# THE IMPACT OF IT ON THE GLOBAL ECONOMY OF 21ST CENTURY

**Ciprian Ionel Hretcanu**

**PhD Student, "Ştefan cel Mare" University of Suceava**

*Abstract: It has been noticed that the competition between business entities has registered a very fast upward trend in the current global economy. The increased competition occurs primarily due to the intense use of information technology, thus influencing all the economic activities. This paper focuses on the influence of information technology in the knowledge society and its effects upon any modern business organizations. The characteristics of the new economy created by Internet are also being dealt with.*

*Keywords: IT, holonic business network, Internet economy, knowledge society, global economy.*

## Introduction

Information technology is the technology required by processing (i.e. supply, processing, storage, conversion and transmission) of information, especially by the use of electronic computers[1]. The term of information technology was used first in 1958 by H. J. Leavitt and T. L. Whisler who stated: "The new technology does not have a well-established name; we shall name it *information technology*"[2].Communication technology includes electronic systems for different forms of communication between people or groups of people.

The boundary between information technology and communication technology has become very fine and even imperceptible. As technology has evolved rapidly, the services provided by the Internet, telecommunication and media services are convergent both for consumers and the industry[3]. So, we can ascertain that information and communication technology is a combination / an interplay between information technology and communication technology and relies on computers, connectivity, content and human capacity.

## 1.IT and economic growth

[1]Dennis Longley, Michael Shain - *Dictionary of Information Technology* (ed. 2), Macmillan Press, 1985.
[2]Harold J. Leavitt şi Thomas L. Whisler – *Management in the 1980's*, Harvard Business Review, 36(6), 1958, pp.41-48.
[3]Ivan Huang, Roc Guo, Harry Xie, ZhengxiangWu - *The Convergence of Information andCommunication Technologies GainsMomentum*, 2012 World Economic Forum, în SoumitraDutta, BeñatBilbao-Osorio - The Global Information Technology Report 2012 Living in a Hyperconnected World, SRO-Kundig, Geneva, 2012, http://www3.weforum.org/docs/GITR/2012/GITR_Chapter1.2_2012.pdf


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In the present day modern society, due to TIC, business firms have got access to a huge data and information amount, but mention must be made that what matters is not the information quantity but its quality. Therefore, business firms need only the best information since their decision making and operational process is based on information that must be, at the same time, clear, complete, concise, accurate and relevant[4]. So, it has become obvious that computer use and that of modern technologies do not provide the business companies with development only, but they have become absolutely necessary elements for the daily organization and management of companies.

It is obvious that in the new context of economic environment, IT in all its forms, together with a well-done planning, completed by common knowledge and interests, determines almost inevitably the occurrence of a holonic business network (HBN)

This type of business as HBN results in the occurrence of new business opportunities, and allows process optimization and a better satisfaction of customers, offering faster response to customers' needs / desires, all these leading to the survival of companies involved in the network on the global market.

Therefore, we believe that especially IT (i.e. PC and computer networks) has become a "*vector*" of economic growth and of competition between countries / corporations.

In other words, nowadays the computer determines the daily life of any business organization, irrespective of the company size and / or its sector of activity. Moreover, the use of computer, internet and other "*tools*" provided by IT has become inevitable for any strategy aimed at by a company (growth, stability, threat avoidance, etc). Furthermore, this appeal is expected to be extremely beneficial for the future of companies and other type of organizations and individuals as well. Exploitation of the benefits offered by IT requires, however, well-qualified employees who are willing to **learn continuously**.

It is clearly understood that IT benefits are closely correlated with those provided by telecommunication networks. It is also understood that IT provides the management of any company with major opportunities even if this is or not addressed as a Holon and / or part of a holonic business network (HBN).

The economic and financial crisis has greatly influenced the business environment, both globally and regionally / locally, but it affected strongly enough consumers' behavior.

As a result, many companies have redesigned their main business processes by investing in key technologies - mobility, cloud computing, IT systems for economic analysis, decisional

[4]Gheorghe Militaru – *Sisteme informatice pentru management*, Bucureşti, Editura ALL, 2004, p.12.


