

VII. E-ECONOMY

During the 1960s Bulgaria acquired a number of COMECON specializations in the production of communication equipment, which made it possible to begin extensive training of personnel, developing R&D organizations and the respective production capacities. As a result, Bulgaria achieved a monopoly position with over 48 percent of the electronics market in CMEA since late 1970s to late 1980s²². Employment in ICT sector reached 200,000 in 1980s and the production capacity of microprocessor plant in Pravetz reached 100,000 annually²³. 130,000 were employed in electronics and telecommunications in 1989, 8 thousand of them being highly qualified professionals. Almost the entire production (95%) of the sector (equal to 25% of the industrial manufacturing output) was export oriented, mainly targeted at USSR market.

Since 1989, the beginning of transition to market economy, a dramatic decline in electronics production and export was observed. Among the main factors contributing to this situation were: increased international competition, poor corporate governance, lack of state financing and collapsing supply and demand mechanisms within CMEA. Thus, for instance, export decreased more than 20 times over a period of 10 years from \$ 1.5 billion in 1984 to less than \$ 75 million in 1994. The result was significant structural unemployment, leading to serious social problems and labour force de-qualification, especially in towns whose urban growth was based on new technologies specialization.

In expert estimates, the Bulgarian ICT market amounts to about BGN 1.6 billion, accounting to 6% of GDP. Among the fastest growing markets are mobile communications (preliminary circa BGN 700 million), cable televisions (estimated at BGN 250 million), Internet access and, especially during the second half of 2001, Voice over IP (estimated at BGN 15 million). The computer market is around BGN 480 million, the largest share – 64% being that of hardware, 21% - services, and a small share for software – 15%. The growth is still dependant more on hardware, infrastructure and access to technologies rather than on IPR or services transmitted via them.

VII.1. Access to ICT

1.1. Computers in business

Unfortunately, computer and internet usage in business has not been studied systematically and by representative samples. Nevertheless, a few specialized studies targeted at different types of companies could serve as a starting point for analyses.

At the end of 1999 “around 23% of SMEs had computers and 5.7% had intranet”²⁴. A study of the innovation potential of Bulgarian SMEs in third quarter of 2000²⁵ found that 40 percent of the companies used electronic networks,

²² Tactics (2001) Final Reports prepared for the European Commission, Sofia

²³ For comparison, according to IDC, circa 60,000 new PCs were sold in Bulgaria in 2001.

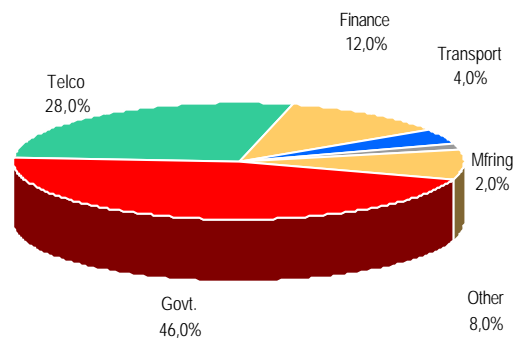
²⁴ Report on Small and Medium-Sized Enterprises in Bulgaria 1996-1999, Agency for SMEs, 2000

²⁵ Vitosha Research and IRC-Bulgaria, 2000

databases and Internet. According to Vitosha Research estimates, around 30% of the active companies in Bulgaria use computers in their daily work.

Computers in business are not uniformly distributed and are not effectively used. Only 7.3 percent of workplaces have PCs installed, and only 20 percent of companies with computers have built their own intranets. New computers in private business (excluding finance and telecom sectors) are rarely shipped. Private business and home users segment altogether account to only 14 percent of all new shipments. The government has the largest share of new computer imports – 46 percent of the total volume.

Figure 7.1. Shipment of new computers by sector



Source: IDC 2000

In the majority of companies, computers are being used for document processing, accounting and legal information systems. Fax machines and telephone, as well as personal contacts, are perceived as key to doing business. It is still required to have signed paper documents almost everywhere.

