

*Information and
Communication
Technology
as a Driving Force
of Change in Public
Administration*

EDITED BY
MIRKO VINTAR
HEINRICH REINERMAN

THE THIRD SUMMER WORKSHOP HELD IN PRAGUE
CZECH REPUBLIC, SEPTEMBER 8 - 13, 1996

NISPAcee

The Network of Institutes and Schools of Public Administration in
Central and Eastern Europe

**INFORMATION AND COMMUNICATION
TECHNOLOGY AS A DRIVING FORCE OF
CHANGE IN PUBLIC ADMINISTRATION**

Proceedings from the third summer workshop held in Prague, Czech Republic
September 8 - 13, 1996

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Prague, Czech Republic, September 8 - 13, 1996

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An Introduction to the NISPACEE Summer Workshop on Information and Communication Technology as a Driving Force of Change in Public Administration

*Mirko Vintar **

The workshop was organized in time in which Public Administration is entering a period of profound changes. In EU countries there are two main paradigms around which practically all changing processes evolve: the New Public Management (NPM) and informatization of Public Administration. The idea of NPM is focusing on making the public sector more efficient, closer to its customers and at the same time providing better quality of its services. It seems that NPM and informatization match very well together. It has been proved that innovative use of new technologies can be seen as the most powerful instrument of changes and improvements in public sector.

Changes of political and economic systems in Central and Eastern Europe request complete restructuring of public sector, development of new structures, organizations and services. However, the final aims and objectives of changes are more or less the same; the development of Public Administration will provide the setting and the necessary stimuli for competitive development of national economies towards approaching information societies.

The role of Public Administration in transformation into the information society of respective country will be crucial. This was one of the point which was specially underlined in the famous Bangemann report "Europe and the global information society". On one hand PA will play very important role in establishing as good as possible conditions for private business and enterprises to be able to adjust to the information society. On the other hand PA itself will have to change tremendously in order to be able to use full potentials of Information and Communication Technologies (ITC).

ITC has become inevitable in managing the huge amount of information which flows every day through PA organizations and one of the most powerful instruments for changing and improving the quality of services of PA. The strategic role of ITCs has been widely recognized by business and

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public administrators and managers. Computers and related technologies have become an integral part of the working environment in all organizations and PA agencies. Practically, all public servants, not only professional workers and managers, are in a position to use and cope with new technologies.

Furthermore, the information infrastructure i.e. computers, peripheral equipment, networks etc. in an average organization is becoming very complex and the investments in ICTs are growing to the sky and are already representing substantial part of budgets of public enterprises and organizations. Management of information resources has become strategic part of the overall management practices.

We should strive for PA which will be dynamic, creative and innovative and which will on one hand provide environment for quick economic development in respective countries and on the other hand high quality of services to the citizens. In both of mentioned endeavors, the intensive and innovative use of ICT will play decisive role. Development of PA in such direction can be achieved through improved training of public servants. In this respect, there is much to be done in Eastern European countries.

Before the process of transition started in Eastern Europe, Public Administration was among the most neglected areas either as a field of study, as a scientific discipline or as a vocation. With some rare exemptions there was no educational or training institutions focused on PA in the whole region before 1989. After 1989, new training and educational institutions in PA are mushrooming in the region and development of new curricula in PA is very intensive in many countries. However, in a rush, ICT topics and courses were in many occasions considered as less important and hence underestimated or ill developed. In addition, the lack of equipment and experienced lecturers even worsened the situation. It seems that there is still a lack of understanding the role and the potential of ICT in the process of modernization and transformation of PA in post communist countries, not only among senior servants and functionaries but also among directors and administrators of the training and educational institutions in PA itself.

Although courses in ICTs became the standard part in PA curricula, there is still a great lack of understanding what is the main role and mission of this teaching. To train students in basic computer skills in order to be able to use computers only as a typing machine or to give them, who will in the future become professionals or managers and administrators in

different sectors of PA, broader knowledge and understanding of the role of ICTs in transformation of PA into more efficient productive and less bureaucratic part of societies.

In order to provoke changes in perception and understanding of the role of ICTs in PA, within the PA itself and especially within educational and training future public servants and administrators, we dedicated this workshop to the following issues and opened questions:

- information society and the role of Public Administration;
- role of the ICT in changing PA;
- role of ICT education and training in changing the understanding of the role of ICTs in Public Administration;
- current experiences of participants at teaching ICTs as a part of PA curricula;
- what to teach future professional workers, middle and senior managers in Public Administration about ICTs;
- how to integrate ICT topics into the rest of PA curricula;
- what teaching strategies to use in order to achieve better results.

Workshop was organized into three parts. At the beginning, the facilitators presented the key issues and problems and identified the open questions. In the second part, the participants presented their cases, examples from their native institutions and views how to make further progress in the field. In the third part, the conference participants were divided into three working groups which worked in three sections.