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support and social networks[5]. The effect of the new way of business conception is the appearance of new products and services fundamentally based on the Internet and nowadays online platforms which represent an intermediary between sellers and buyers have become very fashionable. All these changes and transformations have led to the occurrence / creation of new markets, emergence of new types of industries, companies and working ways that are specific to the new and the current type of XXI century economy, namely the digital economy.

## 2. IT and knowledge society

The information technology, to which communications are added, is considered the foundation on which the new knowledge-based society was built/created, this being shown in Figure no. 1. As discussed above, ICT contributes to inform each person / organization and having in view that better information means education, it leads to knowledge, to much broader knowledge which influences positively the development, all of these being the ingredients of the knowledge-based society.

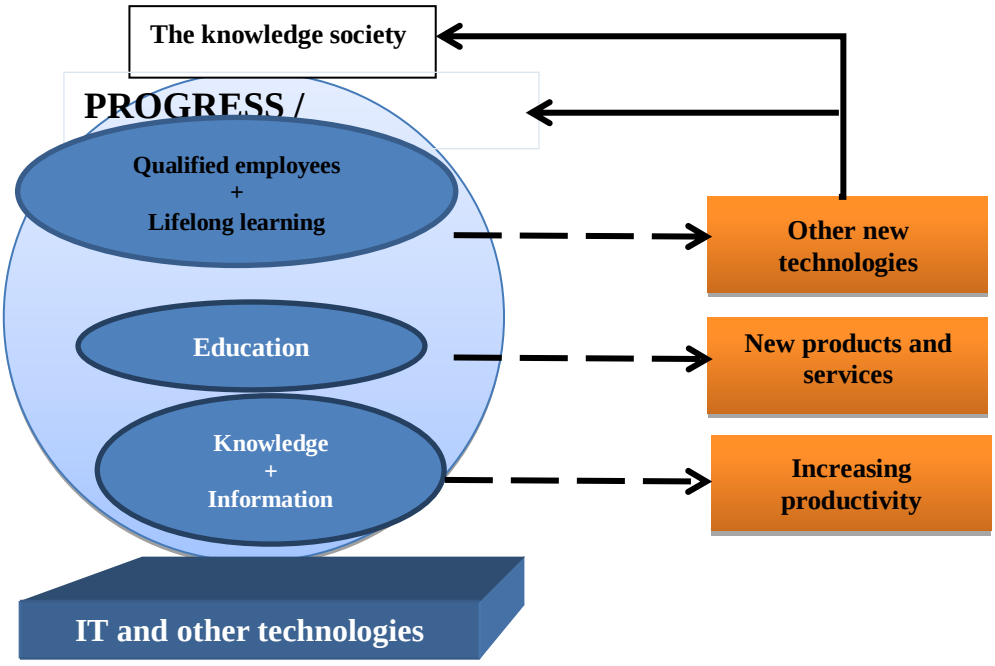


**Figure 1. Impact of IT on the knowledge society** (Source: own elaboration)

[5] Gheorghe Oprescu, Daniela Eleodor – *Impactul dezvoltării economiei digitale*, International Conference of the Institute for Business Administration, Bucureşti, 2014, pp.21-44.


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The knowledge society and the widespread use of information and communications technology generate the need for new skills and digital competences for employment, education and training, self-development. Being the basis of knowledge society, IT must exist in any business entity, namely it must be purchased, then customized and adapted to the specific of the organization in question. The efficient use and exploitation of information and communication technology lead to the improvement of company activities, aspect involving the rapid development of own organization.

To be permanently supported, this growth needs continuously the most performing technologies and, therefore, information and communication technologies must be updated and improved permanently, which means that the the adaptable modern company is forced to acquire the latest-oriented new technologies to satisfy the global single market.

The permanent updating necessity of IT by business companies in the knowledge society is shown schematically in Figure 2.

