

**ESTONIAN
INFORMATION SOCIETY
STRATEGY 2013**

2006

FOREWORD

Dear reader,

The document you are holding in your hands is called the „Estonian Information Society Strategy 2013“. The development plan serves as a good example of the systematic character of information society development in Estonia – its elaboration was not initiated due to an unexpected need to change course, but because the time frame of the previous information policy had come to an end.

The strategy is special for several reasons. Never before have activities related to the development of the information society in Estonia been planned for such a long period. We have reached a level, where these are not single projects, services and technologies that need to be focused on, but more general and long-term goals rather. When reading the strategy, one might note the less frequent than expected use of the prefix “e”. This is because the strategy seeks to contribute to the improvement of the living standard, economy, and public services, not just to some individual phenomena beginning with “e” that have been developed for a chosen few.

It is only natural and reasonable to use information technology for a more rationalized organization of living. Preconditions and possibilities for this have, to a large extent, already been developed. The more citizens, enterprise and the public administration get established in the information society, the more important it becomes, how to employ the new possibilities in a manner that would benefit us all.

Information technology can help us in our daily lives, in entrepreneurship as well as in the public administration. It allows us to continuously develop and achieve success – isn't this the kind of future we all wish for the years to come?

I hope that the following pages give you an overview of shaping a better future in Estonia from the standpoint of the information society.

Enjoy reading!

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INTRODUCTION

In the modern globalizing world, economic success and high quality of living are achieved only in countries attaching great importance to the efficient handling of knowledge and information and using them for the benefit of the society. There is no doubt that information and communication technology (ICT) has a significant impact on economic growth, employment and human behaviour. Thus, for a small country with limited resources like Estonia, the development of knowledge-based economy, compact yet efficient functioning of public administration and inclusion of all citizens in the organization of public life are of particular importance.

According to the European Union's information society strategy i2010¹, ICT accounts for 25% of GDP and 40% of productivity growth in the EU. In Estonia, too, modern ICT solutions developed and used both by the public and private sector give reason to regard the development of the information society as a strategic choice.

The term "information society" usually denotes a society, where the majority of values created by mankind are contained in information. Most of the information stored by the society is maintained, transformed and transmitted in a universal digital form. By using a data exchange network, all members of society have access to information. Furthermore, in the information society, all the routine mental work is entrusted to machines².

In Estonia, the development of the information society is based on the Principles of Estonian Information Policy, adopted by the Estonian Parliament in 1998. A follow-up to the document, the Principles of Estonian Information Policy 2004-2006, was elaborated and approved by the Government of the Republic in 2004. The strategy you are holding in your hands right now – the Estonian Information Society Strategy 2013 – entered into force in January 2007.

The Estonian Information Society Strategy 2013 is a sectoral development plan, setting out the general framework, objectives and respective action fields for the broad employment of ICT in the development of knowledge-based economy and society in Estonia in 2007-2013. Several international and EU-level policy documents, notably the EU i2010 and eGovernment action plans, were taken into consideration when elaborating the strategy.

Activities to be carried out in the framework of the strategy are in line with the priorities set out in the Estonian Action Plan for Growth and Jobs 2005-2007 and the Estonian National Development Plan for the Implementation of the EU Structural Funds 2007-2013. In addition, the strategy is mutually complementary with several other sectoral development plans, such as the Estonian Enterprise Policy 2007-2013, the Estonian R&D strategy "Knowledge-Based Estonia 2007-2013", the Strategy for the Preservation of Estonian Digital Heritage 2007-2010 etc.

The development of the information society as well as the application of ICT for an increased efficiency in economic and societal processes requires co-coordinated efforts from all government agencies. Thus, the Ministry of Economic Affairs and Communications as the main co-ordinator of information society related developments in Estonia involved all ministries, the State Chancellery, as well as organizations representing the third sector and scientific circles in the elaboration of the strategy.

¹ "i2010 – A European Information Strategy for growth and employment"

² An article entitled "Information society and its signposts" by Valdo Praust in "IT in Public Administration of Estonia 1998"

1. PRINCIPLES FOR THE DEVELOPMENT OF INFORMATION SOCIETY

Principles for the development of the information society in Estonia were first set out in 1998. Though most of them have maintained their topicality, the fast development of technology has necessitated certain shifts of emphasis.

The principles to be followed in the development of the information society in Estonia are the following:

- the development of the information society in Estonia is a strategic choice with public sector leading the way in pursuing its principles;
- the information society is developed in a co-ordinated manner in co-operation between the public, private and third sector;
- the public sector is a smart customer, ensuring that in public procurements as much freedom as possible is left for innovative solutions;
- the information society is created for all Estonian residents, whereas particular attention is paid to the integration of social groups with special needs, to regional development and to the strengthening of local self-initiative;
- the consistency of the Estonian language and culture is ensured;
- the interests of both the creators and the users of intellectual property are taken into account;
- the development of the information society must not undermine people's sense of security. The protection of basic rights, personal data and identity must be ensured, and mitigation of non-acceptable risks in information systems must be guaranteed;
- activities aimed at the development of the information society are linked to the R&D efforts in Estonia;
- the information society and the opportunities it brings are taken into account in the elaboration of all sectoral policies;
- trends occurring in the EU and elsewhere in the world are taken into consideration. Furthermore, as an active partner, Estonia shares its experience and learns from others;
- the public sector employs the already existing technological solutions (i.e. the ID card, the data exchange layer X-Road) and avoids duplication of IT solutions;
- the public sector re-organizes its business processes so as to ensure a one-off collection of data from citizens, entrepreneurs and public bodies;
- the public sector gives equal treatment to different hardware and software platforms and ensures interoperability of information systems by using open standards;
- the collection of data and the development of ICT-solutions proceed from the principles of re-usability.

