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# BASICS OF THE INFORMATION ECONOMY

**Textbook**

**Харків. Вид. ХНЕУ, 2013**

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ВВС 65в6я73
L56

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**Рекомендовано до видання рішенням вченої ради Харківського національного економічного університету.**
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The book provides information about the main aspects of the information economy, company's problems under the conditions of informatization. The trends and stages of the information economy development, the main components and features of business activity in the information economy are presented. Each theme contains control questions. The practical work consists of workshops, case studies and problems.

It is recommended for students of the training direction 6.030601 "Management" of all forms of study.

Досліджено основні аспекти інформаційної економіки, проблеми і завдання економічних систем в умовах інформатизації. Розглянуто тенденції та етапи становлення інформаційної економіки, її складові й особливості ведення бізнесу в інформаційній економіці. До кожної теми наведено питання для самоконтролю. Подано практикум, що включає семінарські завдання, практичні та ситуаційні вправи.

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# Introduction

The commercialisation of information communication technologies has been widely recognised as an important tool for economic growth. Not surprisingly, the full potential of information technologies has not been realised in most developing countries. The dramatic growth of the Internet and the World Wide Web are changing the way we live, work, and play in many ways. One important change has been the transition from the industrial economy to the information economy. The information economy is based on computers, connectivity, and human knowledge and will involve changes in the way goods and services are created, produced, sold, and distributed. The new information economy creates new, unusual relationships between enterprises, changing the structure of most organizations and standards of management.

The main goal of the discipline is to develop the necessary theoretical knowledge and practical skills for working in modern conditions of information economy.

The textbook is intended to provide students with assistance in forming knowledge of the information economy, acquiring skills and abilities to manage organizations in the information economy, analysis of internal and external environments, making appropriate management decisions, the use of modern information systems and technologies in the enterprise.

After studying the material presented in the textbook, students should acquire the following **professional competencies:**

*the knowledge of:*

theoretical and practical features of the functioning of enterprises in the information economy;

approaches to evaluating the effectiveness of projects in the field of information;

*the skills:*

to identify resources necessary to increase the efficiency of business information services;

to develop an information strategy of the company;

to prepare information for decision making;

to choose an information system that meets the requirements of business;

to choose e-commerce model;

to assess the effectiveness of information technology projects;

*communication:*

ability to organize and conduct information activities at any facility;

*autonomy and responsibility:*

responsibility for decisions in the field of information.

This textbook is a generalization of domestic and foreign scientists researches in the field of informatization. The material is presented in a set of topics. In each topic theoretical material that reveals the essence of current issues of information economy is given.

The textbook contains case studies for analysis, which will help to acquire skills in the information field. In addition, the topics propose practical exercises that are designed to form certain skills in decision making on informatization of a company. It should be noted that there is a list of questions for self-control for each of the topics that will allow students to work out in detail the theoretical material.

The book also contains a glossary, subject and author indexes, which allow to find quickly the definition of the required concepts in the text and a link to a particular author. The textbook has a large number of visual material in the form of figures and tables that can help to understand the text visually and promote better mastering of the material by students.

# Theme 1. Information economy: formation, nature and main features

1.1. Stages of development of information society.

1.2. The essence of the information economy and its main characteristics.

## 1.1. Stages of development of information society

The 21st century is a period of economic, social and technological transformations that facilitate the development of the new society that is referred to as the information society. It is worth adding that the very notion of the information society was firstly used in the sixties of the 20th century by a Japanese economist named Tudao Umesao who paid much attention to the role of information and technology in the development of civilization.

The literature on the subject provides different interpretations of the term "information society". For the purpose of the research it is assumed that the information society is a society the development of which is largely determined by utilization of information and knowledge and by diversified information and communications technologies (ICT). It is believed that in case of the information society, information is a fundamental resource and the national income generating source. Different computer related technologies including the Internet, microprocessors, biotechnologies, information technologies, cordless communications, hardware or software are intensively being developed. The information society is provided with inexpensive methods of storing, transferring and processing of vast amounts of information (by means of data bases, data warehouses and knowledge repositories, etc.) [8].

The collocation "information society" as it is now used, first emerged in Japanese social science in the early 1960s. The Japanese version of the expression *(joho shakai, johoka shakai)* was born during a conversation in 1961 between Kisho Kurokawa, the famous architect, and Tudao Umesao, the renowned historian and anthropologist. It debuted in written texts as the title of a study published in January 1964. The first English language reference dates from 1970 and can also be linked to Yoneji Masuda, who used the expression in his lecture at a conference (it appeared in print in the

same year). Of course all of this does not imply that the literature (in English) of the information society does not have even earlier antecedents. It was just that different expressions were used for the newly emerged social-economic entity, namely *post-industrial society* [12].

**Information society** is the new mode of human existence, in which the production, recording, processing, and retrieving of information in organized networks plays the central role.

**Information Society**: a society characterised by a high level of information intensity in the everyday life of most citizens, in most organisations and workplaces; by the use of common or compatible technology for a wide range of personal, social, educational and business activities, and by the ability to transmit, receive and exchange digital data rapidly between places irrespective of distance [12].

It is necessary to note that in the information society context, the economy is not simply continuation of already existing methods to be used while producing goods and rendering services. Universal usage of different information and communications media along with sophisticated electronic information resources that are available to all citizens involves major changes in lifestyles, work habits and business manners. Intangible entities and network cooperation principles are preferred. A good example is provided by e-business, e-commerce, telecommuting and virtual organizations. Economic processes are realized on electronic platforms and human beings are more and more frequently excluded.

When analyzing the nature of the information society, it is invariably noticed that its typical feature is the demand for new professions and specialties in the field of non-material activities, related, first of all, to information processing in broad terms. At the same time, we can see a dramatic reduction in employment in the area of material production, both industrial and agricultural. Professional work increasingly tends to be not connected with fixed employment. Owing to ICT, work may be done at home or in any other place and time. Work is becoming personalized and non-formal. In the information society, the model of education is subject to thorough review. The existing paradigm, based on fact graphic, mechanical and lineal acquisition of knowledge, is often abandoned and replaced by the proactive and creative approach, lifelong learning and training. The information society is highly mobile, in time and in space alike. However, the

information society development is also connected with some concerns and threats. Social conflicts and unrest look a bit different from what they used to be. They primarily stem from a lack of access to ICT and the skills required for using it and, as a consequence, leading to the so-called digital division of the society [12].

In the last third of the twentieth century a lot of fundamental, technological and applied discoveries in the field of electronics, radio physics, optoelectronics and laser technology, modern materials science, chemistry, microbiology were made, the modern aviation and space exploration were created. The rapid development of information technology advances in micro- and nano-electronics have created a product based on the latest technologies. In recent years the economic development of nations orrures owing to innovations.

There was actual competition of scientific knowledge and technical improvement of production. It has become more economically profitable to develop production on the basis of new scientific ideas than on the basis of the most modern technology. As a result, the interaction between science and production changed: early technology and production used to evolve through the accumulation of empirical evidence, now it began to develop on the basis of science – in the form of high technologies.

Such changes in the economy and technology can be regarded as the beginning of humanity's movement towards a new civilization.

For example, **D. Bell** – one of the first researchers, described the process of informatization as the emergence of postindustrial society – believes that in the world there are **three** fundamentally different **social organizations** [4]:

I – **pre-industrial**, based on agriculture, fishing, mining, the essence of which can be expressed as a "competition with nature".

II – **industrial**, based on the application of energy to the machines, i. e. "competition with the transformed nature".

III – **post-industrial**, which is based on the initialization of the process, control and information, or "competition between human beings".

The three great periods correspond to the typology used by **Tadao Umesao**, who divided the economy into *endodermal* (agriculture, fishing), *mesodermal* (transportation, heavy industry) and *ectodermal* (information, communication, training) sectors [12].

These social organizations have been directly linked to the **technological revolutions**. There are three revolutions.

1. The first revolution was the revolution of steam, which led to a new machine production: the creation of steam engines, locomotives, ships, etc., which ensured the emergence of a new concept of growth of benefits. The main result of this development was the idea of productivity.

2. The second revolution is connected with electricity and chemistry. Electricity allowed to decentralize the production and to implement it at a great distance from the source of energy.

3. The third revolution is connected with computers and telecommunications. It is based on four technological innovations: 1) the transition from mechanical and electrical machines to electronic, 2) miniaturization, and 3) digitalization, 4) the development of software controlled machines and processes.

P. Drucker points out the following **information revolutions** in the history:

I. The invention of writing.

II. The appearance of books.

III. A series of inventions: the telegraph, telephone, radio, television.

IV. The emergence of computer.

In accordance with these revolutions **D. Robertson** suggested the formula: "a civilization – is information" and *identified four civilizations*:

civilization of the Ist level – language;

civilization of the IInd level – writing;

civilization of the IIIrd level – printing;

civilization of the IVth level – electronic processing of information.

In the civilization of the Ist level information varies in size, determined by the number of the tribe and clan.

In the civilization of the IInd level there is no quantitative restrictions on manufactured information, but in practice, its limits are determined by rank, in which information is produced and the rank at which it collapses. In such a civilization there is a repository of information – libraries, the rank of the production of information depends on the ability of people to produce it in writing. However, the ability of people to destroy libraries sometimes brings the civilization of the second level almost to the first level.

At the third level information production by printing is always greater than the range of destruction. Therefore, such a civilization can not be reduced to the lowest level. On the contrary, the IIIrd level civilization always take precedence over the prior civilizations.

In the civilization of the IVth level, there are the latest ways of storing, processing and dissemination, resource constraints are not so strong as at lower levels. This property of the IVth level civilizations should identify the subsequent radical changes of humanity [4].

Daniel Bell surveys the characteristic differences reflected by the social-historical phases – simplified into three main periods – along nine distinctive aspects. These are as follows: *economic sector, resources bringing about change, strategic resources, technology, knowledge-base, methodology, time perspective, planning, guiding principle* (Table 1.1).

Table 1.1

**Dimensions of the information society according to Daniel Bell** [12, p. 35]

| Characteristics | ***Pre-industrial*** | ***Industrial*** | ***Post-industrial*** |
|---|---|---|---|
| 1 | 2 | 3 | 4 |
| **Mode of Production** | Extractive | Fabrication | Processing; Recycling |
| **Economic sector** | *Primary*<br>Agriculture.<br>Mining.<br>Fishing.<br>Timber.<br>Oil and gas | *Secondary*<br>Goods producing.<br>Manufacturing.<br>Durable products.<br>Non-durable products.<br>Construction industry | *Services*<br>Transportation, Trade, Finance, Insurance<br><br>*Quinary*<br>Real estate, Health, Education, Research, Government, Recreation |
| **Transforming resource** | *Natural power* – wind, water, draft animals, human muscle | *Created energy* – electricity oil, gas, coal, nuclear power | *Information* – computer and data-transmission systems |
| **Strategic resource** | Raw materials | Financial capital | Knowledge |
| **Technology** | Craft | Machine technology | Intellectual technology |
| **Skill base** | Artisan, manual worker, farmer | Engineer, semi-skilled worker | Scientist, technical and professional occupations |

Table 1.1 (the ending)

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| **Methodology** | Common sense, trial and error; experience | Empiricism, experimentation | Abstract theories, models, simulations, decision theory, system analysis |
| **Time perspective** | Orientation to the past | Ad hoc adaptiveness, experimentation | Future orientation: forecasting and planning |
| **Design** | Game against nature | Game against fabricated future | Game between futures |
| **Axial principle** | Traditionalism | Economic growth | Codification of theoretical knowledge |

In contrast to Bell, Schement and Curtis reduce the "essential components" to six categories. The categories related to goods, industry and work incorporate a number of the already known possible elements but entirely new ones, such as interconnectedness, media environment and community, also appear in their work and are even represented as being equal to goods, industry and work (Table 1.2).

Table 1.2

**The six characteristic and determining components of information society by Schement and Curtis** [12, p. 37]

| **Category** | **"Content" behind the category** |
|---|---|
| 1 | 2 |
| Information commodities | market and commercial processes related to their production |
| Information industry | industries built on the large-scale manufacturing, production, distribution and consumption of information in an increasingly global competitive arena, where information export is the measure of economic fitness |
| Information work | traditional employment indicators are gradually shifting towards more employers (and professions) dealing with information due to the nature of the work involved |
| Interconnectedness | increasing social complexity and labour distribution are realized through increasingly indispensable technological support systems, while technology facilitates the emergence of secondary networks in addition to the traditional (primary) ones |

Table 1.2 (the ending)

| 1 | 2 |
|---|---|
| Parallel use of several media | the cohesive power of communities of increasing size, independent of the debates surrounding the disfunctions of the media |
| Interaction of technological and social progress | strengthening of new community formulae versus traditional (economic, scientific and political) elites. |

There is no consensus in literature with regard to the fact when individual countries "entered" information society and what variables should be examined.

According to a tentative assessment, the United States became an information society in the early 1960s, with Japan joining ten to fifteen years later and the pioneering countries at the end of the 1970s, with other fast developing countries (primarily Asia's four little tigers) attaining the same at the beginning of the 1990s. In the case of countries that joined the EU at a later stage, among them Hungary, this entry dates from around the millennium. A great part of Africa, Asia and Latin America cannot be regarded as information societies [12].

The emergence of the information society led to the emergence of the information economy. Two factors have had mutually reinforcing effects, and many other forces are also contributing to shaping the new global economy. The term *global knowledge economy* or *information economy* makes explicit reference to what we take to be the defining characteristics of the world economy emerging as a result of these causal factors – the rise in the knowledge intensity of economic activities and the increasing globalization of economic affairs.

Let's characterize these factors [21]:

**1. The Driving Forces**

*The Information Technology Revolution*

- continued dramatic progress in chip technology;
- the development of photonic communications technologies, as well as major improvements in both wire-based and wireless communications systems;
- the digitalization of products, processes and services, and the development of open systems and common standards;

- rapid development in supporting technologies, such as those for scanning and imaging, memory and storage, and display and copying;
- the creation of appropriate software, and of new tools for the development of software, and
- the explosion of Internet technologies.

*National and International Deregulation*

The period since the early 1970s has seen a widespread movement to economic deregulation, manifested principally in three areas:

- liberalization of trade, that is reduction of tariff and non-tariff barriers to trade in both goods and services;
- liberalization of capital markets, including floating of currencies, deregulation of financial markets more generally and reduction of barriers to foreign direct investment and to other international capital flows, and also of barriers to technology transfer, and
- deregulation of internal markets for goods, services and financial flows.

**2. The Defining Characteristics**

*Knowledge Intensity*

Knowledge becomes incorporated in productive activities in many different ways, ranging from learning by doing on the shop floor to formal processes of knowledge generation and application, of training and of investment in advanced equipment. The economic value of a typical knowledge intensive good – an advanced aircraft, a drug, a computer or a 'smart' card – goes far beyond the value of the materials of which it is composed, owing to the knowledge embodied in the product. Similarly, services such as medical diagnosis and treatment, education and training and business consulting rely heavily on embodied knowledge. The process of the increasing knowledge intensity of economic activity involves both the increasing knowledge intensity of individual goods and services and the growing importance of those goods and services which already rely heavily on embodied knowledge.

*Globalization*

The second aspect of the new knowledge based economy is equally important: the rapid globalization of economic activities.

The process of globalization has not involved by any means only trade in goods. Indeed, there are at least five matters involved in globalization:

foreign direct investment, capital transfers other than direct investment, trade flows of goods and of services, and technology transfers. These aspects of globalization are of course interrelated.

## 1.2. The essence of the information economy and its main characteristics

At the end of XX century information has come to play an important role in modern socioeconomic processes. There are three **reasons** for this [4]:

**Firstly**, the production of information is becoming one of the most important spheres of human activity. In developed countries more than 80 % of costs in manufacturing in terms of cost and time refer to information.

**Second,** information is the foundation of information technology that defines the content, scope and pace of the development of other technologies, thus having a profound impact on all aspects of society.

**Thirdly,** the production of information has initiated an information explosion.

The end of the twentieth century and the first years of the twenty-first century have been exciting times. The rise of networked technology as an important form of communications and commerce has profoundly influenced the way people communicate and the way companies and organizations do business. High-speed communication links connect technology and people. Networked technology is also having a dramatic effect on the relationships between companies and their customers, suppliers, and employees.

A widely used form of networked technology is the computer network, which consists of two or more connected computers. Such computer networks form the nervous system of modern companies and organizations by enabling stakeholders, managers, employees, suppliers, and customers to interact electronically.

Computer networks are not just a new way of handling business transactions or searching for information; they also provide a better way of doing business [16].

Computer networks are the basis of a new type of economy – a networked economy. For 200 years, people have lived and worked in the industrial economy, which was built on the existence of capital, in the form of

factories and machines, and labor, in the form of employees. In contrast, the networked economy combines enhanced, transformed, or new economic relationships [16].

Thus, up to this day the new economy has been formed. There are different points of view on the definition – "information economy", "network economy", "global economy", "Internet economy" etc.

We will use the term "information economy".

**Information economy –** the combination of production system and sphere of consumption, where the information is the leading productive force, as well as the main product of production and consumer goods [4, p. 14].

Table 1.3. highlights some distinctive features between industrial and information economies.

Table 1.3

**Comparison of industrial and information economies** [4]

| **Industrial economy** | **Information economy** |
|---|---|
| 1 | 2 |
| The laws of decreasing marginal utility and negative feedback | Direct network effects and positive feedback, which is embodied in the growing marginal profitability are dominating |
| The high degree of external regulation | Forming of alliances and focus on self-regulation |
| Competitiveness is based on material factors of production | The basis of competitiveness is formed by effectiveness of management, various communication tools |
| Large competitors absorb small ones | Enterprises-innovators have a competitive advantage |
| The mass consumer does not control a market | Individual consumer has information about all alternative choices |
| The basis of market behavior is security and stability | Enterprise characterized by readiness to take risks and able to overcome the negative effects |
| Relying on capital | Relying on intellectual property |
| Trying to save the current condition | Speed and changes |
| Sustainable hierarchical organizational structure with vertical links | Flat, horizontal structure, self-organizing |
| A company is a monolithic, stable and centrally controlled organization | A company is a form of adaptation to changing market requirements |

Table 1.3 (the ending)

| 1 | 2 |
|---|---|
| The strategy of information hiding | Strategy of disseminating information in order to receive benefits through strategic initiatives |
| Competition | Cooperation |

**Some key features of the information economy** [21]

*1. The growing importance of knowledge.*

The growing importance of knowledge in modern economies is evident in many aspects of public and private behaviour in advanced economies. For example: investment in knowledge now exceeds 10 % of GDP; investment in information and communications technologies.

*2. Changing competitiveness and industry composition.*

It is widely understood that the advent of the knowledge economy has been associated with sharp changes in the structure of economic activity in the developed countries, and that these changes have substantial implications for firms and industries, and for individuals, communities and nations. One dimension of these changes – the changing industry composition of economic activity – while the changing nature of the activities undertaken within particular industries, and specifically the increasing integration of manufacturing and service industries.

*3. Convergence of goods and services industries, and the new manufacturing.*

This shift from the manufacturing industries to the knowledge and person based industries in terms of the composition of GDP or employment is a fundamental feature of the information economy. Economic activity is certainly becoming more service intensive – drawing more heavily on service rather than production activities – but this is occurring across virtually all industries.

*4. Low inflation and variable unemployment.*

That is, there are strong anti-inflationary pressures in the global economy, which emerges from many sources, and which lies behind the low rates of inflation currently being experienced in almost all developed countries.

*5. Rising inequality, within and between nations.*

Another important fact is that the world appears to be seeing growing inequality arising from economic trends, both within and between countries.

A primary result of the movement to the information economy is that organizations of all types need to learn how to use the new combination of computers, connectivity, and human knowledge to remain competitive and to survive [16].

Organizations can no longer hope to do the same thing they have been doing for years; instead, they must change or risk being driven out of business by competitors they did not even know existed. The essence of the networked economy is not just change; it is change at an accelerating rate of speed. Companies must continually scan their environment for new ways to serve their customers or else face the prospect that another company will serve their customers instead. This requirement may mean radically changing the way these companies have done business or it actually may spur companies to move into new businesses.

The transition to the information economy affects you both as an individual and as an employee. As an individual, you need to learn how to take advantage of the new opportunities for information, employment, and entertainment that are constantly becoming available in this new economy. As an employee, you need to look for ways to help your organization take advantage of the opportunities for new markets offered by the networked economy. You need to do so regardless of the type of position you hold in your organization, because opportunities are not restricted to those elements of the company normally associated with technology.

The information economy is bringing about great changes in our personal lives as well as in business and industry. Let's now take a closer look at the new economic relationships and new jobs being spawned by the networked economy and the **elements of the networked economy – computers, connectivity, and knowledge** [16]. These three elements work together so that each element multiplies the effects of the other elements, thereby enhancing, transforming, and creating new economic relationships, as shown in Fig. 1.1.

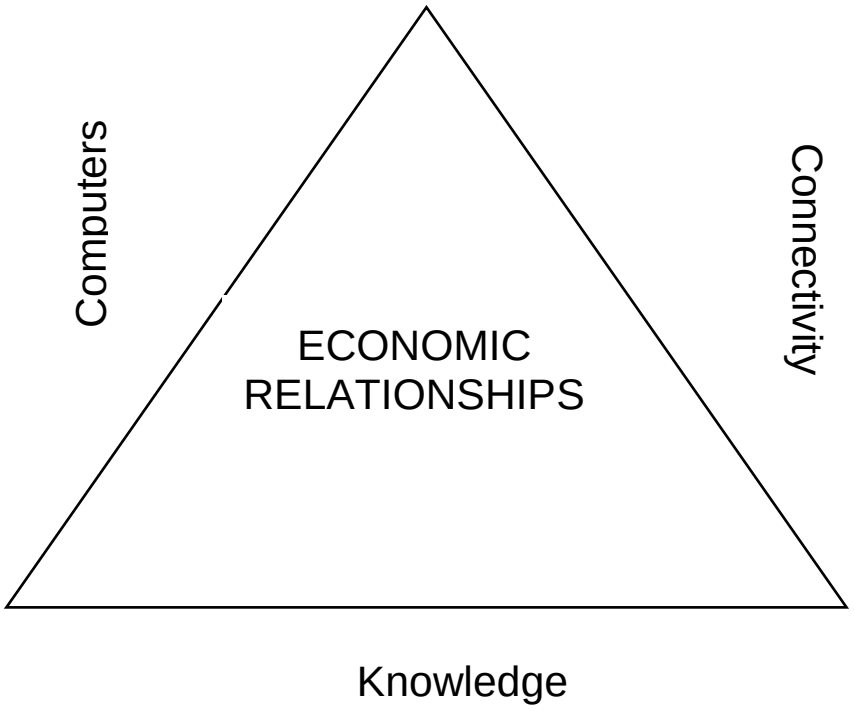


Fig. 1.1. **Elements of the information economy** [16]

*Economic Relationships*

Traditionally, management primarily has been concerned with three stakeholder relationships: relationships with customers, relationships with employees, and relationships with suppliers. However, in the information economy, a whole host of different relationships are now possible. Consumers are not always just customers; in some cases, they take on the role of employees.

Relationships among customers have become more important to firms because those customers may form user groups that provide important feedback to the firms about their products. In some cases, employees within the firms actually form direct relationships among themselves and customers, as they become special service representatives. For example, a customer might work directly with a technician on a problem or communicate with other customers though an Internet news group. The firms that benefit most from these changes will be those that take the greatest advantage of new and different relationships by thinking "outside the box" about ways to improve customer service. Fig. 1.2 shows the various relationships that are possible in the networked economy.

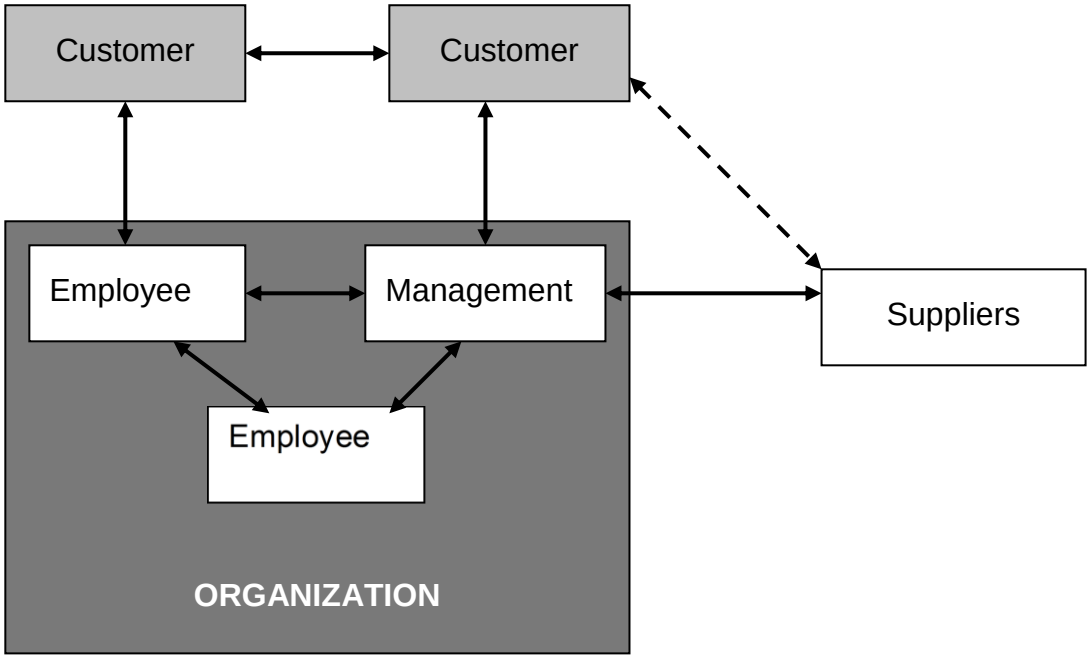


Fig. 1.2. **Possible relationships in the information economy** [16, p. 12]

*Computers*

The infrastructure of the industrial economy included canals, roads, railroads, power plants, factories, and so on; these components enabled companies to bring in raw materials, produce finished goods, and transport them to the customer.

The infrastructure of the networked economy is based on computers and communication networks, and it is commonly referred to as information technology. Computers provide the processing and communications capabilities for the networked economy.

*Connectivity*

**Connectivity** refers to the availability of high-speed communications links that enable the transmission of data and information among computers and conversations between people [16]. This communication has involved the use of both wired and wireless media. On the wired side, connectivity includes the use of fiber-optic cable, new ways of using traditional copper wire to send voice and data over telephone lines, and increasing use of TV cable as a two-way communications medium. On the wireless side, a large variety of approaches are being used for primarily short-distance (line-of-sight) communications.