1.2. Internet and web use in business

Around 40% of companies having computers, or 12% of the active companies, are connected to the Internet. Only 3.85% of employees have access to the Internet, which is predominantly used for email communication. This fact could be explained by two factors – (a) a large amount of outdated computers (prohibiting effective use of the Internet) and (b) lack of understanding among business managers about the role of Internet as a driving force for business development.

There was an initial boom of launching Internet sites by companies in 1999 and 2000. The general pattern was to leave the site very simple and not updated. 2001 marked a slight change of the migration of companies to Internet. New sites tend

to be more sophisticated and regularly updates. The growth is rather linear than rapid exponential development (as is the global trend). According to optimistic estimates 5% of Bulgarian companies have Internet sites.

Currently, around 1,900 domains are registered in **bg** TLD, being used roughly by 700 organizations. About 2,500 domains are registered in **com**, **net** and **org**, but quite a large number of companies maintain two or more domains. In addition, 800 company sites are believed to be hosted by local portal sites (including free hosting) – i.e. www.hit.bg, www.dir.bg, www.online.bg, www.bol.bg, www.search.bg and others.

Company sites present mainly basic, static and rarely updated information, often limited to a short company profile, address and brief description of products and services. Expert estimates suggest that 75 percent of company sites fall in this category (see Table 7.1.) The interactive sites and detailed corporate presentations with actual and dynamic information are rather an exception to the rule.

TABLE 7.1.: DISTRIBUTION OF COMPANY SITES BY QUALITY (EXPERT ASSESSMENT)

“Quality of Internet sites”	Short presentation of the company, not more than 1-3 pages	Detailed presentation, incl. product catalogues, price lists, etc	Dynamic information, news	E-commerce, online payment or payment on delivery
Frequency	75%	20%	3%	2%

Source: Expert assessment by Bazar.bg

There are significant discrepancies in Internet use and quality of websites according to the area of company activity, size, ownership and other characteristics. Foreign companies, export-oriented companies, larger companies, those in the banking and finance sector, software development companies, hardware dealers and technology support centers, and human resource management companies usually have good and updated web pages and use ICT extensively in their everyday work. Small, locally targeted Bulgarian firms use, if at all, Internet primarily for communication purposes and computers – for accounting and warehouse databases or secretarial tasks. There are also a few small Bulgarian internet based retailers.

In a survey (FDI 2000) of companies with foreign direct investments²⁶ carried out in December 2000, 75.3% of firms (with capital over \$10,000) were found to use email and Internet in their everyday work. Despite the obvious use of Internet for general information gathering (74.1% of all firms), Internet is mostly used for interaction with company suppliers – 45.9%. About one-third of the firms used Internet for communication with clients and just 7% were involved in e-commerce.

²⁶ ARC Fund was coordinator for Bulgaria in a research project on “Barriers to FDI on the Balkans” funded by Freedom House.

TABLE 7.2 INTERNET USE IN ENTERPRISES IN BULGARIA

Internet usage	FDI 2000	GCR'99
e-commerce	7.1%	12.8%
Servicing clients	34.1%	37.1%
Relations with suppliers	45.9%	47.1%
General information	74.1%	83.9%
Do not use at all	24.7%	16.1%