2. CURRENT STATE OF AFFAIRS AND FUTURE CHALLENGES

2.1. State of affairs

Estonia has, on its way to the information society, made considerable progress. The following includes some examples of that:

- advanced communications network and good internet availability;
- innovative mindset in the public sector and its high-quality IT solutions:
 - service-oriented approach to the development of state information systems and a secure data exchange layer called the X-Road, which constitute the cornerstones of the so-called common service space;
 - single-point-entry to the state at www.riik.ee;
 - Citizen portal at www.eesti.ee reflecting the state as an integral whole, where authorized users have three possible roles: that of the citizen, the entrepreneur and the official;
- high-quality IT solutions in the private sector, in particular internet banking and mobile applications;
- success stories in the Estonian ICT sector (i.e. internet communications company Skype, provider of various GIS and mobile positioning solutions – Regio, provider of different m-applications and m-solutions – Mobi Solutions etc);
- wide use of ICT in education as a result of the Tiger Leap programme aimed at the internetization of general education schools and improvement of IT skills among teachers;
- the largest functioning public key infrastructure in Europe, based on the use of electronic certificates maintained on the national ID card and allowing to considerably improve the security and functionality of IT solutions. More than 80% of the population possess the ID card that enables both electronic authentication and digital signing. Relevant legislation is in place, giving the digital signature equal power with the handwritten one, and imposing a responsibility on public authorities to accept digitally signed documents;
- eagerness of the Estonians to use innovative solutions (wide take-up of IT solutions provided by the Tax and Customs Board, internet banking, m-parking etc).

Estonia's achievements in developing the information society have been recognized in various EU and international surveys, such as the European Commission's Information Society Benchmarking Report 2005, Global Information Technology Report 2004-2005 (published by the World Economic Forum), Top 10 Who are Changing the World of Internet and Politics (compiled by the global eDemocracy Forum in 2005) to name a few.

This success has been based on the implementation of priorities set out in the Principles of Estonian Information Policy. So far, information policy related activities in Estonia have mainly been focused on the development of ICT infrastructure and the creation of systems necessary for implementing sectoral policies. However, in order to increase the competitiveness of the society, more emphasis needs to be placed on the development of citizen-centred and inclusive society, knowledge-based economy as well as transparent and efficiently functioning public administration.

2.2. Future challenges

2.2.1. Computer and internet access. Information society infrastructure

Participation in the knowledge-based society presumes access to the internet and ICT-based services. As a result of the early liberalisation of the telecommunications market and intense competition, Estonia has a well-developed communications network: all central and local government agencies, public libraries as well as educational and health institutions have an internet connection, as do 90% of Estonian enterprises. Approximately 90% of the Estonian population lives in areas with immediate availability of broadband internet. Technology convergence, development and increased supply of triple play (digital TV, internet connection and telephone) solutions and mobile data communications will facilitate access to the internet further. At the same time, it should be kept in mind that the use of information society services will raise the bar for the speed and quality of data communications. Though regionally the spread of the internet is rather even, significant discrepancies still exist locally. The launch of new and advanced services tends to be focused in bigger centres, while in dispersed areas high-quality broadband still remains a challenge. However, the internetization of rural areas largely contributes to rural development, ensuring the availability of operational information and services as well as helping to increase the quality of life in rural areas.

For a certain part of the population, in particular for the economically underprivileged and the elderly, access to the internet is often restricted by lack of home PCs. Survey results reveal that for half of non-users, lack of home PCs due to high computer prices is the main reason for not using the internet. At the same time, a third of today's non-users would start using the internet if their economic situation improved. Thus, continuous efforts are needed to ensure internet access in public places. In addition, awareness needs to be raised about intellectual property rights. Half of the respondents to a survey carried out by the Estonian Software Association in spring 2006 claimed that their home PC contains legal software, whereas a third of them did not consider the legality of software in their home PC important at all.

Wireless Estonia

In Estonia, wireless internet is a rule rather than an exception – for its 45,000 square kilometres surface area there are nearly 900 wi-fi hotspots in Estonia, most of them free.

In Tallinn, wi-fi is offered in numerous cafes and petrol stations; in addition, in summer 2005 wireless internet was made available for free in all the capital's beaches and many parks. Wireless internet can also be used on commuter trains, allowing thus to stay in touch with your friends/colleagues and keep working while travelling around Estonia.

