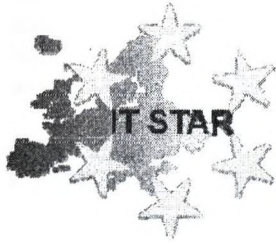**3rd IT STAR Workshop on National Information Society Experiences □ NISE 08 8 November 2008, Godollo, Hungary**

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CONTENT

ON STIMULUS FOR USE PUBLIC INFORMATION SERVICES IN THE EUROPEAN UNION

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Abstract

The paper presents some social causes which stimulate or divert citizens from using public available information services in the EU countries. Analysis is based on the secondary information sources from EU. We find out that national innovativeness is the strongest indication of environment that motivates use of e-services. On the other side, we concluded that common presumption that public interest in information technologies significantly stimulates usage of e-services is not correct. We pointed to high correlation between usage of public e-services and general trust among citizens, which is an important part of the Social Capital. Consequently, well known inertia of social variables over time will prevent fast leaps in the use of e-services in countries with low or average social capital and dissimulative social values. It is also interesting that behavior of old EU15 and new EU27 member states is quite often different. For IT STAR countries it is particularly important to assess their progress into information society with proper indicators. Otherwise, they can make wrong conclusions followed by inappropriate public measures. Finally, results also indicate that large systems like public administration and other big e-service providers have to find much more innovative instrument to motivate citizens to use their e-services.

Key words
Public information services, Motivation of users, EU, Social environment

1. WHAT MOTIVATES THE USE OF PUBLIC E-SERVICES

Implementation of any IT project depends on users' motivation and acceptance of new e-services. Basically, we have two groups of users. In the first group are internal employees in corporations, public administration, or any other organization. As employees they are bound to use in-house introduced application regardless of their personal position. Individual motivation is obviously less important and all potential problems with the use of new services are solved internally. On the other side, we have more and more IT applications that are developed for public use outside of the provider's organization. In such cases we don't have a managerial authority to enforce external clients to use particular application. Typical examples are public e-government services (Scharma, 2004, Wauters in Colclough, 2006, Bavec in Vintar, 2007). Practical experiences and also researches (Heeks, 2003) confirm that citizens' acceptance of public e-services is not granted per se and that public acceptance is quite often below what providers expected (Deursen, van Dijk, and Ebbers, 2006). It indicates that they often misjudge citizens' motivation and stimulus to use public services.

Understanding what motivates citizens is obviously a relevant issue for service providers and also for national decision-makers that are responsible for development of information society (Centeno, van Bavel, and Burgelman, 2004). From this point of view, it is interesting to notice that the use of many public services significantly vary across European regions (Wauters and Colclough, 2006). For example, Nordic countries are doing significantly better than Southern or Central European countries. We could imagine many reasons for that. The usage of public e-services is clearly correlated with economic power of these countries and their ability to invest into different e-services. However, economy cannot explain all regional differences (Bavec, 2007, Van Oorschot in Arts, 2005, Pohlmann, 2005). We should also look for other forces that cause this diversity.

There are many different concerns that influence users. The basic one is a comfort that new e-service provides to users. However, many evidently helpful applications for wider public were not utilized as predicted. So, what are other stimuli that have to be considered? One of them is a social environment that influences behavior of individuals. This issue is too often neglected or overlooked. We can illustrate this view with the indicators for assessing information society where technological and macro-economic indicators entirely prevail even in comprehensive EU projects designed to evaluate development of European information society (Spangenberg, 2005). From his point of view it is enough to have high penetration of IT technology and appropriate infrastructures. The use will automatically follow technology. Many researchers and practitioners argue this stand. For that reason is introduction of "softer" socially oriented indicators an exciting research issue with significant practical consequences.

In the paper we present partial results of a wider research on social acceptability and users' absorption ability of innovations and consequently of new e-services in EU27. We were interesting in regional dissimilarities and tried to identify any possible differences between old EU15 and new EU member states. Our research ambition was limited to initial assessment of social values and individual citizens' perceptions that are significantly correlated with the public use of e-services.

2. SHORT PRESENTATION OF RESEARCH

We performed a typical desk research based on publicly available data from Eurostat, Eurobarometer, and other European Commission's information sources:

1. Individual use of Internet (Eurostat, 2007);
2. Use of e-commerce by individuals (Eurostat, 2007);
3. Public use of e-government services (Eurostat. 2007);
4. Public interest in Internet (Special Eurobarometer 282, 2007);
5. Public interest in IT news in media (Special Eurobarometer 282, 2007);
6. Public interest in innovations and Science and Technology (Special Eurobarometer 224, 2005);
7. Level of computer skills (Eurostat, 2007);
8. Public perception that personal data are properly protected (Special Eurobarometer 225, 2005)
9. Work at home (Eurostat, 2006)
10. Work requires learning new things (Eurobarometer 273, 2007);
11. Personal Trust (Special Eurobarometer 223, 2005)
12. National Innovativeness – Summary Innovation Index (European Innovation Scoreboard 2006).

To reduce dimensions of the model we introduced a *Composite index of public use of e-services* (sum of individual use of Internet, E-commerce, and public use of e-government services). In the initial phase of the research we were interested mainly in correlations between this index and selected indicators describing different social values, public interests and working requirements. Our first hypothesis was based on "common sense" assumption that high public interest in Internet and IT stimulates higher use of public e-services. The second hypothesis predicted that some social values and habits have positive effect on the use of e-services.

In the Table 1 we collected individual data elaborated in this paper.

Country	Acronym	Composite index of public use of e-services	Public interest in Internet	Public interest in IT news in media	Public interest in innovations and S&T	Individual level of computer skills	Perception that personal data are properly protected	Work at home	Work requires learning new things	Personal trust	National innovativeness
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Austria	AT	114	2,19	22	32	0,48	77	117	71	32	0,48
Belgium	BE	101	1,71	13	29	0,48	81	142	70	29	0,47
Bulgaria	BG	36	2,07	24	17	0,21	59	36	42	17	0,23
Cyprus	CY	63	1,53	12	18	0,3	90	100	69	18	0,33
Czech Rep.	CZ	66	1,82	19	17	0,34	80	94	58	17	0,36
Germany	DE	148	1,75	17	35	0,59	85	119	75	35	0,59
Denmark	DK	177	2,42	24	76	0,63	82	222	84	76	0,61
Estonia	EE	95	2,07	19	33	0,34	75	105	69	33	0,37
Greece	EL	45	1,34	10	18	0,22	81	91	58	18	0,26
Spain	ES	83	1,88	19	36	0,31	77	62	62	36	0,31
Finland	FI	157	1,89	16	61	0,68	83	157	88	61	0,64
France	FR	124	1,30	8	22	0,48	86		80	22	0,47
Hungary	HU	81	1,76	23	25	0,26	79	60	41	25	0,26
Ireland	IE	109	2,22	22	32	0,48	74	117	67	32	0,49
Italy	IT	57	1,43	8	21	0,34	72	32	65	21	0,33
Lithuania	LT	67	2,66	34	14	0,27	60	54	62	14	0,27
Luxembourg	LU	161	1,86	14	31	0,54	86	107	72	31	0,53
Latvia	LV	76	2,53	30	15	0,22	75	44	76	15	0,19
Netherlands	NL	159	2,32	18	61	0,49	87	170	81	61	0,48
Poland	PL	65	2,35	31	10	0,22	69	26	70	10	0,24
Portugal	PT	60	1,85	19	24	0,23	68	77	63	24	0,25
Romania	RO	29	2,48	29	17	0,19	58	35	52	17	0,18
Sweden	SE	167	0,86		64	0,73	89	177	80	64	0,73
Slovenia	SI	88	1,93	18	24	0,35	82	120	69	24	0,35
Slovakia	SK	85	2,24	25	16	0,23	75	63	64	16	0,25
UK	UK	147	2,21	25	36	0,53	78	154	78	36	0,57

Table 1: Individual data for EU member states (not including Malta)

	Correlations with the Composite index of public use of e-services
National innovativeness	0,91
Work at home	0,85
Level of computer skills	0,83
Personal trust	0,83
Work requires learning new things	0,78
Public interest in innovations and S&T	0,66
Personal data are properly protected	0,65
Public interest in Internet	0,44
Interest in IT news in media	-0,21

Table 2: Correlation of selected indicators with use of public e-services

In the Table 2 we can see correlations with public use of e-services sorted from the highest to the lowest value. The most essential indicator that identifies highly stimulative environment for the use of public e-services is obviously national innovativeness (Summary Innovation Index on country level) with the correlation R=0,91. This complex index is composed from 26 indicators measuring all relevant national activities that contribute to national innovativeness and is assessing by the European Commission every year. An overall innovative economic and social environment is obviously the main stimuli even for individual users. However, we could also hypothesize in opposite direction; that general public innovativeness and openness to new technologies is a basis for national innovativeness. The next on the list is percentage of employees working predominantly at home (R=0,85). Individuals working at home are likely using Internet more extensively then others, so it is not a surprise that they also use public e-services more often. It is also reasonable that high level of computer skills stimulates use of e-services (R=0,83).

Less obvious is high correlation between the use of public e-services and personal trust. In this case we have to emphasize that we are talking about interpersonal trust and not trust into technology or service providers. This correlation indicates that trustful environment significantly stimulates citizens to be innovative and consequently to use e-services (Putnam, 1993, Sabatini, 2006). Trust is also an important component of the Social Capital, so we can hypothesize that the Social Capital is a relevant stimulus, too. This conclusion leads to some other hypothesis. For example, that we can not reach very high usage of public e-services just with technological means and "education" of users because we could be suppressed by social environment. The correlation between Social Capital and other social issues on one side and public openness to new technologies and services on the other side is fairly uncharted area in theory and practice.

The first group of highly correlated indicators ends with citizens' perception that their work requires permanent learning new things. It means that innovative working setting also influence individual use of public e-services (R=0,78). Less expected results are again seen in the second part of the Table 2. Public interest in Internet and IT in news has low or nearly no effect on public use of e-services (R=0,44 and R=-021). Much higher effect has a general interest in innovations and S&T (R=0,66) which comes as a small surprise. These conclusions contradict common opinion that interest in Internet automatically provoke it use. It is difficult to give a comprehensive explanation for that finding, but we can guest that public services are relatively easy to use and they don't require extensive knowledge of IT. Interest in Internet and IT is limited to a smaller group of citizens. Some researches (Estabrook in Rainie, 2007) indicate that relation between use and interest in Internet can be interpreted on the very opposite way. Use of Internet consecutively stimulates interest in Internet as technology and even in classical libraries with primary source of information.

We will conclude this brief comment on correlations in Table 2 with moderate correlation between citizens' believe that personal data are properly protected and the use of public e-services (R=0,65). It looks that people generally trust e-service providers and governments that they implemented a trustful framework for personal data protection.

3. GRAPHIC PRESENTATIONS OF SELECTED INTERDEPENDANCES

From correlations in the Table 2 we can comprehend just statistical averages for all EU member states. However, graphical presentation is the easiest way to provide us with deeper insight into the structure of interdependences and eventual clustering of countries. We will present just few most illustrative examples.

In the Figure 1 we can notice that in EU countries with the highest use of e-services (DK, SE, LU, NL, FI, DE, UK) public perception that personal data are properly protected doesn't play any role in their decision to use these services. They demonstrate very high usage of e-services, regardless that many of them don't believe that personal data are well protected. We could just guess that there are some other motivators that overcome data protection issues. On the other side, in all other countries citizens' concerns in personal data protection correlates with the use of e-services.

We have already concluded that interrelation between the public interest in IT and the use of e-services is not relevant, but it is interesting to notice how differently are clustering new and old EU member states (Figure 2). In many new EU countries interest in IT in media is even higher then in the old ones. Nevertheless, their use of public e-services is significantly lower and entirely independent of this interest. Old member states display low but positive correlation (R=0,36).
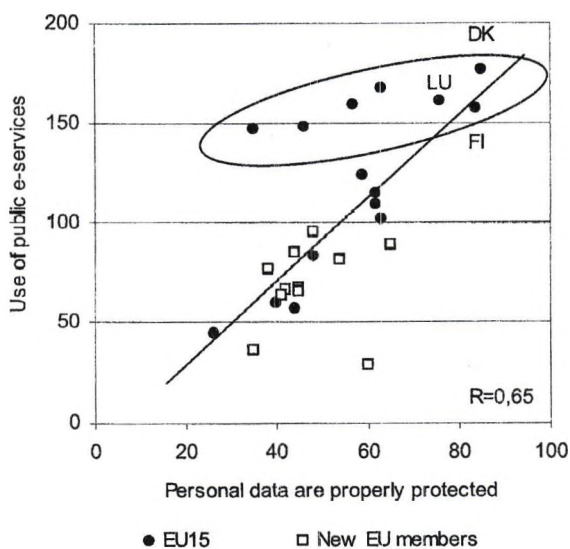
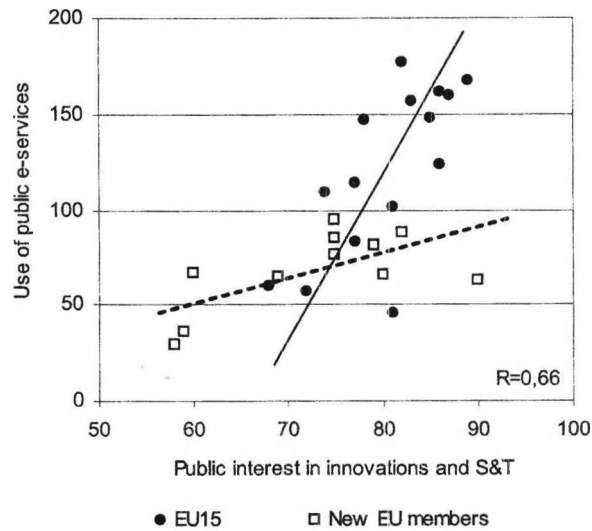**Figure 1**: Interdependence between the use of public e-services and public believe that personal data are properly protected
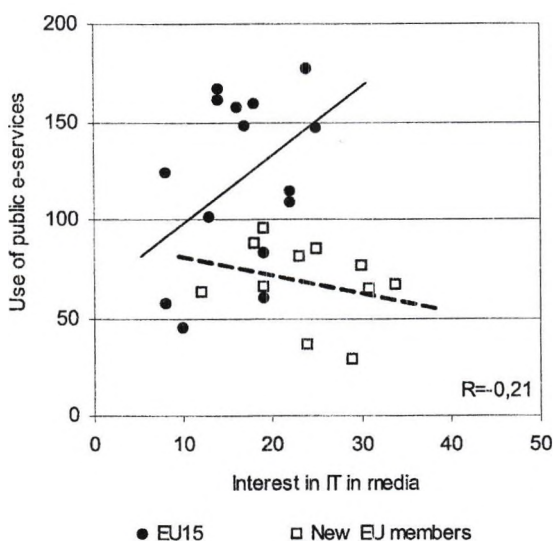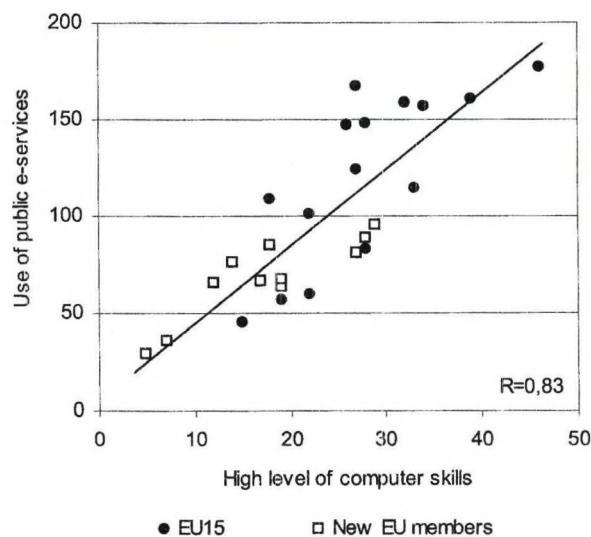

Figure 2: Interdependence between the use of public e-services and interest in IT in media

The difference between new and old EU member states is even more evident in the Figure 3. The correlation between use of e-services and public interest in innovations and S&T is significantly

higher in the old EU member states and significantly correlated with use of e-services. In new EU member states is this correlation lower, it means that higher interest in innovations and S&T has much lower impact on use of e-services than in old member states.

Figure 3: Interdependence between the use of public e-services and public interest in innovations and S&T

Figure 4: Interdependence between the use of public e-services and public interest in innovations and S&T

On the other side, Figure 4 reveals that computer skills have the same effect in all EU countries; higher skills lead to higher use of public e-services. We will not present other graphs, but very similar patterns demonstrate interdependences with the following indicators: National innovativeness, Work at home, Personal trust, and Work requires learning new things. There were no differences in the behavior of old and new member sates.

4. CONCLUSIONS

In this short presentation we argue that it is not so obvious what motivates or de-motivates individuals to use public e-services. We concentrated our discussion on "softer" and more socially oriented indicators. We intentionally omitted economic (GDP per capita or investments into IT) and technological (IT penetration, availability of Internet and so on) indicators because we know from many other researches that they significantly correlated with the use of public available e-services. In search for relevant indicators that describe social environment that stimulate use of e-services we identified four of them that are statistically highly significant: national innovativeness, work at home, level of computer skills, and personal trust. It is interesting that each of them identify very distinctive group of social values or conditions in which citizens use public e-services. Particularly personal trust and innovativeness are not directly linked to IT, and this is the main reason that they are neglected in majority of assessments on use of IT and e-services. However, they are obviously relevant and this fact in some way explains why some regions are significantly more efficient in use of public services than others. As we already said, pure economic and technological indicators revealed just a part of a puzzle that composed individuals' relation to IT and new services.

What we can learn from these conclusions? Firstly, e-service providers from government agencies to private corporations should take into account national innovativeness and different social aspects in particular country or region. They should understand the reasons why we can not make "big leaps" just by introducing more and more e-services and investing into technology. Social environments have brakes and accelerators that could significantly influence behavior of users. On the other side, social values, habits and also social capital are very inert over time and are changing slowly; in any case slower than technology and new services. As result, it is easy to transfer technological solutions from one country or region to another, but the effect of these solutions will be different in different countries, dependently on social environment.

Secondly, in many cases we can notice different public behavior in old and new EU member states. We have seen these differences on many other areas, too. Particularly for the Central European countries we can hypothesizes that for some historical reasons and their recently ended transition to market economy they still "adjust" their social structures. On the other side they demonstrate agility and readiness for changes seen, for example, in relatively high public interest in IT. However, they still lag behind the old member states in using public e-services.

Majority of IT STAR members are new EU member states. So, for them it is particularly important to assess their progress into information society, which also includes use of e-services, with proper indicators. Otherwise, they can make wrong conclusions followed by inappropriate public measures. We should avoid only economic and technological indicators which would lead policy makers just to higher investments. We have to balance these investments with national efforts to change public atmosphere concerning IT and innovative e-se4rvices and perception of potential users. Otherwise, many costly investments could be in vane.

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STRATEGIES IN DEVELOPING IT SKILLS: NATIONAL AND INTERNATIONAL EXPERIENCES

Giulio Occhini

All of our IT STAR Member Societies have at least one common goal: the promotion of cultural and economic development through a wider and better use of information and communication technologies.

This might be expressed in different ways, stressing more the cultural aspects of informatics or the technological development, the pure research or the value of IT in various application domains.
In any case, one of the central ingredients (perhaps the most important) is the spread of IT knowledge and skills across the whole society: this is an extremely hard task, considering how small our associations are if we compare their size to our countries' population.

Moreover, it's somebody else's responsibility to steer the development: we have national governments, local authorities, international organizations such as the EU and the UNO...

On another side, there are large companies – both producers and users of IT – that have a strong interest in spreading the new technologies.

Last but not least, universities and schools are the primary public entities in charge of education and culture.

So, what can be the role of our informatics societies?

Looking at where the real powers are, our mission might look very pretentious.

Nevertheless, in the past two decades we decided to join our forces and we created at least two things we can be proud of:
   1. IT skills certification programmes;
   2. A large international network linking our societies.

Both these results come from our unique strength, which is – in my opinion – a specific focus on informatics. We're small but focused, and even if we have some problems with English, basically we all speak the same language: our common language is based on IT culture.

Let me describe briefly our two successes I've just mentioned.

Skills certification programmes, and in particular the ECDL/ICDL initiatives, are definitely the main reason why our societies are known to the large public.

Let's look at my country, Italy.

AICA was founded in 1961, and for more than 35 years it was a respected association that nobody knew in Italy, apart from a limited élite of computer scientists, professors, researchers and fans.

Our goals were always the same, including the progress in information processing, the divulgence of ICT knowledge and skills, the scientific and technological development of our nation in co-operation with other nations, and so on...

But in the first part of our history, we simply did not have the "gas", we didn't have enough energy to launch initiatives that could really give a measurable contribution to our national society.

When we started thinking of a European Computer Driving License, none of us would have forecasted the tremendous success ahead; the idea was not so original, something similar existed already in Finland, and despite we called it a "license", we all knew that it was just an option, and that no policeman will ever stop you if you use a computer without having the ECDL. I'm not going to tell you again the story of this success, you know it.

But coming back to Italy, the ECDL really changed AICA's position: we had an interesting and practical proposal to discuss with the Ministry of Education, in few years the business grew and reached 100.000 ECDL tests per month!

As a result, AICA had gained an enormous visibility and a financial strength it never had before.
Unfortunately, every medal has a reverse side: many professors and IT professionals started thinking of AICA as the company running the ECDL business, and some started blaming us for "betraying" our original mission; in their views, AICA was now simply competing with Microsoft and other private companies in the IT user certification market.

Our vision is quite different:

- AICA is still a not-for-profit organization, and we use ECDL revenues exactly to pursue our cultural mission, just with more internal resources;

- the ECDL business model in Italy is extremely open; we allow any credible organization to become an accredited test centre, we let them free to decide everything about training programmes, materials, and prices; the only part on which AICA dictates inflexible rules is quality assurance, and in particular the governance of examination procedures, as we must ensure that a certificate means something, it's not only a piece of paper for which a candidate has just to pay;

- we are not competing with Microsoft or any other company; we let the market choose the technology platforms, but it's a fact that more than 90% of ECDL candidates are tested on Microsoft Windows and Office products; on the other hand, there's a clear overlap between ECDL and MOS certifications, but we are convinced that education is a delicate matter, and that our not-for-profit, vendor-independent, and open business model is preferable; Microsoft has a number of other things to do and products to sell, our focus is just IT skills development;

- last but not least, we firmly believe that the ECDL business is fully compatible with our mission; it's not just a way to raise funds that we can then use to pursue our goals. On the contrary, the effect of ECDL is a very practical contribution to the spread of digital literacy: without it, most Italian schools would not care for IT training at all, or some would propose a number of different courses (as it was 10 years ago) with very limited value to their students. Our proposal, ranging from e-

Citizen to ECDL Core, Advanced, Specialised, and up to the EUCIP certifications, provide a comprehensive and sensible framework for any level of IT skills, both for users and for professionals.

If we look back a moment at IT professionals, they should not disregard the value of ECDL and even lower programmes, such as e-Citizen.

Having a high level of digital literacy among target users is definitely an advantage for any organization using ICT to support business processes.

For instance, all you know that traditional bank accounts cost a lot more than an internet banking service. Yet, the majority of bank accounts in Italy are still classic-style, requiring the client to go to the bank during office hours; one of the highest barriers here is clearly the lack of confidence from clients who are not familiar with web services.

