FINAL REPORT & CONCLUSIONS WHY AND HOW TO USE ABE CAMPUS

D R A F T

Education plays a key role in the development of a country, which is true for Bulgaria as well. Information Technologies represent a great challenge and effective measures are being sought for including IT as a broader and more detailed subject, as well as a new and more efficient tool in the educational process.

The main problems that need to be solved are connected with the broad introduction of IT in the Bulgarian educational system, the improvement of the educational process, thus harmonizing it with the European one, development, qualification and realization of the personnel potential in Bulgaria. As well as synchronizing the European criteria for the scope of introduction of IT in the sphere of education and its adaptation in view of the Bulgarian potential and its specifics,

I. General problems that need to be solved in the IT field of Bulgarian education:

- To improve and encourage the development of the educational system at home by training more and highly-qualified young IT specialists.

The computer, as one of the most typical symbols of everything new, is also the most sophisticated toy man has ever created. It serves and leads at the same time, entertains and is an indispensable operative assistant, it kills fundamental activities like reading, but at the same time imposes it most powerfully, creating a new vision of text –text on a screen. The complex and modern flexibility, enforced by Information and Communication Technologies, serves as a basis on which the desired level of high adequacy in the educational process can be achieved.

- To update and develop the following:

National educational strategy for Information and Communication Technologies (NESICT), where the principles and objectives of the contemporary Bulgarian IT education are worked out.

A law concerning the standard for the educational degree, the educational minimum and the syllabus where the IT criteria are clearly stated.

Regulations concerning IT in the curriculum and the system for certification.

II. In the system of secondary comprehensive education the problems are closely connected with the following main goals:

Analysis of the existing IT equipment at schools and the problems that have led to failure to carry out NESICT

Updating on legal grounds, thus matching the changes in the contemporary educational system, based on the new technologies.

Introduction of a *Law for the professional technical education and training*, which has to comply with the IT requirements. This law is one of the steps, which will take Bulgarian legislation closer to that of the European Union. The main goal of this law, in accordance with the requirements of the market economy, is to give rise to a qualified and mobile workforce, which will be competitive in the conditions of both markets – the domestic and the European one.

The main points which have to be considered in collaboration with the Ministry of Education and Science concern:

The necessary technical equipment – The technical and programme equipment needs not only to be enlarged, but also to be updated.

The active curricula and syllabi – IT has to become a compulsory subject in every school, as are the European trends for training/usage/ of IT in the chosen field of work.

The organization of the educational process – A stress can be laid on the potential of IT for distance training, diagnosis, control and assessment

Personnel provision in education and use of IT – It is advisable that there are at least two IT teachers at every secondary school, who have to be adequately trained in order to teach and use IT in their job.

Allocation of funds from the budget, invested in IT education every calendar year.

The problems of the professional technical education and training cannot be solved only with the help of specialists, working in the field of education. There is a need for assessment of the professional competency, practical education, as well as updating of the contents of the educational course.

Some key points are:

- Curriculum for education in Information and Communication Technologies for the schools in Bulgaria and their application in the educational process.

- This curriculum has to consider the fact that in the contemporary globalizing and dynamic society the command and use of IT is an essential element of the functional literacy of a person, a necessary condition for their personal and professional development, a key factor for the economic prosperity of a country.

- Improvement of the syllabus, the methods, forms and means of education in IT and their application in the educational process on the basis of new state educational requirements;
- Development of a suitable computer environment for the goals of contemporary education by supplying the schools with equipment, software and Internet connection;
- Acquainting the teachers and the managerial staff with the changes connected with the introduction of ICT in education;
- The regulations for the application of the National Education Law and the approved Strategy must pay greater attention to the contemporary training in IT, as well as their application in other school subjects; the National Requirements for Education (NRE) must also allow certain freedom in terms of subject contents and methodology
- Necessary technical and information equipment, demanding the following steps:
- Assistance in legal software supply
- Equipping schools with computers, software and Internet access.
- The successful implementation of the ideas, underlying the National Educational Strategy in IT, poses some requirements for the equipment and the programme products.
- Utilization of the existing and development of new educational software.
- The successful integration of IT in various school subjects necessarily requires quality educational software (incl. multimedia), connected with the training in different school subjects.

This purpose entails:

- Encouragement of Bulgarian manufacturers to develop educational software and multimedia educational means for local and distance training;
- Purchase of suitable software educational materials;
- Access to the world best achievements in the educational software for the Bulgarian teachers;
- Development of a Web server with educational data base and resources for fast and up-to-date collection and concentration of information from Bulgaria and worldwide;
- Certification– harmonizing it with the European education and granting of a certificate like the European Computer Driving License. The course must end with an assessment of the trainee and obtaining of the respective certificate.

