

INTRODUCTION TO ELECTRONIC COMMERCE

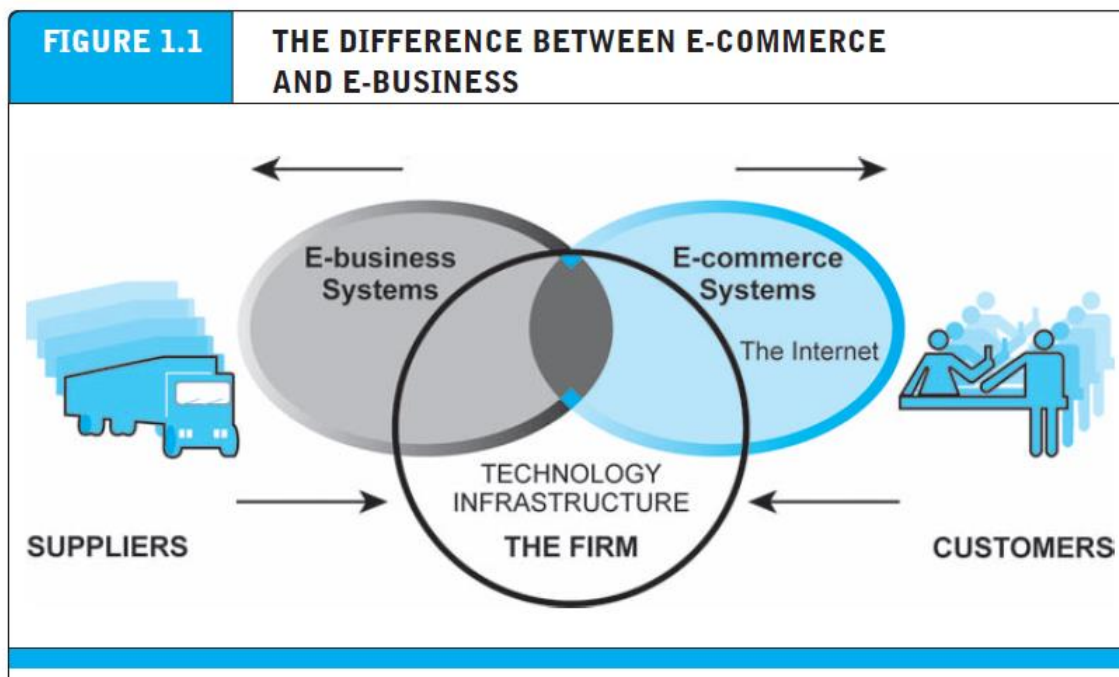
Electronic commerce (e-commerce) remains a relatively new, emerging and constantly changing area of business management and information technology. E-commerce is digitally enabled commercial transactions between and among organizations and individuals. *Digitally enabled transactions* include all transactions mediated by digital technology e.g. Internet. For the most part, this means transactions that occur over the Internet and the Web. *Commercial transactions* involve the exchange of value (e.g., money) across organizational or individual boundaries in return for products and services. Exchange of value is important for understanding the limits of e-commerce. Without an exchange of value, no commerce occurs.

Some of the definitions of e-commerce often heard and found in publications and the media are:

- Electronic Commerce (EC) is where business transactions take place via telecommunications networks, especially the Internet.
- Electronic commerce describes the buying and selling of products, services, and information via computer networks including the Internet.
- Electronic commerce is about doing business electronically.
- E-commerce is defined as the conduct of a financial transaction by electronic means.

THE DIFFERENCE BETWEEN E-COMMERCE AND E-BUSINESS

E-business refers primarily to the digital enablement of transactions and processes *within* a firm, involving information systems under the control of the firm as shown in figure below.



E-commerce primarily involves transactions that cross firm boundaries. E-business primarily involves the application of digital technologies to business processes within the firm.