A world with more IT-skilled consumers and higher performing employees would certainly recognize a higher role even to IT practitioners and professionals: this is why we think that high-end professionals should not underestimate the value of our digital literacy programmes.

Now, coming to the second merit, let's just quickly consider the value of an international network of informatics societies. This ranges from worldwide level, i.e. the IFIP organization, to CEPIS in all countries of the Council of Europe, down to "regional" level, as for our IT STAR organization.

Firstly, it's clear that the ECDL would not exist without CEPIS.

Secondly, there are not so many organizations that manage to represent the various countries in such a capillary way. Our member societies are not giants, I said it earlier, but still we are present everywhere with a real local touch.

Other international organizations, like the EU, really appreciate the value of our wide presence.

Our main weakness is probably that it's not easy to find a common position on every matter; but this is just a consequence of the fact that we have different faces and brains, and our cultural differences would better be regarded as richness.

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E-GOVERNMENT: WHICH INTERPRETIVE KEY?

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Abstract. *These notes seek to demonstrate that by approaching e-government as an organizational problem, and not as a technocratic and neutral (by which we mean unbiased) issue, we can identify the problems, contradictions and pitfalls that otherwise remain invisible. It is a question of substance not of terminology (we will not talk about the difference between e-governance and e-government; in our view, e-government is the use of ICT technologies in all areas of the public administration, from front office to back office). The perspective that continues to prevail in the public discourse is a generator of limitations. Only by adopting a less algorithmic method can we highlight the confusion and contradictions otherwise labelled as inefficiencies, misalignments, resistance, cultural inadequacy. Our choice of approach can produce useful ideas to move forward the current e-government debate and formulate ways to intervene.*

Introduction

One perspective alone is not enough to analyse and interpret e-government[2]. Up to now, the prevailing line of the Italian e-government debate centres on the technical content of the various solutions developed for the implementation of digital government services and applications. Without detracting from the validity of that viewpoint (and the disciplines that support it), it is clear that the technological approach risks capturing only a small part of the complexity that characterises the scenario. In other words, it is hardly plausible to retain that ICT on its own can "determine" change in either the central PA or its peripheral structures. A more realistic and convincing picture demands that we expand the field of observation by harnessing other types of contributions, by listening to other "voices".

The time now seems right to launch a debate based on different foundations, i.e. which focuses on organisational reflection. Albeit with a warning: the experiences

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[2] M. Sorrentino "eGovernment research: time to switch direction" in A. Grönlund, H. J. Scholl, K. V. Andersen and M. Wimmer (eds.) *Electronic Government, Proceedings of the Fifth International EGOV Conference,* Krakow (Poland) – September 4-8 2006, Schriftenreihe Informatik, Universitätsverlag Rudolf Trauner, Linz. Vol. 18, pp. 17-24 ISBN 3-85487-994-6.

underway stop us from drawing a clear-cut picture of e-government and its implications. Further, the effects that can be concretely captured are traceable in part to univocal tendencies. The need to arrive at a coherent analytical picture that can help us form ideas useful to the action phase has been detected on more than one front.

Despite the fact that information technologies entered the public sector about 50 years ago, the idea of "reinventing government" through intensive ICT use came to light only in recent times: in fact, the idea started to gather momentum in the United States in the early Nineties, after which it caught on in all the main industrialized countries[3]. ICT was immediately designated a neutral and highly versatile tool. This new "lever" came with a promise to develop brand new solutions to the problems of management and service-user relations and, therefore, was (perhaps too hurriedly) considered a factor capable on its own of transforming internal work practices and, in tandem, of promoting new relations with citizens. The roads embarked on by governments in their recent development plans vary greatly from one case to another, in line with their respective specificities[4]. A common denominator in all countries is that e-government has quickly turned into a public policy of national import. Naturally, the internet takes on a key and decisive role[5] in such a scenario.

The online circulation of information, resources and services – in the opinion of the mainstream – enables the practical adaptation of a *bottom-up* approach to public-sector *governance*. In addition, the internet allows us to implement new organisational models of the network type, featuring the presence of a multitude of subjects who – together and based on their respective prerogatives – orient their own action towards common goals, i.e. to provide timely responses to different recipients (individuals and collective subjects), inside and outside the public administrations. But just how true is this basic assumption?

It is difficult to respond directly to that question. e-government is a complex creature with a myriad facets. The past few years have witnessed numerous attempts to conceptualise it through interpretive models and frameworks[6]. Surprisingly, and despite their diversities, these proposals reveal an almost one-way approach. In essence, most of the research conducted to date states that, in any event, the technologies "are not a problem" because these have become economically accessible and increasingly user-friendly. If an e-government programme meets with hurdles in

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[3] OECD, *The e-Government Imperative*. Paris: OECD, 2004.

[4] Capgemini, *Benchmarking the Supply of Online Public Services*, 2007.

[5] CNIPA, *Linee strategiche volte ad indirizzare le Amministrazioni nella predisposizione del piano triennale per l'informatica 2008-2010 (in Italian)*, 2007.

[6] H.J. Scholl, Is E-Government Research a Flash in the Pan or Here for the Long Shot?, In M.A. Wimmer, H.J. Scholl, A. Grönlund, K.V. Andersen (eds.) *Electronic Government, Proceedings of the Fifth International EGOV 2006 Conference*, Krakow, Poland – September 4-8, Berlin Heidelberg: Springer-Verlag, 2006, pp. 13-24.

the implementation phase, or if it fails to produce the expected results, the knots and the "blame" need to be looked for "elsewhere"; that "elsewhere" being synonymous with criticality, however, is almost always found in the administrations themselves. The most common reference is to internal procedures, to the institutional cultures and practices, which, as a whole, tend to maintain the status quo. It is no coincidence that the concepts of "inertia" and of "resistance to change" are continually raised in the debate on change management in the public sector.

e-government as a new source of constraints

The current discourse describes the PA as a static entity closed to the outside world with its own peculiar logic that – purely by chance and in rare moments – meets the demand expressed by the service users, although more often than not it counteracts it, generating pernicious effects. This self-referential attitude also would explain the persistence of organisational structures always similar to each other, as well as the predominance of a bureaucratic management culture. That is the perspective that interprets the bumpy road that marks the network organisational models (still poorly diffused in reality) or the low diffusion of services based on interagency collaboration. The weak relations that exist between one administration and another, but also between units belonging to the same structure, appear to give rise to the "leopard spot" logic that characterises the current ICT landscape in the public sector.

The main limitation of that situation – which is partly understandable – is that it assumes e-government differs to the other types of actions and decisions performed by the administrations. The idea of a public sector radically transformed thanks to the "enabling" role played by the new technologies (and, markedly, by internet) has now become an obvious assumption and, therefore, takes for granted all the discourses on "modernisation". Unfortunately, the empirical reality, also outside Italy, does not support those arguments. Further, there is no lack of paradoxical situations.

For example, Italy's public sector is apparently highly structured. It has preset procedures for everything: whether for awarding a literary prize or for issuing a passport. On its own, the meticulous scanning and the extreme formalization of each and every step of public choices in e-government implementation should facilitate the identification of algorithms on which to base computerized solutions. In essence, administrative law, which prescribes exactly how to regulate each phase of the treatment of the practices according to detailed types of objects and cases, constitutes a kind of pre-packaged codebook that could help our country compared with other scenarios characterized by a more pragmatic administrative tradition. If it is true that the formalization of knowledge is the basis that enables its archiving, transfer and automatic treatment, it should be relatively simple to put online the didactic proposals of a university faculty or the results of implementing a regional policy. It

should be. But it isn't. Those who try to do so discover that, in actual fact, the public administrations tackle the rigidity of the rules through a number of practices that are supported by extremely elastic interpretations of the constraints.

In addition, the PA are often the first not to comply with the legal provisions: think only of the diffusion of the Computerized Correspondence Register (CCR) in the central PA – still widely underused even today, more than four years after it officially came into effect. Or the solution called the "Civil Computerization Process, which has suffered delays due to the two-year delay in enacting the implementation bill. Those who have an intimate knowledge of the Italian e-government program nurture more than one doubt on the effective practicability of these plans, despite the accompanying array of multicoloured flowcharts and milestones presented by the agencies.

Given that these practices extend across all levels of the public sector, we should hardly be surprised that, in many situations, the introduction of technologies and solutions capable of speeding up and heightening the transparency of the administrative process is often seen by the agencies themselves as[7]:

- just another source of constraints;

- a removal of discretionary power;

- a toll to pay to obscure directives issued from above;

- a tool that penalizes efficacy instead of promoting it.

We believe that the situation of "detachment" between the statements of principle and the reality (in e-government just as much as in other environments) is the result of the rational concept that permeates the PA discourse.

An alternative perspective

The continually suggested view that e-government clashes with how the collective imagination perceives the public administration model often fails to take into account that the ICT applications and systems in the public sphere - even before these became a "fashionable" topic, tagged with the most fanciful labels (G2C, G2B, G2G, etc.) - have always been discussed in organisational studies. Therefore, a solid reflection should seek to use this interpretive key to surpass both the simplifications and the limitations of the dominant technocratic approach. The knot of the problem has nothing to do with issues of terminology, but with the ability to understand the nature of the change and the reasoning behind it. Our theory is that technological change cannot be separated or distinguished from organisational change.

An alternative perspective of e-government enables us to say that any ICT solution (regardless of its intrinsic features or the type of components used for its

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[7] G. Regonini, *Capire le politiche pubbliche*. Bologna: il Mulino, 2001 (in Italian).

implementation) plays a decisive role not only and not so much – as many factions maintain – because it has an impact on the organisation (whether public or private), but because it guides the action of the people and the structures, influencing the relations between actors and the ways in which problems are concretely addressed.

In choosing to adopt that perspective, we deny that the organisational structure must adapt itself to the technology in a passive way, admitting, instead, that there is no predetermination in the technological compared with the structural choices. And with what consequences at the analytical level? Having thrown out the idea that e-government can "determine" or "produce" certain types of impact, it stands to reason that the relevance of e-government must necessarily be evaluated in overall terms, i.e. in terms of the processes of design, adoption and use of the ICT solutions. No solid analysis is capable of establishing (even though some seductive formulas affirm the opposite) what direction change will take as a consequence of the implementation of a specific computerised application, nor which critical factors can determine its success.

We underscore that the inability to make predictions not only stems from the fact that the public sector is an especially complex universe to decipher, due to the combined forces of many variables (internal and external), but also, for example, from the behaviours of the service users, of the type of decisions that the information system is called on to support, and the constraints of both time and public responsibility. The discussion centres on the mainstream view that tends to attribute the technological lever with the capacity to solve organisational problems, a capacity that, however, it does not possess.

The current opinion that likens e-government to a choice capable by itself of optimising the provision of services to citizens and businesses, of increasing democratic participation and of improving the governance of these same administrations is a deterministic theory that should be rejected outright. Just as we should reject the image of an e-government that is invariably linked to the surpassing of the stereotyped model of "old-school" administration presented in its most negative and worst aspects.

Adopting a viewpoint whereby ICT and organisation cease to be distinct elements propelled by their own dynamics means assuming that every computerised solution introduced and used in a social context is the bearer of new rules (and new constraints) that define the action of the individuals and the collective subjects. According to this perspective – harvested from the field of organisational studies – the results of the processes of design, adoption and use of the technologies are not (and cannot be) a one-way street because ICT can be used to introduce or support clashing organisational logics. As demonstrated in real everyday life, which is far more composite and structured than a double-entry table, given that it is, in fact, made up of contradictory trends and hybrid situations where the effects of

contrasting signs (decisional centralisation and decentralisation, the establishing of routines and skill-building, etc.) live side-by-side and interweave.

The interpretive key we propose here is interesting because it lets us discover that e-government, the new passwords (efficacy, efficiency, transparency, and more) that lie under the enticing façade and the most advanced technologies can yield solutions that do not truly break away from the past. For example, the collaboration networks launched between local authorities across Italy would seem to emphasise partnership and inter-organisational cooperation, even though, in practice, these often favour the persistence of control and decisional centralisation mechanisms not unlike those that make up the stereotyped model of public administration.

Nevertheless, the illusoriness and inconsistency of some analyses must not be an excuse for giving up the wish to address, evaluate and control the performance and the results of e-government programmes, but, conversely, must give us a reason for introducing diverse forms of managing change in public organisations. Sometimes, many managers, and, along with these, many consultants to the PA, are unable to react positively to the everyday situations they encounter in the offices, also because they have been trained according to conceptual models that fail to match the practices and conditions in which they effectively work. Again, we underscore that it is not the presence of principles and techniques changed by the management of the business, but the absence of other analytical benchmark tools. Recognising that different effects can be manifested during the development and use of the technologies, on the other hand, enables us to see the change management process as an uninterrupted chain of expected, opportunistic and emerging changes, rather than a series of predefined steps along a road of concatenated actions.

Choice and implementation of the technologies are part of the same continuous process. This "uninterrupted flow" generates new ideas for learning and reflection that can translate into useful implementation strategies on practical grounds: for example, it becomes possible to understand what type of effects the administration can expect from a computerisation initiative. Or which problems might arise in the absence of specific guiding actions by management. Ultimately, albeit not in terms of importance, such a perspective can help us to develop diversified evaluation systems to meet the cognitive needs that tend to appear *in the different stages* of an e-government project's lifespan. As we know, the evaluation practice in Italy sharply favours the preliminary analysis of public interventions, while the ex-post evaluation is carried out to a far lesser extent.

Attention. When we speak of evaluation, the discourse invariably addresses the methods, models, techniques and metrics (and in the debate: quantitative versus qualitative) and then everything dies there. In reality, the question should not be posed in these terms. The true crux of the matter (still unresolved today) is to distinguish successfully between:

- The economic and technical resources deployed in a specific project (*input*);

- The observable results, e.g., waiting times, availability, accessibility of e-services (*output*);

- the *impacts* or effects compared with the problem that the plan seeks to address (e.g. social inclusion, democratic participation, equity). Which factors tell us that the initiative has been successful? How have the conditions of the service users changed?

Substantial differences exist between these categories of effects. At most, the public programs stop at the first two, and even then often confuse them[8].

That creates an absurd situation. On the one side, the public sector uncritically translates the managerial practices (believed of higher efficacy), but, on the other, fails to apply the most important lesson taught by the private sector: to focus on past performance in order to surpass and improve it.

To conclude, the rhetoric of change of the "administrative machine" - this latter being a highly revealing metaphor of the instrumental view of the public administration and of its reduction to a "technical device" - that accompanies the use of ICT needs to be overcome using a "toolbox" in which space exists for a conceptual toolkit also of the interdisciplinary type. The scope of e-government remains mostly unexplored, which therefore requires an effort of reflection that, while starting with concrete practices, seeks to decipher the more general reasons, without giving up the challenge to critically evaluate all that is uncritically considered real and true.

In brief

An interdisciplinary view of the public administrations helps us to slot the e-government discourse into a more realistic context. Indeed:
- e-government should be understood as a process of bounded rational actions and decisions that cannot be separated from the other PA processes;
- the focus of the analysis should be extended to the processes of:
  o Design;
  o Adoption; and
  o Use
of the technological solutions.

Organization Science and Policy studies help us to wipe the plate clean of the assumption that e-government is neutral. In addition, these studies admit from the start that the initial plan is subject to shifts and swings, so we must perforce consider the implementation of the provisions, not the provisions as such.

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[8] J. Pressman, and A. Wildavsky, *Implementation*. Berkeley: University of California Press, 1973.

In addition, these studies can help us to concretely address a key theme, that of e-government evaluation, which in Italy has been inexplicably neglected up to now.

Perhaps it is no coincidence that the dominant public-sector discourse takes into account solely the ex-ante evaluation. The attention paid almost exclusively to complying with the formal requirements is a clear indicator of the supremacy of the legal perspective. The economist attributes the shifts in the plans to the presence of inefficiencies. The engineer reads the misalignments not as a manifestation of the margins of discretion anywise insuppressible in complex organizations, but, instead, as resistance and backwardness.

e-government is not a neutral ground. It is a public policy to all effects and purposes. To date, it has been interpreted using an unsatisfactory key that concentrates solely on the formal, design and technical phases. Clearly, that is of no help to the administrators when it comes to avoiding the pitfalls of e-government.

REFLECTIONS ON NATIONAL ICT STRATEGIES IN ALBANIA

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Abstract

National ICT Strategies in Albania are drafted under the pressure of international agendas and visions of individual political leaders, without a common political consensus. This is reflected in the way strategies are drafted and implemented. Two strategic documents are adopted by different governments. The first one failed to be implemented due to lack of political interest. Part of the second draft, while not formally approved, are in implementation following political objectives of government. A considerable progress is done already. The process in its totality shows signs of lack of harmonization and sustainability.

Introduction

In a global political climate of promoting ICT for development and democracy, compilation of national strategies seem to be a precondition for collaboration with many international actors, even in case that its need is not felt by local policy-makers. The role of ICT in developing and democratic processes is widely discussed by many researchers and a contradictory opinion on ICT's role and impact seems to prevail [Frasheri 2002].

ICT emerged in a developed world and globalization processes exported it in developing countries. As result ICT becomes a kind of "inevitable luxury", and at the same time it creates a feeling of "cargo cult" – people begin to think that simply by using computers problems will be solved [Harris 1998][Kransberg 1991]. It requires lot of efforts for people to learn that it is not true, as it happened with Stability Pact structures when at least discovered that it is not possible to solve institutional problems simply by using computers [ESEE 2003].

While developed and developing worlds collide, we see the impact of difference of rationalities [Avgerou 2000] when living habits and means and technologies of one world are somehow "alien" imported into the other. Even in case of useful technologies as ICT, the difference of rationalities makes their deployment processes and their impact in one place different from the other. In particular, in developed countries we see that political visions on ICT are too much dependent on individual visions of some leader. As result there is missing of continuity in deployment processes and the development phenomenon is similar with a "Brownian movement", with high cost for the country.

National ICT Strategy of 2003

In a context of pressure from outside, in 2003 Albanian government accepted and approved the strategy draft prepared by international actors in collaboration with local experts. In 2005 the new government, being enthusiast on ICT, decided to revise this draft and at the same time strengthened the measures for its implementation.

The first draft was compiled by a team of foreign and local experts from different institutions, funded by international donors. The first draft was presented in a national conference, afterwards different sections of the document were discussed in details in separate sessions for main topics –governance, education, business etc. The improved draft was approved by government at beginning of 2003 and one of ministers was charged with its implementation. Together with the draft of strategy, three other

documents were prepared: e-readiness of the country, development indicators, and the roadmap for implementation of the strategy.

Strategy of 2003 [ICT Strategy 2003] has 92 A4 pages and is published in both Albanian and English as book and a CD. It was well structured, clearly separating priorities, objectives and actions. It is divided in five chapters covering main sectors:

- Government as Promoter, Legislator and User of ICT
- Use of ICT for Education, Research, Health and Social Services
- Building Infrastructure needed for an Open Information Society
- Accelerating Economic Growth in the Private Sector
- Ensuring Relevance of ICT Strategy within a Regional and European Context

For each sector specific goals and necessary actions are described. The document is accompanied by two other documents: an E-readiness Assessment and a Roadmap. The Roadmap simply presents sectors, goals and actions as a table, with some recommendations about deadlines in time. While the E-readiness Assessment was the most problematic document difficult to be compiled. Organizations collecting statistical data in Albania had no specific information on ICT; even the number of computers was evaluated based on small surveys and unreliable data from other sources. One of conclusions of the strategy itself was the need for collection of ICT related data, a goal still not achieved in satisfactory level.

Implementation of the strategy failed. Strategy implied creation of a consultative body for the government, with representatives of different communities. This body was created but composed by some of ministers – ministers serving as consultants of council of ministers (!). Actions defined in the roadmap were not seriously followed, probably except the creation of a government metropolitan network and some Internet services, always with the funding of international actors. A minister without portfolio was charged with the implementation of the strategy as an extra task, practically neglected. It was clear that government had other priorities instead of ICT; and all was done quite formally as response to the external climate.

National ICT Strategy of 2007

In 2005 the new government decided to revise the strategy. For a long time its leaders were sensitive about ICT. The ministry covering telecommunications was charged with the task of revising the strategy. Some international organizations and foreign experts invited to help for this purpose. Differently from the first time, experts from other local institutions were not involved and no public consultancy organized.

In 2007 the relevant ministry informed with an official letter other institutions about the existence of the draft in its web site and inviting for comments. Until mid 2008 there is no sign for a formal approval of this second draft. Nevertheless, many of its ideas are already in implementation process, and probably the hurry on its implementation may be a problem by itself.

The new strategic document of 2005-2007 [ICT Strategy 2007] has only 54 A4 pages published in the website of the relevant ministry. The new strategy was not based in the critics of the first one but drafted from the scratch and it is more government-oriented. It offers also some evaluation of the costs for its implementation.

The draft has five chapters organized by thematic:

- General Overview
- Vision, Priorities and Objectives

- Policies
- Requested Resources
- Accountability, Monitoring and Assessment

First chapter includes a general description of ICT situation in the country, playing the role of E-readiness Assessment covering main sectors: ICT indicators; ICT regulation; e-commerce; e-government; education and research; local governance, employment, and ESEE obligations.

Visions, priorities, objectives and policies, despite their repeating formulation, match more or less with the sectors explicitly mentioned in the first chapter. In this draft concepts are confused with each other, the same words are periphrased for priorities, objectives and policies. Some objectives are fuzzy, ambiguous or even unrealistic. There are mentioned: monitoring of ICT; public relations; promotion of ICT; regulatory environment; modern government; e-commerce and concurrency; human capacities; education and research; health care; juridical system; and digital content.

Requirements for resources presents in a table an evaluation of financial resources requested for the implementation of the strategy; and a description of running projects in different institutions of public administration.

The last chapter includes several tables with definitions, indicators, and a roadmap for implementation of the strategy.

Introduction of ICT and Internet in schools takes a particular place in the strategies of government. It is mentioned in the strategy draft, and at the same time a special master-plan is prepared, aiming to complete with labs and Internet connectivity all schools of the country within 2008.

Comparing two Strategies

It is possible to match somehow of both strategies. In a synthetic mode both strategies are compared in the following table.

