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**METAMORPHOSIS**   
I C T F O R B E T T E R S O C I E T Y

# GENERAL DATA ABOUT THE SITUATION REGARDING THE ICT (INFORMATION COMMUNICATION TECHNOLOGIES) IN MACEDONIA

2003-2004

**Skopje 2004**

# **CITIZEN POLL: USE, ATTITUDES AND OPINIONS ABOUT THE INFORMATION-COMMUNICATION TECHNOLOGY**

## **INTRODUCTION**

It is generally accepted that the survey of public opinion tests the reality, which is recognizable within a spectrum, which implies selection of certain selected elements. The attitudes and opinions of the public as generalized equivalent of individual beliefs, feelings and findings about different situations, become valid in the majority and get the form of collective judgement for current social situations which are essential for the life and practice of the social community. This synthesized reaction of the public has the function of stimulating the political subjects towards certain type of behavior in the resolution process of the current social situation transformed into a problem.

Methodologically, the polling procedure is based on the so-called binary system of questions and answers, kind of triangle, whereby the roles of the surveyor, respondent and instrument (questionnaire) are mutually intertwined. Each player knows the role and in that mutual interaction the public is 'the winner' or it is the attitude of the public that should be respected as the relevant indicator for the situation in the society.

In that sense, if we accept that the public opinion has the function of mobilizing or activating, then it is very relevant that the attention, besides on the always actual political and economic issues and problems in the society, is directed towards issues in the sphere of the so-called information-technology structural changes, which is directly reflected in every segment of the social life. It is a matter of the 'new' communication technologies, which if not today then almost tomorrow, will have strong impact on each individual regardless of his/her position in the social scale. It is becoming clearer that the new technologies can activate but also derange the mind, they can democratize and pluralize both information and fun or can act in direction of their harmonization and control. This generates the intentions to define their importance and role in the reality of Republic of Macedonia. The interest of the survey is based on two global areas:

1. Knowledge about the information-communication technologies: possession of communication technologies, computer programs and their application, the language of the computer technology, protection
2. Use of new technologies: family use, use of computers (forms and ways of use, operational systems in use), use of internet (forms and ways of use, maintenance services and providers).

Therefore, it is necessary that the results from this survey are observed dynamically, primarily in accordance with the overall social changes in the political, economic and cultural sphere. Particularly due it, certain 'disparity' in the attitudes of the public are possible, which does not put into question the validity of the survey indicators, but on the contrary, it determines the dynamics and direction of development of certain relevant social phenomena and occurrences.

## I. KNOWLEDGE ABOUT THE INFORMATION-COMMUNICATION TECHNOLOGY

### 1. Possession of computer technologies:

In the world today, the possession of computer technologies is no longer an advantage, but rather it is something that everyday life cannot be imagined without it. Fixed telephones become constituent part of homes, and the mobile telephones are not only 'trend' but also the necessity for the people. The army of users of cable and satellite TV programs is constantly increasing, which is followed close behind by the computers, as another means for mass communication. These are the world trends, and what is the situation in Macedonia? Whether and to which extent are the new technological achievements massively accepted and who are their users?

In terms of communication-technology, the citizens of Republic of Macedonia are rather 'poor'. Besides the fixed telephone line and to certain extent the mobile telephony, all other communication means are rarity, and some of them are almost an exception. That is, 89,9% of all the polled have telephones at home, 35,3% have cable TV in their households, 13,3% satellite TV antennas, 27,4% have computers at home and 8,9% have credit cards.

Although the biggest number of citizens possess **telephones in their households**, it is a defeating datum that Macedonia today is still not completely covered with fixed telephone lines and part of the population is literally cut off in communication sense from the world. Undoubtedly, the indicator, which has direct impact on this situation, is the poor economic situation and low standard of the population. Thus, as expected, the citizens that do not have telephones are the ones with low income, lower educational level (especially with uncompleted primary education), rural population and unemployed. And vice versa, fixed telephones are mostly present in the households with highest income per family member, in the towns, among the younger population and the ones with college and university education.

On the contrary, it seems surprising that the number of citizens that possess **mobile telephones** is relatively high, especially knowing that they are still an expensive 'toy' in Macedonia (which in the other countries is given free of charge). Is it a matter of fashion or social status? No matter the reason, the necessity of fast and efficient communication both private and business is becoming more present. Proof for that are the two mobile operators, which very successfully function on the Macedonian market, and are constantly trying to increase the number of users. Thus, the mobile telephones are owned by the ones that already have fixed telephone lines, and the most numerous are men, young population (at the age from 21 to 30), the ones with college and university education, persons in private business, the ones with bigger income per family member and the citizens of Skopje.

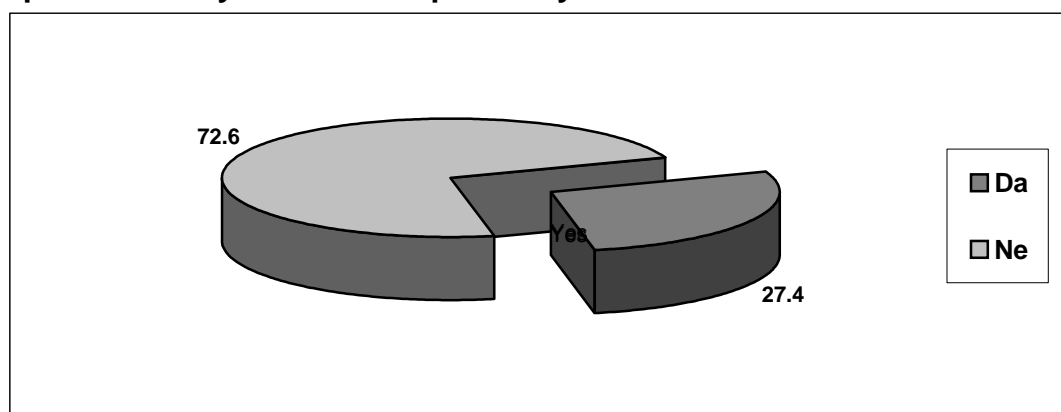
Therefore, the lower number of **cable TV connections** that the citizens possess can be explained by the fact that it is a matter of a 'relatively' new technology in Macedonia. The cable operators received the license for broadcasting almost one year ago, although part of them previously worked illegally. Hence, it is understandable that the number of their users is still small. It should be added that the use of cable connection first requires payment for installation, and then payment of monthly subscription, which does not exempt the citizens from the payment of the compulsory broadcasting fee (for public radio broadcast). The biggest number of cable TV connections is among the citizens with college and university education, the ones with biggest income per family member, the town population, and the citizens in the south-west and eastern region who have an advantage in comparison with the citizens from Skopje, which is understandable because in this way they have access to numerous local (primarily Skopje TV stations), which the citizens from Skopje can have with an ordinary antenna and without cable connection.

It is not surprising that the number of **satellite TV antenna** users is very small. They have proved to be non-functional in practice primarily because they require regular maintenance, which is to be done on the part of the citizens themselves, and of course requires certain material expenses. In the meantime, the cable connections (the operators take care of the maintenance) appeared as a good substitute for the satellite ones. Therefore, the figure of 13.3% households that own satellite TV antennas is more than expected. These are most often the same households that own cable connections as well.

The lowest is the number of **credit card users**, that is, credit cards are the privilege of few people. Obviously, the majority citizens cannot afford such 'luxury' because they know they need sufficient amount of money for credit cards. Probably it is not small number of citizens who have not seen a credit card at all or who do not know what credit cards serve for. Thus it is expected that there are several categories of citizens that own credit cards: at the age from 21 to 30, with college and university education, employees in public enterprises, urban population, citizens with biggest income per family member, citizens from Skopje.

Somehow better, but not optimistic is the situation regarding the **possession of computer at home**. The graphic presentation of the situation is as follows:

**Graph no. 1: Do you have computer in your household?**



Within the group of 27,4% polled citizens that own computer, the most numerous are the young population, the respondents with college and university education and the respondents whose education is ongoing, the respondents with bigger income per family member (more than 130 EUR), the town population, and especially the respondents from Skopje. However, only more than half of the polled citizens have access to internet, which implies that they use the computers potentially as a means for receiving and sharing information and not as a typing machine or for playing games.

However, besides the limited possibilities for use of communication technology, the citizens are familiar with the value of their 'use', and more or less are prepared to use these advantages. Thus, 61,0% of the polled citizens would like to **perform the bank transactions on internet**, while 29,0% of the citizens are skeptic about it. Within the first group the most numerous are the respondents with college and university education, the respondents at the age from 21 to 30, the employees in public enterprises, the citizens with highest income per family member, the respondents from the south-west and eastern part of the country, while in the second group the most numerous are the respondents at the age from 41 to 50, the respondents with uncompleted and completed secondary education, the unemployed as well as the respondents with lowest income per family member. Obviously such transactions are 'illogical' for them, as they do not have either material (regular monthly income) or technical means (computer and internet connection). Besides that, most probably it is a matter of uncertainty as well as unfamiliarity with the possibilities, which are offered by internet in this area.

Somehow similar is the situation regarding the **possibility for purchasing on internet**. Half of the polled citizens (55,0%) would purchase on internet. These are especially the young population (mostly at the age from 12 to 20), the students that is the ones whose education is still ongoing, the respondents with higher income per family member (more than 130 EUR), the citizens from the Skopje and south-west region of the country. Why would we purchase on internet? Primarily, because this is a fast (27,2% of the polled citizens) and simple way (22,6%) which offers bigger choice (17,4%). One part of the respondents, although fewer, consider that purchasing on internet is more practical (10,9%), more interesting (7,0%), more economical (6,1%) and products, which cannot be found in the shops, are offered (7,0%). The lowest is the number of respondents that would purchase on internet because it is cheaper (4,0%), because more data are available about the product (2,2%), the product is delivered at home (2,1%) and because it is safer (1,1%). 8,2% of the polled citizens are prepared to purchase on internet, although they do not know why.

The other half (45,0%) are the citizens that consider this manner of 'trading' as unacceptable. These are mostly among the older population (at the age from 41 to 50), the respondents with uncompleted primary education and primary education, unemployed and the ones with lowest income per family member. This implies that the social status has direct impact on the attitude towards this type of services. However, half of them (25,3%) do not know why they would not purchase on internet, while the others state reasons such as that they are not certain (14,1%), that they are not interested (11,5%), that it is expensive (7,4%), as well as that this system is not developed in our country, that the product cannot be seen and that there are other ways of shopping.

*Undoubtedly, the modern technology is very expensive for the citizens in Macedonia. Owning any technological device implies regular monthly payment of at least several bills (for fixed and mobile telephone, fees for cable TV connections and internet). On the contrary, they would be disconnected. At the same time, the country and the citizens are faced with the big percentage of unemployment, poverty and poor economic situation. That is to say, lack of any assumptions about following the new information-communication technologies. However, it is obvious that the contrary is proved in practice. It is 'fascinating' that the citizens are prepared even at very high prices to keep pace with the modern information trends.*

## **2. Computer programs and their application**

*The use of modern information-communication technologies implies having knowledge about them. Knowledge about the capacities, possibilities, advantages, pros and cons. Otherwise, the investment would be expensive and not cost-effective especially if it is limited to simple routine operations. Whether and to which extent is the Macedonian population educated when it is a question of computers and computer technology?*

### **a) Knowledge in the area of computer technology**

First, the citizens were asked whether they have **knowledge in the area of computers**? 50,3% of the polled citizens gave positive answers, and most educated among them were the youngest (at the age from 12 to 20), the respondents who have completed college and university education, the respondents whose education is ongoing, the respondents with highest income per family member and the urban population, the citizens from Skopje and the citizens from the south-western part of the country. They have acquired their knowledge in the area of computers in several ways: individually (51,6%), through formal education (42,2%), and at courses (28,9%). Self-taught are mostly the older respondents (at the age from 31 to 50), the respondents with uncompleted primary and primary

education, persons in private business, respondents with higher income per family member (over 130 EUR) and the respondents from Skopje. The formal education has mostly helped the youngest population in acquiring knowledge in the area of computers, as well as the ones whose education is still ongoing, the students and the respondents from the south-western part of the country. The respondents at the age from 31 to 40 and the employees in the public enterprises are the biggest number of respondents who have attended courses. Thus, it is a matter of basic courses, such as Word and Excel, and rarely specialised or advanced courses.

The second group are the citizens who **do not have knowledge of computers** (49,7% of the polled citizens). Among them, most numerous are the older population (at the age from 41 to 50), the citizens with uncompleted primary education and primary education, the unemployed, the citizens with lowest income per family member, and the citizens from the north-western part of the country. Among them, 64,8% feel the need and preparedness to make up for it (35,2% - no) and these are mostly the youngest (at the age from 12 to 20), the students as well as the ones whose education is ongoing. Obviously, the acquiring of knowledge in computers and computer skills is mostly left to the youngest? Why? Are the others afraid of the new and unknown? The reasons are probably numerous and stratified, and the roots among other things should be searched for in the traditional concept of education which is primarily aimed for the youngest regardless of the world trends that insist on continuous learning process during the whole life, in which all people equally participate regardless of their age.

However, regardless of the fact whether the citizens have or do not have knowledge in computers, they are obviously aware of the advantages, for instance, for employment, education, career etc. In their consideration, the **biggest benefit from computer literacy** is during the educational process as well as for searching and finding employment. 70,5% of the polled citizens consider that the knowledge of computers and internet helps to a great extent during the educational process, 21,9% consider that it helps partially, and 2,5% think it does not help at all. (5,1% answered that they do not know). The computer knowledge is beneficial for educational process especially for the employees in the state companies, the students, the respondents at the age from 21 to 30, the respondents who have completed college and university education, the urban population and the citizens from the eastern region.

Regarding the employment, 67,3% of the respondents consider that the knowledge of computers and internet helps to a great extent for **searching and finding employment**, 21,3% only partially, and 5,5% consider that it does not help at all (5,9% answered that they do not know). Their attitude is confirmed by the fact that there is no job advertisement, which does not state requirement for compulsory knowledge of using a computer. (even specific programs are stated). Accordingly, knowledge of computers is an advantage for employment primarily according to the respondents who have completed college and university education, respondents with highest income per family member, the employees in state companies, the urban population, the citizens from Skopje and the eastern region, but also according to all age categories.

According to the frequency of given answers, next is the issue of having **information about world events**. According to 59,0% of the polled citizens, the knowledge in the area of computers and internet helps to a great extent in receiving information about world events, 26,0% think it helps only partially, and 7,8% think it does not help at all (7,2% do not know). This advantage is especially emphasised by the citizens from the eastern region, the citizens with highest income per family members, the students, the respondents whose education is ongoing, and the respondents up to the age of 30. The information about **events in the country** has lower rate. 50,2% of the citizens stated their opinion about this issue (31,0% think the use is only partial, 11,9% think it is of no use, and 7,1% do not know). Perceived according to the social-demographic characteristics, these

are the same respondents that emphasised the advantages of using computers and internet for receiving information about world events. However, in terms of **achieving professional career**, 57,4% of the polled citizens stated positive attitude, 25,8% could not decide, and 8,0% stated negative attitude (8,8% of the polled citizens stated that they do not know). The knowledge in computers and internet can mostly help in the career according to the respondents who have completed college and university education, the employees in the state companies, the respondents with highest income per family member, the citizens from the eastern region and the respondents at the age from 21 to 30.