*Knowledge*

**Knowledge** can be defined as the capacity to request, structure, and use information. For example, it takes knowledge to understand the meaning of the numbers generated by a networked computer, say, in a departmental payroll, and to know if these numbers are within acceptable values. Although a variety of computer programs have attempted to incorporate human knowledge, they cannot make the decisions that require intuition, and leaps into totally unrelated areas, which humans make every day without a second thought.

In the new economy, information is simultaneously an intrinsic characteristic of markets as well as a product for sale in markets. Intellectual property subjects such as copyrights, trademarks, and patents, as well as new subjects of proprietary protection such as databases, are all paradigmatic examples of information products. At the same time, the Internet has made information about comparative prices for goods and services readily and easily available through software agents that aggregate data from various Internet sites. The potential for economic growth that is made possible by information technology has also engendered new challenges over what rules are necessary to govern the information market [19].

## Control questions

1. Characterize the preconditions of the information society.
2. Describe the stages of the information society development.
3. Describe the existing paradigm of the information economy.
4. Give the main characteristics of the information economy.
5. Describe connection between information society and information economy.
6. What is creative destruction, and why is it important in the networked economy?
7. What are the three elements of the information economy?

# Theme 2. Information – main resource of the enterprise in the information economy

2.1. Information and information resources: the essence and main characteristics.

2.2. Classification of information resources.

2.3. Information Resources Management.

## 2.1. Information and information resources: the essence and main characteristics

In the transition to an information society information is a basic factor in social production.

**The information** should be understood as a measure of unbalanced distribution of matter and energy in space and changes that have accompanied all taking place in the world processes [4].

From a practical point of view, **information** can be defined as a reduction of uncertainty, until its removal.

It is important to distinguish between data and information.

***Data*** are raw facts that describe the characteristics of an event [7].

Think of data as a "raw material" - it needs to be processed before it can be turned into something useful. Hence the need for "data processing". Data comes in many forms - the date, item number, item description, quantity ordered, customer name, and shipping details. Data relates to transactions, events and facts. On its own – it is not very useful.

Data consist of facts, numbers, or symbols that can be processed by humans or computers into information. Data on its own has no meaning and must be interpreted in some way before it can be useful. Although this interpretation can be accomplished by humans, today it is more commonly achieved by inputting the data into a computer and processing it into a meaningful form known as ***information***.

***Information*** is data converted into a meaningful and useful context. Information from sales events could include best-selling item, worst-selling item, best customer, and worst customer [7].

In transforming data into information, the goal is to combine it with knowledge to make decisions in organizations. The relationships among data, knowledge, information, and decisions in information systems are shown in Fig. 2.1.

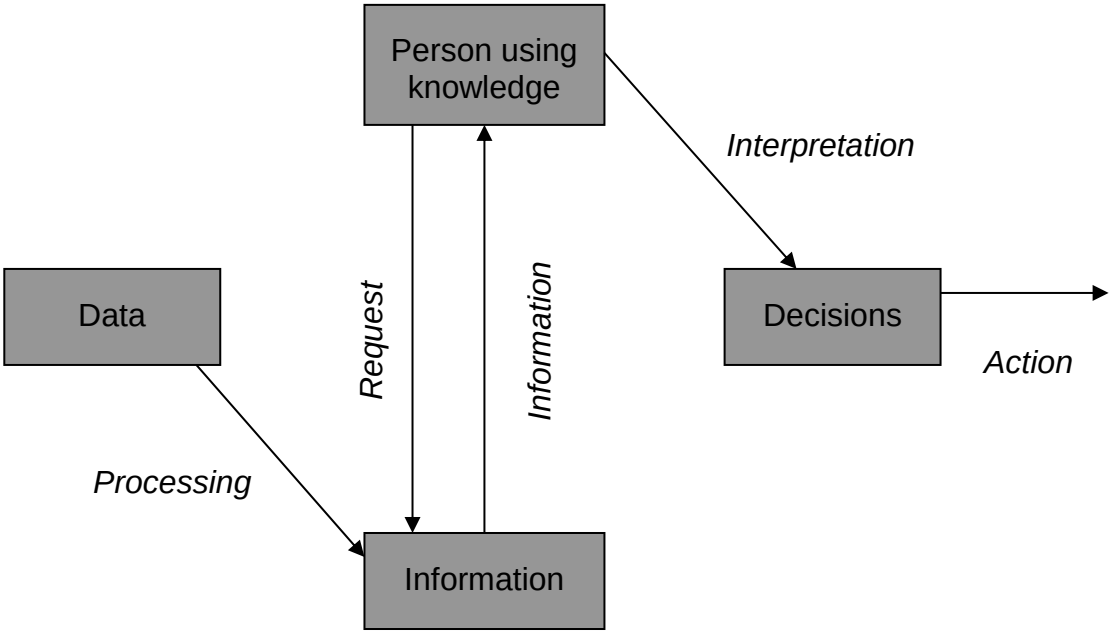


Fig. 2.1. **Information, knowledge, and decisions** [16, p. 16]

In this figure, a request for information from a knowledgeable person results in data being processed into information. Personal knowledge is then used to interpret the information, reach conclusions, and make decisions that lead to action. This cycle can be repeated as often as necessary to acquire sufficient information to make a decision. Be aware, however, that if managers fail to have the wisdom to use their knowledge to interpret the information available to them, the whole system breaks down. For example, in one case, the CEO of a technology company noticed that it was taking longer to close deals but failed to take action to slow production. As a result, his company was stuck with a large volume of unsold inventory, resulting in layoff and significantly reduced profits.

Information in the economy is manifested in many **aspects** [23]:

1) production of information – a manufacturing industry, i.e. economic activity;

2) information is a factor of production, one of the fundamental resource of any economic system;

3) the information can be bought and sold, it serves as commodity;

4) some of the information is a public good consumed by all members of society;

5) information is an element of the market mechanism, which affects the determination of the optimal and equilibrium states of the economic system;

6) information in modern conditions is becoming one of the most important factor in competition;

7) information becomes a reserve business and government circles, for decision-making and in shaping public opinion.

Consequently, information resources are part of the basic resources that are used by any organization, along with manpower, capital, materials, technology and so forth.

**Information resource (IR)** is a resource that has the information base; that is produced within the company or involved from its external environment, and is used in the process of personnel and agents intellectual activity to achieve specific goals of the company.

Information as a resource, on the one hand, has much in common with other resources, on the other hand, differs from other resources.

There are six *inherent characteristics* of information as a resource [32]:

1. *Information is expandable*: it is recognized that for specific purposes information may deplete, but in general, the more we have, the more we use, and the more useful it becomes. Information is certainly not scarce, and is available in profusion. This concept of "information-rich" may not necessarily be good, but may instead mean being "swamped". There are limits to the growth of information, but they lie in the time and capacity of people.

2. *Information is compressible*: it is possible to concentrate, integrate, and summarize information for easier handling.

3. *Information is substitutable*: information can and does replace land, labor, and capital. It is the use of computers and telecommunications that aids in this phenomenon.

4. *Information is transportable*: information can be tapped into just about anywhere; this has led to the idea of being remote as much more difficult to achieve since people and information can be taken to the remotest of places.

5. *Information is diffusive*: there tends to be an ability for information to leak. This leakage allows us to have more, and more of us to have it.

6. *Information is shareable*: no exchange transaction of information can take place, only sharing transactions, and this leads to an entire sharing environment.

Our entrance into the information age has had many impacts on our way of life. One of these being the changes in the work force. The jobs and functions performed by the workers are becoming increasingly information oriented. We are now working in an information economy – with information as the key resource. But *similar to other resources*, information must be produced, consciously used, and effectively deployed. It is important to be aware of the characteristics of our newest resource, so that we are able to use it efficiently, and benefit from it, as well as not abuse it.

## 2.2. Classification of information resources

Classification and characteristics of information resources can be implemented in different ways (Fig. 2.2). It depends on the purpose and practical orientation of this classification. First of all, it is expedient to share information resources according to such equivalent features [2]:

1) type of ownership of the IR owner;
2) form of providing IR;
3) readiness for use;
4) affiliations;
5) significance;
6) purpose.

**The type of ownership** can be distinguished as state, non-government (municipal, private) and IR mixed forms of ownership. The owner of Information Resources is the subject (an individual or legal entity) who has possession and use of IR within the limits of a statutory right.

Accordingly, government resources are the object of public property; communal resources – the object of communal property, private resources – the object of private property rights.

**The form of providing** IR can be distinguished as automated IR; traditional forms, microforms.

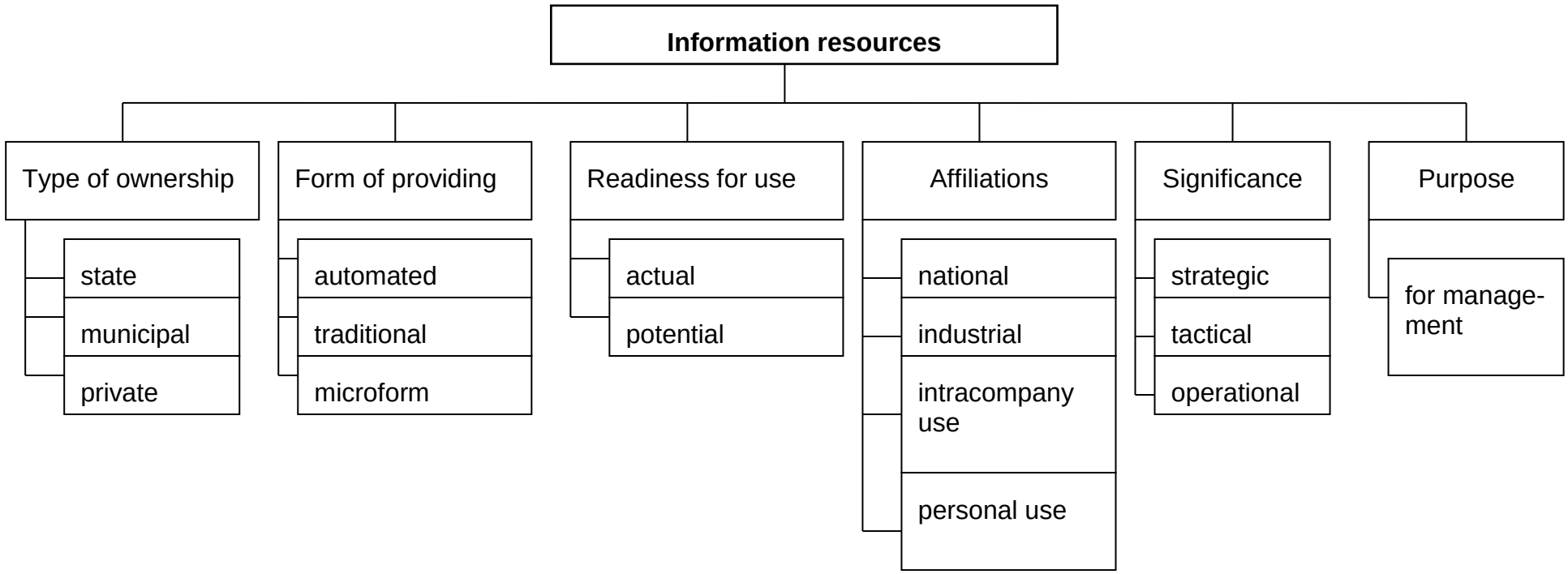


Fig. 2.2. **Classification of information resources** [2]

Given the rapid pace of computerization and informatization of all spheres of activity, it is necessary to single out such form of automated IR as *electronic information resources* – information resources provided in electronic form or in a form ready for the operation of machine-technical systems, tools and devices. For example, electronic information resources are a software and computer information management, data and other information that circulates in the management of automated information systems in electronic form and is used to solve specific problems.

The degree of **readiness to use**: actual, potential.

*Actual information resource* – a collection of information or knowledge, prepared for the effective use in a particular area of the state, industrial or social activities.

*Potential information resource* – a set of information or knowledge, which requires additional costs (time, analysis, research, etc.) to convert them into the actual information resource. For example, the national library of scientific and technical literature provide a great range of information resources that can be used in the production sphere (industrial information resource), in science, education and so on.

It should be noted that the information resource may be a potential for some problems and actual to others. But important is the inherent quality, which characterizes an information resource, and defines it specifically as a resource – it is its consumer value or usefulness.

**The affiliations:** information recourses can be divided into: national (e.g., the national library), industrial (information resources of the State Committee of Communications and Informatization of Ukraine); intracompany use; for personal use; others.

In turn, each of these groups can be divided into strategic, tactical and operational **on the significance**. The *national strategic information resources* are the resources that are created and used to ensure the strategic objectives of the state. The structure of the national strategic information resources should include cultural, historical, legal and other humanities, as well as basic natural sciences, turned into an easily accessible form of multiple users, including electronic.

*Tactical information resources of the state* – include the application of scientific and technical, economic, environmental, demographic and other

knowledge, transformed into a resource and needed to address problems in the current period of economic growth and security. It is also a mathematical and software of automated control systems and information systems for different purposes.

*Operational information resources* include business, commercial and other background information designed to satisfy daily needs in different areas.

**According to their purpose** information resources are divided depending on the problems they are used for. For example, you can solve information resources problems of economic management, legal information, scientific and technical information resources, statistics, and political information and so on.

At present, information resource has become a major resource of humanity, the main value of modern civilization. But any complex problems relate to the role, mechanism of operation, the social consequences of the use of information resource.

## 2.3. Information Resources Management

Every business needs information to help it succeed. A combination of internal and external business information resources can provide the background necessary to evaluate current performance and plan future progress. Knowing the types of information resources that are most critical to business can help companies to plan, analyze and use that information most effectively [40].

*1. Internal.*

The first source of information that businesses should turn to is the information they already have. Every business will have the ability to gather information about employees, about sales and about customers. Setting up systems and processes for gathering the right information can help business owners track, trend, analyze and act upon business that gives them clues into such issues as what drives employee satisfaction, the products most demanded by customers, areas of employee and customers satisfaction and dissatisfaction.

*2. Industry Information.*

Every business can consider itself part of at least one industry, if not more. And every industry has an association connected with it that can serve

as a rich source of business information. Weddles.com is a site where businesses can go to find out about the associations that serve their industry. Joining the appropriate trade and professional associations can help businesses gather information about industry trends, best practices and resources.

3. *Competitive Information.*

No business is without competition and gathering information about competitors is critical. Fortunately, this is easier than ever to do with the advent of the Internet. Through search and through participation in social networks including Twitter, Facebook, businesses can gain competitive knowledge about what others are doing.

*4. Government.*

The government provides an enormous amount of information for small businesses, much of it available online. Keeping up with legal and regulatory trends is a key area of business information need and one that can be managed effectively by visiting sites that include OSHA.gov, EEOC.gov. Virtually every government agency has a Web site.

Businesses and other organizations need information for many purposes [41]:

1. Planning.

To plan properly, a business needs to know what resources it has (e.g. cash, people, machinery and equipment, property, customers). It also needs information about the markets in which it operates and the actions of competitors. At the planning stage, information is important as a key factor in decision-making.

2. Recording.

Information about each transaction or event is necessary. Much of this is required to be collected by law – e.g. details of financial transactions. Just as importantly, information needs to be recorded so that the business can be properly managed.

3. Controlling.

Once a business has produced its plan it needs to monitor progress against the plan – and control resources to do so. So information is needed to help identify whether things are going better or worse than expected, and to spot ways in which corrective action can be taken.

4. Measuring.

Performance must be measured for a business to be successful. Information is used as the main way of measuring performance. For example, this can be done by collecting and analyzing information on sales, costs and profits.

5. Decision-making.

Information used for decision-making is often categorised into three types:

(1) Strategic information: used to help plan the objectives of the business as a whole and to measure how well those objectives are being achieved. Examples of stategic information include:

- profitability of each part of the business;
- size, growth and competitive structure of the markets in which a business operates;
- investments made by the business and the returns (e.g. profits, cash inflows) from those investments.

(2) Tactical information: this is used to decide how the resources of the business should be employed. Examples include:

- information about business productivity (e.g. units produced per employee; staff turnover);
- profit and cash flow forecasts in the short term;
- pricing information from the market.

(3) Operational information: this information is used to make sure that specific operational tasks are carried out as planned/intended (i.e. things are done properly). For example, a production manager will want information about the extent and results of quality control checks that are being carried out in the manufacturing process.

**Information Resources Management (IRM)** is a comprehensive approach to planning, organizing, budgeting, directing, monitoring and controlling the people, funding, technologies and activities associated with acquiring, storing, processing and distributing data to meet business needs for the benefit of the entire enterprise [24].

To manage all kinds of information resources used in the organization it is necessary to solve such tasks [4]:

1) data processing;
2) information management.

Data processing includes the following steps:

*1. Regulation of information flow* – information should be structured according to certain categories, consumers should be aware of each category of information and channels of its receipt.

One way of informing employees about the company is a newsletter that can be distributed both in printed form and with the help of modern information technology.

*2. Organization of the feedback*, through which governing body receives information about the current situation.

3. *The introduction of modern information technology*.

The introduction of computer technology allows the business processes management (Workflow Management), which is logistics management information based on computer technology and is designed to ensure that for the fulfillment of economic tasks there is necessary information at an appropriate time and in the appropriate place. This topic will also be considered in this course.

The use of marked concepts enables us to construct an information model of organization, which is a flow diagram of information messages used in the management process, presents the various procedures perform the functions of organizational management and associates each task with the input and the source documents. Theory and methods of information management and document management processes, document management (including electronic) are necessary to study the most controlled schemes, management relations, as well as problems associated with the use of the following documents in their dynamic state, applying the methodology of information management.

***How to Manage Information as a Strategic Asset*** [43]

*1. Understand the role of information.*

Information can add value to your products and services. Improved information flows can improve the quality of decision making and internal operations. Yet many managers do not fully understand the real impact of information – the cost of a lost opportunity, of a poor product, of a strategic mistake – all risks that can be reduced by using the appropriate information.

*2. Assign responsibility for leading your IRM initiative.*

Developing value from information resources is often a responsibility that falls between the cracks of several departments - the user departments in different business units, and corporate planning, MIS units or librarians.

*3. Develop clear policies on information resources.*

Policies for ascertaining information needs, acquiring and managing information throughout its life cycle. Pay particular attention to ownership, information integrity and sharing. Make the policies consistent with your organizational culture.

*4. Conduct an information audit (Knowledge Inventory).*

Identify current knowledge and information resources (or entities), their users, usage and importance. Identify sources, cost and value. Classify information and knowledge by its key attributes. Develop knowledge maps. As knowledge management gains prominence, this is sometimes called a knowledge inventory "knowing what you know".

*5. Link to management processes.*

Make sure that key decision and business process are supported with high leverage information. Assess each process for its information needs.

*6. Systematic scanning.*

Systematically scan your business environment. This includes the wider environment – legal and regulatory, political, social, economic and technological – as well as the inner environment of your industry, markets, customers and competitors. Provide selective and tailored dissemination of vital signs to key executives. This goes beyond the daily abstracting service provided by many suppliers.

*7. Mix hard/soft, internal/external.*

True patterns and insights emerge when internal and external data is juxtaposed, when hard data is evaluated against qualitative analysis.

*8. Optimize your information purchases.*

You don't have to control purchasing, but most organizations do not know how much they are really spending on external information. By treating consultancy, market research, library expenses, report and databases as separate categories, many organizations are confusing media with content.

*9. Introduce mining and refining processes.*

Good information management involves 'data mining', 'information refining' and 'knowledge editing'. You can use technology such as intelligent agents, to help, but ultimately subject matter experts are needed to repackage relevant material in a user friendly format. One useful technique is content analysis. The classifying, synthesizing and refining of information combines the crafts of the information scientist, librarian, and business

analyst and market researcher/analyst. Yet many organizations do not integrate these disciplines.

*10. Develop appropriate technological systems.*

Continual advances in technology increase the opportunities available for competitive advantage through effective information management. In particular, intranets, groupware and other collaborative technologies make it possible for more widespread sharing and collaborative use of information. Advances in text retrieval, document management and a host of other trends in knowledge management technologies have all created new opportunities for providers and users alike.

*11. Exploit technology convergence.*

Telecommunications, office systems, publishing, documentation are converging. Exploit this convergence through open networking, using facilities such as the World Wide Web, not just for external information dissemination but for sharing information internally.

*12. Encourage a sharing culture.*

Information acquires value when turned into intelligence. Market Intelligence Systems (MkIS) are human expert-centered. Raw information needs interpretation, discussing and analyzing teams of experts, offering different perspectives. This know-how sharing is a hallmark of successful organizations.

Information Resources Management (IRM) is an emerging discipline that helps managers assess and exploit their information assets for business development. It draws on the techniques of information science (libraries) and information systems (IT related). It an important foundation for information management.

## Control questions

1. Describe the essence of information and information resources.
2. Describe the properties of the information resources.
3. Concept and types of information flows of the company.
4. Requirements for the information that circulates in the enterprise.
5. Characterize types of information resources.
6. Describe the relationship between data, information and decisions.
7. Determine information resources as an economic category.
8. Describe main sources of information.

# Theme 3. Information technologies and information systems in enterprises

3.1. The concept of information communications technology: basic properties and types.

3.2. Enterprise information systems.

3.3. Types of business information system.

## 3.1. The concept of information communications technology: basic properties and types

Any enterprise, company, organization in the process of economic activity has to constantly deal with large information flows: international, economic, political, competitive, technological, market, social, etc. At the same time from multiple streams of information it is necessary to select one that fits goals. Quality information makes the action of specialists in various areas of the economy targeted and effective.

Organizations have used information technologies for many years in an effort to reduce their labor costs by automating many of their operations. Many organizations have also used information technologies to ensure that the correct information is made available to the correct person so that workers can make better decisions. The most successful companies have found that their goal must be to use information technologies to serve their customers better. Using information technologies to better serve customers increasingly will become the norm in the networked economy as prices and profit margins associated with manufactured goods drop [16].

**ICT** is an acronym that stands for Information Communications Technology.

Lets focus on the three words behind ICT:

- information;
- communications;
- technology.

A good way to think about **ICT** is to consider all the uses of digital technology that already exist to help individuals, businesses and organizations use information.

**ICT** covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form [39]. For example, personal computers, digital television, email, robots.

So ICT is concerned with the storage, retrieval, manipulation, transmission or receipt of digital data. Importantly, it is also concerned with the way these different uses can work with each other.

In business, *ICT is often categorized into two broad types of product* [39]*:*

1) *The traditional computer-based technologies* (things you can typically do on a personal computer or using computers at home or at work); and

2) The more recent, and fast-growing range *of digital communication technologies* (which allow people and organizations to communicate and share information digitally)

Let's take a brief look at these two categories to demonstrate the kinds of products and ideas that are covered by ICT (Table 3.1, 3.2).

Table 3.1

**Traditional Computer Based Technologies** [39]

| **Application** | **Use** |
|---|---|
| 1 | 2 |
| **Standard Office Applications – Main Examples** | |
| Word processing | E.g. Microsoft Word: Write letters, reports etc. |
| Spreadsheets | E.g. Microsoft Excel; Analyze financial information; calculations; create forecasting models etc. |
| Database software | E.g. Oracle, Microsoft SQL Server, Access; Managing data in many forms, from basic lists (e.g. customer contacts through to complex material (e.g. catalogue) |
| Presentation software | E.g. Microsoft PowerPoint; make presentations, either directly using a computer screen or data projector. Publish in digital format via email or over the Internet |
| Desktop publishing | E.g. Adobe Indesign, Quark Express, Microsoft Publisher; produce newsletters, magazines and other complex documents. |

Table 3.1 (the ending)

| 1 | 2 |
|---|---|
| Graphics software | E.g. Adobe Photoshop and Illustrator; Macromedia Freehand and Fireworks; create and edit images such as logos, drawings or pictures for use in DTP, Web sites or other publications |
| **Specialist Applications – Examples** | |
| Accounting package | E.g. Sage, Oracle; Manage an organization's accounts including revenues/sales, purchases, bank accounts etc. A wide range of systems is available ranging from basic packages suitable for small businesses through to sophisticated ones intended for multinational companies |
| Computer Aided Design | Computer Aided Design (CAD) is the use of computers to assist the design process. Specialized CAD programs exist for many types of design: architectural, engineering, electronics, roadways |
| Customer Relations Management (CRM) | Software that allows businesses to better understand their customers by collecting and analyzing data on them such as their product preferences, buying habits etc. Often linked to software applications that run call centers and loyalty cards for example. |

The ***information technology (IT) industry*** has become one of the most robust industries in the world. IT, more than any other industry or economic area, has an increased productivity, particularly in the developed world, and therefore is a key driver of global economic growth. Economies of scale and insatiable demand from both consumers and enterprises characterize this rapidly growing sector.

Both software development and the hardware involved in the IT industry include everything from computer systems, to the design, implementation, study and development of IT and management systems.

Owing to its easy accessibility and the wide range of IT products available, the demand for IT services has increased substantially over the years. The IT sector has emerged as a major global source of both growth and employment.

**Features of the IT industry** [35]:

- Economies of scale for the information technology industry are high. The marginal cost of each unit of additional software or hardware is insignificant compared to the value addition that results from it.
- Unlike other common industries, the IT industry is knowledge-based.
- Efficient utilization of skilled labor forces in the IT sector can help an economy achieve a rapid pace of economic growth.
- The IT industry helps many other sectors in the growth process of the economy including the services and manufacturing sectors.

A wide variety of services come under the domain of the information technology industry. Some of these services are as follows [35]:

- systems architecture;
- database design and development;
- networking;
- application development;
- testing;
- documentation;
- maintenance and hosting;
- operational support;
- security services.

The latest ICT Development Index (IDI), which ranks 152 countries according to their ICT level.

The IDI combines 11 indicators into a single measure that can be used as a benchmarking tool globally, regionally, and at national level, as well as helping track progress over time. It measures ICT access, use and skills, and includes such indicators as households with a computer, the number of fixed broadband Internet subscribers, and literacy rates [17].