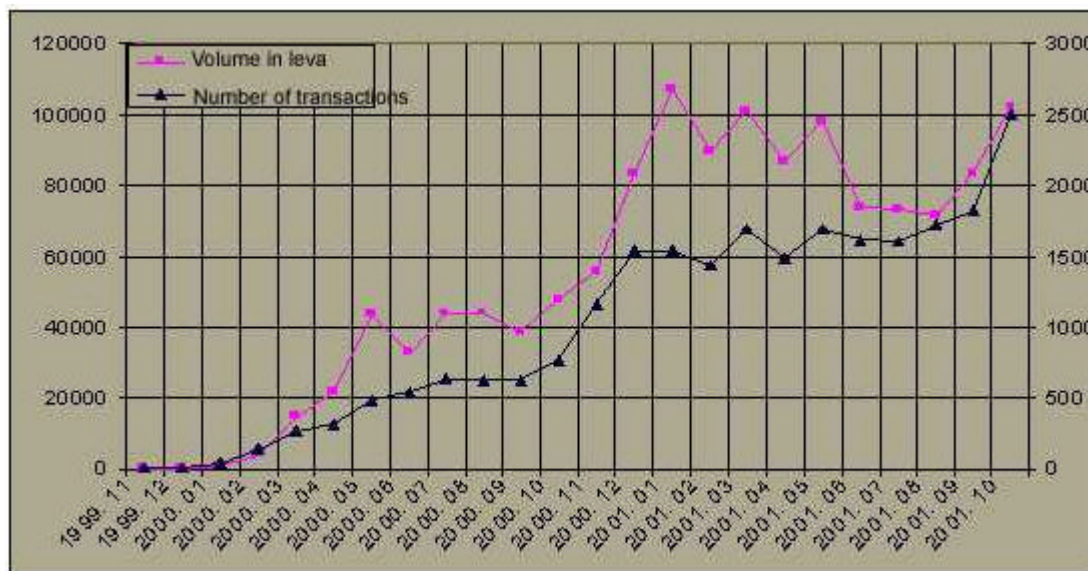
The data support the tendency observed by the Global Competitiveness Report for 1999 (GCR'99) (field research conducted in January 2000).

VII.2. Electronic commerce

Still the share of revenues generated over the Internet is symbolic – 1.06% according to the GCR 2000. 7.6% of companies report that around 2% of their revenue is generated over the Internet. 2.8% report values in the margin of 4 to 11%. It should be noted that the revenue is either generated from outside Bulgaria or through external online payment systems.

There are two existing e-payment systems in Bulgaria, ePay.bg being the most developed:

FIGURE 7.2. ELECTRONIC PAYMENTS THROUGH ePAY.BG FOR THE LAST TWO YEARS. (LEFT SCALE – TURNOVER; RIGHT SCALE – NUMBER OF TRANSACTIONS)



Source: Borika

There is a clear trend of relatively stable transfers via the Internet of about BGN 80,000 monthly. Two major factors account for this situation – demand has already peaked and there are not enough attractive goods and services available for online purchase. The somewhat clumsy and complicated procedure for online debit cards registration is yet another negative impact – only 1.4% of debit card holders are

currently registered in ePay.bg. A second e-payment system, BGPAY, was launched in mid-2000 but still has no real turnover.

A relatively new service, Net-Card, for e-payment by prepaid cards is fast growing. In just 3-4 months of existence, registered users of the service are about 3,000 with a total of 11,000 transactions worth BGN 60-70,000.

2.1. B2C

E-commerce development in Bulgaria is still at an early stage, when it is difficult to determine the market niches and their potential. The current distribution of existing internet shops/e-commerce sites is given in Table 7.3. . The respective share of turnover is based on expert estimations.

Table 7.3. Distribution of Internet shops by type of payment

Type of payment	Number of Internet shops	% of total turnover
Payment trough debit cards	10-15	20-25%
Payment trough credit cards	7-8	7-10%
Payment on delivery	40	60%
Payment services only for utility bills	1	8-10%

Source: Expert assessment by Bazar.bg

There is a bit of confusion in the overall business language related to e-commerce and most of the Internet shops currently in operation are in fact company catalogues for home/office delivery with payment in cash upon delivery. Rough estimates show that they account to 60% of the total turnover, compared to online sales by debit cards accounting to only 30-32% (including payment of utility bills). Although the number of credit cards is significantly less than debit cards, they account for 7-10% of the volume of online transactions.