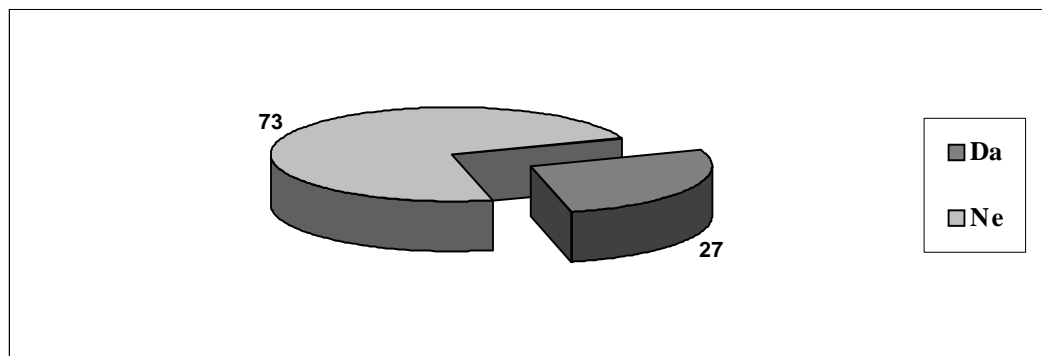
The citizens do not neglect computers and internet regarding the **communication with relatives and friends**. 52,2% of the respondents share this attitude, while for 31,4% it is partially acceptable, and for 9,7% it is not acceptable at all (6,7% do not know). The modern technology mostly helps in the contacts with relatives and friends according to the younger population, the ones whose education is ongoing, the students, the urban population and the respondents from the eastern region. It seems that they are the ones that mostly use these modern technologies. That is why, it is expected that the knowledge of computers and internet is mostly acceptable for **communication with business partners** for the ones for which it can be helpful in the working process, that is, the employees in the state companies, the citizens who have completed college and university education, the respondents at the age from 21 to 30 and the citizens with highest income per family member. This group is comprised of 50,1% of the polled citizens, whereas 29,5% consider that it helps partially and 10,6% think that it is impossible (9,8% do not know).

The knowledge of computers and internet has the least 'usability' when it is a matter of making a political career, communication with the governmental institutions and public administration. Only 31,8% of the polled citizens consider that modern technology is of great **assistance in the career**, 33,7% consider it helps partially, and 22,9% think it does not help at all (11,7% stated that they do not know). The biggest optimists are the respondents at the age from 21 to 30, the respondents who have completed secondary education, the owners of private businesses, the citizens from the south-western and eastern region, and the biggest sceptics are the respondents at the age from 31 to 40, the employees in the state companies and the citizens from the Skopje region. The citizens have almost identical attitude towards the use of computers and internet in the **communication with the public administration**. 31,9% consider that it helps to a great extent in the contacts with the administration, 32,4% consider it helps only partially, and 24,4% consider that it does not help at all (1,3% stated that they do not know). In the first group the most numerous are women, the respondents at the age from 21 to 30, the ones whose education is ongoing, the students, the citizens from the south-western region. The second group is comprised of the polled citizens at the age from 31 to 40, the citizens who have completed college and university education, the employees in the state companies, the citizens with highest income and the citizens from the Skopje region. The third group is primarily comprised of men, unemployed citizens, the citizens with lowest income and the urban population. However, computers and internet are least applicable in **communication with the governmental institutions**. Only 28,4% of the respondents consider that it is possible to a great extent, 34,1% partially, 24,6% not at all, and 12,8% do not know. Most favourable answers were given by the citizens at the age from 21 to 30 and the citizens from the south-western and eastern region, most critical were the respondents with secondary education and occupation as well as the town population and most ignorant are the citizens with uncompleted and completed primary education, the private business owners and the citizens from the north-western region.

## b) Application of new technologies

How interested are Macedonian citizens about the new technologies? If it is judged according to their answers on the question: **Do you follow the novelties in the area of information-communication technology?** – it seems that it is little and insufficient:

**Graph no. 2: Do you follow the novelties in the information-technology**



Least interested (73,0%) about the new technologies are the older population (at the age from 41 to 50), the respondents with uncompleted and completed primary education, the unemployed as well as the ones with lowest income per family member. Mostly (27,0%) the novelties about the new technologies are followed by the youngest (mostly at the age from 12 to 20), students, the ones whose education is ongoing, the citizens who have completed college and university education as well as the respondents with highest income per family member. **The citizens that follow the new technologies, do that by using several sources:** professional magazines (58,2% of the respondents), television (55,2%) and internet (37,4%). Thus, the choice mainly depends on the age and educational status. The professional magazines as source are mainly used by men, the respondents at the age from 31 to 40, the respondents who have completed college and university education; whereas television is mostly used as a source by women, population at the age from 41 to 50, the respondents who have completed secondary education and have occupation, private business owners, and the internet as a source is mainly used by the youngest (at the age from 12 to 20), the ones whose education is ongoing and the students. This category of citizens would even **pay more for a Macedonian magazine with higher quality in the area of information-communication technology**. Such preparedness was stated by 58,0% of the polled citizens, and 21% did not state preparedness (21% stated that they do not know). This especially refers to the youngest, the ones whose education is ongoing, the students, that is, the category that mostly receives information through internet and obviously needs such type of education as well.

However, the education in the sphere of new technologies requires fulfilment of certain preconditions. One of the initial steps is familiarity with the **ways of internet connections**. The citizens are informed and state several ways, most often the fixed telephones (65,8%), the mobile telephones (24,7%), as well as the cable connections (10,5%), whereas 30,8% are not familiar at all with the ways of connecting to internet. The youngest, the respondents with completed college and university education, the ones whose education is ongoing, the students and the respondents highest income are mostly familiar with the fixed telephones as a way of connection. Men, the respondents at the age from 21 to 30 and the respondents who have completed college and university education are mostly informed about the mobile phones as a way of connecting to internet, and for the cable option of connecting to internet mostly informed are the respondents at the age from 21 to 30 and the respondents who have completed college and university education. The respondents at the age from 41 to 50 are most numerous among the least informed



as well as the respondents who have not completed primary education and with primary education, the unemployed and the respondents with lowest income.

Then follows the question regarding the **selection of internet provider**, the one which will provide the access to the world network. There are many internet providers in Macedonia, and the citizens were mostly informed about MtNet (48,3% of the polled citizens), Unet (39,9%), OnNet (34,1%), MobiMak (22,4%), MoL (15,0%), and least informed about SoNet (5,4%) or MarNet (2,4%). However, almost 1/3 of all polled citizens do not know about (31,2%) a single internet provider, and these are mostly women, older respondents, the respondents with lower educational level, the unemployed and the ones with lowest income per family member. MtNet is mostly known to the citizens at the age from 21 to 30, and less known to the older citizens at the age from 41 to 50 the ones who have completed college and university education, and least to the ones with uncompleted and completed primary education, students and unemployed. Unet, OnNet, MobiMak and Mol are mostly known by men, the ones at the age from 21 to 30, the respondents with completed college and university education, students, town population and respondents from Skopje.

However, not less important is the **cost for using the internet**. For half of the polled citizens (50,5%) internet is expensive, especially for the older respondents (at the age from 41 to 50), the respondents who have completed college and university education, the employees in state companies, and the citizens from the south-eastern region. On the contrary, 30,5% consider that the price is acceptable, whereas only for 6,4% of the respondents the internet is cheap (12,7% have not stated opinion). The cost for internet is mostly acceptable by the youngest respondents at the age from 12 to 20, the ones whose education is ongoing, the students, the respondents with highest income and the citizens from the Skopje region. The respondents who have not completed primary education or with primary education, the unemployed, the ones with lowest income and the citizens from the north-western region are most often the one who do not state any opinion.

However, the selection of computer programs and companies that support them is of central importance. Macedonia as a country has signed a contract with Microsoft for licensed use of its programs, and according to the citizens' attitude regarding **Microsoft as a company**, it is obvious that good choice has been made. Namely, more than half of the polled citizens consider Microsoft as a good (33,4%) that is very good company (23,2%), 15,7% consider it as neither good nor bad, only 0,7% consider it as a bad company, and 0,3% as a very bad company. Microsoft was highly evaluated by the youngest respondents at the age from 12 to 20, the respondents who have completed college and university education, the ones whose education is ongoing the students, the respondents with highest income per family member and the citizens from the Skopje and southwestern region. The evaluation was not made by (26,7%) the older respondents (at the age from 41 to 50), the unemployed, the respondents with primary education and uncompleted primary education and the respondents with lowest income per family member. The attitude of the citizens is not different regarding the **Microsoft computer programs**: 32,8% consider them as good, 23,0% as very good, 15,2% neither good nor bad, 0,3% bad, and 0,1% as very bad, while 28,6% stated that they do not know. Observed according to the social-demographic characteristics of the respondents, they are identical with the evaluation of Microsoft as a company.

However, when it is a matter of **strategic partnership with some of the major computer companies such as Microsoft, Oracle, IBM**, the attitude of the public is divided among the ones for which it is necessary at all costs (39,6%) and the ones for which it is necessary, but depending on the contract which will be concluded (40,4%), whereas minimal number of citizens are against it (4,1%), and 15,9% do not have any attitude. Unreserved support is stated by the majority of citizens who have completed college and university education, the employees in the state companies, the citizens with

highest income per family member, the citizens in the south-western region, and more careful respondents, most often connect the contract with the partnership with the computer companies are the citizens at the age from 21 to 30, the citizens whose education is ongoing, the students and the citizens from the Skopje region.

Taking into account the overall situation in Macedonia, the computer literacy of the citizens in Macedonia is not that bad. They have relatively good knowledge in the area of computers, which can be especially helpful, for the education and the employment, and they are informed about the ways for connecting on internet, the internet providers and the major computer companies. *However, they do not follow the novelties in the information sufficiently, and the biggest problems are the internet prices.*

### 3. Language- advantage or handicap n the computer technologies

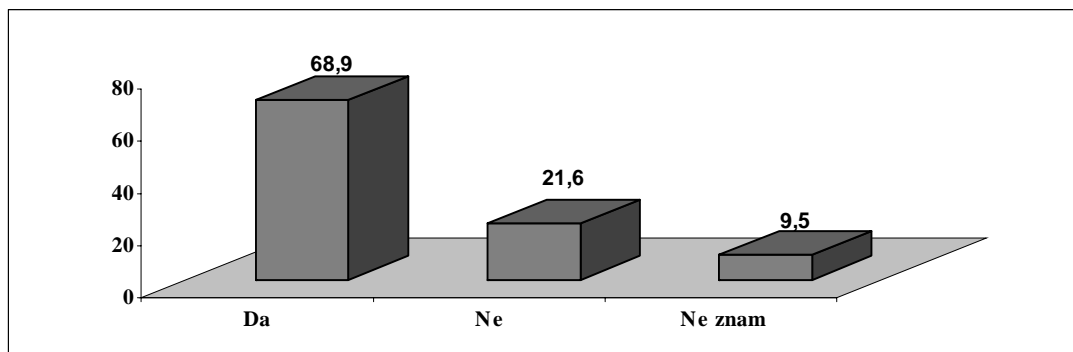
It is generally known that *the new technologies work dominantly with the support of the English language. Almost all computer programs and internet sites are in English. For some it is an advantage, for some it is a problem. How the Macedonian citizens deal with this?*

Rather difficult if we judge according to their answers on the following question: To which extent do you know English? Only 23,8% have active knowledge of English (comprehension, reading and writing). This group is comprised of the youngest (at the age from 12 to 20), the ones whose education is ongoing, the students, citizens who have completed college and university education, the citizens with highest income and the citizens from the Skopje region. Undoubtedly the use of internet and computers does not present a problem, but the contrary. However, it can be a problem for 26,9% of the polled citizens with passive knowledge of English (understand, but cannot read and write), and these are mostly citizens at the age from 21 to 30, with completed secondary school and occupation, the employees in the state companies. The biggest is the group of citizens (38,9%) that do not have any knowledge of the English language (0,3% do not know). Most illiterate for English language are the older citizens (at the age from 41 to 50), the citizens with lower educational level, the unemployed, the citizens with lowest income per family member and the citizens from the north-western region. It would be hardly possible to count on them as the active users of the services offered by the new technologies.

Obviously, English language is a real barrier for the access to the new technologies. This is confirmed by the answers to the following question: **do you find the insufficient knowledge of English language as a handicap for the use of computers?** Even 2/3 (68,6%) of all polled citizens gave positive answer to the question, and only 22,3% gave negative answers (9,1% do not know). In addition, not a single category according to the social-demographic characteristics can be separated, which does not find this as an obstacle. Accordingly, it is not surprising that big percentage of the citizens consider that **computer programs (software) should be available in Macedonian**. This opinion is shared by 59,5% of the polled citizens, 25,8% consider that it would be good if computer programs are available both in Macedonian although not compulsory, and only 7,2% consider it as unnecessary (7,5% do not know). Considering the social-demographic characteristics of the respondents, the majority of citizens that state the necessity of having programs in Macedonian are at the age from 31 to 40, with secondary education and occupation, the employees in the state companies, the urban population, and especially the citizens from the south-western region as well as the ones who have passive knowledge of English language, and least the ones with uncompleted or completed primary education, the citizens whose income is up to 35 EUR per family member and the citizens from the north-western region.

But, language has the crucial role in the use of computers and the **citizens would be using internet more, if there were more programs in Macedonian language**. This is the attitude of 2/3 of all polled citizens and can be clearly seen from the following graph:

**Graph no. 3: If there were more contents in Macedonian on internet, would you use internet more frequently?**



In the most numerous group (68,9%) the dominant are the youngest respondents at the age from 12 to 20, the ones with completed secondary education and occupation, the respondents who have completed college and university education, the employees in the state companies, the citizens from the south-western region and the ones with passive knowledge of English language. However, internet would not be used even if the contents are in Macedonian by the citizens who neither have computers nor knowledge of computers, and would hardly decide to make up for it and do not follow the novelties in the information technology. These are older citizens at the age from 41 to 50, the citizens with uncompleted or completed primary education, the unemployed, the citizens with lowest income per family member and the citizens from the north-western region.

The public has an identical attitude towards the following question: **If computer programs for internet are in Macedonian would you use them more frequently?** Positive answer was given by 68,2% of the respondents, and 22,1% gave negative answers (9,7% do not know), and there are no differences according to the social-demographic characteristics of the respondents. Obviously, the citizens have the need for computer programs, and even more if they are in Macedonian. But not at all costs. For 61,0% of the citizens it is unacceptable if FYROM is placed on the computer programs in Macedonian, mostly for the citizens at the age from 21 to 40, with secondary education and occupation, citizens who have completed college and university education, the employees in the state companies, the urban population, the citizens from the eastern region and even the ones who have active knowledge of English language. On the contrary, 25,0% of the polled citizens do not mind (14,0% do not know), and most numerous among them are the youngest citizens at the age from 12 to 20, the ones whose education is ongoing and the students. Obviously, it is more important for the younger population to use the advantages of computers and internet in a faster and more efficient way rather than how these programs would be marked.

*The Macedonian citizens have problems with the successful acquiring of communication technologies. The level of foreign languages knowledge, primarily English, is still considerably low and is proved to be a big handicap for work on computer or use of internet. For many citizens, especially the youngest, the real solution would be if the computer programs were in Macedonian language. However, it would not be helpful for some. It seems that they are giving up?! Obviously, Macedonia has to do something about it and give equal chances to all citizens.*

#### 4. Protection with or without regulation

From day to day, there is an increase in the number of social actors in the world whose central interest is the regulation in the sphere of new technologies: copy rights, the contents of websites, safety of files, safety signs, electronic payment, designer rights, law provisions, court jurisdiction.

What is the citizens' attitude regarding these issues? First about the copy rights and intellectual property. On the following question: **who according to you is protected by the Law on copy rights and intellectual property?**, they primarily state the authors (49,9%), as well as the producers (17,8%), major corporations (13,8%), state (13,4), whereas small number considers that in this way even the consumers (9,5%) and lawyers (4,0%) are protected. But, the number of the ones uninformed (34,8%) is not small. Considering the social-demographic characteristics, the authors are mostly protected for the respondents at the age from 21 to 30, the category of respondents with completed college and university education, the students as well as the employees in the public enterprises, the urban population and citizens from the Skopje and south-western region. The producers and major corporations are protected according to the respondents at the age from 21 to 30, the citizens who have completed college and university education, the employees in private companies, the citizens from the south-western region, whereas the older respondents at the age from 30 to 50, the citizens who have college or university education, the employees in the state companies and the citizens from the south-western region have answered for the state. Most unfamiliar are the youngest (at the age from 12 to 20), the citizens with uncompleted or completed primary education, the unemployed and the citizens from the north-western region.

Regarding the **computer criminal**, that is, whether and how it should be punished, almost 72,5% of the citizens consider that there should be penalties as for any other crime, 14,9% consider that the penalties should not be very severe, and 2,7% of the citizens are against punishment (10,1% do not know). Most strict towards the computer criminal are the age categories from 21 to 50, the citizens with college and university education, the employees in state companies, the citizens with income from 36 to 75 EUR per family member and the citizens from the south-western region. The youngest respondents, the respondents whose education is ongoing, the students and the citizens from Skopje region gave milder answers. Usually as for the other questions the least informed are the oldest respondents, the citizens with uncompleted or completed primary education, the unemployed and the citizens from the north-western region.