Village Road 3 (KülaTee 3)

Village Road 3 is a target programme aimed at the internetization of rural areas. It serves as a follow-up to similar programmes Village Road 1 (aimed at the internetization of local government agencies) and Village Road 2 (targeted at the internetization of public libraries).

The objective of Village Road 3 is to improve the availability of broadband internet in scarcely populated areas, where the private sector has no economic interest to invest. By the time of the completion of the programme, the availability of broadband internet in remote areas will be as high as that in densely populated regions. The target group of the programme includes local government agencies as well as people residing in areas of market failure.

2.2.2. ICT and internet use

Internet use in households

Despite good and affordable internet availability, computer and internet use in Estonian households still lags behind that in the public and private sector. In spring 2006, 58% of the population aged 15 to 74 used the internet and 39% had an internet connection at home. As mentioned earlier, one of the challenges lies in raising the quality and availability of the internet in different regions, especially in areas of market failure, where it is not profitable for the private sector to invest. However, internet use does not solely depend on the availability of infrastructure, or the price of service, but, to a considerable extent, also on motivation – the existence of useful and necessary content as well as awareness of opportunities the information society offers. Though Estonia has been successful in bringing public sector services online, further efforts are necessary to increase people's awareness of the population about new convenient services still needs to be strengthened.

Furthermore, for some non-users the use of the internet is restricted due to insufficient consideration of their specific (i.e. regional, cultural and social) needs and expectations. A significant part of non-users, in particular the skilled labour and the elderly, lack motivation to use ICT due to the shortage of interesting and necessary content. As a result, they do not regard the internet as part of their life. Survey results indicate that eHealth and other social services have a strong potential of boosting motivation to use the internet and e-services. In addition, more can and should be done in the field of eAccessibility. In the elaboration of centrally developed portals, such as www.eesti.ee, www.riik.ee, etc, WAI (Web Accessibility Initiative) guidelines have been followed. However, compliance to WAI standards still needs to be raised in individual public agencies.

The development of an inclusive society requires the creation of trust towards electronic channels. The growth of internet-based attacks, limited awareness of IT security issues, and possibilities to quickly copy and integrate voluminous data might pose a threat to people's privacy, lower their sense of security and, thus, their interest to use the opportunities of the information society. Trust in the internet and motivation to use it depend on people's skills to use the computer and e-services. Public sector e-services are considered difficult to use by slightly more than a quarter of internet users in Estonia, in particular by the over-60 age group. Thus, computer and internet training for the entire population must be continued. It is also important to realize that ICT does not only create opportunities for fixing bottlenecks, but also offers additional options for participating in public life (eDemocracy), for continuous, flexible and personalized self-perfection (eLearning), entertainment, etc. Similarly, it has to be kept in mind that more than half of today's internet non-users have no intention of starting to use it. In order to avoid the deepening of the digital divide between those with access to the internet and e-services and those without it, public service provision must be ensured via multi-channel systems.

eVoting

At local government elections of 2005, the Estonians could, for the first time, cast their votes electronically, using the secure ID card as an authentication mechanism. eVoting does not aim to replace the traditional voting methods, but provides, with the help of new technology, additional options for enhanced inclusion. Thus, people could vote electronically on advance polling days with a possibility to change their vote on the election day at the polling station, making the previously given eVote void.

Estonia is the only country intending to make use of eVoting also at its general elections (to be held in March 2007). This time, an additional feature will be added to the process: voters can request their elector cards to be sent to them electronically, eliminating thus the need for the paper card and doing one's bit for the environment.

Computer Protection 2009

The objective of the joint project of the private and public sector is to increase public awareness about IT security and teach people, how to use the internet safely. To this end, a number of sub-projects will be launched, one of the priority fields being the promotion of ID card based authentication in the use of e-services.

One of the first steps taken within the project was the launch of an IT security portal www.arvutikaitse.ee, which provides information on how to protect one's computer from cyber criminals and gives advice on how to be safe and avoid falling victim to fraud when shopping online.

The project is carried out by the Look@World Foundation, which was established in 2001 by ten leading companies in Estonia with the aim to considerably increase the number of internet users, and raise, thereby, the living standard. The projects implemented so far include basic computer and internet training for 100,000 people, development and implementation of the eSchool environment, and opening nearly 500 public internet access points in Estonia. The state is represented in the partnership by the Ministry of Economic Affairs and Communications.

