MODERN TRENDS OF THE INTERNATIONAL ICT MARKET'S DEVELOPMENT

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Abstract. The article deals with the main features of international ICT market formation and its development. The fundamentaltrends of ICT development in the global economy are determined. The ICT indicators indifferent areas of the world are given. The basic rates of technological support of ICT developmentare analyzed. The peculiarities of Ukraine's economy information development are defined; Ukraine's competitive advantages in the international ICT market arerevealed.

Keywords: ICT, market, world economy, Internet, development, services, NRI, ranking.

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Introduction

Nowadays, the information and communication technologies (ICT) are the basis forthe development of any country integrated into the world economy. The potential benefits of ICT development include management efficiency and increase productivity, show the emergence of new export opportunities and efficient supply with software services in the information and communication technologies field, providewith information by the market terms, empower the distance education and improve service quality, especially in the services sector. In addition, modern ICT form the human capital of the country, which is the basis for creating the "information society". Modern ICT can offer countries with different levels of economic development an unprecedented opportunity to change their education system, adopt and fulfill more efficientpolitical programs and provide their rapid implementation, expand the range of opportunities both for businesses and households.

Some countries consider ICT to be a major incentive to promote their social and economic development. By means of ICT, on the one hand, they can quickly make up the economic gap with world leaders and get huge returns on creating more wealth and jobs for highly skilled workers. On the other hand, some countries consider the development and use of ICT in the economy and society as a key component of the national strategy to improve living standards, increase knowledge and enhance their own international competitiveness.

Main results

The information technology sector has an important cascading effect on the global economy. Spending on worldwide information technology continues to grow. The market rose to US $2,081.9 billion in 2014 and to US $2,199.3 billion in 2015. Emerging markets are still the engines of growth for Worldwide IT spending, with strong trends continuing in markets such as India and Brazil in recent months. The weakest-performing geographies will be Western Europe and Japan, where slow economic growth is inhibiting IT spending while the United States market remains fragile in the context of political uncertainty.

Information technology is one of the most promising export sectors for many countries, which reached a bigvolume in US $1979997.1 billion with respect to the total volume of exports in 2014. The world ICT market is growing steadily, although the pace of growth in small but well seen.Total sales of the global IT market during 2010-2014 years exceeded in the pre-crisis period, indicating that the market is recovering and demand for technology and services increased. In the first half of 2014, some areas of the world, such as China and Singapore, suspended the growth of their ICT export performance, and Japan's ICT exports decreased to US $4.0503 billion. At the same time, in 2014, information technologies services exports of national economy were equal to about US $800 million.

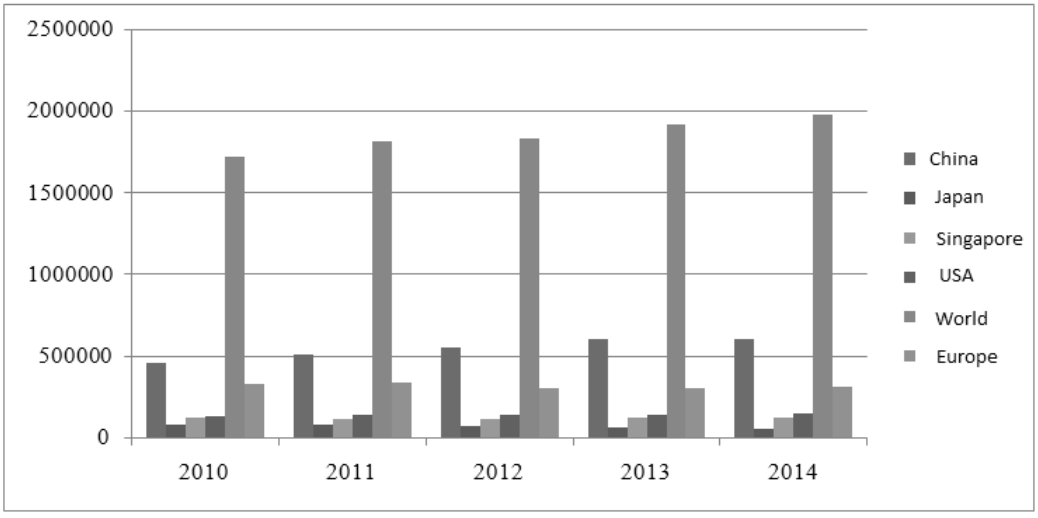

Fig. 1. The volume of ICT exports in relation to total world exports, US million
(Statistics data base. World Trade Organization)

Information and communication technologies have become the main engine of economic development for any country in today's globalized world. Recently, the main market trends and ICT are:

– the increased number of information intermediaries who give information in modified forms under the client's relevant request;

– higher degree of information companies specialization according to the field of their activity: science, business, industry, law etc.;

– intense competition in the global information market between the US, EU and China.