*What conclusions can be drawn? The category of copy rights and intellectual property still does not have the real importance for the citizens of Republic of Macedonia. Although for most of them it is undoubted that the authors should be protected, yet the number of uninformed should not be neglected. Therefore on the other hand, the very severe attitude of the citizens towards computer criminal implies the necessity of legal regulations in this sphere.*

## II. USE OF NEW TECHNOLOGIES

### 1. Family use of new technologies

Today it is almost impossible to imagine that any segment of the society can function without computer. There are fewer people who would voluntarily give up from these modern advantages.

In Macedonia there are a small number of people that own computers at home, and the number of computer users is not much bigger. Such are 40,9% of the polled citizens versus 56,3% that do not use computer (2,8% refused to answer). The computers are mostly used by the youngest (especially at the age from 12 to 20) and the ones whose studies are ongoing, whereas the computers are least used by the older respondents (at the age from 41 to 50) and the citizens with uncompleted and completed primary education. The citizens that use computers, do that mostly at home (49,0%), in internet cafes (39,2%), at school or faculty (26,3%), 13,7% at work, and 13,0% use their friend's computer. The home and the working place are reserved primarily for the older respondents (at the age from 30 to 50) and the citizens with college and university education, whereas the school/university or internet café for the young population (at the age from 12 to 30) and the ones whose studies are ongoing. The young people also often seek computer services from their friends.

The number of **internet users** is even lower, only 30,0% of the citizens, and that is mostly the men, young people at the age from 12 to 20 and the ones whose studies are ongoing, whereas in the group of respondents that do not use internet (66,9% of the polled citizens) the most numerous are the older citizens (at the age from 41 to 50) and the citizens with lowest educational level. Internet is usually used in internet cafes (56,2% of the respondents), at home (33,6%), at school/faculty (15,9%), at work (13,7%) or with friends (13,0%). Internet cafes and schools/faculties as well as friends are reserved for the youngest and the ones whose studies are ongoing, whereas the work place or home computers for the older respondents (especially at the age from 41 to 50) and the citizens with college and university education.

*Undoubtedly, the young population in Macedonia are the most numerous categories that use computers and internet. It is obvious that for them this is one of the most efficient ways for acquiring knowledge, tools that help in education and studying. However, it must be worked on identifying ways how to attract the others.*

### 2. Use of computers

#### a) Forms and ways of using computers:

*There are numerous forms and ways of using the new technologies. How, to which extent and what for are they used depends primarily on the individual needs and interests as well as depending on the familiarity with the possibilities.*

It was already stated that 40,9% of the citizens in Macedonia use computers. **But how often?** The most numerous are the respondents that use computers every day (42,7%), and especially the respondents at the age from 41 to 50, the respondents with completed college and university education, the employees in state companies and the citizens from the Skopje region. Then follows the group of citizens (29,8%) that use computers several times a week. This is especially among the citizens at the age from 21 to 30; citizens with completed secondary education and occupation, the employees in private companies, and the citizens from the south-western region. 10,6% of the citizens use computer once a week, and similar is the number of citizens (11,9%) that use

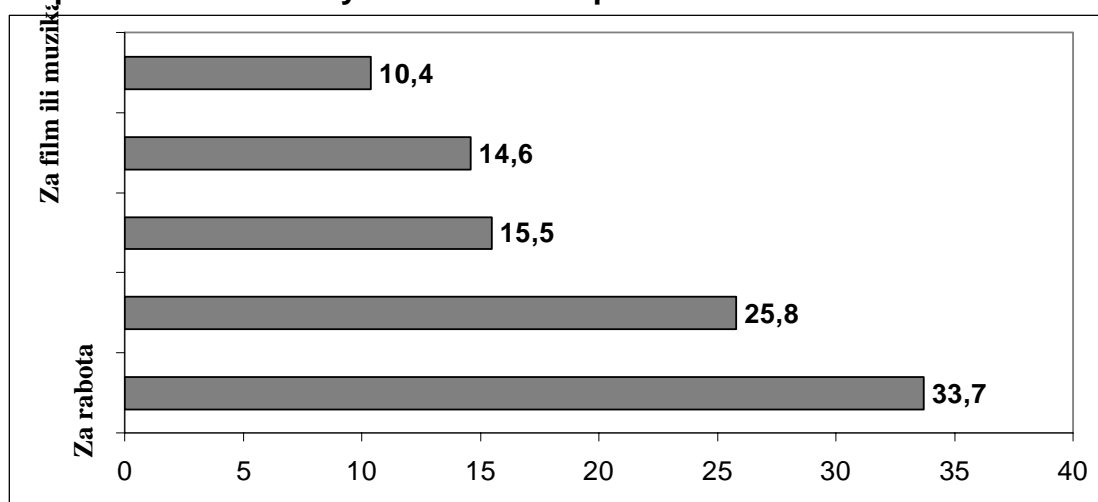
computer several times a month. In these two groups, most numerous are the youngest citizens at the age from 12 to 20 and the students.

Individual use of computers is the privilege of few citizens. Most of the polled citizens (47,0%) **share the computer at home with the other family members** and most often the computer is used by two (36,5%) or three people (31,0%). This especially refers to the older citizens (at the age from 41 to 50), the citizens with college and university education, the employees in private companies, and the citizens from the north-western region. On the contrary, only 14,0% of the polled citizens individually use the computer at home (39,0% did not answer this question). This privilege is mostly among the youngest at the age from 12 to 20, the ones whose studies are ongoing, the students and the citizens from the Skopje region. **Computers at the work place are shared** by 24,0% of the polled citizens, and personal computers are individually used by 16,0% (60,0% did not answer this question). The ones that share the computers at the work place, most often share the computer with another colleague (31,2%) or two colleagues (22,0%), and rarely with three (8,8%), four (7,2%) or several colleagues (10,3%). The social-demographic characteristics of the respondents do not have significant impact on this division.

In this context, it is very important **what the citizens use the computers for?** Mostly for internet (65,4% of the polled citizens), games (59,1%) film or music (54,4%), work (51,2%) and school/faculty (42,2%). The internet is mostly used by the citizens at the age from 21 to 30, the citizens with college and university education and ongoing studies, the unemployed and the citizens from the south-western region, whereas games, film and music are most attractive for the youngest population and the students. This category uses the computer for school/faculty, whereas the respondents at the age from 31 to 50, the respondents with completed secondary, college and university education, private business owners, and the employees in the state companies use computers as helping device for the work.

However it is good that **computers are mostly used** for work and for internet, and least for games, film or music. The picture is as follows:

**Graph no.. 4: What do you use the computer most often for?**



Mostly for work (33,7%) the computers are used by the employees in the public enterprises and the respondents with college and university education, the age category from 31 to 50, as well as the citizens from the north-western region, and internet (25,8%) is mostly used by the respondents at the age from 21 to 30, the unemployed, the citizens with lower educational level and the citizens from the south-western region.

Hence, the big number of computer programs that the citizens use is not surprising. Mostly exploited are the text processing programs (84,1%), but highly used are also the programs for table creation (62,0%), for searching the internet (55,7%), for electronic

communication (43,2%), and even for chat on internet (39,5%), audio/video programs (34,7%) and programs for picture editing (31,6%). Less used are the programs for multimedia presentation (22,3%) or for protection – antivirus programs (20,7), and least used are the programs for website design (12,6%) or the specialised software for work (11,2%). Considering the social-demographic characteristics of the respondents, it is obvious for example that the simplest programs as well as the specialised software are mostly used by the older and employees in state companies, the programs for table creation and searching the internet are mostly used by the respondents at the age from 21 to 40, while e-mail communication and chat on internet are mostly used by the youngest at the age from 12 to 20, that is, students, who are also mostly attracted by the audio/visual programs and programs for picture editing.

## **b) Operational systems in change**

In the attempt to determine the level of communication-technological literacy of the citizens that use computers, they were first asked for which **operational systems** they have heard, that is, which of the operational systems they know how to use? Most known and mostly used is Windows (88,0% of the polled citizens), the mostly spread operational system in Macedonia and less spread are Unix or Linux. 16,2% of the respondents have heard about Unix, and 5,4% know how to use it, whereas 15,1% have heard for Linux, and 5,0% know how to use it. For these two systems most informed are the citizens at the age from 31 to 40, the citizens with college and university education and the citizens from the Skopje region. Yet, the citizens state the **need for computer operational system in Macedonian**. This attitude is shared by 60,5% of the respondents, 27,3% consider that it is good, but not compulsory, and 7,5% are against (4,8% do not know). The Macedonian computer operational system is mostly supported by the citizens at the age from 21 to 50, citizens with secondary education and occupation, the employees in private companies and the citizens from the south-western region. Obviously, in this way the computers would have much bigger usability, especially for the ones with poor knowledge of English language and the ones for which it is a handicap for work on computer.

When **software is to be procured**, that is mostly done through friends (42,9%), CD-shops (35,4%), the company that sold the computer (33,5%) or internet (29,6%). Only 13,9% of the respondents procure the software from an authorised distributor, and 6,2% from the producer. The youngest at the age from 21 to 30 mostly rely on friends and internet, whereas the respondents at the age from 31 to 50, the respondents with completed college and university education and the employees in the state companies rely mostly on CD-shops, the company that sold the computer and the authorised distributor. Their replies are identical regarding the concrete software that they use. More precisely, most often they procure the software from friends (18,0%), companies that sold the computer (17,5%), CD-shops (16,4%) and internet (16,0%), and only small number from the authorised distributor (6,6%) and producer (2,3%). However, almost 22,8% do not know where the software can be procured, that is, where was the software that they use procured. Most probably those are the citizens that had the software installed when they purchased the computer, and consider it as something which goes together, without knowing or without thinking of other options.

But, what do the citizens know about the software they use? **Is it licensed?** Positive answer was given by 39,0% of the respondents, negative answer by 23,0%, while 38,0% of the respondents do not know what kind of software they use. The older respondents (at the age from 41 to 50), the citizens with college and university education, private business owners, the citizens with highest income per family member and the citizens from the south-western region mostly rely on licensed software, whereas least informed about the software's origin are the youngest respondents, the ones with lower

educational level and the unemployed. The citizens that use licensed software, almost more than half of them (53,3%) have bought it, 27,1% answered that it belongs in the category of the so-called free software, and 19,6% answered that they do not know. Among the buyers most numerous are the citizens at the age from 31 to 40, as well as students, the ones whose studies are ongoing, and the citizens from the Skopje region, whereas free software is mostly used by the citizens at the age from 21 to 30, the citizens with college and university education, the employees in the state companies and the citizens from the north-western region. However, illegal software is also used to a great extent. It is used by 35,0% of the polled citizens, 24,0% do not use, and almost 41,0% stated that they do not know. The illegal software is used by all categories of respondents regardless of their social-demographic characteristics, and least used by the respondents with completed college and university education and the employees in private companies.

*It seems that the use of computers and internet in Macedonia is on 'critical' level. It is a dissatisfying number of everyday users of computer and internet services, as well as the type of computer programs that are most often used. The quantity and quality of their use is mostly influenced by the age and education of the citizens, and this is the area that requires intervention. In addition, the citizens have limited knowledge of the operational systems and almost always rely on the ones, which have managed to impose in our country. The citizens are insufficiently informed about the software they use, and most probably are not familiar with the obligation for licensed use.*

### 3. Use of internet

#### a) Forms and ways of using internet:

Regarding the citizens that own computers at home (27,5%), 60,0% of them have access to internet or in respect with all polled citizens they comprise only 16,4%. However they use internet services moderately. On the question –**how often do you use internet**- only 20,5%, answered that they use internet regularly every day, and those are most often the older citizens (at the age from 41 to 50, the citizens with completed college and university education, the employees in state companies, the citizens with highest income per family member, and the citizens from Skopje. The most numerous is the category that use internet several times a week (40,5% of the respondents), and especially the youngest (at the age from 12 to 30), the citizens with secondary education and occupation as well as the ones whose education is ongoing, the students and the citizens from the south-western region. Then follow the citizens that use internet once in a week (14,9%) or several times a month (15,6%) and finally the citizens that use internet once a month (4,4%) or rarely (3,7%).

What is internet usually used for? According to the internet-users they use it for searching (76,0%), checking the electronic mail (75,5%) for chat (60,3%), for work (38,5%), and very rarely for shopping (6,5%) or something else (1,7%). Internet is mostly used for 'surfing' by the citizens at the age from 21 to 30, with completed college and university education, the urban population and the citizens from the Skopje region. The electronic mail is used by the respondents at the age from 31 to 40, with college and university education, the employees in the state companies, whereas internet chat is most popular for the youngest, the ones whose education is ongoing and the students. As a tool for work the internet is used by the respondents at the age from 31 to 50, the citizens with college and university education, the employees in state companies and the respondents with highest income per family member.

However, **internet is mostly used for** searching the net (31,7%) and for checking the electronic mail (30,8%), and less for work (18,4%) or chat (17,9%). The youngest, the ones whose education is ongoing and the students most often search the internet and



check the electronic mail and also chat with their peers. For the respondents at the age from 21 to 30 most important is the search on internet and checking the electronic mail and even work, while for the respondents at the age from 31 to 50, with college and university education and the employees in the state companies most important is the work, and then the search on internet.

## **b) Maintenance services and providers**

In Macedonia there are many **internet providers**, but most used are MtNet (60,6%), Unet (26,9%), OnNet (23,1%), MoL (11,6%) and MobiMak (10,1%), and least used are MarNet (3,5%) and SoNet (3,0%), while 16,6% of the respondents do not know who is their provider. The most numerous MtNet users are at the age from 31 to 40, citizens with college and university education, the employees in the state sector and the citizens from the eastern and southwestern region. Unet is used by the older citizens, the ones with secondary education and occupation and the private business owners, whereas a OnNet is also used by the older citizens (at the age from 41 to 50) as well as the citizens with college and university education, the employees in state companies and the students. Least informed about the internet providers are the youngest, the citizens with lower educational level and the unemployed.

Regarding the **internet maintenance services**, 68,7% of internet users most often mention the e-mail services, 47,9% Web services, 23,5% Chat services, 8,7% News groups, and 4,4% FTP, whereas 19,4% do not know what it is. E-mail and Web services are mostly used by the citizens at the age from 31 to 40, with college and university education, the employees in the state companies and the citizens with highest income {per family member. Chat services are given priority by the citizens at the age from 21 to 30, private business owners, the citizens from the south-western region, and least informed about internet services are the youngest, the students, the unemployed and the citizens from the north-western and Skopje region.

As biggest problem while connected to internet, the citizens state the slow connection (65,4% of internet-users), the unstable connection (32,7%), while 13,7% state that the lack of English language knowledge is a problem and 15,1% of the respondents answered that they do not have problems. Slow and unstable connections are most troublesome for the respondents at the age from 21 to 30, the respondents with college and university education, private business owners, as well as the employees in state companies, the citizens from the south-western region, while least problematic it is for the youngest, the ones whose education is ongoing and the students. Most of the internet-users (62,1%) find the so-called junk e-mail inconvenient, 10,2% say that it violates their privacy, 11,1% that they get information, while 15,9% do not know what is junk e-mail. These messages are mostly considered as inconvenient by the respondents at the age from 31 to 40, with completed college and university education, the employees in state companies, and according to the private business owners they mostly influence their privacy. Least informed about the dangers from spam, bulk, junk, e-mail messages are the oldest (at the age from 41 to 50), with completed secondary education and occupation, and the citizens from the north-western region.

*Despite the great number of internet providers in Macedonia, the category internet-users is a real rarity. Their number is that low that neither the modest knowledge nor poor information about the internet advantages and disadvantages can be surprising.*

## **SUMMARY OF FINDINGS:**

Adhering strictly to the data from the survey, it can be generally concluded that the Macedonian citizens are not prepared, educated and, organized 'in a responsible manner' to encounter the new information-communication technologies. There is lack of the so needed period of so-called cultural adaptation, namely, instead of 'smart' investment for enriching the communication possibilities and knowledge, more or less it is a process of spontaneous introduction and use of new technologies.

