

## IT MARKET IN POLAND

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The paper presents the changes that have taken place in the IT market in Poland. It was examined both the supply side and the demand side of the market. Throughout the IT sector in Poland in 2014 were employed 400 thousand people. This was a market creating the most new jobs in Poland. The value of the IT services market in Poland represented about  $\frac{1}{3}$  of the total value of the domestic IT market. The largest share in sales of IT products and services in Poland had equipment (53.5%), then services (30%) and finally software (16.5%). From Poland were exported mainly services programmers for foreign customers. It is expected that in the coming years, the largest increase will occur in the case of cloud solutions, and subsequently the data center and outsourcing services. Most sensitive to changes in the economic is IT hardware sector, less software and services.

Key words: IT market, hardware, software, ITT services

### 1. Introduction

Information technology tools include all elements allowing IT to function and develop itself. They involve computers and technical equipment cooperating with them, computer software, methods of communication between computers, methods (algorithms) of solving particular tasks, methods and tools of data organization, storage and transfer as well as programming languages [1, 2].

In the entire IT sector in Poland in 2014, 400,000 people were employed. It is a market creating the largest number of new workplaces in the country. In Poland

there are plants producing computer hardware, however, the number of hardware produced constituted two thirds of the desktop computers sold in the country. About 10% of computer hardware market in Poland accounted for tablets [3].

Firms providing IT services employ more than 140,000 people in Poland. It has been estimated that, in 2013, IT services accounted for 1.7% of the value of the global IT services market. The value of the IT services market in Poland accounted for one third of the total value of the domestic IT market. The number of firms providing IT services which operate in Poland is increasing rapidly as it increased by half, from 40,200 to 60,700, in years 2009 – 2013. The highest increase in the number of firms (by over 60%) was recorded in Wrocław, Kraków, Lublin and Rzeszów. At that time, two thirds of workers were employed in firms with foreign capital [4, 5].

In 2010, HP ranked first in the world in computer sales, followed by Acer and Dell. In 2014, 308,600,000 computers were sold around the world. The leaders were Lenovo (19.2%) and HP (18.4%), followed by Dell (13.5%), Acer (7.8%) and Apple (6.4%). It is worth noting that a yearly decrease in computer sales is recorded, mainly due to the competition of tablets and smartphones. Fewer and fewer desktop computers are being bought, whereas the number of laptops bought remains at the same level. It is predicted that in the next years the entire sector of computer hardware and other equipment will increase in the annual rate of 2-3% [6, 7, 8, 9]. In the case of business software, the world leader in 2014 was Oracle (17.3%), followed by SAP (14.3%), IBM (11.4%), Microsoft (8.4%) and SAS (6.8%) [10].

In 2014, the biggest IT firms in Poland based on sales revenue were consecutively HP Poland, Action, AB, ABC Data, Lenovo Poland, Komputronik, IBM Poland, Asseco Poland, Microsoft, and Dell Poland. In the majority of the firms, their activity was 100% connected with IT. In 2014, the biggest share in the sales of IT products and services in Poland had hardware (53.5%), then services (30%) and, finally, software (16.5%). Mainly programming services for foreign clients were exported from Poland [11].

A barrier to a faster IT market development in Poland is limited capital for IT investment in firms. The biggest chance, in turn, is greater use of European Union funds and raising awareness of the firms about benefits of IT investment. It is predicted that in the near future the largest increase will be recorded in cloud solutions, and subsequently, data center solutions and outsourcing services [12, 13]. The development of the sector in the future will be concerned with the application of solutions within cloud, mobility, Big Data/analytics, social technology, Internet of Things, 3D printing, automation/robotics and cybersecurity [14].

At the beginning of the twenty first century, an increase in the sales of software and services and decrease in the computer hardware sector can be observed.

The situation on the IT market in Poland was dependent on the economic trends. IT hardware sector is most vulnerable to economic changes, whereas software and IT services sectors are less so [15, 16].