III. Problems in the sector of higher education that need to be solved:

There is a call for changes in the sector of higher education as well. Judging from the analysis of the trends in the development of the European higher education, the following problems can be pointed out:

- Adoption of a universal, but flexible framework for the educational qualification process.
- Common European standards for the quality of education, assessment and accreditation
- Synchronizing the educational specialities with the IT industry requirements.
- Gradual introduction of ECTS compatible systems for credit collection.
- Improvement of the necessary equipment at universities with modern computers, periphery, software and networks.
- Development of national and international university computer networks with an Internet access.
- Updating of the syllabi, curricula, textbooks and teaching aids with a stress on the use of modern IT.
- Accelerated introduction of multimedia technologies and distance training.
- Development of an adequate system for education of teachers – not only these in IT disciplines, but also those who teach other subjects, thus aiming at integrating modern IT in the overall educational process.
- Interaction between universities and non-governmental organizations on the one hand and the business circles on the other when solving the problems connected with the introduction of information technologies.

  Proposals for changes in the existing normative basis or for the development of a new one, which will boost the implementation and use of modern IT in education.

In order to carry out joint projects, cooperation should be sought from the moment the funds are attracted till the moment the project is worked out and implemented. For this purpose the Bulgarian Association of Information Technologies will seek collaboration with governmental units, as well as with non-governmental organizations, university and scientific units, institutions and other business organizations. A considerable part of the above mentioned institutions have access to local and international resources and programmes, which if applied for, will attract resources and know-how for broader integration of IT in higher education.

The professionals available in IT, as well as the experience from the last years enable Bulgaria and the Bulgarian academic, scientific and business circles in particular, to turn into an attractive point in South-Eastern Europe in the field of high technologies. In order to achieve this, serious attention should be paid to the educational process in IT, as this will turn it into a tool for educating more and better specialists, who in turn will take part in this process later and will raise the standards further.

I. Practical steps for the realization of the above mentioned goals

- Forming of an Expert Coordination Committee (ECC), where representatives of different institutions concerned about education can take part.
- Updating and control of the execution of the National Educational Strategy for Information and Communication Technologies.
- Foundation of new or transforming some of the existing schools into specialized schools for education of programmers.
- Establishing and keeping relations with school boards of trustees and other non-governmental organizations connected with education and IT.
- Updating of the outdated and insufficient computer equipment.
- Conditions for tax concessions for firms in the IT business, which meet the criteria for legal and loyal activity and donations, sponsorship and other forms of supporting Bulgarian education.
- Opportunity for practice/training of students in firms from the Bulgarian Association of Information Technologies.
- Setting up lobbies for taking legislative and other measures for encouraging the development of young specialists and their realization in Bulgaria.
- Tax preferences for firms that purchase houses for young specialists.
- Putting aside part of the insurance payments in the young specialists' personal accounts.
- The possibility to exempt from military service young specialists who are employed in IT firms.
- Tax concessions up to a certain amount of the scholarships granted to IT students.
- Attracting young specialists among the ethnic Bulgarians to work in the country.
- Certifying teachers who work at elementary and secondary schools.
- Attendance of IT teachers at seminars and other events connected with innovations in the field.

- Preparation of a general information package containing:

- information about the Bulgarian educational system, the problematic points and the development of the educational policy in the IT field.

- data and analyses from national and international comparative researches, showing the condition, problems and needs of the educational system in terms of IT.

- Preparation, dissemination and organization of start-up seminars, attended by potential interested partners and acquainting them with the ready-made information packages.
- Integration of the Internet clubs in the process of education.
- Launching pilot projects in several schools and universities.
- Setting favourable conditions for joint projects with the participation of the private, public and educational sector.

In 1998 the Ministry of Education and Science analyzed the following key points:

1.Provision of funds for setting up computer classrooms in every school, starting from the less developed regions and those of ethnic diversity;

2.Looking for alternative and modern software solutions, which are economically efficient and also have the potential to boost the domestic industry (like an open-code software, Linux, etc.);

3.Consistency in implementing the strategies for the development of the information society, including them in the educational field;

4.Consulting with its own IT specialists and with representatives of the community service associations prior to signing major contracts.

