and size e-commerce sites. Examples of such professionals include Webmasters of e-commerce sites and ISPs, CIOs, system architects, project managers of e-commerce companies, e-commerce application developers, capacity planners and performance analysts, designers of Internet-based products for e-commerce, and e-commerce consultants.

Book Organization Part I: Modeling for E-Business

Chapter 1 presents a framework for analyzing and designing e-business sites. The framework is based on a four-level model that includes a business model, a functional model, a customer behavior model, and an IT resource model. The chapter discusses various types of electronic markets including various types of business-to-business, business-to-consumer, and consumer-to-consumer markets.

Chapter 2 discusses the motivations for capturing user behavior and presents customer models at various levels. The models presented in this chapter can be used to answer what-if questions at the customer behavior level and can serve as a basis to build models at the resource level. Two types of customer models are presented in this chapter: the Customer Behavior Model Graphs and the Customer Visit Model.

Chapter 3 discusses the anatomy of e-business functions from the logical view point. The chapter describes how software servers interact to implement e-business functions and provides a graphical notation—the Client/Server Interaction Diagrams—to describe these interactions. Several numerical examples illustrate how these diagrams can be used to answer quantitative questions about the execution of e-business functions.

Part II: Evaluating E-Business Infrastructure and Services

Chapter 4 describes the various elements that comprise the IT infrastructure needed to support e-businesses. The discussion includes hardware, software, and networking issues. Multi-tier website architectures, composed of dynamic load balancers, Web servers, application servers, and database servers, are described.

Chapter 5 presents a quantitative analysis of authentication services used in e-business. The chapter shows how the mechanisms and protocols used to support security may impact system performance. Many quantitative examples illustrate the tradeoffs between performance and security. In particular, the chapter analyzes how authentication protocols such as the Transport Layer Security (TLS) protocol, a successor of the Secure Sockets Layer (SSL) protocol, affects performance.

Chapter 6 provides an overview of what happens when one uses a credit card for payment in the physical world. Then, it discusses how Secure Electronic Transaction (SET) allows for credit card payments to take place over the Internet. The chapter describes SET at a high enough level of detail to provide the reader with an overall picture of the protocol as well as its performance implications. The performance of SET transactions is then discussed through various numerical examples. The chapter concludes with a brief discussion of other payment services.

Part III: Capacity Planning for E-Business

Chapter 7 contains an example-driven description of a capacity planning methodology for e-businesses. The methodology is composed of three planning activities: business and functional planning, customer behavior planning, and IT resource planning. Each of these activities is described in detail and illustrated with examples.

Chapter 8 provides insight and intuition regarding how simple performance models can be constructed, solved, and used in the context of electronic business environments. The fundamentals of performance models are then introduced. These include concepts such as service time, service demand, waiting time, response time, throughput, and performance laws. Scalability analysis techniques based on the study of performance bounds is presented here.

Chapter 9 starts by introducing very simple models. Complexity is progressively introduced and the solution to each model is presented using first principles and intuitive concepts. Two broad categories of models are covered in this chapter: system- and component-level models. System-level models treat the actual system as a black box that receives requests, processes them, and returns the results. Component-level models, based on queuing networks, in which components are represented by queues, allows one to explicitly represent processors, storage subsystems, networks, and routers.

Chapter 10 uses several examples to illustrate the performance impacts of contention for software resources (e.g., threads of a software server, database locks, and semaphores). Performance models that deal with software contention may be based on approximate analytic models or on simulation models. This chapter gives an overview of the techniques used to solve approximations that represent the effects of software contention. To show the impact of software contention, we discuss various results obtained by a combination of simulation and analytic models.

Chapter 11 presents a methodology for characterizing e-business workloads. In particular, the chapter shows how Customer Behavior Model Graphs (CBMGs) and Customer Visit Models (CVMs) can be obtained from HTTP logs and describes methods, based on clustering analysis, to derive small groups of CBMGs or CVMs that accurately represent the workload. The chapter also shows how the parameters for the resource models (e.g., queuing network models) can be derived from customer behavior models. Chapter 12 discusses techniques that can be used to analyze and forecast the demand for e-business sites. The chapter discusses traffic burstiness, traffic patterns in e-business, and forecasting techniques including regression methods, moving averages, and exponential smoothing. Logs of a real e-tailer are used to illustrate the traffic characteristics of an e-business site.

