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BASIC ASPECTS OF THE DIGITAL ECONOMY

Ekonomia cyfrowa charakteryzuje się cyfryzacją wielu produktów i usług oraz wykorzystaniem Internetu i innych sieci do kreowania działalności gospodarczej. Wyraźnie występuje zjawisko transformacji tradycyjnego, fizycznego rynku w stronę wirtualnej przestrzeni rynkowej. Konkurencja w tak określonym środowisku ulega znaczącym zmianom i zasadniczo wzmagą się. Wpływ ekonomii cyfrowej na sposób prowadzenia biznesu uwidacznia się na trzech zasadniczych poziomach: doskonalenie marketingu bezpośredniego, transformacja organizacji oraz przededefiniowanie podstawowej działalności organizacji.

The digital economy is characterized by the digitations of many product and services and the use of the Internet and other networks to support economic activities. The traditional marketplace shifts to a virtual marketplace. Competition in such an environment is very intense and major changes occur. The impact of digital economy on business can be identified at three basic levels: improving direct marketing, transforming organizations, and re-defining organizations.

Introduction

One of the most significant changes that we experience today is the move to an Internet-based society. Some of the changes are already here, and they are spreading around the globe, others are just beginning. One of the most significant changes is in the manner we conduct business, especially in how we manage the marketplaces and commerce. Electronic commerce (e-commerce) refers to the way in which transactions take place over networks, mostly the Internet. E-commerce facilitates the growth and dynamic development of the digital economy, taking place in the digital ecosystem.

The article analyzes the basic aspects of the digital economy, defining the notion of this important phenomenon and its basic advantages, describing the universal shift from a marketplace to the marketplace, referring to the nature of

competition in this new environment, and the overall impact of the digital economy on business.

The notion of digital economy

The *digital economy*, also known as the *Internet economy*, *new economy*, or the *Web economy*, refers to the economy that is based in a large part on digital technologies, including digital communications networks (Internet, intranets, etc.), computers, software, and other related information technologies (Turban et al. 2002, p.45). In other words, the term digital economy refers to the convergence of computing and communication technologies through the Internet and the resulting flow of information and technology that is stimulating e-commerce and spurring vast organizational changes.

Digital networking and communication infrastructures provide a global platform to interact, communicate, collaborate and search for information. This unique platform includes the following components:

- A wide area of products made of digital bits – databases, news and information, books, magazines, TV and radio programming, movies, electronic games, musical CDs, and software – that are delivered over the digital infrastructure anytime, anywhere in the world in the 24/7 mode.
- Consumers and firms conduct financial transactions digitally through digital currencies or financial tokens downloaded and carried on smart cards via networked computers and mobile devices.
- Physical goods such as home appliances and automobiles are embedded with microprocessors and networking capabilities (Choi and Whinston 2000).

Basic advantages of digital economy

According to a report issued by one of the governmental agencies in the United States (Emerging, 2002), the digital economy has created an economic revolution, which is evidenced, as of today particularly in the US, by unprecedented economic growth and the longest period of uninterrupted economic expansion in history. Even the recent slow down in this up-trend does not rule it out.

Information technology industries have been growing at more than double the rate of the overall economy, reaching close to 9% of GDP in 2000, up from 4.9% in 1985. IT industries by themselves have driven on average over one-quarter of total real economic growth in the years 1966-2000.

Without IT, overall inflation would have been 3.1% in 1997, more than a full percentage point higher than the 2.0% that it was. Companies throughout the economy are betting on IT to boost productivity. In the 1960s, business spending in IT equipment represented only 3% of total business equipment investment. In the late 1990s, IT's share rose to 45% each year.

In 1999, over 8.5 million people worked in the IT sector and in IT-related jobs in the US workforce. These workers earned about \$49,000 per year, compared to an average of \$29,000 for the private sector as a whole. At almost \$60,000 per year, workers in the software and services industries were the highest wage earners. Salaries have been growing at a rate of 6.6% per year, versus 3.8% for total private sector employment.

There were nearly 2.5 million Internet-related jobs in the US in December 1999, up 36% during the year. In Silicon Valley, unemployment is the lowest in the world, frequently at a negative 3 to 5 percent (more jobs than employees).