The National educational strategy for information and communication technologies is developed on the basis of these analyses. It contains the principles and goals of ICT education. In 1999 a detailed programme for the implementation of this strategy was developed. It estimates the expenses for equipment and funding of the programme. In 1999 and 2000 part of the funds were provided to finance the programme in terms of the technical equipment of schools and Internet access. The Ministry of Education and Science continues its work for modernizing education, developing standards and specific syllabi.

The National strategy has a complex nature and it doesn't end with supplying the schools with computers. Its main goal is to create a different quality of educational environment that will teach the students to be flexible in looking for and finding information, as well as to be able to analyze and use it in the process of education and later this consequently will make them competitive on the labor market.

With the implementation of the Strategy:

• Bulgarian schools will leap ahead in their development, placing the whole system of secondary education on a completely different level and at the same time giving equal chances to Bulgarian students and teachers and their counterparts all over the world.

• Bulgaria will join the EU with a modern educational system of a new quality, based on the broad application of ICT in the process of education. All Bulgarian schools will be equipped with up-to-date computers and fast Internet access

• All students who complete their secondary education will be computer literate and will have the necessary knowledge about word-processing, spreadsheets, making presentations, working with data bases and Web-based applications.

• In the process of education the students will have access to data bases in the respective disciplines and will be able to check and upgrade their knowledge continually. On the other hand, the electronic contents of high quality will encourage the process of education of the coming generation and the formation of their value system.

• The teaching staff will have the possibility to present their lessons in a contemporary way by actively involving the students in the process of teaching.

The Strategy consists of five main directions:

• The development of suitable normative regulations and the introduction of the rules for education in and via ICT.

• Computerization – setting up computer classes in every school

• Building of an information network and fast Internet access at every school

•Training and increasing the qualification of teachers for the purpose of the introduction of ICT in all school subjects

• Creation of an educational portal, programmes for distance training and educational contents in all disciplines.

- The implementation of the Strategy actively involves the following categories in the educational process:

• The students, who are being taught, will have the opportunity to complement the contents of the school subjects

• The teachers, possessing the necessary qualification, will choose the most interesting and easy to remember ways to present the teaching material.

• The parents will have the possibility to check the achievements of their children and the contents of the school subjects at any time and thus will take part in school life.

The Strategy for 2005 - 2007 includes:

It has a 3-year long term of action and includes the period of 2005 – 2007. In the plan of action there is a detailed description of the projects for each one of the directions, the necessary funds, the terms for implementation and the results to be achieved. All the elements of the Strategy will be realized in accordance with the requirements of the Law for social orders. This fully guarantees the transparency of implementation of the Strategy, as well as the desire of the government to encourage the dialogue between the public and private sectors.

The realization of the Strategy will happen in three stages and the necessary funds amount to 140, 987, 000 levs. The yearly allocation of the funds is the following:

STAGE	**TOTAL (thousand levs)**
Ist - 2005	41, 000
IInd – 2006	65, 107
IIIrd – 2007	34, 880
Total sum for the stages:	**140, 987**

IMPLEMENTATION OF THE STRATEGY:

The implementation of the Strategy is assigned to panels of experts from the Ministry of Transport and Communications and the Ministry of Education and Science as:

• MTC is in charge of the computerization of schools and the building of the information network

• MES is in charge of the normative regulations, the training of the teaching personnel and the devising of the educational contents in the respective disciplines.

EUROPEAN PRACTICES:

All the members of the EU have their own national strategies for introduction of ICT in education. Thanks to such a strategy, for example, in the Czech Republic the number of computers per 100 students has increased more than 5 times in the period 2001-2003; and 80% of all schools have Internet access available. In Hungary 85% of the elementary and secondary schools are connected to the Web, and 25% have high-speed Internet access. The situation in the rest of the European countries is similar. With a successful implementation of our strategy for introduction of ICT in all Bulgarian schools, Bulgaria will reach the average indexes of the European Union.

After joining the EU all Bulgarian schools will have computer labs with bandwidth Internet. This will inevitably broaden the general knowledge of young people, enlarge their international relations, help them master foreign languages, as well as gain new knowledge and skills in accordance with the trends on the labor market. The young Bulgarians will be competitive to their European peers and will take an active part in the new world economy, based on knowledge.

One step towards the realization of the goals is the signing of a contract between the Ministry of Education and Science and Microsoft for $1,036,000 for providing all schools with systems software (operating systems) and office-programme products.

The agreement for cooperation between Microsoft and the Bulgarian Academy of Sciences, signed by Bill Gates himself in 2003, aims at stimulating the IT education at schools and universities and at developing the programmes for education by introducing the latest software achievements in the IT industry. The aim is to create opportunities for a favourable environment in Bulgaria for the development of software products.