Fig. 1.1 presents the IDI results and country ranking for 2010 and 2008 years. Except for the Republic of Korea and Hong Kong (China), all countries in the top ten are from Europe.

| Economy | Rank 2010 | IDI 2010 | Rank 2008 | IDI 2008 |
|---|---|---|---|---|
| Korea (Rep.) | 1 | 8.40 | 1 | 7.80 |
| Sweden | 2 | 8.23 | 2 | 7.53 |
| Iceland | 3 | 8.06 | 7 | 7.12 |
| Denmark | 4 | 7.97 | 3 | 7.46 |
| Finland | 5 | 7.87 | 12 | 6.92 |
| Hong Kong, China | 6 | 7.79 | 6 | 7.14 |
| Luxembourg | 7 | 7.78 | 4 | 7.34 |
| Switzerland | 8 | 7.67 | 9 | 7.06 |
| Netherlands | 9 | 7.61 | 5 | 7.30 |
| United Kingdom | 10 | 7.60 | 10 | 7.03 |
| Norway | 11 | 7.60 | 8 | 7.12 |
| New Zealand | 12 | 7.43 | 16 | 6.65 |
| Japan | 13 | 7.42 | 11 | 7.01 |
| Australia | 14 | 7.36 | 14 | 6.78 |
| Germany | 15 | 7.27 | 13 | 6.87 |
| Austria | 16 | 7.17 | 21 | 6.41 |
| United States | 17 | 7.09 | 17 | 6.55 |
| France | 18 | 7.09 | 18 | 6.48 |
| Singapore | 19 | 7.08 | 15 | 6.71 |
| Israel | 20 | 6.87 | 23 | 6.20 |

Fig. 1.1. **ICT development index, 2010 and 2008** [17]

**Properties of Information Technologies** [4]

Among the distinctive properties of information technology with strategic importance for the development of society, it seems appropriate to allocate the following:

1. *IT can enhance and effectively use information resources of the society*. Experience shows that the activation, dissemination and effective use of information resources allow us to obtain significant savings in other types of resources: raw materials, energy, minerals, materials and equipment, human resources, social time.

2. *IT can optimize and in many cases, automate information processes*, which in recent years are taking a greater place in the life of human society.

3. *Information technology serve as components of production or social technologies*. Typical examples include computer-aided design of industrial products, flexible automation and robotic production, automated process control systems, etc.

4. *IT now plays a vital role in providing information communication between people, as well as in systems training and dissemination of media*. In addition to traditional means of communication (telephone, telegraph, radio and television) in the social sector system of electronic communications,

electronic mail, facsimile transmission of information and other communications are more widely used.

5. *ICT today occupies a central place in the process of intellectualization of society, the development of its education system and culture.* Almost all developed and many developing countries use computer and television equipment, training programs on optical disks and multimedia – technology is becoming commonplace attributes not only to institutions of higher education, but also the ordinary schools of primary and secondary education.

6. *ITs now play a key role also in the processes of production and accumulation of new knowledge.* In this case, to replace the traditional methods of information support of scientific research through the accumulation, classification and dissemination of scientific and technical information, new methods appear based on the use of newly emerging opportunities of informational support, basic and applied science, which provide modern information technology. Modern methods of production and accumulation of knowledge based on the theory of artificial intelligence, methods of information modeling, cognitive computer graphics that allow to find solutions to ill-formalized problems, and problems with incomplete information and fuzzy input data.

7. *Use of ICT can significantly assist in addressing the global problems of humanity and, above all, the problems associated with the necessity to overcome the global crisis of civilization*. After all methods of information modeling of global processes, especially in conjunction with the methods of space information monitoring, can provide today possibilities to predict many crisis situations in the regions of increased social and political tensions, as well as areas of ecological disasters and major technological accidents.

## 3.2. Enterprise information systems

You will often hear the terms information technology and information systems used interchangeably, sometimes leading to some confusion.

**Information systems (IS**) are the systems that develop the information that managers and other employees combine with knowledge to make decisions. Basically, you can think of information systems as information technology applied to organizations. To fully understand information systems, you first need to understand the concept of a *system* [16, p. 18].

**A system** is a group of elements (people, machines, cells, and so forth) organized for the purpose of achieving a particular goal [16, p. 18].

Almost everything around you is a part of one type of system or another. Examples of systems include your college, a business, or a computer system. Your college is a system composed of the faculty, staff, and students in addition to the buildings and equipment; this system is organized for the purpose of providing a college-level education to the students. A business is composed of a variety of elements, including production, marketing, distribution, accounting, and so on, with a goal of making a profit and increasing the value of its owners' investment. A computer system is composed of input, output, processing, and secondary storage elements. The goal of a computer system is to process data into information.

All systems have input, processing, output, and feedback.

**Input –** receiving the data to be manipulated and the instructions for performing that manipulation.

**Processing –** converting data into information.

**Output –** the result of processing as displayed or printed for the user.

**Feedback –** information about output that may cause a system to change its operation [16].

Anything that enters the system is classified as i*npu*t, which is transformed in some way by *processing* and then *output* in some form. *Feedback* is information about the output that may cause the system to change its operation.

## IS Functions

Information systems are used in organizations for three primary purposes or functions:

- *handling the present;*
- *remembering the past;*
- *and preparing for the future.*

Handling the present means that the organization must be able to take care of its day-to-day business, primarily by processing transactions that involve customers, suppliers, and employees. These transactions must be stored if the organization is to remember its past. Data on transactions are then used to prepare for the future, which results in decisions that determine

the way transactions are handled in the future. Because each function provides input to the next function, with the third function leading back to the first, they can collectively be thought of as a cycle of functions, called **the IS cycle**, shown in Fig. 1.2.

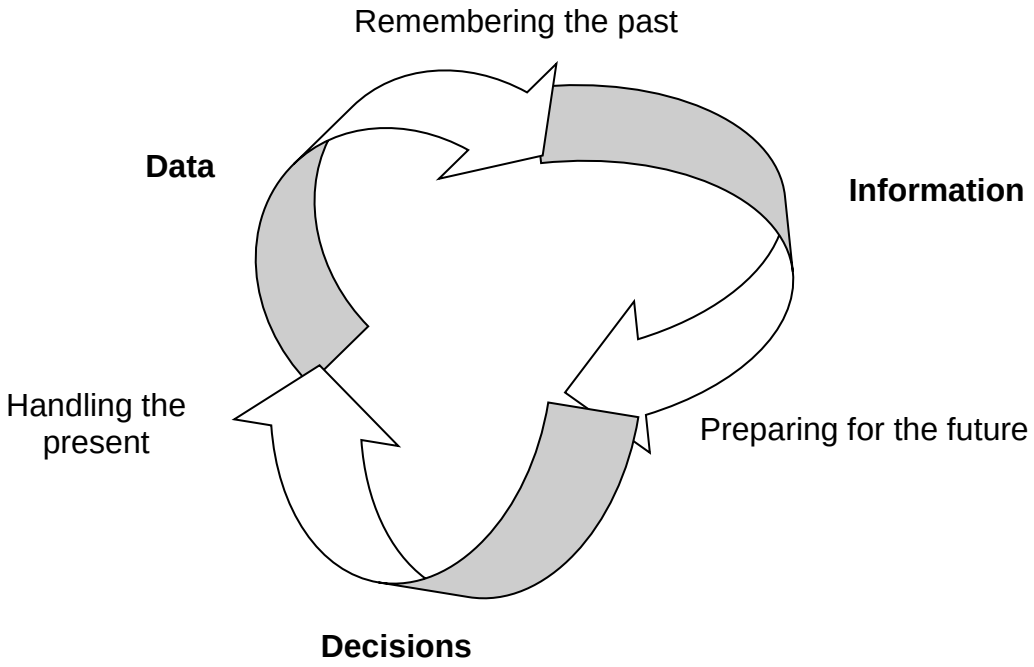


Fig. 1.2. **The IS cycle** [16, p. 19]

**IS cycle** – information systems for handling the present, remembering the past, and preparing for the future.

Note that there is no break in the cycle and that it continues from one operation to the next. The three primary purposes will be discussed here; they will be related to the three risks facing every business in the next section.

**Handling the Present**

In many cases, the original purpose of many types of IS was to process data into information. This operation continues to be extremely important for all organizations because it handles the present by processing transactions. Originally, transactions were limited to physical purchases between buyer and seller, in which the buyer might be the end consumer, another company, or another unit within the same company. In this case; the transaction process

includes ordering a product, transferring the funds between buyer and seller to pay for the product, and delivering the product to the buyer. However, in the networked economy, because so many more events can be handled as electronic transfers of information between computers or other IT devices, the definition of a **transaction** needs to be broadened to include any event that involves the digital transfer of money or information between entities. Transactions now include payments to employees, employee payments to pension funds or tax-deferred savings accounts, payments of tuition, transfers of funds between accounts, queries to a Web page, and so on.

If an organization fails to process transactions accurately and in a timely manner, it will not continue to exist for very long. If customer transactions are not handled, revenue will not come in. If transactions involving suppliers are not handled appropriately by the organization ordering and paying for raw materials, the firm will have nothing to offer its customers. Finally, the organization must ensure that its employees are paid in a timely manner or else they will cease to work for that company.

The transaction process in the information economy is quite different from that in the industrial economy because of the capability to carry out all of these events electronically. For example, if you use any of the many electronic bill-payment services, the process is quite different than when you write a paper check or visit the payee to pay with cash.

At the end of the process, you have an instant record of paid bills without having to deal with paper bills and returned checks. Money can easily be transferred between accounts, and it is even possible to set up automatic transfers and payments.

**Remembering the Past**

Handling the present through transaction processing involves checking existing data (for example, to determine whether the product is in stock and whether the buyer has good credit) and storing new data (for example, the number of units of which item was sold to whom and for how much) . Checking existing data and storing new data require an extensive amount of **organizational memory** in the form of databases, data warehouses, information management systems, knowledge management systems, and so on. The most common form of organizational memory is the **database**, which is a collection of information that is arranged for easy manipulation and

retrieval. Organizational memory, in turn, enables an organization to perform the vital function of remembering the past. To see how this process works, think about what happens when you purchase a product from Lands' End (www.landsend.com). The transaction processing includes looking up the customer's personal information such as your address, credit card number, and previous purchases. It also includes checking the availability of the items you are ordering or determining whether they must be back-ordered and sent at a later date. When the transaction is completed, all of these data must be updated or, if you are a new customer, new data must be created.

**Preparing for the Future**

Although handling the present and storing the data and information generated by this process are critical to the efficient operation of almost any type of organization, another important operation is extracting the data and information and combining it with human knowledge to prepare the organization for the future. Preparing for the future involves using information technology to improve the capability of employees to understand, respond to, manage, and create value from information. Often this endeavour involves using a variety of information systems to help employees make better decisions. Examples of the use of information systems to prepare for the future include using data mining to find needed data in data warehouses, combining data with models of the firm to predict the result of various courses of action, and presenting information to executives in a form that they can use to make decisions. Data warehouses, data mining, and firm modelling are all **decision support systems**, which have been in use for almost a quarter of a century and have become important to the financial health of today's firms.

Using IS functions to deal with business risks [16].

**Three risks** that every organization faces:

- demand risk;
- efficiency risk;
- and innovation risk.

Failure to successfully deal with any of these risks can result in an organization's demise. Many of the now defunct Internet-based companies found that the cost and effort involved in selecting, packing, and shipping products to their customers made their operations inefficient and unprofitable. Even if they had sufficient demand, they could not efficiently meet it and

make a profit. Finally, failure to innovate in terms of developing new or improved products, services, or operations has resulted in many well-known companies being forced out of business by their competitors. Reducing these risks can be closely linked to the IS functions discussed in the preceding section.

**1. Reducing Demand Risk**

Every company faces the risk of lowered demand, which can lead to unsold inventory and lower profits, which could in turn result in layoffs. Even well-known and well-established companies with a history of success are vulnerable to the risk of lowered demand*. One way to address this risk is through improved customer service.*

If customers perceive that they are being served by one company better than by another, they will probably return for repeat business and bring their friends and associates with them. Information technology in the information economy can deliver improved customer service in a number of ways, including the following:

- Providing self-service to customers on a 24 hours a day, seven days a week (24/7), basis by making products and services available on the Web;
- Providing product information to customers on the Web in a variety of ways;
- Enabling customers to have contact with other customers, resulting in customers adding value to customers.

You can understand how IT helps reduce demand risk by examining the underlying IS functions that play a role in improved customer service. For example, the first approach to improved customer service – self-service checkout uses IT to handle the present more efficiently. The second approach – making information available to customers – uses all of the memory of the organization, its customers, and, potentially, its suppliers so as to improve the level of service to customers. The IT involved also provides improved search technologies that enable people to find information on products and services quickly and easily. Finally, by enabling customers to add value to one another, the organization prepares for the future by locking customers into the organization.

Improved customer service also helps people conserve their scarcest resource in the networked economy-time. With the world moving at an ever faster pace, any way to reduce the time necessary to carry out an activity will

be seen as valuable. Instead of being limited by business hours, during which traditional merchants are open, banks, stores, and other providers can be open on a 24/7 basis in the networked economy, meeting customer needs rather than their own needs. This trend does not mean that people will stop sleeping; only that Internet technology will provide services around the clock.

**2. Reducing Efficiency Risk**

If companies fail to carry out transactions efficiently, they run the risk of making stakeholders unhappy, which results in lower profits and lost sales. For example, customers become unhappy when transactions fail to go through or are lost. They also become unhappy when returns are not credited. Similarly, suppliers and employees become unhappy when they are not paid in a timely manner. Failure to deal with stockholders in an efficient manner can lead to a stockholder revolt and removal of the current management team. Finally, failure to meet tax deadlines will usually result in the taxing agency placing a lien on the company or worse.

The IS function of handling the present is key to reducing efficiency risk. It does so by enabling a company to use a variety of networks to lower its transaction costs.

Many IT elements are involved in this process, and how companies handle the present is constantly being improved. For example:

- Ordering products and services over the Web leads to much lower transaction costs;
- Specialized networks enable companies and their suppliers to conduct business;
- Companies are paying employees in a more efficient manner by electronically delivering paychecks directly to the bank and sending paystubs to employees via e-mail;
- The U.S. Internal Revenue Service is developing more and more ways for individuals and companies to file and pay taxes electronically.

**3. Reducing Innovation Risk**

Of all the risks, innovation risk is the greatest in the networked economy. If companies and organizations fail to innovate, they face extinction as their rivals find better ways to provide the same or better products and services. Innovation risk is reduced through an appropriate application of the IS function of preparing for the future. IT can implement this IS function in a number of ways, including providing access to ideas from customers, employees, suppliers, and Web search engines.

*Customers* are often the best source of new ideas for a company if an easy way is provided for them to send in those ideas. Electronic methods for customers to share ideas include the company Web page, e-mail, bulletin boards, and chat groups. *Employees* can also be a great source of innovations, as they often discover better ways to do their jobs if they are given proper means to share their discoveries with other employees. Likewise, *suppliers can be a fine source* of new ideas, as they want the company to prosper and remain a customer. Finally, a search of the Web can often generate new ideas.

One of the results of the World Wide Web is an increase **in many-to-many communication**, in which any person on the Internet can easily communicate with a large number of people also using the Internet. Many-to-many communication represents a dramatic change from traditional forms of communication that have been one-to-one (for example, telephone calls) or one-to-many (for example, newspapers, radio, and television). With many-to-many communication, a tremendous amount of information flows around the Web each day. Companies taking advantage of many-to-many communications will find many new ideas about how to carry out their business.

### 3.3. Types of business information system

Information and communication technologies are used by private enterprises to improve their productivity and competitiveness in the marketplace. Various kinds of ICTs help firms in all sectors to manage their resources more efficiently, access the information needed for better business decision-making, reduce the costs of business transactions and enhance their ability to bring their products and services to customers.

Evidence from both developed and developing countries has shown that effective use of ICTs affects productivity in both large and small enterprises. A firm-level study covering 56 developing countries found that "ICT is playing an important role in allowing businesses to grow faster and become more productive – this alone suggests that creating an appropriate environment to exploit ICT is important". Developing-country enterprises using ICT had better performance compared with enterprises that did not use

ICT, with notable improvements in enterprise growth, profitability, investment and productivity (Fig. 1.3) [11].

| Performance indicator | Enterprises that do not use ICTs | Enterprises that use ICTs | Improvement |
|---|---|---|---|
| Enterprise growth | | | |
| Sales growth, % | 0,4 | 3,8 | 3,4 |
| Employment growth, % | 4,5 | 5,6 | 1,2 |
| Profitability, % | 4,2 | 9.3 | 5,1 |
| Investment | | | |
| Investment rate, % | n.a. | n.a. | 2,5 |
| Re-investment rate, % | n.a. | n.a. | 6 |
| Productivity | | | |
| Labor productivity (value added per worker, $) | 5 288 | 8 712 | 3 423 |
| **Total factor productivity, %** | 78,2 | 79,2 | 1 |

Fig. 1.3. **Effects of ICT use on enterprise performance in developing economies** [11, p. 16]

However, benefits from ICT use are not equally distributed across the private sector. ICTs vary in terms of accessibility, functionality and user requirement. The extent to which an enterprise gains from enhanced access to different ICTs depends on its needs for information, storage and communication, which in turn are affected by its size, industrial sector, and location and workforce skills. It also depends on whether its suppliers and customers are frequent users of ICTs.

It is furthermore influenced by the business skills of managers, the availability of personnel trained to use and maintain the equipment, and the availability of additional information sources that enable improved decision-making in procurement and other business processes.

ICT use enables enterprises to benefit from diverse forms of information and business support services [11].

• In order to *access information* on market demand and prices in a timely fashion, entrepreneurs may need access to radio, fixed telephony, mobile and SMS services or Internet, depending on the capabilities of the user;

• ICT use can help access *advice and training in business skills*. Basic use of ICT is needed to support skills for internal management such as training, cost calculation, product design and enterprise administration. At this level, both computers and smart phones may serve as a basis. In cases where marketing and product research is relevant, Internet access grows increasingly;

• The ability to interact with various e-government services will also require different ICT access, depending on the tools used by the government for a given service.

Fig. 1.4 and 1.5 highlight the business functions receiving the greatest benefit from information technology, along with the common business goals associated with information technology projects.

Achieving the results outlined in Fig. 1.4, 1.5, such as reducing costs, improving productivity, and generating growth, is not easy. Implementing a new accounting system or marketing plan is not likely to generate long-term growth or reduce costs across an entire organization. Businesses must undertake enterprise wide initiatives to achieve broad general business goals such as reducing costs. Information technology plays a critical role in deploying such initiatives by facilitating communication and increasing business intelligence. For example, e-mail and cell phones allow people across an organization to communicate in new and innovative ways.

For most businesses, there is a variety of requirements for information. Senior managers need information to help with their business planning. Middle management needs more detailed information to help them monitor and control business activities. Employees with operational roles need information to help them carry out their duties [41].

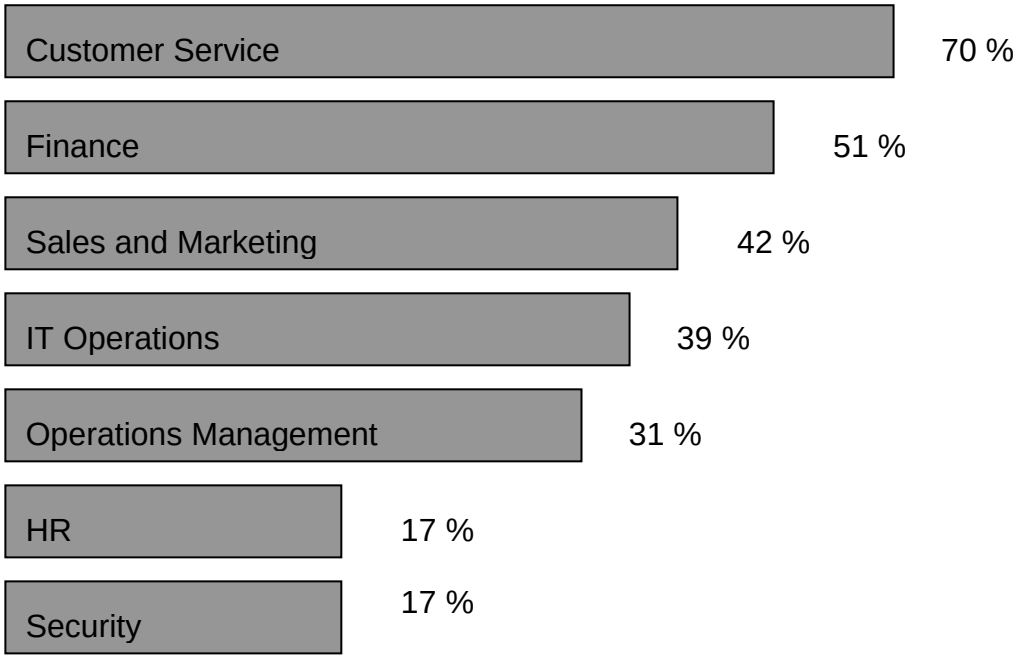


Fig. 1.4. **Business functions receiving the greatest benefits from IT** [7, p. 6]

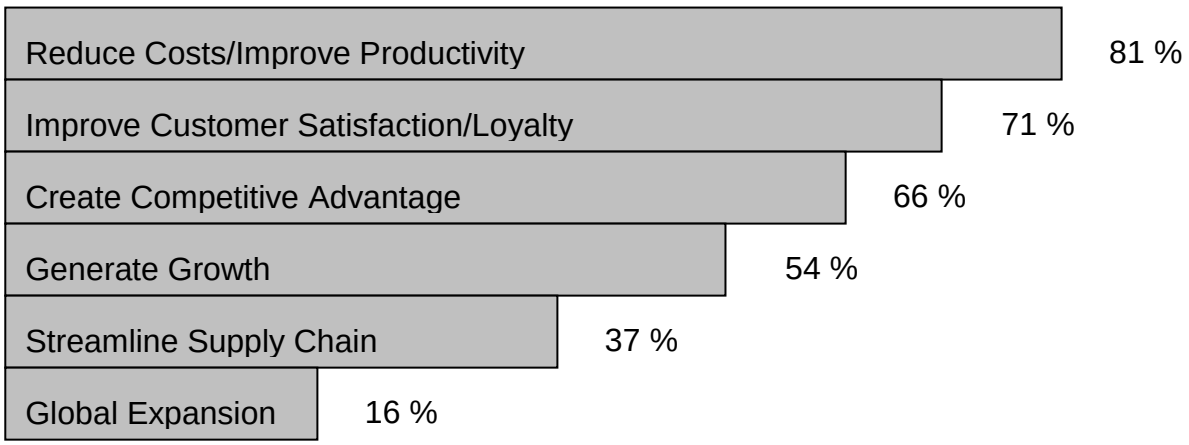


Fig. 1.5. **Information technology project goals** [7, p. 6]

As a result, businesses tend to have several "information systems" operating at the same time. This revision note highlights the main categories of information system and provides some examples to help you distinguish between them.

The main kinds of information systems in business are described briefly in Table 3.1.

Table 3.1

## The main kinds of information systems in business

| Information | System description |
|---|---|
| 1 | 2 |
| Executive Support Systems | An Executive Support System ("ESS") is designed to help senior management make strategic decisions. It gathers analyses and summarizes the key internal and external information used in the business.<br>A good way to think about an ESS is to imagine the senior management team in an aircraft cockpit - with the instrument panel showing them the status of all the key business activities. ESS typically involves lots of data analysis and modeling tools such as "what-if" analysis to help strategic decision-making. |
| Management Information Systems | A management information system ("MIS") is mainly concerned with internal sources of information. MIS usually takes data from the transaction processing systems (see below) and summarise it into a series of management reports.<br>MIS reports tend to be used by middle management and operational supervisors. |
| Decision-Support Systems | Decision-support systems ("DSS") are specifically designed to help management make decisions in situations where there is uncertainty about the possible outcomes of those decisions. DSS comprise tools and techniques to help gather relevant information and analyse the options and alternatives. DSS often involves use of complex spreadsheet and databases to create "what-if" models. |
| Knowledge Management Systems | Knowledge Management Systems ("KMS") exist to help businesses create and share information. These are typically used in a business where employees create new knowledge and expertise - which can then be shared by other people in the organisation to create further commercial opportunities. Good examples include firms of lawyers, accountants and management consultants.<br>KMS are built around systems which allow efficient categorisation and distribution of knowledge. For example, the knowledge itself might be contained in word processing documents, spreadsheets, PowerPoint presentations. Internet pages or whatever. To share the knowledge, a KMS would use group collaboration systems such as an intranet. |

Table 3.1 (the ending)

| 1 | 2 |
|---|---|
| Transaction Processing Systems | As the name implies, Transaction Processing Systems ("TPS") are designed to process routine transactions efficiently and accurately. A business will have several (sometimes many) TPS; for example:<br>• billing systems to send invoices to customers;<br>• systems to calculate the weekly and monthly payroll and tax payments;<br>• production and purchasing systems to calculate raw material requirements;<br>• stock control systems to process all movements into, within and out of the business. |
| Office Automation Systems | Office Automation Systems are systems that try to improve the productivity of employees who need to process data and information. Perhaps the best example is the wide range of software systems that exist to improve the productivity of employees working in an office (e.g. Microsoft Office XP) or systems that allow employees to work from home or whilst on the move. |

Managers should keep in mind the following advice in order to get the most out of an information system [30]:

- Use the available hardware and software technologies to support the business. If the information system does not support quality and productivity, then it is misused.
- Use the available technologies to create and facilitate the flow of communication within your organization and, if feasible, outside of it as well. Collaboration and flexibility are the key advantages offered for all involved parties. Make the most of those advantages.
- Determine if any strategic advantages are to be gained by use of your information system, such as in the areas of order placement, shipment tracking, order fulfillment, market forecasting, just-in-time supply, or regular inventory. If you can gain any sort of advantage by virtue of the use of your information system, use it.
- Use the quantification opportunities presented by your information system to measure, analyze, and benchmark the performances of an individual, department, division, plant, or entire organization.

An information system is more than hardware or software. The most integral and important components of the system are the people who design

it, maintain it, and use it. While the overall system must meet various needs in terms of power and performance, it must also be usable for the organization's personnel. If the operation of day-to-day tasks is too daunting for the workforce, then even the most humble of aspirations for the system will go unrealized.

A company will likely have a staff entrusted with the overall operation and maintenance of the system and that staff will be able to make the system perform in the manner expected of it. Management should find those employees who are most likely to adapt to the system and its operation. They should be taught how the system works and what it is supposed to do. Then they can share their knowledge with their fellow workers. There may not be a better way to bridge the natural chasm between the IS department and non-technical personnel. When the process of communicating information flows smoothly and can be used for enhancing and refining business operations, the organization and its customers will all profit.