ICT and internet use in enterprises

Though most Estonian enterprises have an internet connection, the use of ICT and the internet for eCommerce and eBusiness is still limited. In 2005, 24% of Estonian companies received orders from customers and business partners via the internet (e-mail excluded) and 69% of companies placed orders to other companies online. The limited spread of eCommerce can be explained by Estonia's geographical size and unsuitability of the internet for the purchase and sale of certain service and product groups. Without sufficient consumer demand investments in the development of internet-based purchasing and selling might not pay off. However, the competitiveness of enterprises is clearly jeopardized by the limited use of eBusiness, i.e. use of ICT-ies in their basic business processes. The development of ICT has reached a stage where, from the viewpoint of economic competitiveness, it is not only the strength and export capacity of the ICT sector itself that plays a significant role, but also the take-up of ICT in all sectors of economy. Despite the continuously fast economic growth the productivity growth in Estonia still remains to be desired – in 2004, it only accounted for 50.6% of the EU average. The use of ICT-ies allows enterprises to significantly increase their productivity and launch more innovative products and services, in particular if organizational change and upgrading of skills are accompanied with the implementation of new technology. While the public administration as well as the banking sector and telecom companies have changed their business processes through the use of ICT, the awareness of eBusiness among SMEs just as well as their capability to apply ICT-ies in their basic processes are more limited.

Furthermore, increased efforts are needed to improve companies' understanding of the impact of ICT on their economic activities. According to a survey on eBusiness carried out in 2006, only 16-18% of Estonian enterprises found that ICT-ies play a significant role in cost reduction, increase of turnover and profit, and launch of new products or services. The survey results reveal that the main reason enterprises do not use eBusiness solutions lies in the need to make huge investments the profitability of which is uncertain.

Understanding the impact of ICT on entrepreneurship and economy in general is, in fact, a challenge not only for businesses, but for the public administration as well. Therefore, research efforts aimed at analyzing the influence of ICT on economic growth and society at large will be increased.

Set up a business in two hours!

Beginning from January 2007, a business can be set up in Estonia by way of expedited procedure over the web at: <http://ekanded.eer.ee/>.

One of the main differences between the traditional and expedited procedure lies in the fact that in case of the latter, one does not have to go to the notary: persons are identified with the national ID card and documents are concluded by digital signature.

In case of the expedited procedure, petitions for entry are reviewed within the next working day after the receipt of the petition. The objective is to achieve a situation, where a business could be set up in 2 hours.

Initially, expedited procedure will only be applied to the first entries of limited liability companies, self-employed entrepreneurs, general and private limited partnerships. In addition, businesses will be able to change the data they have submitted in the Commercial Register – this possibility is open also for public limited companies, commercial associations and branch offices.

2.2.3. Competitiveness of the Estonian ICT sector

In 2004, the Estonian ICT sector contributed 9.2% of the country's GDP. However, more should be done to improve the competitiveness and added value generated by the sector. Many large ICT companies mainly operate in a market segment determined by their international parent company or perform subcontracting. In addition, the sector can be characterized by a rather high level of fragmentation, which may pose problems for actively launching innovative products and services as well as for entering new markets. Furthermore, lack of qualified IT professionals is a growing challenge for the sector, both in terms of vocational and post-graduate skills. To ensure the development of innovative products and services, co-operation between research institutions and entrepreneurs needs to be intensified.

In the light of the above, the sector would benefit from re-orientation from low value-added activities to those generating higher added value. This, in its turn, presumes sufficiency of qualified IT professionals. In order to facilitate the internationalization of the Estonian ICT cluster, it is necessary, among other things, to provide business support measures aimed at marketing and sales promotion, to facilitate the migration of foreign labour with post-graduate degree, and to attract large corporations to Estonia.

The convergence of IT, voice telephony and media will give rise to entirely new business models and forms of partnership. In this context, issues related to the protection of intellectual property represent a significant challenge in terms of avoiding a situation, where the desire to create intellectual property or use it legitimately might be suppressed from the outset. The creation of intellectual property as well as its legitimate use can be promoted by ensuring efficient legal protection and raising public awareness.

State orders constitute a considerable part of the ICT sector's turnover. However, in public procurements the determining factor usually tends to be the price, which is why the private sector often lacks motivation to offer the best solutions. By becoming a smart customer, the public sector can, in addition to meeting its own needs better than so far, contribute to the development of competitive products and services that could be marketed abroad.

Information security has become crucial both in Estonia and in the rest of the world. Compared to the situation several years ago, the volume of information assets has grown, threats and attacks have become more massive, security measures have become more costly, and risks are higher. Information security can no longer be guaranteed by one agency, enterprise, working group or a state – it requires the co-operation of all stakeholders in Estonia and elsewhere.

Competence Centre Programme

The Competence Centre Programme was launched with the objective to increase the competitiveness of Estonian enterprises through long-term strategic co-operation between research institutions and companies. One of the recipients of the support is ELIKO – a competence centre for electronics, information- and communications technologies – which brings together eight technology companies and the Tallinn University of Technology.

The main objective of the competence centre is to develop innovative technologies and products based on intelligent embedded systems. The main areas of its activities are embedded networks, self-organizing ad hoc RFID reader networks and non-classical signal processing.

Thanks to its shared competence, ELIKO has been able to launch a Europe-wide project on robotics called ROBOSWARM. The project, funded by the 6th Framework Programme, aims to develop an open knowledge environment for self-configurable, low-cost and robust robot swarms usable in everyday applications.

Tiger University+

The objective of the programme is to support ICT academic staff and degree courses' infrastructure as well as to contribute to the development and modernization of ICT infrastructure at higher education establishments.