Part IV: Models for Specific E-Business Segments

Chapter 13 illustrates the use of the quantitative methods presented in the book through several examples in the business-to-consumer segment. A hypothetical electronic retailer is described. Then, different planning situations are discussed. In light of the models introduced throughout the book, we show how to tackle the problems and we present their solutions. The goal of the chapter is to guide the reader, in a step-by-step manner, through the model-based solution of a number of e-commerce examples.

Chapter 14 illustrates the use of the quantitative methods presented in the book through several examples in the business-to-business segment. An example of supply-chain integration and made-to-order computers is used to illustrate how capacity planning can be carried out in business-to-business environments. The chapter also shows how business-to-consumer transactions generate business-to-business transactions.

Part V: Summary, Challenges, and Perspectives

Chapter 15 concludes the book with a summary of important points covered in the book, challenges for e-business, and future perspectives. Appendix A contains a glossary of the important terms introduced in the book.

From the Same Authors

Menascé and Almeida co-authored the following books:

- Capacity Planning for Web Performance: Metrics, Models, and Methods, D. A. Menascé and V. A. F. Almeida, Prentice Hall, 1998.
- Capacity Planning and Performance Modeling: From Mainframes to Client-Server Systems, D. A. Menascé, V. A. F. Almeida, and L. W. Dowdy, Prentice Hall, 1994.

Book's Website and Authors' Addresses

Readers of this book can download the various MS Excel workbooks refer-enced in the various chapters from www.cs.gmu.edu/~menasce/ebook/. This website will also be used to keep the readers informed about new develop- ments related to the book. The authors' e-mail and postal addresses and websites are:

Prof. Daniel A. Menascé
Department of Computer Science, MS 4A5
George Mason University
Fairfax, VA 22030-4444
+1 703 993-1537
menasce@cs.gmu.edu
<http://www.cs.gmu.edu/faculty/menasce.html>

Prof. Virgilio A. F. Almeida
Department of Computer Science
Universidade Federal de Minas Gerais
P.O. Box 920
31270-010 Belo Horizonte, MG
Brazil
+55 31 499-5887
virgilio@dcc.ufmg.br
<http://www.dcc.ufmg.br/~virgilio>

SCALING FOR E-BUSINESS: TECHNOLOGIES, MODELS, PERFORMANCE, AND CAPACITY PLANNING BY DANIEL A. MENASCE, VIRGILIO A.F. ALMEIDA PDF

[Download: SCALING FOR E-BUSINESS: TECHNOLOGIES, MODELS, PERFORMANCE, AND CAPACITY PLANNING BY DANIEL A. MENASCE, VIRGILIO A.F. ALMEIDA PDF](#)

Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida. A task might obligate you to always improve the knowledge and encounter. When you have no adequate time to enhance it directly, you could get the encounter and expertise from checking out guide. As everybody understands, publication *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida* is incredibly popular as the home window to open the globe. It implies that reading book *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida* will provide you a brand-new means to find every little thing that you need. As the book that we will certainly offer right here, *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida*

When some individuals checking out you while reading *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida*, you might feel so happy. But, instead of other people feels you must instil in on your own that you are reading *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida* not due to that reasons. Reading this *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida* will certainly provide you greater than individuals appreciate. It will certainly guide to know more than the people staring at you. Even now, there are lots of resources to learning, reviewing a publication *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida* still ends up being the front runner as a fantastic way.

Why ought to be reading *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida* Again, it will certainly depend upon how you really feel and also think of it. It is definitely that of the perk to take when reading this *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida*; you can take a lot more lessons directly. Even you have not undergone it in your life; you can acquire the encounter by checking out *Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida* And also currently, we will introduce you with the on-line book [Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida](#) in this internet site.