## Control questions

1. Describe the features of an information system development.
2. Define the concept of information goods.
3. Describe information industry and its structure.
4. Give characteristics of types of information technologies.
5. Characterize types of information systems in the enterprise.
6. What are the levels of information systems in the enterprise?
7. Explain information functions.
8. Characterize information systems functions.
9. What is the difference between information technology and information system?
10. Why IT is an integral part of the information economy?
11. The structure of information system cycle.
12. In what ways does information technology help an organization to handle the present?
13. How is the past remembered in an organization?
14. In what ways does information technology help an organization prepare for the future?

# Theme 4. The information systems strategy

4.1. The information systems strategy triangle
4.2. The essence and structure of information systems strategy

## 4.1. The information systems strategy triangle

This topic introduces a simple framework for understanding the impact of IS on organizations. This framework is called the **Information Systems Strategy Triangle** because it relates business strategy with IS strategy and organizational strategy.

The Information Systems Strategy Triangle presented in Fig. 4.1 suggests three key points about strategy.

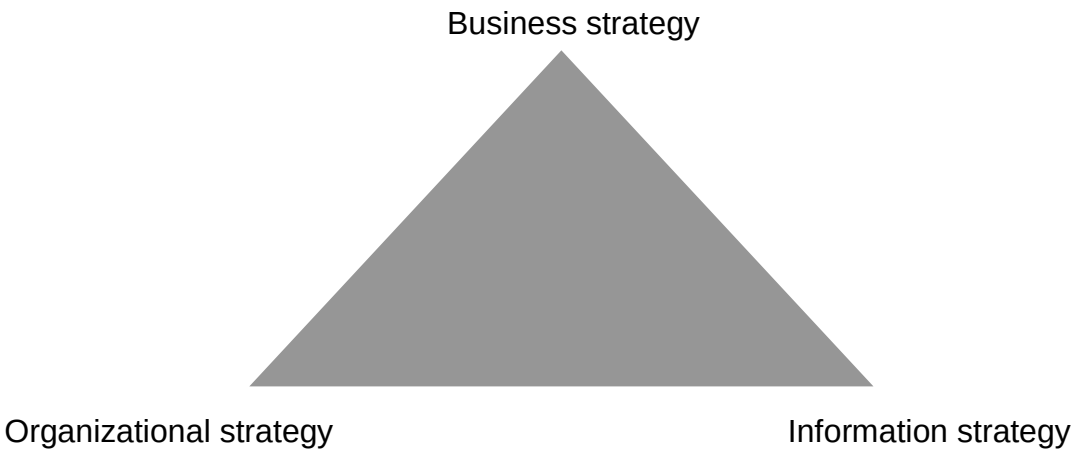


Fig. 4.1. **The information systems strategy triangle** [18]

Successful firms have an overriding business strategy that drives both organizational strategy and IS strategy. The decisions made regarding the structure, hiring practices, and other components of the organizational strategy, as well as decisions regarding applications, hardware, and other IS components, are all driven by the firm's business objectives, strategies, and tactics. Successful firms carefully balance these three strategies – they purposely design their organization and their IS strategies to complement their business strategy.

IS strategy can itself affect and is affected by changes in a firm's business and organizational strategies. In order to perpetuate the balance needed for successful operation, changes in the IS strategy must be accompanied by changes in both the organizational and overall business strategy. If a firm designs its business strategy to use IS to gain strategic advantage, the leadership position in IS can only be sustained by constant innovation. The business, IS, and organizational strategies must constantly be adjusted.

A strategy is a plan. A **business strategy** is a well-articulated vision of where a business seeks to go and how it expects to get there. It is the form by which a business communicates its goals. Management constructs this plan in response to market forces, customer demands, and organizational capabilities. Market forces create the competitive situation for the business. Some markets, such as those faced by airlines, makers of personal computers, and issuers of credit cards, are characterized by many competitors and a high level of competition so that product differentiation becomes increasingly difficult. Other markets, such as those for package delivery, automobiles, and petroleum products, are similarly characterized by high competition, but product differentiation is better established. Customer demands comprise the wants and needs of the individuals and companies who purchase the products and services available in the marketplace. Organizational capabilities include the skills and experience that give the corporation a currency that can add value in the marketplace [18].

A business strategy is important because it allows resources to be targeted and also because it allows the shareholders, customers, banks and employees (the "stakeholders" of the business) to see that the business is taking account of their interests [33].

Several well-accepted **models** frame the discussions **of business strategy**. Let's review:

(1) the Porter generic strategies framework and two variants of its differentiation, and

(2) D'Aveni's hypercompetition model.

**The Generic Strategies Framework.**

Companies sell their products and services in a marketplace populated with competitors. **Michael Porter's** framework helps managers understand the strategies they may choose to build a competitive advantage. In his book

"*Competitive Advantage",* Porter claims that the "fundamental basis of above-average performance in the long run is sustainable competitive advantage".

Porter identifies three *primary strategies for achieving competitive advantage* [18]:

1) cost leadership;

2) differentiation;

3) focus.

These advantages derive from the company's relative position in the marketplace, and they depend on the strategies and tactics employed by competitors. Fig. 4.2 summarizes these three strategies for achieving competitive advantage.

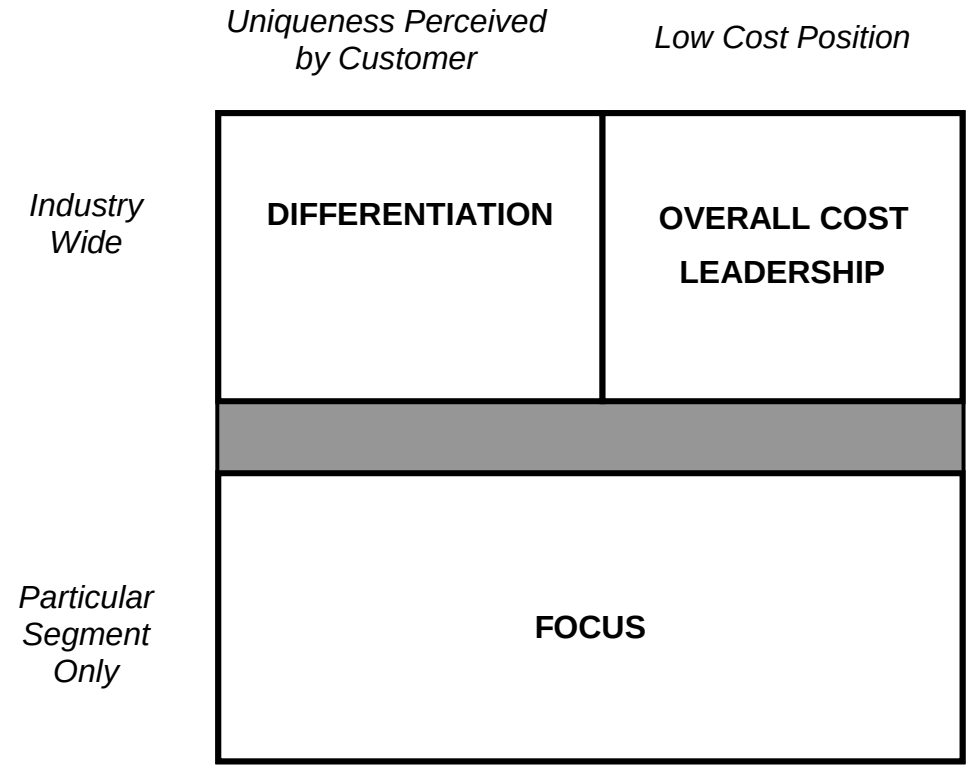


Fig. 4.2. **Three strategies for achieving competitive advantage**

**Cost leadership** results when the organization aims to be the lowest-cost producer in the marketplace. The organization enjoys above-average performance by minimizing costs. The product or service offered must be comparable in quality to those offered by others in the industry so that customers perceive its relative value. Typically, only one cost leader exists

within an industry. If more than one organization seek advantage with this strategy, a price war ensues, which eventually may drive the organization with the higher cost structure out of the marketplace. Through mass distribution, economies of scale, and IS to generate operating efficiencies, Wal-Mart epitomizes the cost-leadership strategy.

Through **differentiation,** the organization qualifies its product or service in a way that allows it to appear unique in the marketplace. The organization identifies which qualitative dimensions are most important to its customers, and then finds ways to add value along one or more of those dimensions. In order for this strategy to work, the price charged from customers by the differentiator must seem fair relative to the price charged by competitors. Typically, multiple firms in any given market employ this strategy.

**Focus** allows an organization to limit its scope to a narrower segment of the market and tailor its offerings to that group of customers. This strategy has two variants: 1) *cost focus,* in which the organization seeks a cost advantage within its segment, and 2) *differentiation focus,* in which it seeks to distinguish its products or services within the segment. This strategy allows the organization to achieve a local competitive advantage, even if it does not achieve competitive advantage in the marketplace overall.

**Hypercompetition and the New 7 Ss Framework**

Discussions of hypercompetition take a perspective different from the previous models. Those models focus on creating and sustaining competitive advantage, whereas **hypercompetition models** suggest that the speed and aggressiveness of the moves and countermoves in any given market create an environment in which advantages are "rapidly created and eroded."

D’Aveni identified **four arenas** in which firms seek to achieve competitive advantage under hypercompetition [18]:

1) cost/quality;

2) timing/know-how;

3) strongholds;

4) deep pockets.

His framework suggests seven approaches an organization can take in its business strategy.

D’Aveni’s model describes the strategies companies can use to disrupt competition, depending on their particular capabilities to seize initiative and

pursue tactics that can create a series of temporary advantages. For the purposes of this book, we briefly summarize his 7 Ss in Table 4.1.

Table 4.1

**D'Aveni's new 7 Ss** [18]

| Approach | Definition |
|---|---|
| Superior stakeholder satisfaction | Understanding how to maximize customer satisfaction by adding value strategically |
| Strategic soothsaying | Seeking out new knowledge that can predict or create new windows of opportunity |
| Positioning for speed | Preparing the organization to react as quickly as possible |
| Positioning for surprise | Preparing the organization to respond to the marketplace in a manner that will surprise competitors |
| Shifting the rules of competition | Finding new ways to serve customers which transform the industry |
| Signaling strategic intent | Communicating the intended actions of a company, in order to stall responses by competitors |
| Simultaneous and sequential strategic thrusts | Taking a series of steps designed to stun and confuse competitors in order to disrupt or block their efforts |

The 7 Ss are a useful model for identifying different aspects of a business strategy and aligning them to make the organization competitive in the hypercompetitive arena of business in the millennium. This framework helps assess competitors' strengths and weaknesses, as well as build a roadmap for the company's strategy itself. Using this model, managers can identify new organizational responses to their competition, as well as new opportunities that extend their current strengths. This model is particularly useful in markets where the rate of change makes sustaining a business strategy difficult. It suggests that a business strategy must be continuously redefined in order to be successful.

**Organizational strategy** includes the organization's design as well as the choices it makes to define, set up, coordinate, and control its work processes. The organizational strategy is a plan that answers the question: "How will the company organize in order to achieve its goals and implement its business strategy?" A few of the many models of organizational strategy are reviewed in this section.

A simple framework for understanding the design of an organization is the *business diamond*, introduced by Leavitt and embellished by Hammer and Champy. The **business diamond** identifies the crucial components of an

organization’s plan as its business processes, its values and beliefs, its management control systems, and its tasks and structures. This simple framework is useful for designing new organizations and for diagnosing organizational troubles. For example, organizations that try to change their cultures but fail to change the way they manage and control cannot be effective.

The next framework suggests that the successful execution of a business’s organizational strategy comprises the best combination of organizational, control, and cultural variables. Organizational variables include decision rights, business processes, formal reporting relationships, and informal networks. Control variables include the availability of data, the nature and quality of planning, and the effectiveness of performance measurement and evaluation systems, and incentives to do good work. Cultural variables comprise the values of the organization. These organizational, control and cultural variables are **managerial levers** used by decision makers to effect changes in their organizations [18].

Our objective is to give the manager a set of frameworks to use in evaluating various aspects of organizational design. Using these frameworks, the manager can review the current organization and assess which components may be missing and what options are available. Understanding organizational strategy means answering the following questions:

1. What are the important structures and reporting relationships within the organization?

2. What are the characteristics, experiences, and skill levels of the people within the organization?

3. What are the key business processes?

4. What control systems are in place?

5. What is the culture of the organization?

The answers to these questions give assessment of the organization’s use of IS.

### 4.2. The essence and structure of information systems strategy

The business model of a firm defines the alignment of a company's strategy with its environment and with the capabilities required to execute strategy and deliver value to all stakeholders. Increasingly, IT has become central to designing and evolving a company's business model and value

proposition. Given that a company's business model links decisions executives make to business performance, it also serves as a useful tool for analyzing the impact of IT on business performance and for framing IT investment decisions. The IT Impact Map describes the impact of IT along the two key dimensions of business model performance: strategy and capabilities.

- *IT impact* on *strategy* defines the role that IT plays in determining product, market, business network, and boundary positioning. It seeks to explain the mechanisms through which IT drives differentiation, sustainable advantage, and the development of proprietary assets. It also identifies the impact of lT on defining the growth path of the company over time.
- *IT impact on capabilities* defines the role that IT plays in building the capabilities needed to execute strategy. These capabilities include processes and infrastructure, people and partners, organization and culture, and leadership and governance. It is important to note that these capabilities may be located inside an organization or may be dispersed over a network of business partners. As such, it is important to analyze business network capabilities (for example, end-to-end processes and governance systems) and not just those located within the walls of an organization.

The IT Impact Map can be used to analyze the impact of a single project or it can beused to analyze a series of projects through which a company evolves its strategy over time [9].

**IS strategy** is the plan an organization uses in providing information services. IS allows a company to implement its business strategy. Business strategy is a function of competition (What does the customer want and what does the competition do?), positioning (In what way does the firm want to compete?), and capabilities (What can the firm do?); IS help determine the company’s capabilities [18].

The purpose of the matrix in Table 4.2 is to give the manager a high-level view of the relation between the four IS infrastructure components and the other resource considerations that are key to IS strategy. Infrastructure includes hardware, such as desktop units and servers. It also includes software, such as the programs used to do business, to manage the computer itself, and to communicate between systems.

Table 4.2

**Information systems strategy matrix**

| | What | Who | Where |
|---|---|---|---|
| **Hardware** | List of physical components of the system | Individuals who use it<br>Individuals who manage it | Physical location |
| **Software** | List of programs, applications, and utilities | Individuals who use it<br>Individuals who manage it | What hardware it resides upon and where that hardware is located |
| **Networking** | Diagram of how hardware and software components are connected | Individuals who use it<br>Individuals who manage it<br>Company from whom service is obtained | Where the nodes are located, where the wires and other transport media are located |
| **Data** | Bits of information stored in the system | Individuals who own it<br>Individuals who manage it | Where the information resides |

The third component of IS infrastructure is the network, which is the physical means by which information is exchanged among hardware components, such as through a modem and dial-up network, or through a private digital network. Finally, the fourth part of the infrastructure is the data. The data are the actual information, the bits and bytes stored in the system. In current systems, data are not necessarily stored alongside the programs that use them; hence, it is important to understand what data are in the system and where they are stored. Many more detailed models of IS infrastructure exist, and interested readers may refer to any of the dozens of books that describe them. For the purposes of this text, the matrix will provide sufficient information to allow the general manager to assess the critical issues in information management.

In formulating this strategy, it is important to identify the information needs of the organisation. It must be led by the needs of the organisation and not by the availability of the technology.

The main factors that contribute to the success of an IS strategy are commitment from senior management, adequate resources and sufficient training [18].

## Control questions

1. Describe aspects of the development of the enterprise information systems strategy.
2. Describe relationship of information, organizational and business strategies.
3. Characterize the types of business strategy.
4. Give characteristics of hypercompetition model.
5. Framework of an organizational strategy.
6. Why is it important for business strategy to drive organizational strategy and IS strategy?

# Theme 5. Electronic commerce and the information economy

5.1. The origin and development of e-commerce.
5.2. The definitions of e-commerce.
5.3. Categories of the e-commerce.

### 5.1. The origin and development of e-commerce

One of the biggest forces changing business is the Internet. Technology companies such as Intel and Cisco were among the first to seize the Internet to overhaul their operations. Intel deployed Web-based automation to liberate its 200 salesclerks from tedious order-entry positions. Instead, salesclerks concentrate on customer relationship management functions such as analyzing sales trends and pampering customers. Cisco handles 75 percent of its sales online, and 45 percent of online orders never touch employees' hands. This type of Internet-based ordering has helped Cisco hike productivity by 20 percent over the past two years.

***E-business*** is the conducting of business on the Internet, not only buying and selling, but also serving customers and collaborating with business partners [7].

E-commerce is the necessity of international business, vice versa, international business boosts e-commerce. The development of computer

science and communications sciences has laid a solid foundation for e-commerce. The development of information security makes e-commerce proceed in a secure way; the laws concerning this field also provide legal guarantees for e-commerce. The origin and development of e-commerce is illustrated in Fig. 5.1. It has been through three phases.

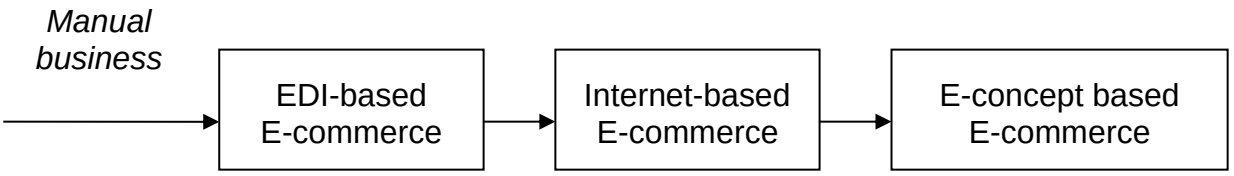


Fig. 5.1. **The development of e-commerce** [22, p. 5]

**Phase One:** ***E-commerce based on EDI (Electronic Data Interchange)***

EDI (Electronic Data Interchange): The EDI originated in the 60s of the 20th century. The large-scaled business enterprise in the developed countries carried out the EDI basically in the 80s. **EDI** is a kind of teleportation method to transmit business documents from one computer to another. Because EDI reduces the paper note greatly, people vividly call it as "trade without paper" or "bargain without paper". From the perspective of technology, the EDI includes both hardware (mainly the network) and software (mainly software and standard of EDI). For the sake of safety, most EDI were not transmitted by network until the 90s of the 20th century, but by VAN (the value-Added Network) of exclusive use. What EDI needs is a standard software to translate information in the customer databases into the EDI-standard so as to deliver. Because the business enterprise of different professions adopt different format on the basis of their own business characteristics, therefore when transmitting documents, they must be translated into the EDI standard format. Before EDI, the primary stage of e-commerce, becomes universal in China, electronic commerce has developed quickly to the second stage.

**Phase Two:** ***E-commerce based on Internet***

EDI enjoys advantages and tremendous strength in decreasing enormously the intensity, mistakes and cost to make and handle documents on the one hand, and in improving efficiency to a large extent on the other

hand. Therefore, it speeds up the development of international business. However, the high cost of VAN and EDI communication system hinder the expansion of e-commerce based on EDI. Moreover, EDI is only suitable for large-scaled transnational corporation rather than medium and small-sized ones, for it does not take information share into account. Since both the increasing large-scaled transnational corporations and many a medium and small-sized enterprise thirst for information sharing, the establishment of a new electronic information exchange system of low cost is on the agenda to realize the information sharing.

In the middle and late 90s of the 20th century, owing to the prompt popularity of Internet, from universities to enterprises, and then even to households, Internet functions range from the information sharing to a popular mass media.

After 1991, business that has always been outside of Internet came into the realm and made e-commerce a big hit in Internet, which gives impetus to the rapid development of Internet. Many enterprises made a big success by online direct marketing such as Dell Company, distinguished for direct online selling, online book store Amazon, Yahoo Internet search engine, Baidu Internet search engine, and Ebay. By 2001, Internet has become the largest network in the world and covered up to 150 areas and countries, linking more than 25,000 networks and 520,000 mainframe computers [22].

The ***reason why e-commerce based on Internet*** **is so attractive to enterprises is that e-commerce enjoys several** evident advantages over e-commerce based on EDI:

1) low in cost. The expense of Internet is low, no more than 1/10 of VAN in general;

2) wide in overlaying. Internet spreads all over the world, by which trade partners can conveniently send commercial information and documents with common telephone wires;

3) complete in function. Internet can help different users to carry out their targets on different levels, such as issuing electronic commercial information negotiating online and setting up virtual department stores and online banks etc.;

4) flexible in use. E-commerce based on Internet is not confined to agreement of special data exchange. Any commercial document can be

formed by filing the screen documents that are identical with the current paper documents. Such documents can be understood and used directly by anyone without any translation.

In e-commerce based on Internet, at first, people mainly make daily "business correspondences" by e-mails, and then release information by Internet. Since 1995, enterprises have gradually turned to Internet to release information. Therefore, the public can directly get access to the enterprise information, goods and services by Internet, which leads to the exploration of information issuing system represented by the technology of Web and becomes the principal application of Internet.

**Phase Three: *E-concept e-commerce.***

Since early 2000, people's understanding has developed from e-commerce to higher e-concept e-commerce, and it is realized that e-commerce is in fact the combination of information technology and commerce applications. Apart from business, electronic information technology can be applied in many other fields, such as medical treatment, education, hygiene, military, administration and so on, to form e-concept in the fields. For instance, electronic education is remote education, the combination of electronic information technology and education; electronic treatment is remote treatment, the combination of technology and treatment; electronic administration, the combination of technology and administration; electronic command, the combination of technology and command; online banks, the combination of technology and finance; virtual enterprises, the combination of technology and business organizations and so forth. Various patterns of e-commerce such as E-B, E-C, E-G etc., have come into being by applying e-concept. With the development of electronic information technology and the increasing need of the society, more and more e-concepts will emerge and the genuine e-times will advene [22].

In the past few years, e-business seems to have permeated every aspect of daily life. Both individuals and organizations have embraced Internet technologies to enhance productivity, maximize convenience, and improve communications globally. From banking to shopping to entertainment, the Internet has become integral to daily life.

## 5.2. The definitions of e-commerce

**Electronic commerce** is the process of carrying out business transactions over computer networks [16].

Notice that the definition is not restricted to the Internet and Web, because a firm may use other types of networks or network protocols to carry out transactions as well. Increasing profitability, gaining market share, improving customer service, and delivering products faster are some of the organizational performance gains made possible by electronic commerce.

A large number of well-known organizations and corporations also have their own definitions of e-commerce. For example, **ISO defines e-commerce** as: it is the general term for exchange of information among enterprise and between enterprise and customers; **the Global Information Infrastructure Committee** defines it as the economic activities using electrical communications, with which people can purchase products, advertise goods and settle.

The following are definitions given by transnational corporations Intel, IBM and HP respectively.

**Intel:** E-commerce = electronic market + electronic trade + electronic service

**IBM:** E-commerce = information technology + web + business

**HP:** E-commerce is to accomplish commercial business by electronic means.

Since e-commerce is a brand new science, it is not at all surprising that there are various definitions about it [22].

The implication of e-commerce: it refers to commercial trade activities carried out by electronic methods, the electronization of traditional trades. The electronic means refer to electronic technologies, tools, equipments and systems, including telephone, telegram, television, facsimile, E-mail, electronic data interchange, computer, the communication network, credit card, electronic money and Internets. Commercial activities comprise inquiry, offer, negotiation, contract signing, contract fulfillment, payment.

However, electronic commerce entails more than simply ordering goods from an online catalog. It involves all aspects of an organization's electronic interactions with its stakeholders, the people who determine the future of the organization. Thus, electronic commerce includes many activities, such as

establishing a Web site to support investor relations and communicating electronically with college students who represent potential employees.

Components of e-commerce are illustrated in Fig. 5.2.

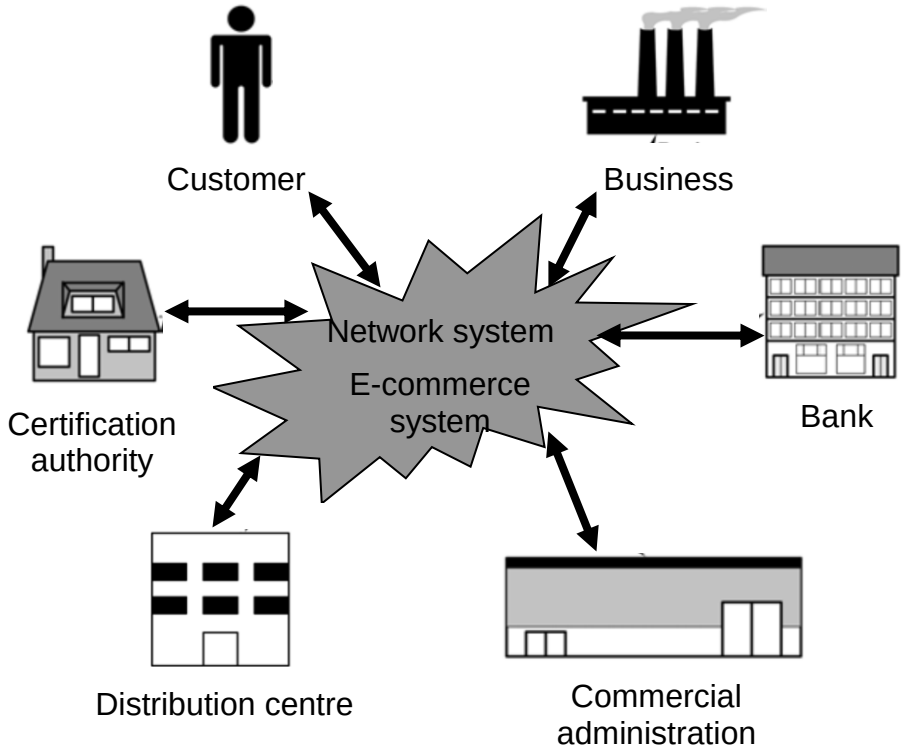


Fig. 5.2. **Components of e-commerce** [22, p. 8]

**1. Network.** It includes Internet, Intranet, and Extranet. Internet is the foundation of e-commerce and the carrier of commercial business information. As to Intranet, it means for enterprises to carry out internal affairs. With regard to Extranet, it is the link between enterprises and users to carry out commercial activities.