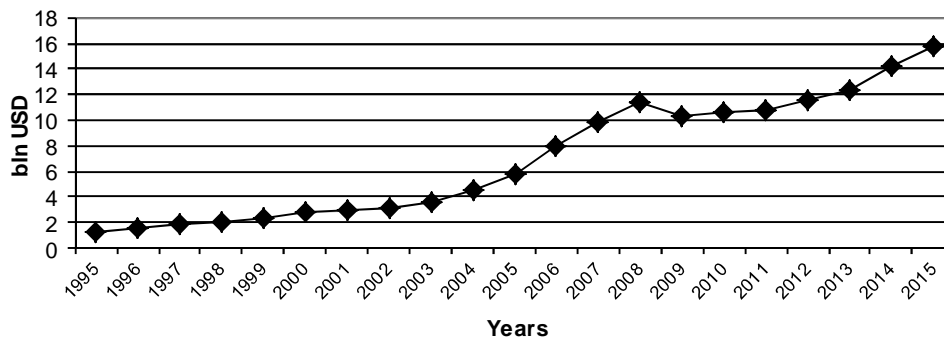
## **2. Research methodology**

The main objective of the study was to assess the functioning and changes taking place on the IT market in Poland. The detailed objectives included: presentation of the meaning of IT in economy, specification of changes on the IT market, depicting of correlations between IT market and economic condition of the country. Research encompassed the period of 2005-2015. The source material includes foreign and domestic literature on the subject, numerical data provided by the Central Statistical Office, reports and studies on IT. The work was developed using the descriptive, tabular and graphic tools, as well as the correlation coefficient. In order to determine the relationship between the economic condition in the country and the IT market, the correlation coefficient was applied. The indicators describing the economic condition of the country included indices of changes in GDP, gross value added, domestic demand, import and export. On the other hand, the parameters describing the condition of the IT market included the market value and the dynamics of its changes, the number of computer sales and the dynamics of its changes, the domestic computer production and the associated change dynamics. The demand side of the market was presented on the basis of surveys conducted by the Central Statistical Office.

## **3. The results**

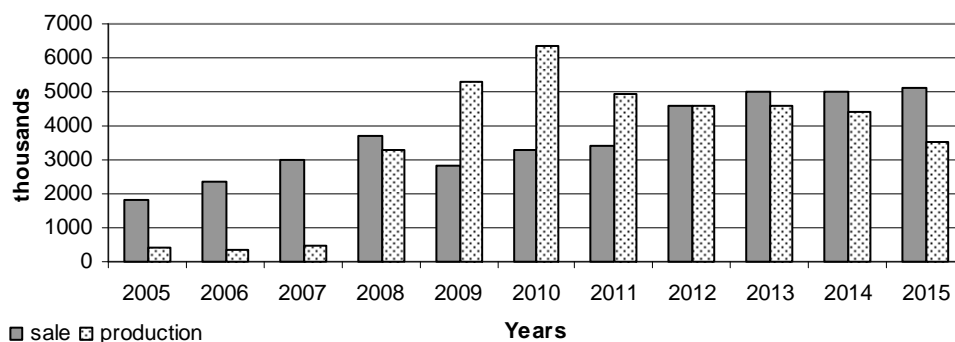
IT market in Poland is one of the most dynamically developing areas of activity. In 1995, the market value was about \$ 1.2 billion, and, in 2015, as much as \$ 15.7 billion, which means a thirteen-fold increase (Fig. 1). In the final years of the twentieth century, the changes were not big. It was only after Poland's accession to the EU that a dynamic market growth occurred. Poland gained free access to the huge European market and also saw the inflow of capital from abroad. As a result, the IT industry began to expand rapidly. Of course, market trends and its structure were changing. In addition to hardware sales, IT services started to gain importance. In years 1995 – 2015, the industry increased on average 14.2% per year. It should also be noted that during the economic crisis there was a decline in the value of the IT market by 9.7%. It was the only year in which there was a decline. The largest increases were recorded in 2004 – 2007, as in each of these years the

value of the IT market in Poland increased at least 25% annually. 2006 was a record year with the growth rate of 36.2%.