No.	ICT STRATEGY GOALS 2003 - ICT STRATEGY PLAN 2003	ICT STRATEGY GOALS 2007 - ICT STRATEGY PLAN 2007
1	Pro -Active, Well-Coordinated National ICT Policies - Action plan, Coordination and Follow-up of ICT strategy	Awareness campaign in communication media - Information for decision-makers, understanding profits from ICT, getting support
2	Creation of ICT-Supportive Legislative Environment - Development of e-legislation and regulatory mechanisms	Wide and modern regulatory system - Laws for information, e-commerce, IPR, juridical capacities, regulatory organs, define by law what is ICT
3	Effective, Transparent, Responsive Government and Public Services - E-government services, interactive websites, local governance, promotion and training	Policies for modern civil services Strengthening of juridical system - E-gov services, transparency, accountability, implementation of eSEE programme, government portal, efficiency for the law court
4	Basic Computer Literacy and ICT Education for all - Basic computer literacy, certification, ICT in non ICT subjects, general awareness	Increase of human capacities - Improvement of teaching, Albanian Internet, concurency in informatical economy, elemination of unemployment, increase of research and its connection with main flow of science and technology, investments in technology

5	Cadre of Advanced ICT Specialists Education and Research in ICT - Certification of higher level ICT education, ICT in universities, vocational training	
6	ICT in Health and Social Services - ICT health and social services, end-user devices for medical and social care, training	Computerization of public healthcare system - Improvement of healthcare using ICT, computerization, management systems, insurances, services on line, telemedicine
7	Supporting Development of Locally Relevant Content and Applications - Internet content and web portals, software accessibility	Community connectivity for services country-wide - Public services in all country, participation in economic social political cultural life, empower local communities, decentralization
		Preparation od digital content for Albanian Internet - Incentives for online information and services, increase of information providers with address ending in ".al"
8	Creation of a competitive, liberalized telecommunications sector - Privatization, competitive market, independent regulatory authority, 3rd generation mobile, incentives for new players	Regulatory environment for opportunities, public relations for ICT lead by government - Deregulation of frequencies, competitiveness, connectivity for all, national base support network, telephonic services, objects of connectivity of communities in all the country, decrease of connectivity costs, expansion of government network. ICT in private sector and agriculture, blooming bussiness sector.
9	Development of the ICT Sector as a Production Sector - Favorable climate for the high-tech sector, permanent business forum, technology parks and business incubators, education, training	
10	Inexpensive, fast and secure ICT infrastructure throughout Albania - Country wide infrastructure, Academic Networks, government network, Internet in schools, public access points, advanced technologies	Development of ICT infrastructure of high speed - Information and services for all, national cohesion, connection of Albanian base network with the Internet of EU and region, collaboration to increase necessary regional base technologies to profit from scale economy of the region
11	Supporting Electronic Business - Business trade portal, Affordability of equipment, Public-Private, Training	Competitiveness of private usiness - Strengthen ICT industry, private-public, associations with foreign companies, foreign investments and know-how transfer, incentives for R&D, e-agriculture, online procurements
12	Active participation in SEE regional Initiatives - Participation in e-SEE Europe and regional	Implementation of eSEE and bSEE recommendations - Unique informatics space for SEE,

	projects	innovation and investments in research and education, information society for all
13	Active participation in EU Initiatives - eEurope+ and CEEC strategies, Participation in ICT funding of EC	Tools for regional and eSEE/bSEE collaboration - Collaboration for regional network and SEE activities, empowering SEE, EU integration and interoperability
14	Monitoring of Albanian ICT Development in Regional and European Context - Scenarios, indicators, roadmap, objectives, outputs, quantitative statistics of ICT	Status analysis and monitoring of ICT - Needs and conditions, comparative indicators, priorities and needs

As seen in the table, despite reformulation, principles remain the same in both strategic drafts. Differences in the second draft are more related with concrete visions of actual political leaders.

Implementation of Strategic Objectives

Implementation of strategic goals is going on for a long time, even before drafting a formal strategy. Formal strategic goals are a mirror of actual world-wide actual and perspective development. The role of the strategy would be to coordinate actions in order to lead in a stable, harmonized and sustainable nation-wide system.

Projects for implementation of ICT systems, independently from strategic documents, include:

- Partial liberalization of telecommunications market
- Expansion of mobile telephony country-wide
- Private Internet providers in major urban centers
- Banking systems in private banks, and beginning of Internet banking services
- Specific management systems in certain private companies
- Laboratories and Internet connectivity in some schools
- Local networks and scientific applications in universities
- Local networks in part of public administration, including some metropolitan connections and Internet services
- Information systems in critical sectors as central taxes, customs offices and police.

The strategy document of 2003 was formally approved but no concrete steps were undertaken by government. The document of 2007 is still not formally approved, but government is working to implement ICT in critical sectors. Government projects with important ICT components are funded with about 64 million €UR mainly from international donors (data based on the draft strategy of 2007):

- Deepening the liberalization of telecommunications market, including completion of privatization of incumbent fixed operator
- Legislation for electronic services in public procurement, electronic certificates, electronic payments, and electronic surveillance.
- Creation of National Agency for Information Society and National Center for Registration of Businesses
- Deployment of the site for electronic public procurement
- Launch of online services to help tax payment from businesses
- Adoption of Automated SYstem for Customs Data (ASYCUDA) in customs.

- New electronic civil status registry
- Preparation for smart identity cards and deployment of electronic certificates
- Planning of reorganization of address system in urban centers
- Remote access to the database of Ministry of Justice arranged for other high level institutions.

Special attention is given to introduction of ICT in schools, aiming the whole pre-university education system in the country. The initiative is formalized in a master-plan [E-schools 2006]. The objective is to introduce ICT and Internet in all schools of the country, in a period of three years terminating at the end of 2008. Funding for this project is about 25 million U$D. Management of the project is done by foreign experts working in premises of Ministry of Education and Science and the work is going on. There are 2,125 schools with about 590,000 students and 33,000 teachers in the whole country, 70% of territory is mountainous. Attention is shown for training of teachers. Also notebooks and projectors are procured for high schools as mobile laboratories for different disciplines. Improvement of curricula is ongoing.

Specialized on ICT departments from University of Tirana and Polytechnic University of Tirana are involved in regional SEE initiatives for development of academic networking and grid technologies through participation in SEEREN (www.seeren.org) and SEE-GRID (www.see-grid.eu) funded by European Commission. Nevertheless, critical situation is in the university system – there is yet no national research and education network. This network is one of objectives of a project funded by Italian government. After several years of stalling, in 2007 the project was ratified by both parliaments and actually a PIU is working in Ministry of Education and Science to create the inter-university services center as a legal entity dependent from this ministry, which will play the role of ANA – Academic Network of Albania. The creation of national academic backbone will be the first task for the center. Unclear remains the question of connectivity with GEANT; despite the fact that a project (SEELIGHT) is proposed for the countries of the region, government has not concluded yet the participation in this project that requires 20% of local co-funding.

At last, in framework of government programme for research and development, a number of ICT-oriented projects are realized from universities departments. In framework of 2007-2009 programme the ALBGRID project is running, lead by Faculty of Information Technology of Polytechnic University of Tirana. The objective is improvement of grid infrastructure, dissemination and applications. This local project is complementary with the FP7 running project SEE-GRID-SCI (www.see-grid-sci.eu). While SEE-GRID-SCI focuses in development of applications through regional collaboration in areas as seismology, meteorology and environment, other FP7 planned projects focus on the harmonization of national research programmes and strategies in the SEE area.

Conclusions

Pushing aside difficulties, all these actions promise a good step forward, match with international political agendas and initiatives, but the reality is more problematic.

In the direction of e-governance, undertaken actions mainly support the e-bureaucracy [Nowicka 2007], which is not "better governance" by default [Heeks 2004]. Harmonization between different projects remains problematic, as well as creation of different executive entities due to lack of qualified people in public administration. There is lack of collaboration with academic institutions.

Prices of ICT equipment are decreased significantly, but not telecommunication prices. Nevertheless usage of PCs and Internet is increasing rapidly. Businesses are forced to use ICT in order to participate in public procurement and download tax obligations. Part of businesses are using internet banking services.

Mega-project for introduction of ICT in schools remains problematic considering the sustainability of created labs and continuity of Internet connections. It is necessary to see in terrain the impact of measures government is planning for this purpose.

Situation in high education and research seems more problematic for many reasons. Missing of national academic network is one of problems, and considerable parts of university departments do not have institutional Internet connection. This makes difficult for all researchers to communicate effectively with their homologues abroad; and in particular main ICT projects as SEE-GRID & ALBGRID which require qualitative connectivity.

The crucial problem seems to be lack of harmonization and sustainability. Society is making steps forward, but its path seems not a straight one, slowing down the overall progress and spending lot of efforts, while there is no time to lose and resources to waste.

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Outline of the presentation
Hungarian Information Society Strategies
3rd IT STAR Workshop
National Information Society Experiences – NISE 08
November 8, 2008, Budapest (Gödöllő), Hungary

Mr. Gábor Bódi, State Secretary of the Prime Minister's Office, Budapest

I. State of play (main problems, strategic goals)

1. online public services
2. SMEs
3. broadband penetration
4. level of digital illiteracy, lack of motivations
5. computer coverage
6. internet statistics (households and enterprises with Internet access, individuals using the Internet, households and enterprises with broadband connection, individuals and enterprises using the Internet for interacting with public authorities

II. Development trends

1. ePublic Administration Strategy

This strategy establishes that the Hungarian system of public administration, public services and the administration of justice should operate on the basis of modern principles, focusing upon the needs and requirements of citizens. This should result in better quality services and a more sensible use of available resources. Serving as both an example and a model, a modern system of public administration and government action could become a force promoting the modernisation of society and the fulfilment of democracy.

Objective: to set up a general vision for all the participants on the field of e-public administration, a framework to be followed by all projects, and to define the key strategic factors for the implementation of the goals.
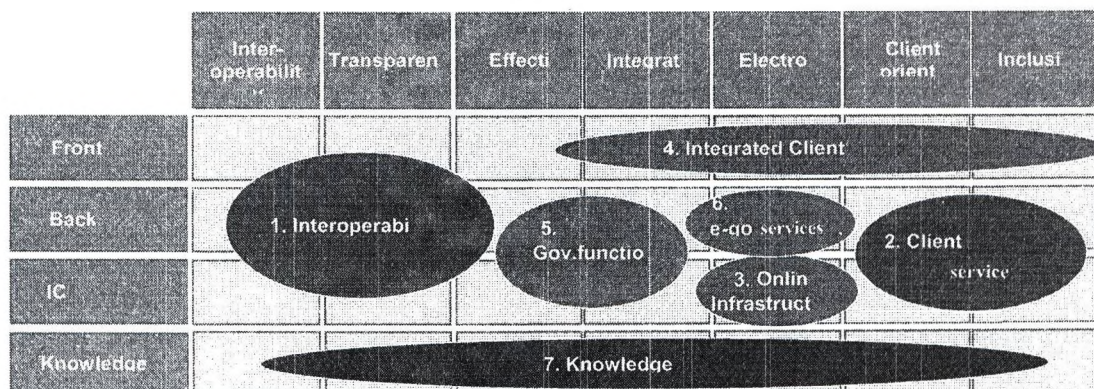
4 strategic fields of the strategy:
- Modernization of the public services for the citizens, enterprises and the public administration
- Introduction of integrated services for the governmental institutions, back offices in order to promote a transparent and effective public administration
- Contribution to the spread of the professional e-government knowledge at leadership level and implementation
- Development of the e-government adaptability especially of those enterprises, citizens disadvantaged in the area of IT .
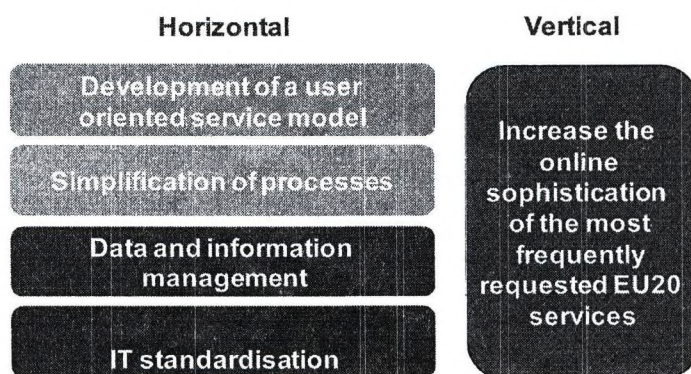
The strategy identifies main programmes that should be followed by the institutions while they provide their own services.
- Horizontal programmes: set up guidelines and framework for the institutional service developments, including the content-, process development and technological implementation of those services.
- Vertical programmes: EU 20 services development by sectors
- Integrated, shared services: contributes to illiminate parallel processes, and to futher cost-efficient developments and function. Investments related to the reforms can be implemented and time-management improves.

Overall programmes 1-7: The e-public administration matrix and these overall programmes derived from the e-government concept. These programmes have their own objectives and their implementation will be managed through the actions set up in each programme.

Actions:

Horizontal

- Development of a user oriented service model
- Simplification of processes
- Data and information management
- IT standardisation

Vertical

Increase the online sophistication of the most frequently requested EU20 services

2. Digital Literacy Action Plan

In Hungary 51% of adult population is digital illiterate – does not use computer and internet. Only 37% is regular internet user and 12% uses PC but does not use internet.

Objective: to reduce the high proportion of digital illiteracy to below 40% by 2010 via enhancing motivation and developing training opportunities.

Background:

- In 2006 56% of the population over 18 was digital illiterate, namely did not use either internet, nor computer. In 2007 the proportion of the illiterate population was still above 50%.
- The rate of the digital literate population has been growing continuously, but the dynamic of the growth still lags behind in European comaprision.
- Reason: the number of consumers not using computer and internet because of financial reasons has decreased, however the proportion of people not using them for cultural purposes has increased. Don't care, don't need to.
- Instrument ensuring programs like Sulinet, eHungary points prevailed. Thanks to these, institutional infrastructures have gone through a rapid progress, and given social groups obtained computer.
- Looking at the programmes launched until now, we can see that so called awarness raising programmes were underrepresented. The state intervening has to focus on these spheres.
- With the growth of the penetration programmes focusing smaller target groups become more and more important.

Target groups:

- Middle classes: to be able to move the digital illiterate population to the other side

- Upper classes: government measures built on market mechanisms can help closing the gap of the upper classes
- Under classes: an action plan aiming at reducing the digital literacy is not enough. Integrated actions are capable to contribute to the reduction of the backwardness of this population.

Planned pillars, priorities and actions:

Pillars	Priorities	Actions
Cognitive conditions	Motivations (attitude forming, interest raising, trust strengthening)	Ready for the NET communication campaign: to enhance motivation and increase the openness toward info communication tools and contents
		Ready for the NET: forming and operation of a user-, age-, child friendly, trust affirming and knowledge transmitting program
	(Education, knowledge transfer, information)	Ready for the NET: sponsoring of training programmes
		eAdvisor: setting up and operation of a service providing network
		Launching of targeted complex training access programmes (like "Wifi village")
		Introduction of consultancy (e-Entrance)
		Ensuring the harmony between the NHDP relevant programmes and the Action plan

3. **eEconomy Action Plan**

Objectives:

To determine the business, the infrastructural and other (concernig business environment) conditions influencing the development of eEconomy.

The strategic document tried to focus on the following problems:
- where stands the eEconomy in Hungary in international perpective;
- ICT usage among Hungarian enterprises, eLearning and telework;
- B2B, B2C applications, analyzing the development of eCommerce, eBanking and ePayment;
- G2B, B2G relations analyzing development tendencies of eGovernemnt;
- Regulatory and institutional framework of eEconomy.

Actions (ICT usage within the enterprise)

- **ICT training and motivation programme for SMEs**

Objective: covering approximately 10.000 SMEs, complex, tailor-made training, information, advisory and motivaton programme in all regions that will contribute to:

- the increase of ICT investments within SMEs that will improve their competitivness;
- the intensification of the IT market indirectly with the growth of the demand;
- the increase of the use of eGovernment services among SMEs

As a result Hungary can improve its ranking concerning the E-business Readiness Index from 25 to 20 by 2013.

- **„Fair Business" – eCommerce certification and alternative whipper-in forum based on PPP**

The objective of the project is to call a certification system into action and the intensification of consumer's trust into eCommerce as a result of „Fair Business" certificate. That will contribute to the increase of the online turnover.
As a result more than 200 traders will gain „Fair Business" brand within 3 years (by 2011), that means: the given enterprise fulfils all necessary conditions of legal, safety and consumer friendly operation.

- *Database free of charge and a webpage enabling intelligent search about Hungarain SMEs*

The objective of the project is the widening of local and international business connections of SMEs, improvement of their functional efficiency. As a result data regarding the activity of every second SME will be available by 2010.

4. Broadband Action Plan

Objectives:
- Broadband covarage 100%, in order to promote poeple to use electronic (residential-, business- and public) services
- Winding-up bottlenecks in the backbone and distribution networks
- pro-active planning and integrated approach are needed to help the strategies backing each other (Governmental Client Information Centre, eHungary Points, Public Network).
- The development of the infrasturcture is not enough! It is useless to build infrastructure without users. That is why the digital literacy is highly important. (from SROP=TÁMOP).
- Positive social and economic outcomes of eServices based upon the infrastructure

State of play

- In the past 3-4 years the number of broadband subscriptions has tripled, even so our backwardness besides the growing penetration has not diminished. Compared to the developed countries. In 2007 the number of subscriptions was 1 million 678.

- Broadband coverage has risen rapidly in the last 4 years.: in 2004 below 70%, today over **94% can have broadband connection** (min. **256 kbps down- and 64 kbps uploading speed**) additional 2-2,5% use mobile internet, generally in settlements above 10 000 inhabitants (grey settlements). The current tenders (GOP 3.1.1) determine min. 2 Mpbs down- and 512 kbps uploading (but there is preferred) simmetric 2 Mbps) speed.

- The settlement structure means the greates challange that the development policy has to face (relative high proportion of the provincial population). There were still about 500-550 uncovered settlements at the end of 2007.

- Broadband prices have been diminshing rapidly and continuosly.

Actions

- **EDOP (GOP) 3.1.1 tender that aims** Building broadband infrastructure in the uncovered areas (co-financed by EU Structural Funds and Hungarian budget)
- **EDOP (GOP) 3.1.2 tender** that aims building high-capacity fiber optic to winding up bottlenecks in the distribution networks (co-financed by EU Structural Funds and Hungarian budget)
- **Rationalise the regulation of creating electronic infrastructures**
- **Analise the possibility of tax allowance motivating development of innovative communication networks**

SWOT

Strengths	Weaknesses
Significant growth concerning broadband penetration	Penetration still below the EU average
Almost full penetration in the business and institutional segment	High broadband prices in international comparison in base of PPP (but not the real price in EUR)
Dynamic coverage expansion in the fix line and wireless technology	Bottlenecks in the capacity of distribution networks
Significant reduction regarding the prices	Backwardness in PC usage and penetration
Continuously growing bandwidth	Hungarian users are more critical against internet providers compared to other European citizens
Besides DSL technology cable service providers' proportion is also relevant	Little progress concerning spectrum liberalization
Active and successful control of competition	Relevant part of the communal access points did

Communal and state sources for the development of the broadband infrastructure Significant network of communal internet access points was created	not succeed to be self-sustaining Monitoring of state measures, measurement of outcomes and effects in some cases not solved
Opportunities The continuously declining price and growing coverage regarding (3G) keep increasing the competition More efficient spectrum management could keep increasing the competition alternative broadband techniques develop, new, innovative solutions appear (FTTH, WIMAX, HSDPA) development and use of MVM's (Hungarian Power Companies Ltd.) already existing telecommunications network as a Wholesale Service Provider	**Threats** Narrow brand users have switched to broadband, the growing process can stop PC penetration's recoiling at present level holds back the increase of internet penetration With the increase of users and applications new bottlenecks arise on the existing networks Consumers do not feel inclined to pay for additional expenditure coming from the increase in technical content

E-Government strategy in Italy

F. Amato, A. Mazzeo, A. Picariello

Italian e-Government activities

E-Government, or electronic management of public services (or e-Gov), or processes of democratic governance, concerns the reorganization of the bureaucratic processes in both central and local Public Administrations. In this context, one of main goal of e-Gov is that of providing a strong computerized management of electronic documents in order to optimize the work of the governmental offices and offer the users (citizens and businesses) both faster and more effective services and new ways of accessing such services.

From a general point of view, the theme of e-Government can be traced back to the overlap between two worlds that are apparently different and distant from each other; in particular it can be considered as the application of Information and Communication Technology (ICT) to problems that are typical both of the Public Administration and the legal domain.

The use of ICT in the public administrations is not new, being introduced some decades ago with a series of specific projects, which were often the evolution of pre-existent legacy applications, conceived to automate single parts of the information and bureaucratic system and devoid of a systemic and global vision.

Many initiatives, often supported by facilitated finances, were introduced in the eighties within the Community in order to deeply introduce ICT into public administrations and realize strong and flexible information systems, flexible to changing and with the objective of supporting the principal bureaucratic processes within specific domains (Ministries, Local Bodies, Regions, etc.).

In the nineties and until the beginning of the present decade, with the spread of the Internet and the related technologies, the focus has been moved towards the opening of such systems to the web, in order to carry out initiatives of e-Gov and define a first level of interconnectivity shared among the administrations belonging to different domains, principally in the national environment, but also in an international one.

Nowadays, the process of combining the effectiveness of the services and their transparence within Public Administration context, goes through a strong automation of the internal processes and in addition through the capacity of using open systems, able to cooperate at application levels, following federate models: in this way, it is possible to ensure the observance of legal and organizational binding forces established by the autonomy of the various governmental Entities and the achievement of automatic and inter-domain bureaucratic processes.

Note that such technologies are not always directly and easily suitable to the specificities of the Italian bureaucratic applications (of e-Government) because of the binding forces of the specific regulations.

Generally speaking, the strategic plans provided for by all the actions of e-Government have the aims of establishing cooperation and coordination among the different subjects of Public Administration. In the last decade and more, Public Administration in Italy has been changing its own organizational structure to enable the development of its own information systems with respect to the new application requirements, by opening and reorganizing itself, enacting new regulations, implementing its own standards and using European and international ones, resorting to solutions that often realize real "technological leaps" in the automation solutions applied.

Why revolutionize a bureaucratic organization existing since more than a century and based on paper documents and mechanical processes? Why change?

A first simple answer is given in the following. Looking at the Italian system, the need of change is principally due to the strong necessity of a de-bureaucratization and a simplification of the processes in order to: i) provide the public and private administrative acts with transparencies; ii) to increase in the quality of the offered services; iii) to decrease the costs of the organization, thus increasing its efficiency.

Looking, instead, from a wider point of view, we conclude that there is a great need to arrange, for a national system, convenient instruments able to ensure its growing, development and competitiveness.

The system of a Nation can't compete in the International and Community environment without a modern and suitable bureaucratic system, based on the use of the new technologies, operating in the Internet, and able to grant to the administrative actions continuity, definite times, quality, safety and privacy.

It is necessary to pass from systems based on computerized procedures, which are often centralized and supporting organizations based on paper documents and manual processes, to information systems focused on processes, which are often so totally automated and completely based on electronic documents that are able to optimize and rationalize the use of the human resources involved.

The incentives to change are above all represented by the spread usage of electronic documents and the related processes of dematerialization, by the implementation in full cooperation and interoperability of inter-intra domain processes, by the availability of qualifying and low-cost technology; by the evolution of the communication networks both in terms of available band and capillarity, by the safety of the various levels of the system, by effective systems of access control and profiling of the users.

The main instruments achieved, but still in evolution, concern electronic signature for documents legal validity, temporal mark-up for providing temporal evidence, digital protocol, long term preservation of electronic documents according to the regulations, the service of certified electronic mails to give evidence to the posting and receipt of documents.

In Italy the CNIPA has regulated a model of reference for the interoperability and the applicatory cooperation for the Public Administration named "Architecture of the Public System of Connectivity and Cooperation (PSC)"; the Public System of Cooperation (PSCoop) is a set of technological standards and infrastructural services whose objective is enabling the interoperability and the cooperation of the information systems for the fulfillment of administrative actions; the services offered aim at creating a groundwork to which all the Regions can connect in order to use and distribute services through standard protocols, with rules of safety and access that are shared and with a prearranged and monitored quality of the service.

