

**ELECTRONIC COMMERCE.  
BASICS AND MORE**

*www.editurauniversitara.ro*

**NIRVANA POPESCU**

**ELECTRONIC COMMERCE.  
BASICS AND MORE**

[www.editurauniversitara.ro](http://www.editurauniversitara.ro)



**EDITURA UNIVERSITARĂ**  
**București, 2012**

Referenți științifici: Prof.dr.ing. Valentin Cristea  
Prof. dr.ing. Mariana Mocanu

Redactor: Gheorghe Iovan  
Tehnoredactor: Ameluța Vișan  
Coperta: Angelica Mălăescu

Editură recunoscută de Consiliul Național al Cercetării Științifice (C.N.C.S.)

**Descrierea CIP a Bibliotecii Naționale a României**

**POPESCU, NIRVANA**

**Electronic commerce : basics and more / Nirvana**

Popescu. - București : Editura Universitară, 2012

Bibliogr.

ISBN 978-606-591-358-5

004.738.5:336.717.13

DOI: (Digital Object Identifier): 10.5682/9786065913585

© Toate drepturile asupra acestei lucrări sunt rezervate, nicio parte din această lucrare nu poate fi copiată fără acordul Editurii Universitare

Copyright © 2012  
Editura Universitară  
Director: Vasile Muscalu  
B-dul. N. Bălcescu nr. 27-33, Sector 1, București  
Tel.: 021 – 315.32.47 / 319.67.27  
www.editurauniversitara.ro  
e-mail: redactia@editurauniversitara.ro

Distribuție: tel.: 021-315.32.47 / 319.67.27 / 0744 EDITOR / 07217 CARTE  
comenzi@editurauniversitara.ro  
O.P. 15, C.P. 35, București  
www.editurauniversitara.ro

## Contents

Overview .....	7
1. Concepts.....	9
1.1. Introduction to E-Business .....	9
1.2. E-commerce- an integral part of the business strategy.....	10
1.3. E-commerce Models.....	13
1.4. The Structure of an E-commerce Application.....	18
1.5. E-commerce model architecture.....	19
1.6. Examples of E-commerce Architectures.....	29
2. Security of electronic commerce systems .....	36
2.1. System Security – an important issue for electronic commerce ..	36
2.2. Goals when providing security .....	37
2.3. Data vulnerability.....	38
2.4. Technologies for access security.....	38
2.5. The benefits of cryptography.....	44
2.6. U-Prove Technology .....	52
3. Electronic payment systems.....	62
3.1. Standards in electronic transactions .....	62
3.2. On-line payment methods .....	63
3.3. E-banking .....	69
4. Developing e-commerce applications .....	72
4.1. Choosing the best solution .....	72
4.2. Useful tools for building active content.....	75
4.3. Online catalogs.....	79
4.4. Useful features of e-commerce sites .....	80
4.5. Steps for e-commerce system development.....	86
5. Microsoft Commerce Server 2009 – a useful solution for complex e-commerce applications .....	89
5.1. Important features .....	89
5.2. The systems of Microsoft Commerce Server 2009.....	93
5.3. BizTalk Adapters.....	134
5.4. Commerce Server Staging.....	143
6. Neuro-Fuzzy Systems and E-Commerce – an intelligent approach ..	152
6.1. Preliminary considerations.....	152

6.2. Fuzzy set theory - fundamentals .....	153
6.3. Neuro-fuzzy modelling .....	175
6.4. Fuzzy solutions in e-commerce .....	193
6.5. Neuro-Fuzzy Web Intelligence .....	195
References .....	212

[www.editurauniversitara.ro](http://www.editurauniversitara.ro)

## Overview

The technological innovation and business determinants produce major changes in how businesses cooperate and compete in the global marketplace. At the same time, customers are aware of new technology services that they offer and become more demanding and less patient. Thus, companies are faced with the urgent need to become more customer focused, organized by client profile to provide the best service and remove processes that do not add value along the supply chain, customer or ultimate consumer benefit. That is why, nowadays, electronic commerce means not only buying and selling products and services over the Internet. Year by year it becomes more sophisticated and implies different intelligent technologies.

This book focuses on two aspects, as even the title suggests. On one hand it presents some basic concepts that represent the fundamentals of electronic commerce – the “*basic*” part. On the other hand it shows how Web Intelligence has improved this domain – the “*more*” part. Following this book, the reader can understand not only how an electronic trading system fully integrates IT technologies with business, but also some interesting implementation ideas based on fuzzy logic and neural networks that improve the systems, increasing the revenue of an electronic business.

The book is structured into six chapters. The first one is called “Concepts” and provides the basic notions related to e-business. The e-commerce models are discussed here emphasizing the idea that e-commerce is an integral part of the business strategy. Also, the chapter presents different specific architectures.

The second chapter, “Security of electronic commerce systems”, focuses on the security aspects of the commercial transactions over the Internet. Companies are increasingly looking to securely identify individuals who access their services, both on the Internet and offline. That is why the basic requirements for conducting commerce include confidentiality, integrity, authentication, authorization, assurance and privacy. Different technologies for access security are presented and modern-day cryptographic algorithms

are discussed. One example is *U-Prove Technology* which is one of the most recent encryption technology proposed by Microsoft and launched in 2010.

The third chapter, “Electronic Payment Systems” presents some technological solutions for providing *confidentiality*, *integrity* and *authentication* of online financial transactions. For example the authentication can be accomplished using a digital signature, but other problem can arise when implanting a complete system that respects all three principles, as it will be seen in this chapter.

