

# E-Commerce

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Alpha Science

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**Alpha Science International Ltd.**  
Oxford, U.K.

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264 pgs. | 76 figs.

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ALPHA SCIENCE INTERNATIONAL LTD.

7200 The Quorum, Oxford Business Park North  
Garsington Road, Oxford OX4 2JZ, U.K.

**[www.alphasci.com](http://www.alphasci.com)**

Printed from the camera-ready copy provided by the Authors.

ISBN 978-1-84265-878-9

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# **E-Commerce**

Dedication

*To our parents, grand parents  
and  
Most beloved  
Shilu  
and our children*

**S. K. Mourya  
Shalu Gupta**

# Foreword

Information and Information Technology are the key drivers of the Information age, which is also referred to as the post industrial society. The Information Age has ushered in a knowledge-based industrial revolution. The businesses in this era are networked and use IT to survive in a highly competitive environment. The relationship between IT and business is discussed in Information Technology and Business, while E-Commerce provides glimpse of the worldwide developments that have made e-commerce what it is today.

E-Commerce is a series of ten “written chapters” that explores in depth the core of Electronic Commerce (e-commerce) technology and the tools that make e-commerce the cutting edge of business. It covers both the “technology” and the “non-technology” aspects of Electronic Commerce and the Internet.

First, an overview: the volume is divided into five parts which comprises 10 chapters. The main body of the book is as follows:

- Part 1, Introduction to E-Commerce and Architecture to Models (two Chapters),
- Part 2, The Network Infrastructure for E-Commerce and Mobile Commerce (two Chapters),
- Part 3, E-Commerce: Web and Network Security and Firewalls (two Chapters),
- Part 4, Encryption Techniques and Virtual Private Network (VPN) (two Chapters),
- Part 5, Electronic Payment System (EPS) as well as the last EDI and E-Commerce Laws (two Chapters).

Both the ordering of the sections and the amount of material devoted to each particular segment tells a lot about the authors’ expertise and perfect control of the various models of e-commerce the forces behind them, electronic service delivery and mobile commerce as a new challenges for e-commerce are discussed in the this book. The book is written in simple language for better understanding by all levels of readers. It is suitable for teaching as well as practical use.

# Preface

This book is organized as follows. The book is divided into ten chapters.

In **Chapter 1**, described a brief introduction to E-Commerce, buying and selling of goods and services, and the transfer of funds, through digital communications. Functions such as marketing, finance, manufacturing, selling, and negotiation has been explained that enable commerce and use electronic mail, EDI, file transfer, fax, video conferencing, workflow, or interaction with a remote computer.

**Chapter 2** deals with explaining a prescriptive architecture for e-commerce. It introduces the concept of an e-commerce architecture frame that identifies the key decisions you need to make and the tradeoffs you need to consider when developing reliable and scalable systems.

**Chapter 3** examines the Internet and World Wide Web of today and tomorrow, how it evolved, and how the present and future infrastructure of the Internet and Web enables new business opportunities. It is important for the business people to understand how the internet and related technologies work, and to be aware about the latest or upcoming technologies on the Internet.

**Chapter 4** deals with Mobile Commerce and its growth track. How it is gaining increasing acceptance amongst various sections of the society. This growth can be traced back to technological and demographical developments that have influenced important aspects of the socio-cultural behavior in today's world. The need for mobility seems to be a primary driving force behind M-Commerce applications such as Mobile Banking, Mobile Entertainment and Mobile Marketing etc.

In the **Chapter 5**, we have explained multiple security strategies which any e-commerce provider can instigate to reduce the risk of attack and compromise significantly. Awareness of the risks and the implementation of multi-layered security protocols, detailed and open privacy policies and strong authentication and encryption measures will go a long way to assure the consumer and insure the risk of compromise is kept minimal.

**Chapter 6** explains the basic principles of firewalls. A firewall provides access control to a protected network, protecting a company's private network from an untrusted public network. Every access request from a public network to the protected (that is, corporate) network must pass through the firewall. Different types of firewalls and firewall architectures have also been discussed.

In **Chapter 7**, we study a well-accepted definition of the idea of Internet's openness and danger of web surfing, which explains the growing popularity of

data encryption including public key encryption and private key encryption. The latter is being frequently applied even to such common communications as instant messaging and emailing. And that is worth it, as otherwise with a lack of security mechanism any data transferred over the Internet may be easily stolen and viewed by anyone. It is even more dangerous in case of critical data that can be compromised in many ways, particularly if it is being stored in servers than can change its owner over the years.

**Chapter 8** presents an overview of virtual private network(VPN) and how it is a secure network within an environment like the Internet. If you have set up a law office network with time/billing software and file, print, and fax servers, setting up VPN access to that network will save you the time and money of replicating those resources on other computers when you work from home or on the road.