**2. E-commerce user.** It includes personal consumers and business consumers. The business consumer scientifically manages staff, wealth, goods, production, supply and sales by Intranet, Extranet and MIS. Personal consumer has access to information and purchases goods by connecting Internet with browsers, set-top boxes, PDA (the personal digital assistance), Visual TV etc.

**3. Authentication Authority.** The authentication Authority (CA), the authority recognized by law, is responsible for issuing, managing digital

certificates and facilitating parties involved in online sales to identify each other.

**4. Distribution center.** It is in charge of sending goods that cannot be delivered on line to consumers and keeping track of goods flow.

**5. Online bank.** It provides the sellers and buyers with the traditional bank business, such as settlement, and round-the-clock service.

**6. The administration of the commercial activity.** It consists mainly of departments of industry, customs, tax and trade [22].

## 5.3. Categories of the e-commerce

An ***e-business model*** is an approach to conducting electronic business on the Internet. E-business transactions take place between two major entities – businesses and consumers.

Advanced digital technologies, combined with enterprises and customers of these technologies, boost e-commerce. Similar to digital technologies, e-commerce cannot reach its goal in one move. As to enterprises and customers, e-commerce of different types and levels imply different opportunities.

In terms of transaction categories, e-commerce falls into **categories** (Fig. 5.3):

1) business to business (B2B);
2) business to customers (B2C);
3) business to governments (B2G);
4) governments to governments (G2G);
5) customers to customers (C2C);
6) others.

B2B is the mainstream in e-commerce and the principal method to improve competition ability in the competitive market. B2C takes place between business and customers, in which online sales are carried out by Internet, such as the online bookstore Amazon. B2C has enormous potential and will be the main drive for the development of e-commerce. B2G, the business between enterprises and governments, is still in its experimental phase, focusing on administrative management, governmental invited tender, and the implementation of various economic policies etc. C2C, the individual consumption behaviors, has not yet taken shape, such as the second-hand

market. But along with the development of B2C and B2G, all countries will perfect the personalized services in e-commerce.

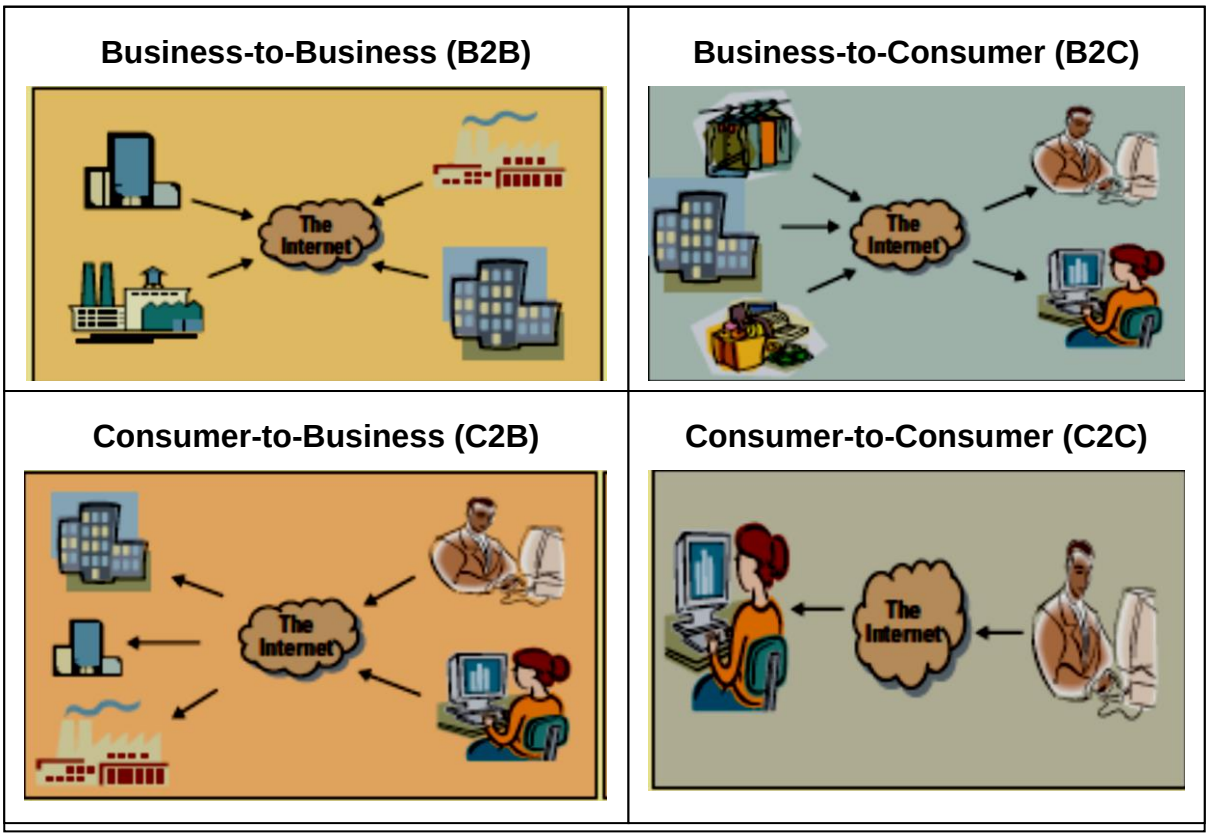


Fig. 5.3. **Main e-business models**

**1. B2B.**

In the five categories, B2B plays central part and will be the mainstream in the future, for the following reasons.

**1. Volume of business transaction of B2B takes up the majority of the total trading volume in e-commerce**

Because the B2B transactions take up the dominative share in e-commerce market, more funds flow into B2B companies, and thus make them retain invincible position in the prospective market and go invariably from strength to strength. From the economic standpoint: capital usually flows to the fields where more profits can be obtained. Capital flow will definitely bring out the capital accumulation and gradual increase of the market share of B2B companies, thus enabling B2B companies to become the main force of e-commerce.

**2. The B2B e-commerce companies hold an advantage in lowering operation cost.**

The online business of B2B companies covers production, supply, sales, or purchase, transfer and storage, which are so extensive that it can provide many ways to reduce the cost: First, reducing procurement cost by purchasing multitudinous commodities of single kind. Second, reducing production cost by shortening production period. Third, reducing operation cost by efficient inventory control. Fourth, reducing sales cost by global batch sale. The advantages of above ways are incomparable to e-commerce company of other categories.

**3. B2B e-commerce companies are more suitable for modern logistics management**

The logistics distribution plays a prominent role in all the commercial activities of e-commerce companies. There will be no cycle of operations without logistics. Even though there is external logistics, its expense will directly influence the achievements of e-commerce companies. Compared with other e-commerce companies, the characteristics of B2B companies logistics are fewer in times and large in quantity, while logistics of other e-commerce companies are characterized as small in quantity, more in times and high in turnover speed. According to statistics, B2B e-commerce companies are more competitive than B2C e-commerce companies in reducing logistics dispatching by 20 % – 60 %.

**4. B2B e-commerce companies are competitive in guaranteeing credit and capital security during operation course**

Credit and security will ever hinder the rapid development of e-commerce whether in the past, at present or in the future, which will obsess e-commerce companies for a long term as long as the complete e-commerce activities are carried out on Internet. As for the credit issue, it is a hard nut to crack, because B2C companies have thousands of clients and it is difficult to explore the credit of clients.

Additionally, the frequent less in quantity and more batch online payment make clients more worried about the security of online payment, which will seriously affect the B2C companies to seize commercial opportunities. Contrary to B2C companies, it is easy for B2B companies to inspect and identify the credit of their trade partners, because of their operation methods, fewer in batch and larger in quantity. Moreover, payment categories of special-purpose communications link of bank networks is

adopted to guarantee the safety of capital flow. This will speedup the development of B2B e-commerce companies with less batch and client stability.

**5. E-commerce of B2B is more mature in both theory and practice**

E-commerce of B2B involved here refers to e-commerce of B2B based on Internet.

From the above, B2B e-commerce companies will become more competitive in the fierce competition, and B2B categories will become the main categories of e-commerce in the future, to which great importance shall be attached. According to experts, global e-commerce has already entered the third stage. The first stage, attention economy presented by Yahoo. The second stage, professional network economies (B2C, C2C) with Amazon and eBay as representatives of. The third stage, integration economy, characterized by intermediary services supplied by ASP, facing the four elementary markets (e-market, e-channel, e-procurement, e-enterprise etc.) by Internet and B2B e-commerce to boost the interaction of new economy and old economy. The era of B2B e-commerce is coming [22].

Electronic marketplaces represent a new wave in B2B e-business models. ***Electronic marketplaces,*** or ***e-marketplaces,*** are interactive business communities providing a central market where multiple buyers and sellers can engage in e-business activities [7].

**2. B2C.**

In B2C (Business to Customer) e-commerce, Internet is resorted by businesses or enterprises to provide customers goods and services via Web sites. Presently, various types of B2C Web sites spread all over Internet to supply customers with a variety of goods and services, varying from flowers and books, to computers and cars etc.

From the perspective of the business relations between enterprises and customers, B2C falls into two categories: seller (enterprises) – the personal buyers, and buyer (enterprises) – the personal sellers.

Seller (enterprise) as a personal buyer is the category in which enterprises sell goods and commodities to individual customers. In this e-commerce category, the sellers first open an online store, then release the information on variety, specification, price, and capability of the goods or on variety, price and measures of service, by which the individual customers choose goods, place an order and decide to make online or off-line payment, and last deliver goods to the customers.

By this kind of online shopping, customers can acquire further information on goods, shop around, and purchase goods at the lowest cost and save shopping time without going outside. Without doubt, this e-commerce category requires the support of high-efficient, low-cost logistics.

Enterprise as a personal seller is the category in which business purchases goods or services from individuals. This category is usually used for online job application. By this category, enterprises release information on needed talents at first and then appliers negotiate with enterprises online, which is very popular in this society with big talents flow for it offers a communication platform and bridges the enterprises and individuals, thus making full use of human resources.

E-commerce of B2C can be divided into tangible and intangible goods and services, of which the latter can be completed by network, while the former cannot unless the traditional methods are resorted to. Thanks to the information transmission and processing abilities of computer network, intangible goods and services (e.g. e-information, computer software, digital audiovisual entertainment products, etc.) in general can be presented to customers directly via network. E-commerce categories of intangible goods and services are mainly online subscription categories, advertisement-supported pattern and online domination categories [22].

Common B2C e-business models include e-shops and e-malls.

**E-Shop.** An ***e-shop,*** sometimes referred to as an ***e-store*** or ***e-tailer,*** is a version of a retail store where customers can shop at any hour of the day without leaving their home or office. These online stores sell and support a variety of products and services. The online businesses channeling their goods and services via the Internet only, such as Amazon.com, are called pure plays. The others are an extension of traditional retail outlets that sell online as well as through a traditional physical store. They are generally known as "bricks and clicks" or "click and mortar" organizations, such as the Gap ( www.gap.com ) and Best Buy ( www.bestbuy.com ).

**E-Mall.** An ***e-mall*** consists of a number of e-shops; it serves as a gateway through which a visitor can access other e-shops. An e-mall may be generalized or specialized depending on the products offered by the e-shops it hosts. Revenues for e-mall operators include membership fees from participating e-shops, advertising, and possibly a fee on each transaction if the e-mall operator also processes payments. E-shops in e-malls benefit from brand reinforcement and increased traffic as visiting one shop on the e-mall

often leads to browsing "neighboring" shops. An example of an e-mall is the Arizona (e-mall www.1az1.com/shopping) [7].

**3. B2G.**

Governments, as national administrators, play a significant role in guiding, administrating and adjusting economy. The advent of e-commerce age put forward the new request to the original functions of governments. Governments should administrate e-market effectively and render better service to enterprises and the public by e-government on the one hand. Governments, as the "big clients" in economy should take the lead to adopt e-commerce and offer efficient path through electronic tender invitation for government procurement on the other hand.

Governments undertake large numbers of social, economic, cultural and service functions, and as "visible hands" in particular, they play a significant role in coordinating market economy and keeping markets from being out of order. At the age of e-commerce, the governmental supervision is definitely to change when enterprises apply e-commerce to produce and operate, banks realize the finance electrification, and customers carry out online shopping.

E-commerce age is an information-based and digital age. Governments always play an important part in guiding, managing and adjusting economies. In the new age, it is required that governments adopt the modern means to manage the economies, and specify e-commerce market so as to sustain the healthy and continuous development of national economy. Governmental functions can be carried out online, that is the forming of e-government which will become an important component of e-commerce supporting environment.

**4. G2G.**

Governmental e-commerce requirements in social production and commercial activities can be divided into the following categories: participation, statistics, service, leading of production, circulation, consumption etc. Original national information system is mostly made up of national, provincial (municipal), local (municipal) organic statistics systems or multilevel statistics bureaus.

E-commerce of administrations is to carry out the administration, service and internal administration etc. effectively on computer network by making use of the information and communication technology and to establish an assembly of organic service systems between administrations,

society and the public. In general, the targets of the e-government mainly are embodied in the following five aspects:

(1) Computerization, network and information of each government sector are beneficial to improve governmental efficiency, service and supervision. The e-government positively boosts the streamline of government agencies and business simplification with the help of information technologies.

(2) Administrations serve economy actively rather than passively, for which enterprises and citizens can have the knowledge of, and master governmental guideline and policies and services without the restriction of time and space.

(3) Supply the public with excellent and diversified services by making use of network and information system built up by governments. The network covers all government sectors. The e-government supplies simple diversified services by making use of the unified information resources and modern technology, such as voice and Internet etc.

(4) Advance the whole social informatization by government informatization. Display the application of the hi-tech to the community, enables the whole society to enjoy the facility of the information network, and practically boosts the social informatization.

(5) Create e-commerce supporting environments to suit the development of digital economy and to guide, layout and supervise e-commerce activities.

The government is much more than a national governor, and also a great consumer. The government purchases the public suppliers each year, which accounts for 7 % – 15 % of GDP. Therefore, the government's purchasing necessarily involves online shopping, which includes supervision of e-commerce and the application. Currently, among the more mature e-commerce applications of government are **online tax-collection** and **government procurement.**

*The government procurement* means the government at all levels, for the sake of the day-to-day affairs or providing public service for the community, purchase commodities and services for themselves and the relevant public departments according to legal procedures.

*The electronic taxation* includes two links of electronic filing of returns and electronic settling of accounts. *The electroic filing of returns* means tax payer makes use of the calculating machine of the server to pass the

telecommunication network systems, such as telephone toll, grouping exchange toll and Internet toll, etc., directly sending out the filing of returns data to the taxation department, thus realizing tax payer's filing of returns without going personally to tax authority. *The electronic settlement* means a process that the national treasury directly receives the tax from the bank account of tax payers depending on the information on their tax bills.

**5. C2C.**

The C2C is a schema of trade of the consumers, sharing similar characteristics with agriculture trade market or flea market. What constitutes it are vendors and purchasers, electronic trade provider suppliers, similar to space suppliers and governors agriculture trade market in the real and the flea market. In the categories of C2C, the electronic trade provider suppliers play the prominent role.

Firstly, in such wide range of the network, if without a well-known supplier trusted by both vendors and purchasers, bunching both vendor and purchaser together, it is very difficult for buyers and sellers to find each other, and also will cause loss of chances.

Secondly, the electronic trade provider suppliers also take the responsibilities of supervision and management for honesty and creditability of vendors and purchasers monitoring their transactions and minimizing the occurrences of fraud in order to protect the interests of buyers and sellers.

Thirdly, electronic trade provider suppliers can offer the technology support to vendors and purchasers, including helping sellers to create online shop, release product information, decide on pricing strategy etc., helping buyers to select products or electronic settlement etc. It is just because of the technology support that a C2C category has been accepted by a large group of users within a short period of time.

Lastly, along with the maturity of pattern C2C, the electronic trade provider supplier can still offer buyers and sellers the financial services like insurance, loans, thus better services for the both vendors and purchasers [22].

## Control questions

1. Define the concept and structure of e-commerce.
2. Characterize models of e-commerce.
3. Describe selecting models of electronic commerce.

4. Explain main aspects of business organization in the Internet.
5. Describe e-commerce development.
6. Characterize perspective directions of the electronic commerce development.
7. Explain the e-commerce classification.
8. What is the specific functioning of B2B?
9. What is the specific functioning of B2C?
10. What is the specific functioning of C2C?
11. What is the specific functioning of C2B?
12. Determine the main components of electronic commerce.

## Theme 6. Implementation of e-commerce

6.1. Definition and types of Web sites.
6.2. Contents and structure of Web site.
6.3. Limitations of electronic commerce.

### 6.1. Definition and types of Web sites

**Web site** is a set of documents, which united under one address of an individual or organization in a computer network.

*The world's first Website appeared on Aug. 6, 1991. Its creator, Tim Berners-Lee published the description therein of the new technology World Wide Web, based on data transfer protocols HTTP, URL addressing system and the Hypertext Markup Language HTML. Also the principles of installation and operation of servers and browsers were described on the site. The site became the world's first online catalog as later Tim Berners-Lee posted the list of links to other sites on it.*

Taking into account that the Web is the primary source of electronic commerce activities, to develop and implement an electronic commerce strategy, you must understand the types of business-related Web sites in wide use. You can **classify business-related Web sites** using the same technology classification system: Internet, intranets, and extranets [16]. Recall that the Internet is global in scope, whereas an intranet is limited to the

organization, and an extranet is based on business partnerships. Fig. 6.1 illustrates these three Internet technologies.

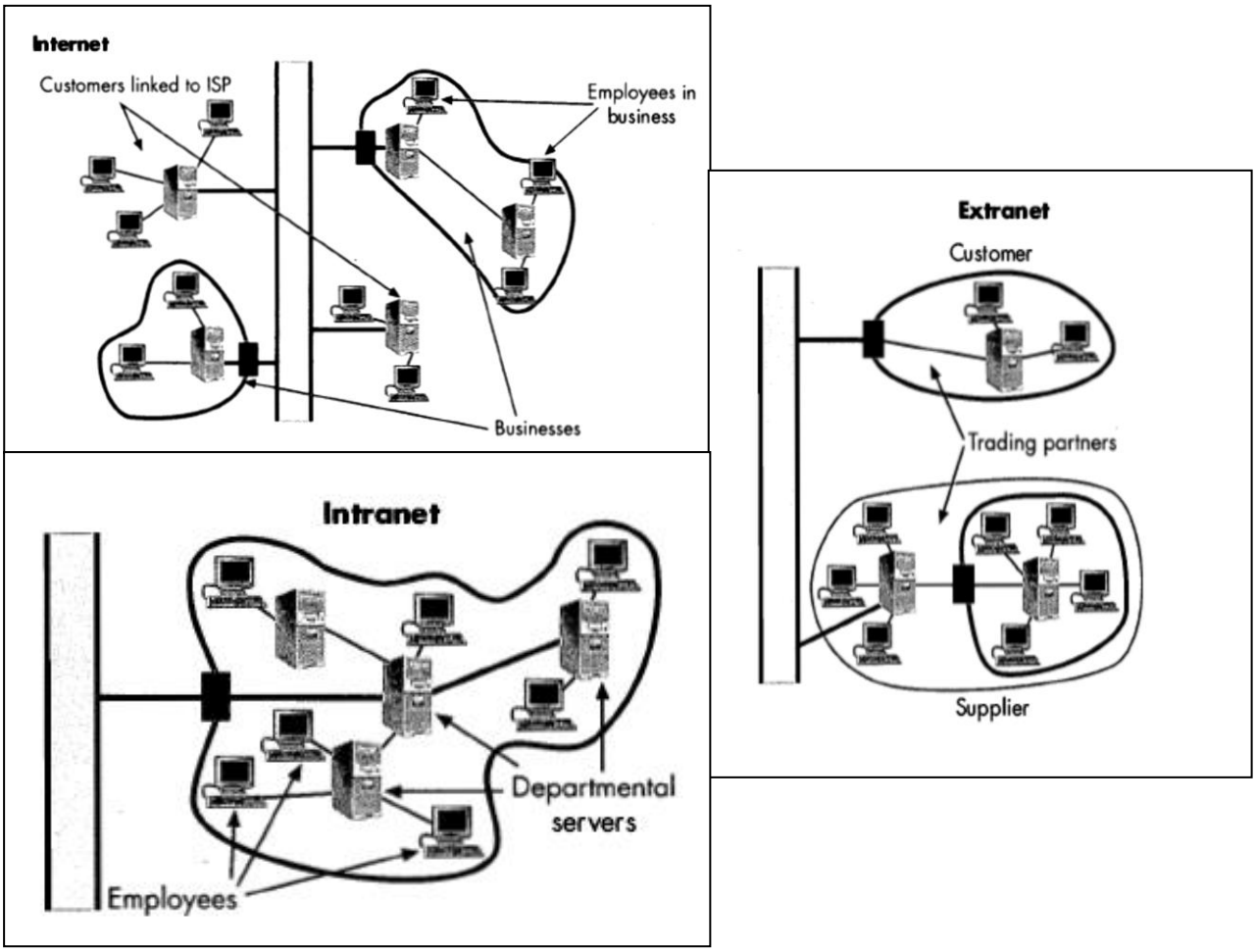


Fig. 6.1. **Internet technologies** [16, p. 218]

An ***Intranet*** is an internalized portion of the Internet, protected from outside access that allows an organization to provide access to information and application software only to its employees. An intranet is an invaluable tool for presenting organizational information as it provides a central location where employees can find information. It can host all kinds of company-related information such as benefits, schedules, strategic directions, and employee directories.

An ***Extranet*** is an intranet that is available to strategic allies (such as customers, suppliers, and partners). Many companies are building extranets as they begin to realize the benefit of offering individuals outside the organization access to intranet-based information and application software such as order processing [7].

Although a company will usually recognize the audience to which it markets its products and services – consumers or other businesses – it may not be very sure about the appropriate business model to use in developing its Web presence. Ten business models for Web sites exist, each of them has the same goals: to find a customer need, build demand, fulfill the demand, and then repeat the process. Table 6.1 lists ten types of business models for Web sites, along with a description, the Web site technology used, and an example. The types of Web sites are arranged from those with which you are probably most familiar to those that may be new to you.

Table 6.1

**Business Models on the Web** [16, p. 220]

| **Business model** | **Description** | **Techno-logy** | **Category of e-com-merce** | **Example** |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |
| E-tailers/ e-mail | Retail sites aimed at the Web consumer | Internet | B2C | Lands' End (www.landsend.com) |
| Portals | Sites that are major starting paints for users when they connect to the Web | Internet | B2C | Yahoo! (www.yahoo.com) |
| Auctions | Sites that enable an online shopping popu-lation to bid on items and offer items for sale | Internet | B2C | eBay (www.ebay.com) |
| Communities of interest (COI) | Sites that create niche content and context for their members | Internet | B2C | Wine.com |
| Informediary | Sites that gather, organize, and link to new information and services on the Web | Internet, Extranets | B2C, B2B | www.webmd.com |
| Utility | The utility model is based on the concept of metered use, where clients pay for services as they are used, for example downloading documents or music | Internet | B2C, C2C | iTunes |

Table 6.1 (the ending)

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Business Card | Contains the most general information about the owner of the site | Internet | B2B, B2C | Different company's sites |
| Process/services improvement | Sites aimed at improving supply chain management processes internally and externally | Intranets, Extranets | B2B | Manheim Online (www.manheim.coml |
| Value chain service provider | Sites for companies that focus on dominating a specific function of the value chain | Extranets | B2B | UPS (www.ups.coml |
| Value chain integration | Sites for companies that integrate all steps in a market's value chain | Extranets | B2B | Manugistics (www.manu.coml |

In Table 6.1, you can see that the first four classifications involve business-to-consumer models that attempt to generate revenue by selling goods and services over the Internet (e-tailers /e-malls and communities of interest), by advertising (portals), or by charging a fee for a service (auctions). The fifth business model, informediaries, generates revenue by charging customers for information that they need. The last three business models target the business-to-business value chain using intranets and extranets.

## 6.2. Contents and structure of Web site

The site is formed of a set of pages linked by references (hyperlinks). Each page contains text, graphics, illustrations, and, in principle, can be sound. Information section is highlighted on the page. Visitors do not like it, if the page is loaded for a long time, so do not use many charts, drawings and photographs. This, of course, does not apply to photographic materials, which show the objects that attract too many curious visitors. Headings and logos should be very memorable, as in a good advertisement. Colors must not interfere with reading texts and seeing the illustrations.

Preferably, it is better to use the short pages, because of the speed of loading.

A small Web site consists of 3 – 5 pages where there is minimal information about the firm. A full-featured Web site is 15 – 20 pages, including the hit counter, guestbook, forms for e-mail and other programs [4].

**Site Structure**

The site, in its minimal revision should include:

1. Information about the company (haunting story of creation, objectives and achievements, reviews of specific customers and partners), details: postal address, phone, fax, e-mail address.

2. Catalogue of products or services with the addition of features and benefits of goods and services, price lists, delivery terms and service.

3. Information and Advisory section containing advice and features of using the presented products, as well as general news and additional information on this industry and related fields (for reviews, analysis of key events). Information about new products, analytical materials, surveys. Links to other Web sites. Information to support dealers and distributors. Form to request additional information.

4. Count of the number of visitors, registration form (guestbook) with a concomitant set of standard and special issues (the most general information about the visitor, his interests, his income level, whether the desired product was found, the reasons to buy and not to buy.

5. Information on payment methods. Order form where you can further include a small list of questions for the client, which he can answer, if desired.

**Standard pages –** these are Homepage (front page), List of services (Services), Employee bios (biographies of staff), Privacy Policy (obligation dealer), About us, Business relationships (partners), Events list (events calendar), Contact us, Survey (interviews), Q&A (questions and answers), Job listings (vacancies), Map and directions (physical office location), News and PR.

When you create a virtual storefront products are distributed by sections and are supplied with illustrations, some items can be temporarily hidden from the buyers to change prices, put some blocks on the title page. *Commerce section* explains how to open an account and sign up for service transactions on electronic cards. *Section Communication* helps to organize the survey and create a guestbook, provides registration site on search sites (such as Excite, Lycos, AltaVista), organization newsletters and announcements [4].

## 6.3. Limitations of electronic commerce

In thinking about electronic commerce, you should realize first and foremost that computer networks, including the Internet, can do only one thing: transmit electronic messages between computers. Although these messages can include data, information, and software, you cannot move anything physical over a computer network. Because electronic commerce relies on computer networks, the shipment of any physical good purchased using electronic commerce must still take place through traditional means. That is, when you buy a physical good over the Web, it must be picked from a shelf in a warehouse, packed for shipment, and physically moved from the warehouse to the customer via a package delivery service.