Many Regions and Local Bodies have been equipping themselves to take advantage of the offered services and many initiatives promoted by the Ministry of Innovation are leading to the sharing of the models and the solutions adopted in order to achieve in a short-term period a real solution of interoperability.

Dematerialization Processes

Note that all the e-Gov applications so far described have dematerialization activities as a common and fundamental factor: information, previously stored using graphic marks on material (paper) supports, is made immaterial using a codified electronic representation, and can be nowadays stored on several digital supports such as memories, magnetic or optical disks, tapes or other mature technologies nowadays in use.

Dematerialization is not only a normative and technological challenge but also an organizational matter involving various human resources. The transformation of a bureaucratic organization based on paper into one based on electronic documents is not easily achievable according to general models that are exportable among the organizations themselves.

So far, we have described the main characteristic of the e-Gov system, in particular, we note that e-Gov processes are usually characterized by a huge quantity of paper documents that need to be properly managed, stored and distributed. In order to reduce the huge amount of hard papers for optimizing information communication in terms of consumed time and resources, it is widely agreed that a semantic-based dematerialization process will greatly enhance e- Government systems and application procedures.

The dematerialization process implies the application of syntactic-semantic methodologies in order to automatically transform the unstructured or sometimes semi-structured document into a formally structured, machine readable records.

The core aspect related to a novel and efficient dematerialization process is the idea standing beyond the common document concept, that can be defined as the representation of acts, facts and figures directly made or by means of electronic processing, and stored on a intelligible support. In other words, a document consists of objects such as text, images, drawings, structured data, operational codes, programs and movies, that, according to their relative position on the support, determine the shape and, consequently the structure of the document itself through the relationships between them. During the various and different e- Government processing phases, that are really different from an application domain to another, a document is processed and eventually stored on

various kinds of media, properly defined in order to archive and preserve papers, photographic films and microfilms, VHS cassettes, Magnetic Tapes, DVD disks, and more.

In the following we will provide a novel model for digital documents and we describe a system for multimedia document management, in particular for those regarding archiving and long term preservation.

A document model for e-Government

A document managed in e-Government information system is usually composed by different multimedia data types, as images, text, graphic objects, audio, video and composite multimedia. This is usually related to two main problems: a multimedia document contains heterogeneous information contents and has to manage different formats: in addition, depending on the authorities which manages the document itself, the same information content is presented in multiple ways, using several presentation formats.

For this reason, in order to opportunely manage and preserve the real useful information contained in a certain document despite the required different presentation formats, it is necessary to provide a novel model for a multimedia document, pointing out:

- how to identify and characterize what is the minimal content of the document itself, given a certain normative context, and

- how to relate this minimal content to a presentation level, depending on different users at different times.

The proposed document model is composed by several layers, as described in the following.

- *Data Management Layer*: describes the semantic minimal content (or kernel) of a document, usually codified by different media types. This layer manages the different data types, furnishing all the necessary functionalities and facilities operating over a certain single media; for example, information extraction and indexing over texts, images, videos, audios and son on.

- *Integration layer*: provides a proper integration of the heterogeneous data sources, having the aims of regulating the coexistence of the different objects within the context of a single document.

- *Presentation layer*: this layer regulates the way in which the information has to appear to a single user within a certain context in different times.
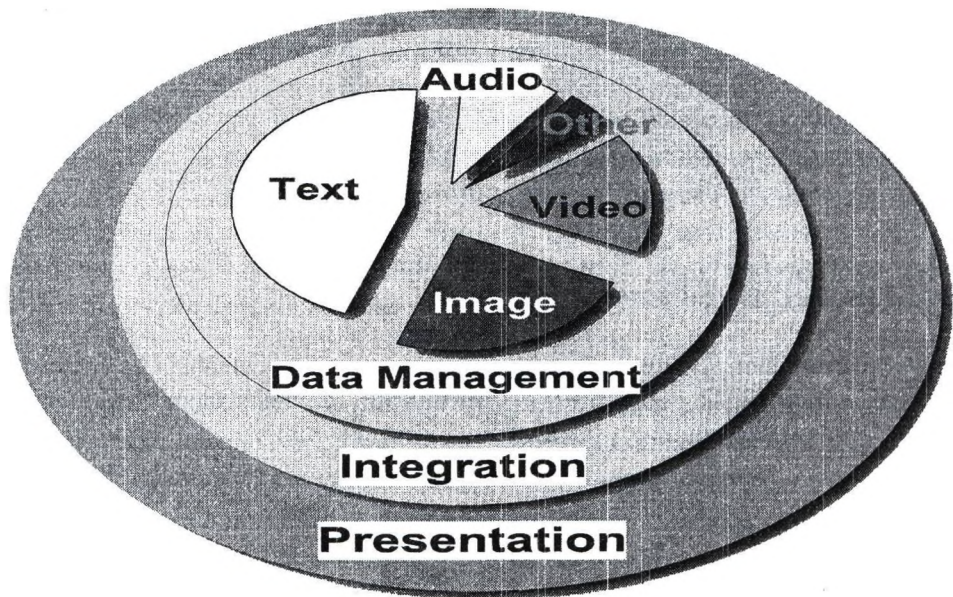
Figure 1:The Document Model

Note that usually the juridical validity of a document is nowadays provided on the whole file document, without any discrimination between the effective content and the different ways in which it is showed out. Differently, our model try to explore the possibility of giving juridical validity to the single level of the documents, thus giving the possibility of validating both the minimal content alone independently from the presentation layer and the complete presentation content.

A System Architecture for e-Government information system

Considering the theoretical aspects depicted in the previous sections, we are in a position of sketching a novel architecture for supporting e-Government activities: in particular, we propose a multimedia information system that integrates and processes different multimedia data types (as images, text, graphic objects, audio, video, composite multimedia, etc.) and provides facilities for indexing, storage, retrieval, control of multimedia data together with long term preservation strategies [1,2,3].
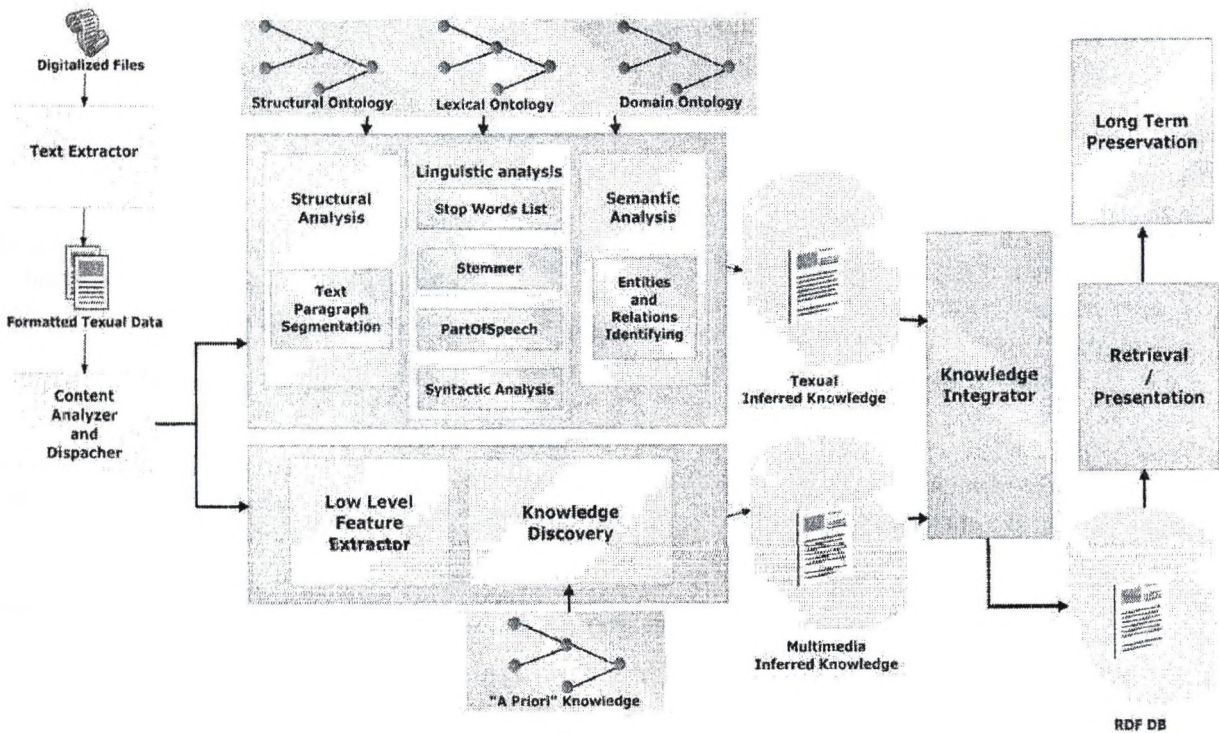
Fig. 2. The proposed architecture

The architecture of the proposed system, as shown in figure 1, is constituted by modules delegated to manage the *Information Extraction and Indexing* process and those related to *Retrieval and Presentation* applications. The knowledge associated to E-Government document activity is codified using appropriate *ontology repositories*.

In the current implementation of the system, we have realized three main separate subsystems that are responsible of information extraction and presentation tasks: one for the text processing operations, another one for processing the other kinds of multimedia information, in particular images, and the last one for presentation aims, in according to the normative requirements of public administrations. The features of text and image management subsystems will be described in the following.

Text Processing Module: automatic extraction of RDF information triples from unstructured documents

The *Text Processing Module* extracts relevant information from the documents of the E-Government domain, starting from the analysis and the processing of the textual content of the submitted input document.

This module is based on both linguistic and statistical approaches for the early stages, and semantic function for the recognizing purpose. The semantic methods make use of a knowledge domain built over the top of an ontological system in order to control identification and extraction of relevant words in the text, representing the instances of the concept of interest. The text processing procedure is composed of several stages[6]: (i)*Text extraction*, where the plain text is extracted from the source file; (ii)*Structural analysis,* where the textual macrostructures are identified for text sections recognition; (iii)*Lexical analysis*, where each text element is associated with a grammatical category (verb, noun, adjective etc.) and a syntactic role (subject, predicate, complement, etc.); (iv) *Semantic analysis* where, proper concepts are associated with discovered entities and relations among them, by means of structural, legal domain, and lexical ontologies. The output of such procedures is a semantic annotation codified by RDF triples.

The Multimedia Processing Module: automatic annotation of images using visual information and pre-defined taxonomies

The goal of the *Multimedia Processing* subsystem is to automatically infer useful annotations for images looking at their visual content and exploiting an "a priori knowledge" (obtained in the training step of the system) in the shape of pre-defined taxonomies of image contents[4].

To such purposes, each image, belonging to a given concept (category) of the a-priori taxonomy, undergoes a particular indexing process, where in a first step a low-level description is obtained and then in a second one an apposite indexing structure is created/updated for facilitating the successive retrieval and annotation tasks. The indexing process can then support the *Knowledge Discovery* task (i.e. the "category detection" procedure presented in [5]), which automatically discovers those concepts of the a-priori taxonomy that better reflect the semantics of the input images. The obtained information can be thus used as useful annotations for each image, in order to infer knowledge about the content of the images, that is codified in a multimedia ontology (taxonomy concepts + images). The inferred knowledge is recorded using RDF triples.

The Integration and Presentation modules: merging knowledge from heterogeneous multimedia data and delivery of e-docs in different formats

The objectives of the *Integration and Presentation* modules are: from one hand, to merge in a unique "container" the heterogeneous knowledge coming from text and multimedia data, and from the other one, to delivery the content of e-docs in different formats.

In the current implementation of the system the integration module uses a human-assisted semiautomatic approach to instantiate relationships among concepts of the different ontologies. The result of such a process is an ontology that contains all the knowledge related to the e-Government documents.

The presentation module works on the top of such ontologies and exploiting the set of relations about structure of multimedia assets and e-gov documents, in order to present and delivery to final users the content of an e-Government document in different ways.

Conclusions and future directions

In this paper we presented a model for digital document suitable for e-Government activity, and a system for management of multimedia information related to e-Government procedures. At the moment we have implemented a prototypal version of the system that realizes the described information extraction and presentation tasks. Future efforts will be devoted to implement the other modules of the system and to obtain experimental results that validate the proposed approach.

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Development and Application of
Information Society Strategies in Lithuania

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This paper presents an overview of alternative Information Society notions and benchmarking approaches, international and European context of Information Society development in Lithuania. The guidelines, problems, challenges and success stories of Lithuanian Information Society development policy, current status and future prospects are presented, too.

1. Information Society notion and evaluation parameters

Information Society is a post-industrial society in which information technology (IT) is transforming every aspect of cultural, political, and social life and which is based on the production and distribution of information [BusD, 2008]. Characteristics of the Information Society are: (1) information becomes an economic good, (2) widely applied IT with integration of different IT types, (3) national economy dominated by the information sector, (4) special status of knowledge [Pawl, 1992].

There are various different paradigms and measurements of Information Societies. E.g., Andrew S. Targowski indicates even 14 alternative types (or qualitative states) of Information Societies (i.e., Dossier, Computer, Mass Media, Networked, Virtual, Informative, Communicative, Knowledge, Automated judgment, Informed, Learning, Global, Self-sustainable, and Monitoring), each type having specific paradigm, purpose, main information solution, measures [Targ, 2005].

Frank Webster in his book [Webs, 2002] has presented a typology of Information Society theories [Dral, 2007]:

- Technological vision of the Information Society (IS):
  - Puts emphasis on ICTs and their transformative powers.
  - Technological innovation: new possibilities in transmission and storage of information.
  - Society has moved from the "Industrial Revolution" and now entered an "Information Age". "Computer technology is to the information age what mechanisation was to the industrial revolution" (John Naisbitt quoted in Frank Webster).
- Economic vision of the IS:
  - Concerned with "economics of information" (Fritz Machlup). Assesses the size and growth of the information industries.
  - Puts emphasis on the importance of knowledge to the economy.
  - Technological innovation central for increasing productivity and thus for growth of economics and competition between economies (inspired by Joseph Schumpeter's thinking).
- Occupational vision of the IS:
  - Focuses on occupational change- argues that the predominance of occupation is found in information work: "service workers" now in the majority.
  - Emergence of "white collar" society and decline of "blue collar" workers (influenced by Daniel Bell).
  - Many OECD and EU documents on the IS focus on this aspect of the IS.
- Spatial vision of the IS:
  - Puts emphasis on the information networks which connect locations and have great impact on the organisation of time and space.
  - Information Networks are linking together locations within and between offices, towns, regions, nations, continents and the entire world, seen in increase in transborder data, telecom facilities, ISDN, movements of money across nations, Internet [Cast, 1996].
  - Concepts of "information superhighway" and "wired society" are found in these arguments.

- Cultural vision of the IS:
  - – Contemporary culture is manifestly more heavily information laden than any of its predecessors- we are existing in a media saturated environment.
  - – Growth of institutions dedicated to investing everyday life with symbolic significance - e.g. global advertising, publishing empires, film industry, fashion industry, etc.
  - – Interactivity of new technologies provides many channels to consume cultural products, thus increasing our dependence on information for everyday interaction.

There are used many various approaches, methods, frameworks for the evaluation, measurement of Information Society in different countries, depending on the investigation needs. The paper [Scia, 2004] analyses Information Society international benchmarking during 1996-2003 years using:
- Networked Readiness Index, evaluating 48 indicators, grouped into: Environment (Market, Political and Regulatory, Infrastructure), Readiness (Individuals, Business, Government), and Usage (Individuals, Business, Government);
- Digital Divide (ORBICOM), evaluating 21 indicator, grouped into: Infodensity (Networks/Infrastructure, Skills) and Info-use (Uptake, Intensity of use);
- Digital Access Index (ITU), evaluating parameters: Infrastructure, Knowledge, Affordability, Quality, and Actual usage (that was used by the World Summit of the Information Society);
- McConnell International e-readiness assessment, evaluating several indicators: connectivity, e-leadership, information security, human capital, e-business climate;
- Mosaic (Interned development within a country): evaluating pervasiveness, geographic dispersion, sectoral absorption, connectivity infrastructure, organizational infrastructure, sophistication of use;
- Economist Index, evaluating many indicators: connectivity and technology infrastructure, business environment, consumer and business adoption, social and cultural environment, legal and policy environment and supporting e-services, and a large number of qualitative variables;
- Statistical Indicators Benchmarking the Information Society (SIBIS): evaluating ICT access and usage elements (such as Internet readiness), the digital divide, information security, and factors determining access to and use of ICTs (such as perceptions of barriers, digital literacy, learning and training, and benchmarks applications like e-commerce, e-work, e-science, e-government and e-health);
- Connectedness Index (Conference Board of Canada), evaluating 42 indicators, grouped into: availability, reach, use, price, inputs, impacts, and socio-economic enablers;
- Technology Achievement Index (UNDP), evaluating creation and diffusion of technology, and how prepared users were for new technologies;
- UNDP Composite Index (for ICT and human development), evaluating 9 indicators: availability or supply-linked, efficiency and speed, targeting social sectors, targeting vulnerable groups;
- Information and Communication Technology Development Indices (UNCTAD), evaluating 12 indicators, grouped into: connectivity, access, policy.

The analysis of Information Society measurement in Europe during 2000-2005 period by ESIS, Eurostat, BISER, INRA, ESPON, and Statistics Finland projects using eEurope, Networked Readiness, and ESPON 123 indices is presented in [FrHi, 2006] paper. Digital Opportunity Index 2005/2006 (presenting data in table form and on maps: whole World, Africa, Americas, Asia-Pacific, Europe)[1] was used evaluating Information Society in the World Information Society Report 2007[2]. And, 2008 Knowledge Economy Index with Knowledge Assessment Methodology (taking into consideration: 1. Economic and institutional regime, 2. Education and Skills, 3. Information and communication infrastructure and 4. Innovation system) was used in [WBI, 2008; KAM, 2008].

National e-strategies of Information Society development around the World are overviewed in the Report on the World Summit on the Information Society Stocktaking [ITU, 2008].

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1 http://www.itu.int/osg/spu/publications/worldinformationsociety/2007/WISR07-stats.pdf
2 http://www.itu.int/osg/spu/publications/worldinformationsociety/2007/report.html ,
  http://www.itu.int/osg/spu/publications/worldinformationsociety/2007/WISR07_full-free.pdf

2. European Information Society development policies

The main guiding document of Information Society development in Europe is EU policy framework "i2010 - A European Information Society for growth and employment" [CEC, 2005]. It promotes the positive contribution that information and communication technologies (ICT) can make to the economy, society and personal quality of life. All i2020 policies[3] are grouped into sections:

- *Regulating the Market[4]*, with two main areas of Information Society regulation at European level: Transmission (regulating the Networks: Electronic Communications regulatory framework, Mobile Roaming Charges, Radio Spectrum policy, 112 - a single emergency number for Europe, regulating the telecommunications equipment market, preventing health-related effects of Electromagnetic Fields, etc.) and Content (regulating what flows through networks: Audiovisual regulation, Copyright and related rights in the Information Society, Web Accessibility);

- *Stimulating the Information Society[5]*, with three main directions: Research and Innovation (Public R&D Funding, Encouraging Private R&D Investment, Coordination of R&D in Europe, Innovation through ICTs), Infrastructure (Europe's electronic communications regulatory framework, Bridging the Broadband Gap, Space policy), Content and Services (Cultural Heritage, Security-Reliability-Protection, Radio Frequency Identification, advanced services based on publicly created information, VAT on electronic services);

- *Exploiting the Benefits[6]*, with three main directions: Public Services (eGovernment, Electronic Public Procurement, eHealth, eLearning, Electronic Customs), Society & Environment (eInclusion, Environment, Road Safety), eBusiness and eCommerce (".eu" domain, ICT Industries and eBusiness, Consumer policy and e-commerce, Online Financial Services, e-Invoicing Rules, VAT on electronic services, etc.).

European i2010 policies of Information Society development are obligatory to EU member states; the evaluation is annual [CEC, 2008]; that definitely has very positive influence on the development of Information Society in Lithuania.

2.1. European success story: national Information Society development in Finland

Good example of national Information Society development policy is demonstrated by Finland [ISSPP, 2007; FinG, 2007; MTCF, 2008a; MTCF, 2008b]. Their primary goal is to increase citizens' wellbeing and economic productivity by utilising information and communications technologies. At the same time, the objective is to strengthen Finland's position as a leading Information Society country. This work utilises Finland's traditional strengths, such as speed of reaction to changes that take place in the operating environment, as well as the long-term, close cooperation of the public and private sector. Information Society development in Finland is promoted in all areas, both in the development of infrastructure, public electronic services, and content as well as in safeguarding fundamental requirements such as security and trust. As the Information Society develops, the challenges also change, so Information Society work is a continuous process.

On 21 June 2007, the Finnish Government adopted a resolution on the objectives of the national Information Society in the period 2007–2011 [FinG, 2007]. The resolution includes the Government's key objectives and priorities to accelerate Information Society development.

The background to the resolution is the third national Information Society strategy, "A Renewing, Human-Centric and Competitive Finland" [ISSPP, 2007]. It covers the period 2007–2015 and it was prepared during 2006 as part of the implementation of the previous Government's Information

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3 http://ec.europa.eu/information_society/tl/policy/a2z/
4 http://ec.europa.eu/information_society/tl/policy/regulate/
5 http://ec.europa.eu/information_society/tl/policy/stimulate/
6 http://ec.europa.eu/information_society/tl/policy/exploit/

Society programme. The strategy outlines the national vision and strategic intent for the kind of Information Society the Government wishes to create in Finland.

On 21 June 2007, the Government appointed a minister-led Ubiquitous Information Society Advisory Board. The Advisory Board's task is to ensure the implementation of the national Information Society strategy as well as the aims outlined in the Government resolution.

During its term of office, the Ubiquitous Information Society Advisory Board is expected to provide insight on the identification of priorities for the national Information Society policy as well as on the setting of ambitious but realistic goals.

The Ubiquitous Information Society Advisory Board will report to the Government annually on the progress of key projects presented in the action programme. The action programme will be supplemented flexibly during the Government's term of office and updated according to new measures or perceived shortcomings.

The national Information Society policy is formulated in the best interests of citizens and companies. The Ubiquitous Information Society action programme [MTCF, 2008a] aims to secure the strong, rapid and balanced development of Finland's Information Society. Action programme projects and measures seek to safeguard the current service offering and to create new services for citizens and companies. The projects help to enhance the productivity of Finnish society as well as international competitiveness.

The ubiquitous Information Society action programme is centred on the development of public administration Information Society projects. The public administration's task is to promote the development of the Information Society by creating operating conditions for companies and by actively developing its own services and operating practices. Business life is also strongly involved in developing the Information Society with its own resources.

In terms of Information Society development, the key measures of the Government's term of office will be directed towards developing the following:

- Information Society basic requirements (trust or service quality, information security, compatibility through standardisation),

- Information Society infrastructure development (electronic identification methods, electronic invoicing);

- the innovation environment and market (competitiveness of communication sector, copyright system changing);

- content and services (new distribution paths for TV programs, e-services in social services and health care, public administration services from single location, uniform, secure and reliable single gateway to public services online);

- expertise/skills and preparedness (new kinds of learning environments, a safe media environment for children and young people).

In the Ubiquitous Information Society Action Programme projects, international influence is exercised via: (1) active involvement in implementing and guiding EU's Information Society policy; (2) development work in international organisations: OECD, World Summit of the Information Society, UNESCO, the International Labour Organization , etc.; (3) close relations with pioneering Information Society countries outside EU: US, Japan, South Korea. At the same time, Finnish technology and service innovations are actively marketed abroad. Promoting Information Society development everywhere, in less developed countries too, is also in accord with Finland's objectives.