SCALING FOR E-BUSINESS: TECHNOLOGIES, MODELS, PERFORMANCE, AND CAPACITY PLANNING BY DANIEL A. MENASCE, VIRGILIO A.F. ALMEIDA PDF

Foreword by Jim Gray Microsoft Research and 1998 ACM Turing Award Recipient The Complete Guide to Techniques and Models to Evaluate and Plan E-Business Sites! *Avoid losing customers due to site crashes *Performance modeling and capacity planning for e-business infrastructure *Build and analyze customer behavior models *Plan your e-business site to avoid frequent upgrades and migrations E-business is transforming every element of business in many unknown ways. This book will give its readers a headstart in understanding the quantitative underpinnings of the new environment. - Howard Frank, Dean, Robert H. Smith School of Business University of Maryland at College Park Solid analysis of performance modeling and capacity planning for your e-business site! S low e-commerce sites cost their owners billions and embarrass and degrade their owners brands. Dont let it happen to you! Scaling for E-Business presents analysis techniques for quantifying and projecting every element of your e-business sites performance-and planning for the capacity you need, no matter what! Discover how to... *Characterize e-commerce workloads more accurately *Analyze the performance of authentication and pay

- Sales Rank: #2749977 in Books
- Published on: 2000-05-07
- Original language: English
- Number of items: 1
- Dimensions: 9.40" h x 1.20" w x 6.90" l, 1.64 pounds
- Binding: Paperback
- 462 pages

From the Back Cover

Foreword by Jim Gray
Microsoft Research and 1998 ACM Turing Award Recipient

The Complete Guide to Techniques and Models to Evaluate and Plan E-Business Sites!

- Avoid losing customers due to site crashes
- Performance modeling and capacity planning for e-business infrastructure
- Build and analyze customer behavior models
- Plan your e-business site to avoid frequent upgrades and migrations

"E-business is transforming every element of business in many unknown ways. This book will give its readers a headstart in understanding the quantitative underpinnings of the new environment."

— Howard Frank, Dean, Robert H. Smith School of Business

University of Maryland at College Park

Solid analysis of performance modeling and capacity planning for your e-business site! S low e-commerce sites cost their owners billions and embarrass and degrade their owners' brands. Don't let it happen to you!

Scaling for E-Business presents analysis techniques for quantifying and projecting every element of your e-business site's performance-and planning for the capacity you need, no matter what! Discover how to...

- Characterize e-commerce workloads more accurately
- Analyze the performance of authentication and payment services
- Model contention for software servers, and ensure scalability
- Model and plan for communications infrastructure
- Forecast and cope with peak demand
- Project the impact of agent technologies and non-PC devices

You can't turn to your vendors for these state-of-the-art techniques. But you can turn to Scaling for E-Business-and if you plan to succeed, you'd better!

About the Author

DANIEL A. MENASCÉ is Professor of Computer Science at George Mason University, and a fellow of the Association for Computing Machinery.

VIRGILIO A. F. ALMEIDA is Professor of Computer Science at the Federal University of Minas Gerais, Brazil, and formerly held visiting positions at Xerox PARC and Boston University.

The authors' interests include performance modeling and capacity planning for large-scale Web and e-commerce environments.

Excerpt. © Reprinted by permission. All rights reserved.

Preface Goal, Theme, and Approach

The Internet is profoundly affecting almost all businesses and commerce paradigms. Global competition, industry traditions, laws, and consumer preferences are among the many issues being impacted by e-business. Weekly magazines and newspapers have dedicated large amounts of space to discuss e-business and the new economy. Newspapers publish news about e-business almost every day. However, there is good news and bad news. The good news is many innovative people are constantly creating new and exciting ways to use the Internet to provide novel, efficient, and convenient shopping paradigms as well as streamlining ways for businesses to do business with their partners. The bad news is the most successful e-business sites are at greater risks of being overwhelmed by large numbers of customers who can potentially bring the site operation to a halt. Scalability is then a challenge to the success of e-business. Our primary goal in writing this book was to create a framework in which e-business scalability could be discussed and evaluated.

This book presents a quantitative approach to understanding and analyzing e-business scalability based on a four-level reference model. The four-level model is composed of a business model, a functional model, a customer behavior model, and an IT resource model. This framework is used throughout the book to explain how e-business technologies work and how they impact performance, to characterize and forecast the workload of e-business sites, and to plan their capacity with the use of performance models.

New performance metrics for e-business are presented in the book. Models at the various levels of the reference model are used to represent and understand problems in e-business. These models include customer behavior models (e.g., Customer Behavior Model Graphs and Customer Visit Models), Client/Server Interaction Diagrams, and analytic (e.g., state transition diagrams and queuing networks) and

simulation performance models. The combined use of these models provides a framework for assessing and evaluating the scalability of e-business sites.

