e-business: challenges and trends

Fernando Silva Parreiras
Agenda

- Why we are here today? What we are looking for?
- Concepts and definitions;
- History of EB;
- Challenges
  - Financial
  - Technological
- The future of EB
Learning Objectives

1. Define electronic commerce (EB) and describe its various categories.
2. Describe and discuss the content and framework of EB.
3. Describe the major types of EB transactions.
4. Describe some EB business models.
Learning Objectives (cont.)

5. Describe the benefits of EB to organizations, consumers, and society.
6. Describe the limitations of EB.
7. Describe the role of the digital revolution in EB.
8. Describe the contribution of EB to organizations responding to environmental pressures.
9. Describe the possible application models to evaluate ROI.
10. Describe the main technological issues.
11. Identify the trends
Electronic Commerce: Definitions and Concepts

- The Internet has emerged as a major, perhaps eventually the major, worldwide distribution channel for goods, services, managerial and professional jobs
- This is profoundly changing economics, markets and industry structure, products and services and their flow, consumer segmentation, consumer values, consumer behavior, jobs, and labor markets
- The impact may be even greater on societies and politics, and on the way we see the world and ourselves in it
Electronic Commerce: Definitions and Concepts (cont.)

- **E-commerce defined from the following perspectives:**
  - **Communications:** delivery of goods, services, information, or payments over computer networks or any other electronic means
  - **Commercial (trading):** provides capability of buying and selling products, services, and information on the Internet and via other online services
**Electronic Commerce: Definitions and Concepts (cont.)**

- **Business process:** doing business electronically by completing business processes over electronic networks, thereby substituting information for physical business processes.

- **Service:** a tool that addresses the desire of governments, firms, consumers, and management to cut service costs while improving the quality of customer service and increasing the speed of service delivery.
Electronic Commerce: Definitions and Concepts (cont.)

- **Learning**: an enabler of online training and education in schools, universities, and other organizations, including businesses
- **Collaborative**: the framework for inter- and intraorganizational collaboration
- **Community**: provides a gathering place for community members to learn, transact, and collaborate
Electronic Commerce: Definitions and Concepts (cont.)

- **e-business**: a broader definition of EC, which includes:
  - buying and selling of goods and services
  - servicing customers
  - collaborating with business partners
  - conducting electronic transactions within an organization
Electronic Commerce: Definitions and Concepts (cont.)

- **Pure vs. Partial EC** depends upon the *degree of digitization* (the transformation from physical to digital) of:
  1. the *product* (service) sold;
  2. the *process*; and for
  3. the *delivery agent* (or digital intermediary)

- **Brick-and-Mortar organizations** are old-economy organizations (corporations) that perform most of their business off-line, selling physical products by means of physical agents.
Electronic Commerce: Definitions and Concepts (cont.)

- Virtual (pure-play) organizations conduct their business activities solely online
- Click-and-mortar organizations conduct some EB activities, but do their primary business in the physical world
- Electronic market (e-marketplace) online marketplace where buyers and sellers meet to exchange goods, services, money, or information
Interorganizational information systems (IOSs) allow routine transaction processing and information flow between two or more organizations.

Intraorganizational information systems enable EB activities to go on within individual organizations.
Exhibit 1.1: The Dimensions of Electronic Commerce

Exhibit 1.1  The Dimensions of Electronic Commerce

The EB Framework, Classification, and Content

- Two major types of e-commerce:
  - **business-to-consumer (B2C):** online transactions are made between businesses and individual consumers
  - **business-to-business (B2B):** businesses make online transactions with other businesses
    - intrabusiness EB: *EB conducted inside an organization* (e.g., business-to-employees B2E)
The EB Framework, Classification, and Content (cont.)