What it is that attracts special attention, but also creates concerns? Primarily, the lack of economic assumptions for following the new information-communication technologies despite the unexpectedly high preparedness on the part of the citizens to follow the world information trends. Unfortunately, it does not help in acquiring computer skills, and the problem can only be partially solved by the computer programs in Macedonian language. Namely, the communication in the world and the access to numerous computer programs, especially for searching, is almost unreachable for many due to the poor knowledge of English language. Despite the great number of internet providers, the number of computer-users and especially internet users is considerably low. At the same time, the citizens have limited and insufficient knowledge about the operational systems and software they use, which has direct impact on the quantity and quality of their use.

What is optimistic? Primarily, the young population is the most numerous category that uses computers and internet, and consider it as the most efficient way for acquiring new knowledge and very useful tool in the educational process. Yet, it is not sufficient. It will be sufficient when the advantages of the new technologies would be recognized and applied by everybody.

# **INTERVIEW WITH THE LEADERS OF SOCIAL STRUCTURES: USE, ATTITUDES AND OPINIONS ABOUT THE INFORMATION-COMMUNICATION TECHNOLOGY**

## **INTRODUCTION**

**In view of the forthcoming campaign for IT policy – strategy for information –communication technologies, the attitudes and opinions of the leadership structures in the organizations and institutions in the public and business sector in Republic of Macedonia are of indisputable importance. Namely, their preparedness to accept and use the information-communication technologies in their everyday work as well as their visions for further development.**

In order to determine the assumptions for application and use of new technologies, a survey was carried out in the form of half-structured interview with 286 entities in the organizations/institutions of the local and central government, the education, the private business and public sector. More precisely, the survey was carried out with the mayors and spokesmen on local government level, with 7 ministries, the Sector for European Integration and the Committee for information technologies at central government level, in the educational sector with the secondary schools and faculties (engineering), in the public sector with banks, courts, employment bureaus, institute for social welfare, customs administration, hospitals and policlinics, the railway and airport services, and in the private business sector with internet providers, computer companies and companies oriented towards the domestic and foreign markets.

**The interest of the survey was focused on three key aspects:**

- **Use of communication technologies (forms and ways of use, education, computerization, maintenance)**
- **Situation with information-communications technology in Macedonia (activities, visions for development of ICT, standards and regulations),**
- **Strategy for development of new information-communications technologies.**

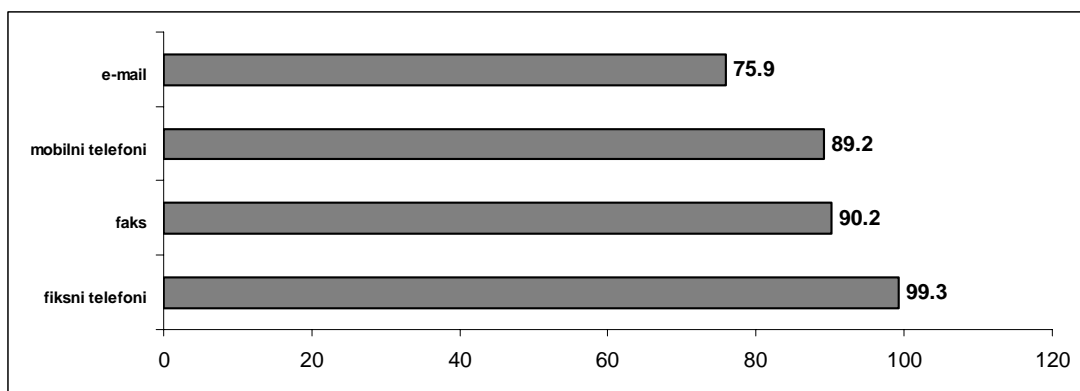
## 1. Use of communication technologies in organizations

*The use of new information-communication technologies usually starts with the so-called basic ones, fixed telephone and fax machine. Further more, mobile telephones and electronic mail, that is, computers and internet, and then the more sophisticated forms and ways of communication. Thus, the level of use of these capacities is an assumption for “realization” of the following steps towards complete communication network. How does this structure function in Macedonia and is the existing system compatible in communication-technological sense with the requirements of the so-called IT policy?*

### a) Forms and ways of using communication technologies

In the attempt to determine the level of use of communication technologies in the survey, the “leadership” from the public and business sector were first asked to state to which extent **are fixed telephones, mobile telephones, fax machines and electronic mail used** in their organizations/institutions? Both according to the quantity and the quality, the fixed telephone is the mostly used communication device and it is almost used by everybody. Then in sequence come the fax machine, mobile phones and finally the electronic mail. That is clearly seen on the following graph:

**Graph: Do you use fixed telephone, fax, mobile telephone and electronic mail at work?**



The fax as a communication device is mostly used in the private business and education sector, mobile telephones by the educational institutions and the electronic mail by the central government. In addition, the central government and educational institutions besides the fax machines, they mostly rely on mobile telephones, and for the private sector both mobile telephones and fax machines have equal importance whereas in the public sector besides fixed telephones mostly used are fax machines. Thus, the local government is exceptional by the fact that it uses all communication means but also to a much greater extent than the other institutions, but the public sector is exceptional as well, especially because electronic mail is least used (used only by 57,0% of the respondents), which is far below the level of other institutions. More precisely, fax and mobile telephones are least used in the department for client relations at the Ministry of Interior, and the electronic mail in hospitals, companies oriented towards the domestic and foreign markets, the secondary schools, the Ministry

of health, the citizen service department at the Ministry of Interior, and courts whereas the situation is worst in the employment bureau.

Similar is the situation regarding the quantity of use of these communication means. Namely, most intensive is the daily dynamics of communication in the organs of the local government, and least intensive in the educational sector. Somewhere in the middle are the central government and the private sector with almost identical intensity of daily communication, while in comparison the private sector is more passive. For instance, in the organs of the local government, all the respondents use the fixed and mobile telephones 'intensively' and 'as much as needed' on daily basis, 83,3% use fax, and 83,4% of the respondents use electronic mail. On the contrary, in the educational institutions, 94,3% of the respondents use fixed telephone on daily basis, 80,0% use mobile telephones, 37,1% fax, and 51,5% use electronic mail.

**Who do they communicate most often with?** With colleagues and business partners. However, the communication means that are used are different. That is, when the communication is with colleagues, priority is given to fixed telephones (54,5% of the respondents), then mobile phones (49,0%) and electronic mail (40,2%), and when the communication is with business partners the priority is given to fax (62,2%). Much less, even incidentally, the communication is directed towards the relatives, friends and the public. Thus, the local governments and private companies have most intensive communication with the business partners and the colleagues. More precisely, when it is about fixed telephones, both the local governments and the private sector almost equally use this type of communication with colleagues and business partners, whereas the central government, the education and especially the public sector give priority to colleagues. On the contrary, all organizations/institutions mostly use the fax for communication with business partners, and the local governments and education very often use it for communication with the public. In this way, the customs administration mostly communicates with the colleagues, while the Sector for European Integration, banks, hospitals and policlinics, the companies for the domestic and foreign markets, internet providers, computer companies, Institute for social welfare and the universities use this way to communicate with business partners. Therefore, mobile telephones are equally used for contact both with the colleagues and business partners, so that little priority is given to colleagues by the central government and the public sector, especially banks, hospitals and policlinics, secondary schools, courts and the ministries of economy, justice, transport and communication. The organs of the local government and the private sector and especially the companies oriented towards the domestic and foreign markets mostly communicate through electronic mail with their business partners, whereas the central government, public sector and educational institutions, i.e. universities, the Ministry of economy, as well as Macedonian telecommunications, customs administration and Kosmofon use electronic mail to communicate with their colleagues. Besides that, the local governments use the electronic mail to communicate with the public much more than the others.

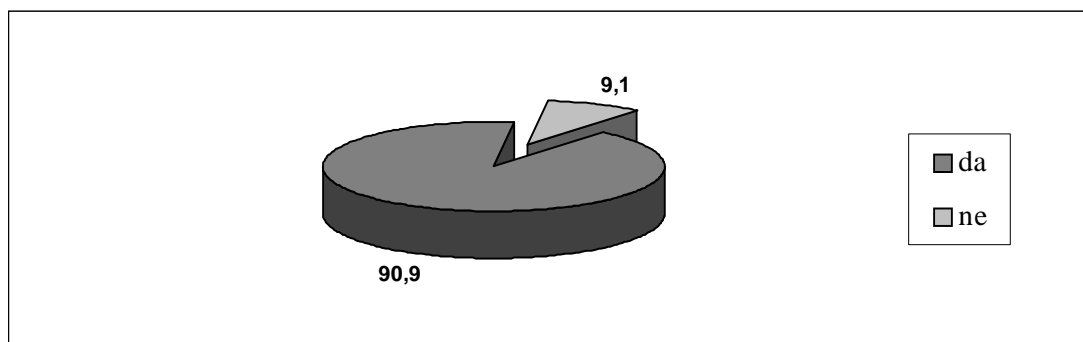
*Which institutions are exceptional? Primarily, the organs of the local governments and the private companies. The organs of the local government, are exceptional because without exception, most intensively use all the communication means, and the private companies because they have maximally put the communication means in use of 'business' and business partners. The educational institutions and the public sector rate lowest, and the very low level of communication, especially with the public, creates concern.*

## **b) Use of computers**

Today, the computer, next to the telephone and fax becomes almost irreplaceable device, without which the functioning of any organization cannot be imagined. Its everyday use in all working processes is no longer matter of 'prestige'. On the contrary, if the computer is blocked, the whole working process is blocked.

The computers are widely used in the organizations of public and business character in Republic of Macedonia. **The biggest number of leadership structures uses computers for the performance of tasks. It is shown on the graph below:**

Graph no. 2: Do you use computer in the course of performance of your tasks at work?



The organs of the central government (95,0%) and the private companies (95,0%) mostly work on computers, and to some degree less the public sector (86,0%) and the local government (83,3%). Thus, it is impressive that within the group that do not use computers, most numerous are the heads of organizations and sectors and primarily in the department for citizen relations at the Ministry of interior, the Macedonian railways as well as in the Ministry of health.

**Computers are used for work every day** intensively (70,7% of the respondents) or every day as much as needed (25,8%). Only small number of respondents work on computer several times a week (3,8%) or once a week (0,4%). Most intensively computers are used for work in the private sector (78,9% use computers intensively every day) and the central government (73,7%), to some extent less in the public sector (68,8%), and to a lowest degree in the educational institutions (53,1%) and the local governments (53,3%). However, in comparison with other organizations, the educational institutions and the local governments use much more computers on daily basis when needed (attitude of 40,0% respondents from the education and the same percentage from the local governments). Despite the intensive everyday use of computers, it is a real handicap that several employees use most often one computer for work. Namely, in almost half of the organizations/institutions two employees work on one computer, while in 1/4 of the companies even more than four employees work on one computer.

Thus, computers are used for the needs of different **working processes**. Namely, according to the statements of respondents, 45,4% stated that computers are used in all working processes, (18,1%) in administration, (7,7%) in accounting and finance and (7,7%) in business communication, and much less, for instance, for information processes (4,6%), for teaching (3,1%), for work on projects and analyses (3,1%) or for databases (2,3%) as well as other similar activities (4,2% of the respondents did not answer the question). Considered per sectors, the computers besides in all working processes are mostly used according to the type of organization and the activities it performs. For instance, computers are mostly used for correspondence by the local governments, for the needs of administration by the central government, for the teaching process in education, for accounting and administration in the private sector and for administration in the public sector.

*The public and business organizations and institutions in Macedonia do not have sufficient number of computers at disposal for the performance of tasks. They are constantly turned on and intensively are used for work, which implies that they are exploited to the maximum, but, in addition, it is a fact that they are used by at least two and even more employees, which undoubtedly influences the work efficiency. However, taking into account the current, and primarily the overall economic situation in the country, it seems that the overcoming of this problem is not only a technical issue.*

#### **v) Use of software**

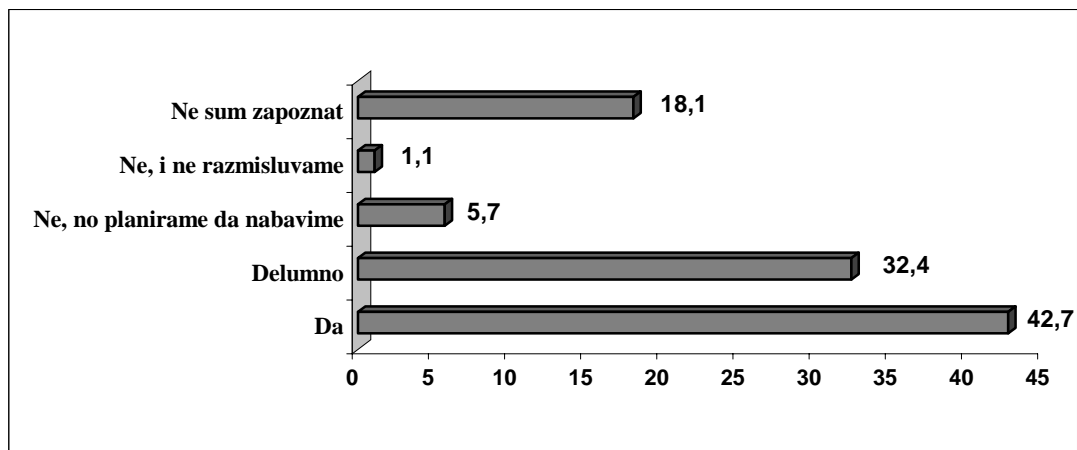
*The quantity of using computers does not immediately imply quality, especially if it is subject to 'exploitation' of basic program packages. Maybe then it is not that important whether the computer programs are licensed or not. More or less, it seems that this is the practice of the organizations and institutions in Macedonia.*

On the question, **what kind of software packages are used in your organization**, 91,3% of the respondents answered that they do most of the work on text processing programs (Word, Page Maker), small number (1,4%) work on programs for tabled calculations (Excel, Lotus), specialized software (2,8%) and other (0,7%), while 1,7% of the respondents are not informed about the software packages which are used in their organizations (2,1% did not answer the question). The programs for data processing are mostly used by the central government (96,7%) and by private companies (96,3%), whereas the specialized software by the public sector (7,5%). None of the respondents mentioned the multimedia presentations (PowerPoint, Promedia, Director), for picture editing (Corel, Photo Shop), audio/video programs, for e-mail communication, website design, for searching the internet or chat on internet and for protection - antivirus programs. Obviously, there is a very poor choice of computer programs for the needs of the working process.

It is very surprising that there is a relatively big number of organizations/institutions that own **licensed software**, especially if known that this was not obligation for Macedonia until recently. Besides that, the

price of the specialized software packages is not to be neglected. Namely, almost half of the respondents answered that their organization works with licensed software, and 1/3 use both the licensed and unlicensed software. Their answers are as follows:

**Graph no. 3: Is the software, that your organization uses, licensed?**



- not familiar
- no, and we are not thinking about it
- no, but we plan to procure
- partially
- yes

The licensed software is mostly used in the private sector (confirmed by 46,3% of the respondents), whereas most numerous are the educational institutions that use both the licensed and unlicensed software (55,9%). On the contrary, local governments are poorly equipped with licensed software (only 22,4% stated that they have licensed software), but, more than the others, are ready to procure it in near future (22,2%), while least informed are the employees in the central government (27,1% do not know what kind of software is used). Concretely, the banks, IT Committee, Kosmofon, Employment Bureau and the Institute for social welfare have the licensed software at disposal to the greatest extent, while the companies for the domestic and foreign markets, the Ministry of education, the secondary schools and universities have at disposal both the licensed and unlicensed software. Least informed about the software that their organization is using are the advisors and managers especially in the companies that work for the domestic market.