Many new technologies and offers are disrupting the technology landscape. Mobile device innovations have made headlines for the past five years and, while mobile phones may no longer be a source of game changing innovation, suitable technology is. Cloud software, and even software hosting to an extent, have disrupted the normal purchasing patterns in the enterprise software market.

Many new enterprises that did not want to purchase traditional license software have been enticed into cloud purchases, and at the same time traditional enterprises are shifting to a hybrid approach to software, where cloud, hosted and license are all viable, co-existing options. Global IT is in a transition from the era of IT industrialization – where efficiency and effectiveness were the hallmarks – to the era of digitalization and digital business. Digital business is about the creation of new business designs by blurring physical and digital worlds. It is about the interaction and negotiations between people, businesses and stuff. It takes place when things begin to negotiate amongst themselves, as well as people and businessesdo, thereby we see that we have entered an entirely new and disruptive world. In the past, people could control everything in business. In future, things will tell their own tales and thus will shift the way in which a business restricts its opportunities.Cognizant computing — the next phase of the personal cloud movement — will become one of the strongest forces in consumer-focused IT. It will also have an immense impact across a range of spending areas, including mobile devices, mobile apps, wearable, networking, services and cloud.

Bridging the digital divide between developed and developing countries is a priority for modern international community. The present level of Internet access in developed countries is much higher than in developing ones. In particular, there is a tangible lag in the least developed countries. The program "Connect 2020" aims to ensure that by 2020 at least 50 percent of households in developing countries and at least 15 percent of households in the least developed countries will have had access to the Internet. According to the International Telecommunication Union's (ITU) data, the foregoing time access to the Internet will have 45 percent of households in developing countries and 11 percent of households in LDCs. The current distribution of households with Internet access is shown by the following data (Fig. 2).

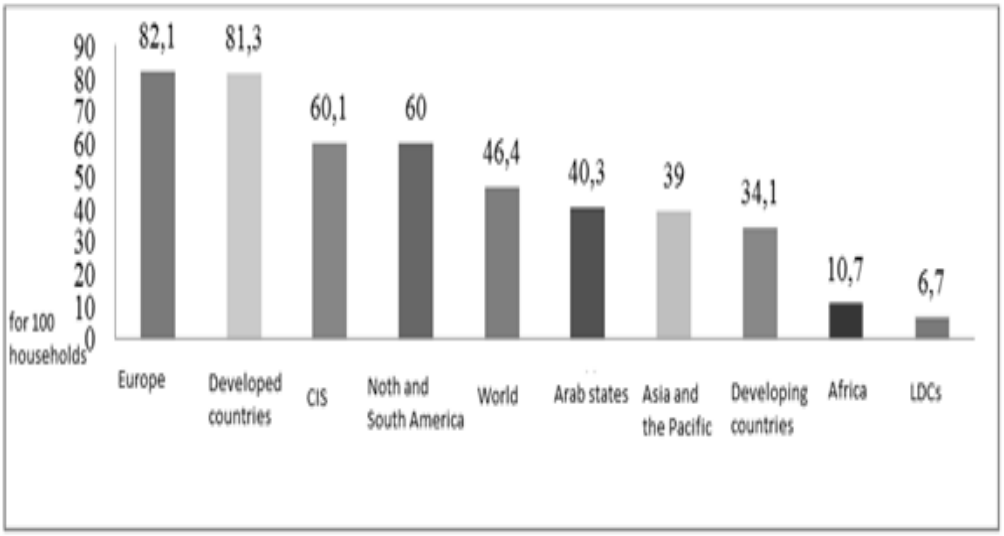

Fig. 2. Households with Internet access, by region, %, 2015
(ICT Statistic. International Telecommunication Union)