4. Information Society development in Lithuania

4.1. Guidelines of Information Society development

Information and Knowledge Society development is one of strategic goals (priorities) of the Government of the Republic of Lithuania (2006)[7].

Development of Information Society in Lithuania is guided by interwoven *national and European strategy documents*. On the one hand, there are approved:

1. Conceptual Framework of the National Information Society Development of Lithuania (2001)[8] and Lithuanian Information Society Development Strategy [LISDS, 2005], approved for 6-year-long period with 5 priorities:
    - Competence of Citizens, social cohesion,
    - Modernization of Public Administration (using IT),
    - Knowledge Economy,
    - Lithuanian Culture and Language;

2. Lithuanian Information Society Development 2006-2008 Program [LISDP, 2006], indicating concrete tasks, means, expected results, funding needs, deadlines, and responsible institutions.

On the other hand, Lithuania seeks to comply with the European requirements:

3. EU policy framework "i2010 - A European Information Society for growth and employment" [CEC, 2005]. It promotes the positive contribution that information and communication technologies (ICT) can make to the economy, society and personal quality of life. The detailed results of progress evaluations of 52 benchmarking indicators (for which up-to-date data is available) are issued annually [CEC, 2008];

4. National Lisbon Strategy Implementation Program [NLSIP, 2005]. It has the Guideline No. 9 "Spread of information and communication technology, the ease of effective use and the creation of a universally receptive knowledge-based society". The implementation of Lisbon Strategy in Lithuania is controlled by EU with annual national self-assessment Progress Reports[9] and European Commission's assessment of National Reform Programme for Growth and Jobs[10].

In addition, EU structural assistance (period 2007-2013) for Lithuania is allocated in accordance with:

5. National general strategy: The Lithuanian Strategy for the Use of European Union Structural Assistance for 2007-2013 [NGS, 2007]. It has 4 general (horizontal level) areas, the first of which is Information Society. There is presented EU structural funding allocation for Broadband Networks, ICT (Access, Security, Risk Prevention, Research, Innovation, e-Content, etc.), Services and Applications for Citizens (e-Health, e-Government, e-Learning, e-Inclusion, etc.), Services and Applications for SMEs (e-Commerce, Education, Networks, etc.); and

6. Operational programs for implementation of this strategy: Human Resources Development, Economical Growth, and Cohesion Promotion. The largest part of funds (45.72 %) are allocated to Operational programme for the Economical Growth for 2007–2013 [OPEG, 2007]. The 3rd priority (i.e., investment direction) of Economical Growth operational programme is "Information Society for All", funded by the European Regional Development Fund (ERDF), with Information Society Development Committee under the Government of the Republic of Lithuania as a responsible authority. "Information Society for All" has 2 sub-priority areas:
    - Development of e-Services and Content (Services of e-Government, e-Health, e-Learning; e-Public Procurement; e-Commerce; e-Democracy; Lithuanian Language and Culture; Scientific Data Archives; Intelligent Management Systems; Development of Digital TV);

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7 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=319951 (in Lithuanian)

8 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=130056

9 http://ec.europa.eu/growthandjobs/pdf/nrp2007/LT_nrp_en.pdf

10 http://ec.europa.eu/growthandjobs/pdf/european-dimension-200712-annual-progress-report/200712-annual-progress-report-LT_en.pdf

– Development of Infrastructure (Broadband Networks; Compatibility; e-Security)].

Recently the Information Society Development Committee has approved the Plan of Implementation of "Information Society for All" priority measures [PI"ISA", 2008]. It designates the ERDF funding for e-Government services (LTL 168 million), e-Democracy (LTL 17 million), Intelligent Management Systems (LTL 85 million), and Broadband Electronic Networks (LTL 149 million). The schedule of funding of "Information Society for All" priority measures has been approved, too[11].

In addition, there are approved:

- Law on Electronic Signature [RLLES, 2000],
  Electronic Signature Monitoring Authority (2002)[12],
  Requirements for Providers of Certification Services Issuing Qualified Certificates, of the Requirements Applicable to Electronic Signature Facilities, of the Procedure of Registration of Providers of Certification Services Issuing Qualified Certificates, of the Electronic Signature Monitoring Regulations (2002)[13];
- Position Paper on E-Government (2002)[14] and
  Plan of Means for Implementing the Concept of Electronic Government (2003)[15];
- National Program for Social Integration of the Disabled for 2003-2012 (2002)[16];
- Strategy for Creating the Integral System of State Registers (2002)[17],
  Plan of Means for Implementation of the Strategy for Creating the Integral System of State Registers (2003)[18],
  Law on State Registers (2004)[19];
- Law on Legal Protection of Personal Data (2003)[20];
- Law on Electronic Communications (2004)[21];
- Strategy for the Public Administration Development until 2010 (2004)[22] (with special attention to e-Government) and Plan of Means for 2007-2010 for Implementing the Strategy for the Public Administration Development until 2010 (2004)[23];
- Program of General Computer Literacy [GCLP, 2004],
  Standard of General Computer Literacy (2005)[24],
  Strategy of Introduction of Information and Communication Technologies into the General Education and Vocational Training for 2008-2012 (2008)[25],
  other *eSchool*-related Lithuanian policy documents[26];
- Law on Information Society Services (2006)[27];
- Lithuanian eHealth Development Strategy for 2007-2015 (2007)[28];

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11 http://www.ivpk.lt/fondai/12.htm (in Lithuanian)
12 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=165046 (in Lithuanian)
13 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=198003 (in Lithuanian)
14 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=313042
15 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=273447 (in Lithuanian)
16 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=279741 (in Lithuanian)
17 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=245654 (in Lithuanian)
18 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=253228 (in Lithuanian)
19 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=250197
20 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=208886
21 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=242679
22 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=316688 (in Lithuanian)
23 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=321487 (in Lithuanian)
24 http://www.emokykla.lt/admin/file.php?id=185
25 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=312799 (in Lithuanian)
26 http://www.emokykla.lt/en.php/documents/lithuanian_policy_documents/1126
27 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=277491 (in Lithuanian)
28 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=306637 (in Lithuanian)

- Law on <u>Documents and Archives</u> (1995; last amended on 15 April 2008)[29] ;
- etc.

So, Lithuania has enough strategy documents and good prospects of EU funding for Information Society development.

4.2. Information Society development current status

According to [CEC, 2008], Lithuania lags behind with many aspects of Information Society development, i.e., most of the Lithuanian benchmarking indicators are below the EU average. However, fast progression in Internet usage by households and intensive e-commerce activities are laying the foundations for further developments.

<u>Broadband.</u> In October 2007, broadband penetration reached 13.7%, compared to 10.6% a year earlier, but still lags behind the EU27 average of 20%. Broadband services are provided through a number of alternative platforms. The mobile market is well developed in Lithuania and is expected to be a source for future growth in broadband connectivity and use of online services.

Overall growth in take-up of broadband and amongst enterprises is stalling, but households seem to be converting from narrowband faster with now 77% of connected households using broadband. This corresponds with the usage of online services where Lithuania is above EU average in services requiring higher bandwidth, and placed below EU average in the low bandwidth consuming services. As in the other Baltic countries Internet telephoning/videoconferencing is a major driver of growth.

<u>Online Public Services.</u> The average score for all public services for *fully-online availability* is 35%, well below the EU average. Online availability of services both to citizens and to enterprises has remained constant over the past few years. *Online sophistication* is 12 points below the average. Two out of nine relevant services reach the fifth level of sophistication.

Take-up by citizens lies 12 points below the average, whereas for businesses it is 11 points above. What is significant is that 60% of companies have used eGovernment to send filled in forms, against an EU average of 45%.

The goals of Lithuania's eGovernment strategy are to improve transparency of the decision making process, efficiently deliver high-quality public services and provide information to the public, businesses and institutions by exploiting the possibilities offered by information technology.

<u>ICTs in the Economy.</u> ICTs have a minimal impact on the Lithuanian economy. Investment in ICT-related R&D is very small as are exports of ICT products. Enterprise take-up of broadband has not grown, and is well below EU average. Use of ICT tools and online services among enterprises is low with the exception of selling online which is above average. But having a rather good level of digital literacy of the population and basic user skills in the workforce, Lithuania has a sound basis for future developments.

4.3. Main problems and challenges

There are problems because of lack of central managing institution for all Information Society activities: Information Society Development Committee (ISDC) has a lower status than Ministries (head of it is not a member of Lithuanian Government), on some Information Society questions ministries make decisions without coordination with other ministries and ISDC. Not all responsibility boundaries are clear, better coordination would be helpful. There is some redundancy of Information Society - related institutions; some work is duplicated by several governmental institutions; some important areas are left out of scope by all institutions.

Sometimes the available Information Society development finances of EU structural funds are spent, but the expected outcome is not delivered. E.g., National Audit Office has cleared up that LTL 17 million are spent on development of e-Health information system, but it is not functioning yet; consequently, three Committees of Lithuanian Seimas will apply to Prosecution Service to

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29 http://www3.lrs.lt/pls/inter3/dokpaieska.showdoc_l?p_id=319540

investigate this case [Mate, 2008].

IT standardisation in Lithuania is one of biggest problems for Lithuanian IT companies: long term IT standardisation policy and plans, interoperability framework for IT systems (e-services) development and operation are lacking. Because of that, plenty of closed (proprietary) systems are developed and used, having low competition possibilities, and high development/usage cost.

Involvement in EU's Information Society policy institutions, international standard Committees and working groups, development work in international organisations is low. Closer relations, cooperation with pioneering Information Society countries are lacking.

4.4. Success stories[30]

Developing Information Society in Lithuania, there is a good tradition of fruitful cooperation between responsible governmental institutions (Information Society Development Committee, Ministry of Education, Centre of Information Technologies of Education, Ministry of Economy, etc.) and associations of IT professionals and companies (Association of the information technology, telecommunications and office equipment companies Infobalt, Lithuanian Computer Society, representative office of the ECDL Fund in Lithuania, Knowledge Economy Forum[31]. (E.g., 1 % of Lithuanian population has ECDL computer driving licences, already). We hope that fruitful collaborative work will continue and expand in the future, too.

For the period of 2004-2006, LTL 217.7 million (over €63 million) of EU Structural Funds Support was assigned for the implementation of the Lithuanian Information Society projects in two main areas: IT infrastructure and eServices. Of this, some LTL 158.9 million (€46 million) came from the European Regional Development Fund. In all, five major infrastructure projects were financed and 14 projects in the area of eGovernment and eServices. These were part of the Information Society for All project, of the Economic Growth Action Programme, which the Government wishes to continue implementing in the next programming period 2007-2013. It is intended that 4% of the total amount allocated to Lithuania should be assigned to this end. 70% (LTL 577 million or €167 million) of funding for the Information Society for All priority would be assigned to the development of eContent and eServices, while the remaining 30% (LTL 247 million or €71.5 million) would go to IT infrastructure.

The project "Rural Area Information Technology Broadband Network (RAIN)"[32] creates broadband infrastructure in white areas, where this infrastructure is missing but the potential for eliminating the digital divide between urban and rural areas is strong. The project aims to transform the lives of individuals, increase social cohesion and contribute to economic growth. RAIN's initial phase (which has been successfully finished in 2008, already) entails laying fibre-optic channels to all local administrations in rural territories (some 3,200 km).

RAIN uses the most modern fibre-optic infrastructure with unlimited transmission capacity and is targeted at creating the basic broadband infrastructure connecting rural townships. Technological neutrality and open access to this infrastructure for all existing and new operators will be guaranteed. The infrastructure will be operated by an independent, non-profit public company, which must provide it to all operators. The operator is not entitled to provide services to end users – guaranteeing competition in all territories.

A later phase, in 2008-2010, will expand this infrastructure so that rural inhabitants and organisations can experience equivalent broadband services (price and technical range) as urban areas. It is also planned to develop the infrastructural part of the network and to invite all existing and new operators to complete the last mile and deliver services to end users. RAIN is expected to improve opportunities for rural inhabitants to use ICT for education, training, creativity and

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30 http://www.epractice.eu/index.php?page=document.list&cntr=15
31 http://www.zef.lt/
32 http://www.rain.lt/EN/index_1.php

entrepreneurship. It is hoped that RAIN could become a model for Central and Eastern European countries for engaging rural communities in modernising their activities.

RAIN is also expected to stimulate existing and new commercial operators to provide broadband Internet services in rural areas to citizens, non-governmental organisations, public bodies and enterprises. RAIN will create more favourable conditions for economic and cultural activities, the development of alternative activities and partnerships, the provision of services, and communication with self-governance and public bodies.

At present rural Internet access points (RIAPs) still are one of the most important sources of access for the population living in rural areas (Lithuania has about 23 000 small villages; 33 % of the population live in rural areas in 2007). Development of RIAPs network is a project with the aim to set up and provide computer services with Internet access mostly to small communities in rural and remote areas of Lithuania. During 2007-2008, 400 public Internet access points are opened to Lithuanian people in rural areas. The project "Development of Rural Internet Access Points Network"33 is financed by EU Structural funds and Lithuanian Government and is implemented by the Ministry of Interior. This initiative is generating new IT knowledge influencing the development of economics, social life, education and decrease of unemployment in rural areas. After implementation of the project at the end of 2008 Lithuania will have the biggest number (875) of established RIAPs (considering population density) in EU.

"A Computer Literacy Basics for e-Citizens" project has been successfully finished by the Association "Window to the Future" (W2F) on May 2008[34]. The objective of the project was to provide training on basic computer literacy, as well as raise awareness about safe Internet usage, to 50 000 persons. The content of the training courses is based on the computer literacy standard developed by the Government-approved qualification programme, which corresponds to the latest version of the European Computer Driving Licence (ECDL) programme.

The Lithuanian State Tax Inspectorate has announced that over 844 000 taxpayers submitted their income tax declarations on-line in 2008, bringing the percentage of on-line declarations to 88 %. The Inspectorate also received 59 000 on-line asset declarations and almost 530 000 applications for the allocation of a 2 % tax rebate. The new features this year included an increase in the amount of data provided in the pre-filled tax forms, an on-line calculator of tax-free income, and the option to fill in or amend the declaration on-line. All these features further encouraged Lithuanians to switch from hard-copy declarations to the electronic version, bringing the percentage of on-line declarations up to 88% (from 75% in 2007, 46% in 2006, 25% in 2005, and close to 20% in 2004). The on-line declaration system has not only facilitated the process of declaring income, but has also reduced errors, cut processing and storage costs and has reduced the amount of paper wastage (i.e., it has calculated that, if all residents had filled in hard-copy declarations, they would have used 20 tonnes of paper. By submitting eDeclarations, the Lithuanian taxpayers have preserved a small grove of more than 300 trees this year, it reveals). Another development in 2008 was that a higher number of eDeclarations were submitted from 'public hotspots' in rural areas. The Tax Inspectorate has established a successful co-operation with the Ministry of the Interior and the Association of Public Hotspots, which allows people with no computer or internet access to use the hotspots for free in order to submit their tax declarations. Over 5 000 declarations were submitted this year through this service, which is twice as many as last year.

A government-backed multi-stakeholder programme has developed a special eSignature which Lithuanians can use for electronic signatures using their mobile phones since November 2007. Just one year ago, the Lithuanian government, two leading telecommunications companies (Omnitel and Bitė Lietuva), two major banks (Hansabankas/Swedband and AB SEB Vilniaus bankas), as well as the Window to the Future Association (Langas į ateitį) signed up for the eSignature Initiation Programme. And the programme has already yielded its first results: qualified, secure mobile

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33 http://www.vipt.lt/
34 http://www.langasiateiti.lt/nauiienos/nauiienu-archvvas/?newsid=132 (in Lithuanian)

eSignatures which were developed based on the technical recommendations of the stakeholders. The new system allows Lithuanians to sign electronically using a mobile phone with a new eSignature-compliant SIM card. People who wish to take advantage of the mobile eSignature needs to replace their SIM card and sign an eIdentity agreement. Since mobile penetration is very high in Lithuania and because mobile eSignature is very simple and convenient, the new solution is expected to become very popular. To eSign social security documents, customers have to submit their mobile phone number and then they will receive a request to enter their six-digit PIN code in their phone. The security of eSignatures is guaranteed by UAB SSC, the only Lithuanian company officially authorised to issue digital certificates. Thanks to the latest technological standards, the digitally signed documents are more secure than the ones signed by hand (i.e., according to specialists in the field, this mobile eSignature infrastructure is especially secure: two codes, known only to the user, protect the ID key contained in the telephone from illegal use. This means that, even if the telephone is lost or stolen, another person cannot use the eSignature). Now eSignature can be used with the Social Insurance Fund, the State Tax Inspectorate and the eGovernment Portal. In future, the range of services for which citizens can sign electronically will be significantly expanded.

In a first for a Lithuanian state institution, the Lithuanian Social Insurance Fund SODRA has introduced a new on-line system for communicating with its clients using certified eSignatures on January 2008. Now users are able to employ the new Electronic Servicing System for Insurers (EDAS) to find information in the SODRA databases and to submit their social insurance notifications and applications. Access to the service is limited to those whose identity has been verified by way of eBanking systems or a qualified electronic certificate. In order to make full use of all of the EDAS' functions, an insurer must first obtain a qualified electronic certificate (Class 3), the necessary secure equipment for Generation eSignature and a contract with one or more Lithuanian banks for the provision of eBanking services. However, for the simple submission of applications or the location of relevant information on the 'Insurer's Portal' it is necessary only to be a user of eBanking services. On the other hand, insurers who are still not ready to communicate with SODRA on-line can submit their signed social insurance notifications in hard copies to the territorial offices of SODRA, as before.

Under the EU structural fund project „Creation of interoperability – capacity to interact of information systems of public administration institutions"[35] a central (state) website of electronic services is developed. It will become a mediator between business, residents and institutions providing services. Such a website would guarantee organization of provision of 20 main public electronic services, authentication of users while providing third- and fourth- sophistication level services as well as could provide services which are not attribute to any other institution, or new complex services (i.e. composed of electronic public services which are already being provided).

Now Lithuania is undertaking implementation of two projects related to digital libraries: "Establishment of the Lithuanian National Radio and Television virtual library" and "Creation of an integral virtual information system of libraries". The first project involves a TV and radio public virtual library and seeks to ensure electronic access to Lithuanian audiovisual heritage recorded in television programmes. The second project is being implemented in cooperation with the Lithuanian Art Museum and Lithuanian Archive Department. This project anticipates harmonization of a data bank of digital cultural heritage objects belonging to libraries, archives and museums holding over 3 million digital pages of original manuscripts, newspapers, old books, registers of births marriages and deaths, works of art, folk graphics, maps, drawings, paintings and other valuable cultural heritage objects of high historic value.

Since February 2007 the Lithuanian Ministry of Culture is implementing a national programme to provide free internet access to the general public through their local library within three years. The first step is to equip all national libraries with computers. The programme is part of the wider

35 http://www.evaldzia.lt/govgate/investicinis.html (in Lithuanian) ,
http://www.evaldzia.lt/govgate/index en.html

international *Global Libraries*[36] initiative supported by the Bill and Melinda Gates Foundation, which has already provided an initial grant of over €220.000. It is believed that public libraries, of which there are 1.382 in Lithuania, could become a strategic link in the efforts to improve access to the internet, especially in rural areas. The first wave of library computerisation is expected to take place in 2008, while the second should follow in 2009. The project aims to make at least six computers available for every 10.000 residents.

5. Conclusions

Because of the availability of EU Structural funds, there are prepared and implemented valuable costly Information Society projects in Lithuania. Information Society development policy documents (except IT standardisation ones) are prepared, but in some cases neglected (delaying needed actions). Current status of Information Society development in Lithuania is rather promising. On the other hand, serious improvements of Information Society development policy based on the examples of European leading countries (first of all, consolidating Information Society development activities) would be helpful.

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Polish ICT Strategies

As part of the implementation of the Lisbon Strategy, Polish Parliament adopted in 2004 amendments to the Act on Public Administration creating a new department of "computerization" with the head in the rank of the Minister. In February 2005 Parliament adopted the Act "On IT business entities pursuing public goals", which creates a legal conditions for the systematic implementation of information technologies in the "e-government" – specifically, areas of citizen services and functioning of state and local authorities. This Act provisions, that the Minister responsible for the computerization must establish the Council for Information Technology, which consists of representatives of government and non-governmental organizations. The Council is a consulting body to the Minister, with the term of office lasting two years. Currently, the Council is chaired by Professor Zdzislaw Szyjewski, Vice-president of the Polish Information Processing Society.

On the basis of the above Acts in the years 2005 - 2007 several laws related to specific problems associated with use of information technology in the public sector and to relations with citizens were issued. These laws have helped to implement the guidelines contained in the European framework of interoperability into the Polish legal system and create the minimum requirements for public records, administration systems, databases, exchange of information in electronic form, publication of legislative regulations in Internet, requirements for electronic signature within the administration, templates of electronic documents and forms based on XML. Rules for archiving electronic documents and their descriptions were set out, as well as principles of electronic confirmation of delivery through electronic means. Introduced solutions provided basic framework of interoperability of information systems created within the public sector. As a result, since August 2008 all state bodies are obliged to receive complaints from citizens filled by means of electronic communication and signed with the electronic signature, and must consider them to have an effective legal status.

Regardless of the solutions of a technical nature, such legal framework made possible for the Council of Ministers to issue the regulation determining the state IT development roadmap – Information Technology Plan for years 2007 - 2010. It is the first document in the history of the computerization of Polish public administration, which systematically describes specific tasks to be carried out by government departments for the development of the information society in Poland.

The IT Plan defines:
• IT priorities and objectives of the country that should led to development of systems used in performing public functions,
• list of projects, which will be needed in order to meet specific priorities and services, detailed descriptions of these projects, estimated costs of their implementation, possible sources of funding and entities responsible for their implementation,
• action plan for the development of information society, taking into account implementation priorities of information systems, consistent with the initiative *i2010 European information society for growth and employment*,
• public tasks, which should be implemented with the use of electronic means (priority services for citizens and businesses); additionally, entities responsible for implementing specific services have been identified as well as dates for their commencement.

In order to ensure proper coordination of the IT Plan, in March of 2007 the President of Council of Ministers established a standing Committee of the Council of Ministers for information technology and communication. Its objectives include initiating and preparing opinions on government documents in the field of computerization of public administration, development of information society, communication, public registers and applications of information technology in building a knowledge-based economy. One of the first actions of

this Committee was to create legal conditions for facilitating free Internet access in areas at risk of digital exclusion.

Regardless of the strategy aimed at the application of information technology in public administration, in 2007 the information society strategy was set out. Both strategies have been subjected to extensive public consultation, for instance they were widely discussed in May 2008 during events celebrating World Information Society Day, coordinated by the Polish Information Processing Society. In those annual events, purpose of which is to promote public awareness of the idea of the information society and to address barriers to be overcome, the largest Polish chambers of commerce, professional associations, non-governmental organizations and public institutions are involved.

Considerable part of the tasks arising from the strategy is implemented within the framework of the projects supported by the European Union for the period 2007-2013. Currently, in conjunction with advanced discussion on the European Interoperability Framework version 2.0, Minister in charge of the computerization began the process of adopting solutions proposed during the discussions on the EU document to the Polish legal system.