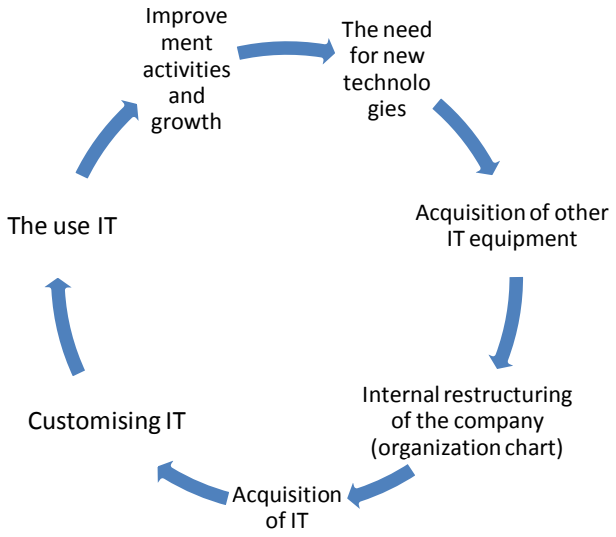


**Figure 2.The "Spiral" effect of IT application by companies (Source: own elaboration)**

Many companies have understood that the profit is conditionned by effective and correct IT use, and not by the technology itself, and as a result, the adoption of ICTmust be seconded by its efficient management use. Therefore, it should not be overlooked that the activity of acquiring information technology involves several steps to be carefully taken: acquisition, customization / adaptation, use and development of IT. (Figure 2).


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It is useless for the most modern technologies to be purchased and implemented unless they are used properly, the expected results will not be achieved either and that investment is ineffective.

Therefore, managers must focus their resources on the proper implementation of information technology and its effective use[6].

According to some opinions, information and communication technology generates seven structural effects: reduction of the number of hierarchical levels, disappearance of routine places of employment, integration of departments, formation of working groups, change of information flow throughout the organization, possible implantation of remote communication, relationship between ICT architecture and organizational structure.

ICT has a significant influence on the development and application of globalization capabilities. The globalization capabilities are: ability to internationalization, global network capability and worldwide development capacity.[7]

We are aware that no company / business organization will ignore in the future this evolution of IT and it will have always to adapt to the development of new technologies. This new concept of *adaptive enterprise* being closely related to the development of information and communication technologies together with the ensurance of a high automation level that would satisfy market requirements.[8]

The first business system based on the latest information technologies is the holonic network which exploits knowledge as a new type of resource and information becomes an "asset" of the new company, available to everybody. The business holonic network is the best method by which a business entity may get shaped/ cope very quickly with the customers' new demands. ICT can dramatically compress time and distance, facilitates the coordination and movement of goods and services worldwide, allows sharing of human expertise and other resources, and provides the necessary infrastructure for the operation of new services making a real and competitive benefit. [9] According to many opinions, the globalization increase together with the growth and spread of information technology will continue to dominate the

[6] Marian Stoica - *Posibilități de trecere spre societatea informațională***,** Revista *Informatica Economică*, nr. 1(17), 2001, pp. 38-42.
[7] Thomas Borghoff - *Evolutionary theory of the globalisation of firms*. Wiesbaden, Gabler Verlag, 2005.
[8] Narcisa Isăilă – *Sisteme informatice în mediul de afaceri*, București, Editura Prouniversitaria, 2012.
[9]IamesE.Whitworth, Prashant C. Palvia, Susan R. Williams, Cheryl Aasheim -*Measuring the impact of global information technology applications*,International Journal of Technology Management, *29*(3/4), 2005, pp.280-294.


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world economic scene for many years to come and their importance will increase as globalization and ICT are reciprocally influenced and managed.[10]

**3. The role of ICT in the development of companies**

ICT has helped reduce transaction costs by promoting increased access to information, aspect that has helped very much everyone in the business world. Also, easy access to information has increased efficiency, competitiveness and entrance on the global market of the companies from less developed countries / areas. Figure no. 3 presents the influence of information and communication technology on the development of business people and companies, so of the society. In other words, we synthesize graphically that ICT facilitates information access, information turning into knowledge and knowledge creates new opportunities / favorable opportunities, leading to increased development.