Following this agreement Microsoft granted the Ministry of Education and Science with temporary, renewable licenses for the latest versions of the Microsoft Windows operating system and the package of applicable programmes Microsoft Office at special prices for education.

Another key moment in the process of introduction and acknowledgement of IT in all spheres of life in Bulgaria is the i-class project:

The Ministry of Transport and Communications is establishing computer labs in all secondary schools in order to set the necessary conditions in which the Bulgarian students to be able to enrich their knowledge and to be motivated to work throughout their lives. The project makes it possible for each child to develop its personality and to become a part of the global world of the information society in a highly competitive environment.

i-class is a strategic project, which encourages the use of information and communication technologies in the Bulgarian schools. Following the programme a total of 800 Bul-

garian schools were equipped with over 7200 new computers till the end of March 2005, as well as with other peripheral technology with the latest parametres. 400, 000 Bulgarian children have access to the new computer technologies at their schools. The main aim of the **i-class** programme is to provide all 3 200 Bulgarian state and municipal schools with modern computer rooms till the end of June 2005.

i-university is a project from the national programme **i-Bulgaria** of the Ministry of Transport and Communications. By the beginning of 2005 more than 2 million levs were invested in this project, which have been used for the equipment of modern computer labs in all 37 state universities, as well as in 32 institutes of the Bulgarian Academy of Sciences.

Due to this project the educational system has at its disposal over 1, 500 computers, over 60 servers, 60 multimedia projectors and a great number of printers, scanners and other peripheral machinery.

The project aims at encouraging good practices in the distance training and giving opportunities to an increasing number of students and teachers to communicate freely, thus making the process of education continuous and much more effective.

i-net: Convinced in the national importance of the National Research Network and the related research projects and initiatives, in 2002 a few institutions and organizations like:

- the Ministry of Transport and Communications (MTC)

- the Development Programme of UN (UNDP)

- the Agency for “Development of the Information and Communication Technologies”

decided to restore the research network through financing a special 3-year long project.

The strategy of the project is based on the continuation of the efforts of the former research networks and renovation of the Bulgarian participation in the Pan-European Research Network.

i-centre is a project in the framework of the same national programme of MTC, which started in 2004 togerther with UNDP. Under this project informational tele-centres are being established on the territory of the country. The main aim of the project is the availability of a cheap Internet access, information and tele-communications technology training for everybody and the provision of electronic services.

A total of 3.1 million levs were invested in the i-centre till the end of 2004, another 2.5 million will be invested in 2005, and by the end of the same year over 1, 600 computers will offer services to the people in 160 small and underdeveloped, in terms of communication technologies, settlements.

ESI@Center – Its main mission is connected with the encouragement of the competitiveness of Bulgaria and the countries from Eastern Europe through transfer of new technologies and know-how for the improvement of the business processes, as well as the recognition of Bulgaria as a leading centre for firm’s improvement and a source of modern technologies.

The establishment of ESI-centre Bulgaria as an entry point of acknowledged world technologies will contribute to the improvement of the business processes and the quality

systems of the firms. The main functions of ESI-Centre Bulgaria are transfer of knowledge, methodologies and technologies from the European software institute in order to help local and regional firms to create competitive business models and to increase their readiness for certification according to standards acknowledged worldwide like ISO and CMM.

Motivation for the joining of Integra as a partner in the Adult Basic Education (ABE) campus:

The social tendencies call for changes in the education of people of all ages. To be competitive on the labor market a person must meet the modern definition of a literate man, that is: to know at least one foreign language, to have basic computer literacy and to be able to use Internet. The achievement of a satisfactory level in all of the above mentioned fields for students is not such a problem, although the results depend not only on the given opportunities for their realization, but also on the mental abilities of a person. As a whole the success among children, pupils and university students is comparatively high. Most of the problems exist among those people who have a certain level of education, but due to their advanced age and the conditions in which they have grown up, have little to no foreign language knowledge and the majority of them have never had access to a PC. Of course, a lot of middle-aged people use modern technology as an immediate assistant in their jobs, but in some parts of the country this is not a very wide-spread practice yet.

With the increasingly tangible problem of the aging of the population, there is a tendency for the rising of the pension age and the need for the participation of middle-aged people in activities, offered at the labor market. These people need higher qualifications not only in their speciality, but also in the field of information technology in order to be competent and to meet the requirements for certain positions.

Due to the unprecedented dynamics of development of these technologies, there is a need for updating the knowledge of people, who have worked with a computer, but due to certain conditions haven't used it for a while and lag behind the innovations in the field.