Support is given, for example, for the participation of ICT professors in international conferences, seminars and workshops, to promote the mobility of post-graduate ICT students etc.

2.2.4. ICT and public administration

Wide use of ICT in the public administration allows to improve the efficiency of the state machinery, influencing, thus, also the availability and quality of public services and increasing opportunities to participate in decision-making processes.

Estonian central and local government agencies have developed and taken into use a number of modern and well-functioning information systems. The development of the state IT architecture is service-oriented, a data exchange layer X-Road has been developed and is fully operational, and a number of e-services have been created both at central and local level. However, increased efforts are needed in order to improve the functioning of different information systems as an integral whole. In addition, more needs to be done in terms of semantic interoperability and re-use of geographical information.

The shift of emphasis from the development of technological solutions to that of information society as a whole poses new challenges also to the national ICT co-ordination model. Today, agencies primarily proceed from an institution-based or local view. Modern ICT solutions, however, allow to develop horizontal (cross-institutional) solutions based on an integral view and corresponding better to citizens' needs.

Increasing the efficiency and transparency of the public sector through the wide take-up of ICT will change the way the public administration functions and pose challenges in terms of skills of civil servants. Organizational changes necessary for the efficient functioning of the public administration in the information society need to be analyzed in depth and implemented. Besides, the fast development of technology and paradigm changes it brings along necessitates an increase in socio-economic research so as to ensure that policy formulation would respond to the needs of the information society.

As mentioned before, smart use of ICT allows to increase the efficiency of public service provision both for citizens and enterprises. A number of convenient complex services have already been developed (e.g. the parental benefit service, the service of informing about state graduation examination results via e-mail, applying for the European health insurance card etc.) and gained popularity in Estonia. Nevertheless, more efforts are needed in order to make service development in the public sector more systematic and responsive to the needs of potential customers.

The use of ICT allows the state to communicate with its citizens in their different roles in a more personalized manner. The Citizen portal at www.eesti.ee provides additional options for that and needs, thus, to be developed further. In the light of the above, principles for the design and development of public e-services are to be agreed upon. The development of e-services should give more consideration to customer expectations and needs. While to date, the main focus has been on the development of services for citizens, in the future more attention needs to be paid to the identification and development of e-services for enterprises.

ICT-ies represent an efficient tool for increased inclusion of citizens in public debates and decision-making processes. Today, public sector websites are mainly used for giving information and, to a certain extent, for the provision of e-services. Their role, however, in increasing citizen participation should still be enhanced.

Public information is generally widely available, yet it is frequently scattered. The importance of an integral systematic approach is increasing, as this would largely facilitate information search and use of e-services. Citizens' trust in the state can be boosted through proper handling of personal data, allowing people to conveniently monitor, who and why uses their data.

Paperless document management

To increase the efficiency of document exchange in the public sector and to facilitate the transition to entirely paperless management of business, a nationwide document repository has been developed in Estonia. Figuratively, the information system functions as an intermediate storehouse where the document sender sends the document to and from where the document receiver can download it.

The document repository is connected to the data exchange layer X-Road. As documents are submitted to the system in a universal digital form, they can be automatically registered in document management systems.

Traceability of the use of one's data

The wide take-up of ICT as well as the constant availability of information and data may raise concerns over loss of privacy and, thus, undermine people's trust in e-services and ICT solutions. In order to ensure transparency when dealing with personal data collected by the state, the Citizen and Migration Board has made it possible on the Citizen portal (www.eesti.ee) to trace, who and when has been checking the citizen's data from their databases. In case any doubts arise regarding the justifiability of such checking, the citizen can contact the respective agency and demand an explanation.

3. VISION

Estonia is a constantly developing, inclusive society, raising the living standard of everybody. The wide take-up of ICT in all fields of life (i.e. culture, education, health care, employment, and internal security) allows to improve citizens' quality of life as well as to actively involve them, risk groups included, in public life. Estonian enterprises use ICT and reorganize their business processes and management models, increasing, thus, their productivity and competitiveness. There are sufficiently qualified IT professionals in the Estonian ICT sector, our ICT solutions are known worldwide, and the ICT sector is successful in exporting its products and services. Rational use of ICT enables the public administration to function efficiently and be inclusive for all. Public sector services for citizens and enterprises are secure, optimized and accessible via one service space. In the governance of the state, needs and expectations of citizens in their different roles are considered. To this end, ICT-ies are made use of so as to ensure the development of individualized and citizen-centred solutions.

4. ACTION FIELDS AND MEASURES

In order to realize the vision, measures have to be elaborated and implemented in three dimensions on which the functioning of the society is based – social, economic and institutional. Therefore, the objectives of the Information Society Strategy are the following:

- **each member of the society leads a full life, using the opportunities of the information society in every possible way and actively participating in public life (“nobody will stay or will be left behind”);**
- **Estonia’s economic growth is based on the wide use of ICT solutions;**
- **public sector is citizen-centred, transparent and efficient.**

Action field I: Development of citizen-centred and inclusive society

In the information society, most of the information is stored in a universal digital form. The availability of information and skills to use it create preconditions for increasing the welfare and quality of life of citizens. Citizens’ welfare also depends on how much their needs are taken into account when organizing public life. Participation in the information society requires, on one hand, multi-channel access to digital information and, on the other hand, skills and willingness to use the opportunities created as well as motivation to actively participate in decision-making processes.