During the first session, working groups focused on development of common basis of teaching ICTs in PA curricula. The main goals of teaching were discussed which took into an account the variety of educational programmes, the necessary depth of the various ICT topics among the future public servants and administrators and the main curricula areas and sub-areas.

During the second session, working groups tried to define the strategies related to integration of ICT topics in the curricula in PA. This seems to be still very serious problem at majority of institutions presented since teachers of other, more traditional disciplines, do not use ICTs in an extent which would be needed in order to change present relatively low level of computer use. The participants agreed that in addition to dedicated courses, an intensive integration of ICT topics and use into other traditional functional

areas of PA curricula would be needed. In order to achieve this, interdisciplinary and multidisciplinary courses were suggested in order to show students the potential of use of ICT in real life situations in PA.

The third session all three working groups devoted to discussions about teaching methodologies and how to improve them, taking into account also constraints with which we are confronting in great number of educational and training institutions, like the lack of equipment, personnel and small amount of teaching hours available.

During the last day, the conclusions were made about the necessary future actions in order to improve the situation and standards of teaching ICTs in the respective institutions. Also the recommendations were summarized which were developed during the workshop and which are published together with the presented papers and case studies in the proceedings.

The papers and materials that are contained in this volume of the workshop proceedings have been arranged in three parts. The first part (Vintar, Reineremann) is trying to identify the key issues related to the topics, aims and objectives of the workshop. The second part contains the selected papers presented by participants. Selection of papers was made on the basis of the extent in which the individual paper addresses and corresponds to the topics of the workshop. The third part contains some most interesting points and thoughts of interest from discussion. In the last chapter, we are presenting the recommendations and conclusions of the workshop which were developed during the sessions of the three working groups.

The workshop was attended by 24 participants from twelve different countries from Central and Eastern Europe and Germany. Sessions were chaired and facilitated by Professor Heinrich Reineremann, Postgraduate School of Administrative Sciences, Speyer, Germany and Professor Mirko Vintar, University of Ljubljana, School of Public Administration. The workshop was hosted by Charles University of Prague, and excellently organized by Dr. Tomáš Kučera.

PART I

1.1. Challenges of teaching computer science and informatics in PA curricula.

*Mirko Vintar **

Introduction

There is no doubt that the information society is on the horizon and that the whole world is entering it with great speed. Countries from around the world are entering and implementing it through the main door. In Eastern European and third world countries it is perhaps more of an unconscious transformation by stealth, a less controlled, planned and supported process, however, still rapid and unavoidable. As usual first governmental action started in the USA and not much later European Union followed with carefully prepared programmes and actions to provide a smooth and as rapid as possible transition to the new society. We all know the so-called Al Gore report 'National Performance Review' prepared in 1993 in the USA, which stirred nervous reactions in the European Union which has resulted in the famous Bangemann report 'Europe and the global information society', prepared for the meeting of the European Council in Corfu in 1994. We will cite a few sentences from this report which are according to our view relevant for our further discussion:

The first countries to enter the information society will reap the greatest rewards. They will set the agenda for all who must follow. By contrast, countries which temporise, or favour half-hearted solutions, could, in less than a decade, face disastrous declines in investment and a squeeze on jobs

According to this view, it will be very important, when individual countries will be prepared and able for transition to the information society. For transformation of societies into something rather new, there are probably two most important factors which will play a decisive role. The infrastructure, in our case information infrastructure, and human resources, which should be able to cope and to take advantage of the new opportunities and circumstances. There is no doubt that the most developed countries are better prepared and equipped for the changes and challenges of the information society. The necessary information infrastructure which is centred around modern telecommunications in developed countries

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already exists. Maybe there are still missing some broadband telecommunications, but at least ordinary telephone lines and narrowband telecommunications are no longer a problem in western countries. By contrast in Eastern European countries (although there are very great differences between the countries in the region) even the availability of ordinary telephone lines can still represent a serious problem in some regions. Let us simply compare the number of ordinary telephone lines, the number of PCs or the number of Internet users in western and eastern Europe and we can easily foresee the number of years which will be needed in most eastern European countries to catch up with the development of western countries.

Public Administration represents in all modern states a very important part of society, and its role in the development process of the respective country could be crucial. This was one of the points which was specially underlined in the Bangemann report. And here we come to the responsibility and the important role of education and training institutions in the field of PA for the future development of these countries. On the one hand PA will play a very important role in establishing the best possible conditions for private businesses and enterprises to be able to adjust to the information society, on the other hand, PA itself will have to change tremendously in order to be able to use the full potential of Information and Communication technologies (ICT).