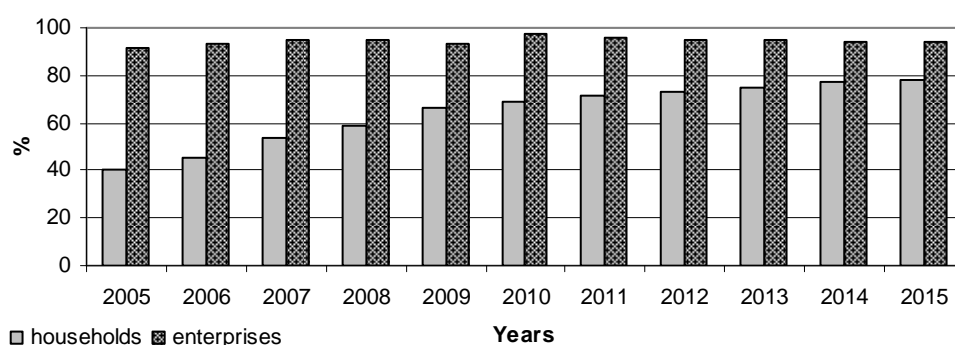
**Figure 1.** The value of the IT market in Poland in 1995-2015 (bln USD)  
*Source: IDC Raports.*

Computer sales was the most important area of the IT market. Initially, in 2005 – 2007, computers sold were imported (Fig. 2). Since 2008, a large increase in the production of computers can be noted, which is related to the launch of plants in Poland. At the same time, it should be added that domestically produced computers were largely intended for export. Imports of computers also occurred. In 2009 – 2011, Poland produced more computers than it sold. In 2009, there was a decline in their sales, however, their production was increased despite the economic crisis. Peak production took place in 2010, followed by a gradual decline in the number of manufactured devices. In years 2013 – 2015, sales amounted to around 5 million units. On the market there appeared changes in the structure of devices sold. In the 90s of the twentieth century, in the early stages of the development of the IT market, desktop computers dominated in sales. After Poland's accession to the EU, laptops gained a significant advantage and accounted for two thirds of the market. Desktop computers were an important tool not only at work but also for customers requiring the highest quality equipment. In subsequent years, the importance of tablets on the market increased, and they slowly started to replace laptops. Here changes in the structure of the equipment are also observed. Small tablets are replaced with bigger ones or smartphones. The future of the market should belong to large-screen tablets, at least 9-inch, or big smartphones, so called phablets (with screen sizes from 5.5 to 7 inches). In the second decade of the twenty first century, there was a rapid increase in the sales of hybrids, that is tablets with an attached keyboard. The most important characteristics on the market are associated with versatility and mobility.



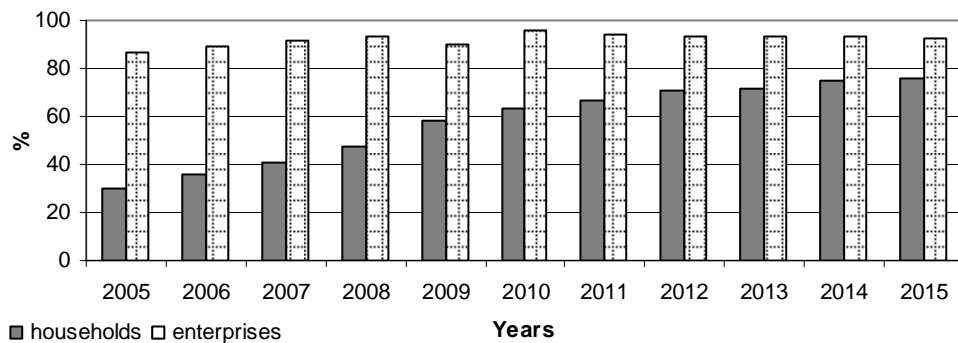
**Figure 2.** Production and sales of computers in 2005-2015 (in thousand)  
*Source:* IDC Raports, publications of the Central Statistical Office.