Many examples derived from real e-business situations are used to illustrate the concepts presented in the book.

Who Should Read This Book

This book can be used by graduate and senior-level computer science students as well as students in e-commerce programs offered by business schools. Students of MBA programs with a concentration in information technology will also benefit from the concepts presented in this book. Many professionals can use this book as a reference or as a way to learn about e-commerce technologies and the quantitative methods used to evaluate and size e-commerce sites. Examples of such professionals include Webmasters of e-commerce sites and ISPs, CIOs, system architects, project managers of e-commerce companies, e-commerce application developers, capacity planners and performance analysts, designers of Internet-based products for e-commerce, and e-commerce consultants.

Book Organization Part I: Modeling for E-Business

Chapter 1 presents a framework for analyzing and designing e-business sites. The framework is based on a four-level model that includes a business model, a functional model, a customer behavior model, and an IT resource model. The chapter discusses various types of electronic markets including various types of business-to-business, business-to-consumer, and consumer-to-consumer markets.

Chapter 2 discusses the motivations for capturing user behavior and presents customer models at various levels. The models presented in this chapter can be used to answer what-if questions at the customer behavior level and can serve as a basis to build models at the resource level. Two types of customer models are presented in this chapter: the Customer Behavior Model Graphs and the Customer Visit Model.

Chapter 3 discusses the anatomy of e-business functions from the logical view point. The chapter describes how software servers interact to implement e-business functions and provides a graphical notation—the Client/Server Interaction Diagrams—to describe these interactions. Several numerical examples illustrate how these diagrams can be used to answer quantitative questions about the execution of e-business functions.

Part II: Evaluating E-Business Infrastructure and Services

Chapter 4 describes the various elements that comprise the IT infrastructure needed to support e-businesses. The discussion includes hardware, software, and networking issues. Multi-tier website architectures, composed of dynamic load balancers, Web servers, application servers, and database servers, are described.

Chapter 5 presents a quantitative analysis of authentication services used in e-business. The chapter shows how the mechanisms and protocols used to support security may impact system performance. Many quantitative examples illustrate the tradeoffs between performance and security. In particular, the chapter analyzes how authentication protocols such as the Transport Layer Security (TLS) protocol, a successor of the Secure Sockets Layer (SSL) protocol, affects performance.

Chapter 6 provides an overview of what happens when one uses a credit card for payment in the physical world. Then, it discusses how Secure Electronic Transaction (SET) allows for credit card payments to take place over the Internet. The chapter describes SET at a high enough level of detail to provide the reader with an overall picture of the protocol as well as its performance implications. The performance of SET transactions is then discussed through various numerical examples. The chapter concludes with a brief

discussion of other payment services.

Part III: Capacity Planning for E-Business

Chapter 7 contains an example-driven description of a capacity planning methodology for e-businesses. The methodology is composed of three planning activities: business and functional planning, customer behavior planning, and IT resource planning. Each of these activities is described in detail and illustrated with examples.

Chapter 8 provides insight and intuition regarding how simple performance models can be constructed, solved, and used in the context of electronic business environments. The fundamentals of performance models are then introduced. These include concepts such as service time, service demand, waiting time, response time, throughput, and performance laws. Scalability analysis techniques based on the study of performance bounds is presented here.

Chapter 9 starts by introducing very simple models. Complexity is progressively introduced and the solution to each model is presented using first principles and intuitive concepts. Two broad categories of models are covered in this chapter: system- and component-level models. System-level models treat the actual system as a black box that receives requests, processes them, and returns the results. Component-level models, based on queuing networks, in which components are represented by queues, allows one to explicitly represent processors, storage subsystems, networks, and routers.

Chapter 10 uses several examples to illustrate the performance impacts of contention for software resources (e.g., threads of a software server, database locks, and semaphores). Performance models that deal with software contention may be based on approximate analytic models or on simulation models. This chapter gives an overview of the techniques used to solve approximations that represent the effects of software contention. To show the impact of software contention, we discuss various results obtained by a combination of simulation and analytic models.