Based on data from Internet shops and e-payment systems, the major categories of goods and services traded over the Internet are given in Table 7.4:

Table 7.4 Type of products and services sold on Internet

Books	45%
Internet access cards	10%
Flowers and souvenirs	10-12%
Music	7-8%
Electronics, GSM telephones	6-7%
Payment of utility bills	12-15%

Source: Expert assessment by Bazar.bg

The average transaction through ePay.bg is BGN 45-50. The low average level is determined by the low consumer purchasing power. There are some seasonal variations in Internet transactions, partially due to higher utility bills in January (BGN 85 on average).

TABLE 7.5. AVERAGE TRANSACTION THROUGH EPAY.BG

January 2000	September 2000	January 2001	August 2001	October 2001
19,1	62,29	69,49	41,61	40,82

Source: ePay.bg

2.2. B2B

Business-to-business e-commerce is still in negligible. Although there are individual attempts for transactions and software platforms for information exchange and internal payment between branches of a company, there are no portals or specialized sites for B2B.

Besides partially payment of company utility bills (water, heating) there are no other major services or goods offered over Internet that could be classified in the B2B category. A few online bookstores (www.office1.bg, www.buloffice.com and others) provide options for online ordering of stationery, but still the majority of orders are made by phone. Rough estimates show that the ration of B2B compared to B2C is about 15:85.

The major barriers for B2B development are low qualifications of company buyers and unwillingness to change stereotypes of work in dealers. Additional factors might be difficulties in accounting and dealing with banks. It was discussed earlier in this report that Internet is mostly used by people younger than 30 years, yet the decision-makers in companies (chief accountants, buyers or even managers) and the majority of public servants feel frightened by the new technologies and do not effectively use computers and Internet.

2.3. Availability of e-payment instruments

The overall assessment is that Bulgaria has a favourable legal framework and technological infrastructure of trade and financial institutions, allowing for online authorization and settlement of e-commerce transactions. The majority of the banks issue debit cards and some – also credit cards.

The number of debit cards was 800,000 in mid-2001 and credit cards were between 7,000 and 10,000²⁷. An annual growth rate of 50% was observed in the last two years. Credit cards issued in Bulgaria have a stable growth of 400-700 new cards issued each month. The credit cards growth is low due to tough requirements by banks – initial deposit in the range of \$300-2,000 (3 to 7 times the average monthly salary) and because the usage of credit cards in Bulgaria is limited. According to the latest available data there are around 3,000 VISA and 4,000 MasterCard in the country. International debit cards Maestro are around 66,000 but the majority of Internet shops do not accept them as a payment instrument.

²⁷ According to Borika

Electronic cards could be used by around 10% of the population through 565 ATMs (as of July 2001) installed in 100 towns and even villages in Bulgaria. There are 200 ATMs installed in Sofia alone (as of end of 2001). In spite of the overall growth of 35% in ATMs, the number of towns/villages covered by the network remains stable in the last year. The major towns and tourist centers are covered by a network of ATMs. POS-terminals, which are more important for e-payment development than ATMs account for a significant growth – from 500 at the end of 1999 they reached 1,600 in mid-2001.

In October 2001 the last remaining five large banks joined in the system of electronic payments and the number of potential users grew by 150% reaching 800,000 people.

TABLE 7.6. CARD HOLDERS

Card holders	Total	With possibilities for electronic transactions	Registered in ?Pay
December 2000	534 000	120 000	5 000
December 2001	810 000	780 000	11 000

Source: Borika

Debit card transactions doubled in 2000. The turnover through ATMs in 2001 increased with 82.8% as compared to 2000, and the growth in Internet payments is even bigger – 180%.

TABLE 7.7. DEBIT CARDS USE

	December 1999	December 2000
Withdrawal from ATMs (in BGN)	2 900 000	5 800 000
Payment through Internet (numbers)	6	1535
Payment through Internet (volume)	168,38	82 883,68

Source: Borika

Electronic payments are made also through prepaid cards and e-banking: pc banking, telephone banking and online banking. The major difficulties to e-banking include the lack of adequate qualification of bank employees, combined with conservative attitudes towards new technologies, security-related problems, and lack of understanding among the businessmen.