**Figure 3. The role of ICT in the development process**
(Source: own elaboration)

ICT should be seen as a tool / a mediator who always facilitates the emergence of new opportunities and types / business models, but also ensures / guarantees transparency, responsibility as well as increased efficiency and competitiveness. Increased sales and marketing on the internet together with the maturing of information and communication technology make the business environments of organizations be more and more international and, as a consequence, their business and communication processes are getting internationalized as well. [11]

[10] Massood Samii, Gerald Karush – *International business and IT*, in M.Samii, G. Karush (Eds.) *International business and information technology*, New York, Routledge, 2004, pp.3-11.
[11] Kemal Bicak - *International knowledge transfer management: Concepts and solutions for facilitating knowledge transfer processes in multilingual and multicultural business environment*. Herzogenrath: Shaker, 2005, p.5.


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ICT is a globalization catalyst and a solution to approach the main international challenges, being the strongest link in the business chain formed by partners, products and suppliers, and being the basis for doing business worldwide.[12]

Facilitating instantaneous communication, ICT makes it possible for modern business organizations to coordinate and control the actions from any place, no matter how far it may be. The value given by ICT to a user is determined by the following interrelated characteristics:[13]

-*sensibilization*: people must know what ICT can be used at and be open to use ICT;

-*availability*: ICT must be provided with the corresponding hardware and software;

-*accessability*: it refers to the ability / ability of using ICT;

-*permissibility*: all ways of using ICT all together, should ideally cost only a few percentages of a person's income (below 10% maximum on average).

Also, following various surveys done in recent years, it can be mentioned that:

-ICT reduces transaction and coordination costs in all forms of organization, increases productivity and accelerates innovation dynamics;[14]

-ICT affects the cost and efficiency of the external market;[15]

-ICT has the potential to reduce dramatically market imperfections and reduces transaction and coordination costs;[16]

-Increased use of ICT and the evolution of cross-border networks determine the blurring of boundaries between various industries; ;[17]

-ICT increases action boundaries;[18]

-ICT, due to its large and rapid progress leads to a totally different type of structure with mutually beneficial industrial cooperation and networking;[19]

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[12] P. Candace Deans, Michael J.Kane – *Information systems and technology*, Boston, PWS – Kent Publishing Company, 1992, p.1.

[13] Rahul Tongia, Eswaran Subrahmanian – *Information and Comunication Technology for Sustainable Development. Defining a Global Research Agenda*, Allied Publishers Pvt. Ltd., 2003, p.29

[14] Institut für Wirtschaftsforschung [Ifo] – *Ifo Studien zur Strukturforschung: Tertiarisierung und neue Informations-und Kommunikationstechnologien*, München, Ifo Institut für Wirtschaftsforschung, 1999.

[15]Michael Blaine, Edward Roche - *Introduction*, In E. M. Roche, & M. J. Blaine (Eds.), *Information technology in multinationalenterprises*(pp. 3-18). Cheltenham, UK: Edward Elgar, 2000, pp. 4-6.

[16]Michael Blaine, J. Bower - *The role of IT in international business research.* In E. M. Roche, & M. J. Blaine (Eds.) -*Information technology in multinational enterprises*, Cheltenham, UK: Edward Elgar, 2000, p.27.

[17]Dieter Ernst, L. Kim – *Introduction: Global production network, information technology and knowledge diffusion*, Industry and Innovation, 9(3), 2002, pp.147-153.

[18] Todd Dewett, Gareth R. Jones – *The role of information technology in the organization: A review, model and assessment*, Journal of Management, 27, 2001, p. 323.

[19] E.M. Roche – *Information technology and the multinational enterprise*, in E.M. Roche, M.J.Blaine (Eds.), *Information technology in multinational enterprises* (pp. 3-18). Cheltenham, UK: Edward Elgar, 2000, p. 82.


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-ICT will not eliminate the importance of distance and location, and in some cases makes proximity and clustering even more important;[20]

-ICT improves the efficiency of business processes; ;[21]

-ICT has promoted transnational interactions and precipitated the growth of globally networked organizations;[22]

-almost 50% of productivity growth is the result of investments in ICT.[23]

**4. The economy created by the Internet**

Considering that the Internet is part of our daily lives and it has become a fundamental element of contemporary society, it has created a type of economy, called networked economy or net-economy.[24]

In the literature this economy is known as the new economy, knowledge-based economy ("*Knowledge-based Economy*"), virtual economy or "weightless" economy ("*Weightless Economy*").[25] Also, this economy may be called i-economy, the Internet economy, the economy of cyberspace, online economy or e-economy.