The process of updating the information society development strategy is almost finished with help from participating local self-government, scientific and non-governmental organizations, as well as open consultations over the Internet. According to the schedule, revised strategy should be published in November 2008, constituting the basis for updating the Information Technology Plan.

Polish ICT Strategies

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Polish ICT Strategies

- New department of "computerization" created in 2004 with the head in the rank of the Minister.
- *On IT business entities pursuing public goals* Act in February 2005 established legal conditions for the systematic implementation of information technologies in the "e-government" – areas of citizen services, functioning of state and local authorities.
- Establishment of the Council for Information Technology – representatives of government and non-governmental organizations.

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Polish ICT Strategies

PTI

2005-2007 – laws addressing specific problems associated with use of information technology in the public sector and relations with citizens:

- implementation of EU guidelines on interoperability,
- minimum requirements for public records, administration systems and databases,
- exchange of information in electronic form,
- publication of legislative regulations in Internet,
- requirements for electronic signature within the administration, templates of electronic documents and forms based on XML.

Marek Hołyński Polish Information Processing Society 26 October, 2008

Polish ICT Strategies

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Polish ICT Strategies

Standing Committee of the Council of Ministers for information technology and communication:

- coordination of the IT Plan,
- initiation and preparation of opinions on government documents in the field of computerization of public administration,
- development of information society,
- organization of public registers,
- applications of information technology in building a knowledge-based economy.

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eGovernment - One step further

The (new) challenges e-government have to face and an example of organization ready to deal with them

Daniel Gruia - President of Agency for Information Society Services, Romania

Once upon a time the e- ... – a déjà-vu

Once upon a time the „e-„ was known as *dot-com*. At these times [1] (as now in e-government) the companies (now the government bodies) asked the investors (now the politicians) for money in exchange of future promises. And the investors pumped money into game. Then you found companies going from $3 per share in April to around $34 per share in early May 1998 [2], based only on promises of future gains. A "new business model" was promoted: "Get Big Fast". Then the reality stroked: there is no gain in this game. So, when the investors got smarter, the *dot-coms* went back to their real value[i]. So you found companies going down from $241 a share in March 2000 to $1.63 a share in 2002 [3], or from a value of $12.5 billion in 2000 to $95 million in 2004 [4].
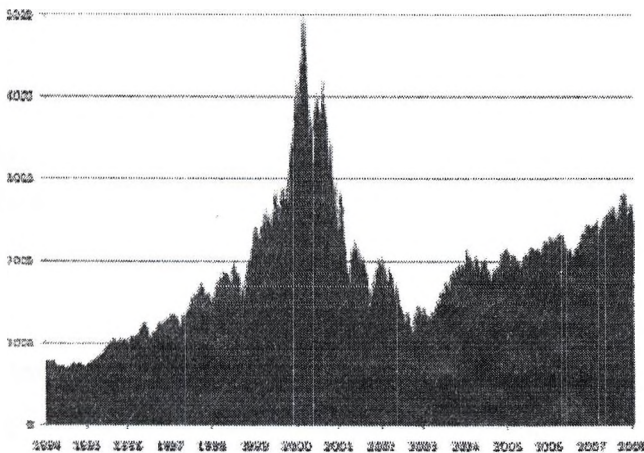

Chart of NASDAQ closing values from 1994

The reason for failure may be the engineer's approach to business. That is happening when a company wrongly defines as good product, the product with the most features technologically possible, ignoring the reality of the market and putting the business into expenses not covered by sales.

What is happening now into e-government? The government bodies (as companies in the past) are asking the politicians, who have the role of distributing resources (then, the investors), for governmental funding (equities in the *dot-com* era) in exchange of good e-services for citizen

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[1] late 90's early 2000's
[2] K-tel International.. See http://en.wikipedia.org/wiki/K-tel
[3] Inktomi Corporation, See http://en.wikipedia.org/wiki/Inktomi
[4] Lycos, See: http://en.wikipedia.org/wiki/Lycos

1

(future promises). In Europe, the result looks disastrous even in the most appreciated e-government systems.

As an example, in one of the most appreciated e-government systems in Europe, 23 of its 60 services were never used in the last 5 years. In the same country, in one of its richest regions, the number of electronic transactions represents less than 0.1% of total transactions – less than three transactions per week[1].

Questions: How many of e-government services were developed asking the end user in a business-like approach (market study, segmentation, positioning, pricing, up-selling, cross-selling etc)? How many of the services were created in offices by smart engineers, knowing what technology may offer but with no link with the end user, other than common-sense, then promoted for funding to political layer? Isn't it a déjà-vu?

Agency for Information Society Services (AISS) – e-government AsIs – a *dot-com* approach

The Agency is operating some critical e-government systems: the Electronic Public Procurement System, the National Electronic System and the Electronic Assignment of International Road Transport Licenses and Persons Transport Licenses System.

The National Electronic System – www.e-guvernare.ro – is, by the law, the portal for service delivery by the central government. It gives, to the big companies, the opportunity to provide all fiscal declarations online. It also centralizes the forms of the central administration so the citizen may download them with paying only a last visit for submitting the filled forms to the public institutions.

In April 2008, The Government of Romania adopted a memorandum stating that the *e-guvernare* system will be developed as electronic Single Point of Contact for implementing the EU Service Directive boosting the position of AISS and its systems among other institutions.

The Electronic Assignment of International Road Transport Licenses and Persons Transport Licenses System is a fully bidirectional system which assigns the licenses to the transporters according with criteria established by Romanian Road Transport Authority and the Ministry of Interior. The transport companies introduces their transport offers (type of cars, number, usage etc) and their path request, the Romanian Road Transport Authority or local

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[1] The country name is less important than the phenomenon.. For more details see: From Electronic Government to Information Government, Viktor Mayer-Schönberger, Harvard University

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Administration introduces other criteria (transporter experience and vehicle confirmation) and the application, select the winners for each path.

The Electronic Public Procurement System is the star of the Agency. One of the top three e-procurement systems in Europe[ii] was developed starting with 2002 and in 2008 will be fully compliant with EU directives and Manchester declaration – 2005.

The system is fully bidirectional, with the possibility of rolling the public procurement, in different types of procurement, entirely by electronic means. Even if the system is not used for procurement, all public institutions are obliged by the law to publish through it the public procurement announcements and assignments.

The number of users (companies as bidders and public institutions as buyers) registered in the system is more than 20 000.

Starting with 2008, the Government of Romania published the decision that contracting authorities are compelled to use electronic means for at least 20% of public procurement. This will create an electronic procurement market of more than 3.5 billion EUR.

All of the systems, as well as part of its personnel, were previously part of another governmental body, having as main duty the supervision and management of the frequencies spectrum. Their main challenge was to provide reliable services and still remained as such when the IT systems and people were moved apart and created AISS. The agency is still an organization more "service oriented" than "customer oriented" and, under the (still) general accepted e-government principles, could stay as such indefinitely, with only minor changes to accommodate new services when needed.

This may be the end of a successful presentation of an e-government institution.

But...

We already know it – Some classic e-government challenges

Lack of data reusability

Since most of the data rest in governmental "silos" (see "Low maturity" below) a strong sense of ownership is developed. Mixing the understanding of the power of information ownership with the drastic penalties (image is power) in case of sensitive data disclosure and with (sometimes) an inherited culture of secrecy and you will find an almost impossible-to-break

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wall against data exchange. Therefore citizens are asked to bring the same data again and again, to same or different organizations or even parts of the same organization[1].

Lack of human resources

Since sometimes the governmental institutions are used to act like monopolies, most of the time they do not understand that labor market means free competition for people's will to work. Having strong restrictions in wages of the public personnel, a wage of 3000-5000 EUR per month for an IT expert is out of the question, being seen more like an exotic issue than like a fight for human resources.

Unforeseen consequences – Some post-classic e-government challenges

Data tsunami

"Number of transistors on a chip doubles every two years". This assumption known as Moore's law, still valid since 1986, is used mostly on describing how fast the technology advances. However one of its unforeseen consequences is that this processing power will pump more data in IT systems. Therefore "Data" itself become one of the main issues. Business continuity and data reliability are concepts that should be added to classic data security (confidentiality, integrity, availability). In the same time a new question is raised: How much information can you extract from your data? The existence of analytical systems and the difference between them and operational systems are still a white spot on the knowledge map of government IT employees.

Citizen education

Citizen expectancies rise as their digital education increases. This happen as more devices and commercial services are available and used.

Although digital gap in education was seen as between people with access versus people with limited access, a new digital gap is rising: between average people and their governments. The spread of mobile phones and other digital devices (mp3 players, GPS systems or just digital cameras) has as unforeseen consequence the rise in digital education of citizens. "If I can receive weather info from any corner of the world or I can make banking transactions using my digital device, why can't I see online at least the tax amount I have to pay? Why they ask again and

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[1] Bulgaria made an impressive step forward forcing the institutions to ask for data not from citizen but from the issuer of the data.

again for the same document issued by "them" and provided already to "them" in another public institution?"

The governments have to face the pressure of their citizens who, being more "digital" educated, increase their expectancies and ask for more: better services, more transparency, cost cuts.

Ivory tower approach

As described above (see "Once upon a time the e- ... – a déjà-vu") most of the e-government services are developed using engineer's approach: "its technical possible then we should deliver it". Questions:

- **How often does e-government providers:**

  - Analyze the customer needs and satisfaction?

  - Analyze the customer behavior?

  - Prioritize the investments according with the above?

  - Give up the projects without usage?

- **What is the percentage of e-government sales, promotion and advertising in each project?**

As unforeseen consequence we have a loose couple with the end user and a total link with political layer as investor, which brings a set of technically brilliant but useless systems for the end user.

Low business approach

Beside the creation of services accordingly with the customer's needs, a lot of tools are used in different stages of electronic service delivery:

- how user finds the provider: search engine, on-line catalog

- tools for selecting the goods: recommender agent, configurator,

- negotiations: aggregators

- sales: transaction processor, data interchange

- payment: cryptography, e-payment systems

- delivery: tracking agent

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- post-sales: on-line help, call-center

Too often the service provision is under evaluated and a lot of useful business information is lost. As unforeseen consequence, knowledge of customer relation management is not developed and business opportunities like cross-selling or up-selling are missed.

Low outcome orientation

If for front office services the customer is easier to be identified, for back-office services the customer is more diluted and harder to point. As a consequence, the accent of investment is put on computerization, without links to what should be the outcome of computerization: business process improvement. As consequence, money is wasted in useless systems and services.

A useful IT investment is the one that is explicitly linked with business process improvement. Therefore a Governmental Architecture Framework is needed as a methodology for creating this link. Also, if business processes should be described, then a methodology for this action should be chosen. And here comes a more subtle decision: should it be an added value oriented (like DMM-DFD-WFA, used in oriental countries[1]) or a cost oriented methodology (like BPMN[2]).

Low maturity

A CMMI[3] may be used to assess and predict behaviors in organizations and, maybe more important, to the entire government.

Understanding the level of maturity and applying it at the governmental level, with ministries as departments, can explain why public institutions are reluctant of sharing data (i.e. a level 2 maturity – "Our group vs. the rest of the organization") and the cultural change needed to change the situation (grow the maturity towards level 3 for inter-institutional data exchange and further to level 4 for sharing data with business and citizen). Such an understanding gives the real image of the size of the hurdles that have to be overcome in implementing useful e-government.

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[1] South Korea, Japan, usually countries under USA influence.

[2] The Business Process Modeling Notation (BPMN) is a standardized graphical notation for drawing business processes in a workflow. BPMN was developed by Business Process Management Initiative (BPMI), and is now being maintained by the Object Management Group since the two organizations merged in 2005.

[3] Capability Maturity Model® Integration (CMMI) is a process improvement approach that provides organizations with the essential elements of effective processes. It can be used to guide process improvement across a project, a division, or an entire organization. It is developed by Software Engineering Institute, Carnegie Mellon University. See http://www.sei.cmu.edu/cmmi/ for more information.

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Level	Human Capital	Knowledge Processes	Culture	Infrastructure
OPERATE	Individual	Personal	Me	Manual systems of non-networked PCs
CONSOLIDATE	Functional group	Department	Our group vs. the rest of the organization	Functional systems
INTEGRATE	Enterprise group	Enterprise	All of us	Enterprise Systems
OPTIMIZE	Enterprise group	Extended enterprise	Our partners and us	Extended enterprise systems
INNOVATE	Dynamic network	Situations matrix	Adaptive groupings	Adaptive systems

Five levels of maturity as described in The Business Intelligence Competency Center: A SAS® Approach

Agency for Information Society Services (AISS) – e-government ToBe – a new approach

Going out of silos

The creation of the Agency and the position it was given related with other public institution will definitely not solve all the problems e-government has in Romania but gives a strong pretext for starting the long and painful trip to success.

The road from government AsIs, with loose couple between institutions, lack of alignment and common understanding, towards ToBe, with integrated institutions and real common actions is to be sustained on four pillars:

- Central provisioning

- Administration data exchange

- Unified methodologies

7

- Standardization

Central Provisioning

AISS is also designed to provide central back-office systems for central government. Several outcomes are targeted: common knowledge pool, costs cuts, simultaneous improvement, cross-domain analysis, improved security.

Administration data exchange

By using its position created by the operation of the only portal for provisioning of e-government services by the central government institutions and by the memorandum for implementing the portal as electronic point of single contact, AISS may become the data broker for public institutions. However, enforcing the law may be proved as insufficient and more actions to be done. The main challenge of AISS is to become the most trustee partner for the other institutions. The cultural wall can be overcome mainly by cultural means and trust is one the most important mean.

Unified methodologies

In order to obtain a synergy effect among the public institutions in regarding the improved outcome of IT&C a common methodology should be used. Here the AISS have, by the law, the authority to regulate the e-government domain.

Some of the main targets are: developing a Government Architecture Framework and a Business Process Methodology.

New version of IT public servant

The lack of human resources and the past experience of failed projects in public administration increased the understanding of advantages brought by outsourcing. However, there is a pool of business and IT knowledge that should be preserved and used in new services development. Therefore, a new position of IT public servant should be considered, going from programmer towards a more value-added position: business process analyst. Indeed, the former IT public servant is the depositary of business process knowledge in his/her organization and is a key person for developing the appropriate back office services for the institution. Again, for a common understanding among the institutions, a common methodology framework is needed.

8

Agency Core Business

Having as premises the experience gathered both in public administration and in business, the training provided by third parties and the information coming from other e-government environments, the AISS management designed the organization from scratch delivering a fully business approach inside a public institution.

Starting from cultural changes (implementing concepts like "client", "marketing", "sales", "business process analysis") to structural changes (the business was split into a promotional and an operational branches) the organizational design was oriented to face the challenges into developing useful, outcome oriented e-government services.
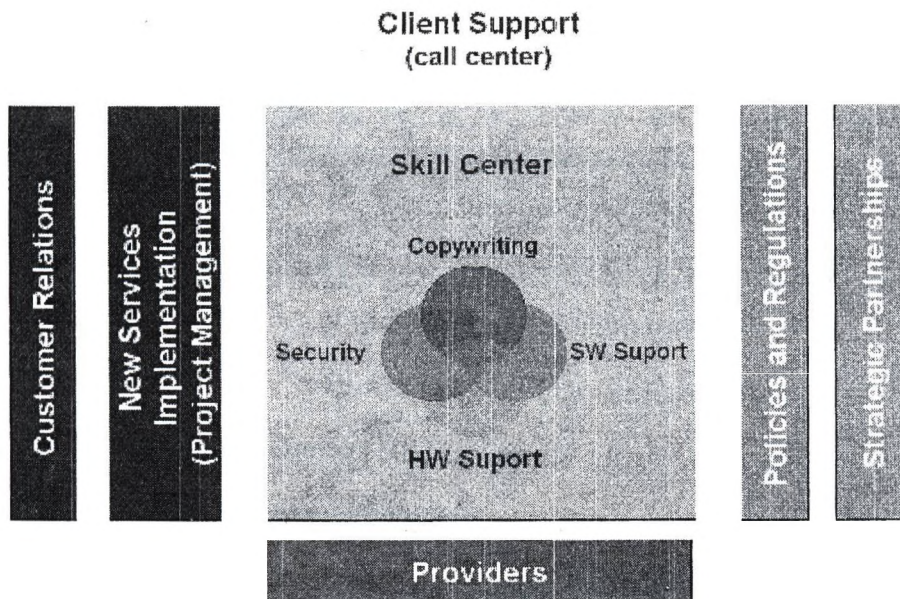
4 Conclusions

1.   "The internet was invented in the 1950's; it didn't become popular until the 1990's. When a company or many companies[1] are promising life-altering changes in how we live our lives, be very skeptical. Even if these ideas for change are realistic, they don't happen overnight, in most cases they don't happen for decades!"[2]

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[1] Read „e-government providers" instead "companies"
[2] http://www.theinvestorsjournal.com/lessons-from-the-dot-com-bubble/

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2.   Because of a strong link with its finance providers and a weak link with its end users, e-government may invest in useless projects (as "dot-com" companies in the 90's)

3.   An output or outcome-oriented metric (i.e. cost per user or cost per burden saved) may affect the political trust, support and financing therefore a fall of e-government as we know it.

4.   When a service is delivered to a customer a <u>sale</u> should be made (Know Your Customers!)

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<div align="right">Daniel Gruia, 2008</div>

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[i] The "dot-com bubble" was a speculative bubble covering roughly 1995–2001 during which stock markets in Western nations saw their value increase rapidly from growth in the new Internet sector and related fields. The period was marked by the founding (and, in many cases, spectacular failure) of a group of new Internet-based companies commonly referred to as dot-coms.

[ii] Good practice title at the European level (European Conference for e-Government, Como, 2003) and international level (International Conference for eGP, World Bank, Manila, 2004); The International Golden Link 2005 prize of the Association for the Communications and Electronics of the Military Forces, USA for "The most innovative solution", at the International Defense or Civil Government section; Finalist at eEurope Awards 2005, Manchester, UK; 1st European Country in terms of electronic announcements delivered to JOUE (more than 99% of announcements)

<div align="right">10</div>

P. Tarina , I. Privara

Slovakia on (winding) Road to Information Society

Experience, Problems and Perspectives

- Short overview of strategic documents and action plans from the beginning of years 2000s
  - competencies, coordination
  - evaluation of action plans pursuance
- Where we are – e-solutions in action
  - legislation and standards
  - integration tools
  - public administration portal
  - available e-services
- New strategic documents a plans - perspectives
  - EU-funded „Operational Plan for Information Society" – priorities and feasibiity studies
  - priorities: e-government, digitalized cultural heritage, broadband
  - coordination and integration between state administration and municipalities
  - tuning coordination and competencies – everlasting problem
  - departmental action plans – health, educational system, research in informatics etc.

THE INTERNATIONAL PROFESSIONAL PRACTICE PARTNERSHIP

Transforming and Informing IT Professional Practice

A global programme initiated by IFIP (International Federation for Information Processing) to promote professionalism in IT, define international standards and create a global infrastructure that will encourage and support the development of both practitioners and employer organisations and give recognition to those who meet and maintain the required standards for knowledge, experience, competence and integrity.

The Vision

Our vision is the creation of an international IT profession, equivalent in prestige and structure to other established professions such as law, accountancy and medicine, that is:

- focussed on improving the ability of business and other organisations to exploit the potential of information technology effectively and consistently,

- respected by its stakeholders – including employees, employers, customers, governments and key international bodies

- a source of real pride and aspiration for IT practitioners.

Within that professional structure we see the creation of a worldwide set of professional certification schemes which are recognised and trusted globally as representing the hallmark of true IT professionalism. These certifications, delivered through independent, not for profit, national member societies will be available to suitably qualified professionals and will be supported by development frameworks for both individuals and organisations.

The Background

The IT profession is at a critical point in its development. IT is now quite clearly an activity which is vital to the world economy and to the prosperity and quality of life of ordinary people across the world. At the same time it is marked by an almost complete absence of well established national or international standards to assure the essential requirements of a truly professional practitioner. While a confusing array of examination-based qualifications provide an indication of relevant knowledge, it is generally impossible to validate subjective judgements about the experience, competence or ethical standards of individuals – even where those judgements relate to business-critical or even safety-critical positions. In a global industry in which practitioners are numbered in millions, this is very clearly unacceptable.

This lack of established national and international standards is a serious problem in a world in which everyone is now acutely aware of the need for IT professionalism - but it also provides a valuable opportunity. The IT profession stands on a cusp – sufficiently mature to recognise the importance of professionalism but not so far down the track that every nation has developed its own standards that would now require difficult and time consuming retrofitting to form an international standard. It is this unique, and possibly short lived, opportunity that IFIP is determined to seize and exploit.

IP3 - Delivering the Vision

The IFIP *International Professional Practice Partnership* (IP3) is designed to deliver the vision set out above by the development of an overarching professional framework maintained and delivered through its network of over 90 national member societies.

The approach is essentially inclusive, intended neither to reinvent the wheel nor to supplant existing certifications. Rather the aim is to embrace and incorporate existing capabilities, strengthening and augmenting existing certification schemes by giving them a broader professional context and coherence, setting them in an architecture and generally promoting the value of standards, certifications and accreditations. The overriding aim is to develop, and to give recognition to individual practitioners and to IT employers who are ethical, experienced and competent and can be relied upon to form sound judgements and to make rational and principled decisions - qualities and capabilities that are especially important in our fast-moving business and rapidly changing technological world.

The profession reflected in the vision is one that has an extensive range of skills, encompassing not only the essential technical and engineering skills but also the key business focussed skills that ensure real business benefit. A vital role will be played by newer IT skills such as information management and business change management and it is particularly important that recognition is given to the growing importance of IT professionals in areas such as corporate governance and enterprise security

An essential feature of these arrangements will be encouraging and supporting development. Whilst certifications provide valuable markers on the path to full professionalism, it is equally important to provide the resources to support the development of knowledge, skills, competence and best professional practice for both individual practitioners and their employer organisations at all stages of that journey.

The Key Features of IP3 Certification

IP3 certification schemes, of which the first will be the 'gold standard' *International IT Professional (IITP)* certification will be:

- Vendor independent
- Operated by accredited IFIP member bodies
- Available worldwide
- Based on consistent global standards for professionals in all areas of IT activity
- Built around a requirement for complete professional formation – including relevant knowledge, experience, competence and commitment to a code of professional ethics
- Dependent on the maintenance of competence through a programme of continuing professional education and development
- Supported by a disciplinary code with a process for public complaint and sanctions where appropriate.

Within this overall independent framework IP3 certification schemes will recognise and give credit to other certification schemes, including vendor certification, wherever these provide appropriate and valuable assurance for part of the overall professional formation.

Summary

We have a unique opportunity to put in place an urgently needed professional structure to underpin the competence and professionalism of IT practitioners and organisations on an international basis. IFIP, through the IP3 proposals outlined above, is committed to lead the development of that structure and invites support for a ground-breaking programme which will be of immense value to both the IT industry and to its stakeholders.

Professionalism in ICT

who is accountable and to what extent?

Hans Frederik

President NIOC, Dutch Congress Foundation on ICT-education

And how is your country coping with the financial problems? In the Netherlands – just a few weeks ago - our government had to buy the second largest bank. And one of the arguments was that they had to act, to avoid a system-breakdown. How is that possible we ask ourselves? All those financial professionals, accredited and screened. Their Financial companies and accounting firms are inspected by the Governmental Financial Department and the National Bank. A lot of the 'experts' in Wall Street, City of London, Frankfurt, Budapest, Amsterdam, Dublin and else are 'certified financial analysts'. Where was their professional behavior, social responsibility, public obligation, integrity, what did or will their guild, their chamber do,...?