VII.3. ICT employment opportunities

According to Vitosha Research data²⁸ 186,000 people in Bulgaria currently have high education related to information and communication technologies, and 565,000 have formal computer training. A quarter of those with high education in ICTs had further or parallel computer training. Around 443,000 people trained themselves, either at the

²⁸ National representative survey, May 2001

job or assisted by friends. **It could be concluded that some 16.2% of the population is computer literate.**

Assessment of the labor supply related to production of ICT goods and services is a difficult task and often subjective. Experts estimate IT specialists (incl. software developers, Internet applications and design, system administration and hardware assembling and support) in a wide range from 4,000 to 15,000²⁹. In the most popular site for IT jobs (www.itjobs.bg) 2,000 actively seek employment out of 9,000 registered IT professionals.

If other categories are included in this number, such as professional users, telecommunications specialists, ICT equipment dealers, teachers and those employed in the public administration, the range of employed would be from 30,000 to 45,000.

According to experts from recruitment agencies 'IT education is not a decisive factor for recruitment and in more than 80% of the cases it is not a prerequisite for employment. The reason lies in the fact that the skills sought most often are not taught at the university or school but are gained through individual learning or practical experience.'

It is even more difficult to assess the ICT related workplaces/jobs. The main difficulty arises from the fact that a large share of this employment is in the gray/informal economy. Employed students, or those working on outsourced projects often are not socially insured even on a minimal wage. In view of this, the only source of information are expert estimations and assessments.

According to different estimates the gray sector of IT market ranges between 30 and 80 percent. Despite its negative effects, the gray economy also has a positive influence on computer and software penetration and computer literacy becomes more accessible.

Although the demand for qualified IT labor force is always ahead of supply, *ceteris paribus*, we could consider that IT jobs are overall equal to the number of IT specialists, both values increasing in time. The firms and employers meet the demand for more specialists with extension of working time and increasing the requirements/intensity of work, outsourcing orders to partners or on-the-job training. The last option is not considered very efficient, since the majority of those trained soon leave for better employment opportunities and higher salaries. As a reaction to this problem, large IT companies have been seeking closer cooperation with the universities. Up until now this cooperation was based on sponsoring and advertising contracts, but it is expected that in the next few years the cooperation will be institutionalised through establishment of high-tech parks and contractual relationships with spin-off companies.

As far as official statistics are concerned, according to experts from the National Statistical Institute, the closest chapter is "activities on project-programming production and support and related services". 2,319 firms with a total of 5,117

²⁹ The Deputy Minister of Transport and Communications Mr. Nikolay Nikolov mentioned 6,000 at the SEE Economic Forum, October 2001; IDG estimates 3,900-4,2000 IT specialists in a total of 600 active IT companies in September 2001; BAIT puts the figure at 15,000.

employees were reported in 1999, accounting for a growth rate of 12% among firms and 6% among employees, as compared to 1998. Data for 2000 is not yet published but preliminary estimates show 2,600 firms with 5,450 employees.

Workplaces with installed computers (or requiring part-time work with computer) are estimated between 12%³⁰ and 19%³¹. **For the purposes of the current study the average value of 15% is taken for jobs requiring ICT skills.**

3.1. Remuneration of IT specialists

Unfortunately there are no regular labour cost surveys on the ICT market. There is a large discrepancy in salaries – from around BGN 200 in public administration, universities, or start-up salaries of people with no experience in the private sector; through around BGN 400 for heads of IT departments in public administration, qualified students working on international projects at universities or NGOs; to BGN 700-1,200 for middle level specialists in the private sector; to the highest levels of over BGN 2,000-3,000 – for managers, head of IT departments in banks, or the best software developers (around 5% of the total).