This i-economy can be considered a new dimension of physical / real / conventional economy and it is centred on information and ways of transmitting it. So, online economy has as main support, the extensive use of the Internet and that of information and communication technology.

The Internet gives people the opportunity to form new social areas / groups / communities. Irrespective of the names given by the literature, electronic communities, cybernetic communities, cyber-communities, virtual communities, e-communities, virtual groups, all these are the basic elements of the new knowledge-based economy. We can define these new social sectors as e-groups, web-groups, cyber-groups, virtual collective and community-net groups, virtual meetings.

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[20] Jose De la Torre, Richard W. Moxon – *Introduction to the symposium e-commerce and global business: The impact of the information and communication technology revolution on the conduct of international business*, Journal of International Business Studies, 32(4), 2001, pp. 617-639.

[21] Michael Blaine, J. Bower - *The role of IT in international business research.* In E. M. Roche, & M. J. Blaine (Eds.) - *Information technology in multinational enterprises,* Cheltenham, UK: Edward Elgar, 2000, p.37.

[22] Peter McMahon – *Global control*, Cheltenham, UK, Edward Elgar, 2002, p.142.

[23] Marcel Duhăneanu, Florin Marin – *Agenda digitală pentru Europa-riscuri și oportunități pentru Europa*, International Conference of the Institute for Business Administration in Bucharest, 2014, pp.67-77.

[24] Gabriela Grosseck -*Marketing și comunicare pe Internet*, Editura Lumen, Iași, 2006, p.70.

[25] Andreea Mărășescu - *Servicii software în Economia Virtuala*, Informatica Economica, nr. 3(23), 2002, pp.17-23.


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Considering that one of the characteristics / important features of this virtual community is interaction, the feedback obtained by companies from customers is instantaneous.

Nowadays, a business organization does not exist as a business entity unless it is on the Internet, and, according to Michael Porter, the Internet use tends to expand the geographic market, by putting many more companies in competition with each another.[26]

An organization can use the Internet as a cheap advertising tool, by making orders, promoting its own philosophy, and communicating with their customers all over the world. [27]

The Internet has dramatically reduced the cost of "point to multi-point" coomunication, making it much easier the provision of their clients with information.[28]

According to a study conducted by McKinsey Global Institute data from G8 group of countries plus Brazil, China, India, South Korea and Sweden, it was found that the Internet is about 3.4% of GDP and determined the increased of the GDP by 10% during 1995 -2009 and by 21% in the next five years in the economies of the previously mentioned countries. .[29]

So, it can be stated that online sales have become in the modern economy, important channels of distribution of goods and services and determined quite significant competitive pressure on the traditional distribution channels and types of traditional business.

Any business organization must change its organizational culture and rethink of a fast and efficient integration into i-economy because the internet network has formed its own culture, which some call cyber-culture or the info- culture.[30]Also, we believe that this culture of the net is a new culture, the electronic culture, the virtual culture, net-culture, web-culture or i-culture and modern companies are forced to adopt new technologies and to become a part of the single global market, represented by the internet in order to benefit from the opportunities of the new economy of cyberspace.

Information and communication technology, along with the globalization, contribute to the creation of a new economic framework and change dramatically the operation of the companies, which result in the modification of the functioning of economies as a whole.

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[26] Michael Porter – *The strategic potential of the Internet*, in R.D. Galliers, D.E. Leidner, B. Baker (Eds.) – *Strategic information management*, (3erd ed), Oxford, Elsevier Science, 2003, p.381.

[27] Kemal Bicak - *International knowledge transfer management: Concepts and solutions for facilitating knowledge transfer processes in multilingual and multicultural business environment*. Herzogenrath: Shaker, 2005, p.12.

[28]Steven Globerman, Thomas W. Roehl, Stephen Standifird – *Globalizationand electronic commerce; Inferencesfrom retail brokering*, Journal of International Bussines Studies, 32(4), 2001, p. 759.