In order to fulfill all the business needs, the development of an e-commerce application starts with choosing the best solution for implementing it. There are a lot of platforms that can be used and the fourth chapter presents the most important ones. Microsoft Commerce Server 2009 is a useful solution for complex e-commerce applications and for this reason the entire chapter five is dedicated to the systems integrated in this powerful platform that provides facilities for any type of online shopping, personalized in any environment that uses Web technology. The site based on it allows easy navigation and the buyer loyalty is encouraged.

The sixth chapter, “Neuro-Fuzzy Systems and E-Commerce – an intelligent approach”, focuses on some intelligent solutions based on the fuzzy set theory and neural networks. In the last years of the electronic commerce some researchers brought interesting implementation ideas based on neuro-fuzzy intelligence, facing the challenge of designing systems that can handle the uncertainty of customers’ shopping behaviors and learning from them.

Being a combination of fundamental concepts and very new intelligent solutions in electronic commerce, this book can be useful to students, to e-commerce developers and to researchers in this domain that understand the importance to improve e-commerce systems by using certain intelligent techniques to filter the information and present only those products that fit the customers’ needs, increasing the business efficiency.

# 1. Concepts

## 1.1. Introduction to E-Business

**E-business** may be defined as the application of information and communication technologies supporting all the activities of business. It can be seen as a SOA-based architecture integrating a lot of disparate applications for a world that is Web based and uses multiple implementation platforms. It provides an integrated suite of services that can be used within multiple business domains.

The technological innovation and business determinants (such as pressures to reduce inventory and mass customization) produce major changes in how businesses cooperate and compete in the global marketplace. At the same time, customers are aware of new technology services that they offer and become more demanding and less patient. Thus, companies are faced with the urgent need to become more customer focused, organized by client profile to provide the best service and remove processes that do not add value along the supply chain, customer or ultimate consumer benefit .

This new wave of dynamic relationships and client-centered innovation requires the integration of the overall level of business processes, applications and systems at an unprecedented scale. This integration at the business unit is called *e-business*, organizational foundation that can support business in the Internet economy, in particular *electronic commerce*.

For the first time, IBM has defined e-business as: “secure, flexible and integrated access for business development by combining the various processes and systems that perform basic operations of the business with those of making possible to find information on the Internet.”

The *e-business* term refers to the continuous improvement of supply value management and position the company in the supply chain, enabled by digital technology and the Internet as the primary medium of communication [1]. There are two factors that support this optimization, enabling a company can take full advantage of digital technology and the

Internet: the concepts of *reengineering* and *integration*. E-business represents a business organized on the basis of two concepts, able to overcome the traditional business performance through: quicker adaptation to market changes, a faster response to customer needs, one operating at the lowest possible cost and manage the creation and reformulation market relations as needed.

Also, E-business represents electronic communications networks enabling businesses to exchange information of different nature and includes e-business processes (recruitment, strategic planning, tactical and operational control and inventory management, customer support, statement of financial operations etc..) and e-commerce (buying and selling).

The relationship between electronic commerce and e-business depends on interpretation. Yet some authors consider electronic commerce as being included into electronic business because it provides a firm link with the outside without putting emphasis on transactions within it. So it can be said that electronic commerce is a component of e-business.

**E-service** is another term that Hewlett-Packard launched in 1999. It refers to the delivery of e-business solutions, comprising hardware, software, information and consulting company in promoting business. The Internet provides various forms of communication, combining all the current technologies in a single virtual environment in which to integrate different models, software instruments and hardware equipment that enable online sending a fax on the Internet, transmission of audio and / or video sequences for video presentation or receiving a voice message, converting a fax into an e-mail etc. In this way it offers possibilities of integrating business much easier.

Electronic collaboration is fabulous in the current conditions due to the compressing of time and space resources, by almost instantaneous decks between any corners of the globe.

## **1.2. E-commerce- an integral part of the business strategy**

Commerce constitutes the exchange of products and services between businesses, groups and individuals and can be seen as one of the essential activities of any business. Electronic commerce focuses on the use of information and communication technologies to enable the external

activities and relationships of the business with individuals, groups and other businesses.

From e-business point of view, e-commerce covers:

- The sale and purchase of goods and services.
- Customer Service.
- Working with business partners.
- The management of electronic transactions within an organization.

An e-commerce business is based on a web-centered information system built around the site that contains online store.

During the dot.com boom in the 1990s, many companies rushed to build e-commerce sites to capture their share of the exploding demand for goods and services online. Mature, off-the-shelf e-commerce packages were not commercially available, or were unable to meet the requirements that businesses had. As a result, these organizations had little choice but to invest in rudimentary, stand-alone solutions that were largely homegrown. In many cases, organizations created their own search, content-management, shopping-cart and product-catalog capabilities. And because they were pressured to establish an online presence quickly, most companies designed and developed their e-commerce platforms without thinking about their long-term needs.

Without a doubt, electronic commerce is one of the most important changes occurring in the contemporary economy and enterprise, with multiple and significant economic and social effects. There are four elements that make electronic commerce to be different from the previous types of economic transactions and they are discussed further:

a. Transformation of commercial space, more change in the involved elements and the economic behavior. In this context, the traditional intermediaries are replaced and new products and markets appear. More direct and intense relationships between companies and between them and consumers have been developed. There are new jobs. New functions and powers of employees are redefined. Also, the organizations become more flexible and adaptable.

b. Manifestation of electronic commerce as a catalyst in many areas. More specifically, electronic commerce causes wide dissemination in organizations of information, communication, managerial and economic changes. New regulations are needed in activities of organizations. Also it is an increased demand for skilled employee.