Table 7.8 Salaries in IT-firms

Salaries in IT-firms, working for European or American markets		
Position	Minimum	Maximum
Assistant to the CEO	250.00	800.00
Director of Software Developers Department	900.00	3 000.00
Senior Programmer/Developer	600.00	1 600.00
Junior Programmer/Developer	400.00	1 000.00
Director Web Design Department	1 000.00	1 500.00
Senior Web Designer		1 100.00
Junior Web Designer		500.00
System analyser	800.00	1 500.00
System administrator	500.00	1 500.00
Director Sales and Marketing		2 350.00
Senior specialist Sales and Marketing		1 500.00
Junior specialist Sales and Marketing		650.00
Specialist Databases		1 600.00
Specialist Analyzer of Web sites		1 200.00
Specialist – Advertising department		1 100.00

Source: Dr Pendl and Dr Piswagner – Bulgaria

According to IDC, the average salary of ICT specialists in year 2000 accounted to 220% of the average salary in the country. Programmers/software developers, system administrators and other highly qualified professionals earned 340% the average salary in Bulgaria.

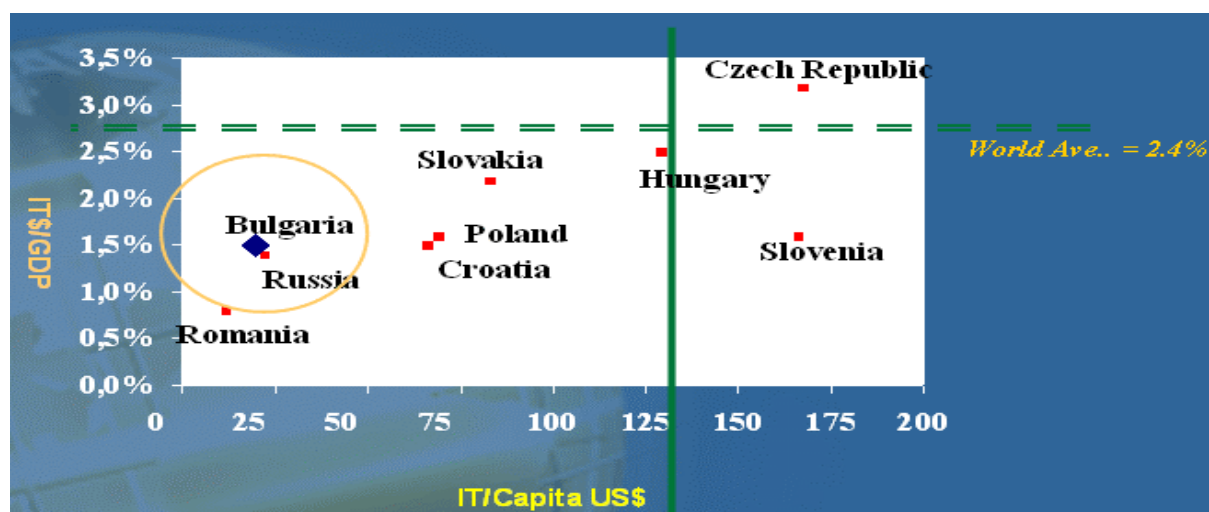
A leading indicator for the future attractiveness of work in the information society and e-development as a whole is investing in IT (excluding telecommunications),

³⁰ Based on employment data from NSI and IDC data on PC penetration in business and public administration

³¹ National Representative Survey, Vitosha Research, May, 2001

which is about 1.4% of GDP, according to IDC. The Figure 7.3. provides the comparative positioning of Bulgaria in the context of other transition economies.