However, when we start to analyse the situation and level of teaching ICTs at educational and training institutions offering programmes and curricula in Public Administration, we easily come to the conclusion that what we are saying above forms part of a science fiction novel while reality is something completely different. A great number of institutions in the region are struggling with a lack of equipment, inexperienced lecturers and outdated programmes. There still exists a prevailing opinion that even for graduate students, basic PC training is sufficient to master the challenges of the approaching information society. By contrast, nobody would consider today basic book-keeping skills as sufficient knowledge for future financial managers. In this paper we will try to address some of the open questions and misconceptions related with the role of ICTs in Public Administration, and the respective education and training needed in order to make its use more efficient.

Public Administration and ICTs

Many private enterprises and businesses all over the world report on serious business process re-engineering projects (BPR), through which the whole organisational and administrative structures were completely reorganised on the basis of implementation of the newest ICTs. In some branches of industry and services, especially in banking, insurance and similar companies whole departments will have to be closed in the near future, because of the implementation of *tele-services etc.* Public Administration is certainly one of the areas which will also suffer great changes in the future because of the intensive use of modern technologies.

In order to make PA fit and capable to change, and to adjust to new circumstances, we need well educated and trained public managers, administrators and competent professional workers in the public sector. There is no doubt that knowledge in ICTs is an equally important functional area in PA curricula, as for instance the techniques of financial administration or organisation and management concepts which are normally considered as standard building blocks of PA curricula. Knowledge and skills in ICTs can be considered a very important, if not strategic asset, for organisations and for individuals in the public sector for at least three reasons:

- growing importance of knowledge and skills in computers for personal productivity and effectiveness
- growing investments in ICT in public sector
- growing importance of information as a strategic resource

Growing investments in ICT in the public sector

The public sector has always been one of the biggest purchasers of hardware and software in all modern countries. However, in the last few years expenditures for technology in PA have been rocketing, hence a general understanding of computerisation and networking policies and price/performance issues are becoming increasingly important and vital issues for all decision makers in PA.

Growing importance of information as a strategic resource

In the past, financial and human resources were considered the most important resource for any kind of human undertaking.. Nowadays, information has become an equal, or even more important asset and resource for running businesses, or providing any kind of service. Managers

and entrepreneurs are more and more aware of the fact that their ability to manage depends to a great extent on the quality of information systems available.

Growing importance of knowledge and skills in computers for personal productivity and effectiveness

There is probably no need to say that an average civil servant today cannot be successful in his/her post without using a variety of computer based tools and solutions on a daily basis.

Innovative and creative PA and education in new technologies

These could be probably the starting points for our discussions about the role and position of ICT training and education in PA curricula. We should strive for PA which will be dynamic, creative and innovative and which will on the one hand provide an environment for quick economic development in respective countries, and, on the other hand, provide a high quality service to the citizens. In all of these endeavours the intensive and innovative use of ICT will play a decisive role. Development of PA in such a positive direction can be achieved through improved training of public servants. In this respect there is much to be done in Eastern European countries .

Before the process of transition started in Eastern Europe, Public Administration was among the most neglected areas either as a field of study, as a scientific discipline or as a vocation. With some rare exceptions there was no educational or training institutions focused on PA in the whole region before 1989. After 1989 new training and educational institutions in PA mushroomed in the region, so that the development of new curricula in PA is now very intensive in many countries. However, in such a rush ICT topics and courses were on many occasions considered as less important, and hence, underestimated or ill developed. In addition, a lack of equipment and experienced lecturers even worsened the situation.

It seems that there is still a great lack of understanding of the role and potential of ICT in the process of modernisation and transformation of PA in post-communist countries, not only among senior servants and functionaries but also among directors and administrators of the training and educational institutions in PA itself. We have still to deal with several misconceptions which are the greatest obstacle in the way to better and

more efficient use of ICTs in PA. Some of these misconceptions and misunderstandings deserve mentioning and more elaborate analysis.

One very widespread view among administrators and managers about ICTs is that such technologies are closely specialised an isolated field which is something very “technical” by nature, hence it should be dealt with by a rather strange brand of computer specialists and engineers. Even when it comes to strategical questions of development, information infrastructure in an organisation, investments in ICTs, personnel development related to ICTs, we can usually identify same kind of negative attitude. While this understanding of the role of ICT was partially true and justifiable twenty or thirty years ago, it is completely wrong in the 1990’s. The process of implementation of ICTs in an organisation, together with the necessary changes in organisational, managerial and working structures is nowadays normally called “informatization”. This process is still quite often understood as a simple activity, of the implementation of new technologies into an existing organisational setting. We believe that Frissen’s (Frissen,1992) definition of “informatization” is the best argument against this widespread misunderstanding of informatization, and encompasses the real dimension of what has to be understood under this term.