- ***By 2013, 75% of Estonian residents will be using the internet, while household internet penetration will amount to 70%***
- ***By 2010, all public sector websites will comply with WAI quality criteria***

To achieve the objective, two measures will be focused on:

- 1. Broadening technological access to digital information;**
- 2. Improving skills and widening opportunities for participation.**

Within the two measures, the following activities are planned:

1. Broadening technological access to digital information

- *Development of data communications networks in areas of market failure and ensuring their commercialization.* The objective is to ensure the availability of high-quality internet service throughout Estonia. Thus, the development of internet connections will be facilitated in regions, where the private sector lacks economic interest to invest, and in areas, where the quality of internet does not correspond to the needs and requirements of the information society.

Responsible authorities: Ministry of Economic Affairs and Communications, Ministry of Internal Affairs

- *Ensuring favourable environment for the development of new telecommunications technologies and technological convergence, including the take-up of digital TV.* The objective of the activity is to ensure a smooth launch of new telecommunications-based services and guarantee the possibility to use services of similar quality irrespective of technological solutions used for their transmission.

Responsible authority: Ministry of Economic Affairs and Communications

- *Bringing public sector websites into compliance with WAI quality criteria* so as to ensure their accessibility for all, including people with special needs.

Responsible authorities: central and local government agencies, with Ministry of Economic Affairs and Communications taking responsibility for the awareness raising and monitoring of the process

- *Further development of the Citizen portal at www.eesti.ee*. For citizens, the portal serves as a secure personalized “virtual office” through which they can, in their different roles, manage their affairs (use public services etc.) and communicate both with the state, enterprises and other citizens. All public sector services will be made available via the Citizen portal.

Responsible authority: Ministry of Economic Affairs and Communications

2. Improving skills and widening possibilities for participation

- *Continuous upgrading of knowledge and skills of all members of society in order to ensure their ability to cope in the information society*. Provision of basic computer and internet training for the elderly and people with special needs will be continued. It will be ensured that curricula of all levels of education would facilitate the acquisition of computer and internet skills. In addition, the development of public sector e-services will include relevant instructions and guidebooks.

Responsible authorities: Ministry of Education and Research, Ministry of Economic Affairs and Communications

- *Development and promotion of internet-based learning environments (eLearning)*. The objective of the activity is twofold:
 - to facilitate the improvement of existing and the acquisition of new skills in continuing education and retraining;
 - to make traditional learning processes more flexible and individualized.

Responsible authorities: Ministry of Education and Research, Ministry of Social Affairs

- *Raising public awareness about the information society*. The objective is to increase the awareness of the Estonian population about internet-based services as well as the opportunities and threats related to the information society.

Responsible authorities: Ministry of Economic Affairs and Communications, Ministry of Internal Affairs and other agencies

- *Digitization and digital preservation of cultural heritage, making it available via the internet for citizens, and integrating it with eLearning environments*. Information about objects of historic, scientific, artistic, technological, social etc. value will be digitized and made available for the public. Planned activities include the development of a digital library and a virtual museum, establishment of a digital archive and a portal on cultural heritage.

Responsible authority: Ministry of Culture

- *Widening opportunities for participation in decision-making processes (eDemocracy)*. Ministries and local governments will develop internet-based environments for the inclusion of citizens and interest groups in decision-making processes. In addition, eVoting will continually be used.

Responsible authorities: State Chancellery, Ministry of Justice

- *Implementation of flexible work arrangements*. Barriers to teleworking will be identified and solutions will be developed to overcome these.

Responsible authorities: Ministry of Social Affairs, Ministry of Internal Affairs, Ministry of Finance

Action field II: Development of knowledge-based economy

In its economic dimension, the strategy aims to increase the ICT uptake in all economic sectors. It will contribute to the increase of productivity in enterprises, as well as their capability to develop innovative products and services, and improve thereby the competitiveness of the Estonian economy. On the other hand, the strategy seeks to create necessary pre-conditions for greater competitiveness and internationalization of the Estonian ICT sector.

- ***By 2013, the productivity per employee in Estonian enterprises will account for 75% of the EU average***
- ***By 2013, the share of ICT enterprises in the national GDP will amount to 15%***

To achieve this, the following measures will be pursued:

- 1. Promotion of ICT uptake by enterprises;**
- 2. Increasing the competitiveness of the Estonian ICT sector.**

1. Promotion of ICT uptake by enterprises

- *Supporting the ICT uptake and use of eBusiness through business and innovation support measures. The planned activities are the following:*
 - elaboration and implementation of a specific ICT programme;
 - raising awareness about the opportunities of eBusiness in the framework of the Innovation Awareness Programme;
 - supporting feasibility studies related to technology transfer;
 - giving investment support to manufacturing enterprises for the modernization of technology;
 - provision of training and consulting for enterprises, including IT companies;
 - giving support for enterprise diagnostics to identify the development barriers and opportunities of enterprises. A part of the diagnostics focuses on the level of ICT uptake in a company and related possibilities.