However, there is a poor knowledge regarding the **software package that is needed, that is, which the organization/institution should purchase?** Almost 41,3% of the respondents answered that they do not know what kind of software package should be purchased by their organization, and among the respondents that are familiar with this area 19,5% consider that a



specialized software is needed, while 19,2% stated different software, such as for example, Office, Oracle, Delphi, Windows, Microsoft document or Manager. There were respondents, (although few of them) who emphasized that licensed software are needed without stating which ones, or that the software is granted by donors and that it does not depend on them. On the contrary, only 6,6% of the respondents are satisfied with the software they have, and 6,3% consider that there is no need for special software, and some stated that they need licensed software. Least informed regarding the necessary software in their organization are the directors of companies, the heads of departments and the advisors. These are mostly the companies that work for the domestic and foreign markets, the mayors and spokesmen, the Ministry of justice, the Ministry of transport and communication, secondary schools, Employment bureau, even part of the employees in the computer companies.

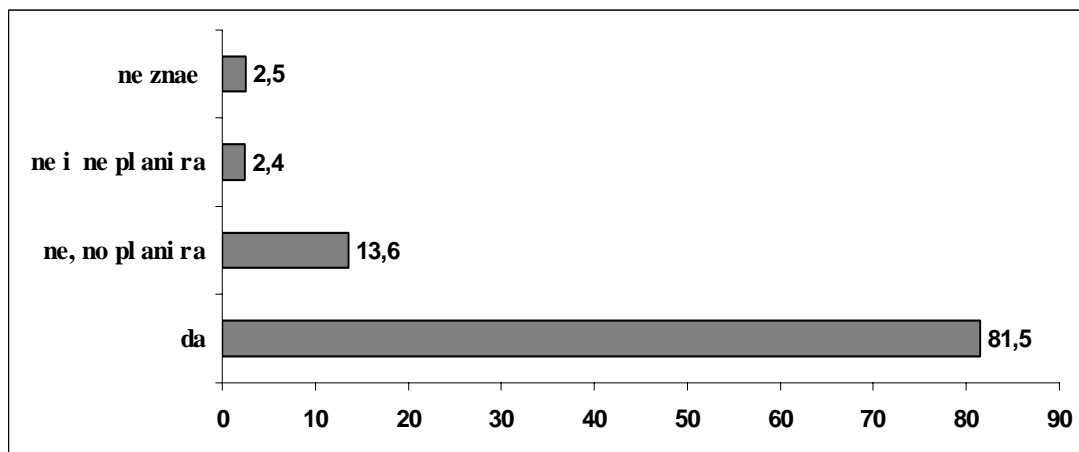
*It is a fact that in the public and business organizations and institutions in Macedonia, the computers are dominantly used for performance of basic business operations – text processing. This is backed by poor software support and relatively poor information about the needs for upgrading, development and modernization of the existing capacities.*

### g) Use of internet

Despite the poverty of computer programs for the needs of the working process, for the Macedonian organizations/institutions more important is the internet connection. Obviously not only for communication and searching the net, but also for self-promotion through internet sites for the general public.

On the question **whether your organization is connected to internet**, the biggest number of respondents gave positive answers, and very small number gave negative answers, whereas 13,6% are planning that for the near future. Their answers can be seen in the following graph:

**Graph no. 4: Is your organization connected to internet?**



- do not know
- no, and does not plan

- no, but plans

-yes

The situation is best with the local governments, as they are all connected to internet, while the situation is worst in the public sector where only 64,5% of the respondents answered that their organization is connected to internet. Part of the departments in the employment bureau and the institute for social welfare, the courts and the Ministry of health do not have connections to internet. However, when it is a question about the **cost of internet**, almost 61,8% consider the costs as high, 21,0% as acceptable, 1,8% as low, and 15,4% are not familiar with this datum. Thus, almost equally critical towards the internet cost are the ones that have internet connections in their organizations and the ones that plan to connect to internet. However, within the first ones there are more respondents that consider the costs as high, whereas among the second ones there are more respondents who are uninformed. The internet cost is mostly considered as too high by the local governments- the mayors (88,9%) and by the education sector - professors, associate deans (71,4%). Most numerous are the respondents from the private companies (managers) that consider the internet cost as acceptable (33,3%), while least informed are the respondents from the central government (24,1%), primarily the advisors.

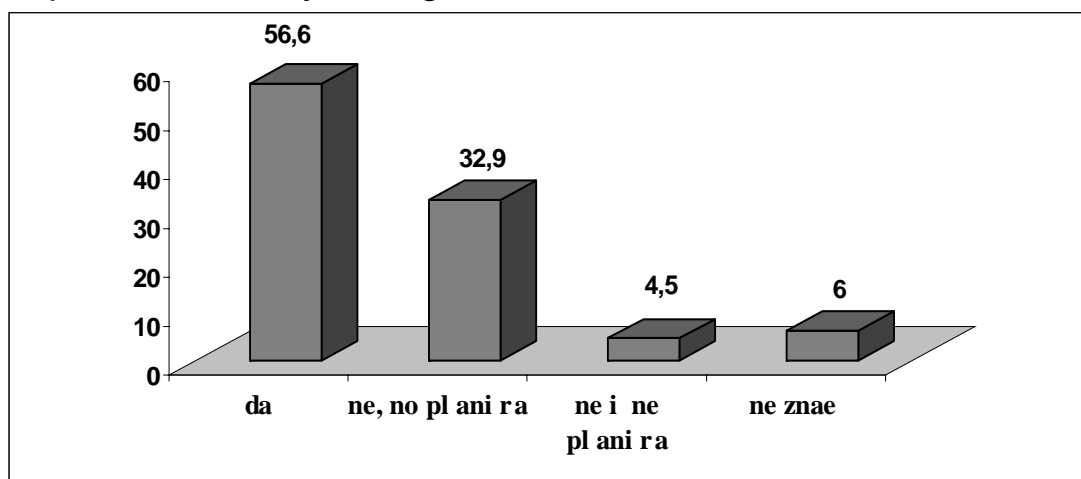
The level of technical culture in this sphere is surprising. Thus, regarding the **type of connection to internet** used by the organization, 39,9% of the respondents stated the on-line (non-stop) connection, 27,5% dial up – ISDN, to some extent less (17,2%) stated the standard dial up connection, and least respondents (2,1%) stated the wireless connection and on line-ISDN (4,3%). Only 7,7% are not informed about the type of connection to internet that the organization uses, and most numerous in this group are the institutions of the central government (14,8%). Regarding the type of connection, the local governments mostly use the on-line connection (50,0%) or dial up - ISDN (44,4%), the central government uses the standard dial up connection (68,5%), in the education, both the dial up – ISDN (37,5%) and standard dial up connection (37,5%) are used equally, the private companies use the on-line connection (31,9%) and the standard dial up connection (39,1%), whereas the public sector almost equally uses the on-line connection (23,3%), dial up - ISDN (28,3%) and standard dial up connection (26,7%).

Similar is the situation regarding the **internet providers that the organizations use**. Namely, the biggest number of 'leaders' in the public and business sector knows which is their internet provider. Most often it is MtNet (answered by 63,1% of the respondents), and among other providers are OnNet (6,9%), Unet (5,2%), MarNet (4,7%) and Mol (3,4%) or other (2,6%), while 4,7% are not informed about it (9,4% of the respondents did not answer). MtNet is mostly used by the public sector (68,3%), local government (66,7%) and central government (66,7%), and among the other providers OnNet is used by the local governments (16,7%) and the private sector

(14,5%), while MarNet is used by education (12,5%). Mostly connected through MtNet are hospitals and policlinics, customs administration, companies for the foreign markets, Macedonian telecommunications, Ministry of economy, Ministry of justice and the courts. OnNet is used by Kosmofon, the second mobile operator in Macedonia. The so-called university network – MarNet is used by the Agency for European Integration and the universities (they are also connected through MtNet), while the computer companies are connected through MtNet, OnNet, Unet or Mol.

However, besides the connection to internet, the public and business organizations and institutions consider it as very important to have **internet site**, as a usual way for communication with the world today. However only half of the interviewed leadership structures confirmed that their organizations have internet-sites, while 1/3 stated that they do not have internet-site but plan to have it in near future. This is shown in the following graph:

*Graph no. 5: Does your organization have internet-site?*



*yes, /no, but plans/ no, and does not plan/ do not know*

The organs of the local governments have the biggest number of internet-sites (66,7% gave positive answers), and the other plan to have them in near future (33,3%). Similar is the situation with the education (62,9% gave positive answers, and 34,3% plan to have internet-sites) and private companies (63,8% gave positive answers, and 30,0% plan to have internet-site). The least number of positive answers were given in the public sector, and the most numerous are the respondents from the private sector who stated that they do not have internet-sites and do not think about it (9,7%) whereas least informed whether the organization has internet-site are the respondents from the central government (10,0%). No internet-sites were reported by the respondents in part of the banks, part of the companies oriented towards the domestic and foreign markets, part of the employees at the Ministry of health and the Ministry of transport and communication, many hospitals and policlinics, secondary schools, courts, the Institute for social welfare, and the respondents from the Ministry of justice.

**Regarding the maintenance of the internet-site** in the organizations, most often they have engaged an employed specialist. This is emphasized by 62,3% of the respondents, while 17,3% of the respondents stated that they have engaged a specialized firm, and 14,2% stated that they combine the engagement of the employed specialist and the specialized firm. Only few of them do not use either specialists or specialized firms (4,3%), and 1,2% of the respondents are not informed about the maintenance of the internet-site (0,6% did not answer the question). In the biggest number of public institutions and local governments, the maintenance of the internet-site is done by an employed specialist (76,2% in the public sector, that is, 83,3% in the local governments), the central government besides an employed specialist also engages a specialized firm, and very often both (22,9%), in the majority of private companies the maintenance is done by their employees (56,9%), and in some of them by specialized firms (31,4%), whereas in the educational institutions there are least employed specialists (36,4%). The customs administration, the Agency for European integration, internet providers, public enterprise for airport services, computer companies, Macedonian railways, Ministry of education, and employment bureau have their own employed specialists for maintenance of internet-sites, whereas the companies that work for the domestic and foreign markets mostly rely on specialized firms.

Yet, few can be praised for **regular updating of internet-sites**. Only 27,2% of the respondents stated that the updating is done on daily basis, whereas 20,4% of the respondents stated that updating is done several times a week. But, almost 1/3 answered that the updating of the internet-site is done very rarely. That is, 9,9% answered that updating is done once a week, 9,9% several times a month, and 18,5% once a month or rarely, whereas uninformed are 12,3% of the respondents (1,9% gave no answer). Biggest attention on internet-sites is paid in the public sector (38,1% answered that the internet-site is updated on daily basis) and in private companies (31,4%). On the other hand, the updating of the internet-sites in the local and central government is done several times a week (33,3% of the respondents in the local and 31,4% of the respondents in the central government), whereas the situation in the education is even worse. The biggest number of educational institutions update their internet-sites mostly once a month (27,3%). The biggest number of uninformed respondents are from the central government (17,1%) and the public sector (19,0%). Thus, it should be emphasized that the regular everyday updating of internet-sites is done in the institutions/organizations that have their own employee that takes care of the maintenance.

Taking into account the character of the institutions/organizations that are included in the survey, it is very important that their **internet-sites are open for the general public**. Obviously that this type of communication with the public is seriously taken by all organizations which have decided to design an internet-site. Namely, positive answers were given by 96,3% of the

respondents, negative answers by 2,6%, but plan to do that in near future, whereas only 0,5% do not think about it, and almost the same number of respondents (0,5%) are not informed. All internet-sites of the central government and education sector are open for the general public, whereas in the other sectors, local government, private companies and public sector there are some internet-sites which are not open for the general public.

However, what is the use of an internet-site if it is not continuously and regularly updated with new fresh information and data, or if **public tenders** are rarely announced. Namely, only 14,8% of the respondents, whose organizations have internet-sites, answered that public tenders are announced on their internet-sites. On the contrary, 35,8% stated that they plan to do that in near future, and 30,2% do not announce public tenders at all and do not think about it, whereas 17,1% are not informed about such activities in their organization (1,9% gave no answer). Who are the ones that announce the public tenders on internet? Mostly the central government (attitude of 28,6% of the respondents), primarily the Ministry of economy, then follows the public sector (16,7%). The announcement of tenders on internet is planned in near future by the local government (83,3%) and the education (50,0%), while least interested is the private sector (52,9%), especially computer companies, but universities as well.

However, that is not an obstacle that they receive **messages on their public e-mail addresses**. Almost 81,5% of the respondents (who answered that their organization has internet-site) confirmed that they receive messages, and 11,1% do not receive messages (7,4% are not informed). The biggest number of messages is received on the public e-mail address by the local governments (91,7%), by the educational institutions (86,4%), private companies (86,3%) and the central government (80,0%), and least by the public sector (71,4%). Most uninformed are the employees of the central government whether and who receives the messages on the public e-mail addresses (11,4%).

But it seems that there is no 'organization and order' how to **reply to these messages**. Namely, several subjects are included in the overall process, which have different assignments and positions. Usually it is done by an assigned responsible person in each department (12,9%), as well as by IT specialists (8,3%), the department for public relations (7,6%), the secretary in the organization (6,8%), everyone for the personal e-mail (6,8%) or the head of department for information technology (6,1%). Some have mentioned the staff from the sales department, heads of software departments, marketing managers, technical persons, officers, correspondents, and sometimes even the directors of organizations. In the local governments, most often it is done by a respective person in each department, in the central government it is done by the sector for public relations, in the education by an assigned person or the secretary of the organization, in the private sector it is either done individually or by the marketing department, and in the public

sector it is done by the IT department, that is, either the IT specialist or the head of the department for information technology.

On the other hand, relatively small number of organizations/institutions has their own **internet domain**. Namely, only 29,7% of the respondents whose organizations are connected to internet answered that they have internet domain, and most numerous are the ones in the central government (41,7%) and the private sector (41,3%). In this group belong the internet providers, Kosmofon, Macedonian Telecommunications, the Ministry of economy and Ministry of education, who are obviously aware of the importance of the so-called virtual space. On the contrary, 29,7% answered that they do not have internet domain, but have plans for the near future especially in the educational institutions (45,7%) and the local government (38,9%) that is, the mayors, secondary schools, banks, hospitals and policlinics, companies that work for the foreign markets, employment bureau. In the second group of organizations (12,6%) that do not have internet domain and are not considering it, most numerous are the companies that work for the domestic market, and the institute for social welfare. Among the ones that do not know whether their organization has internet domain (23,8%), most numerous are the employees in the customs administration, the Ministry of transport and communications and the Ministry of health.

Regarding the **cost of the internet domain**, 37,4% consider the costs as high, 23,1% as appropriate, 2,2% as low, while 31,9% of the respondents are not familiar with the costs (5,5% gave no answer). The respondents from the local governments (63,6%) and the education (52,2%) consider the costs for the internet domain as too high, while it is reasonable for most of the respondents from the private sector (38,9%). The biggest is the number of respondents from the central government (35,1%) and the public sector (35,1%) that do not know what is the cost for the use of the internet domain. More precisely, for the mayors and spokesmen, the employees in the Ministry of economy, Ministry of justice, Ministry of health, secondary schools, employment bureau and the Institute for social welfare, the costs for the internet domain are too high; it is reasonable for the companies that work for the domestic and foreign markets and the computer companies, whereas least informed about the cost of internet domain are the respondents from the banks, hospitals, policlinics as well as the Ministry of education.