Frissen defined the process of informatization as a combined set of activities which can be defined in five points:

1. The introduction of information technology to shape or take care of the information retrieval process by means of automated information systems.
2. The rearrangement of information flows and information relationships to facilitate the administrative or management information process.
3. The adjustment or change of the organisational structure in which information technology is introduced.
4. The development of information policies as a differentiated area of decision-making in the organisation.
5. The introduction of specific expertise in the field of information technology through functionaries or consultants with specific tasks in this field.

According to this definition those who are responsible for the informatization of administrative processes should be in possession of a broad range of interdisciplinary knowledge and skills, ranging from computer science to system analysis, organisation and management etc.

The introduction of new ICTs offers a good opportunity to radically change and rationalise working procedures and re-engineer processes. But this is possible only if we understand the substantive context in which informatization is being carried out.

This, broader understanding of informatization processes should find reflection in PA curricula. It must be evident that in this respect that skills in basic PC tools are not nearly enough. It is necessary to provide students with a much broader set of required knowledge and skills if we want them to be capable of solving real life problems which are normally interdisciplinary.

There is no doubt that teaching ICT without contextualising it within the PA domain would bring very poor results. The question is how to achieve contextualisation in a most efficient way: either through implementation of case studies within dedicated ICT courses, or through intensive integration and use of ICT tools in courses covering other functional areas. According to our experience both ways are important, however, the second approach is very difficult to achieve in a satisfactory manner.

In order to change this situation we have to work simultaneously on at least two fronts. On the one hand, we have to change the understanding of the role of modern technologies in society in general, i.e. cultural change (without this all other activities will be only partly efficient). On the other hand, we have to develop and provide modern and efficient training to public servants in all aspects of the use of ICTs in PA , and this is the point where the role of curricula in PA becomes vital.

ICT as an instrument of change

For many years the use of ICTs in public administration was perceived mainly as the automation of routine tasks and procedures. Hence, the informatization process was regarded as the simple replacement of manual tools and procedures with computer based tools and solutions. This approach has resulted in the creation of what is more or less considered to be isolated technological islands, while the organisational context has been virtually unchanged.

We can say, therefore, that in the past the use of ICTs was mainly technology driven rather than content driven. The real needs of administrative processes were never brought into question. On the contrary, the question which was normally asked was really what technology should

be used to automate administration. In other words the usual supposition was that all automation brings positive results.

Only very recently has the term informatization acquired a wider meaning, and it now implies organisational and even social change, as well as technological innovation.

What kind of training do we need?

One of the possible approaches in the search for answers to these questions would be to consider what we would like to achieve with education and training in ICTs, and what kind of users of computers we need in the public sector. We believe that one of the big problems we encounter nowadays in PA organisations are so-called “passive users”. They normally claim and argue that they are using computers every day, and that they really do use computers for simple tasks, mainly as a replacement for typewriters. Their desks are full of modern technology, mostly superfluous, hence we realise great investment costs but poor results. We believe that one of the main objectives of ICT courses in PA curricula should be to encourage students to become creative and innovative users of the new technologies, to understand ICTs as the so-called “enabling technologies”, technologies which are providing new opportunities and possibilities in the organisation of working procedures.

With some simplification we can classify users of ICTs into four qualitative groups:

1. Users able to use computers for simple tasks
2. Users able to use ICT within existing, more sophisticated tasks (activities, processes, services) while replacing manual activities with the use of ICT
3. Users able to reorganise or re-engineer the existing activities, processes, organisations on the basis of the implementation of ICTs
4. Users able to create new knowledge, processes, services and products on the basis of the innovative use of ICT

This classification was made on the presumption that today everybody appreciates ICT and its role in the business and administrative processes. If we as teachers agree on this simplified classification of possible users of ICTs, then we can probably also agree that our general motivation and aim should be to encourage our students to reach the most demanding level required of them, and to make them capable of solving complex problems

using advanced tools. It is a relatively easy task to train users to fit into the first two groups defined above, being sufficient to provide students with basic skills in computers and related tools (i.e. to train them to be able to use word processors, spreadsheets, drawing tools and similar packages). The results of such training are the most tangible and measurable, hence the most rewarding, and many training institutions adopt this approach. In order, however, to develop students to become more knowledgeable and innovative users of modern technologies, corresponding to the third and forth defined level, we have to provide them with much more. The necessary conceptual knowledge about information systems, and their role in modern organisations, requiring knowledge from other functional areas, such as legal, organisational, financial, etc. is in this case vital. We also have to give them enough practical experience, examples, case studies, so that they would be able to start independently more sophisticated and innovative projects. Hence, an interdisciplinary and multidisciplinary approach is needed in order to achieve these desired goals.