Figure 7.3. IT spending for Central and Eastern European Countries



Source: IDC 2001

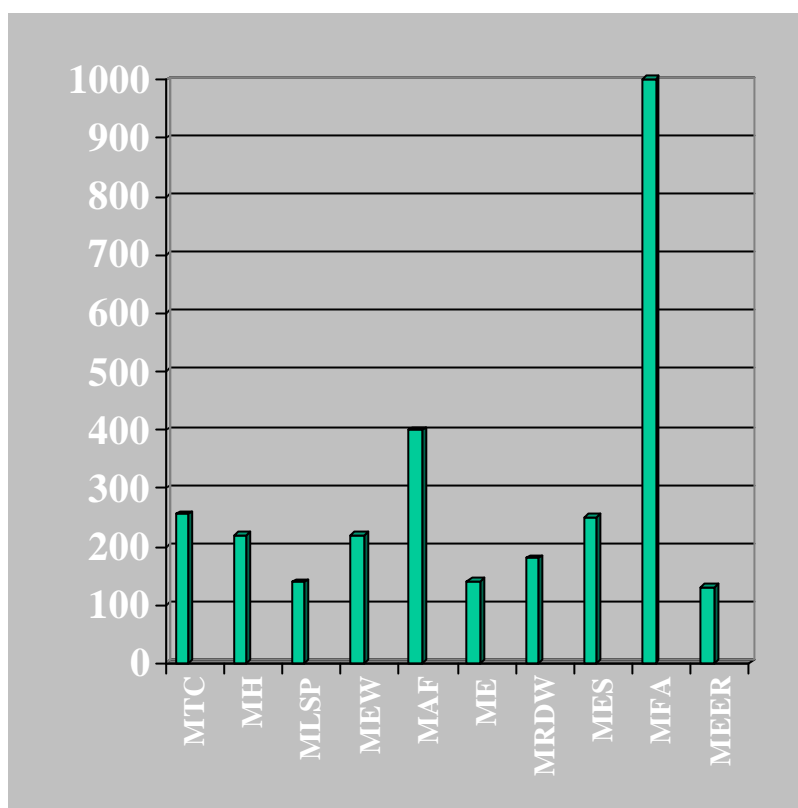
VII.4. e-Government

There has been much debate on e-government in the last three years, yet the last year saw the first significant development in this area.

The government has been working for two years now to create a backbone network for internal communication between ministries, regional government, municipalities, etc. The network use an Intranet/VPN solution, opened to the public with own security system, optic-fiber channels for high speed (T-1; T-3; OC-3); supporting systems for national registries with public access and support of internal document management system, and two way Internet connection of at least 2 MB. The launching of the project is expected to be in mid-2002. Currently it is operating in Sofia and some of the larger towns.

The National Statistical Institute collected information on IT resources in public administration in 2001 but the data is not available even to senior state officials. Most recently IDC and the Council of Ministers conducted a survey among central government ministries (with the exception of Ministry of Interior, Ministry of Defense and Ministry of Finance) on IT equipment and human resources. The results of this survey are shown in Table 7.9:

Table 7.9 : Number of computers in central government ministries



Source: IDC 2002

According to the origin of computers, 45% of respondents indicated that they had computers manufactured by leading EU or US producers, 45% reported leading Bulgarian assemblers, 18% - producers from Far-Eastern countries and 9% - small unknown or even non-brand computers.

Expert estimates suggest that around 18% of workplaces in the central and local government administrations are equipped with computers. The regional governments have the most up-to-date equipment and almost 90-100% of the workplaces are computerized.

Problems related to computer usage in the public administration could be summarized as follows:

- outdated equipment – many departments still have 16 bit PC 386, 486;
- cutting edge technology – mainly bought through loan schemes or public procurement; due to the high cost of this equipment it often impossible to buy appropriate software and consumables for effective use of the equipment;
- low interoperability of databases and specialized software.

Not all computers are yet connected in a network. More than a third of respondents say that intranets do not cover all units or branches of a given ministry in the country. The predominant type of the network in the government is Ethernet (44% of

respondents) and Fast Ethernet (39% of respondents). Only 11% responded that they had FDDI and 6% – Gigabit.

Connectivity to Internet varies from 80-100% in regional administrations, trough 70-80% in the ministries to less than 20% in local government administrations. The average level would be 20% connectivity of computers to Internet.