Also, according to the "Connect 2020" agenda (Connect 2020 Agenda. ITU) by 2020 telecommunications ICT must become by 40 percent more affordable in price terms in comparison with the year 2012. Thus, mustbe reduced the existing gap between developed and developing countries in the access to ICT. It means that price for the use of telecommunicationsmust be reduced by 4 per cent; consequently, the cost of broadband communications has to reach the level that does not exceed 5 percent of the people average income. ITU defines the ratio of prices for services of fixed and mobile telephony and broadband, to the average monthly income from the basket price for ICT services. The fact is, in recent years, prices for ICT services have become more affordable, particularly in LDCs (Fig. 3).

Since 2012, prices for mobile services have been reduced by 29 percentboth at the local and the global level. In the same period there was also a sharp decline in prices for mobile broadband services. By early 2015 the economies of 111 countries (160 for which data were available) have fulfilled the target to reduce the cost of broadband services to a level that does not exceed 5 percent of the average income of their population.

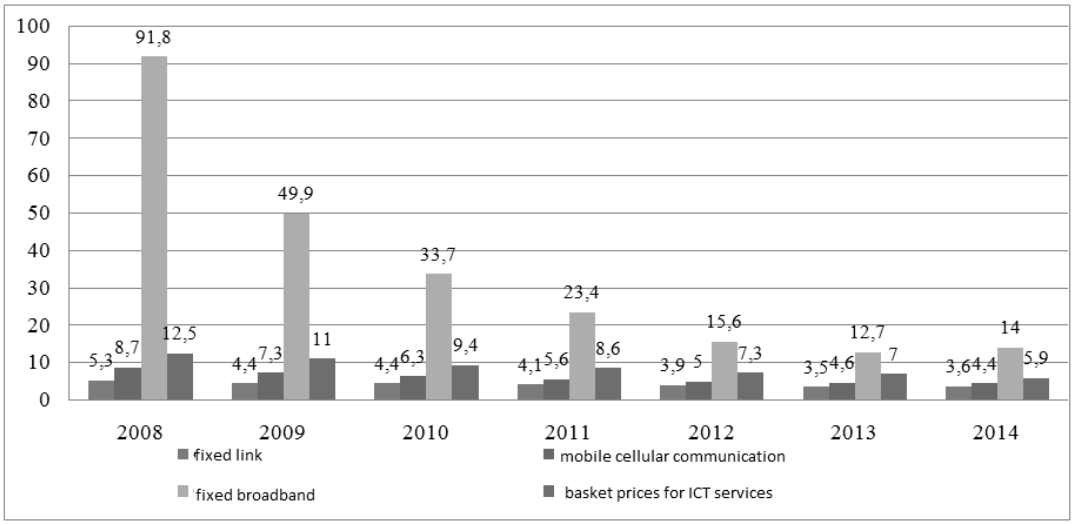

Fig. 3. Value pricing of ICT services
(ICT Statistic.International Telecommunication Union)

However, in 22 developing countries, the price of broadband services still exceeded 20 percent of the average income. These data indicate not only that progress has been achieved in ensuring the acceptability in price terms, but that the continued decline in prices for performance targets for admissibility in the price requires the adoption of sustainable measures in the regulatory and political level, in particular in the developing countries.

Nowadays in order to solve problems in the field of information and communication technologies operational management applies the latest developments. These developmentsgive growing possibilities for information and communication technologies improving.

Analysis of ICT in enterprises showed rapid development of research in the field of telecommunications that use ICT for external accounting information. As we can see it is a small proportion compared with other sectors (Fig. 4)