Delineation between courses in informatics and other subject areas

With the rapid development of ICT and the growing potential of its use in increasingly complex situations, informatization, as a process of ICT implementation in organisations, is increasingly intertwined with the organisation of working processes, business process re-engineering (BPR), and changes in the organisational structures of organisations under consideration. In order to make informatization successful we should understand the object system in which the new technology has been implemented (in our case the public administration context). Hence, as teachers of ICT subjects, we have been facing in the last few years a very serious dilemma, which is actually our mission. Should we understand and teach informatics in a more general sense, as a more or less universal discipline, which can later be applied in any area, when students begin their jobs. Or should we focus the teaching of ICTs in a more specific problem domain, related to specialised field, such as public administration. It is our belief that the latter approach should be the case. According to this view there exists an independent discipline called “administrative informatics” which deals with the implementation of ICTs in PA. Following this line of thinking, we should understand our occupation in a broader sense, as an interdisciplinary and multidisciplinary area of thinking and acting (i.e. bridging the gap between the new technologies and their

application within all disciplines relevant to public administration. We believe that clarification of these views is very important for further discussions about curricula development.

Some aspects of ICT curricula development within the context of PA

In our discussion several vital questions on the development of curricula have thus far surfaced, namely:

- what is administrative informatics as a discipline and subject of our discourse
- where is delineation line between the ICT subjects and subjects constituting the other parts of curricula in PA
- what to teach future professional public servants and managers about ICTs
- how to teach ICT subjects in order to get the best results
- how to integrate ICT topics, i.e. administrative informatics, with other scientific disciplines etc.

Curricula development cycle

When we start to think about our curricula and its development we should bear in mind that this is a multi-phase process, where in each phase several important factors should be defined and clarified. We attempted to illustrate this process in Figure 1, from which we could derive the following vital factors and elements for curricula development:

- level of program (programme profile)
- target groups
- level of use of ICTs
- available body of knowledge elements
- depth of knowledge
- teaching methodologies
- supporting areas of learning

As a first step we normally should ask ourselves about the aims and objectives of teaching. These are the function of a target group and the level of programme or programme profile. Teaching objectives are quite often much more clearly defined for the whole curriculum and more vague for an individual functional area. If, for example, we take curriculum in

Public Administration Management, we would be probably able to describe the aims and objectives of it . By contrast when we think about the aims and objectives of one particular functional area within this curriculum, like ICT, we are more unsure and we necessarily have to deal with very different views about what is important and what is not. Discussions of this type are very often the subject of a kind of bargaining between different interest groups within educational institutions.

Administrative informatics is still a very young discipline, with a lack of a long-standing tradition, standards etc. In this situation some relevant recommendations can lessen our burden and can underpin our position as teachers of ICTs, or those who are responsible for the development of these areas within educational and training institutions, when we are discussing and defending the contents and the role of ICT courses. There are two “formal” recommendations which might be useful in this respect and which are worth mentioning.. Probably the most comprehensive guidelines were developed at NASPAA (National Association of Schools of Public Administration in America) in the mid 1980's (see Reinermann, H., New Technologies and Management). As NASPAA associates more than two hundred American universities, those recommendations can probably serve as relevant guidelines in the development process of ICT within PA curricula. The problem is that those recommendations were developed nearly ten years ago. In the last ten years the development of informatics has been so explosive and immense, especially in the field of personal computing, that we have to take these recommendations with some reservation.

More up to date recommendations or guidelines for curricula development have been developed by the Joint Task Force set up by ACM/ACS-ICIS/DPMA. Despite being created mainly for students of MIS (Management Information Systems) the guidelines can be a very useful source of reference, and also a useful tool when we start the development of courses which constitute ICT modules as part of the curricula in Public Administration. In such situations we have to deal with questions such as:

- *selection of the necessary ICT knowledge elements for PA students*
- *definition of the necessary or recommended depth of knowledge*
- *the necessary activities to attain the required depth or level of knowledge*
- *what are the recommended supporting areas of learning, in order to underpin and make the learning process successful*