Chapter 11 presents a methodology for characterizing e-business workloads. In particular, the chapter shows how Customer Behavior Model Graphs (CBMGs) and Customer Visit Models (CVMs) can be obtained from HTTP logs and describes methods, based on clustering analysis, to derive small groups of CBMGs or CVMs that accurately represent the workload. The chapter also shows how the parameters for the resource models (e.g., queuing network models) can be derived from customer behavior models. Chapter 12 discusses techniques that can be used to analyze and forecast the demand for e-business sites. The chapter discusses traffic burstiness, traffic patterns in e-business, and forecasting techniques including regression methods, moving averages, and exponential smoothing. Logs of a real e-tailer are used to illustrate the traffic characteristics of an e-business site.

Part IV: Models for Specific E-Business Segments

Chapter 13 illustrates the use of the quantitative methods presented in the book through several examples in the business-to-consumer segment. A hypothetical electronic retailer is described. Then, different planning situations are discussed. In light of the models introduced throughout the book, we show how to tackle the problems and we present their solutions. The goal of the chapter is to guide the reader, in a step-by-step manner, through the model-based solution of a number of e-commerce examples.

Chapter 14 illustrates the use of the quantitative methods presented in the book through several examples in the business-to-business segment. An example of supply-chain integration and made-to-order computers is used to illustrate how capacity planning can be carried out in business-to-business environments. The chapter also shows how business-to-consumer transactions generate business-to-business transactions.

Part V: Summary, Challenges, and Perspectives

Chapter 15 concludes the book with a summary of important points covered in the book, challenges for e-business, and future perspectives. Appendix A contains a glossary of the important terms introduced in the book.

From the Same Authors

Menascé and Almeida co-authored the following books:

- Capacity Planning for Web Performance: Metrics, Models, and Methods, D. A. Menascé and V. A. F. Almeida, Prentice Hall, 1998.
- Capacity Planning and Performance Modeling: From Mainframes to Client-Server Systems, D. A. Menascé, V. A. F. Almeida, and L. W. Dowdy, Prentice Hall, 1994.

Book's Website and Authors' Addresses

Readers of this book can download the various MS Excel workbooks refer-enced in the various chapters from www.cs.gmu.edu/~menasce/ebook/. This website will also be used to keep the readers informed about new develop- ments related to the book. The authors' e-mail and postal addresses and websites are:

Prof. Daniel A. Menascé
Department of Computer Science, MS 4A5
George Mason University
Fairfax, VA 22030-4444
+1 703 993-1537
menasce@cs.gmu.edu
<http://www.cs.gmu.edu/faculty/menasce.html>

Prof. Virgilio A. F. Almeida
Department of Computer Science
Universidade Federal de Minas Gerais
P.O. Box 920
31270-010 Belo Horizonte, MG
Brazil
+55 31 499-5887
virgilio@dcc.ufmg.br
<http://www.dcc.ufmg.br/~virgilio>

Most helpful customer reviews

5 of 5 people found the following review helpful.

Excellent performance &n capacity approach for app layer

By Mike Tarrani

This is one of a series of books about performance and capacity metrics by the authors. Each of their books covers a specific environment (client/server, mainframes, web services), and each explains the theory, quantitative methods and practical approaches using common tools like Microsoft Excel.

This book's focus is on performance and capacity of applications in the e-commerce infrastructure, and like the other books by the authors, it covers every facet while explaining the what's and why's. More importantly, this book will not overwhelm readers who are rusty in math because the authors weave in

refresher material as they go along.

What makes this book valuable is the blend of business and technical topics, particularly in Part I where business models are thoroughly discussed. I personally believe that this material is as important as the more technically focused material in subsequent chapters because it wakes up the technical reader as to why their job of developing scalable solutions is important by linking the technical aspects to business imperatives.

Parts II (Evaluating E-Business Infrastructure and Services) and III (Capacity Planning for E-Business) are the heart of the technical matter, and the chapters systematically dissect each aspect of an e-commerce infrastructure from the application layer point of view. This is where quantitative methods are introduced and where the value of the spreadsheets on the CD ROM increase. Note that there are more up-to-date versions of these spreadsheets on the book's associated website, as well as errata for the book.

Practical considerations that blend the business and technical perspectives are presented in Part IV (Models of Specific E-Business Segments). This chapter consists of case studies that tie together all of the preceding material using real world examples.