- Computer environments
  - **Internet**: global networked environment
  - **Intranet**: a corporate or government network that uses Internet tools, such as Web browsers, and Internet protocols
  - **Extranet**: a network that uses the Internet to link multiple intranets
EB Framework

- EB applications are supported by infrastructure and by five support areas:
  - People
  - Public policy
  - Marketing and advertising
  - Support services
  - Business partnerships
Exhibit 1.2: A Framework for Electronic Commerce

Exhibit 1.2 A Framework for Electronic Commerce

Electronic Commerce Applications
- Direct Marketing
- Search Jobs
- Online Banking
- E-government
- E-purchasing
- B2B Exchanges
- C-commerce
- M-commerce
- Auctions
- Travel
- Online Publishing
- Consumer Services

People:
- Buyers
- Sellers
- Intermediaries
- Service IS People
- and Management

Public Policy:
- Taxes, Legal
- Privacy Issues
- Regulations, and Technical Standards

Support Services:
- Logistics
- Payments, Content, and Security System Development

Business Partnerships:
- Affiliate Programs
- Joint Ventures
- Exchanges
- E-marketplaces
- and Consortia

Support Services

(1) Common business services infrastructure (security, smart cards/authentication electronic payments, directories/catalogs)

(2) Messaging and information distribution infrastructure (EDI, e-mail, hyper tekst transfer protocol, chat rooms)

(3) Multimedia content and network publishing infrastructure (HTML, JAVA, XML, VHML)

(4) Network infrastructure (telecom, cable TV, wireless, internet) (VAN, WAN, LAN, intranet, extranet) access (cell phones)

(5) Interfacing infrastructure (with databases, business partners applications)

Management

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Classification of EB by Transactions or Interactions

- **business-to-consumer (B2C)**: online transactions are made between businesses and individual consumers
- **business-to-business (B2B)**: businesses make online transactions with other businesses
- **e-tailing**: online retailing, usually B2C
Classification of EB by Transactions or Interactions (cont.)

- **business-to-business-to-consumer (B2B2C):** e-commerce model in which a business provides some product or service to a client business that maintains its own customers.

- **consumer-to-business (C2B):**
  
e-commerce model in which individuals use the Internet to sell products or services to organizations or individuals seek sellers to bid on products or services they need.
Classification of EB by Transactions or Interactions (cont.)

- consumer-to-consumer (C2C):
  e-commerce model in which consumers sell directly to other consumers

- peer-to-peer (P2P): technology that enables networked peer computers to share data and processing with each other directly; can be used in C2C, B2B, and B2C e-commerce
Classification of EB by Transactions or Interactions (cont.)

- **mobile commerce (m-commerce):**
  e-commerce transactions and activities conducted in a wireless environment

- **location-based commerce (l-commerce):** m-commerce transactions targeted to individuals in specific locations, at specific times
Classification of EB by Transactions or Interactions (cont.)

- **intrabusiness EC**: e-commerce category that includes all internal organizational activities that involve the exchange of goods, services, or information among various units and individuals in an organization.

- **business-to-employees (B2E)**: e-commerce model in which an organization delivers services, information, or products to its individual employees.
Classification of EB by Transactions or Interactions (cont.)

- collaborative commerce (c-commerce):
  e-commerce model in which individuals or groups communicate or collaborate online

- e-learning: the online delivery of information for purposes of training or education

- exchange (electronic): a public electronic market with many buyers and sellers
Classification of EB by Transactions or Interactions (cont.)

- **exchange-to-exchange (E2E):** e-commerce model in which electronic exchanges formally connect to one another the purpose of exchanging information

- **e-government:** e-commerce model in which a government entity buys or provides goods, services, or information to businesses or individual citizens
The Interdisciplinary Nature of EB

- Major EB disciplines
  - Computer science
  - Marketing
  - Consumer behavior
  - Finance
  - Economics
  - Management information systems
A Brief History of EB

- 1970s: innovations like *electronic funds transfer* (EFT)—funds routed electronically from one organization to another (limited to large corporations)

- *electronic data interchange* (EDI)—electronically transfer routine documents (application enlarged pool of participating companies to include manufacturers, retailers, services)

- *interorganizational system* (IOS)—travel reservation systems and stock trading
A Brief History of EB (cont.)

- 1969 U.S. government experiment—the Internet came into being initially used by technical audience of government agencies, academic researchers, and scientists
- 1990s the Internet commercialized and users flocked to participate in the form of dot-coms, or Internet start-ups
- Innovative applications ranging from online direct sales to e-learning experiences
Most medium- and large-sized organizations have a Web site
Most large U.S. corporations have comprehensive portals
1999 the emphasis of EB shifted from B2C to B2B
2001 the emphasis shifted from B2B to B2E,
c-commerce, e-government, e-learning, and
m-commerce
EB will undoubtedly continue to shift and change
A Brief History of EB (cont.)