All this served as a motivation for Integra as an association, aiming at increasing the level of education of the population at all ages, to join as a partner in the establishment of the ABE campus, believing that the main ideas underlying it will bring positive results for everybody who will use it afterwards.

One problem in Bulgaria is the fact that there isn't an authorized organization or firm which to grant a legalized European certificate for computer literacy – ECDL. In spite of the great demand for Bulgarian computer specialists all over the world, there still isn't a solution to this problem. Eventually, this results in the need for programmes, comparable with the international ones, which to be used for teaching and testing the knowledge at basic and more advanced levels of computer literacy.

There are traditions for such education in Bulgaria and there is also a number of Internet sites on the subject – free for use or paid, in Bulgarian. Integra was impressed by

the completely new platform, underlying the ABE project, namely, so called mixed committees to be included in the programme, comprised of people of different levels of education, various professions and ages, who to serve as a testing unit from the moment of origination of the idea till the completion of the project. Such a committee is a very essential factor, as it will guarantee brilliant results because the platform will be implemented under the supervision of the actual ultimate user. That new point turned out a key element in the work of Integra when developing the curriculum in IT.

The mixed committee included the following persons – pupils, a librarian, IT specialists, teachers with a rich experience in IT training of students and adults, unemployed with secondary education degrees. The programme was developed under the immediate supervision of the participants in the committee. The stages of development were several:

- **Identifying the main modules, required as knowledge for obtaining a certificate for elementary computer literacy**

A comparison was made with the ECDL requirements and with an aim to a maximum approximation to European standards, the following components were chosen:

- **Operating systems**
- **Word-processing**
- **Spreadsheets (including operation with data bases in them)**
- **Presentations**
- **Internet**

- **Identifying the main topics in each one of the specified modules**

- **Operating systems** (They include the basic knowledge about the main components of the computer system and the peripheral devices, measures of information and its cartridges, distinction between text and graphic interface, basic operations with files, catalogues, etc.)
- **Word-processing** (the main notions when working with a text, the options for creating, editing and formatting of a text or other types of information, which can be added to the documents, fast- button combinations, schemes, etc.)
- **Spreadsheets** (main notions, formulae, diagrams, arbitrary expressions, operation with data bases)
- **Presentations** (main notions, creation of personal slides, their linking in the form of a presentation, the rules for these operations, inserting different types of effects)
- **Internet** (main notions, surfing and the criteria for identification of the type of site, searching for and downloading information, using e-mail and other means for communication in the Web)

- **Initial testing stage of the created contents**

Here the leading role was played by the members of the mixed committee, non-specialists in IT. Their assessment according to the pre-arranged criteria was important. These criteria included such points as: comprehensiveness, simplicity of use, usefulness, quantity and quality of the illustrations used, etc.

A very important factor for the developers was the evaluation of the rest of the members of the mixed committee in terms of the type and quality of the practical exercises included. Practice in operating with a computer is a more important element, although it undoubtedly rests on a sound theoretical knowledge.

- **Corrections in the contents according to the opinion, assessment, and recommendations of the mixed committee**

All the corrections that were made about the format and quality of the contents of the theoretical, as well as the practical part, were taken into consideration and the necessary additions and corrections were made.

That's what led to the idea to add essential questions after each topic. Also, where the subject permits, jokes are used to make basic computer terms easy to remember.

- **Testing stage of the completed material**

The general evaluation of the mixed committee about the quality, quantity and the main indicators for this was high. The conclusion was that with thus developed material, high results could be achieved when working with people with different degrees of education and knowledge in the field of IT.

- **Final stage – publishing the whole contents in the Bulgarian section of ABE campus**

Till September 2005 the Bulgarian section of ABE campus will be completed not only with IT materials, which have only to be attached in their final version, but also there will be other materials, which could be used by the students in the country for free. Such materials are presentations on various topics and their main directions are:

- **Natural sciences**
- **Chemistry**
- **Ecology**
- **Network communications**
- **Hardware and innovations in its development**

They are also ready and are waiting for upload in the campus. One main problem could be outlined in the use of the ready-made platform and it concerns Bulgaria in particular.

The use of our own information from a Spain-based server is not efficient, because it has a negative effect on the traffic quantity, used by a given user, which will in turn decrease the number of potential users of the campus. We shouldn't underestimate the slowing down of the connection, which will inevitably follow.

In order to avoid this, Integra requests its partners to be given the source of the Bulgarian part of the platform, which to be placed in a Bulgarian server and thus by a massive use of the products in it to achieve the desired results.