**Chapter 9** deals with Electronic Payments (e-payments), also how EPS enables us to perform financial transactions electronically, thus avoiding long lines and other hassles. Electronic Payments provides greater freedom to individuals in paying their taxes, licenses, fees, fines and purchases at unconventional locations and at whichever time of the day, 365 days of the year. A brief introduction to On-line payment has also been given.

**Chapter 10** presents an overview of Supply chain management, EDI which is a process which allows one company to send information to another company electronically rather than with paper. Business entities which conduct business electronically are called trading partners. Also this chapter highlights various Laws related to e-commerce.

### **Suggestions**

It is likely that this book may contain typing mistakes, errors, or omissions. If you notice any errors, have suggestions regarding additional exercises or have other constructive criticism. We would be very happy to hear from you. We welcome and appreciate your suggestions. You can send your comments to: S. K. Mourya Shalu Gupta.

**S. K. Mourya  
Shalu Gupta**



# Acknowledgements

*"Few successful endeavors have ever been made by one person alone, and this book is no exception".*

We would like to thank the people and organizations that supported us in the production of this book and the authors are greatly indebted to all. There are several individuals and organizations whose support demands special mention and they are listed in the following-

Our special thank to MGM's family Mr. Kamalkishor N. Kadam (Chairman), Dr. Mrs. Geeta S. Lathkar (Director), Prof. Sunil J. Wagh (VP) for being our inspiration and enabling us to publish this book. Above all we want to thank our colleagues of Computer Science and Engineering Department, MGM-Noida, our family and friends who supported and encouraged us in spite of all the time it took us away from them.

I am deeply indebted to Mr. N. K. Mehra, Director at Narosa Publishing House Pvt. Ltd., for his enthusiasm, patience, and support during our writing of this book, as well as the Production Editor, and his staff for their conscientious efforts regarding production, editing, proof-reading and design.

We would like to express our gratitude to the many people who saw us throughout this book and to all of the reviewers for their invaluable feedback.

**S. K. Mourya  
Shalu Gupta**

# Acronyms

The following abbreviations and acronyms are used in this standard:

2TDEA	Two key Triple DEA
3TDEA	Three key Triple DEA
AES	Advanced Encryption Standard Specified in [FIPS197].
ANS	American National Standard
ANSI	American National Standards Institute
CA	Certification Authority
CRC	Cyclic Redundancy Check
DRBG	Deterministic Random Bit Generator
DSA	Digital Signature Algorithm Specified in [FIPS186-3].
ECC	Elliptic Curve Cryptography
ECDSA	Elliptic Curve Digital Signature Algorithm Specified in [ANSX9.62].
FFC	Finite Field Cryptography
FIPS	Federal Information Processing Standard.
HMAC	Keyed-Hash Message Authentication Code Specified in [FIPS198].
IFC	Integer Factorization Cryptography
IV	Initialization Vector.
MAC	Message Authentication Code
NIST	National Institute of Standards and Technology
PKI	Public Key Infrastructure
POP	Proof of Possession
RA	Registration Authority
RNG	Random Number Generator
RSA	Rivest, Shamir, Adelman (an Algorithm)
TDEA	Triple Data Encryption Algorithm; Triple DEA
TLS	Transport Layer Security

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# Chapter 1

## Introduction

**E**commerce (the trading of goods) has been a major impetus for human survival since the beginning of recorded history and beyond. The mass adoption of the Internet has created a paradigm shift in the way businesses are conducted today. The past decade has seen the emergence of a new kind of commerce: e-commerce, the buying and selling of goods through human-computer interaction over the Internet. Traditional physical trading of goods and currency is becoming increasingly unpopular and more businesses are jumping on the e-commerce bandwagon. Today, the line between e-commerce and traditional commerce is becoming more blurred as more businesses start and continue to integrate the Internet and e-commerce technologies into their business processes.

### CHAPTER OBJECTIVES

- Definition of Electronic Commerce
- Evolution of E-commerce
- E-Commerce Technologies
- E-Commerce from Different Perspective
- E-Commerce Applications
- Incentives for engaging in E-commerce
- Needs of E-Commerce
- Advantages and Disadvantages of E-Commerce
- Electronic Commerce Frame Work
- Forces behind E-Commerce Industry Framework

### According to Philip Kotler

“E-commerce can be defined as a general term for buying and selling process that is supported by electronic means.”

Electronic commerce, in a broad sense, is the use of computer networks to improve organizational performance. Increasing profitability, gaining market share, improving customer service, and delivering products faster are some of the organizational performance gains possible with electronic commerce.