[29]McKinsey Global Institute - *Internet Matters: The Net'sSweeping Impact on Growth, Jobs, andProsperity*, mai 2011, online at http://www.mckinsey.com/insights/high_tech_telecoms_internet/internet_matters, accessed February 2015.

[30] Gabriela Grosseck -*Marketing şi comunicare pe Internet*, Editura Lumen, Iaşi, 2006, p.82.


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Every economy is a part of the current global economy, but it is also a whole at the same time. In other words, information and communication technology, causing globalization has influenced the development / creation of a global economy which we can call holonic economy / global holonic economy / holono-economy / h-economy.

We have already agreed that the information technology plays a fundamental role in a holonic firm and any business holonic system is mainly based on a computer network such as the internet by means of which data and knowledge are distributed / shipped instantaneously.
If we consider each economy as a holon, then the global holonic economy has a holonic structure of network type.

If we look at the global holonic economy and regard it as a holonic network made up of *n* economies, we can find that the four fundamental characteristics of a Holon suggested by Piero Mella[31] and holons'properties of a complex set mentioned by Andrew Wallace in "*Holons and holonic society*" are kept for each economy in turn (each economy from the network being considered a holon):

***-auto-preservation***: any economy of the holonic network can maintain its basic structure, even if, in time, its components (ie firms in that economy) change. By preservation, the holonic economy maintains its own identity;

***-auto-adaptation***: being part of a network, that economy must be able to adapt and create links with other economies in the network and react to requests / proposals / requests of these ones; ie the economies within a holonic network must work in communion / cooperation;

***-auto-transcendence***: the holonic network is dynamic and creative, thus allowing the inclusion of new economies in the network;

***-auto-dissolution***: auto-dissolution of the entire holonic network may take place if all the n economies in the network cease their collaboration in the network or if ICT - the binder of global holonic economy disappears. And all these are very unlikely to happen, if not impossible.

-s***calability***: global holonic economy is autonomous and, therefore, other economies can be added to this holonic network, without affecting the previously existing network economies. But an optimal organization will lead to a positive influence of the new economies on the global holonic economy.

[31]Piero Mella – *The Holonic Revolution*, Editoria Scientifica, Pavia University Press, 2009, p.7.


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-***robustness*****:** means autonomy resulting from a network. Namely, holonic global economy, regarded as a network of *n* holonic economies can operate smoothly and *n-1* savings (provided that n> 3).

Considering every economy in part as an opened socio-economic system, we can find that some of the attributes / characteristics established by Koestler regarding the Holon go together with the economies as well:

-the economy has an *autonomous nature and a stable form* that allows it to survive environmental disruptions.

-the economy has the capacity of *self-reliance* and has the ability of dealing with the unexpected;

-the economy operates *dependently* because it is subjected to various forms of control by customers, these ones representing the superior entity that the survival of an economy depends on;

-the economy has an *interactive* nature and this economic interactivity reflects the connection between economies and demonstrates the connection between economies and demonstrates the integrative trend of economies.

**Conclusions**

As we previously stated the development of information and communication technology has led to the birth and development of the global economy, but the continuous evolution of ICT will generate the "liquefaction" of the global economy, aspect that leads to a global "internal" economy, which is marked by a redefinition of corporative boundaries and the development of some flexible network structures.[32]. In the current global economic context, we come across a higher and higher occurrence of " global born" and self-regulated global markets. [33]

It can be seen that nowadays there are no areas where the information technology has got in yet, and the labour market asks for new skills / qualifications of staff required by new technologies.

As a result, these modern technologies have led to the emergence of new professions and created new jobs (computer expert, cyberneticist, electronics technician / administrator / network engineer, web designer, programmer / analyst programmer, IT manager).

[32] Thomas Borghoff - *Evolutionarytheory of theglobalisation of firms*, Wiesbaden, Gabler, 2005.
[33] T.C. Melewar,C. Stead – *The impact of information technology on global marketing strategies*, Journal of Global Management, 2(4), 2002, pp.29-40.


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We are confident that this trend will continue in the future and new professions will emerge and new jobs will be created due to IT.

Information and communication technology determined, is determining and will determine the globalization of business organizations because it is an inexhaustible source of competitive advantage, it increases efficiency and effectiveness of the company and it is a vital element of business expansion.

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