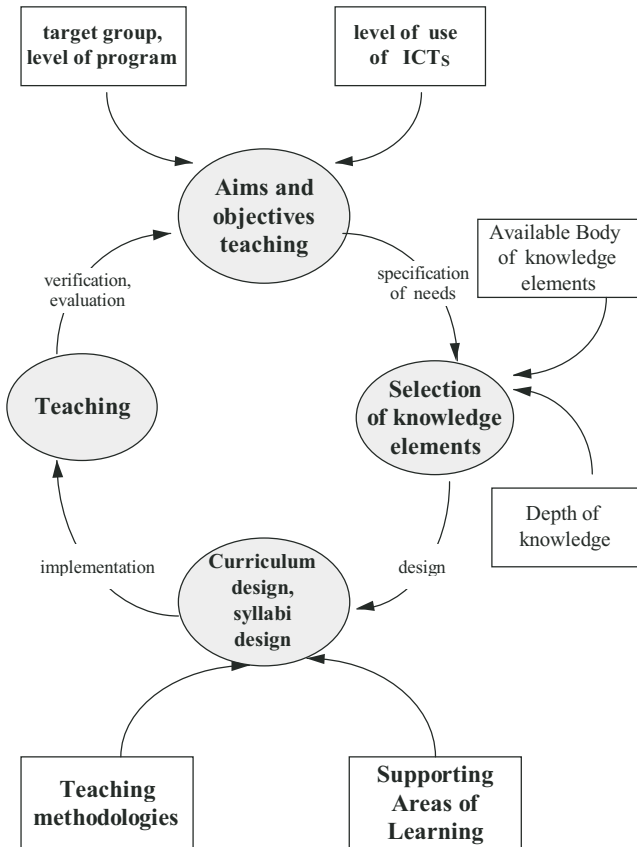


Figure 1: Curricula development cycle

We present the extract from the guidelines discussed above, in the Appendix.

Conclusions

We can summarise from our discussion that it is still a very widely open question as to what kind of ICT knowledge and skills would be most necessary and useful for PA students who will become future public servants, i.e. professionals, managers or top officials in the public sector. A perception that the skilful use of PC tools is fundamental to everybody

working in PA is very much accepted. Discussions and different views normally occur when we try to think and to define what additional, more sophisticated knowledge blocks of ICT are needed to be successful for the multifarious tasks which exist in public administration. One of the dilemmas which must be solved is the ratio between the necessary PC tools related skills, and a more advanced conceptual knowledge focused on information systems and their role in public administration organisations. We advocate a broader, interdisciplinary approach in the teaching of ICTs in the PA context. We also believe that a conceptual knowledge about information systems, their development and the role they play in modern organisations is indispensable for anyone in a leading position in PA, and this stand should be reflected in PA curricula to a much greater extent than it has been in the past.

Whether we are right remains to be seen.

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The Joint Task Force ACM/AIS/-ICIS/DPMA, Information Systems Curriculum 1995

*Appendix: Guidelines for development of curricula developed by
ACM/ACS-ICIS/DPMA Joint Task Force*

- A. Fundamentals of Computer Information Systems**
 - A.1 IS Literacy
 - A.2 End-User Computing
- B. IS Theory and Practice**
 - B.1 Systems and Quality
 - B.2 Decision Making
 - B.3 IS Planning
 - B.4 IT and Organizational Systems
- C. Information Technology**
 - C.1 Computer Hardware
 - C.2 System Software
 - C.3 Telecommunications
 - C.4 Programming
 - C.5 Algorithmic Design
- D. Systems Development**
 - D.1 Software Development
 - D.2 Database
 - D.3 Systems Analysis and Information System Design
 - D.4 Teams and Interpersonal Relations
 - D.5 Project Management
- E. IS Deployment and Management**
 - E.1 Support Services
 - E.2 Systems Integration
 - E.3 Management of the IS Function
 - E.4 Information Resource Management

Figure 2: Curriculum areas and sub-areas for curriculum 1995

DEPTH OF KNOWLEDGE	MEANING OF DEPTH OF KNOWLEDGE LEVEL
1. AWARENESS	<p>Introductory Recall and Recognition but with little ability to differentiate.</p> <p>Students completing this level will be able to:</p> <ul style="list-style-type: none"> · List characteristic of... · List Advantages, Disadvantages of... · Name Components of...
2. LITERACY	<p>Knowledge of Framework and Contents,Appreacation of what computers are, their parts, how they work, how they relate to work</p> <p>Students completing will be able to:</p> <ul style="list-style-type: none"> · Compare and contrast... · Explain... · Describe interrelations of ...to related objects · Execute simple....
3. CONCEPT/USE	<p>Comprehension and Ability to Use Knowledge when Asked</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> · Use... · Communicate the idea of... · Form and relate the abstraction of... · List concepts/define major steps in...
4. DETAILED UNDERSTANDING/ APPLICATION	<p>Selection of the Right Thing and Using It without Hints</p> <p>Students will be able to:</p> <ul style="list-style-type: none"> · Search for correct solution to... · Design and implement a.... · Apply the principles of... · Implement a.... and maintain it
5. SKILLED USE	<p>Identification, Use and Evolution of New Knowledge</p> <p>Students completing this level will be able to:</p> <ul style="list-style-type: none"> · Develop/Originate/Institute... · Construct/adapt... · Generate novel solutions to... · Come up with new Knowledge regarding...