The public administration shows a positive development in web presence over the last few years. In 1997 there were only two sites, that increased to more than 120 in 2001. More than 90% of the state institutions have Internet sites. 4-5 are the sites of regional administrations, more than 30 of municipalities. Still the sites are mainly with static information and not updated. Where applicable downloading of forms is possible. It is expected that in 2002 with recently published secondary e-commerce legislation necessary for the implementation of the Law on electronic document and electronic signature, more government sites will become interactive and will allow for e-payments and electronic submissions of documents.

Table 7.10 Government sites

Total sites of Ministries	Providing dynamic information	Allowing for feedback	e-Payments, B2G	Good design
15	3	9	0	3

Source: Expert assessment by Bazar.bg

Nine sites of ministries provide feedback possibilities through email or web form. The same option is provided by three to five regional administrations (15%) and around 15-25 of the municipalities (7-8% of all). Sofia Municipality is a big exception at the municipal level providing tracking services for the citizens requests.

Only 4.3% of the population visit public administration web pages. Firms visit more often government Internet sites due to their interest in public procurement – around 6% of the companies use the public-procurement registry, Bulstat, tax administration sites or other company-related online services.

The overall assessment of e-government in Bulgaria is that it is in its early stage of development, but if good coordination and project management is applied, and adequate training of civil servants is provided, it is possible to achieve at least 90 percent of the ambitious government program in e-government.

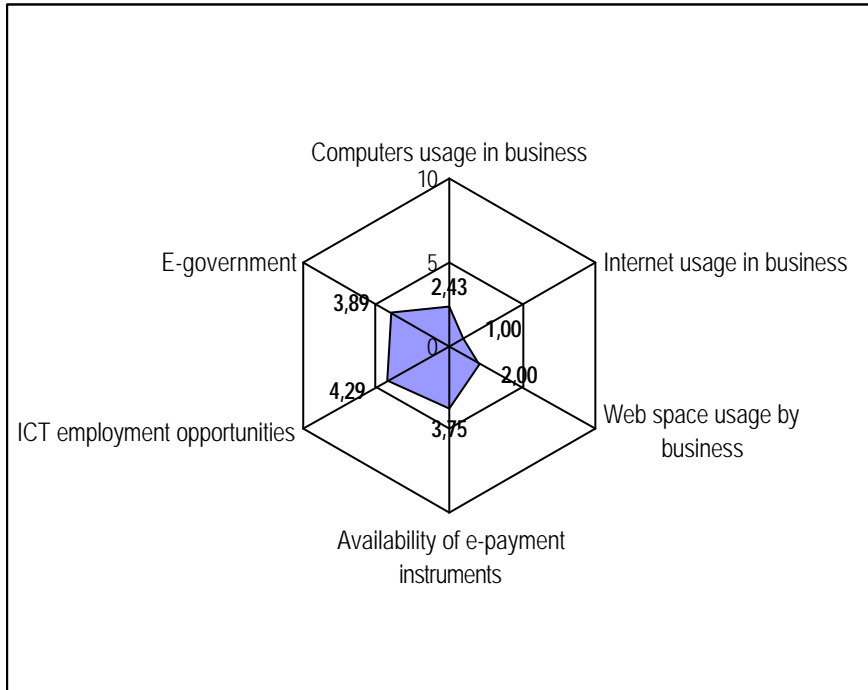
VII.5. Quantitative Assessment

The **overall** e-economy assessment is measured at 2.89, (see Figure 7.4) indicating a relatively low degree of preparedness compared to the aggregate e-readiness index for the country – 3.36, and only better than the e-society index.

Different factors in this indicator show serious discrepancies in values. For instance, there are enough ICT employment opportunities – 4.29 with available e-payment instruments – 3.75. Yet, the Internet usage in business is critically low – 1.0 and web space is not effectively used by business – 2.00. This could be partially explained by the low level of computer penetration and usage in business – 2.43.

The government seems somewhat better prepared for the new economy than business – the e-government indicator is measured at 3.89. One of the reasons is the larger funds available for investments in IT from the government than the private sector.

Figure 7.4.: e-Economy



Average value: 2.89