Although many electronic commerce systems rely on a Web page and ordering system, it is still important to have the so-called back-office elements in place to handle order fulfillment. Beyond order fulfillment, any company in the business of accepting orders and shipping goods to customers must be prepared to handle returns – another physical process, and one that can prove more complicated than the actual order fulfillment.

The fact that order fulfillment and returns continue to represent a part of the business process even when electronic commerce is used explains why the more successful implementations of electronic commerce have involved companies that were already engaged in accepting orders by telephone or postal mail and fulfilling those orders. Firms such as Dell or Lands' End are good examples of this type of company. Telephone- and mail-order companies also have vast experience in handling returns, so returns from Web orders pose no special problems for them. In essence, electronic commerce extends their existing, profitable business model by providing another channel for interacting with customers.

The limitations of computer networks pose little or no problem when the good being purchased is itself electronic or can be converted to an electronic form.

Electronic goods include computer software and games, audio and video products, news sources, and electronic books (e-books) . Because these electronic goods can be transmitted directly over the Internet or a local network as a series of bits, no picking, packing, and shipping problems occur.

Likewise, returns are a simple matter; if a problem occurs with the electronic product, the company can send out a new one to replace the defective product. A common strategy used by companies dealing in electronic products is to make reduced-functionality versions of their products available for no charge or full-functionality versions available for a test period, typically 30 or 90 days. This strategy assumes that the user will either pay to upgrade to the full version from the reduced-functionality version or buy the full version when the test period ends [16].

## Control questions

1. Give definition of a company Web site.
2. Describe Web site structure.
3. Characterize types of Web sites.
4. What are the limitations of e-commerce?
5. What are the three Web technologies? Which is used for business-to-business electronic commerce?
6. List the ten types of Web sites commonly used in electronic commerce. Provide examples of the first three types.

# Theme 7. Marketing in the information economy

7.1. Opportunities and challenges of marketing in the information economy.

7.2. Internet marketing.

7.3. The possibilities of using Internet in advertising of the company.

7.4. Attracting customers.

## 7.1. Opportunities and challenges of marketing in the information economy

**Marketing** is the art and science to choose the right target market, attract, keep and increase the number of customers by making the buyer confident that he is the highest value for the company, as well as "orderly and purposeful process of understanding the concerns of consumers and regulation of market activities" [3].

Generally marketing procedures are defined by [3]:

• the goals and objectives of business in the industry and specialization (general description of business);

• the type and characteristics of the market (customers and their needs);

• allocation of customer groups (segmentation) and the size of the expansion (market coverage, location and distribution of goods);

• competition (market positioning, presence of competitors, pricing);

• use of resources;

• selling (stages of the product, trade methods);

• advertising and Public Relations (promotion of products, demand).

The development of information technology, with one of the key places occupied by the Internet, the emergence and rapid growth of e-commerce are the basis for the emergence of a new trend in modern marketing concept.

With the rapid development and diffusion of the information and communications technology, the information economy is including richer and richer contents. While the backbone providers, the Internet service providers, and the last mile providers are the enablers of the network economy, broadly speaking, all the market participants whose activities are critically based on the Internet are also important market players in this emerging ecosystem.

Traditional economic theory believes that perfect competition is the most efficient market structure. However, due to the unique characteristics of the information economy, this may not be true in all segments of the network economy [27].

The Internet radically changed the way human beings gather, compare and share information. While novel technologies meant new channels to reach customers, they also led to intense audience segmentation and consumer empowerment. Today we live in an interactive, globally connected, customer-driven, service economy where time and speed are of the essence.

As a result of these changes, a whole new marketing model was born; one that was no longer founded, exclusively, on the power of the "4 Ps" (product, price, place, and promotion) but instead hinged on four new principles [37]:

1. Target.
2. Experiment.
3. Measure.
4. Adapt.

Some may argue that targeting is not a new concept. While consumer product giants such as Procter & Gamble have, indeed, been at this game for a long time, new technologies have enabled companies of all sizes to successfully deploy highly personalized campaigns.

Experimenting, on the other hand, has not only dramatically changed, but also grown in importance in most marketers' minds over the past fifteen years. Savvy executives worldwide quickly learned that, in order to ensure the success of highly targeted campaigns, they must earmark part of their budget for testing.

Armed with the unforeseen ability to collect detailed data on their customers, in real-time, more and more executives have turned to the web as their primary platform for campaign testing. In turn, the trend towards enhanced measurement has prompted new developments in marketing mix components whose results were, traditionally, much more difficult to quantify. Great developments have been made, for instance, in the field of direct marketing.

After testing and measuring campaign results, the new marketing model calls for executives to constantly adapt their strategies in order to optimize results.

The next time you plan a new product launch, try asking yourself what percentage of your marketing program is made up of initiatives that you've included simply because you've been doing them for a while. Have you bothered to test your strategy prior to making any significant commitments? And, finally, have you equipped yourself with the tools necessary to measure campaign results? Regardless of your company's size and budget, there are several new technologies available today that can help you to implement the new marketing model and make the most of your investment [37].

## 7.2. Internet marketing

**Internet marketing (e-marketing)** is the practice of using all aspects of online advertising for a response from the audience, which includes both the creative and technical aspects of the Internet, including design, development, advertising and marketing [1].

The object of marketing activities on the electronic market is the information-analytical, expert and research activities of the company using network information systems and technology: choosing competitive position in

this market, where the company stands with their goods, identifying strategies for its promotion and distribution, advertising and selection, pricing based on the totality of factors in external and internal environments in terms of risk and uncertainty.

The subject of marketing activities on the e-market serves as a classic marketing activities of a particular owner of a purposeful control of the company, produced a specific technology with the use of methods of analysis and processing digital information electronic market to achieve its goals.

The process of marketing management in the e-market displays a set of operations and procedures performed by employees of marketing services companies in sequence [5].

*Advantages of e-marketing:*

- reduction in costs through automation and use of electronic media;
- faster response to both marketers and the end user;
- increased ability to measure and collect data;
- opens the possibility to a market of one through personalisation;
- increased interactivity.

*Disadvantages of e-marketing:*

- lack of personal approach;
- dependability on technology;
- security, privacy issues;
- maintenance costs due to a constantly evolving environment;
- higher transparency of pricing and increased price competition;
- worldwide competition through globalisation [28].

Internet marketing may contain **elements** of [34]:

1. Search engine optimisation on both traditional search and elsewhere on the Internet;
2. Paid advertising on the search engines, known as PPC (pay per click) advertising;
3. Paid (PPC) advertising on locations other than traditional web search;
4. Banner advertising and other forms of paid advertising (pay per impression);
5. Viral marketing and marketing on the new social networks;
6. Online articles PR distribution;
7. Email marketing;

8. Newsletter signup ;

9. Links with non-Internet advertising (using your Web site in tandem with print / broadcasting or other advertising);

10. Customer feedback;

11. Provision of customised offers based on customer history;

12. Web site conversion (is your Web site designed to sell?);

13. Measuring the ROI (return on investment) of the different parts of online marketing;

14. International considerations.

**E-marketing plan** is a strategic document developed through analysis and research and is aimed at achieving marketing objectives via electronic medium. E-marketing plan represents a sub-set of organisation's overall marketing plan which supports the general business strategy. Every good e-marketing plan must be developed in line with the organisation's overall marketing plan [28].

In a broad sense, e-marketers generally start by analysing the current micro- and macro economic situation of the organisation.

Easy and fast access to conversion data on the success of marketing campaigns allow a very fast response so that effective campaigns can be increased and ineffective ones stopped. Compared to direct mail, radio or TV advertising response times are faster and the assessments of benefits or ROI more reliable and easier to handle as very little manual data entry is required.

### 7.3. The possibilities of using Internet in advertising of the company

Advantages of the Internet marketing are characterized by the following properties [1]:

• *interactivity* – the interaction between objects in a particular environment. In this context, marketing interactivity is the interaction of the customer (buyer) and a manufacturer, seller, allowing strengthening the contact until the sale. Interactivity of Internet is that the potential customer can immediately respond to any information published by the company. The seller, in turn, can easily engage in a dialogue with the interested client;

• *high information capacity*. Modern communication technologies enable to store and at high speed to transfer large amounts of information;

• *multimedia*. Internet provides an opportunity to exchange information in a variety of forms. Information and promotional materials can be presented

in the form of text, graphics, animation, sound, and video. The use of graphics and animation can improve the effectiveness of advertising material, because it allows you to create images that will positively affect the image of the company;

• *opportunity to focus advertising exposure* – targeting that focuses on a particular audience segment. Focusing can effectively solve problems with less cost. There are two types of focusing:

focusing on individual characteristics: geographic location of the user, provider, business profile of the company; demographic profile of the user;

focus for behavioral characteristics: impact on users specific sites, the impact of a certain period of time, the use of certain phrases, the impact only on users who commit certain actions;

• *efficiency* – high speed deployment and client access to necessary information;

• *availability combined with flexibility*. Start, adjust or terminate the project at any time, depending on various circumstances;

• getting the most recent statistical information almost in *real time*.

But along with the benefits of the Internet as a marketing channel it has disadvantages:

• limited audience;

• lack of specialists in online marketing. Today it is easy to find a specialist who will draw attractive banner or write log analysis program, but people who can predict the implementation of certain strategies are difficult to find.

There are five main advertising techniques [25]:

1. *Content advertising.*

The first type of advertising technique is content advertising. It basically uses content to draw visitors' attention. It is the main type of advertising technique because the entire internet is made up of content (or information).

The following traffic strategies all fall under content advertising technique:

- Submitting articles to article directories;
- Posting articles to Squidoo, Hubpages or Blogger;
- Posting articles to your own blog or content Web site;

- Press release;
- Paid reviews at other people's Web site;
- Yahoo answers;
- Social bookmarking at Digg, Propeller etc;
- Post videos in video sites;
- Posting comments in forums.

In content advertising, you draw traffic from 2 sources. You either get the traffic from the Web site where the content is posted or from the search engine.

2. *Link advertising.*

This type of advertising technique typically uses a short link with some description to attract the visitors directly to your Web site.

The following traffic strategies all fall under link advertising technique:

- PPC advertising;
- Classified advertising;
- Submission to directories;
- Link exchange partnership;
- Banner advertising (image version of link advertising);
- Craigslist advertising;
- Email signature.

In link advertising, you draw traffic from just 1 source, that is the existing traffic from the Web site where your link is posted.

The key in link advertising is your offer.

3. *Viral advertising.*

This kind of advertising technique is similar to word of mouth advertising in the offline world. The idea is to encourage your existing traffic to bring more traffic to your Web site.

The following traffic strategies all fall under viral advertising technique:

- Offer your products' affiliate program, including finding joint venture partners;
- Place a "Tell-a-friend" script on your Web site;
- Distribute viral screensaver, software or ebooks;

Success in viral advertising depends a lot on your ability to create a buzz in your community.

4. *Incentivized advertising.*

The forth type of advertising technique is incentivized advertising where the traffic is rewarded to visit your Web site.

The following traffic strategies all fall under incentivized advertising technique:

- Traffic exchange programs;
- Auto-surf advertising;
- Paid to read advertising;
- Safelist advertising;

Success in this type of advertising depends mainly on your offer and the way you present it. Most advertisers who fail either do not have a good offer or they fail to deliver the benefit of their offer across to the target audience.

5. *Obtrusive advertising.*

The last type of advertising technique is obtrusive advertising where the traffic is forced to view your ad. The most typical examples are popup and popunder advertising.

The first rule in obtrusive advertising is to avoid untargeted traffic, which happens to be quite common in this kind of advertising. If your ad is shown to a pool of people who are not interested in your offer, you are simply barking up the wrong tree!

If the traffic is targeted, your success in obtrusive advertising depends mainly on your offer and the way you present it, similar to incentivized advertising.

**The advantages of Internet advertising vs. traditional advertising**

*1. Internet advertising is huge.*

With the growth of information on the Internet the amount of time people spend on it has grown too, which has in turn generated a new market for internet advertising. Some of the wealthiest companies in the world have made sure that they get a piece of the internet marketing pie, and for a good reason.

*2. Internet advertising is targeted.*

As a company is looking for advertising opportunities on a specific market, Internet advertising offers some targeting methods that insure that those who see your ads are the ones most likely to buy. Forget the costly machine-gun strategy of newspaper advertisements, internet advertising is targeted!

*3. Internet adverting enables good conversion tracking.*

It's impossible to get a good idea of how many people see advertising through traditional means. Tracking the reach of newspaper and television advertisements is difficult. However, Internet advertising allows the advertiser to track the number of impressions an ad gets (how many people see it), and how many visits their business Web site gets from particular ads, making it easy to see what kind of conversion rates Internet advertisements are getting.

*4. Internet advertising has lower entry-level fees.*

If you have a limited budget, Internet advertising can be much more in reach than traditional methods. A small yellow-page ad can cost several hundred dollars. However, you can bid for advertisements on Google and Overture on a performance basis. That means that you only get charged when visitors click on the advertisement, and bidding starts at a nickle or dime a pop.

*5. Internet advertising can be much cheaper.*

Because of the targeted nature of Internet advertising and the ability to track the effectiveness of ads, conversion rates from Internet advertising is typically much better than traditional mediums.

*6. Internet advertising has greater range.*

One more benefit is that, since the Internet spans the globe, pockets of your target market scattered around the world can all be targetted at once, rather than trying to find different publications, radio stations and television stations that cater to a particular geographical area [34].

On the whole, Internet advertising can be a great way to get the word out there about your service or product in a cost-effective, efficient way.

## 7.4. Attracting customers

Once a company has decided on a business model to use in developing its Web presence, it must then find the ways to attract customers to its site – not just on a onetime basis, but on a repeat basis. A Web site that attracts very few visitors or the wrong type of visitors represents a very poor investment. Thus, organizations need to consider whom they want to attract to their Web site and how they might attract those users. Because a Web site is essentially located on a one-way street with no other stores on the street, it must be an **attractor** to bring in customers on a repeat basis. As a rule, an

organization should concentrate on attracting the most influential stakeholders – that is, these groups that can determine an enterprise's future.

Usually, it will want to attract prospective customers, but other groups can influence the future of the organization and thus be the target of a Web site. For example, a firm might use its intranet Web site to communicate with employees, or it might attempt to attract and inform investors and potential suppliers. After selecting the targeted stakeholder group, the organization needs to decide on the degree of personalization of its interaction with this group [16].

There are many ways to attract people to your Web site for an initial visit, including advertising on other popular Web sites with links to yours or in other media (television, newspapers, and so on), having your site prominently displayed on a portal site such as Yahoo!, or offering games or giveaways. To attract people on a repeat basis, however, your site must provide customers with something they want – a line of products, a service, or information. Once you have attracted them for the first time, the real trick is to turn visitors into repeat customers. All Web sites that are good attractors, especially for repeat visits, share the feature of interactivity, which is the capability to interact with the user in some way. In most cases, the greater the *interactivity*, the greater the site's perceived attractiveness. The only caveat to this statement is that a high degree of interactivity should not make the site slow and unresponsive.

In all cases, companies must avoid creating Web sites that reproduce their print advertising and publicity – so-called *brochure-ware* – that usually bores visitors.

Although most Web sites allow users to click to Web pages on the same site, or to Web pages on other sites, this level of interactivity often does little to increase the site's appeal. To achieve attractiveness, a developer often uses a programming language to make the page respond immediately to a user's requests or data entry. Another approach is to link the Web server to a database so that it can query a product database to determine whether a product is in stock and then query a credit card database to verify that a credit card number is acceptable.

Beyond interactivity, it is often necessary to identify the strategic properties of a Web site that will make it attractive to selected stakeholders.

Fig. 7.1 shows a **two-stage model** for identifying which features will make a Web site attractive to stakeholders.

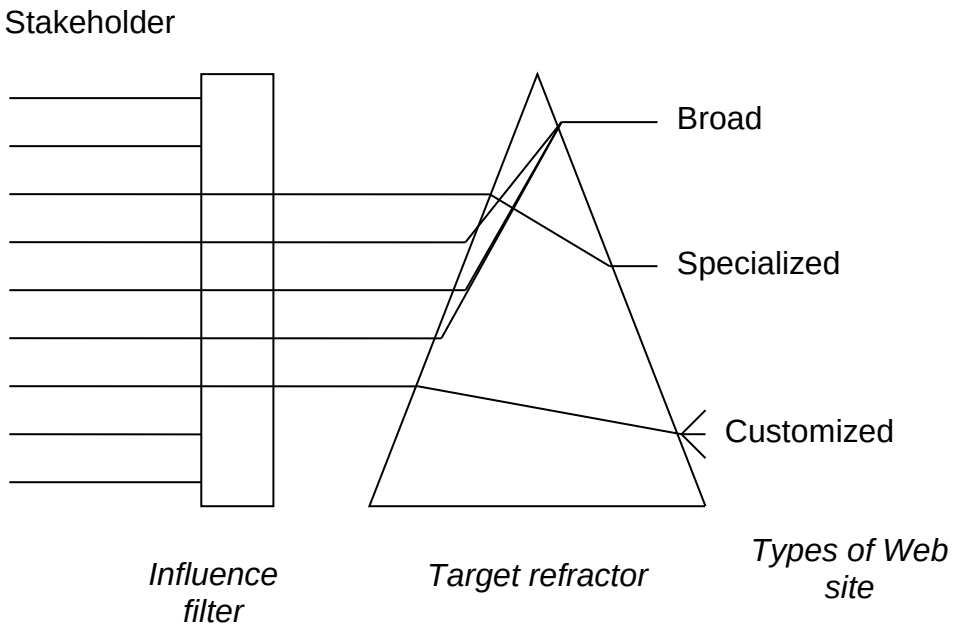


Fig. 7.1. **Two-stage model for attracting visitors to Web site** [16, p. 242]

The first stage involves identifying the target stakeholder groups and using some sort of **influence filter** that makes the site more attractive to the selected stakeholder group. Once this group has been attracted, the site's developer should develop a method for customizing the Web site to meet the needs of the stakeholders, called the **target refractor**.

Influence filters determine the group that will be attracted to the site.

The second stage of strategic planning involves the use of a target refractor to create the desired degree of customization of a Web site: broad, specialized, or personalized. With **broad customization**, a Web site attempts to communicate with several types of stakeholders or many of the people in one stakeholder category. A broad Web site provides content with minimal adjustment to the needs of the visitor. Many visitors may not linger too long at the site because little particularly catches their attention.

With specialized customization, a Web site appeals to a narrower audience. United Parcel Service (UPS), for instance, with its parcel tracking system, has decided to focus on current customers. A customer can enter a

receipt number to determine the current location of a package and download software for preparing transportation documentation. A **specialized Web site** may attract fewer visitors, but nearly all of those who follow the link find the visit worthwhile.

The marketer's ultimate dream is to develop an interactive relationship with individual customers, and a **personalized Web site** does just that. Database technology and back-end application software permit a Web site to be personalized to meet the needs of the individual. For example, many "My"Web pages exist, such as MyYahoo!, MyScudder, MyNetscape, and so on. With these sites, after completing a registration form, the visitor can then select what to see on future visits. All of the information on these "My" sites is controlled by a user name and password for security and privacy reasons.

Two types of personalized attractors exist. Adaptable sites can be customized by the visitor, as in the case of the "My" Web pages. For example, with the MyNetscape Web site, the visitor establishes the content, layout, and settings that fit his or her needs by answering questions or selecting options [16].

In contrast, an adaptive site learns from the visitor's behavior and determines what should be presented. This adapting of a site to the customer's needs usually occurs via a small data file, called a cookie, that the program stores on the user's computer. Amazon.com is among the best known of the adaptive sites. It tries to discover what type of reading material and music the visitor likes so that it can recommend books, CDs, DVDs, and so on in a special Web page that appears the next time you visit the company's Web site. It uses a cookie to remember you when you return to the site. Web sites such as Amazon.com have proved very successful in terms of mass customization, because every visitor feels as if the site has been customized just for him or her through a personal welcome and a suggested list of books. This is true even though thousands of people visit the same site each day.

## Control questions

1. What are the two stages of an attractor Web site?
2. How do an adaptable Web site and an adaptive Web site differ?
3. What are the methods of online marketing?
4. Describe the progress of the goods in the Internet.

5. Explain features of Internet advertising.
6. Give characteristics of types of online advertising.
7. Give indicators of online advertising campaigns evaluation.
8. Define Web site attractiveness.
9. Compare traditional and internet marketing methods.
10. Describe the advantages of online sales.
11. How to analyze competitiveness?
12. What are attractors? Why are they important in choosing an electronic commerce strategy?
13. What is an e-marketing plan?

## Theme 8. Payments technologies in information economy

8.1. The online banks and its functions.
8.2. The essence and features of electronic money.
8.3. Electronic payment system.

### 8.1. The online banks and its functions

The advent of the Internet and the popularity of personal computers presented both an opportunity and a challenge for the banking industry.

For years, financial institutions have used powerful computer networks to automate millions of daily transactions; today, often the only paper record is the customer's receipt at the point of sale. Now that its customers are connected to the Internet via personal computers, banks envision similar economic advantages by adapting those same internal electronic processes to home use.

Banks view online banking as a powerful "value added" tool to attract and retain new customers while helping to eliminate costly paper handling and teller interactions in an increasingly competitive banking environment [44].

**Online banking** (or **Internet banking** or **e-banking**) allows customers of a financial institution to conduct financial transactions on a secure Web site

operated by the institution, which can be a retail or virtual bank, credit union or building society. It may include any transactions related to online usage [42].

Nowadays online banks exist in two forms. One is totally based on the Internet. This type of bank carries out all operations via the Internet, such as Security First Network Bank (SFNB). The other one develops the operations through the Internet on the basis of current business banks by opening electronic service windows online, which is called the e-bank system based on traditional banks [22].

To access a financial institution's online banking facility, a customer having personal Internet access must register with the institution for the service, and set up some password (under various names) for customer verification. The password for online banking is normally not the same as for telephone banking. Financial institutions now routinely allocate customer numbers (also under various names), whether or not customers intend to access their online banking facility. Customer numbers are normally not the same as account numbers, because a number of accounts can be linked to the one customer number. The customer will link to the customer number any of those accounts which the customer controls, which may be cheque, savings, loan, credit card and other accounts.

To access online banking, the customer would go to the financial institution's Web site, and enter the online banking facility using the customer number and password. Some financial institutions have set up additional security steps for access, but there is no consistency to the approach adopted [42i].

Online banking allows us to perform various services with the click of a mouse. **Functions of online banking** [44]:

*1. Pay a bill.*

Electronic bill payment service allows a depositor to send money from his or her online account to a creditor or merchant, for example to a public utility or a department store. There is no need to stand in a long line on a weekend morning to handle your transactions! The payment is virtually instant, though some financial institutions can wait until the next business day to send out the payment. If it is necessary, the bank can generate and mail a paper cheque or banker's draft to a creditor who is not set up to receive electronic payments.

*2. Schedule payments in advance.*

Most banks offer customers the ability to schedule a payment on a specified date. Once the amount is entered and the payee is checked off, the funds are automatically deducted from your online bank account.

It is especially useful if you always forget due dates.

*3. Transfer funds.*

With online banking, you can make money transfers between your own accounts, or send money to a third party account. All you need is recipient/payee information and enough funds in your account. Quite often, the operations are performed in real time.

*4. Manage all your accounts in one place.*

Online banking is a great time saver because it provides an opportunity to handle several bank accounts (checking, savings, CDs, IRAs, etc.) from one site. Most new accounts you open will be automatically added to online banking.

*5. View images of your checks online.*

With online banking, you can view and print scanned images of the front and back of all checks you have written. It is easy and convenient.

*6. Apply for a loan or credit card.*

Having an account online, you can apply for a credit card or a loan (a car loan, a student loan, a mortgage, a home equity loan, etc.) from the same bank. If you have a good credit score and long relationship history with your bank, your application is likely to be approved.

*7. Purchase and manage CD accounts.*

If you have some amount of money you want to invest, you can purchase a certificate of deposit from your bank. Online banking lets you compare all available offers and their terms, for example APY or maturity periods. When you confirm the purchase, the funds will be automatically deducted from your account.

*8. Order traveler's checks*.

You can order Traveler’s Cheques online. The bank will typically charge your online account for the amount of the cheques you bought and an express delivery fee.

*9. Increase your overdraft.*

Going into the red shouldn't leave you red-faced! You can increase your overdraft online. Log in to online banking and click on 'Overdraft' in the menu.

*10. Order a cheque book.*

Save yourself at least one trip to the bank by ordering cheque book online. You will need to visit your bank once when you get a confirmation message that your cheque book is ready for collection.

*11. View up-to-the-minute account statements and balance*.

There is no need to wait for the bank statement to arrive in the snail post to check account balances. You can view all transactions and withdrawals every day just by logging in to your online account. In addition, you can immediately notice errors or unauthorized transactions in the statement.

*12. View automatically updated spending report.*

All your purchases are sorted into familiar categories automatically - no receipts to save, no expenses to enter. It is easy to see where your money goes!

*13. Track your payment history.*

Online banking gives you an opportunity to search your payments by transaction type, date, description or amount. When did you last pay Company X? When did you buy your computer? To whom did you make your most recent payment? Your bank knows the answers.

*14. Integrate the data with personal finance programs.*

Online banking lets you import electronic payment data in personal finance software. You will be able to access your online accounts directly from your personal finance program. An Internet connection and online account log in information is required.

*15. Change contact details.*

You can log in to your online account and change contact information (e-mail address, telephone number, password, etc.). It is more secure than to send this information by e-mail.

*16. Utilize investment research.*

You can receive real-time quotes, analytics, news and stock market information to make a more educated decision.

*17. Take advantage of online brokerage.*

Internet banking lets you invest online. You can place and confirm trades 24 hours a day, seven days a week. Most banks provide a wide range of money market instruments from various issuers.

*18. Get alerts.*

This service allows you to receive timely e-mail messages from your bank about any critical changes related to your Internet accounts. For example, you can get alerts when you make a withdrawal or change your contact information.

*19. Verify terms and conditions.*

You can verify all information about your account online.

*20. Chat with your customer assistant department.*

If you need help, you can send message to your bank's customer assistant department. They will help you solve your problem.

## 8.2. The essence and features of electronic money

**Electronic money** (also known as **e-currency, e-money, electronic cash, digital money, digital cash**) – all types of money which people deal with electronically, far from traditional ways of payment like banks, cheques, paper money and coins, e-Money allow users through internet or wireless devices to pay the charges of their purchases directly from their bank accounts by electronical ways such as Smart cards, Digital wallets and micropayments [42].