Because this book is more focused on performance and capacity at the application and business model layer, you should read the authors' newest book, "Capacity Planning for Web Services: Metrics, Models, and Methods". That book covers the lower level details of the infrastructure to round out the picture of an end-to-end view of performance and capacity management.

12 of 12 people found the following review helpful.

Architecture of E-Business Systems

By Odysseas Pentakalos

Both "old" and "new" economy companies are scrambling to develop e-business systems to take advantage of the Internet revolution. This is the first book in the market to provide a framework that systems architects can use to build scalable solutions or to enhance the user experience of existing systems. There are academic papers that cover related topics at a very abstract level to be of practical use and similarly, there are practical articles that cover very specific topics. This book is a very nice compromise between those two extremes. I found the chapters on characterization of e-business workloads and on the development of performance models to be especially useful.

34 of 34 people found the following review helpful.

Scaling for E-business: Technologies, Models, Performance, a

By Harrell J. Van Norman

Best book in print for designing e-business networking systems. This book leads a designer of E-business solutions through the steps necessary to ensure QoS objectives are met, performance requirements are satisfied, and networks aren't over engineered. As an instructor of E-commerce Network Engineering for the University of California, I'm familiar with current published literature, and there isn't anything out there that compares in clarity and completeness. This is Daniel Menasce's third book on the subject, and his best by far. On my short list of must read books for network engineers and system architects of E-business solutions.

See all 8 customer reviews...

SCALING FOR E-BUSINESS: TECHNOLOGIES, MODELS, PERFORMANCE, AND CAPACITY PLANNING BY DANIEL A. MENASCE, VIRGILIO A.F. ALMEIDA PDF

What kind of book **Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida** you will like to? Now, you will certainly not take the published publication. It is your time to get soft file publication **Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida** instead the printed files. You can appreciate this soft file **Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida** in whenever you expect. Even it remains in expected place as the various other do, you could read the book **Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida** in your gizmo. Or if you want much more, you can continue reading your computer system or laptop computer to obtain complete screen leading. Juts discover it here by downloading the soft file **Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida** in web link page.

From the Back Cover

Foreword by Jim Gray

Microsoft Research and 1998 ACM Turing Award Recipient

The Complete Guide to Techniques and Models to Evaluate and Plan E-Business Sites!

- Avoid losing customers due to site crashes
- Performance modeling and capacity planning for e-business infrastructure
- Build and analyze customer behavior models
- Plan your e-business site to avoid frequent upgrades and migrations

"E-business is transforming every element of business in many unknown ways. This book will give its readers a headstart in understanding the quantitative underpinnings of the new environment."

— Howard Frank, Dean, Robert H. Smith School of Business

University of Maryland at College Park

Solid analysis of performance modeling and capacity planning for your e-business site! S low e-commerce sites cost their owners billions and embarrass and degrade their owners' brands. Don't let it happen to you!

Scaling for E-Business presents analysis techniques for quantifying and projecting every element of your e-business site's performance-and planning for the capacity you need, no matter what! Discover how to...

- Characterize e-commerce workloads more accurately
- Analyze the performance of authentication and payment services
- Model contention for software servers, and ensure scalability
- Model and plan for communications infrastructure
- Forecast and cope with peak demand
- Project the impact of agent technologies and non-PC devices

You can't turn to your vendors for these state-of-the-art techniques. But you can turn to *Scaling for E-Business*-and if you plan to succeed, you'd better!

About the Author

DANIEL A. MENASCÉ is Professor of Computer Science at George Mason University, and a fellow of the Association for Computing Machinery.

VIRGILIO A. F. ALMEIDA is Professor of Computer Science at the Federal University of Minas Gerais, Brazil, and formerly held visiting positions at Xerox PARC and Boston University.

The authors' interests include performance modeling and capacity planning for large-scale Web and e-commerce environments.

Excerpt. © Reprinted by permission. All rights reserved.

Preface Goal, Theme, and Approach

The Internet is profoundly affecting almost all businesses and commerce paradigms. Global competition, industry traditions, laws, and consumer preferences are among the many issues being impacted by e-business. Weekly magazines and newspapers have dedicated large amounts of space to discuss e-business and the new economy. Newspapers publish news about e-business almost every day. However, there is good news and bad news. The good news is many innovative people are constantly creating new and exciting ways to use the Internet to provide novel, efficient, and convenient shopping paradigms as well as streamlining ways for businesses to do business with their partners. The bad news is the most successful e-business sites are at greater risks of being overwhelmed by large numbers of customers who can potentially bring the site operation to a halt. Scalability is then a challenge to the success of e-business. Our primary goal in writing this book was to create a framework in which e-business scalability could be discussed and evaluated.