- EC successes
  - Virtual EC companies
    - eBay
    - VeriSign
    - AOL
    - Checkpoint
  - Click-and-mortar
    - Cisco
    - General Electric
    - IBM
    - Intel
    - Schwab

- EC failures
  - 1999, a large number of EC-dedicated companies began to fail
  - EC’s days are not numbered!
    - dot-com failure rate is declining sharply
    - EC field is experiencing consolidation
    - most pure EC companies, are expanding operations and generating increasing sales
      (Amazon.com)
E-commerce

Business Models

- Business models—a method of doing business by which a company can generate revenue to sustain itself

  - *Examples*:
    - Name your price
    - Find the best price
    - Dynamic brokering
    - Affiliate marketing
E-commerce
Business Plans and Cases

- **Business plan**: a written document that identifies the business goals and outlines the plan of how to achieve them

- **Business case**: a written document that is used by managers to garner funding for specific applications or projects; its major emphasis is the justification for a specific investment
Structure of Business Models

- Business model: A method of doing business by which a company can generate revenue to sustain itself
Structure of Business Models (cont.)

- **Revenue model**: description of how the company or an EB project will earn revenue
  - Sales
  - Transaction fees
  - Subscription fees
  - Advertising
  - Affiliate fees
  - Other revenue sources


Structure of Business Models (cont.)

- **Value proposition:** The benefits a company can derive from using EB
  - search and transaction cost efficiency
  - complementarities
  - lock-in
  - novelty
  - aggregation and interfirm collaboration
Exhibit 1.4: Common Revenue Models

- **Transaction Fees Model**: Commissions paid on volume of transactions.
- **Subscription Model**: Fixed amounts are charged, usually monthly.
- **Advertisement Model**: Payments from advertisers.
- **Affiliate Model**: Commissions for referring customers.
- **Sales Model**: Revenue from sales of goods or services.
Typical Business Models in EB

1. Online direct marketing
2. Electronic tendering systems
   *tendering (reverse auction): model in which a buyer requests would-be sellers to submit bids, and the lowest bidder wins*
3. Name your own price: a model in which a buyer sets the price he or she is willing to pay and invites sellers to supply the good or service at that price
Typical Business Models in EB (cont.)

4. Affiliate marketing: an arrangement whereby a marketing partner (a business, an organization, or even an individual) refers consumers to the selling company’s Web site.

5. Viral marketing: word-of-mouth marketing in which customers promote a product or service to friends or other people.
Typical Business Models in EB (cont.)

6. Group purchasing: quantity purchasing that enables groups of purchasers to obtain a discount price on the products purchased

7. SMEs: small to medium enterprises

8. Online auctions
Typical Business Models in EB (cont.)

8. Product and service customization

*customization*: creation of a product or service according to the buyer’s specifications

8. Electronic marketplaces and exchanges

9. Value-chain integrators

10. Value-chain service providers
Typical Business Models in EB (cont.)

12. Information brokers
13. Bartering
14. Deep discounting
15. Membership
16. Supply chain improvers

Business models can be independent or they can be combined amongst themselves or with traditional business models.
Benefits of EB

Benefits to organizations

- Global reach
- Cost reduction
- Supply chain improvements
- Extended hours: 24/7/365
- Customization
- New business models
- Vendors’ specialization
- Rapid time-to-market
- Lower communication costs
- Efficient procurement
- Improved customer relations
- Up-to-date company material
- No city business permits and fees
- Other benefits
Benefits of EB (cont.)

Benefits to consumers

- Ubiquity
- More products and services
- Cheaper products and services
- Instant delivery
- Information availability
- Participation in auctions
- Electronic communities
- “Get it your way”
- No sales tax
Benefits of EB (cont.)