In this paper I will present you some of my thoughts on the professionalism issues, especially about the ICT-worker. It is a topic I am in a way, obsessed with. Ten years of my teaching career I worked as a professor at the Amsterdam University of Applied Science in ICT[i]. So my point of view is mostly oriented from the education site. As a teaching professor I worked on decreasing the gap between ICT-industry and ICT-education. Do they (the industry) know the competencies of our graduates? And in return I got the same question: Does the university know which competencies we need from the graduates? The last six years I am president of the Dutch congress foundation on ICT-education NIOC and I have been board member of the NGI, the Dutch Computer Society. In both roles I worked on my "obsession".

The main question in this is: who is accountable?	
– Employees?	– Education?
– Industry?	– Government?
– Employers?	– Labor organizations?
	And if so, to what extent?

In my opinion, professionalism is not only an educational topic. The ICT-sector, Government and Education have to work together on the strengthening of professionalism in ICT.

In the first part of this paper I will give a summary on the higher ICT education in the Netherlands (levels and volume). And I give you an overview of the Dutch system for quality assurance in higher education. In the second part I will explain and comment on the EURO-Inf project. In this European project, with the German organization ASIIN in the lead, the first steps to a systematic comparison of higher ICT education and quality assurance is made.

Finally, if the time permits me, I will show you some thoughts on accountability.

Higher education in ICT in the Netherlands

In the Netherlands, we have around 16 million inhabitants. In 2007 we had 260.000 people working in ICT-companies, from whom 125.000 are classified as ICT-professional. In that year we had almost 10.000 open positions as ICT-worker.

In the Netherlands there are 14 universities, with all some master programs on computer science or informatics[ii]. And we have 16 universities of applied science with bachelor programs on ICT, Informatics and Business Informatics. Together this gives us 4.500 new graduates every year. But there is a real shortage on the labor market for ICT-workers in the Netherlands. This shortage is filled with outsourcing software engineering and insourcing ICT-workers from Poland and India.

The Dutch system of education ICT-professionals is built on government regulations. Compared with the European Qualification Framework (EQF) we have higher professional education on level 6 (bachelor at universities of applied science) and academic education on level 7 (master) and 8 (PhD). The NVAO (Accreditation Organization of the Netherlands and Flanders) independently ensures the quality of higher education in the Netherlands and Flanders by assessing and accrediting programs. At the request of an institution, a quality assessment agency organizes an external assessment. The framework of reference that is to be used for the assessment should cover at least the themes, standards and criteria set out in this accreditation framework. The institution carries out a self-evaluation. The self-evaluation report contains a description and an assessment of the program, covering at least the themes, standards and criteria:

1. Aims and objectives of the program
2. Curriculum (consistency of the curriculum, workload, admission requirements, credits, coherence of structure and contents and learning assessment)
3. Staff (requirements for professional / academic orientation, quantity of staff and quality of staff)
4. Services (facilities and tutoring)
5. Internal quality assurance system (periodical evaluations, measures for improvement, involvement of staff, students, alumni and the professional field)
6. Results (achieved learning outcomes and study progress)

In its self-evaluation, the institution should indicate the level (bachelor or master's level) and orientation (professional or academic orientation) of the program. This is to be substantiated with clear argumentation. NVAO assesses the report and its overall assessment. If the program meets the criteria listed in the accreditation framework, it is accredited for a period of six years.

Concluding remarks

Professionalism has, amongst others, to do with the trust someone has in the quality of an ICT-worker. When you want to judge the professional abilities of an ICT-worker, you start to examine his/her graduation. Is it from a recognized institute? And is it with the specialization needed?

We use the educational system to prove one side of professionalism. But is this according to the expectations of the industry? The Dutch assessment system is based on six main topics (see above). Only topic five has an element which refers to the industry (professional field) and the experience of post-graduates (alumni).

To illustrate this with my experience as auditor: In 88% of the audits I participated in, the check on industry and alumni was a meeting once or twice a year with representatives from industry,

respectively post-graduates. In only 12% of those meetings there was a real check on the learning outcome in relation with the expectations of industry.

We can conclude that the quality of the higher ICT education not structural is linked to the needs of industry. A world to gain I think.

EURO-Inf Project

First a summary of the project: The EURO-Inf Project aims at the creation of a framework for setting up a European system for accreditation of higher informatics education with the following aims:

- improving the quality of educational programs in informatics;
- providing an appropriate "European label" for accredited programs in informatics;
- facilitating mutual recognition by program validation and certification;
- facilitating recognition by the competent authorities, within the EU directives;
- increasing mobility of graduates as recommended by the Lisbon Strategy.

Consistent with the framework of the Bologna process, the accreditation will distinguish between the first and second study cycle (Bachelor and Master level); it will cover informatics programs of all types of Higher Education Institutions.

Accreditation of an informatics degree program is the primary result of a process used to ensure the suitability of that program as providing the education base for the entry route to professional practice. It involves a periodic assessment against accepted standards of informatics higher education. Independent, third-party accreditation is essentially based on a peer review process, undertaken by appropriately trained and independent teams comprising peers from both academia and informatics practice, in accordance with agreed principles. It is important that accreditation processes go beyond judgment on the achievement of a minimum standard, and effectively promote the idea of continuous improvement of the quality of higher education programs.

Program Outcomes for Accreditation from EURO-Inf

The program outcomes[iii] can be described as quality standards for competences, skills and knowledge graduates of an accredited course would be expected to have achieved as the education base for practicing their profession or for post-graduate studies. They have been ranged in the following four categories:

- Underlying Conceptual Basis for Informatics
- Analysis, Design and Implementation
- Technological, Methodological and Transferable Skills
- Other Professional Skills

For each of the mentioned category expected program learning outcomes for informatics programs have been formulated.

Each informatics program for which a Higher Education Institution seeks accreditation or re-accreditation against EURO-Inf standards must be consistent with legal and national requirements and have in place:

- program educational objectives consistent with the mission of the Higher Education Institution and the needs of all relevant stakeholders (such as students, relevant employers, informatics associations or societies, etc.) and program learning outcomes

consistent with the program educational objectives and the specified program learning outcomes for accreditation;
- a curriculum and processes which ensure achievement of the learning outcomes;
- academic staff, facilities, resources and cooperation agreements with industry, research institutions, necessary to deliver the learning outcomes;
- appropriate forms of assessment which can validly attest to the achievement by graduating students of the program learning outcomes;
- a management system able to ensure the systematic achievement of the learning outcomes and the continual improvement of the program.

CEPIS contribution

As part of the work program of the EURO-Inf project, a survey was carried out of CEPIS Member Societies to clarify the current and expected national situations concerning the Accreditation of Higher Education Informatics/Computing courses in different European countries, as well as the learning outcomes expected from graduates from such courses. Responses were obtained from 19 of the Member Societies, and the response data provides an important starting knowledge base about the situation in a number of EU Member States. It is clear from the responses that there is considerable diversity in the current and expected quality assurance arrangements for higher informatics courses around Europe.

Concluding remarks

Given the great diversity of informatics education across Europe, the attempt to create framework standards comprising all areas of the informatics discipline appears ambitious. The EURO-Inf Framework is thus intended as a broad common denominator, or reference point for the variety of informatics programs. In order to allow for possible inclusion of existing informatics specializations within European Higher Education Institutions, the framework is formulated in general terms. But besides the global approach of the EURO-Inf project, has a clear contribution to the professionalism question. Each informatics program for which an Institution seeks accreditation against Euro-Inf standards must have in place (amongst others):

1. A systematic check of the program educational objectives with the priorities and needs of all relevant stakeholders, including employers, informatics associations or societies, etc.
2. Educational and cooperation agreements with industry, research institutions and/or other Higher Education Institutions

The link between Industry and Higher Education is recognized and will give support to the strengthening of professionalism in ICT.[iv]

Some thoughts on accountability and professionalism

As a researcher I am studying the balance between management en teaching staff in higher professional education. Management has a responsibility in planning, creating frameworks, quality assurance, and accounting. Teaching staff has a responsibility in the field of facilitating and promoting the best learning outcomes. They both work as `professional` and are interdependent. But who is accountable for what and to what extent? This research will focus on the way the balance is recognizable in the visitation and accreditation process in higher education in the

Netherlands. Regular I participate in audit teams (see above) to examine the quality of higher education programs. A great number of self evaluation reports are available at the Hobéon Institute[v], an Assessing Agency recognized by the Dutch Ministry of Education[vi]. This research will check these reports on the way they report on the topic Staff (requirements for professional / academic orientation, quantity of staff and quality of staff) and on the topic of mutual adjustment between employees and institution in adjusting the ICT study programs.

Professionalism

Let us go back to the original question. Professionalism is an important topic in ICT. Because the ICT projects that went wrong, because of the shortage of ICT-workers and the habit from the industry to go for short wins. But who is accountable? In this discussion the maturity of the ICT sector is a frequently used argument. But I think, we all are accountable. We all have to contribute to the strengthening of the professional behavior in ICT.

The main question in this is still: who is accountable?
– Employees? – Education?
– Industry? – Government?
– Employers? – Labor organizations?
And if so, to what extent?

The employees are represented by CEPIS, counsel of computer societies with 36 computer societies in 33 countries all over Europe. Good for more than 250.000 ICT-workers (estimation). CEPIS has exerted influence in certification and education:

IFIP and IP3, with Charles Hughes as an enthusiastic and professional leader is one of the better developments in our sector. The Open Group with the Certified IT Specialist, EUCIP, the European Certification of Informatics Professionals, this programs all have the same goal: proving the professional behavior of the ICT-worker. CEPIS has started EUCIP and is active involved in IP3 Harmonise[vii] and EURO-Inf both projects funded by the EU and supported by CEPIS, contribute to the comparability of ICT grades and certificates.

The whole secret is now, I think, how we can involve industry and government. Only when they see their role, we are able to leave the adolescent phase and really become mature.

Appeal to you all

Let us use our influence and connections to industry and government. On the local level, in your state, your country and in Europe. To work on professionalism. Only when we all use our influence this growing to maturity will develop regular and smooth.

Thank You.

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[i] This institution of tertiary education in the Netherlands is called "*Hogeschool*". While the literal translation is "high school," these entities are actually equal to universities of applied sciences. They can also be compared with a college, polytechnic and fachhochschule. "*Hogescholen*" are not allowed to be called university in the Dutch language, because they do not confer doctorates.

[ii] Computer Science, Informatics and ICT in this paper will be used inter exchangeable.

[iii] The complete conclusions of the EURO-Inf project are available at the EURO-Inf website www.euro-inf.eu, especially the end report of the project.

[iv] There is a non-for profit association in the process of building up: "European Quality Assurance Network of Informatics Education" (abbreviated: EQANIE) shall work on these EURO-Inf outcomes. Expected founding members are ASIIN, BCS, CEPIS, GI, GRIN, Latvian Accreditation Institution, European Association of Employers; Spanish, Dansk, Dutch informatics societies, EAEEIE (European Association for Education in Electrical and Information Engineering).

[v] Hobéon Institute, Den Haag, the Netherlands.

[vi] http://www.minocw.nl/english/index.html

[vii] HARMONISE contributes to establish comparable data on ICT vocational training systems and various approaches to ICT qualification and ICT certification in the participating Countries. The project aims to elaborate recommendations for the stakeholders by collecting and examining available reference material concerning the potential of applying and implementing standards in order to work towards the convergence of existing approaches to e-skills certification in Europe and beyond. Harmonise closed on 30 September 2007. The Final Report has been approved by the European Commission and can be downloaded here.

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*European Alliance on Skills for Employability
- New Skills for New Jobs in Europe*

IT Star meeting
Godollo, 8 November 2008

*Elzbieta de Paiva Leite
CompTIA
Policy Advisor for Central-Eastern Europe*

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The importance of e-skills for employability in Europe

The latest communication from the Commission on **ICT skills for the 21st century** unveiled that:

- **37%** of of the EU population has **no computer skills** whatsoever

- **More than 60%** of people not educated beyond lower secondary level have **no basic e-skills**

- An increase in the estimated number of **employed IT practitioners** during 1998-2004 of about 48%

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What is the Employability Alliance?
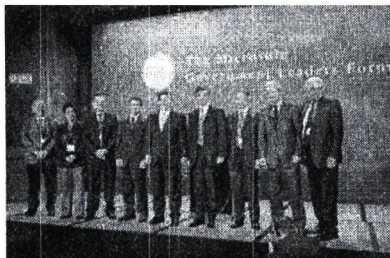
- An autonomous initiative run under the umbrella of the much wider Industry Leadership Board organization

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Objectives

- Help provide 20 million people in the EU with technology access, training and certification in IT and other skills required by current or future employers over the coming five years;

- Focus on young and older at-risk workers with lower employability prospects, people with disabilities and women (re)entering the labor market;

- Build upon and expand companies core competencies and our existing education, training, community and CSR programs;

- Work in partnership with government and NGOs to set up partnerships that respond to local e-skills gaps and needs

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Added Value

- Multistakeholder partnership: Alliance of **different companies, sectors and influentials** (NPO and public agencies)
- Each partner has **specific know-how** that will help to build **strong, integrated projects**
- Deliver the **skills trainings demanded by the job market to the targeted people**
- Corporate Social Responsibility is done in **collaboration with the community** (companies, people, organizations, etc...)

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The Employability Pathway
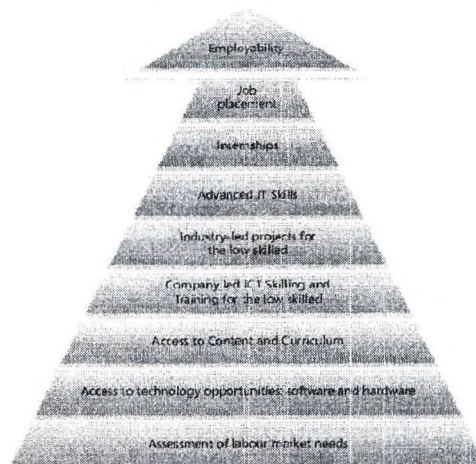
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EA Chapters

EA launched in:

- UK
- Germany
- France
- Belgium
- Luxemburg
- Hungary
- Poland (under preparation)

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Belgium
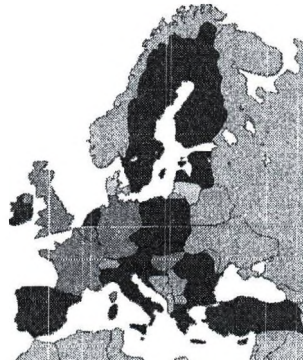
Projects within the Belgium Alliance:

I. Brussels – Interface3 Do-IT partnership

IT, business and administrative skills training to women.

Trained Beneficiaries: 4562. Around 65% of participants in the professional training courses have re-entered the workforce.

II. Wallonia – Technobel

Competence ICT centre where the mission is to inform and raise awareness of ICT, ensure training and contribute to the development of the Walloon economical environment.

Trained Beneficiaries: 1200.

On average, 70% of those trained have found a job within 6 months of the training.

Delivered training hours: 140 000

- Partners:

Organizations: Business & Society in Belgium, Comptia, ECDL

Companies: Randstad, Microsoft, CISCO, State Street, Belgacom, ITQ Group

Public Agencies: FOREM, VDAB, ORBEM/BGDA

NGOs: Technobel, Interface3, Bruxelles Formation, Do IT (Collectif des Femmes, Interface3, Interface3 Namur, Sofft, CDR, Atel, SPK, BLM, IGO Leuven, Link in de Kabel, Aron)

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Conclusion remark

" *The most important phase of the European Union's Growth and Jobs Strategy is underway and the spotlight is firmly on delivering results. Partnerships between the Member States and the private sector can also make a major contribution to Europe's competitiveness as a region and for its citizens. I welcome the creation of the European Alliance on Skills for Employability. The Alliance is a leading example of how innovative business to business collaborations, working with different stakeholders, can provide opportunities to the European unemployed. Access to skills training, content provision and certification can help older workers, people with disabilities and the young to face the challenges of unemployment and the changing workplace and so contribute to Europe's prosperity. I commend this initiative as it represents one of the best practices in this field."*

Vladimir Spidla, EU Commissioner for Employment, Social Affairs & Equal Opportunity, January 2006

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About CompTIA

- The Computing Technology Industry Association (CompTIA) is the voice of the world's IT industry
- Our goal is to provide a unified voice, global advocacy and leadership, and to advance industry growth through standards, professional competence, education and business solutions
- Our members are the companies at the forefront of innovation; and the professionals responsible for maximizing the benefits organizations receive from their technology investment

www.comptia.eu

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About CompTIA(2)

Information: timely and actionable market research examining the many facets of the ever-changing technology landscape

Networking: conferences, events and programs as a platform to exchange information and ideas, educate members and network with industry leaders

Influence: representation of the IT industry before governments, legislatures, regulators, the courts and the media around the world, focusing on policies that protect and advance the interests of the technology industry

Standards: best practices and standards across the industry via technology forums, special interest groups and leadership forums

Education: world's largest developer of vendor-neutral certifications for IT workers

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Skills Gaps in the World's IT Workforce:
A CompTIA International Research Study

IT Star meeting

Godollo, 8 November 2008

by
Elzbieta de Paiva Leite
CompTIA
Policy Advisor for Central-Eastern Europe

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Objectives and Methodology

Primary objectives:
- Identify types of IT skills in demand, any gaps, and possible solutions
- Measure the market demand for IT professionals
- Investigate factors most influencing the IT worker demand

The research was conducted:
- By outside third-party
- Via phone interviews and survey
- Cross-section of Industries: IT, Government, Financial Services, Other Services, Automotive&Other Manufacturing, Education, Wholesale&Retail, Healthcare, Transportation, Mining&Construction, Arts&Entertainment
- 14 countries: **Australia, Canada, China, France, Germany, India, Italy, Japan, The Netherlands, Poland, Russia, South Africa, U.K., and U.S**
- 3,578 survey respondents, minimum 250 per market

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IT Skills by Company Size

- Most opportunities with:
  - Small-size companies
    - Programming
    - Application-level
  - Mid-size companies
    - Networking
    - Operating Systems
  - Large-size companies
    - Security
    - "Soft" skills
    - Server
    - Application-level
    - Programming
    - Networking

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IT Skills by Industry

- Most opportunities with:
  - Government
    - Security
  - Healthcare
    - Networking, RF mobile/wireless
  - Education
    - Operating systems, RF mobile/wireless, Security, "Soft" skills, Hardware
  - IT Services
    - "Soft" skills, Application-level, Web-based, Programming
  - Mining/Construction and Telecom
    - RF mobile/Wireless
  - Arts/Recreation/Entertainment
    - Programming

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Skills Gaps

Overall: IT Skills in Respondent's Organization	% Important (n=3578)	% Proficient (n=3570)	Gap
Security/firewalls/data privacy	74%	57%	17
General networking, network infrastructure	66%	59%	7
Operating Systems (Linux, Windows, XP, Vista, etc.)	66%	65%	1
Hardware skills/knowledge (including printers, PCs, etc.)	57%	60%	-3
Non-specific server technology (including DB, storage, maintenance, administration, etc.)	57%	49%	8
"Soft" skills (customer service, sales, project management, communication, etc.)	56%	45%	11
Application-level (architecture, design, development, programming, integration, etc.)	54%	47%	7
Specific programming languages (non-MSFT, Java, etc.)	40%	40%	0
Web-based technologies (Web2.0, SOA, SaaS, RIAs, Ajax, etc.)	40%	34%	6
RF mobile/wireless technology	27%	26%	1

"Gaps" in skills were determined by subtracting the percent of respondents saying employees are proficient in a skill from the percent saying that skill is important.

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Skills Gaps by Country I

Largest Gaps in Skills by Country	U.S.	Canada	U.K	Germany	France	Italy	Netherlands
Security/firewalls/data privacy	9	16	16	12	13	18	17
General networking, network infrastructure	4	2	5	1	0	7	3
Operating Systems (Linux, Windows, XP, Vista, etc.)	-6	-3	1	-6	-2	4	0
Hardware skills/knowledge (including printers, PCs, etc.)	-3	-4	5	-20	-3	-5	-9
Non-specific server technology (including DB, storage, maintenance, administration, etc.)	3	7	7	2	1	10	4
"Soft" skills (customer service, sales, project management, communication, etc.)	13	13	9	10	-1	4	17
Application-level (architecture, design, development, programming, integration, etc.)	9	6	7	1	-1	1	19
Specific programming languages (non-MSFT, Java, etc.)	-6	0	1	-6	-2	-1	-3
Web-based technologies (Web2.0, SOA, SaaS, RIAs, Ajax, etc.)	6	7	5	4	1	3	6
RF mobile/wireless technology	-6	3	-1	1	-5	4	1

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Skills Gaps by Country II

Largest Gaps in Skills by Country	Russia	Poland	India	China	Japan	Australia	South Africa
Security/firewalls/data privacy	11	20	19	24	23	20	21
General networking, network infrastructure	1	19	7	5	12	13	15
Operating Systems (Linux, Windows, XP, Vista, etc.)	-1	-4	8	4	5	9	15
Hardware skills/knowledge (including printers, PCs, etc.)	-5	8	-3	-4	2	11	13
Non-specific server technology (including DB, storage, maintenance, administration, etc.)	9	11	4	7	10	14	22
"Soft" skills (customer service, sales, project management, communication, etc.)	9	7	10	16	15	19	23
Application-level (architecture, design, development, programming, integration, etc.)	5	4	8	8	6	9	17
Specific programming languages (non-MSFT, Java, etc.)	-6	-2	-1	2	2	10	15
Web-based technologies (Web2.0, SOA, SaaS, RIAs, Ajax, etc.)	0	5	7	12	4	10	15
RF mobile/wireless technology	-1	-1	4	5	-1	4	10

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Skills Gaps by Company Size

- Small-size companies less proficient in:
  - Security
  - Non-specific server technology
  - General networking/network infrastructure
  - RF Mobile/Wireless technology
  - Operating Systems
  - Hardware
  - Web-based
- Mid-size less proficient in:
  - Application-level skills
  - Programming
  - Web-based
- Large-size less proficient in:
  - Hardware

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Skills Gaps by Industry

- Healthcare less proficient in:
  - Application-level
  - Programming
- Government less proficient in:
  - Application-level
  - "Soft" skills
  - RF mobile/wireless
  - Web-based
- Education less proficient in:
  - "Soft" skills
- Auto/Manufacturing less proficient in:
  - "Soft" skills
  - Web-based technologies
- IT Services less proficient in:
  - Hardware
  - Security

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Amount of Qualified Candidates

Just enough 28%

Not enough 38%

More than enough 23%

Don't know 10%
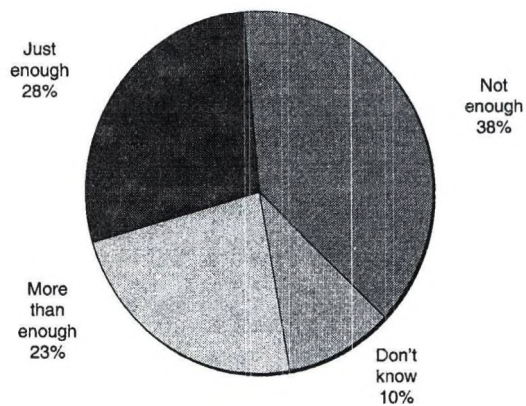
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Factors Driving Change

Factors Overall	Currently	One Year from Now	Five Years from Now	Trend
The fast pace of technological change	52%	51%	43%	-9
Budget constraints/costs	51%	40%	30%	-21
Security and compliance	48%	43%	33%	-15
Consumer needs/demand for goods/services	47%	42%	33%	-14
Outsourcing	37%	39%	32%	-5
The convergence of various technologies	34%	42%	37%	3
Increasing globalization	33%	39%	41%	8
The global shift of IT jobs between countries and across the world	32%	36%	41%	9
An increasingly mobile workforce	31%	38%	35%	4
Open Source Software	30%	35%	34%	4
Government policies/leadership of country	27%	32%	31%	4
An aging workforce	21%	22%	45%	24
None of the above	5%	4%	6%	1

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Factors Driving Change by Company Size

- Small-size companies: Technological change, Budget constraints

- Mid-size companies: Security and compliance, Technological change, Budget constraints/costs, Government policies

- Large-size companies: Fast pace of technological change, Increasing globalization, Global shift of IT jobs between countries, Budget constraints/costs, Aging workforce, Outsourcing, Security and compliance, Government policies

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Summary and Conclusions

- The top three most important IT skills are: security (74%), general networking (66%) and operating systems (66%)

- When comparing reported proficiency in skills to importance of skills, the skill with the widest "gap" in proficiency is security/firewalls/data privacy

- When asked what their organizations should be doing to enhance employees' IT skills, the top two answers are: sending employees for professional training externally (42%), and providing incentives, rewards (41%). Third in order of importance is sending employees for certification (36%)

- The plurality of respondents (38%) report there are not enough qualified IT candidates in their countries

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About CompTIA

- The Computing Technology Industry Association (CompTIA) is the voice of the world's IT industry

- Our goal is to provide a unified voice, global advocacy and leadership, and to advance industry growth through standards, professional competence, education and business solutions

- Our members are the companies at the forefront of innovation; and the professionals responsible for maximizing the benefits organizations receive from their technology investment

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THE COMPUTING TECHNOLOGY INDUSTRY ASSOCIATION

Knowledge Economy and IT-Education in Hungary
Digital Literacy and IT Professionalism

3rd IT STAR Workshop
National Information Society Experiences – NISE 08
November 8, 2008, Budapest (Gödöllő), Hungary

Prof. dr. Maria Raffai
Széchenyi István University, eMail: raffia@sze.hu

The Knowledge Economy Periods

In the last one and a half decade the Hungarian Government and all the professional associations have been striving to do their best in forming the Information Society and give possibility the citizens to get technical assets to access to the Internet. The general program had begun in 1994; from that time we distinguish 3 different periods:

Period I: 1994-2000

The first period was named as the creation of strategic programs. In this period the main purpose of the government was to define the concepts, the national strategy based on the American and international (Japan, EU etc) Information Highway programs and to establish organizations that should be responsible for the realization. For performing the strategic goals the Hungarian Government established a new institute, the NIIF (Institute for National Information Infrastructure Development). This organization is responsible for building out broadband network and public Internet access points everywhere in the country.