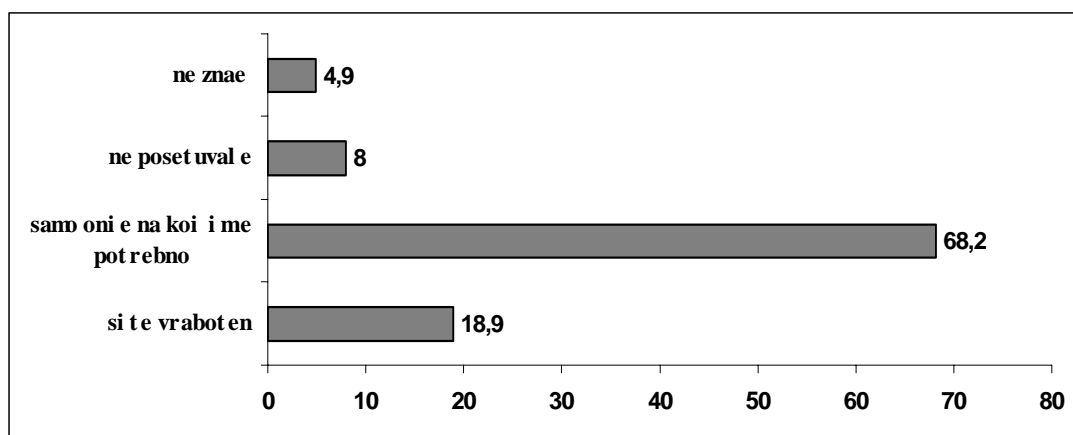
*Although an expensive media, the internet has significant place in the public and business sector in Macedonia. There is an increasing number of organizations and institutions that devote serious attention to their own internet-sites opened for the general public and to the specialists that maintain them as they are good investment for development. They schedule the activities that should be organized especially during the regular updating of the internet-sites, engagements of the persons responsible for the public relations, announcement of public tenders or the activation of the internet domains.*

#### **d) Education for use of communication technologies**

*The appropriate education is indispensability for working on computer, that is, using the software packages as well using the internet. The one who has acquired these 'skills' has an advantage not only for the performance of the concrete assignments, but also to follow and implement everything, which has appeared in the mean time on the market for communication technologies.*

However, in Macedonia this issue is still approached selectively. Courses, seminars or other types of training for advanced technologies are more or less reserved for the ones it is 'assumed' that they need it. Thus, if the leadership of the social structures do not pay enough attention to their own education in this area, in that case we could not discuss about the other employees. That is confirmed by their answers to the following questions. On the question, **whether the employees in your organization have attended courses, seminars or other types of training in order to improve the use of advanced technologies**, almost 2/3 of all respondents confirmed that the specialized courses or seminars were attended only by the ones that needed. The following graph represents the possibilities for education for new technologies.

*Graph no.: Whether the employees in your organization have attended courses, seminars or other types of training in order to improve the use of advanced technologies?*



*do not know/ have not attended/ only the ones that needed/ all employees*

The picture is identical on the level of all sectors. That is, most often, regardless of the type of organization or institution, these specialized courses and seminars have been attended only by the ones that needed that. Why is it so? Most probably it is not a matter of insufficient information about the necessity of improving the use of new technologies. The reasons are the limited financial capacities of the organizations/institutions, so that in the intentions to meet the needs for still insufficient technical capacities, less investments are made in the human resources. Yet, the situation is somehow better in the central and local government. There, more in comparison with the other sectors, it is insisted that great numbers of employees are educated about the new technologies. According to 28,3% of the respondents in the central and 27,8% respondents of the local government, these courses have been

attended by all employees, while in the private sector the same answer was given by only 7,5% of the respondents. However, it is in the central government that we have the biggest number of uninformed respondents about this type of specialized courses and seminars (13,3% of the employees in this sector). In general, the biggest number of courses for advanced use of technologies have been attended by the employees in the customs administration, internet providers, IT committee, Macedonian telecommunications, Ministry of economy, Ministry of justice, Ministry of education, secondary schools, universities, mayors and spokesmen. The worst is the situation in the Ministry of transport and communication and the companies oriented towards the domestic and foreign markets.

However, on the question, **whether they have individually attended any courses, seminars or other type of training for advanced use of technologies**, 2/3 of all respondents (66,8%) gave positive answers, 18,5% that they plan that in near future, and 14,7% answered that they have not attended such courses or seminars. The 'leadership' from the educational institutions, the private and public sector has attended the biggest number of courses, seminars and other types of training. On the contrary, in the central government, the biggest is the number of respondents who have not attended such courses (25,0%), and in the local government, the biggest is the number of respondents that plan to do that in near future (33,3%).

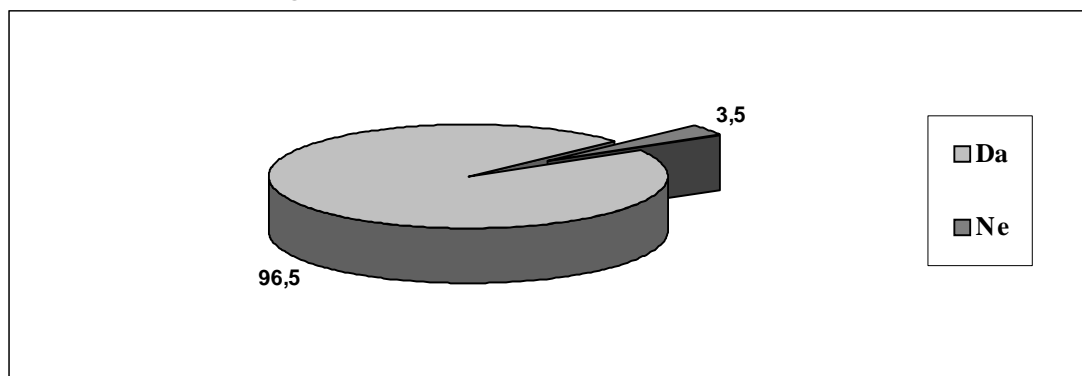
*Undoubtedly, in Macedonia there is need of education for the new technologies. This is especially because of the poor knowledge and poor use of numerous computer programs. However, the education should have wider scope despite the current practice of selective approach.*

### e) Computerization and maintenance

*If we take into account the current information-technological level of the public and business organizations/institutions in Macedonia, it will not be a wrong conclusion that it will take a long time to achieve complete computerization.*

Thus, according to the leadership of the social structures, the necessity of **complete computerization of the working process** is indisputable. This attitude is shared by most of the respondents, while the number of skeptics is insignificant. The picture is as follows:

*Graph no. 7: Would you accept complete computerization of the working process in your organization*





The most numerous respondents who are in favor of complete computerization are the ones from the public sector (97,8%) and the educational institutions (97,1%). Observed according to respondents' positions in their organizations/institutions, certain level of skepticism towards complete computerization of the working process is expressed by the managers in the companies, as well as by the advisors, owners of companies and even by the system administrators and heads of IT departments.

But what is the current situation? On the question, **which department in the organization/institution is most computerized**, 26,6% stated that all departments are equally computerized. Which are these organizations? Primarily, the Ministry of justice, the Ministry of transport and communication and the courts. The others state that most computerized are the IT center (13,6%), accounting (8,0%), educational center (6,3%), administration (4,5%), finance center (4,5%), then the Sector for European integration (2,8%), sale departments, the head office and center for automatic data processing (2,4%), and the respondents "mention" other specialized departments in the organizations such as the head office for information technology as well as different sectors (for civil engineering, development, design, traffic, production, urbanism). To the greatest extent the equal computerization of all departments is being done in the public sector and the central government (attitude of 37,6% respondents from the public sector, that is, 31,7% respondents from the central government), while the computerization in the local governments and education is mostly done in the IT sectors, and in the private companies in all departments as well as the accounting departments.

Positive fact is that the majority of organizations have tried to **connect the computers to a network**. This is the attitude of 78,7% of the respondents, and primarily from the Agency for European Integration, banks, internet providers, public enterprise for airport services, computer companies, Kosmofon, Macedonian railways, Macedonian telecommunications, Ministry of economy, Ministry of justice, Ministry of transport and communications, department for citizen services at the Ministry of interior, universities and the employment bureau. On the contrary, 16,1% answered they they are not connected to networks, but plan to do that in future, 1,7% are not connected to network and are not considering to do that, whereas uninformed are 1,7% of the respondents (1,7% gave no answer). On sectoral level, the computer networking to the greatest extent can be found in the central government (83,3%), public sector (81,7%) and the private companies (81,3%), and least in the local governments (only 38,9% of the respondents gave positive answers), but, according to the majority of the respondents from this sector (61,1%) it is planned for the near future. The education sector is at the level of the data from the general distribution (77,1% answered that their organization is connected to network).

In addition, it is also important that both the **public and business organizations/institutions have computer maintenance sections**. Almost 91,1% of the respondents emphasize that their organization has computer maintenance section, only 4,9% that there is no computer maintenance section but it is planned in near future, 1,3% that there is no computer maintenance section and that they do not have any plans, and 1,8% are not informed (0,9% gave no answer). Best equipped are the private companies (98,5% have computer maintenance section) and the public sector (93,4%),

least in the education (77,8%), and mostly planned it is in the central government (12,0%).

However, there are different **subjects that have been assigned the responsibility for maintenance and safety of the computer system**. 43,7% of the respondents answered that there are employed specialists, 31,1% that specialized firms take care of the maintenance, 16,1% answered that both employed specialists and specialized companies take care of the maintenance, while 7,0% of the respondents answered that none maintains the computer system (2,0% are uninformed). The biggest number of employed specialists is found in the public sector (53,8%) and the central government (46,7%). In the local governments (55,6%) and private companies (41,3%) the maintenance is mostly performed by specialized firms, whereas in the education there are employed specialists (31,4%) and specialized firms (31,4%) that maintain the computer system, however, in this sphere the biggest is the number of institutions where practically nobody is in charge of the safety of the computer system (11,4%), especially in the secondary schools and the companies that work for the domestic market.

*In Macedonia there is no public or business organization/institution that is completely computerized. Nevertheless, the level of networking is relatively good, the establishment of computer maintenance section, and the engagement of specialists or firms for the maintenance and safety of the computer system. These are good bases for further upgrading.*

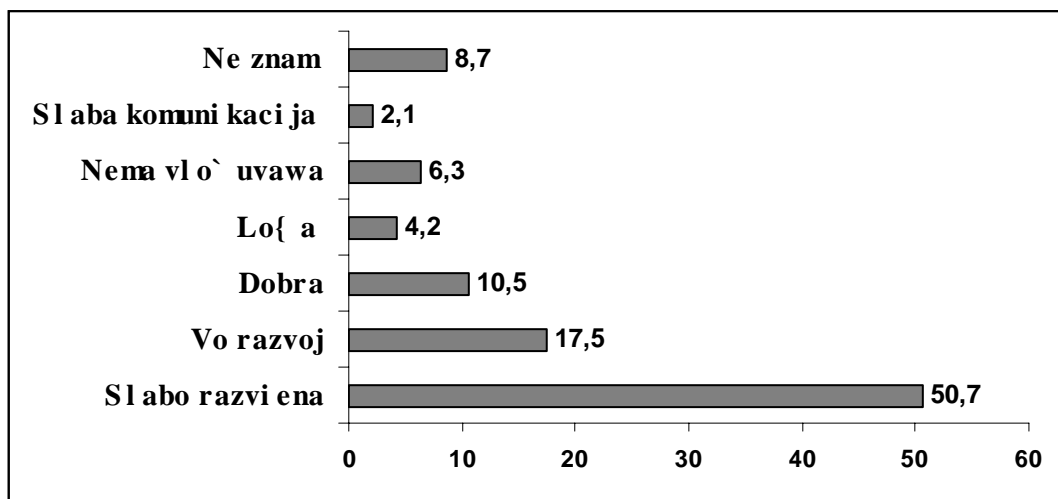
## 2. SITUATION REGARDING THE INFORMATION-COMMUNICATION TECHNOLOGY IN MACEDONIA

- a) Situation, benefits, visions for the development of the information-communication technology

*It is agreeable that the development of ICT is one of the assumptions for faster integration of Republic of Macedonia in the European structures, but obviously this objective is hard to be achieved especially because of the poor results, which have been achieved so far. This is confirmed by the precise data from the survey.*

First, about the **situation regarding the information-communication technology in Macedonia**. The majority of the leadership in the state structures expresses dissatisfaction and critical attitude towards the current situation in this area, the insufficient and unequal development, lack of investments, poor communication among the institutions. It can be clearly seen from the following graph:

*Graph no. 8: What is your opinion about the situation regarding the information-communication technology in Macedonia?*



### do not know/ poor communication/ no investments/ bad/ good/ in development/ poorly developed

Most critical about the current situation regarding the information-communication technology is the local government (66,7% of the respondents stated that it is insufficiently and poorly developed), that is the mayors and spokesmen, as well as the private sector, that is heads of information centers and the heads of departments for information technologies, it seems especially the ones who are most familiar with the new technologies. Among the 10,5% respondents who are satisfied with the current developmental level of the information-communication technology, the most numerous are the employees from the public sector and education, although it is the educational sector where the biggest number of respondents are not familiar with the situation regarding the communication technologies in Macedonia.

Yet, it does not mean that nothing has been done so far in this sphere. On the contrary, considering the **benefits that Macedonia derived from the ICT development so far**, the leadership in the public and business sector stated that there is more, and most often better and faster sharing of information (18,8%), easier communication and better position of RM (18,9%) and more efficient work (9,8%). Less number of respondents emphasize as benefit the implementation of ICT in each sector (2,4%), the following of world trends (2,4%), general development (2,3%), cost reduction and saving time (2,1%), new technologies (1,7%), more investments for development of ICT (1,4%), education (1,0%). On the contrary, 9,4% say that there are not many benefits, 2,4% that there are great benefits, while 1/4 of the respondents (26,6%) do not know which benefits Macedonia acquired from the ICT development so far. Considering it on sectoral level, everywhere the accent is placed on faster sharing of information and more efficient work. Thus, faster and more efficient performance of assignments is stated as a benefit in the local governments, the easier communication is a benefit for the central government, but there are a big number of respondents that consider the benefits as insignificant. The following of world trends and easier communication with the world is benefit for the education sector, in the private companies it is the faster sharing of information (but, here there is a great number of respondents that consider the benefits as insignificant), whereas in the private sector it is the easier sharing of information and efficient performance of assignments which are considered as benefits.

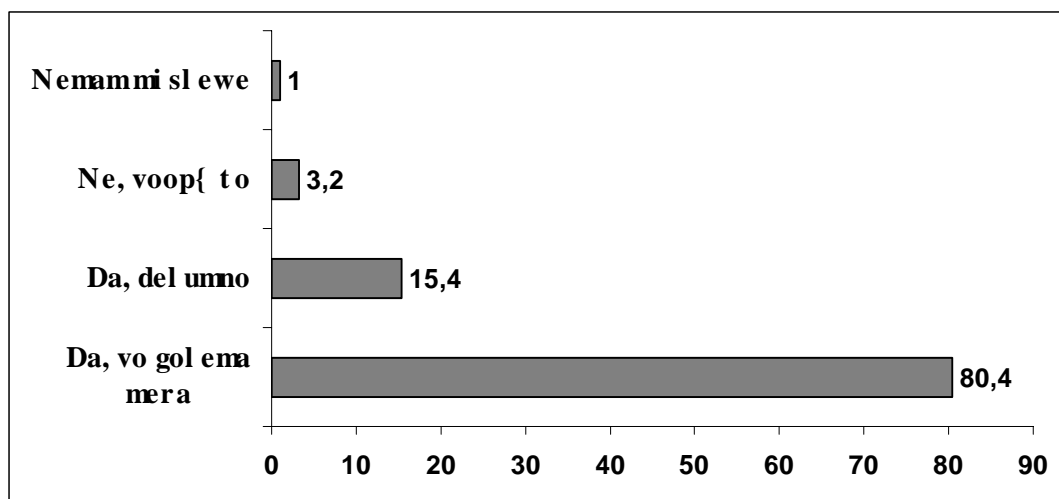
The leadership from the social structures see the **vision for development of strategy in this area** primarily in more investments (18,5%), implementation of ICT in all sectors

(14,0%), following the world trends (9,4%), defining the national strategy for ICT (6,6%), use of new technologies (5,2%), education (5,9%), better, faster informing and communication (5,5%), efficient and economical work (3,4%), development of e-business and e-government (2,8). Smaller number express optimism (2,8%) that is pessimism (2,1%) whereas almost 15,7% do not know what should be the vision for development of ICT strategy in Macedonia. Thus, among the three most numerous categories of respondents, the directors see the vision in the implementation of ICT in each department and more investments, the heads of departments in more investments and the defining of the national ICT strategy, and the advisors see the vision in the education and following the world trend. Considered per sectors, the attention of the local governments, education and private sector is mostly concentrated on the implementation of ICT in each sector, whereas the attention of the central government is concentrated on more investments.