For the most part, in our view, e-business does not include commercial transactions involving an exchange of value across organizational boundaries. For example, a company's online inventory control mechanisms are a component of e-business, but such internal processes do not directly generate revenue for the firm from outside businesses or consumers, as e-commerce, by definition, does. It is true, however, that a firm's e-business infrastructure provides support for online e-commerce exchanges; the same infrastructure and skill sets are involved in both e-business and e-commerce. E-commerce and e-business systems blur together at the business firm boundary, at the point where internal business systems link up with suppliers or customers, for instance. E-business applications turn into e-commerce precisely when an exchange of value occurs (see Mesenbourg, U.S. Department of Commerce, August 2001 for a similar view).

BENEFITS OF E-COMMERCE

The benefits of e-commerce can be seen to affect three major stakeholders: organisations, consumers and society.

1) Benefits of e-commerce to organisations

International marketplace. What used to be a single physical marketplace located in a geographical area has now become a borderless marketplace including national and international markets. By becoming e-commerce enabled, businesses now have access to people all around the world.

Operational cost savings. The cost of creating, processing, distributing, storing and retrieving paper-based information has decreased.

Mass customisation. E-commerce has revolutionised the way consumers buy good and services. In the past when Ford first started making motor cars, customers could have any colour so long as it was black. Now customers can configure a car according to their specifications within minutes on-line via the www.ford.com website.

Enables reduced inventories and overheads by facilitating 'pull'-type supply chain management – this is based on collecting the customer order and then delivering through JIT (just-in-time) manufacturing. This is particularly beneficial for companies in the high technology sector, where stocks of components held could quickly become obsolete within months. For example, companies like Motorola (mobile phones), and Dell (computers) gather customer orders for a product, transmit them electronically to the manufacturing plant where they are manufactured according to the customer's specifications (like colour and features) and then sent to the customer within a few days.

Lower telecommunications cost. The Internet is much cheaper than value added networks (VANs) which were based on leasing telephone lines for the sole use of the organisation and its authorised partners. It is also cheaper to send a fax or e-mail via the Internet than direct dialling.

Digitisation of products and processes. Particularly in the case of software and music/video products, which can be downloaded or e-mailed directly to customers via the Internet in digital or electronic format.

No more 24-hour-time constraints. Businesses can be contacted by or contact customers or suppliers at any time.

2) Benefits of e-commerce to consumers

24/7 access. Enables customers to shop or conduct other transactions 24 hours a day, all year round from almost any location. For example, checking balances, making payments, obtaining travel and other information.

More choices. Customers not only have a whole range of products that they can choose from and customise, but also an international selection of suppliers.

Price comparisons. Customers can 'shop' around the world and conduct comparisons either directly by visiting different sites. (for example www.moneyextra.co.uk for financial products and services).

Improved delivery processes. This can range from the immediate delivery of digitised or electronic goods such as software or audio-visual files by downloading via the Internet, to the on-line tracking of the progress of packages being delivered by mail or courier.

An environment of competition where substantial discounts can be found or value added, as different retailers for customers.

3) Benefits of e-commerce to society

Enables more flexible working practices, which enhances the quality of life for a whole host of people in society, enabling them to work from home. It also potentially reduces environmental pollution as fewer people have to travel to work regularly.

Connects people. Enables people in developing countries and rural areas to enjoy and access products, services, information and other people which otherwise would not be so easily available to them.

Facilitates delivery of public services. For example, health services available over the Internet (on-line consultation with doctors or nurses), filing taxes over the Internet through the Inland Revenue website.

LIMITATIONS OF E-COMMERCE

There was much hype surrounding the Internet and e-commerce over the last few years of the twentieth century. Much of it promoted the Internet and e-commerce as the panacea for all ills, which raises the question, are there any limitations of e-commerce and the Internet?

Isaac Newton's 3rd Law of Motion, 'For every action there is an equal and opposite reaction' suggests that for all the benefits there are limitations to e-commerce. These again will be dealt with according to the three major stakeholders – organisations, consumers and society.