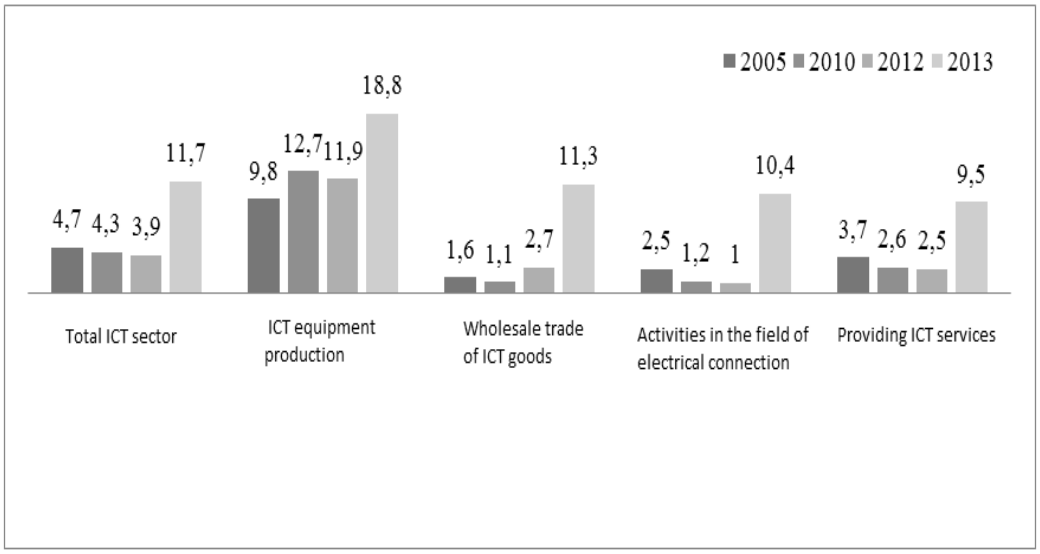

Fig. 4. Organizations engaged in research and development in ICT, % of total number of organizations

(ICT Statistic. International Telecommunication Union)

The innovation activity's increasing in the economy is one of the main tasks of modern development. Modern economies trends show an increase in the market value of just those companies that use new technological knowledge. Today, ICT development has a significant impact on the structural and dynamic parameters of the economic system. As noted M. Porter, "…technological change is increasingly regarded as that having an independent value, and any technological innovation used by the firm is seen as a positive factor…" (Porter, 1998).

The share of companies that have used technology innovation during 2002-2013 tended to decline and stood at its lowest result in 2013.The least indicator of innovative ICT products produced by organizations with respect to the total amount of goods was recorded in 2012 and amounted to 3.9 % when compared with 2003, the figure was 11%. As for the cost of technological innovation, there is a tendency to increase. The main source of financing innovation isenterprise's own funds - 72.9%.

Digital cellular mobile systems of the second generation are growing rapidly worldwide. The biggest characteristic of the cellular mobile networks dynamics was recorded in 2015. Fairly rapid progress of mobile communications standard GSM, primarily due to its broad functionality and continuous improvement is based on the concept of interoperability "bottom-up" that does not require modification of the previous generation equipment for the new network sharing. GSM service area is the entire geographical area in which the user can access the network GSM. GSM service area increases as the new operators sign contracts that provide joint work on customer service. Currently, the GSM service area covers some gaps, many countries from Ireland to Australia and from South Africa to America.

According to the given research of the extent and dynamics of the main indicators of ICT at the macro level, we can identify the following trends:

- the values levelof "penetration rate of telephone communication" indicator Europe consistently holds a leading place;

- the number of mobile telephony subscribers is growing rapidly and steadily since 2001;
- dynamics of the mobile subscribers total number is characterized by a constant tendency for growth, relative decrease occurred only during 2009-2010, amid the financial crisis;
- indicators of spending on research in ICT grew rapidly in 2010, but last year reduced their growth;
- the main trend is the redistribution patterns of communication services towards increasing the share of more technologically advanced - mobile (from 2004), and computer (from 2010) ones.

According to the data indicated in the annual report of the International Telecommunication Union, the most effective countries in the ICT development index survey in 2015 are the Republic of Korea and Denmark. This result was expected, since these countries have very high overall evaluation index, they show high achievements in all assessments of the three main components of ICT. South Korea in recent years shows significant results in ICT development as provided by all indicators in 2015. In 2010, the data in terms of skills in the country were nearly 1.00 (100 percent), the result remained at the same level until this year. There were significant rises in scores on the proportion of mobile subscriptions cellular and international bands crossing the Internet for each user. Almost all households in the country have access.

In the current situation the main task for Ukraine is to increase the role of government in the ICT development as a driving force for improving the competitiveness and sustainable economic growth. To do this, we should use the competitive advantages of the country that already exist, and remove key barriers. To determine the main directions of improving ICT market in Ukraine we need to analyze the main determinants that shape the ICT environment. In our opinion, the key factors forming environment are ICT indices, which cover a considerable range of values.