This book presents a quantitative approach to understanding and analyzing e-business scalability based on a four-level reference model. The four-level model is composed of a business model, a functional model, a customer behavior model, and an IT resource model. This framework is used throughout the book to explain how e-business technologies work and how they impact performance, to characterize and forecast the workload of e-business sites, and to plan their capacity with the use of performance models.

New performance metrics for e-business are presented in the book. Models at the various levels of the reference model are used to represent and understand problems in e-business. These models include customer behavior models (e.g., Customer Behavior Model Graphs and Customer Visit Models), Client/Server Interaction Diagrams, and analytic (e.g., state transition diagrams and queuing networks) and simulation performance models. The combined use of these models provides a framework for assessing and evaluating the scalability of e-business sites.

Many examples derived from real e-business situations are used to illustrate the concepts presented in the book.

Who Should Read This Book

This book can be used by graduate and senior-level computer science students as well as students in e-commerce programs offered by business schools. Students of MBA programs with a concentration in

information technology will also benefit from the concepts presented in this book. Many professionals can use this book as a reference or as a way to learn about e-commerce technologies and the quantitative methods used to evaluate and size e-commerce sites. Examples of such professionals include Webmasters of e-commerce sites and ISPs, CIOs, system architects, project managers of e-commerce companies, e-commerce application developers, capacity planners and performance analysts, designers of Internet-based products for e-commerce, and e-commerce consultants.

Book Organization Part I: Modeling for E-Business

Chapter 1 presents a framework for analyzing and designing e-business sites. The framework is based on a four-level model that includes a business model, a functional model, a customer behavior model, and an IT resource model. The chapter discusses various types of electronic markets including various types of business-to-business, business-to-consumer, and consumer-to-consumer markets.

Chapter 2 discusses the motivations for capturing user behavior and presents customer models at various levels. The models presented in this chapter can be used to answer what-if questions at the customer behavior level and can serve as a basis to build models at the resource level. Two types of customer models are presented in this chapter: the Customer Behavior Model Graphs and the Customer Visit Model.

Chapter 3 discusses the anatomy of e-business functions from the logical view point. The chapter describes how software servers interact to implement e-business functions and provides a graphical notation—the Client/Server Interaction Diagrams—to describe these interactions. Several numerical examples illustrate how these diagrams can be used to answer quantitative questions about the execution of e-business functions.

Part II: Evaluating E-Business Infrastructure and Services

Chapter 4 describes the various elements that comprise the IT infrastructure needed to support e-businesses. The discussion includes hardware, software, and networking issues. Multi-tier website architectures, composed of dynamic load balancers, Web servers, application servers, and database servers, are described.

Chapter 5 presents a quantitative analysis of authentication services used in e-business. The chapter shows how the mechanisms and protocols used to support security may impact system performance. Many quantitative examples illustrate the tradeoffs between performance and security. In particular, the chapter analyzes how authentication protocols such as the Transport Layer Security (TLS) protocol, a successor of the Secure Sockets Layer (SSL) protocol, affects performance.

Chapter 6 provides an overview of what happens when one uses a credit card for payment in the physical world. Then, it discusses how Secure Electronic Transaction (SET) allows for credit card payments to take place over the Internet. The chapter describes SET at a high enough level of detail to provide the reader with an overall picture of the protocol as well as its performance implications. The performance of SET transactions is then discussed through various numerical examples. The chapter concludes with a brief discussion of other payment services.

Part III: Capacity Planning for E-Business

Chapter 7 contains an example-driven description of a capacity planning methodology for e-businesses. The methodology is composed of three planning activities: business and functional planning, customer behavior planning, and IT resource planning. Each of these activities is described in detail and illustrated with examples.

Chapter 8 provides insight and intuition regarding how simple performance models can be constructed,

solved, and used in the context of electronic business environments. The fundamentals of performance models are then introduced. These include concepts such as service time, service demand, waiting time, response time, throughput, and performance laws. Scalability analysis techniques based on the study of performance bounds is presented here.