Responsible authority: Ministry of Economic Affairs and Communications, implementing agency: Enterprise Estonia

- *Re-organization of general, vocational and higher education so as to ensure conformity of labour skills to the requirements of knowledge-based economy.* The objective is to provide workers of all professions with ICT skills and competence in order to cope in the knowledge-based economy. To this end, national curricula will be modernized and electronic study materials, learning environments and e-courses will be developed and taken into use at all educational levels.

Responsible authority: Ministry of Education and Research

- *Development of a common service space for the public, private and third sector to facilitate communication between the three sectors.*

Responsible authority: Ministry of Economic Affairs and Communications

- *Widening the opportunities of re-using public sector information by the private and third sector.* The objective is to ensure barrier-free use, both in terms of financial and administrative obstacles, of public sector information, including for commercial use. To this end, the usability of digital information created by the public sector will be increased through the modernization of legal environment and development of relevant IT solutions.

Responsible authorities: Ministry of Justice, Ministry of the Environment, Ministry of Economic Affairs and Communications

- *Ensuring a favourable environment for the development of eBusiness.* Relevant legislation, including privacy, consumer protection and information security related aspects, will be reviewed.

Responsible authorities: Ministry of Justice, Ministry of Economic Affairs and Communications and other ministries

2. Increasing the competitiveness of the Estonian ICT sector

- *Bringing IT education in accordance with the requirements of the ICT sector.* To this end, training opportunities will be widened for IT lecturers both at vocational and higher education level; the apprenticeship system will be improved, and mechanisms will be developed for increasing motivation among post-graduate students.

Responsible authority: Ministry of Education and Research

- *Supporting the internationalization of the Estonian ICT sector.* Planned activities include, among others, the following:
 - making the software procured by the public sector available in order to avoid duplication of similar solutions and to facilitate the exports of Estonian ICT solutions;
 - facilitating the participation of Estonian ICT enterprises in EU and international programmes and networks by supporting the preparation of project applications and ensuring the availability of required national self-financing;
 - facilitating the migration of highly qualified foreign labour;
 - distribution, creation, and publishing of relevant standards.

Responsible authority: Ministry of Economic Affairs and Communications; implementing agency: Enterprise Estonia

- *Facilitating the development of high-quality and innovative information society and media services as well as settling intellectual property related issues.* Favourable environment will be ensured for the development of multimedia services provided via the internet, digital TV and mobile communications. Legal questions related to the principles of service provision will be solved.

Responsible authorities: Ministry of Culture, Ministry of Economic Affairs and Communications

- *Elaboration and implementation of principles concerning the outsourcing of services necessary for the functioning of the state information system.* The objective is to standardize the requirements, guidelines and practices related to services outsourced in order to ensure the functioning of the state information system (i.e. data communications, server hosting, application hosting, support services etc) in a way that would, on one hand, improve the service quality of different components of the state information system, and, on the other hand, favour the development of the market offering those services.

Responsible authority: Ministry of Economic Affairs and Communications

- *Increasing the role of the Estonian ICT sector in the development of the country's defensive capacity.* To this end, more use will be made of the potential of the Estonian ICT sector in organizing military offset and in promoting civil applications related to development works in the field of defence.

Responsible authorities: Ministry of Defence, Ministry of Economic Affairs and Communications

Action field III: Development of citizen-centred, transparent and efficient public administration

The strategy aims to achieve a situation, where the public sector functions efficiently while collecting, using and maintaining data necessary for ensuring the provision of public goods in a common and systematic manner. Public sector business processes are transparent and easy to understand; public services for citizens and entrepreneurs are accessible via electronic channels, they are widely used and take into account user needs.

- ***By 2013, citizen satisfaction with public sector e-services will reach 80%***
- ***By 2013, satisfaction of businesses with public sector e-services will be 95%***

To achieve this, two measures will be focused on:

- 1. Improving the efficiency of the public sector;**
- 2. Provision of user-friendly public sector e-services.**

1. Improving the efficiency of the public sector

- *Transforming public sector business processes so as to make better use of advantages and possibilities enabled by the application of ICT.* The objective is to simplify and speed up administrative procedures and ensure their efficiency.

To this end, the following activities are planned:

- all management of business in the public sector, including proceeding and archiving of documents, will be made electronic;
- an analysis will be carried out about changes that have to be made in the legal environment and organizational management in order to ensure paperless management of business and automation of business processes. Necessary changes will be implemented;
- the availability of public sector information will be ensured in a unique digital form;
- the capability of civil servants to cope with changes brought along by the development of the information society will be ensured, leading to increased efficiency in their daily work processes;
- those responsible for the development of the public administration will have sufficient ICT competence.