Period II: 2000-2006

The second period was a very successful phase; as a result of the government support the teachers and the students could purchase computers and accessories under the market price, the telecommunication costs and the fee of Internet services had become lower, eMagyarország and WiFi points were built up, the primary and secondary schools were equipped with computers and supplied by Internet access, the number of on-line services increased dynamically, the electronic administration started to expand. The higher education reform has got an important meaning: the Information Science was defined as a standalone discipline separated both from the engineering and the economic studies. The professional non-profit associations organized trainings, courses for young and also for the older people in order to raise the level of digital literacy. The Information Society index increased to 7,64 by what Hungary reached place 28 on the KEI list.

Period III. from 2007

The third period can be characterized as the governmental withdrawal, the Administration keeps passive eye on the worldwide development, and there are only few particular Information Society programs, although the pressure and the claim from the academic side, professional and civil organizations and also from the ICT enterprises are arising. The program for building up a Knowledge based Information Society is yet continuing; the main purpose is to modernize public services for the different parties (citizens, business, administration, governmental institutes), to support the SMEs in using up-to-date information and communication technologies, and to increase the level and wide-spreading of digital literacy and Internet penetration. It is also high time to change the way of thinking and living.

Some programs and results in figures:

— Producing information infrastructure:
  - high speed network: 10 Gbit/sec
  - computers in the schools (18,5% vs 61,4% in EU),
  - access to the Internet: public WiFi and eMagyarország Internet access points (more than 3.000), 439 IT service centres (Teleház), digital towns but sorry to say no Internet access in 20% of the Hungarian settlements
  - Széchenyi Program: that helped SMEs to invest ICT solutions
  - Sulinet Program: supported the teachers and students in purchasing computers and other digital tools without paying VAT
— R+D+I: government-supported programs for developing and using the most up-to-date ICT solutions, financed research centres in business
— Digital content on the Web: Digital Library of National Cultural values, digital Database, digital maps etc.

The Figure 1. represents the structure and data transmission speeds of the Hungarian backbone.
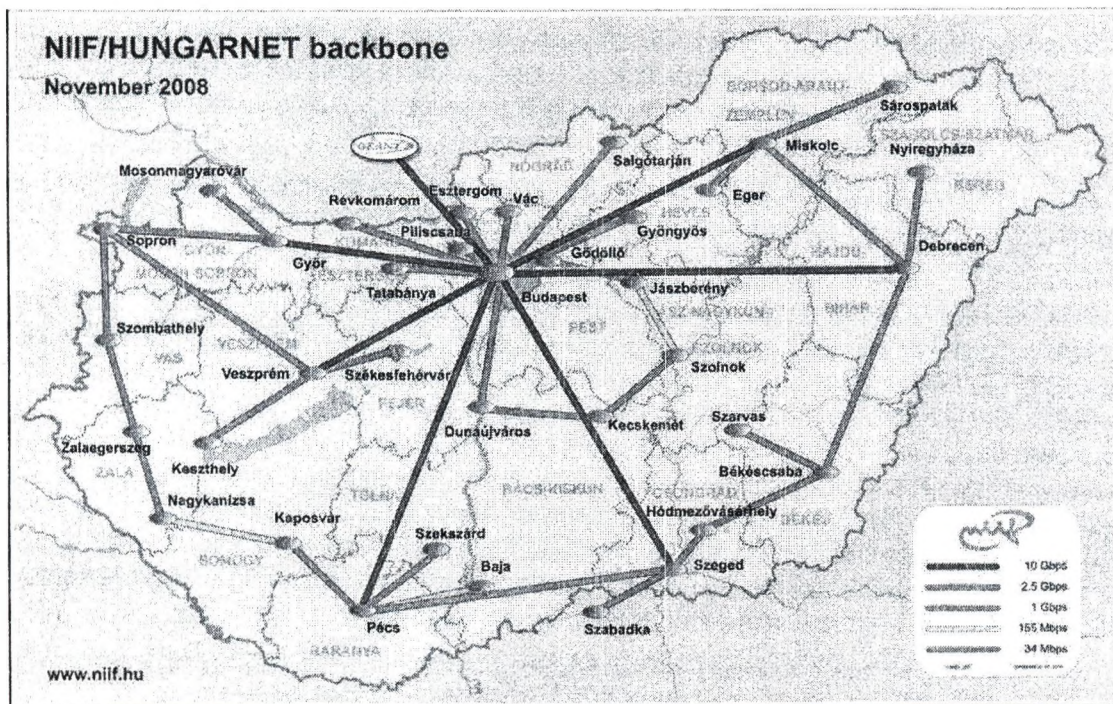

Figure 1. The Hungarnet Backbone

IS/ICT Knowledge and Skills in Education

Talking about the education of IT, it is needed to distinguish two different approaches. One of them is the training of children, students and non IT specialists, who have to obtain the knowledge and skills necessary for using the information technology as a tool in their daily life: in learning, working, getting information, communicate and play/amuse. The other approach is the education of IT professionals.

Realizing the Strategy

In order to reach the objectives defined in the National Strategy for Information Society Hungary has to carry out actions had been defined in different programs:

- Spreading digital culture in civil and business sphere: giving basic computer knowledge and skills on every age and educated level;
- Increasing the role of the professional organizations such as NJSZT[1], VISZ[2], INForum: by arranging trainings, preparing and publishing popular educational materials, IT-books, TV-programs (e.g. University of Knowledge), teaching how to use the ICT, how to live, learn and work in the Information Society;
- Programs of supporting economy and politic: eCommerce, on-line banking, eGovernment, eAdministration, open universities;
- Legal background: codifying Law for Data protection, for Digital Signature (e.g. digital tax confession);
- High quality CS/IS/IT[3] courses on different levels.

Getting IT Skills

In the last years almost 1/5th of *primary schools* have been equipped with computers and got Internet access. Teachers were acquired training with IT so it has become possible to give basic computer skills in optional groups. Beside the IT trainings the main target is to use computers as school equipment and Internet as the source of excavating information and to update the teacher's knowledge.

There is Internet Access in every secondary school; the IT-subject is already obligatory, so that gives computer skills presented by qualified teachers. The teachers majoring not in IT use the computers in different subjects as a presentation tool.

It is important to mention, that the John von Neumann Computer Society plays definitive role in spreading digital literacy with the ECDL (European Computer Driving Licence) and the Digital Equal Opportunities (DE!) programs. The ECDL celebrated its 10th anniversary this year. There are already more then 400 accredited ECDL Centres all over the country, where by now already 330.000 registrants have been trained and 170.000 certificates were issued. The Ministry of Education financially supports to receive basic skills in ECDL program for the students in secondary schools [as a result 10% of the graduates possess already the certificate as part of their final examination (Matura)] and the employees who need the computer in their job. Besides the NJSZT continue to train handicapped people for using computers as an effective tool and by this way give them chance for an active life. ECDL has received official accreditation in several areas of Adult Education (e.g. civil servants etc.) as well.

The DE! program deals with issues like eInclusion digital literacy, assisted living etc. resulting in enhancing quality of life in the population. These activities are connected to the Hungarian eInclusion program, being part of the similar initiative of the European Union and coherent with the Lisbon principles and the i2010 strategy.

IT Professionalism

The Hungarian Higher Education Reform started to be planned in 2003, is based on Bologna process. The Bologna Committees on different levels with members, both of academicians and officers from Administration transformed the whole higher education system from the traditional type into a three level system (BSc, MSc, PhD) in concept, structure and competences (see **Figure 2**).

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[1] NJSZT: John von Neumann Computer Society (Hungary)
[2] VISZ: Alliance of Chief Information Officers
[3] CS/IS/IT: Computer Science/Information Science/Information Technology
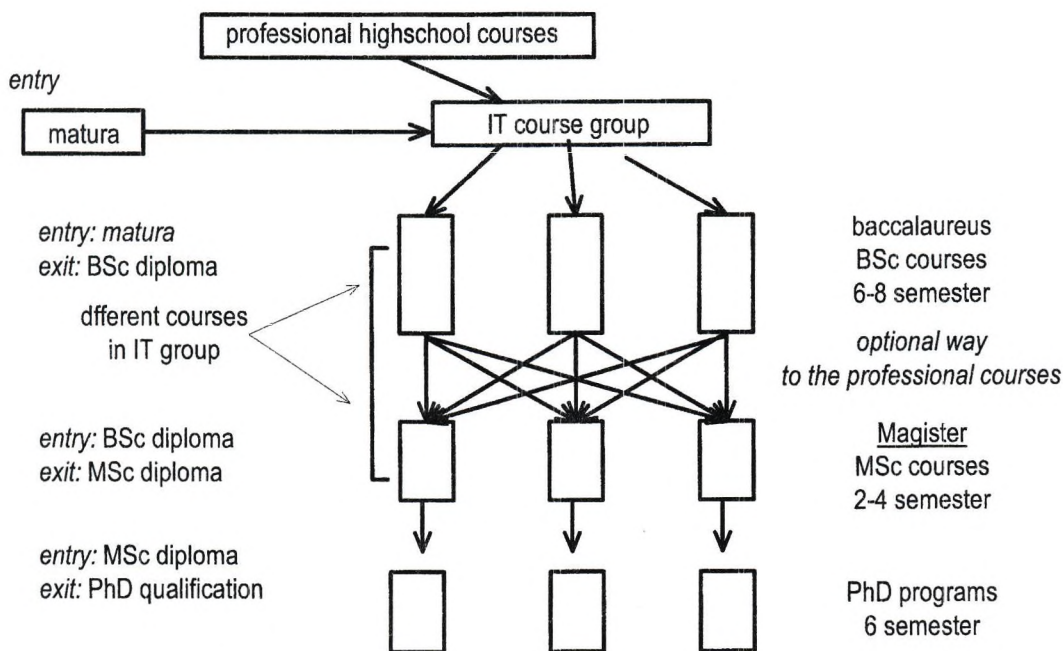
Figure 2. Relation of IT professionalism education programs

As first step of performing the planned transmission the officials had to change the Law of Education. In 17th of June 2003 the law LXXX./1993. was modified: the **§30.** declares, that by the year of 2006 the universities have to begin teaching by the new curriculum. The second urgent tasks from governmental side (Accreditation Committee) were: (1) specifying the disciplines and the structure of the new system, (2) creating the new governmental circumstances and conditions and (3) the frame and the way of financing. The effective work has begun with specifying the qualification requirements in general and also in the special fields of ICT, namely it had to define the aim of the study, to declare the competences and the diploma qualification.

Courses for Future IT Professionals

The members of Bologna Subcommittee specialized on IT were IS/IT experts and professors defined the main tasks as follows:

- deciding the number and type of the courses,
- specifying the duration and the structure of the courses (completed with 30 credits/semester),
- defining competences and qualification requirements (QR),
- fixing entry criteria and conditions,
- preparing the document of foundation,
- accrediting courses and curriculum and
- starting the education.

The performance of the students is measured in credit points. Every semester is 30 credit worth adjusting to the Bologna declaration. The committee agreed on education process in which the BSc course has 7 semesters, the MSc 4 and the doctorate school is 6 semesters long. The expected credits on each level are as follows:

- basic university level with 210 credits (BSc; by ISED V.),
- master level 120 credits (MSc; by ISED IV.),
- doctoral degree 180 credits (PhD).

In the development process it was a revolutionary consequence that the Committee responsible for courses teaching future IT professionals could achieve that CS/IS/IT has become a standalone scientific field instead of belonging to the engineering or to the economic sciences. Despite the earlier 130 different IT specialized courses the Committee defined only 3 different courses in the CS/IT-group:

- specialists in technical CS,
- program designers,
- specialists in business information science (Wirtschaftsinformatik).

After approving this three courses, the Committee defined and discussed the knowledge structure and credits with the interested parties, and specified three main and one optional selectable level of competences (see Figure 3):

- general basic knowledge → core competences,
- basic professional knowledge → special competences,
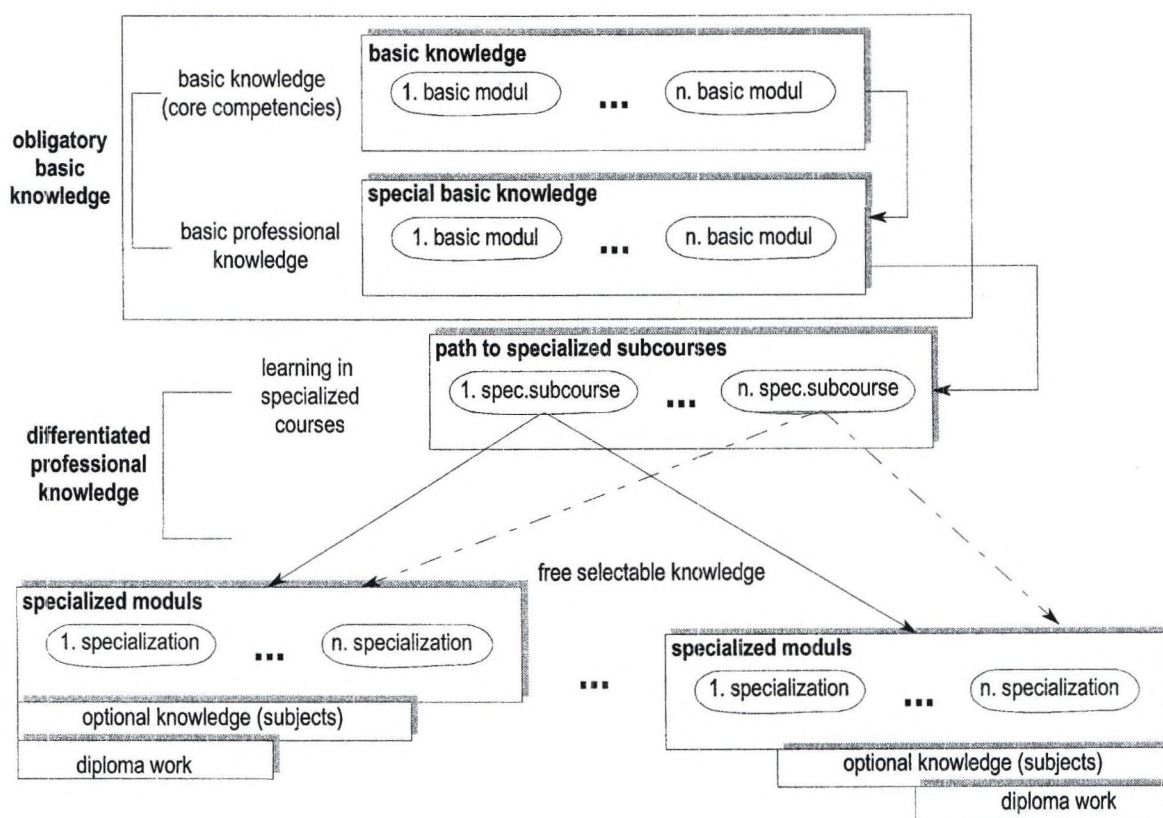- specialized professional knowledge.

Figure 3. The Structure of Education System teaching IT Professionals

The core and the special competences were defined and discussed on meetings with the participation of academicians, professors and the representatives of leading IT enterprises and employers in order to satisfy the professional demand. The core and the special competences are defined from two aspects, first the theoretical knowledge had to be specified and then the skills needed to apply effectively the obtained/learned knowledge. In *Core Competencies* the students have to acquire the knowledge of

- architecture of computers and computer-networks,
- system software (concepts and tasks of operation systems, protocols) and system close software (programming languages, data base management systems, utilities etc.) and skills in application,

- software development methodologies and techniques,
- logical programming, artificial intelligence techniques

and they have to get skills in

- designing, analyzing and implementing algorithms,
- using visual modelling tools (UML) and CASE technologies,
- recognizing the problem space and solving problems,
- designing, creating databases,
- Web programming.

In *Special Competencies* the required knowledge has to be changed more often because of the dynamically changing technology and the users' demand, but the Committee tried to specify fields that should be necessary for years:

- intelligent enterprise applications (MIS, EIS, DSS, CRM etc.),
- standards (MOF, EAI, UML, CWM, XMI/XML, CORBA),
- expert systems concepts, skills in development and application,
- juristic questions concerning to the development and application of different IS/IT solutions.

The *special skills*, that is necessary for using out the learned material are:

- modelling and designing organization information systems,
- planning computer environment and operating IS/IT infrastructure,
- using OMG's MDA framework modelling with UML,
- adopting business information systems in practice, cooperating with users and managing application development projects,
- organizing/managing units responsible for IS/IT tasks,
- designing, implementing and operating multimedia applications.

Risks and Problems of the Change Over

We are getting closer to the end of this changeover process and we definitely see the problems, the difficulties we meet, and I unambiguously say that the double load of the teachers (teaching parallel the traditional and new type courses) and the lack of motivation and conditions hinder the high quality of the education. Let us see only some of the problem-components:

- lack of resources (professors, rooms, labs) for teaching parallel both the traditional and three-level system,
- the walk-through criteria between the traditional and the new systems are not correctly and unambiguously defined,
- the education/training quality is very different in the various universities and colleges,
- the applicants come from different places with different educational and cultural background,
- there is a great diversification among the EU-countries in culture, in financial and infrastructural facilities, and also in supporting systems inside and outside the institutes.

As Conclusion

Summarizing the performed programs, the results we have already achieved and our placing in the global Information Society we have to acknowledge that there are important tasks left which are necessary to solve as soon as possible. It is needed to increase the Internet penetration, the level and wide spreading of digital literacy and our role in the international programs.

John von Neumann Computer Society
a not for profit Association for the Information Society

Ability, pride and creativity of our compatriots are for Hungary the fundament of progress and the only spring-board into the future.
(Count István Széchenyi 1842)

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CEO:	**Mr. István ALFÖLDI**

Basic data

*Founded: **1968***
Membership: 2300 individual members, 50 corporate members

Fields of activity

The John von Neumann Computer Society (NJSZT) is dedicated as a non-profit organization to preserve values that can be included in today's knowledge-based society as well as to set new directions that meet the requirements of the age and to form the IS world of the future actively. NJSZT is a scientific organization in the first place but we consider a very important task of us playing a leading role within the nation-wide dissemination of "computer literacy". Our Society is member of the CEPIS (Council of Professional Informatics Societies) and of the European Computer Driving Licence (ECDL) Foundation to disseminate ECDL in Hungary. Our Society coordinates the ECDL activity all over Hungary.

John von Neumann Computer Society supports the activities of leader persons and industrial companies by staging conferences and running workshops as well as by virtue of regular events of its technical working units that are aimed at promoting the exchange of experience and information among computer professionals. We put our support behind new ideas in informatics and provide the necessary institutional framework for them to materialize. Young people's education and support of young talents have special importance to our Society. To this end we have set up special standing committees. Many times over, we have acted as initiators and organizers of nation wide contests in programming and we prepare the Hungarian team participating in the International Olympiads in Informatics.

In early 2007. NJSZT has launched the **Digital Equal Opportunity Program (DE!)**, and joined the e-Inclusion year of the European Union in 2008. In the framework of the **DE!** program – which is completely conform with the Riga Declaration – NJSZT has many own projects and supports also other initiatives related to the aim of *e-inclusion,* and based on the triple principle of Infrastructure, Demand and Knowledge – which are indispensable in order to build up and develope the Information Society.

Together with ECDL, **AAL – Ambient Assisted Living** is another very important issue of the DE! program. NJSZT has joined the initiative of the European Union, and is now leading a national consortium supported by Ministry for National Development and Economy (NFGM), to coordinate any development and disseminating activities related to embedded and ambient systems, which aims to facilitate (elderly) people's living.

The DE! Program has been set up by the evident sense of responsibility of NJSZT towards the civil society, and aims to integrate the biggest majority of the habitants in the Information Society.

International ties and affiliation

The Society represents Hungary in a number of international organisations of high prestige. It thus gains access to sources of precious professional information and its members, and can benefit from participating in international projects.

IFIP
International Federation for Information Processing
CEPIS
The Council of European Professional Informatics Societies
EFMI
European Federation for Medical Informatics
IAPR
International Association for Pattern Recognition
ECCAI
European Coordinating Committee for Artificial Intelligence
IEEE
The Institute of Electrical and Electronics Engineers
IEEE CS
IEEE Computer Society
ECDL Foundation
European Computer Driving Licence

As regards bilateral ties, a sustained close cooperation with ÖCG has been pursued since 1984 including an annual joint conference.

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