Figure 3: Definition of knowledge levels

Depth of Knowledge	Activities Associated with Attaining this Level
1. Awareness	<i>Class presentations, discussion groups, reading, watching videos, structured laboratories. Involves only recognition, but with little ability to differentiate. Does not involve use.</i>
2. Literacy	<i>Continue lecture and participate discussion reading, team work and projects, structured labs. Requires recognition knowledge as a prerequisite. Requires practice.</i>
3. Concept/Use	<i>Requires continued lab and project participation, presentation involving giving explanations and demonstrations, accepting criticism; may developing skills in directed labs.</i>
4. Detailed Understanding Application	<i>Semi-structured team-oriented labs where n students generate their own solutions, make their own decisions, commit to and complete assignments, present and explain solutions continuously.</i>
5. Skilled Use	<i>An advanced level of knowledge for those very capable of applying existing knowledge in which “de novo” solutions are found and utilized in solving and evaluating the proposed new knowledge.</i>

Figure 4:
Activities associated with attaining defined knowledge level

Recommended supporting areas of learning

Communications and Presentation Skills	Problem Solving	Public/Business/Organisation
Writing	College Algebra	Financial Accounting
Listening skills	Calculus/Business Calculus	Managerial Accounting
Public speaking	Statistics	Auditing, Security, Control
Presentation techniques	Decision Science	Management
Team work	and Modelling	Organisational Behaviour
Small group discussion		Group Dynamics
		Organisation Development
		Quality Management
		Macro Economics
		Public Finance
		Administrative Law

***Figure 5:
Recommended supporting areas of learning***

1.2. Impacts of New Technologies on Public Administration

- Some Deficits of ICT-Applications in Public Administration Today: Challenges for Curricula in Administrative Informatics

*Heinrich Reinermann **

Whereas Professor Mirko Vintar started his deliberations from the aspect of the future (the “information society”: what kind of ICT-providers and ICT-users do we need?), I would like to start from the present: what kinds of information systems have we got in public administration (PA) today? To what extent are we satisfied with them? Is there something that needs to be changed? And what implications for curricula in administrative informatics (AI) can be derived from our conclusions?

1. Administrative Informatics - a Necessary Interface

My point of view will be that of administrative informatics. By AI I mean the interface between informatics and public administration; by informatics I mean a set of knowledge necessary for developing and providing hardware (computers, peripheral devices), networks, software (systems and application software), and data. By PA I mean parliaments, governments, departments, agencies, public utilities, both on state and local levels, as well as courts. In other words: PA is used in the broad sense of the public sector, in the following deliberations.

Of course, interfaces are very important in informatics, and so AI, as an interface, raises two questions:

- How does informatics influence PA?
- How do the requirements of PA influence informatics?

To deal with AI as an interface of this kind seems to be quite necessary. This becomes obvious when you take a closer look at ICT systems in PA. Often they are not in good shape! In many countries quite a gap exists in PA between ICT potential and ICT reality. Some call this gap an “EDP

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legacy". In the following I would like to list some examples of this phenomenon.

2. Some Deficits of ICT Systems in PA

- a) Application systems often resemble "islands". They lack horizontal integration and links to the clients of PA (e.g. other agencies, business companies, citizens, etc). Instead, ICT systems follow the hierarchical structure of PA: a system for budgeting, a system for citizen administration, another system for social administration and so on.
- b) Traditionally, ICT systems were built on proprietary hardware and software from different vendors and suppliers, and as a consequence, incompatibility quite often occurs.
- c) Implementation periods for software packages can be astonishingly long. In one case, in one of the 16 states of my country, it took not less than 20 years before an application system was installed in the last of the 43 identical agencies - needless to say that, by then, the system was outdated in terms of its hardware and software features.
- d) Even in 1996, the proportion of workplaces which are actually equipped with ICT, can be quite low - in some of our states it is only 20 per cent. Of course, this alone causes some problems for electronic communication.
- e) There are many complaints about the "productivity paradox of EDP", meaning that actual productivity gains do not live up to expectations or promises. And one should be aware of the fact that a 20 per cent productivity increase alone is necessary just to break even with additional ICT costs (assumptions: on an average 60.000 US Dollars salary ICT costs 12.000 US Dollars per year at a workplace).
- f) One of the reasons for a lack of net productivity gain by investments into ICT, is the 1:1 transfer of traditional administrative procedures to the computer. Often, ICT experts tend "to look over the shoulders" of administrators and to more or less replicate their work on machines. Thus, the potential of ICT as an "enabling technology" is, of course, not utilized.
- g) In the past, computer centers have provided identical application systems for dozens or even hundreds of public agencies within their jurisdiction. Therefore, individuality and locality of applications is often neglected. Here, reference models could provide a better approach; they are able to take care of, let us say 80 per cent of a respective administrative

procedure, e.g. vehicle registration, whereas approximately 20 per cent can be tailored to local and individual needs and circumstances.