These figures confirm that we are indeed experiencing a digital revolution. They also illustrate the following points (Turban et al. 2002, p.44):

- It is sometimes necessary to completely change business models and strategies to succeed in the digital economy.
- Web-based IT and e-commerce are the facilitators of survival by providing companies a competitive advantage.
- Global competition is not just about price and quality; it is also about service.
- An extensive networked computing infrastructure is necessary to support a large global system. This may be very costly, as is the cost of building the e-commerce applications.
- Web-based applications are used to provide superb customer service, not just sales or procurement support.

As a result, Web-based e-commerce opportunities are now attracting universal attention in the executive world. The number one benefit of Web-based systems is enhancing competitiveness or creating strategic advantage (Lederer et al. 1998).

Marketspace as a digital ecosystem

The developments in economics described above has brought about a new reality, sometimes referred to as *Webonomics*, or *Web economy* (Schwartz 1997). In a nutshell, Webonomics amounts to new economic rules, new forms of currency, and new consumer behavior.

One of the most important aspects of this phenomenon is the changing economic role of markets. Markets have three main functions:

- matching buyers and sellers,
- facilitating the exchange of information, goods, services, and payments associated with market transactions,
- providing an institutional infrastructure that enables the efficient functioning of the market.

In recent years, the markets have seen a dramatic increase in the role of IT and e-commerce. The emergence of electronic marketplaces, called *marketspaces*, especially Internet-based marketspaces, changed several of the processes used in trading and in supply chains. These changes, which were driven by IT, resulted in even greater economic efficiencies and lower transaction and distribution costs, leading to more efficient, "friction-free" markets. The process of doing business in the virtual world is completely different from the real world because instead of processing raw materials and distributing them, e-commerce involves gathering, selecting, synthesizing, and distributing information (Rayport and Sviokla 1994). Therefore, the economics of e-commerce, starting with supply and demand and ending with pricing and competition, are completely different from traditional economic models.

Similar to a marketplace, in the marketspace the parties exchange goods and services for money (or they barter them), but they do it electronically. The major components and players of a marketspace are (Turban et al. 2002):

- *Digital products*. There is a wide range of products that can be digitized. Basically there are three groups of them:
 - information and entertainment products (paper-based documents, product information, graphics, photographs, audio and video, software),
 - symbols, tokens, and concepts (tickets, reservations, financial instruments),

- processes and services (government services, electronic messaging, business-value-creation processes, auctions, bartering, distant learning, entertainment).
- *Consumers*. Although there are tens of millions of people worldwide that surf the Web, and they are potential buyers, 85% of e-commerce activities are performed by organizations.
- *Sellers*. There are hundreds of thousands of storefronts on the Web, advertising and offering millions of items.
- *Intermediaries*. The role of all kinds of intermediaries on the Web is different from that of regular intermediaries. They create and manage the online market, help match buyers and sellers, provide some infrastructure services, and help the parties to institute and complete transactions. Most of the intermediaries are computerized systems, referred to as *e-intermediaries*, or *infomediaries*.
- *Support services*. These services are created in order to address implementation issues, and they range from certification and trust services, which ensure security, to knowledge providers.
- *Infrastructure companies*. Many companies provide both the hardware and software necessary to support e-commerce and consulting services on how to set up a store on the Web. Other companies offer hosting services for small sellers.
- *Content creators*. The quality of Web content is a main success factor in e-commerce and there are hundreds of media-type companies that create and constantly update Web pages and sites.
- *Business partners*. They operate additionally to buyers and sellers, mostly along the supply chain.
- *Electronic marketplaces*. The major types of electronic marketplaces include: *exchanges* (many-to-many), *sell-side* (one seller-many buyers), and *buy-side* (one buyer-many sellers). E-marketplaces can be public and private. There are many market mechanisms that can be used in e-marketplaces. The most common and important are electronic auctions.

The nature of competition in the digital ecosystem

The model of competition in the digital ecosystem reminds a web of interrelationships and not exactly the traditional, hierarchical, command-and-control model of the industrial economy. Like an ecosystem in nature, activity in the digital economy is self-organizing. The process of natural selection takes place

around company profits and value to customers. The new ideas and ways of doing things can come from anywhere at any time, and the old rules of doing business no longer apply.

There are several reasons for which the competition in the digital ecosystem is very intense:

- lower buyer's cost,
- speedy comparison,
- differentiation and personalization,
- lower prices,
- customer service,
- insignificant role of the distance from the customer,
- easy removal of language barriers,
- lack of normal wear and tear of digital products (Choi and Winston 2000, Turban 2002, Unold 2001).