Their attitudes are almost identical when it is a matter of the **privileges that the citizens would have from the development of ICT in Macedonia**. Namely, most emphasis is placed on the better and timely information for the public (45,7%), easier communication in the country and with the world (13,2%), faster and more efficient performance of work (10,8%), faster and high quality services (7,8%). Smaller number of respondents consider that the development of ICT would improve the status of Republic of Macedonia (4,5%), that it would help in education and professional development (2,4%), saving time (2,1%), implementation of ICT in each sector (1,0%), or raising the awareness about information culture (1,0%). Thus, 4,2% of the respondents generally conclude that the privileges are big, and 1,4% consider them as insignificant, whereas 9,1% did not know which would be the privileges for the Macedonian citizens from the ICT development. Considered per sectors, they all agree that the development of ICT would enable the citizens to have better and timely information. Besides that, the local governments consider that in this way the citizens would get cheaper services with higher quality, the central government and the public sector consider that it would imply more efficient performance of work, and the private sector considers that it would enable easier communication with the world.

In this context, expectedly, the development of **ICT has impact on the efficient, transparent, accountable and democratic functioning of the public institutions**. The majority of leaders of social structures agree about this, although the number of skeptics should not be neglected. Their answers are presented on the following graph:

*Graph no. 9: Does ICT contribute to more efficient, more transparent, more accountable and more democratic functioning of the public institutions?*



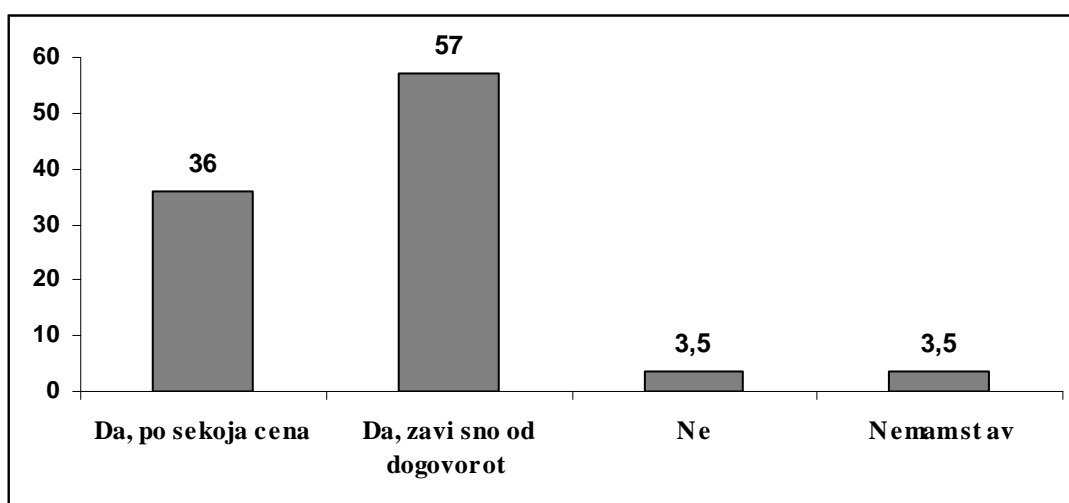
no opinion/ no, not at all/ yes, partially/ yes, to a great extent

The biggest optimists are the 'leaders' from the central (91,7% answered – to a great extent) and the local government (83,3%), and biggest skeptics are the educational institutions (65,7%-to a great extent, and 25,7% partially). In the public sector, which is most directly influenced and which should be interested in efficient, accountable and democratic performance of its functions, 79,6% of the respondents consider that ICT to a great extent can contribute, 17,2% partially, and 2,4% of the respondents consider that it will make no contribution (1,1% have no opinion). Thus, ICT as an instrument for efficient, transparent, accountable and democratic functioning of the public institutions was completely supported by the Agency for European integration, IT committee, Macedonian railways, Macedonian telecommunications, Ministry of economy, Ministry of justice, Ministry of transport and communication, Ministry of health, the department for citizen services at the Ministry of Interior. Probably, they consider that parallel work will be done not only regarding the technical parameters but also the human resources, as complete success is impossible without them.

The **benefits that Macedonia would have from the development of the ICT sector for the integration process in the European Union** are not denied. 72,7% of all respondents agree with this to a great extent, especially the respondents from the central (91,7%) and the local government (83,5%). Agreement was also expressed by 23,4% of the respondents, but emphasize that Macedonia has many other obligations of higher priority. In this group most numerous are the employees in the private sector (32,5%) and education (28,6%). Whereas few of them (2,1%) consider that the development of the ICT sector will not contribute to faster integration of Macedonia into EU because of the obligations of higher priority, and 0,7% consider that it will not contribute at all. (0,7% have no opinion about this question). Biggest optimism is expressed within the Agency for European integration, the mayors and spokesmen, public enterprise for airport services, Macedonian railways, Macedonian telecommunications, Ministry of education, Ministry of economy, Ministry of justice, and the employment bureau.

Probably, because of the stated reasons, **Macedonia needs strategic partnership with major computer companies such as Microsoft, Oracle and IBM**, as a guarantee that there is a serious and responsible approach towards the ICT sphere. Thus, 1/3 of the interviewed leaders consider that such partnership is necessary for Macedonia at all costs, and half of them consider that it depends on the contract that will be concluded with these computer companies, whereas only small number of them are against it. The graphic representation is as follows:

**Graph no. 10: Does Macedonia need strategic partnership with major computer companies such as Microsoft, Oracle, IBM?**



yes, at any cost/ yes, depending on the contract/ no/no opinion

The partnership with major computers companies at any cost is mostly supported by the local (44,4%) and central government (40,0%), and the partnership, but, depending on the contract is supported by the private companies (62,5%) and the public sector (59,1%). For partnership at any cost are mostly the companies that work for the domestic market and the Ministry of health, and for the partnership depending on the contract are the Agency for European integration, the internet-providers, computer companies, Macedonian telecommunications and the Ministry of justice.

*The information-communication technologies in Macedonia are insufficiently and unequally developed. Therefore, it is not surprising that there are requirements primarily for more investments in all sectors as an assumption for more efficient, more accountable and more democratic functioning of the institutions/organizations mainly for the needs of the citizens. In this way, Macedonia would be one step closer to the European Union structures.*

**b) Governmental activities in the area of development of information-communication technologies**

*One of the segments for the development of the IT policy certainly is the IT Committee at the Government of Republic of Macedonia. What does this committee do, which are the functions and competencies, and how much budget funds are allocated for this committee? Probably, all this issues are real enigma for most of the citizens in Republic of Macedonia. Is it for the social structures of the public and business sector?*

Unfortunately, the majority of leaders of the social structures know very little about the **IT Committee**. Namely, only 8,4% of the respondents answered that they are familiar with the committee's work to a great extent, 28,3% partially, 52,4% do not know but would like to learn something more about this committee, and 10,8% do not know about the committee's work at all. Most informed are the respondents from the central government (26,7% to a great extent) and especially the ministries, mostly interested to learn something about the work of this committee are the employees in the education (68,6%) and the public sector (37,0%), especially hospitals, policlinics, secondary schools and universities, and most uninformed are the respondents from the local government (22,2% answered that they are completely unfamiliar with the work of this committee).

In addition, few of them know what is the **budget for development of information-communication technologies**, that is only 3,8% of the respondents, while 72,0% are uninformed but would like to know something more about it, and 24,1% are not familiar with that at all. Considering this on sectoral level, more informed about the budget of ICT are the respondents from the central government (13,3%), uninformed are the respondents from the private sector (33,8%), and most interested to learn something more are the respondents from the education sector (88,6%) and local government (83,3%).

*Therefore, it is not a surprising fact that most of the respondents do not have attitude whether the **budget for ICT development** is sufficient or it should be increased. Namely, almost 66,8% of the respondents do not have opinion about this question, and taking into consideration the respondents' positions in the organizations/institutions these are mostly the directors, heads of sectors and advisors. On the contrary, 32,5% of the respondents consider that it should be increased, probably knowing from experience that minor funds have been allocated in this sphere so far, and only 0,7% consider the budget as sufficient. Thus, regardless of the sector, dominant are the 'leaders' who do not have attitude about the extent of the budget for development of ICT, and most numerous are in the local government (72,2% of all respondents) and in the education sector (65,7%), whereas the increase of the budget is supported to the greatest extent by the central government (38,3%), "most probably" aware of what it means for the development of Macedonia. Therefore, expectedly, 40,2% of the respondents do not know **what should be the extent of the budget for development of ICT**, and they are mostly from the local government. On the other hand, 34,6% of the respondents state concrete amounts (and 25,2% gave no answer to this question), especially the ones from the central government and the private sector.*

*The poor knowledge about the governmental activities in the area of ICT development, that is, the work of the IT Committee, creates concern. Obviously there is lack of mutual communication between the Government and the social structures, which is a serious indicator for the overall situation regarding the IT policy in Macedonia.*

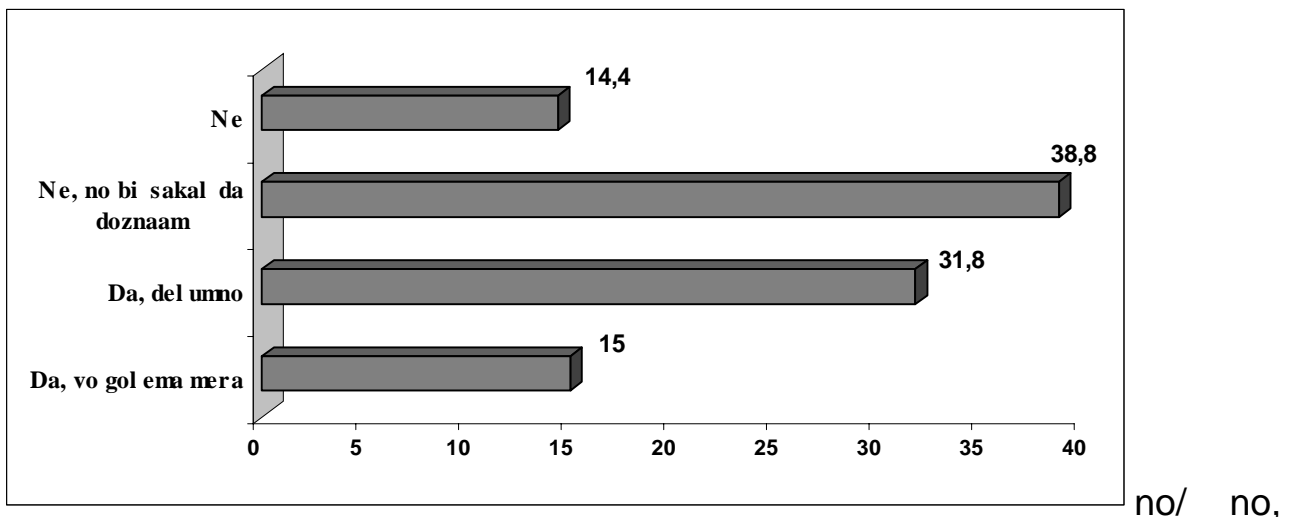
## v) European standards and regulations

There are numerous questions that Macedonia must answer in order to approximate to the European standards for IT policy. Some of them are distant and almost unapproachable, and some of them are very concrete, especially the obligations for development of information society as part of the Stability Pact.

Regarding the European standards and regulations, the leaders of social structures were first asked about the **work of MASIT**. However, only small, almost insignificant is the number (6,3%) of respondents who are familiar with the work of MASIT, 18,2% partially, whereas the category of uninformed is predominant. Among them, 49,3% stated they do not know but would like to learn something more, and 24,8% stated they do not know anything about MASIT. Considering this on sectoral level, best is the situation in the central government (11,7% are familiar with its work, and 25,0% partially), and the worst is the situation in the local governments and education. In these sectors there are no respondents who are familiar with the work of MASIT, and 11,1% from the local government, that is, 11,4% from education know about MASIT only partially.

To some extent better, but far below expected is the knowledge about the **e-government concept**. Namely, only 15,0% of the leadership structures have great knowledge about the e-government, whereas the others either have poor knowledge or no information about this concept. The graphic representation is as follows:

**Graph no. 11: Are you familiar with the concept of e-government?**



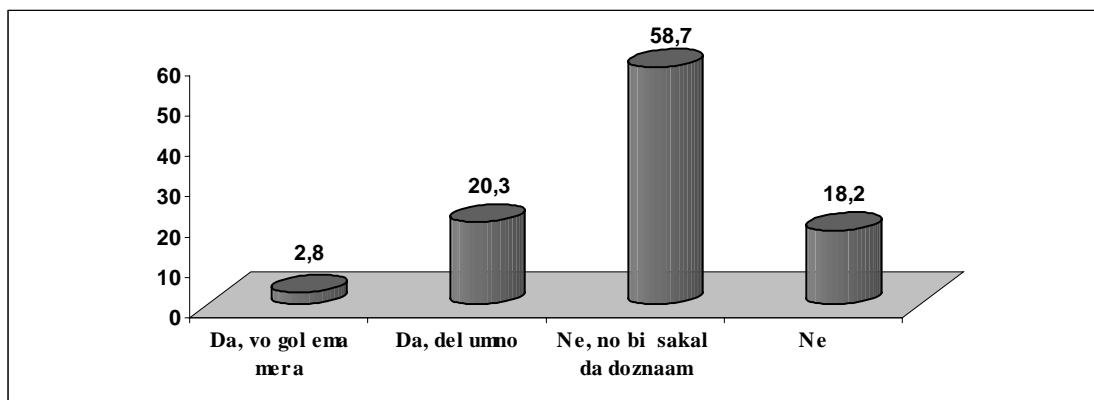
no/ no, but would like to learn sth.more/ yes,partially/ yes, toa great extent

Again, most informed are the respondents from the central government, especially in the Ministry of education (35,0% to a great extent, and 36,7% partially) and in the private sector (15,0% to a great extent, and 35,0% partially), that is, primarily the computer companies and least informed are the respondents from the local government and education (44,4% that is 68,6% do not know anything about this concept).



However, despite the poor knowledge, almost half of the respondents consider that **this concept shall be implemented, that is, it shall function successfully in Macedonia** in a period of several years. So, according to 20,3% of the respondents that will happen in a period of 1-3 years, while 32,5% of the respondents think that 4-6 years will be necessary for its implementation, and according to 15,7% of the respondents it will take 7-10 years. Insignificant number (0,3%) of leaders consider that it will never happen, while 30,8% have no attitude about this question (0,3% gave no answers). In all sectors, dominant is the number of respondents who consider that the implementation of the concept for e-government would take 4-6 years. Yet, the biggest optimists are the central and the local government, and least informed and even least interested are the respondents from the education and public sector (42,9% respondents from education, that is, 38,7% respondents from the public sector have no attitude). It is questionable what are the grounds for such attitudes and to which extent are they realistic. Perhaps, especially among the ones that consider it to be done in a period of 1-3 years, it is the 'unreserved' confidence in the capabilities and capacities of the highest governmental organs to realize it in Macedonia. On the other hand, as much as it is known in Macedonia about the Stability pact, that much is not known about the **Agenda for development of information society in Europe as part of the Stability Pact**. That is, only insignificant 2,8% of all respondents from the social structures are familiar with this agenda to a great extent, while the other only partially or not at all. The picture is as follows:

**Graph no. 12: Are you familiar with the e-SEE Agenda for development of information society in southeastern Europe?**

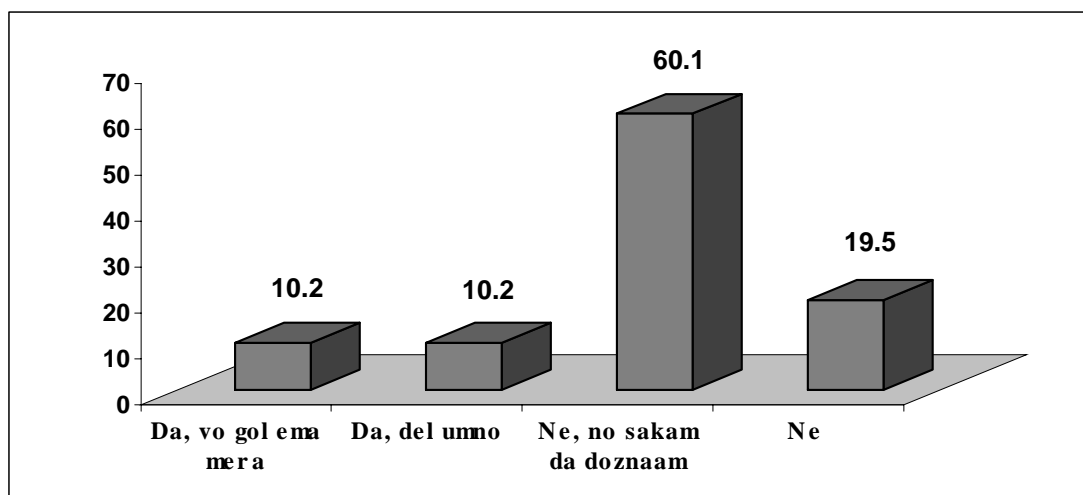


yes, to a great extent/ yes, partially/ no, but would like to know/ no  
 Best informed are the respondents from the central government (11,7% to a great extent, and 26,7% partially). Then follows the private sector (1,3% to a great extent, and 22,5% partially), however, the biggest is the number of respondents who are not familiar with the Agenda for development of information society at all (28,8%), whereas most interested to learn something about the Agenda are the educational institutions (74,3%). Thus, among the small number of respondents who are familiar (to a great extent or partially) with the Agenda for development of information society, as **obligation which their organizations have undertaken (or they personally), and**

which arise out of the agenda, most often mention the new technologies, program support for development of ICT and cooperation with other institutions.