There are two different **types of approaches to electronic money**: on-line and off-line electronic money [29].

*On-line* means there is a need to interact with a bank or another "trusted third party" (via modem or network) to conduct a transaction. On-line systems prevent fraud by requiring merchants to contact the bank's computer with every sale. The bank's computer maintains a database that can indicate to the merchant if a given piece of electronic money is still valid. This is similar to the way merchants currently verify credit cards at the point of sale.

*Off-line* means that a transaction can be conducted without having to involve a bank directly. Off-line electronic money systems prevent fraud in basically two different ways. There is a hardware and a software approach. The hardware approach relies on some kind of a tamper-proof chip in a smart card that keeps a mini database. The software approach is to structure the electronic money and cryptographic protocols to reveal the identity of the double spender by the time the piece of e-money makes it back to the bank. If users of the off-line electronic money know they will get caught, the incidence of double spending will be minimized, at least in the theory.

On-line or off-line, those six characteristics( independence, security, privacy, transferability, divisibility, and ease of use(define the problem space that each electronic money system promoter attempts to solve for one goal: public acceptance wide enough to make the system profitable for those who run it.

It is important to consider the advantages and disadvantages of electronic money because these schemes are set to become the future replacement of physical cash. A brief description of these will be seen now.

**Advantages**. Perhaps one of the main advantages of the proposed system is for the issuing banks. The credit card and debit card payment systems that are in effect are costly, as they require a complex system of contractual and operational interactions between consumers, retailers and issuers. Another factor that elevates the cost of this system – and in particular in credit card payments – is that consumers have to be credit worthy in order to receive credit. This means that the cost of those who do not pay back credit is transferred to other consumers in the shape of interest rates. One of the results of this high cost is that this payment system is not efficient for micropayment systems, such as those that are increasingly popular on the Internet with the adoption of pay-per-use schemes such as digital music, e-books and Internet performances [31].

In contrast to this, electronic money works in a much simpler and cheaper way, which makes it ideal for micro-payments and thus much more attractive for credit companies. The low cost of electronic money is that it does not require the huge amount of expensive infrastructure that other systems do, in particular credit cards, because the value in a card can be transferred into a reader without need to contact a network facility to corroborate the payment, the transaction can be performed locally and the money will stay in the reader until later download [31].

Several authors have pointed out many of the advantages of the electronic money model. Some of these are:

*1. Consumer convenience.* Electronic money could prove very convenient for consumers. Because it involves advanced charge of money from the owner’s bank account, almost anybody can be supplied with a smart card, as there is no risk to the issuer. Consumers will also find it useful to have to do without carrying cash for small transactions, such as bus fares.

2. *Increased consumer confidence.* Because a smart card only holds the amount of money that the bearer has placed on it, consumers will be

more willing to use it to purchase over the Internet without fear of somebody else misusing the payment information, as happens with credit card fraud. Some of the schemes are also being issued with a built in locking code, which will allow users to lock the cash on a card, making sure that if the card gets lost or stolen another person will not be able to use the money.

*3. Payer anonymity.* The payer can remain anonymous, as is the case with paying in cash.

4. *Issuer advantages.* As it has been mentioned, this system is much cheaper to operate than other payment models, which is a great advantage for issuing institutions. The liability for the issuer is also minimal, which reduces costs and enhances profits [31].

**Disadvantages.** Although the potential advantages for electronic money are considerable, there are still several problems that should provide a healthy dose of skepticism for this payment system.

*1. Consumer confusion.* With three schemes competing to become the electronic money standard, there is a real possibility of the whole system becoming too complicated for users. One of the main problems with too many schemes would be that the user may not be able to use the card everywhere, which is what would be expected of a system that is meant to replace physical currency.

2. *Regulatory maze.* As it will be seen later, the regulation for electronic money is still unclear in some vital points, which must be answered before the system is made more widely available.

3. *Security.* The main concern that must exist in the minds of those interested in the implementation of electronic cash must be security. As happens with physical cash, widespread counterfeiting of electronic currency could have huge implications for the economy [31].

## 8.3. Electronic payment system

Compared with traditional payment means, e-payment has the following features [22]:

(1) E-payment introduces digital circulation to realize information transmission, so all means of e-payment are all digitalized; but traditional payment is realized through physical circulation such as cash circulation, bill transfer and bank exchange.

(2) The working environment of e-payment is based on an open system platform (namely, the Internet); while traditional payment is operated in a relatively closed system.

(3) E-payment uses the most advanced communication means, such as the Internet and Extranet, while traditional payment uses traditional communication media. E-payment has a very high requirement for both software and hardware facilities, generally including online terminals, relevant software and some other supporting facilities; while traditional payment does not have such a high requirement.

(4) E-payment enjoys advantages, for it is convenient, fast, efficient and economic. As long as the user has a computer connecting to the Internet, he will be able to stay indoors and complete the whole payment within a very short time. The cost is even less than one percent of that of the traditional way.

There are five forms to carry out e-payment, representing the five different phases in the development of e-payment.

1) the bank uses computers to process the business and settlement between banks;

2) the computers of the bank make settlement with other organizations, such as paying salaries;

3) network terminals are used to provide banking services for clients, for example, clients could withdraw and deposit money on ATM;

4) POS terminals are used to provide automatic deduction services for clients, which are the principal means of e-payment nowadays;

5) it is the latest phase, in which e-payment enables direct transfer and settlement through network at any place and any time, thus bringing into existence e-commerce environment. This is a developing phase, which will also be the principal means of e-payment in this century. E-payment in this phase is also called online payment, and the online payment tools include credit card, digital cash, e-check and intelligent card [22].

Financial services Web sites are enjoying rapid growth as they help consumers, businesses, and financial institutions distribute information with greater convenience and richness than is available in other channels. Consumers in e-business markets pay for products and services using a credit card or one of the methods outlined in Table 8.1.

Table 8.1

**Types of Online Consumer Payments** [7, p. 82]

| Online Consumer Payments | |
|---|---|
| **Financial cybermediary** | A ***financial cybermediary*** is an Internet-based company that facilitates payments over the Internet. PayPal is the best-known example of a financial cybermediary. |
| **Electronic check** | An ***electronic check*** is a mechanism for sending a payment from a checking or savings account. There are many implementations of electronic checks, with the most prominent being online banking. |
| **Electronic bill presentment and payment (EBPP)** | An ***electronic bill presentment and payment (EBPP)*** is a system that sends bills over the Internet and provides an easy-to-use mechanism (such as clicking on a button) to pay the bill. EBPP systems are available through local banks or online services such as Checkfree and Quicken. |
| **Digital wallet** | A ***digital wallet*** is both software and information—the software provides security for the transaction and the information includes payment and delivery information (for example, the credit card number and expiration date). |

Online business payments differ from online consumer payments because businesses tend to make large purchases (from thousands to millions of dollars) and typically do not pay with a credit card. Businesses make online payments using electronic data interchange (EDI) (see Table 8.2). Transactions between businesses are complex and typically require a level of system integration between the businesses.

Many organizations are now turning to providers of electronic trading networks for enhanced Internet-based network and messaging services. Electronic trading networks are service providers that manage network services. They support business-to-business integration information exchanges, improved security, guaranteed service levels, and command center support. As electronic trading networks expand their reach and the number of Internet businesses continues to grow, so will the need for managed trading services.

Table 8.2

**Types of Online Business Payments** [7, p. 82]

| Online Business Payments |
|---|
| ***Electronic data interchange (EDI)*** is a standard format for exchanging business data. One way an organization can use EDI is through a value-added network. A ***value-added network (VAN)*** is a private network, provided by a third party, for exchanging information through a high-capacity connection. VANs support electronic catalogs (from which orders are placed), EDI-based transactions (the actual orders), security measures such as encryption, and EDI mailboxes. |
| ***Financial EDI (financial electronic data interchange)*** is a standard electronic process for B2B market purchase payments. National Cash Management System is an automated clearinghouse that supports the reconciliation of the payments. |

Using these services allows organizations to reduce time to market and the overall development, deployment, and maintenance costs associated with their integration infrastructures [7].

## Control questions

1. Define electronic payments.
2. Characterize electronic payment systems and settlement.
3. Give disadvantages of electronic payments.
4. Describe requirements for electronic payments.
5. Describe the electronic money.
6. What is the difference between electronic money and transfer money electronically?
7. Define online banking.
8. Describe functions of online bank.
9. Explain forms of e-payments.
10. What are the available payment systems for electronic commerce?

## Theme 9. E-commerce evaluation

9.1. Methods of the evaluation and analysis of e-commerce Web sites.

9.2. Methods of e-commerce case analysis.

## 9.1. Methods of the evaluation and analysis of e-commerce Web sites

**Effectiveness of the site** is determined by how it promotes the proposed goods and services, emphasizes the benefits of this particular product line. The site should provide clear and understandable information about the characteristics of specific products and services, as well as the ways and forms of order and payment. Answers to these questions are provided by analysis of traffic to the site (how many and which users are registered to counter Web site during the reporting period, what information they were seeking, etc.) and according to the provider (which pages are visited by foreigners). A simple software is used to evaluate the priority of visited pages, with some efficiency and frequency of search engines and directories, as well as any additional posted links to other Web sites to derive the site visitors. The result of the analysis of the effectiveness of Web site is to make changes in design and / or the commercial part of the site (in particular, changes in product range, prices, sales conditions, etc.). Poorly visited pages must be revised and modified [4].

There are many different models, or frameworks, that you can use to understand the Internet economy, and to develop an appropriate business strategy. One of the models which I use is the five stage conversion process. I find it helpful to analyze our "Web site efficiency", and to know where to invest more on our marketing efforts.

***The Conversion Process***

When you ask most people about their objectives for their Web site, they typically tell you one thing: to maximize sales. It seems that many people still have the "build it and they will come" attitude. The goal of marketing, for these people, is simply to convert a potential buyer into an actual buyer.

However, "conversion" is more complex than that. Research shows that it is not a single step process. In fact, for online businesses, it is helpful to think of five separate questions [36].

1. how do people find out about your site?
2. why do they initially visit your site?
3. what makes them stay?
4. what makes them purchase?
5. and what makes them come back for more?

More formally, we can describe the conversion process in terms of five stages, and the associated objective at each stage (Table 9.1).

At each stage, it is possible to measure your efficiency at achieving the conversion objective. Below is a description of each stage, and an explanation of how to calculate the relevant type of conversion efficiency.

Table 9.1

**The Conversion Process**

| Stage | Conversion | Objective |
|---|---|---|
| Awareness | surfers | aware surfers |
| Attraction | aware surfers | hits |
| Contact | hits | visitors |
| Closure | visitors | purchasers |
| Retention | purchasers | repurchasers |

**Awareness**

The first objective is obviously to build awareness of your Web site; to make your Web site known to potential visitors. At this stage, you want to effectively target your market, advertising in places where you expect to reach the most appropriate audience.

Awareness efficiency (AWe) refers to your effectiveness at making your target audience aware of your Web site. Awareness efficiency can be calculated quite easily: it is equal to the number of aware surfers divided by total number in your target audience.

$$AWe = \frac{\text{aware surfers}}{\text{target audience}}$$

**Attraction**

Once you have built awareness of the existence of your Web site, the next objective is to attract them through the front door. It is important to distinguish between awareness and attraction. For instance, I am aware that The Gap has a Web site, but I have never visited it. Similarly, a certain segment of your target audience may be aware that your Web site exists, but have not yet visited it. Before they can visit, they need to be aware of its existence.

Attraction efficiency (ATTe) refers to your effectiveness at converting an aware person into a "hit" at your Web site. The attraction efficiency of your Web site is the ratio of number of hits to the number of aware surfers.

$$ATTe = \frac{hits}{aware\ surfers}$$

**Contact**

Even once you have attracted a person to your Web site, your job is still not done. Many first time visitors will only stay a few seconds before hitting the "back" button on their browser. There are a number of reasons why it may be difficult to keep the surfer's attention:

if your Web pages load too slowly, or

if it is unattractive, or

if they discover that the Web site is not what they expected, or

if they were busy doing something else, so they don't have time to make a thorough visit.

*For this reason, a "hit" is not the same as a "visit".*

Contact efficiency (CONe) refers to the ability of your Web site to turn a fleeting "hit" into a meaningful visit. A "meaningful visit" might be interpreted to mean "visit for more than 10 minutes", or "visit more than 5 pages", or "read the contents of a particular page". The point is that you want people to become active visitors, interested and engaged with your Web site. How *you* define "meaningful visit" is a question that depends on the objectives of your business.

However you decide to define "meaningful visit", the contact efficiency (CONe) of your Web site can be measured by taking the ratio of visitors to hits.

$$CONe = \frac{visitors}{hits}$$

**Closure**

Ultimately, you want the visitor to take some desired action. In many cases, that means making a purchase, however, it may be subscribing to

your newsletter, entering a contest, or downloading your software. For simplicity, I will refer to this desired action as a "purchase".

Closure efficiency (CLOe) refers to your Web site's ability to convert a visitor into a purchaser. It can be calculated by dividing the number of purchasers by the total number of visitors.

$$CLOe = \frac{\text{purchasers}}{\text{Visitors}}$$

**Retention**

Perhaps even more important than closure is retention, which is your ability to convert a purchaser into a repeat purchaser. Depending on the nature of your products or service, repurchases may actually represent the lion's share of your revenue.

Retention efficiency (RETe) is calculated as the ratio of purchasers to repeat purchasers.

$$RETe = \frac{\text{repurchasers}}{\text{Purchasers}}$$

**Maximize Web site Efficiency**

The overall efficiency of Web site is a function of each type of conversion efficiency described above. Ideally, you would like to maximize all of the five: awareness, attraction, contact, conversion, and retention efficiency.

Although each one is important, you will probably find that it is rational to focus on one or two in particular.

The first step is to begin measuring each of the conversion efficiency indicators for your Web site. This will help you to know which areas need improvement, and where your marketing efforts will be most effective [36].

## 9.2. Methods of e-commerce case analysis

It is very important to analyze and summarize the case of e-commerce. Case study can make readers understand theories more deeply; they can turn knowledge to technology, so that theory study and practice can be

integrated; they can also improve the readers' ability to use knowledge for solving real problems.

There are different methods of e-commerce case analysis [22].

**1. PEST analysis (general environment analysis)**

PEST analysis, also called general environment analysis, is made from the initials of four words: politics, economy, society and technology.

The matrix method which divides the coordinate into four quadrants is usually adopted in PEST analysis. If we take politics and economy as the coordinate, it should develop when both the political and economic environments are good. If neither of them is good, there is no means to develop. While one is good but the other is not good, proper consideration should be taken to make a decision.

PEST analysis is usually used in exterior environment analysis of corporations.

**2. Competition factor analysis**

If one corporation wants to enter into another new field or an old one tries to develop a new product, competition factors should be analyzed.

There are mainly four competition factors:

1. *Development of substitutes*: for example, the output of video tape recorders used to be great, but once a potential substitute VCD appeared, the sale of video tape recorders decreased soon. The emergence of TV also gave a hard blow to film industry. Whatever product it is, it will be substituted one day. The old one gets affected while its substitute is in a predominant state.

2. *Joining in of potential competitors*: if substitute exists, there must be potential competitors at the same time.

3. *Bargaining strength of suppliers*: the upstream of products is the suppliers who always want to increase their profits. In fact they are a source of competitive force, and a potential threat.

4. *Bargaining strength of customers*: Downstream clients try their best to cut your price.

**3. BCG Matrix and Value Chain Analysis**

BCG matrix makes a matrix from the rate of sale increase and relative market share, and it is analyzed through four quadrants. If an enterprise produces various kinds of products, a discussion should be held to decide which one should be continually developed and which one not.

The value chain analysis of products analyzes every link of products from research, production, sale to after-sale service, to find out which link is not done well and which one causes extra profits.

**4. SWOT Analysis**

SWOT analysis is one of the most popular ways for strategic management analysis, which is more important than all the methods we have talked above. SWOT comes from the initials of four words: superiority, weakness, opportunity and threat. It is the most commonly used and most effective way.

While analyzing enterprise's inner and exterior environment, we can divide it into two parts, which are also the first two parts of SWOT analysis: one is the superiority an enterprise owns, the other is weakness. When we talk about its exterior environment, it can also be divided into two parts, which is the latter two parts of SWOT analysis: one is the opportunity we have, the other one is the threat outside.

Decrease inner weakness while avoiding exterior threat.

**5. Three ways to analyze competitiveness**

The so-called three ways to analyze competitiveness refer to three strategies enterprises take in competition: *differentiation strategy, concentration strategy and low-cost strategy.*

*Differentiation strategy* means to achieve superiority in competition by supplying unique products and services to meet customers' special needs. The cause of this strategy relies on enterprise's characteristic product and service instead of its cost.

If the customers in the market are more sensitive about price, to be supplier in the field with the *lowest cost* can be a very powerful means of competition. The strategic goal of low-cost-oriented supplier is to gain long-lasting cost superiority rather than extremely lower cost. While gaining the leadership in this aspect, enterprise managers must consider the most important characteristics and services regarded by the customers.

*Concentration strategy* means focusing on a specific market as the goal, and supplying specific products or service for a special area or customer group, which is quite different from the other two strategies. Cost superiority strategy and differentiation strategy face the whole field and act in it. However, concentration strategy chooses a specific goal to carry out

intensive production which calls for more efficient services than the competitors' ones [22].

**6. Model analysis of five forces**

Customers' competitive environment can be efficiently analyzed by using the way to analyze the competitive strategy. Potter's "five forces" analysis is a static profile scan to an industry's profitability and attractiveness, which explains the average profit opportunities of the enterprises in this industry. So it is a measurement index of a whole industry's situation, not an index of a single enterprise. Usually this method can be used in analyzing the ability of making profit by establishing a new enterprise in certain industry. The main contribution Michael Potter has made to the management theory is to have set up a bridge between industrial economics and management. He believed that the profitability of an enterprise is determined by five forces that are the present competitive situation, suppliers' bargaining strength, customers' bargaining strength, threats from substitutes or substitute services and threat from the new comers of an industry. And the core strategy of an enterprise should lie in the choice of a right industry and an attractive position for competition [22].

Strategy analysis has many ways to be realized. The most usual ones are PEST analysis, competitive factor analysis, value chain analysis and BCG matrix analysis. Of all these methods, SWOT analysis is the most important one. One thing needs to be emphasized is that information should be healthy, unpolluted and real. Know both the enemy and yourself, and you can fight a hundred battles with no danger of defeat. While carrying out strategy analysis, it is very important to seek truth from facts because it is important not to exaggerate one's superiority and to avoid the weakness.

## Control questions

1. Describe the methods of e-commerce analysis.
2. Describe methods of e-commerce case analysis.
3. How to optimize the effectiveness of Web site?
4. Define effectiveness of a site.
5. What is conversion process?
6. Suggest methods of Web site efficiency maximization.

# Practical work

## *Workshop 1*
## Topic "Global trends of the information economy"

1. The main features of the information economy.
2. Information economy development in the USA.
3. Information economy development in China and Japan.
4. Information economy development in European countries.
5. Information economy development in Ukraine and Russia.

## *Case study 1*
## Topic "The structure of information flows of the enterprise"

***Objective:*** To learn how to analyze information exchange between enterprise and the environment, and communication flows within the enterprise.

***Task:*** Based on the company activities and its organizational structure to determine the basic structure and direction of information flow in the enterprise; describe the structure of information circulating in the process of the enterprise activity.

***Steps:***

1. Analyze the information communication within the company:

• review the organizational structure of enterprises, look to the objectives and functional responsibilities of each department;

• define the relationship of each department with other divisions of the company;

• based on the relations departments structure to identify possible information links between departments and determine the direction and structure of information flows (describe the structure of information transmitted by the information exchange between departments);

2. Analyze the information communication enterprise with the environment:

• identify the main elements of the external environment company, which interact with them in the process of enterprise activity;

• describe the structure of information exchange with the environment by identifying input and output information flows, to determine the structure of circulating information.

## Business Review

### Company "ICT"

The main objective of the enterprise is the maintenance and servicing communications systems and computer networks. To this goal, the company enters into a contract for maintenance and servicing communications systems and computer systems with other companies. In some cases, the property (communication systems) owned company and is available to enterprises on lease terms.

The company has the right to:

1) provide services to enterprises, organizations under contracts;

2) buy, sell to other businesses and organizations, take businesses and individuals to rent, provide for temporary use buildings, vehicles, equipment and other tangible assets, and to remove existing on the balance of the property;

3) transfer to the contractual principles of material and financial resources to other businesses, organizations and individuals that produce products or perform work for the company and services.

The main consumers of services "ICT" are banks, industrial enterprises, small and medium-sized firms. For these organizations "ICT" provides for the establishment and maintenance of computer networks and ATX.

To provide quality services "ICT" in their activities using equipment and software from leading Ukrainian and foreign producers.

The main legal documents in the relations between enterprises are commercial contracts (agreements), which constitute the parties' agreement on the establishment and management of any relationship.

Also a contract for maintenance and servicing was signed.

## Job descriptions

Document plays an important role in the company. Very important is documenting agreements (contracts). A very important aspect is the design of payment documents (invoices, etc.), acts of works, etc. (Fig. 10.1).

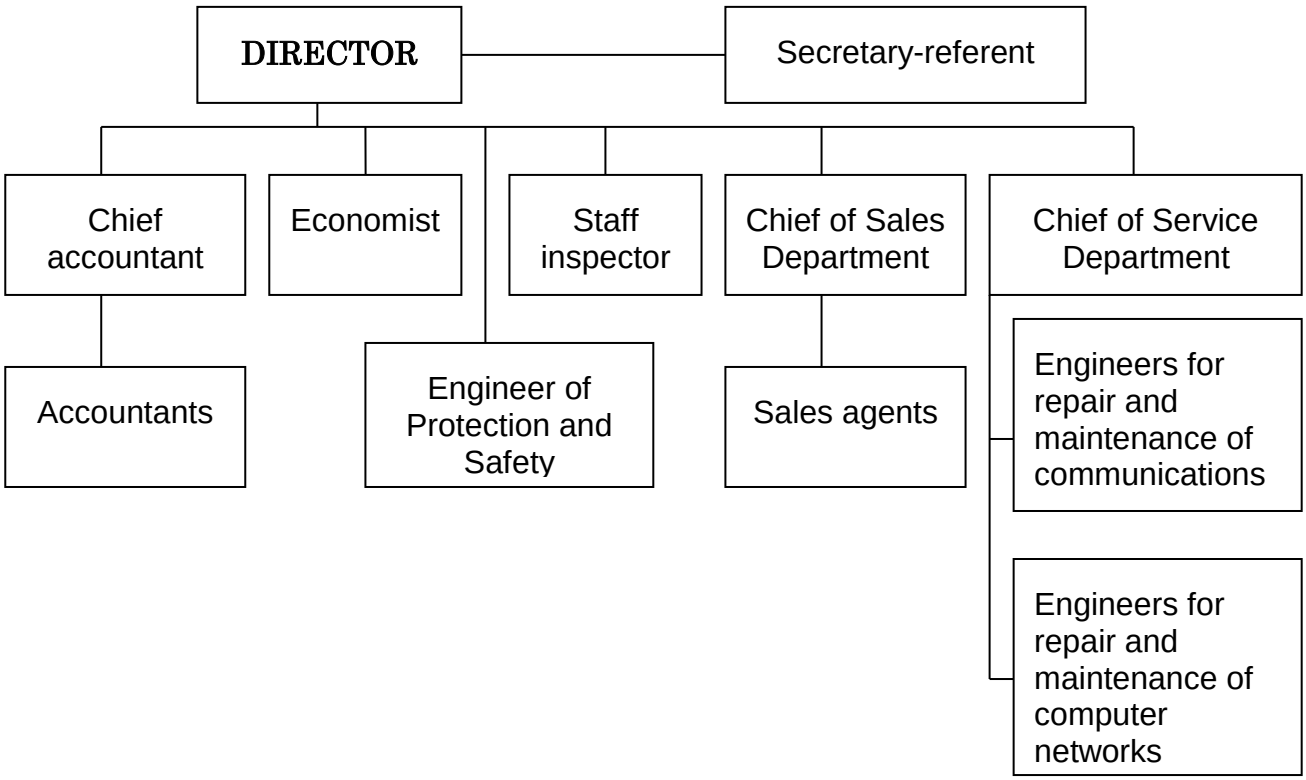


Fig. 10.1. **The organizational structure of "ICT"**

In the company three sets of documents are released:

1) internal;

2) incoming;

3) outcoming.

Each of these groups has its own particular filing and transmission. *Secretary-referent* accepts and processes documents that are received.

The *Director* is the head of the company. He solves independently all the issues of the firm, acting on behalf of the firm, represents its interests in all enterprises, firms and organizations. He also manages within his right to property, making contracts, including staffing, issues orders and instructions obligatory for all employees. The Director is, within his powers, fully responsible for the activities of the company, safeguarding of inventory,

equipment and other assets of the enterprise. Gives orders, opens a bank account.

The chief accountant (accountants); Staff Inspector (Personnel Department), economist; Sales department; Services Department, the engineer for the protection and safety, secretary-referent report to the director.

*Chief Accountant* organizes business accounting and financial activities of enterprises and controls the calculation of material, labor and financial resources, organizes accounting of funds that are received, inventory and fixed assets, integration costs of production and circulation of works, as well as financial and credit transactions.

The Chief Accountant is in charge of *accountants*. They carry out work in asset accounting, cost of production of services and repairs cars, payments to suppliers and customers.

*Staff Inspector* performs work for the company personnel and office workers, makes sure they have qualifications and professional qualities. He is responsible for staffing, dismissal, transfer, controls the placement and correct employment of employees in the departments, handles job applications and new applicants.

The *Economist* is organizing and improving the company's economic activity, aimed at improving productivity, efficiency and profitability, product quality, which is produced, reducing its cost, to ensure correct relations in labor productivity growth and wages, to achieve maximum results with the least expenditure of material, labor and financial resources.

*Sales Department* involves sales agents services. The duties of sales agents department include:

knowledge of business;

product range awareness.

*Sales Agents* are responsible for:

the quality execution of orders for services;

implementation plan for the provision of services.

The rights of these employees are limited – to the extent of the job description proposals aimed at improving the work can be made.