The Networked Readiness Index (NRI) evaluated the driving factors and the degree of impact network availability and ICT in the country. This takes into account an equal role and responsibility of all "players" of society - individuals, businesses and government. ICT playing now a leading role in the development of innovation, productivity and competitiveness capacity diversify the economy and promote the business activity, thus contributing to raising living standards. After reviewing the results of the research on the indexwe can analyze the problematic aspects of the current policy and monitor progress in the implementation of new technologies (Fig. 5).

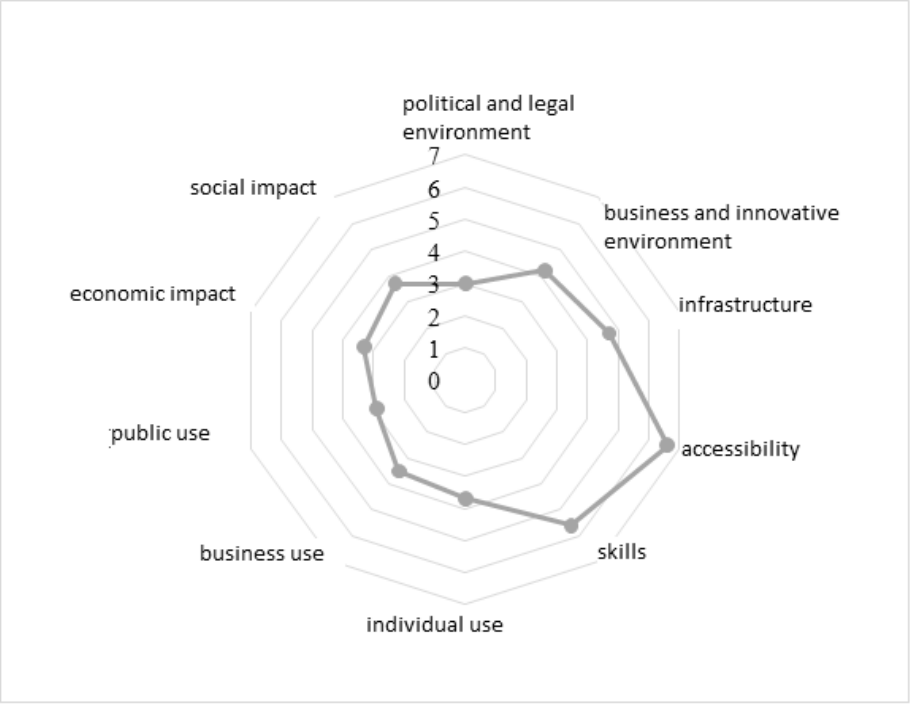

Fig. 5. Components of Networked Readiness Index, Ukraine, 2015
(Measuring the Information Society Report 2015. ITU)

Business demonstrated a negative trend in the use of ICTs (76th place, minus 5 positions). This is due to the fact that Ukraine's economy is still dominated by low-tech industries, which are less in need of a high level of ICT use. The rate of the use of ICT by citizens gets better compared with the state and the business. Growth estimates for this part of Ukraine allowed rising to 12 positions per year in the ranking of 2012. According to some data, 5 years, the number of regular Internet users (people over 16) increased almost 3-fold, to 15 million people in 2012, and broadband - 10 times, to 7 million people. The increase in total Internet users contributed to a significant reduction in Internet tariffs and growth in sales of smartphones, especially in small towns and villages.

High demand for ICT by the population contributes to high technology devices used by the Ukrainians. And even though the delayed transition (licensing) protocol standard for 3G, mobile Internet consumption is increasing even if the use of the protocol 2G is more than 11 million. Subscribers (40% of the total base of subscribers) used the mobile Internet in 2012. The worst indicators for Ukraine received the first part of politicoand regulatory environment (125-th): effectiveness of legislative bodies is at 137-th place in the world, the effectiveness of the legal system to resolve disputes – 138-th place, the effectiveness of the legal system in appeals chewing regulations - in 135-th place. Traditionally, the country gets very low marks in protection of intellectual property rights, and in terms of piracy –97-th place in the world. Lack of confidence in the protection of the rights and investment, corruption and "overregulation" of many processes (especially when starting a business) as well as the instability of the Ukrainian market, often discourage investors, which could spread the

country's best practices for the development of information and communication technologies. Ukraine only occupies the low 111-th place in terms of ICT usage state.