The number of computer equipment systematically increased in Poland (Fig. 3). In the case of enterprises, the percentage of entities with computers in years 2005 – 2015 exceeded 90% and it underwent little change. In the final period of the analysis, even a small decline of this indicator in this group of entities can be observed. Changes in households were very dynamic. In 2005, only 40% of these individuals had computers, and, in 2015, as many as 78%. Already in 2005, the computer was indispensable work tool in firms, while private users started to use computers with their greater affordability. Household computer ownership shows how the market changes and what the level of its saturation is. What should also be taken into account is the fact that in some households there is more than one computer, and the replacement of equipment usually occurs every 5-6 years. There is also a group of customers who follow new market developments and replace equipment frequently.



**Figure 3.** Access to computers in households and enterprises (in% of total in the group)  
*Source:* publications of the Central Statistical Office

The demand side can also be characterized by access to the Internet. The greater it is, the faster demand for devices, applications, and services grows. As in the case of computer equipment, dynamic growth was observed in households (Fig. 4). In 2005, only 30% of these entities had access to the Internet, whereas in 2015 it was already 76%. It can be concluded that the rate of change was similar to this in the case of computer equipment. Internet is, as a matter of fact, a service complementary to computers. In the firms, already in 2005, 87% of the entities had access to the Internet, while in 2015 93%. Saturation with these services took place earlier, already in 2010 (96%). It should also be noted that structural changes occur on the market. New fast broadband Internet services are introduced. As in the case of computers, customers pay more and more attention to mobility.



**Figure 4.** Access to Internet in households and enterprises (in % of total in the group)  
*Source:* publications of the Central Statistical Office.

Table 1 presents results of the Pearson correlation coefficient and p value. The limit value of significance level was assumed to be  $p = 0.05$ . Significant correlations were marked by grey background of the text. Correlation coefficients were calculated for years 2005-2015.

Very strong positive correlation values were found to exist between the condition of economy and value of the IT market and the computer sales and production in Poland. IT market developed faster and independent from economy, therefore, no significant correlation was found. Only in the case of changes in foreign trade, strong dependencies in relation to the change in the market value and dynamics of computer sales occurred. The relations were stronger for changes in exports than imports. The research confirms only a weak relation between the dynamics of changes in the parameters of the economy and the dynamics of changes in the production of computers. Production and assembly of these devices were transferred to other parts of the world. Additionally, a change in the demand of customers and increased demand for tablets and smartphones as well as decreasing demand for desktop computers and laptops were also mentioned.

**Table 1.** Pearson correlation coefficients between the situation and changes in the IT market and selected parameters of the economy

Parametrs	Pearson correlation coefficients				
The coefficients of correlation between the value of IT market and					
	value of GDP	gross value added	value of domestic demand	value of export	value of import
correlation	0,935	0,933	0,943	0,951	0,974
p value	0,001	0,001	0,001	0,001	0,001
The coefficients of correlation between the dynamics of change in value IT market and					
	dynamics of change GDP	dynamics of change gross value added	dynamics of change in value of domestic demand	dynamics of change in value of export	dynamics of change in value of import
correlation	0,564	0,536	0,621	0,932	0,722
p value	0,071	0,089	0,041	0,001	0,012
The coefficients of correlation between the number of computer sales and					
	value of GDP	gross value added	value of domestic demand	value of export	value of import
correlation	0,927	0,926	0,898	0,958	0,931
p value	0,001	0,001	0,001	0,001	0,001
The coefficients of correlation between the dynamics of change in the number of computer sales and					
	dynamics of change GDP	dynamics of change gross value added	dynamics of change in value of domestic demand	dynamics of change in value of export	dynamics of change in value of import
correlation	0,300	0,274	0,394	0,753	0,632
p value	0,300	0,444	0,261	0,012	0,050
The coefficients of correlation between the number of computer production and					
	value of GDP	gross value added	value of domestic demand	value of export	value of import
correlation	0,704	0,710	0,736	0,569	0,593
p value	0,016	0,014	0,010	0,068	0,054
The coefficients of correlation between the dynamics of change in the number of computer production and					
	dynamics of change GDP	dynamics of change gross value added	dynamics of change in value of domestic demand	dynamics of change in value of export	dynamics of change in value of import
correlation	0,069	0,074	0,158	-0,201	0,054
p value	0,849	0,839	0,663	0,578	0,882