*Safety Control Engineer*. The duties of the engineer include: systematic monitoring of the implementation of labor regulations, ensuring proper maintenance of office and industrial premises. This person's responsible for the execution of the basic requirements of safety and protection, quality and

timeliness of performance. He has the right: to make proposals on issues that are the responsibility of the department, with the selection and placement of personnel, providing suggestions for the promotion of workers and imposing penalties on them in accordance with the law, to organize the work of the department in carrying out assigned tasks and adherence to high quality work, and to establish favorable conditions for highly productive labor.

*Services Department*. The duties of the department services include: providing quality services to customers, works on repair and maintenance of equipment, maintenance, etc.

The duties of the *services engineers* include: knowledge of safety rules, fundamental electronic circuits and the principles of electronics.

## *Case study 2*
## Topic "Automating the company"

Victor Kravchenko is the director of the company "Orbit". He is technically competent expert in the industry, a good organizer of production. He has only a basic understanding of computers, working with a specialized computer as a user. He gained experience in a large enterprise. During the period of general crisis and the catastrophic decline in production at the large company he was forced to resign. He organized his small enterprise engaged in the repair of electric motors. Besides working in the service sector, the company is engaged in wholesale trade of supporting goods.

The company "Orbit" won credibility by strenuous efforts and high-quality orders. The number of customers each year has increased and stabilized. In the company office only fax and typewriter are used. Billing, invoices, tax invoices are carried out manually. Bank documents are printed by a typewriter. Accounting is also carried out manually.

The increase in customers and turnover caused an increase in documents. It took considerable time working with routine paperwork. Gradually, this area of work was becoming apparent "bottleneck." The director of the enterprise is increasingly aware of the need to resolve this problem, of automation, but nothing has been started.

The accountant of the enterprise Anatolii Klochko is a specialist with technical background, who also previously worked at one of the industrial

enterprises and during the crisis had retrained as an accountant. He has never worked with computers. Change all accounting process.

The manager Natasha Gordienko is a young specialist with higher education. A year ago, she completed her studies at the university as a manager. The university had a computer class, and she had known the simplest methods of preparing documents in the Word and Excel. Her duties included working with the ordering, billing, invoices, tax invoices, payment orders.

The year was profitable for the company, and the director finally decided to purchase a computer.

A week later a brand new computer with laser printer was brought and installed in office. Computer specialists have installed a general software. The typewriter was pushed aside, but left on the table.

First problems began after installing the computer. Near the table there was only one socket. The table was not suitable for the computer. Everything required additional costs.

After solving the first problem there are more. They had to learn to work on PC. Supplier firms recommended purchasing anything from books series "For Dummies" or going for computer courses. There were a lot of complex terms completely unclear.

Somehow, in the period between reports Anatolii again turned on the computer and started to work, but voltage has disappeared. After some time there was voltage, but the computer no longer worked. The company had to call computers' suppliers. They reported that the guarantee does not cover defects caused by excess voltage on the network, and was discharged due to change of computer power supply.

The director called an emergency meeting of all the company. It was decided to collect information about how to work with computers in other firms and use their experience.

Information about other companies was very different. Different companies have both positive and negative experience of computers. Some companies only bought a computer and it does not work. Some firms have introduced computers and used software packages such as "Accounting - 1C", "Warehouse", using Word and Excel for printing of orders and invoices. Therefore, the company "Orbit" decided to use the positive experience of other firms and to upgrade their operation (Tables 10.1 – 10.3).

Table 10.1

## Management systems (software)

| | Local systems for small business | Integrated systems | | |
|---|---|---|---|---|
| | | Small | Average | Large |
| IS | 1C<br>Parus<br>Kompas | Navision<br>Scala<br>Galaktika<br>other | J.D.Edwards<br>Platinum<br>SQL<br>other | SAP R/3<br>Baan<br>Oracle<br>other |
| Implementation Difficulty | Easy, to 1 month. | Phased, 4 months and more | Phased, 6-9 months | Phased, complex, 9-12 months. |
| Price of IS, UAH | 2 500 | 10 000 (domestic), 50 000 (foreign) | 100 000 | 0,5 mln. |

Table 10.2

## Prices of Training, Information Services

| Services | Price, UAH |
|---|---|
| Training with a special software package | 280 (hour / person) |
| Training departure of a customer | 320 (hour / person) |
| Information support and maintenance | 240 (hour) |
| Program Development | 5 000 |
| The program upgrade (independently) | 2 700 |
| Monthly wages IT specialist | 3 500 |

Table 10.3

## Prices on computers

| Position | Price, USD |
|---|---|
| 1 | 2 |
| **Computers:** | |
| basic office PC | 413 |
| advanced office PC | 585 |
| Super PC | 1 520 |
| computer BRAVO Studio | 1 710 |
| graphic station BRAVO | 2 430 |
| application server BRAVO | 4 050 |
| Office server (Dell, Intel, Maxtor, Quantum) | 4 800 – 6 000 |

Table 10.3 (the ending)

| 1 | 2 |
|---|---|
| **Printers:** | |
| printer Canon LBP-800 | 280 |
| printer HP LaserJet 1100 | 360 |
| printer Kyocera FS-680 | 398 |
| printer Lexmark Optra E310 | 380 |
| printer Minolta PageWorks/Pro 1100L | 397 |
| printer Xerox DocuPrint P8e | 330 |
| **Communication Equipment:** | |
| Internet-server | 140 – 505 |
| Print-server | 135 – 370 |
| **Additional equipment:** | |
| Uninterruptible Power Supply | 80 – 400 |

**Tasks:**

1. Make a plan of automating the company "Orbit", make calculations of necessary investment.
2. Justify the need for implementation of information systems.
3. Calculate the cost of IT servicing for a month.

## *Case study 3*
## Topic "Roche's new scientific method"

For years, the Swiss pharmaceutical giant, Roche Group, pitted veteran scientific teams against one another. The competing teams were mandated to fight one another for resources. That proud, stubborn culture helped Roche develop blockbuster drugs such as Valium and Librium. But, Roche's ultra competitive approach made it almost impossible to abandon faltering projects, because scientists' careers were so wrapped up in them.

Researchers were tempted to hoard the technical expertise they picked up along the way, since sharing might allow others to catch up. In 1998, the company replaced its gladiator mentality with a more collaborative style of teamwork – especially in the chaotic, booming new field of genomics. So Roche began running ads in the back pages of *Science* magazine, looking for

a new breed of researcher – people who were starting out, who could reinvent themselves as job opportunities changed.

For Roche, these are thrilling times. Week by week, new breakthroughs in genomics and molecular biology are upending the way it hunts for new drugs. It's now possible to pursue new drug targets with a speed and gusto that would have been unimaginable a few years ago. It's possible to size up toxicity risks earlier than ever. And it's becoming possible to match up drugs with the people who are best suited for them, ushering in an era of customized medicines.

But the genomics revolution is incredibly jarring as well. In fact, reckoning with its impact demands a fresh start in the fundamentals of innovation and R&D. Old ways of managing projects don't make sense. Roche can now run *1 million* genomics experiments a day, churning out enough data to overwhelm every computer it owns. Research teams that once spent years looking for a single good idea now face hundreds or even thousands of candidates. Without a clear way to handle all of this information, it's possible to drown in the data.

Still, at the highest levels of Roche, there is real excitement about what lies ahead. At a media briefing last August, Roche Group chairman and CEO Franz Humer declared, "Look at this revolution of genetics, genomics, and proteomics. It's becoming ever clearer that we will be able to identify early the predisposition of people to disease – and to monitor and treat them more effectively. We'll develop markers for cancer. That will lead to better test kits and to new pharmaceuticals."

So what is the right way to reconfigure a company when breakthrough technology shows up on its doorstep? Step inside Roche's U.S. pharmaceuticals headquarters, and you'll see how that adjustment is taking place. It begins with something as basic – and hard – as embracing the excitement of having way too much data, too fast. It goes on to include new thinking about the best ways to build teams, hire people, and create a culture where failure is all right, as long as you fail fast. The only way to embrace a technological revolution, Roche has discovered, is to unleash an organizational revolution.

**Learning to Swim in a Deluge of Data**

In the genomics explosion, think of the GeneChip as the detonator. To the unaided eye, it is merely a carefully mounted piece of darkened glass,

barely bigger than your thumbnail. Look closely, though, and you can see countless tiny markings on that glass. Each mark represents the essence of a human gene – assembled one amino acid at a time on to the glass. All told, there may be as many as 12,000 different genes on a single chip. Run the right experiments, and the GeneChip will light up the specific genes that are activated in a medically interesting tissue sample. Suddenly, hundreds of brilliant white and blue dots burst forth against the chip's dark background. Each time a chip lights up, you behold a glimpse of which genes might be markers for disease. Yet for all of the ingenuity involved in making the GeneChip, it has required cleverness on Roche's part to use the chips effectively within a big organization. Take something as basic as computer capacity. Each sample run on a GeneChip set generates 60 million bytes of raw data. Analyze that data a bit, and you need another 180 million bytes of computer storage. Run 1,000 GeneChip experiments a year, which Roche did in both 1999 and 2000, and pretty soon you run the risk of collapsing your data systems. "Every six months, the IT guys would come to us and say, 'You've used up all of your storage," recalls Jiayi Ding, a Roche scientist. Some of those encounters were outright testy. At one point in early 1999, Roche's computer-services experts pointed out that they were supposed to support 300 researchers in Nutley – and that the 10 people working on GeneChips were hogging 90 % of the company's total computer capacity.

**Fail Fast, So You Can Succeed Sooner**

One of the biggest challenges in drug research – or in any field – is letting go of a once-promising idea that just isn't working anymore. Without strict cutoff rules, months and even years can slip away as everyone labors to keep a doomed project from dying. Meanwhile, much brighter prospects sit dormant, with no one able to give them any attention.

New hire, Lee Babiss, head of preclinical research, arrived from arch rival Glaxo with a simple message: Fail fast. Babiss wanted successes as much as anyone. But he also knew that the best hope of finding the right new drugs involved cutting down the time spent looking at the wrong alternatives. For example, screening was becoming a bottleneck for Roche. An ultra-high throughput screening was installed at a cost of more than $1 million. "We can test 100,000 compounds a day," says Larnie Myer, the technical robotics expert who keeps the system running. Nearly all of those compounds will turn

out to be useless for the mission at hand. But that's fine. If his team can get the losers out of consideration for that trial in a hurry and identify a handful of "hits" within a few weeks of testing, that speeds Roche's overall efforts.

What's more, the Zeiss machine represents the gradual retooling of Roche's overall research efforts. Processes farther down the pipeline must be upgraded and reworked in order to handle much greater volume. That is hard and disruptive work – but it is vital.

**Change Everything – One Piece at a Time**

Peek into almost any aspect of Roche's business, and you will find someone who is excited about the ways that genomics could change things. In Palo Alto, researcher Gary Peltz has built a computerized model of the mouse genome that allows him to simulate classical lab studies in a matter of minutes.

In Iceland, Roche is teaming with a company called Decode, which researches genealogical records from the Icelandic population. That data has helped Decode identify and locate genes that are associated with stroke as well as schizophrenia and other diseases, giving Roche new research leads that otherwise might never have surfaced with such clarity.

And in Nutley, there is talk that genomic data will make it possible to size up a drug's side effects with much greater clarity before embarking on lengthy animal experiments. It will be possible to run simulations or Gene Chip experiments with potential new drugs to find out whether they might interact in troublesome ways with the functioning of healthy genes.

Each of those initiatives is running on a different timeline. Some parts of Roche's business will be aggressively reshaped in the next year or two; others may take five years or more to feel the full effects of the most recent genomics breakthroughs. "This isn't just a matter of turning on a light switch," says Klaus Lindpaintner, Roche's global head of genetics research.

Yet eventually, Roche executives believe, all of the retooling within their company will be mirrored by even bigger changes in the ways that all of us get our medical care.

## *Discussion questions*

1. How does the business strategy affect information systems and organizational decisions?

2. What generic strategy does Roche appear to be using based upon this case? Provide a rationale for your response.

3. Apply the hypercompetition model to Roche? Which of the 7 Ss are demonstrated in this case?

4. How do information systems support Roche’s business strategy?

## *Case study 4*
## Topic "E-commerce strategies" [16]

Claire has just returned from leading Wild Outfitters' first "Corporate Bonding Adventure', an adventure weekend designed specifically for business teams. The three-day package is designed to improve team dynamics by providing a unique setting and challenging outdoor activities. So far, the orders for this new service have been encouraging. Alex and Claire began discussing the events of the weekend to assess the lessons learned, with the hopes of applying these lessons to future outings.

"I was pleasantly surprised," Claire said. "Them thar city folk larn't good in them woods," she added in her Jethro twang. Smiling, Alex responded, "I'm glad that it went well. "What do you suggest for the next time? Any changes?" "I have a couple of pages of notes about that," she replied. "But first, they gave me a few ideas that we can use with the Web site."

The ideas for the Web site that Claire mentioned came from several encounters on her trip. First, she continuously sought feedback through observation and direct inquiries about how the trip was going and what the customers were feeling. This feedback enabled her to respond more effectively to their individual needs on the trip. In addition, she took some time on the last night around the campfire to ask them as a group what they thought about the trip and their suggestions for improvement. Claire also questioned what had attracted the campers to the trip in the first place and what would make them come back. These encounters gave her the content for several pages of notes specific to the "Corporate Bonding Adventure" trips.

On the way home from the trip, a light bulb went off in Claire's head. Why couldn't techniques similar to the ones she had used to seek feedback from the trip participants be used with Web customers? If the Campagnes could get good information about their online customers' preferences, then

they could respond more effectively to each customer on an individual basis. They could also use this information to set up special services for attracting new customers and retaining existing customers.

Alex and Claire concluded that a sure way to attract customers was to offer special deals and price cuts on their products. It would be nice if they could somehow combine this approach with the collection of customer information. One solution that they decided to implement involved sending targeted e-mail about specials to selected customers. For example, if a customer had a special interest in water sports, the Campagnes would send the customer information about deals on water sport equipment or river trips. The e-mail would both remind the customer about the Wild Outfitters site, and serve as an attractor to the site to make a purchase. To sign up for the service, the customer would have to fill out an online survey about his or her outdoor hobbies and activities. The survey information would prove valuable to the Campagnes in several ways. First, it would provide them with the data needed to send email to the appropriate targets. Second, the data could be used to gather aggregate statistics on the types of customers who are interested in and shop at their site. Finally, they could use the information for more individual customization of the site in the future.

"Wow! You really learned a lot on this trip," Alex exclaimed proudly. "Maybe we have this whole thing backward. Those city folk should have a trip to guide us around the big city." Of course, this remark got Claire going again. "Reckon so, Pa', Claire cried, as she slapped her knee. "We kin do some corprit bondin' by the cement pond."

## *Discussion questions*

1. In which category of companies affected by electronic commerce does Wild Outfitters fit best? Which business model are the Campagnes following?

2. What is your opinion of the Campagne's plans? What opportunities are available? Are there any potential problems they should work to avoid?

3. Which level of mass customization are the Campagne's focusing on in this case? Is this emphasis appropriate? Why or why not?

## *Project 1*

### Topic "Development the model of Web site of the company"

You are participant of the tender for funding. The main condition for investors is the application of modern business methods, namely the existence of the Web site of the enterprise.

It’s necessary to develop a model of the home page of Web site of the company and make the presentation of your project to investors.

The presentation should include the following elements:

1. Name of the company.
2. Specificity of the company activities, goals.
3. Reasons for creating a Web site of the enterprise. Formulate the objectives of the enterprise Web site. Determine the type of the Web site.
4. Model of the home page of the company Web site.

During the presentation please tell us about the content of each structural element, the update information on this site.

## *Case study 5*

### Topic "Attracting customers"

Tesco – one of the biggest failures on electronic commerce in the United States has involved online grocery delivery companies such as Webvan. In the United Kingdom, however, the largest grocer has proved much more successful with its electronic commerce venture. It is worthwhile to compare the approaches taken in the two countries to learn something about what works and what doesn't in the online grocery business and other similar business models.

**Getting Started**

Tesco started small by picking and packing from existing stores and leveraged its brand, suppliers, and database of affinity card users to launch its online grocery service for just $56 million. The venture started with one store in 1996, then gradually rolled out its service until about one-third of the company's stores were involved. This put it within reach of 91 percent of the U.K. population. In contrast, Webvan spent $ 1.2 billion to create its service but had no customers initially. Interestingly, none of its board members came

from the grocery industry. Webvan tried to enter 24 markets in the first three years, and it opened warehouses in three market areas in its first 15 months. It kept building warehouses even when none of the first three had broken even.

**Delivery Costs**

Bucking the trend of the late 1 990s toward free delivery of goods, Tesco.com charged $7. 25 per order for delivery. It now receives more than 70,000 online orders weekly and collects $27 million annually for deliveries alone, making the difference between profit and loss. In contrast, Webvan tried to woo customers with free delivery for orders less than $50. As a result, it lost between $5 to $30 on every order it delivered, adding millions in unrecovered costs.

**Online Versus Bricks-and-Mortar**

Tesco.com does not have to make it on its own, because the grocer views its online grocery service as a way to extend its brand . In fact, half of Tesco.com's customers come from rival stores, and the parent company hopes they will shop at its supermarkets after purchasing from its Web site. In contrast, Webvan operated as an online company with no bricks-and-mortar component. Given its failure, the Webvan approach might not be the best way to go for online grocers.

**Task:**

Research the current status of Tesco.com in the United Kingdom, and suggest ways in which its approach to online grocery deliveries could be applied in the United States. Create an electronic presentation, with at least 10 slides, on your findings.

## *Workshop 2*

## Topic "Organizing Internet-payments"

1. Technology of Internet-payments.
2. Payment cards.
3. Comparative analysis of the payment systems that are popular in Europe and Ukraine.
4. The practice of internet banking in the world.

## *Problem*
## Topic "Web site Efficiency"

Analyze Web site efficiency. The data of your Web site traffic are presented in the Table 10.4.

Table 10.4

**Data for calculations**

| Indicator | Value |
|---|---|
| Number of aware customers | 90 000 |
| Number of "hits" | 50 000 |
| Advertising cost | 800$ |
| Number of visits | 900 |
| Number of repurchase | 15 |
| Number of sales | 52 |
| Total output | 6 800$ |
| Target audience | 155 000 |

## Tests

1. How many civilizations of the society development were suggested by D. Robertson:

a) 4;

b) 5;

c) 3;

d) 6?

2. How many groups of tendencies are there in the information economy:

a) 4;

b) 3;

c) 2;

d) 5?

3. Choose business, commercial and other background information aimed at meeting the daily needs in different areas:

a) Tactical Information Resources;

b) Operational Information Resources;

c) Strategic Information Resources;

d) Information Resources Company.

4. Choose the combination of internal and external flows of direct and inverse relation of economic information of the object, methods, tools, professionals involved in information processing and making managerial decisions:

a) Information Technology;

b) Information System;

c) Economic Information System;

d) The Structure of Information Flows.

5. What model of e-business activity is aimed at companies working with individual consumers of goods and services:

a) B2B;

b) B2C;

c) G2B;

d) C2C.

6. What is the basis for the organization of the Internet business?

a) e-shop;

b) advertising on the Internet;

c) Web site;

d) search engines?

7. Choose the teleportation method to transmit business documents from one computer to another:

a) Intranet;

b) EDI;

c) Extranet;

d) VAN.

8. What model of electronic business provides transactions between the companies via the Internet:

a) B2B;

b) B2C;

c) G2B;

d) C2C?

9. What strategy does the organization choose to distinguish its products or services within the segment:

a) differentiation;

b) hypercompetition;

c) focus;

d) differentiation focus?

10. What factors do not refer to competitive advantages by D'Aveni:

a) cost;

b) productivity;

c) strongholds;

d) deep pockets?

11. What is the function of information systems to transform data into information:

a) handling the present;

b) remembering the past;

c) preparing for the future;

d) all true?

12. What does the electronic taxation refer to:

a) C2C model;

b) C2B model;

c) C2G model;

d) G2G model?

13. What are the main frameworks of organizational strategy:

a) differentiation; cost leadership and focus strategies;

b) Porter's model and 7Ss model;

c) Porter's and D'Aveni's models;

d) business diamond; managerial levers?

14. What risks can be prevented by customer service:

a) demand risk;

b) efficiency risk;

c) innovation risk;

d) all true?

15. What are the benefits of trading via the Internet:

a) lower costs;

b) the restriction of communication with customers;

c) a wide range of product;

d) a large number of buyers?

16. Web site providing comprehensive information on a specific topic means:

a) site-quest;

b) portal;

c) community of interest;

d) utility.

17. What are the main stages of conversion process?

a) awareness, closure, attraction;

b) design, awareness, attraction, closure;

c) design, awareness, attraction, contact, retention;

d) awareness, attraction, contact. closure, retention.

18. What is a collection of information or knowledge, prepared for the effective use in a particular area of the state, productive or social activities?

a) data;

b) potential information resource;

c) operational information resource;

d) actual information resource.

19. How many basic models of electronic business do you know:

a) 6;

b) 3;

c) 2;

d) 5?

20. Web site, where users pay for downloading something is called:

a) utility;

b) auction;

c) infomediary;

d) e-tailer.

21. A comprehensive approach to planning, organizing, budgeting, directing, monitoring and controlling the people, funding, technologies and activities associated with acquiring, storing, processing and distributing data to meet a business need for the benefit of the entire enterprise is:

a) information economy;

b) information system;

c) information resource management;

d) ICT?

22. What scientist identified a civilization based on the information revolution?

a) D. Bell;

b) P. Drucker;

c) D. Robertson;

d) M. Meskon.

23. What civilization does writing refer to:

a) Level 1;

b) Level 2;

c) Level 3;

d) Level 4?

24. The social organization based on the use of energy of the machines is called:

a) digitization;

b) pre-industrial;

c) post-industrial;

d) industrial.

# Glossary

**Actual information resource** is a collection of information or knowledge, prepared for the effective use in a particular area of the state, productive or social activities.

**Business strategy** is a well-articulated vision of where a business seeks to go and how it expects to get there. It is the form by which a business communicates its goals.

**Connectivity** refers to the availability of high-speed communications links that enable the transmission of data and information among computers and conversations between people.

**Data** are raw facts that describe the characteristics of an event.

**E-business** is the conducting of business on the Internet, not only buying and selling, but also serving customers and collaborating with business partners.

**E-business model** is an approach to conducting electronic business on the Internet.

**Effectiveness of the site** is determined by how it gives a complete picture of the proposed goods and services, clarifies the benefits of this particular product line and the benefits that may help solve problems.

**Electronic commerce** is the process of carrying out business transactions over computer networks.

**Electronic information resources** are information resources provided in electronic form or in a form ready for the operation of a machine-technical systems, tools and devices.

**Electronic money** (**e-currency, e-money, electronic cash, digital money, digital cash**) is all types of money which people deal with electronically, far from traditional ways of payment like banks, cheques, paper money and coins, e-money allow users through internet or wireless devices to pay the charges of their purchases directly from their bank accounts by electronical ways such as Smart cards, Digital wallets and micropayments.

**Electronic marketplaces** are interactive business communities providing a central market where multiple buyers and sellers can engage in e-business activities.

**E-mall** consists of a number of e-shops; it serves as a gateway through which a visitor can access other e-shops.

**E-marketing plan** is a strategic document developed through analysis and research and is aimed at achieving marketing objectives via electronic medium.

**E-shop** is a version of a retail store where customers can shop at any hour of the day without leaving their home or office.

**Extranet** is an Intranet that is available to strategic allies (such as customers, suppliers, and partners).

**ICT** covers any product that will store, retrieve, manipulate, transmit or receive information electronically in a digital form.

**Information** is a measure of unbalance distribution of matter and energy in space and changes that have accompanied all taking place in the world processes.

***Information*** is data converted into a meaningful and useful context. Information from sales events could include best-selling item, worst-selling item, best customer, and worst customer.

**Information economy** is the combination of production system and sphere of consumption, where the information is the leading productive force, as well as the main product of production and consumer goods.

**Information resource** is a resource that has the information base; that is produced within the company or involved from its external environment, and is used in the process of personnel and agents intellectual activity to achieve specific goals of the company.

**Information Resource Management** is a comprehensive approach to planning, organizing, budgeting, directing, monitoring and controlling the people, funding, technologies and activities associated with acquiring, storing, processing and distributing data to meet a business need for the benefit of the entire enterprise.

**Information society** is the new mode of human existence, in which the production, recording, processing, and retrieving of information in organized networks plays the central role.

**Information Society** is a society characterised by a high level of information intensity in the everyday life of most citizens, in most organisations and workplaces; by the use of common or compatible technology for a wide range of personal, social, educational and business

activities, and by the ability to transmit, receive and exchange digital data rapidly between places irrespective of distance.

**Information systems** are systems that develop the information that managers and other employees combine with knowledge to make decisions.

**Internet marketing (e-marketing)** is the practice of using all aspects of online advertising for a response from the audience, which includes both the creative and technical aspects of the Internet, including design, development, advertising and marketing.

**Intranet** is an internalized portion of the Internet, protected from outside access that allows an organization to provide access to information and application software to only its employees.

**IS cycle** is information systems for handling the present, remembering the past, and preparing for the future.

**IS strategy** is the plan an organization uses in providing information services.

**Knowledge** is the capacity to request, structure, and use information.

**Marketing** is the art and science to choose the right target market, attract, keep and increase the number of customers by making the buyer confident that he is the highest value for the company, as well as "orderly and purposeful process of the concerns of consumers and regulation of market activities".

**National strategic information resources** are resources created and used to ensure the strategic objectives of the state.

**Online banking** (or **Internet banking** or **e-banking**) allows customers of a financial institution to conduct financial transactions on a secure Web site operated by the institution, which can be a retail or virtual bank, credit union or building society. It may include any transactions related to online usage.

**Operational information resources** are business, commercial and other background information designed to satisfy daily needs in different areas.

**Organizational strategy** includes the organization’s design as well as the choices it makes to define, set up, coordinate, and control its work processes.

**Potential information resource** is a set of information or knowledge, which requires additional costs (time, analysis, research, and the like) to convert them into the actual information resource.

**System** is a group of elements (people, machines, cells, and so forth) organized for the purpose of achieving a particular goal.

**Tactical information resources of the state** include the application of scientific and technical, economic, environmental, demographic and other knowledge, transformed into a resource and necessary to address problems in the current period of economic growth and security. It is also a mathematical and software automated control systems and information systems for different purposes.

**Web site** is a set of documents, which are united under one address of an individual or organization in a computer network.

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**Lepeyko** Tetyana
**Mazorenko** Oksana

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