Chapter 9 starts by introducing very simple models. Complexity is progressively introduced and the solution to each model is presented using first principles and intuitive concepts. Two broad categories of models are covered in this chapter: system- and component-level models. System-level models treat the actual system as a black box that receives requests, processes them, and returns the results. Component-level models, based on queuing networks, in which components are represented by queues, allows one to explicitly represent processors, storage subsystems, networks, and routers.

Chapter 10 uses several examples to illustrate the performance impacts of contention for software resources (e.g., threads of a software server, database locks, and semaphores). Performance models that deal with software contention may be based on approximate analytic models or on simulation models. This chapter gives an overview of the techniques used to solve approximations that represent the effects of software contention. To show the impact of software contention, we discuss various results obtained by a combination of simulation and analytic models.

Chapter 11 presents a methodology for characterizing e-business workloads. In particular, the chapter shows how Customer Behavior Model Graphs (CBMGs) and Customer Visit Models (CVMs) can be obtained from HTTP logs and describes methods, based on clustering analysis, to derive small groups of CBMGs or CVMs that accurately represent the workload. The chapter also shows how the parameters for the resource models (e.g., queuing network models) can be derived from customer behavior models. Chapter 12 discusses techniques that can be used to analyze and forecast the demand for e-business sites. The chapter discusses traffic burstiness, traffic patterns in e-business, and forecasting techniques including regression methods, moving averages, and exponential smoothing. Logs of a real e-tailer are used to illustrate the traffic characteristics of an e-business site.

Part IV: Models for Specific E-Business Segments

Chapter 13 illustrates the use of the quantitative methods presented in the book through several examples in the business-to-consumer segment. A hypothetical electronic retailer is described. Then, different planning situations are discussed. In light of the models introduced throughout the book, we show how to tackle the problems and we present their solutions. The goal of the chapter is to guide the reader, in a step-by-step manner, through the model-based solution of a number of e-commerce examples.

Chapter 14 illustrates the use of the quantitative methods presented in the book through several examples in the business-to-business segment. An example of supply-chain integration and made-to-order computers is used to illustrate how capacity planning can be carried out in business-to-business environments. The chapter also shows how business-to-consumer transactions generate business-to-business transactions.

Part V: Summary, Challenges, and Perspectives

Chapter 15 concludes the book with a summary of important points covered in the book, challenges for e-business, and future perspectives. Appendix A contains a glossary of the important terms introduced in the book.

From the Same Authors

Menascé and Almeida co-authored the following books:

- Capacity Planning for Web Performance: Metrics, Models, and Methods, D. A. Menascé and V. A. F. Almeida, Prentice Hall, 1998.
- Capacity Planning and Performance Modeling: From Mainframes to Client-Server Systems, D. A. Menascé, V. A. F. Almeida, and L. W. Dowdy, Prentice Hall, 1994.

Book's Website and Authors' Addresses

Readers of this book can download the various MS Excel workbooks refer-enced in the various chapters from www.cs.gmu.edu/~menasce/ebook/. This website will also be used to keep the readers informed about new develop- ments related to the book. The authors' e-mail and postal addresses and websites are:

Prof. Daniel A. Menascé
 Department of Computer Science, MS 4A5
 George Mason University
 Fairfax, VA 22030-4444
 +1 703 993-1537
menasce@cs.gmu.edu
<http://www.cs.gmu.edu/faculty/menasce.html>

Prof. Virgilio A. F. Almeida
 Department of Computer Science
 Universidade Federal de Minas Gerais
 P.O. Box 920
 31270-010 Belo Horizonte, MG
 Brazil
 +55 31 499-5887
virgilio@dcc.ufmg.br
<http://www.dcc.ufmg.br/~virgilio>

Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida When writing can transform your life, when creating can enrich you by offering much money, why don't you try it? Are you still really baffled of where getting the ideas? Do you still have no idea with just what you are visiting write? Currently, you will require reading **Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida** An excellent writer is a great reader simultaneously. You could specify exactly how you create depending upon what books to check out. This **Scaling For E-Business: Technologies, Models, Performance, And Capacity Planning By Daniel A. Menasce, Virgilio A.F. Almeida** can help you to solve the issue. It can be one of the ideal resources to develop your composing ability.