M.E.Porter (2001) introduced a competitive advantage model, which identifies five major forces of competition that determine the industry's structural attractiveness:

- bargaining power of suppliers,
- rivalry among existing competitors,
- bargaining power of channels and of end users,
- threat of substitute products or services,
- barriers to entry.

The combination of these forces determines how the economic value created in an industry is divided among the key players. The impact of the Internet on these forces is divided into either positive or negative for the industry. As an example, a positive determinant within the area of bargaining power of suppliers is the fact that procurement using the Internet tends to raise bargaining power over suppliers, though it can also give suppliers access to more customers. A negative determinant in the same area is the fact that the Internet provides a channel for suppliers to reach end users, reducing the leverage of intervening companies.

In general, the competition is not between online and offline companies but also among the online newcomers. According to Turban et al. (2002, p.52), this competition which is especially strong in commodity-type products (toys, books, CDs), was a major contributor to the collapse of many dotcom companies in 2000-2001.

The impact of digital economy on business

According to Bloch and Segev (1996), the impact of digital economy on business can be divided into three major categories:

- improving direct marketing,
- transforming organizations,
- redefining organizations.

There are numerous impacts of B2C *direct marketing*, and they include: product promotion, new sales channels, direct savings, customer service, brand or corporate image, customization, advertising, ordering systems, markets, reduced cycle time. As an example, the delivery of digitized products and services can be reduced to seconds. Even the administrative work related to physical delivery across international borders can be reduced significantly, cutting the cycle time by more than 90%.

Transforming organizations is based on the premise that rapid progress in digital economy forces companies to adapt quickly to the new technologies and offers them an opportunity to experiment with new products, services and business models. People in organizations are forced to learn and adapt immediately, and this process of adaptation is followed by strategic and structural changes. At the same time, the nature of work itself has to be transformed. Digital economy workers have to be very flexible and very few will have truly secure jobs in the traditional sense. Many will work from home.

There are many potential changes that will *redefine organizations*. Completely new products are created and existing ones are customized. Such changes redefine organizations' missions and the manner they operate. Mass customization enables manufacturers to create specific products for each customer. Using the Web, customers can design or reconfigure products for themselves (T-shirts, furniture, jewelry, and even cars). Digital economy affects entire industries. This leads to the use of new business models that are based on the wide availability of information, for example, electronic intermediaries.

Other impacts include the influence on manufacturing, on finance and accounting, and on human resource management, training and education. An interesting concept is that of *virtual manufacturing*, which is the ability to run global plants as though they were one single plant. For example, Cisco System works with 34 plants globally, 32 of which are owned by other companies (Cisco 2001).

The widespread adoption of wireless and mobile networks, devices, and middle-ware creates an opportunity to use new applications online. The way of

conducting e-commerce via wireless devices is referred to as *mobile commerce*, *m-commerce*, *m-business*, and *pervasive computing*. The number of mobile devices is projected to top 1.3 billion by 2004 (mobile.commerce.net). The main characteristics of m-commerce are: mobility, broad reachability, ubiquity, convenience, localization of products and services. Basic drivers of m-commerce include:

- widespread availability of devices,
- no need for a PC,
- the handset is becoming a culture,
- vendor's push,
- declining prices,
- improvement of bandwidth,
- the explosion of e-commerce,
- the digital divide (Turban et al. 2002, p.829).

The most representative applications of m-commerce include: online stock trading, online banking, micropayments, online gambling, ordering and service, online auctions, messaging systems, B2B (mobile.commerce.net).

Conclusions

The digital economy is characterized by the digitization of many products and services and by the use of the Internet and other networks to support economic activities. Such computerization changes the manner in which business is done and considerably improves economic activities and competition. The main issues that are germane to management include the introduction of new business models, different rules in the area of competition, the issue of organizational transformation to the digital economy, the changing role of intermediation (disintermediation and reintermediation), the process of globalization of each aspect of business activity, organizational changes and new business alliances. Practically all functional areas are impacted by the digital economy. Direct marketing and one-to-one marketing are becoming a norm. Also, mass customization and personalization are becoming more and more common. Production is shifting to a pull model, changing the supply chain relationship. Cycle time is reduced, financial planning and budgeting are outsourced, and human resource management has to take into account the huge IT/human gap.

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