The situation regarding the **e-Declaration** is quite similar. Almost 79,6% of all interviewed leaders in the social structures do not have any knowledge, although most of them (60,1%) expressed preparedness to be informed about it, whereas only 20,4% of the respondents have partial or more detailed knowledge about the e-Declaration. Their answers are shown on the following graph:

Graph no. 13: Are you familiar with the e-Declaration?

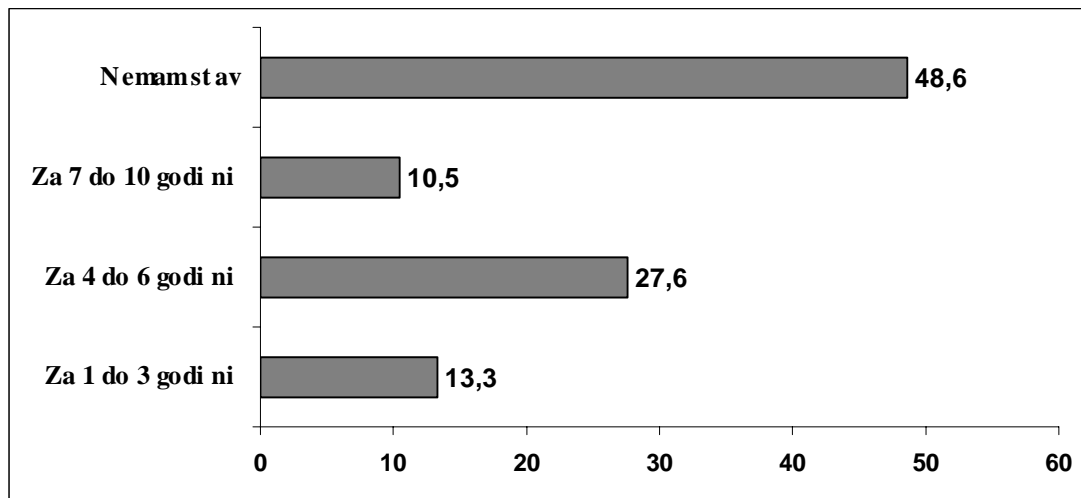


**yes, to a great extent/ yes, partially/ no, but would like to know/ no**

Thus, the poorest knowledge about the e-Declaration is within the local governments and education, but at the same time they express the biggest preparedness for more information (77,8% from the local government, and 77,1% from education), whereas most informed are the respondents from the central government (20,0% to a great extent, and 15,0% partially). Regarding **the obligations that arise out of this Declaration and** which the organizations/institutions have undertaken, mostly stated are the following: implementation of new technologies, establishment of IT committees, connection to the system of e-government, computerization and connection with the centers for support.

Thus, considering the low level of achieved results in this area so far, the lack of clear attitude is not surprising, as well as the different 'calculations' on the part of the leaders of social structures regarding their **expectations for fulfillment of the planned activities and obligations that arise out of these two documents: Agenda for development of information society in south-eastern Europe and e-Declaration**. Really, half of the respondents (48,6%) do not have attitude about this question, while the others are divided in three groups according to the expectations about the number of years that the fulfillment of the planned activities would take. Their answers are presented on the graph as follows:

Graph no. 14: When do you expect, that the planned activities and obligations that arise out of these two documents, to be fulfilled?



no attitude/ 7-10 years/ 4-6 years/ 1-3 years

In all sectors, both the public and the private sector, the local and the central government there is a dominant attitude that the timeframe for fulfillment of these obligations and activities is from 4 to 6 years. Yet, the biggest optimists are from the public sphere (18,3% consider the timeframe to be from 1 to 3 years), and biggest pessimists are the respondents from the private companies (16,3% consider that it will happen in the following 7-10 years), whereas the most numerous respondents without attitude are the employees in the local government (61,1% of the respondents).

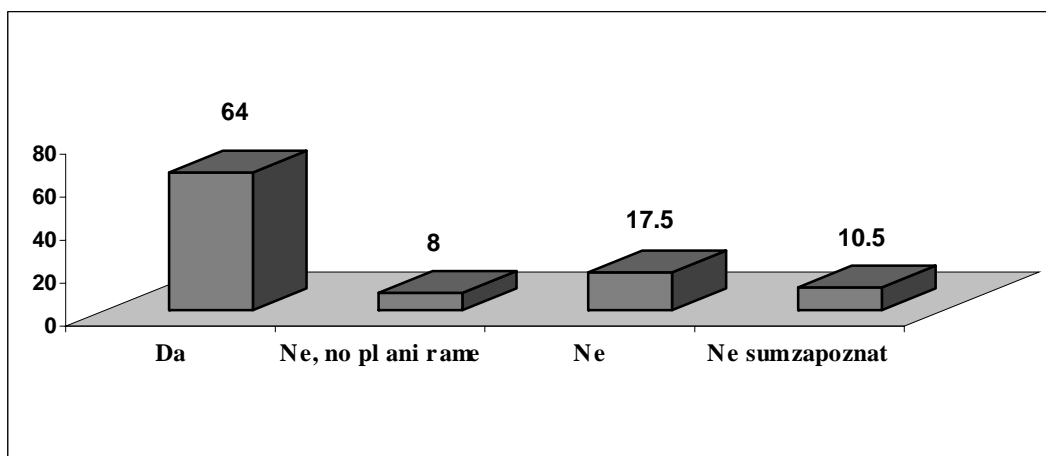
**Macedonia is far away from the approximation to the European standards for development of information technologies. Social structures know little or almost nothing about the e-Government, e-Declaration, Agenda for development of information society, and not to mention their work on the fulfillment of the obligations that arise out of them.**

## 2. STRATEGY FOR DEVELOPMENT OF INFORMATION-COMMUNICATION TECHNOLOGIES

*Do the public and business organizations/institutions in Macedonia have strategy for development of the information-communication technologies? That is, what the strategy in this sphere imply? Whether it is the computerization of the work, improvement of the existing resources, computer networking, introduction of internet and preparation of plan with concrete activities and deadlines?*

In this context, the leaders of the social structures were first asked **whether their organization/institution has ICT strategy?** Positive answer was given by almost 2/3 of all interviewed leaders, and negative answers were given by few of them. Concretely, their answers can be seen on the following graphic presentation:

Graph no. 15: Does your organization have ICT strategy?



yes/ no, but planning/ no/ not familiar

Surprisingly, the biggest number of IT strategies are prepared by the educational institutions (this answer was given by 74,3% of the respondents), which most probably is related to the ongoing reforms, primarily in the reforms of university education. Then come the private (68,8%) and public sector (65,6%), and behind them is the central government (56,7%). Last rated is the local government (38,9%), however, most of the considerations are among the respondents from the local government to make up for it in near future (attitude of almost 44,4% of the mayors and spokesmen). It's defeating, but most uninformed about the ICT strategy are the respondents from the central government (21,7% are not informed, which is twice more than the answers in the general distribution), primarily in the Ministry of education.

In the institutions that have strategies for development of the information technologies, half of the interviewed 'leaders' (53,0%) participated in its **creation**, 30,6% only partially, 5,5% both yes and no, 8,2% generally no, and 2,7% not at all. Among them, most engaged was the management of the institutions and of course the heads of the information centers. This refers especially to the banks, internet providers and the IT Committee.

However, **what has been done SO FAR in direction of developing the information-communication technologies?** Most of the work was done on computerization, that is, procurement and upgrading of the existing computer equipment (answered by 26,6% of the respondents) as well as on development i.e. introduction of the information center, engagement of staff for development, education, and connecting with other institutions (22,9%). Then, (12,6%) worked on establishing technical parameters for more intensive communication with the surrounding (starting from the main telephone exchange up to internet, web-site, ISDN line, software and program packages) as well as computer networking (10,5%). On the contrary, 4,9% of the respondents consider that nothing has been done, and the number of uninformed is not to be neglected. Thus, 17,8% of the respondents do not know what has been done for the development of the communication technology in their organization, and if we add the ones who are undetermined or the ones who have answered that much i.e. little has been done in this area, then the figure is 21,9%. It is important to be emphasized that in this group most numerous are heads of organizations/institutions, advisors, heads of departments. Nevertheless, in all sectors most work was done on computerization and networking; in the private sector also on advancing the ICT, and the central government worked on advancing the ICT and preparation of a concrete plan. But, it is in the central government that the biggest number of respondents are uninformed (25,0% do not know what has been done so far about the development of the information technologies), especially in the Ministry of transport and communication and the department for citizen services at the Ministry of Interior.

Similar, almost identical are the answers regarding the question –**what has been done during the PREVIOUS YEAR – about the development of ICT?** The majority of the respondents answered that most of the work was done about computerization (20,2%), development (16,3%) as well as the introduction of technical parameters for communication (15,5%), and least work was done about networking (5,2%). Precisely, the local governments mostly worked on computerization, the organs of the central government worked on computerization, opening of web-site, and advancing the ICT, in the education it was worked on computerization and introduction of internet, in the private sector it was worked on computerization and networking, while in the public sector it was worked on computerization, networking, advancing the ICT and networking with other institutions. However, there is concern about the number of respondents who think that nothing has been done (10,8%) as well as the number of uninformed (31,0%) especially because it is a question of subjects that have the leading positions in the organizations/institutions. Namely, most uninformed are directors of institutions and heads of departments, especially in the central government (almost 46,7% do not know what has been done in this area the previous year) and in the education (28,6%), whereas most skeptical are the respondents from the private companies and the public sector. Precisely, 16,3% of the respondents from the private companies and 10,8% respondents of the public sector consider that nothing has been done about the development of the ICT in the previous year. In general, the data are rather defeating especially because of the fact that biggest number of activities until now and in the previous year was concentrated on procurement and upgrading of the existing computer equipment. Undoubtedly this will have impact on the following steps that need to be taken in this area.

On the other hand, the level of having information about the world achievements with ICT, is very high. Thus, on the question – **how familiar are you with the level of use of information-communication technologies in similar organizations abroad,** 32,5% of the respondents answered that they are familiar to a great extent, 39,9% partially, and 22,0% that they are not familiar, but would like to know something more (only 5,6% are not informed at all). Thus, the knowledge more or less about the information-technology level in the world (especially the developed world), gives hope that it will be worked more intensively in Macedonia so that the new information-communication technologies become constituent part of each segment of the working process. Worth emphasizing is that among the most informed, besides, expectedly, the heads of the information centers are also the heads of organizations and departments, precisely the ones that are least familiar with what has been done in this area in their organizations/institutions. But, among them most numerous are the ones who are not familiar, but would like to learn more. Anyway, considered per sectors, most informed about the use of technologies in similar organizations abroad are the respondents from the education sector (40,0% answered that they are familiar to a great extent) and the private sector (or 35,0%), and least familiar is the local government (16,7%), whereas the biggest number of uninformed are the respondents from the public sector. (10,8%).

*Obviously, the existence of a strategy for development of information-communication technologies is not a guarantee for taking concrete steps in this area. The public/business organizations/institutions in Macedonia are striving with the computerization and networking of their own systems, and in this race there is no space left for other activities. It seems that the vicious circle, in Macedonia as a developing country, is almost impossible to be broken without foreign assistance.*

## **SUMMARY OF CONCLUSIONS:**

Macedonia cannot be praised for the developed information-communication strategies, although among the leadership structures in public and business organizations and institutions there is an indisputable preparedness for their acceptance and use in all segments of the working process. Nevertheless, despite the optimism, the situation in practice, especially in certain sectors is more than defeating.

No matter whether we do not want to admit, it is difficult to talk (expect) about 'fast and efficient' implementation of IT policy in Macedonia if the existing available resources (both technical and human) are insufficient, and the level of knowledge about the new technologies is more than modest. There are numerous factors, which prove that. With respect to use of new technologies- there is dissatisfying level of technical (computer) capacities as indispensable assumption for efficient performance of assignments, poorly developed communication primarily with the general public, poor usability of the existing program packages, low level of computer literacy especially with regard to software support and knowledge about the necessities of upgrading the existing capacities, modest knowledge and insufficient education for use of numerous computer programs. The results are dissatisfying regarding the situations, benefits and visions for development of the information-communication technologies. Neither in the public and business organizations/institutions, nor in the Government or governmental bodies step forward has been made: there is lack of mutual sharing of information and intensive communication for all activities that are undertaken or are planned to be taken. This is especially due to the exceptionally modest and poor knowledge about the European standards and regulations, such as the e-Government, e-Declaration, Agenda for development of information society, which has direct impact on the non/fulfillment of the obligations that arise out of them. Neither is the situation regarding the development of information-communication strategies any different. Obviously, both the ones that have and do not have developed strategy for ICT are in the same, almost hopeless position, because everything that has been outlined is difficult to be applied in practice.

It is optimistic that there is a maximal usability of the existing information technologies and the fact that they are primarily put in full 'use' of business needs; relatively high level of technical culture regarding the use of internet, awareness about the need of self-promotion (through internet-sites) and preparedness for open and transparent communication with the general public. The local government and the public sector are exceptional regarding this area. In addition, it can be discussed about good grounds in direction of complete computerization of the institutions/organizations in Macedonia. It is confirmed by the relatively good level of networking, introduction of computer maintenance sections, engagement of specialists and specialized firms in charge of the maintenance and safety of the computer systems.

However, if we try to make a parallel between the organizations/institutions covered by the survey, several conclusions can be reached. The local government is distinguished for showing extremely serious attitude towards the use of new technologies and preparedness to make up for everything that is missing in this sector (opening web-site, procurement of licensed software, networking, announcing tenders on internet etc.) in near future. The information-technological level in the organs of the central government is rather low (great number of respondents uninformed about many issues), however, it

is especially impressive that more or less their attitudes overlap with the activities that the government is currently undertaking or planning to undertake in this area. For instance, it is regarding the strategic partnership with major computer companies, the benefits that Macedonia would obtain from the development of the ICT strategy for its integration in the European Union, or for more efficient, more transparent, more accountable and more democratic functioning of the public institutions. On the contrary, the private companies are considerably equipped from technical-technological aspect (for example, with licensed software, networking, computer maintenance sections etc.) and are educated, which undoubtedly is of great help in their work, whereas the educational institutions are recognizable by the fact that they have put the information technologies mostly in use for communication (at home and in the world). Therefore, it is not surprising that they have good computer networking, and most probably that is why they have strong intentions for computerization, thus considering the benefits from ICT as a better opportunity to follow the European trends in the educational sphere. From communication-technological aspect, last rated is the public sector. In the public sector, despite the awareness for the benefits from the new technologies for more efficient performance of administrative tasks, the weak point and real handicap is the 'critical' level of knowledge and use of these capacities (they have the smallest number of internet connections and internet sites, use the electronic mail to the smallest extent etc).

Finally, the key question: If we agree that the development of the information-communication technologies are one of the assumptions for more efficient, more accountable and more democratic functioning of the institutions in the country, as well as for faster integration of Republic of Macedonia in the European Union, then we cannot and should not reconcile to the current very low technological level in Macedonia. The IC strategy is worthwhile only when it has practical application.