Limitations of e-commerce to organisations

Lack of sufficient system security, reliability, standards and communication protocols.

There are numerous reports of websites and databases being hacked into, and security holes in software. For example, Microsoft has over the years issued many security notices and 'patches' for their software. Several banking and other business websites, including Barclays Bank, Powergen and even the Consumers' Association in the UK, have experienced breaches in security where 'a technical oversight' or 'a fault in its systems' led to confidential client information becoming available to all.

Rapidly evolving and changing technology, so there is always a feeling of trying to 'catch up' and not be left behind.

Under pressure to innovate and develop business models to exploit the new opportunities which sometimes leads to strategies detrimental to the organisation. The ease with which business models can be copied and emulated over the Internet increase that pressure and curtail longer-term competitive advantage.

Facing increased competition from both national and international competitors often leads to price wars and subsequent unsustainable losses for the organisation.

Problems with compatibility of older and 'newer' technology. There are problems where older business systems cannot communicate with webbased and Internet infrastructures, leading to some organisations running almost two independent systems where data cannot be shared. This often leads to having to invest in new systems or an infrastructure, which bridges the different systems. In both cases this is both financially costly as well as disruptive to the efficient running of organisations.

Limitations of e-commerce to consumers

Computing equipment is needed for individuals to participate in the new 'digital' economy, which means an initial capital cost to customers.

A basic technical knowledge is required of both computing equipment and navigation of the Internet and the World Wide Web.

Cost of access to the Internet, whether dial-up or broadband tariffs.

Cost of computing equipment. Not just the initial cost of buying equipment but making sure that the technology is updated regularly to be compatible with the changing requirement of the Internet, websites and applications.

Lack of security and privacy of personal data. There is no real control of data that is collected over the Web or Internet. Data protection laws are not universal and so websites hosted in different countries may or may not have laws which protect privacy of personal data.

Physical contact and relationships are replaced by electronic processes. Customers are unable to touch and feel goods being sold on-line or gauge voices and reactions of human beings.

A lack of trust because they are interacting with faceless computers.

Limitations of e-commerce to society

Breakdown in human interaction. As people become more used to interacting electronically there could be an erosion(divide) of personal and social skills which might eventually be detrimental to the world we live in where people are more comfortable interacting with a screen than face to face.

Social division. There is a potential danger that there will be an increase in the social divide between technical haves and have-nots – so people who do not have technical skills become unable to secure better-paid jobs and could form an underclass with potentially dangerous implications for social stability.

Reliance on telecommunications infrastructure, power and IT skills, which in developing countries nullifies the benefits when power, advanced telecommunications infrastructures and IT skills are unavailable or scarce or underdeveloped.

Wasted resources. As new technology dates quickly how do you dispose of all the old computers, keyboards, monitors, speakers and other hardware or software?

Facilitates Just-In-Time manufacturing. This could potentially cripple an economy in times of crisis as stocks are kept to a minimum and delivery patterns are based on pre-set levels of stock which last for days rather than weeks .

Difficulty in policing the Internet, which means that numerous crimes can be perpetrated and often go undetected. There is also an unpleasant rise in the availability and access of obscene material and ease with which paedophiles and others can entrap children by masquerading in chat rooms.

SEVEN UNIQUE FEATURES OF E-COMMERCE TECHNOLOGY

1. **Ubiquity:** In traditional commerce, a marketplace is restricted i.e. we can be in limited physical area to buy or sell. Whereas E-Commerce is ubiquitous meaning that it is available just about everywhere, at all times. It make possible to shop from your desktop, at home, at work or even from your car, using mobile commerce. The result is called a **market space** - a marketplace extended beyond traditional boundaries and removed from a temporal and geographic location. From a consumer perspective, ubiquity reduces transaction costs – the costs of participating in a market. To transact, it is no longer necessary that you spend time and money traveling to a market.