- Benefits to society
  - Telecommuting
  - Higher standard of living
  - Hope for the poor
  - Availability of public services
# Limitations of EB

## Exhibit 1.5 Limitations of Electronic Commerce

<table>
<thead>
<tr>
<th>Technological Limitations</th>
<th>Nontechnological Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. There is a lack of universally accepted standards for quality, security, and reliability.</td>
<td>1. Security and privacy concerns deter customers from buying.</td>
</tr>
<tr>
<td>2. The telecommunications bandwidth is insufficient, especially for m-commerce.</td>
<td>2. Lack of trust in EC and in unknown sellers hinders buying.</td>
</tr>
<tr>
<td>3. Software development tools are still evolving.</td>
<td>3. Many legal and public policy issues, including taxation, are as yet unresolved.</td>
</tr>
<tr>
<td>4. There are difficulties in integrating the Internet and EC software with some existing (especially legacy) applications and databases.</td>
<td>4. National and international government regulations sometimes get in the way.</td>
</tr>
<tr>
<td>5. Special Web servers are needed in addition to the network servers (added cost).</td>
<td>5. It is difficult to measure some benefits of EC, such as advertising. There is a lack of mature measurement methodology.</td>
</tr>
<tr>
<td>6. Internet accessibility is still expensive and/or inconvenient.</td>
<td>6. Some customers like to feel and touch products. Also, customers are resistant to the change from a real to a virtual store.</td>
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<tr>
<td>7. Order fulfillment of large-scale B2C requires special automated warehouses.</td>
<td>7. People do not yet sufficiently trust paperless, faceless transactions.</td>
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<tr>
<td></td>
<td>8. In most cases, there is an insufficient number (critical mass) of sellers and buyers which are needed for profitable EC operations.</td>
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<td></td>
<td>9. There is an increasing amount of fraud on the Internet.</td>
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<td></td>
<td>10. It is difficult to obtain venture capital due to the dot-com disaster (failure of many dot-coms).</td>
</tr>
</tbody>
</table>
Barriers of EB

- Security
- Trust and risk
- Lack of qualified personnel
- Lack of business models
- Culture

- User authentication and lack of public key infrastructure
- Organization
- Fraud
- Slow navigation on the Internet
- Legal issues
The Digital Revolution

- *Digital economy*: An economy that is based on digital technologies, including digital communication networks, computers, software, and other related information technologies; also called the *Internet economy*, the *new economy*, or the *Web economy*.
The Digital Revolution (cont.)

- A global platform over which people and organizations interact, communicate, collaborate, and search for information

- Includes the following characteristics:
  - A vast array of digitizable products
  - Consumers and firms conducting financial transactions digitally
  - Microprocessors and networking capabilities embedded in physical goods
New Business Environment

- Customers are becoming more powerful
- Created due to advances in science occurring at an accelerated rate
- Results in more and more technology
- Rapid growth in technology results in a large variety of more complex systems
**New Business Environment (cont.)**

- Characteristics in the business environment
  - A more turbulent environment with more business problems and opportunities
  - Stronger competition
  - Need for organizations to make decisions more frequently
  - A larger scope for decisions because more factors
  - More information and/or knowledge needed for making decisions
Environment-Response-Support Model

- Critical response activities
  - traditional actions such as lowering cost and closing unprofitable facilities
  - introduce innovative actions such as customizing or creating new products or providing superb customer service
Exhibit 1.6: Major Business Pressures and the Role of EB

Exhibit 1.6 Major Business Pressures and the Role of EC
Major Business Pressures

Market and economic pressures

- Strong competition
- Global economy
- Regional trade agreements (e.g. NAFTA)
- Extremely low labor cost in some countries
- Frequent and significant changes in markets
- Increased power of consumers
Major Business Pressures (cont.)

Societal and environmental pressures

- Changing nature of workforce
- Government deregulation of banking and other services
- Shrinking government subsidies
- Increased importance of ethical and legal issues
- Increased social responsibility of organizations
- Rapid political changes
Major Business Pressures (cont.)

Technological pressures

- Rapid technological obsolescence
- Increase innovations and new technologies
- Information overload
- Rapid decline in technology cost vs. performance ratio
Organizational Responses

- Strategic systems
- Continuous improvement efforts and business process reengineering—including *business process reengineering* (BPR)
Organizational Responses (cont.)

- Business alliances
- Electronic markets
- Reductions in cycle time and time-to-market

*Cycle time reduction:* Shortening the time it takes for a business to complete a productive activity from its beginning to end
Organizational Responses (cont.)

- Empowerment of employees
- Supply chain improvements
- Mass customization: make-to-order in large quantities in an efficient manner
  
  *Mass customization*: Production of large quantities of customized items
Organizational Responses (cont.)