Source: own research

#### 4. Summary

The market of IT in Poland is among the fastest developing markets – the dynamics of development in years 2005 – 2015 exceeded ten percent of growth annually. The supply side is made up of computers and data processing equipment, software and companies providing services. Rapid and dynamic changes which resulted from the introduction of new products, such as tablets, smartphones and phablets, emerged on the market. The demand side is created by customers who purchase computers and use the software. In years 2005 – 2015, the share of households having computers and Internet access grew systematically. In the case of enterprises, the share of entities with access to computers and the Internet was at a high level, so the changes were little. In the case of households, a correlation between computer possession and the Internet access has been found. As mentioned, the demand for hardware changed fairly quickly, as was the case with the Internet, which offered better services over time, such as broadband and mobile Internet. A very high level of correlation between the market value and the number of computer sales in years 2005-2015 and the measures of economic condition of Poland was found. No correlation was found when comparing the dynamics of market changes and economic condition. IT market had developed faster and independent of economy.

#### REFERENCES

- [1] Pirjanowicz W. (2001) *Programowanie komputerów*, Wyższa Szkoła Informatyki i Ekonomii, Towarzystwo Wiedzy Powszechnej w Olsztynie, Olsztyn, 7.
- [2] *Strategia rozwoju branży informatycznej, projekt Transfer wiedzy w regionie*, [http://www.it.rsi.org.pl/dane/Szanse\\_i\\_wyzwania.pdf](http://www.it.rsi.org.pl/dane/Szanse_i_wyzwania.pdf) (26.09.2016).
- [3] *Rynek IT w Polsce 2015, Prognozy rozwoju na lata 2016-2021*, (2016), Raport PMR.
- [4] *Rynek usług IT w Polsce 2015*, Raport ABSL.
- [5] Portal gospodarczy WNP.PL, [http://it.wnp.pl/szybko-rosnie-zatrudnienie-w-polskim-sektorze-it,251776\\_1\\_0\\_1.html](http://it.wnp.pl/szybko-rosnie-zatrudnienie-w-polskim-sektorze-it,251776_1_0_1.html) (26.09.2016).
- [6] *IDC's Analyze for Future*, <https://www.idc.com> (26.09.2016).
- [7] *IDC's Worldwide Black Book, Version 2, 2016*, <https://www.idc.com> (20.09.2016).
- [8] *Na całym świecie spada sprzedaż komputerów, a jak wygląda post-PC w Polsce?* <http://www.spidersweb.pl/2014/03/polski-rynek-komputerow.html>, (20.09.2016).
- [9] *Rynek komputerów PC na dnie*, <http://itwiz.pl/rynek-komputerow-pc-na-dnie/> (20.09.2016).
- [10] *Worldwide Business Analytics Software Market Shares, 2015: Healthy Demand Despite Currency Exchange Rate Headwinds* (2016), IDC Report.



- [11] *100 największych firm IT w Polsce – wyniki raportu ITwiz Best 100*, <http://itwiz.pl/100-najwiekszych-firm-polsce-wyniki-raportu-itwiz-100/> (20.09.2016).
- [12] *Popyt na polskie IT rośnie: Nowe technologie z naszego kraju podbijają świat*, <http://wgospodarce.pl/informacje/21951-popyt-na-polskie-it-rosnie-nowe-technologie-z-naszego-kraju-podbijaja-swiat> (20.09.2016).
- [13] *Rynek przetwarzania danych w chmurze w Polsce 2016 – Analiza rynku i prognozy rozwoju na lata 2016-2021*, Raport PMR.
- [14] *Rynek IT w Polsce ma się dobrze*, <http://www.benchmark.pl/aktualnosci/absl-raport-rosnie-rynek-it-w-polsce.html> (26.09.2016).
- [15] *Rynek usług informatycznych – popularne branże w 2015 roku*, <http://www.prowadzefirme.pl/rynek-uslug-informatycznych-popularne-branze-w-2015-roku/> (26.09.2016).
- [16] *10 najważniejszych faktów na temat polskiego rynku IT*, <http://www.bankier.pl/wiadomosc/10-najwazniejszych-faktow-na-temat-polskiego-rynku-IT-7276863.html> (20.09.2016).