The World Economic Forum in its Index notes that the Ukraine government has no clear plan for implementation and use of ICT to improve the country's competitiveness. As a result,low 122-nd place in terms of "value of ICT in State Policy" and the relatively low score ICT priority on the government's agenda (118-th).

Low assess of the business environment in Ukraine is due to limited free competition in the country (120-th), administrative difficulties with opening the business and high aggregate tax rate. According to business, modern technology in the country is not enough available (96-th), partly because of the inability to obtain financing for practical venture (innovation) projects and the low volume of public procurement of high-tech products (112-th place).

Ukraine's competitive advantage is very high percentage of coverage of higher education - almost 80% (9-th in the world). At the same time it remains a question mark quality, particularly the quality of business schools (116-th), which should prepare high-level managers and possibly future initiators of innovative businesses. The highest position in the world ranking Ukraine occupies partly by the availability of ICT (2-nd place). This is ensured by low tariffs for mobile services (9-th place) and tariffs for fixed broadband (9-th place).

So, at present Ukraine has good potentialities for the e-business development, including marketing communications online, at a high levelbusiness and citizens are ready to use Internet technology. In particular, in terms of availability, this estimates the cost of ICT using with a mobile phone or broadband Internet access. Ukraine also shows good results in terms of the ability to use the Internet - it takes the 35-th place with an index of 3.5, which is significantly above the average of this indicator in the group of countries with incomes below the average.

Ukraine is the worst taking on a group of sub-indices, covering the use of ICT by the state. This shows that Ukraine has not developed the system of ICT regulation and promoting the development of the state.The state regulatory environment in the area of e-business is poor, healthy competition is not developed. The government pays insufficient attention until ICTs as the engine of economic growth and innovation system, which has undergone a deep restructuring after the collapse of the Soviet Union, have not yet been completely reorganized. All this together with imperfect political and legal environment does not allow Ukraine to receive all the benefits of the extensive involvement of economic interests in the use of ICT.

Conclusions and suggestions

The economic relations globalization, lack of information borders between states and therefore the rapid development of information society in developed and developing countries due to intense introduction of the latest achievements of science and technology in the field of ICT. They currently are inseparable part of the world community everyday life.

Information and communication technologies in today's dynamic development play a significant role in the growth of socio-economic and business environment in any country, positively affecting the rapid establishment of relations in trade, finance, transport, encourage active cooperation of influential international organizations.

ICT take priority among other sectors in the Ukraine's economy. This is confirmed by the analysis of its development — reducing resource input economy; they improve social standards of living, have positive impact on the trade balance, the diffusion of ICT in other sectors of the economy, outstripping economic growth. There is an urgent need to develop and

implement a comprehensive state development strategy. The main elements of this strategy should be the improvement of the tax system sector, reforming the education system, infrastructure development and marketing of Ukraine as an interesting player in ICT with an attractive business climate.

References

Connect 2020 Agenda. ITU. [Electronic resource]. Retrieved from http://www.itu.int/en/connect2020/Pages/default.aspx
https://www.statista.com/statistics/552595/worldwide-it-services-market-size/
ICT Statistic. ITU (2017) [Electronic resource]. Retrieved from http://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx
Measuring the Information Society Report 2015. ITU. [Electronic resource]. Retrieved from http://www.itu.int/en/ITUD/Statistics/Documents/publications/misr2015/MISR2015-w5.pdf
Porter, M.E. (1998). Competitive advantage: creating and sustaining superior performance: With a new introduction. N.Y.: free press.
Size of the information technology (IT) services market worldwide from 2014 to 2020. [Electronic resource]. Retrieved from https://www.statista.com/statistics/552595/worldwide-it-services-market-size/
Statistics database. World Trade Organization (2017). [Electronic resource]. Retrieved from http://stat.wto.org/Home/WSDBHome.aspx?Language=E
The Global Information Technology Report 2014 Rewards and Risks of Big Data. World Economic Forum Geneva. [Electronic resource]. Retrieved from http://www3.weforum.org/docs/WEF_GlobalInformationTechnology_Report_2014.pdf