- Intrabusiness: from sales force automation to inventory
- Knowledge management

*Knowledge management (KM)*: The process of creating or capturing knowledge, storing and protecting it, updating and maintaining it, and using it.
Putting It All Together

- Task facing each organization is how to put together the components that will enable the organization to transform itself to the digital economy and gain competitive advantage by using EB.

- Many employ corporate portals:
  
  A major gateway through which employees, business partners, and the public can enter a corporate Web site.
Exhibit 1.8: The Networked Organization

Exhibit 1.8 The Networked Organization: How a Company Uses the Internet, Intranets, and Extranets
Financial Issues

- How to evaluate the risk of a project?
  - NPV
  - CAPM
  - APT (Arbitrage Pricing Theory)
**Technological Issues**

- XML;
- Ontologies;
- RDF;
- Intelligent agents;
- RSS
XML

- Extensible Markup Language:
Ontologies

- An ontology is a description (like a formal specification of a program) of the concepts and relationships that can exist for an agent or a community of agents.

- “When the knowledge of a domain is represented in a declarative formalism, the set of objects that can be represented is called the universe of discourse. This set of objects, and the describable relationships among them, are reflected in the representational vocabulary with which a knowledge-based program represents knowledge. Thus, in the context of AI, we can describe the ontology of a program by defining a set of representational terms”.

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Ontologies (cont.)
Resource Description Framework (RDF) is a standard for describing resources on the web.
Intelligent agents

Intelligent agents are programs that carry out a task unsupervised and apply some degree of intelligence to the task. The intelligence may be pretty minimal but often will include some degree of learning from past experience. For example, an agent that searches the Internet for interesting material can be told by the user whether what it found was interesting or not. In this way it can be trained to be more successful in the future. Some intelligent agents can also interact with one another.
Semantic web

- The Semantic Web provides a common framework that allows data to be shared and reused across application, enterprise, and community boundaries. It is a collaborative effort led by W3C with participation from a large number of researchers and industrial partners. It is based on the Resource Description Framework (RDF), which integrates a variety of applications using XML for syntax and URIs for naming.

- "The Semantic Web is an extension of the current web in which information is given well-defined meaning, better enabling computers and people to work in cooperation." -- Tim Berners-Lee, James Hendler, Ora Lassila, The Semantic Web, Scientific American, May 2001
RSS

- RSS is a format for syndicating news and the content of news-like sites, including major news sites like Wired, news-oriented community sites like Slashdot, and personal weblogs. But it's not just for news. Pretty much anything that can be broken down into discrete items can be syndicated via RSS: the "recent changes" page of a wiki, a changelog of CVS checkins, even the revision history of a book.
Marketing Issues

- Marketing at Internet
Marketing at Internet

- Advertisements
- SEO (Search Engine Optimization)
SEO (Search Engine Optimization)

- Three Search Engines generations
  - Directory service
  - Vectorial Model
  - Link analysis
- Google pagerank
- Good appearance
Managerial Issues

1. Is it real?
2. How should we evaluate the magnitude of the business pressures?
3. Why is B2B e-commerce so attractive?
4. There are so many EC failures—how can one avoid them?
Managerial Issues (cont.)

5. What should be my company’s strategy toward EC?
6. How do we transform our organization into a digital one?
7. What are the top challenges of EC?
The Future of EB

- 2004—total online shopping and B2B transactions in the US between $3 to $7 trillion by 2008:
  - number of Internet users worldwide should reach 750 million
  - 50 percent of Internet users will shop
  - EB growth will come from:
    - B2C
    - B2B
    - e-government
    - e-learning
    - B2E
    - c-commerce

the future is bright
Summary

1. Definition of EC and description of its various categories.
2. The content and framework of EC.
3. The major types of EC transactions.
4. The major business models.
Summary (cont.)

5. Benefits to organizations, consumers, and society.
6. Limitations of EC.
7. The role of the digital revolution.
8. The role of EC in combating pressures in the business environment.
Discussion

- How do you see the issues above applied at your organization?
- Do you think that we need more metrics to measure times and budgets in EB projects?
- What about the technological improves?
References

- www.w3c.org
Thank you very much!

Fernando Silva Parreiras