Responsible authorities: Ministry of Finance, State Chancellery, Ministry of Economic Affairs and Communications, Ministry of Justice, and other ministries.

- *Increasing the efficiency of policy formulation through better use of data and increased research about the impact and challenges of the information society.* Research into different aspects of the information society both from the economic, societal and individual perspective will be increased. In addition, the definition of the ICT sector will be reviewed, and a system of ICT statistics and economic analysis will be developed, allowing thus improved evaluation of the impact of the ICT sector on the economy.

Responsible authorities: Ministry of Economic Affairs together with other ministries

- *Modernisation of state information systems so as to ensure their integration into a single interoperable whole functioning on the basis of user needs, not institutional structures.*

To this end, the following activities are planned:

- ensuring that the data used in different parts of the state information system would have a single meaning. To achieve this, the following actions will be undertaken: development of mechanisms for the re-use of semantic assets; elaboration of XML-based descriptions for main types of public sector documents; development of an XML competence centre; development of a common thesaurus for the indexing of services and websites; standardization of the structure of public sector websites and development of mechanisms for their re-use;
- transition of state databases and registers to a service-oriented architecture;
- ensuring full traceability of all public sector services by stages;

- development of the administration system for state information systems (RIHA), which contains service descriptions and ensures the re-use of services and their fragments;
- ensuring the re-use of geo-information generated by different public sector bodies;
- establishment of a competence centre and a repository for open source software for the re-use of developed solutions and knowledge.

Responsible authorities: Ministry of Economic Affairs and Communications with other ministries

- *Development of electronic authentication and authorization mechanisms, including participation in cross-border eID (electronic identity) projects.* The objective is to ensure the organizational interoperability of public and private sector organizations providing and using the public key infrastructure. Work planned under this activity seek to achieve a situation, where:
 - the ID card is the main personal identification tool in the electronic environment both for the public and private sector;
 - digital stamp or the “Business ID” procedures have been taken into wide use;
 - the ID card and the respective software always correspond to new technological possibilities and international standards;
 - legislation concerning the personal identification code and the ID card is reviewed so as to ensure its conformity to the requirements of the information society.

Responsible authorities: Ministry of Economic Affairs and Communications, Ministry of Internal Affairs and other ministries

- *Ensuring the functioning and development of support systems for the maintenance of the state information system.*

Responsible authorities: Ministry of Economic Affairs and Communications together with other ministries

- *Development of systems necessary for increasing the efficiency of state and local government agencies.* The objective is to improve the provision of e-services at local level and avoid multiple development of similar solutions by different local governments.

2. Provision of user-friendly public sector e-services

- *Integration of the public, private and third sector into one service space to improve the quality of service provision in the public sector.* Citizens will be able, in their different roles, to make use of a common secure service space (based on the “single window” principle), allowing them to use public services and communicate in one environment with the state, businesses as well as other citizens.

Responsible authorities: Ministry of Economic Affairs and Communications together with other ministries

- *Identification, development, launch and active implementation of high impact services (eProcurement, eInvoicing etc).*

Responsible authorities: central and local government agencies

- *Development of public sector e-services in different fields of life for citizens, businesses and public sector agencies.* Relevant information systems will be developed and implemented in order to increase the efficiency of service provision through ICT, including making health and social services available irrespective of one’s location.

Responsible authorities: central and local government agencies

- *Opening up of Estonian e-services for the citizens of other countries, especially those from the EU member states.*

Responsible authorities: central and local government agencies

5. IMPLEMENTATION OF THE STRATEGY

The Estonian Information Society Strategy 2013 sets out the basic principles of the Government of the Republic for the development of the information society in Estonia. These principles are taken into account and translated into relevant activities in the process of updating and elaborating of organizational, sectoral and regional development plans by government agencies.

The strategy is implemented on the basis of annual Information Society Implementation Plans. At the beginning of each year, agencies whose fields of activity and competence are encompassed by the strategy submit to the Ministry of Economic Affairs information about the ICT development works they intend to carry out during the following year. The Ministry of Economic Affairs and Communications as well as other related ministries take this information into account when elaborating their organizational strategies, which serve as an input for the State Budget Strategy. The Ministry of Economic Affairs and Communications submits the draft of the Information Strategy Implementation Plan that has been amended according to the State Budget Strategy to the Government for approval.

The implementation plan is realized in the form of project-based development works in accordance with the principles set out in the Estonian IT Architecture and Interoperability Framework. Projects are financed both from the state budget and the EU structural funds. Expenses related to the activities to be funded from the state budget are planned by the respective implementing agencies, while central and cross-institutional activities are financed via the Structural Funds.

In order to achieve the objectives of the strategy, sectoral expert groups will be established for all three action fields. The expert groups will bring together representatives from respective ministries, the third sector as well as from academic circles. Their task will be to continuously analyze the current situation and evaluate the topicality and significance of objectives set out in the Information Society Strategy. Based on their analysis, expert groups will make reasoned proposals to be considered in the drafting of the priorities and activities of the Information Society Implementation Plan. In addition, the results of their analyses will contribute to the updating of the Information Society strategy itself.