2. **Global Reach:** Unlike traditional commerce, e-commerce technology permits commercial transaction to cross cultural and national boundaries far more conveniently and cost effectively. As a result, the potential market size for e-commerce merchants is roughly equal to the size of the world's online population.
3. **Universal Standards:** One strikingly unusual feature of e-commerce technologies is that the technical standards of the Internet, and therefore the technical standards for conducting e-commerce, are universal standards – they are shared by all nation around the world. In contrast, most traditional commerce technologies differ from one nation to the next. For instance, television and radio standards differ around the world, as doe's cell telephone technology. The universal technical standards of e-commerce greatly lower market entry cost –t he cost merchants must pay just to bring their goods to market.
4. **Richness:** With the use of e-commerce technology merchant can present their message in effective way. Information richness refers to the complexity and content of the message.
5. **Interactivity:** E-Commerce technologies are interactive, meaning they allow two-way communication between merchant and consumer. Television, for instant, cannot ask the viewer any questions, enter into a conversation with a viewer, or request customer information be entered into a form. In contrast, all of these activities are possible on an e-commerce Web site. Interactivity allows an online merchant to engage a consumer in a ways similar to a face-to-face experience, but on a much more massive, global scale.
6. **Information density:** The Internet and the Web vastly increase information density – the total amount and quality of the information available to all market participants, consumers and merchants alike. E-commerce technologies reduce information collection, storage, processing and communication costs. At the same time, these technologies increase greatly the accuracy and timeliness of information – making information more useful and important than ever. As a result, information becomes more plentiful, cheaper and of higher quality.
7. **Personalization/Customization:** E-commerce technologies permit **personalization**: Merchants can target their marketing message to specific individuals by adjusting the message. The technology also permits **customization** – changing the delivered product or service based on a user's preference or prior behavior.

E-COMMERCE FRAMEWORK

E-Commerce applications will be built on the existing technology infrastructure - a myriad of computers, communication networks, and communication software forming the nascent Information Superhighway. The **technology infrastructure** of the Internet is both an enabler and a driver of change. An infrastructure is defined as "*the foundation of a system.*" In this case, the technological foundation of the Internet, simply put, enables the running of the e-commerce enterprises. The hardware backbone of computers, routers, servers, fiber optics, cables, modems, and other network technologies provides half of the technology equation. The other half includes the soft-ware and communications standards that run on top of the hardware, including the core protocols for the Web. Understanding technology infrastructure—and there-fore understanding what is and is not achievable—is essential to formulating a company's vision and strategy.

The framework for e-Commerce consists of three parts as shown in below figure.

1. The first part consists of a variety of electronic commerce applications including both inter- and intra-organizational and electronic market examples such as Supply Chain Management, Video-on-Demand, Procurement and purchasing, On-line marketing and advertising, Home shopping etc.
2. The second part of the building blocks of the infrastructure consists of:
 - **Common business services**, for facilitating the buying and selling process.

- **Messaging and information distribution**, as a means of sending and retrieving information (ex-EDI, e-mail, P2P file transfer)
 - **Multi-media content and network publishing**, for creating a product and a means to communicate about it.
 - **Information Superhighway infrastructure** consisting of telecommunication, cable operator, ISPs , Wireless technologies and Internet.
3. The third part consists of the public policy and technical standards necessary to support the applications and the infrastructure.
- **Public policies** govern issues like universal access, privacy, and information pricing. The public policy infrastructure affects not only the specific business but also direct and indirect competitors. It should take into consideration of:
 - Cost of accessing information
 - Regulation to protect consumers from fraud and protect their right to privacy.
 - Policies of global information traffic to detect information pirating and obscene sites.
 - **Technical Standards** governs issues like technology for communication and as well as for Internet



Fig: Generic Framework of Electronic Commerce

ELEMENTS OF E-COMMERCE APPLICATIONS

Remarks: see the notes provided at the class.