- h) On the other hand, public agencies quite often “reinvent the wheel” although the administrative procedure to be supported might not be much different from others. E.g. although individuality is necessary, to a certain extent, vehicle registration procedures will be more or less the same all over the country, which again points to the benefit of reference models.
- i) Because of the complexity and incompatibility of many ICT-systems, maintenance costs are extremely high. Therefore, the largest part of ICT staff is needed just to maintain existing systems, with little capacity left to develop new applications, leading to the so called “tailback of applications”.
- j) Due to the fact that in the beginning of the computer era there were no trained personnel available, of course. However, a high percentage of today’s IT personnel consists of former administrators who have been retrained so that they were able to develop and maintain software for their sphere of experience. Social administrators became “experts” for ICT systems in social administration, teachers for school software, doctors for hospital applications, judges for ICT systems in courts and so on. Today, of course, the qualifications necessary are quite different. Small application systems (some call them “dog hut software”) are being replaced by big complex networked systems (“highrise complexes” so to speak), and a quite different set of knowledge is needed, especially knowledge of software development tools, for software modeling, prototyping, data modeling, process modeling, software testing, controlling of ICT systems and the like.
- k) Often project management of real EDP projects is non existent or not as effective as it ought to be. Almost all ICT projects last longer and cost more than expected.
- l) There is also an astonishing amount of impatience on the side of the sponsors of ICT projects. As a consequence, quite often there is no time for solid planning of ICT systems. Some call this the “Whiskey-syndrome” - why isn’t Sam coding yet?
- m) ICT systems in reality are often old fashioned. In other words: networking, workflow technology, data warehouses, to name but a few, are not yet utilized as much as they could be. However, when you take the trends towards an “information society” into account, you

would expect PA to be among the pioneer users of new ICT products and services, in order to help pave the way towards a national information infrastructure which can then be utilized by the whole population, by enterprises and by citizens.

- n) To conclude this list, it shall be mentioned that ICT systems in PA are quite often not well protected against computer crime, hackers, viruses, or destruction. Astonishingly enough, PA sometimes runs large ICT networks without even being aware of the risks involved, and in the wake of this, without having a strategy or policy for data security.
- o) It does not come as a surprise after all that there seems to be quite a lot of weariness concerning EDP among politicians, agency heads, and users. Up to now, EDP often does not live up to their expectations or to the promises made by ICT experts. Overall, the “climate” in the area of AI is not as good as it should be - and as it could be.

3. Consequences for AI Curricula

I think, the existence of such gaps has a lot to do with curriculum development for AI. And the gaps lead to two main questions, namely:

- Who should be involved in closing those gaps now and in the future, or in other words: who should be the addressees of AI curricula?
- What knowledge is necessary to avoid such gaps in the future, or in other words: what are the topics to be included in AI curricula?

4. Clients of AI Curricula

At least three large groups of clients of AI curricula should be taken into account:

- The users of future IT systems must become more involved in systems development. In the past ICT experts tended to “look over the shoulders” of future users which is to say that they asked the administrators, carefully, to explain their work; then, after some time, the ICT experts returned with a solution which they presented on nicely colored slides which the users didn’t understand, but to which they were supposed to agree - and normally they did.
- Also, leaders in the public sector (politicians, agency heads, managers) must become more involved in systems development. In the past they have tended to leave ICT, as a supposedly technical matter, to the experts. Sometimes, leaders even seemed to be almost proud not to

know anything about ICT. However, they are supposed to answer policy questions related to ICT, such as “is it worthwhile to invest in ICT?”, “where do we want to go, what goals do we want to achieve with ICT systems?”, “what harm to society (citizens, civil service, etc.) do we want to avoid?”, or “how much ICT training do we need for our staff?”

- Last not least, ICT experts should be addresses of AI curricula. In the past they tended to be satisfied with ICT knowledge in a narrow sense; very often they didn't know as much about PA as their clients. In the future, however, they should be better able to communicate with administrators, and this means that both are necessary: to explain, let us say tax administration, to ICT experts as well as to explain IT matters to tax administrators.

ICT experts also need constant upgrading with regard to the rapid technical progress in their field.

5. *ICT as an “Enabling Technology”*

To get these three groups of actors involved in the development of IT systems for PA is especially necessary because ICT, in the last decade, has become an “enabling technology”. Two basic phenomena are behind this:

- Whereas ICT, some 40 years ago, started out with “computers” (i.e. machines which were able to do just that - to compute), it has become possible in the meantime to digitize, to store and to manipulate, automatically, all the three communication media which are important in PA, namely writing, speech, and pictures (both, fixed and moving). This is, of course, what “multimedia” is all about.
- Given the electronic networks of today, information has lost one characteristic feature dominant in the past: locality, meaning that the content of information used to be tied to a carrier, like paper. Because of locality, as a secondary characteristic, it was difficult and time consuming to communicate. With electronic networks, however, information has become ubiquitous; since electrons travel at the speed of light (7.5 times per second around the globe), information put into a computer which is connected to a network, is available anywhere around the world, and practically without any loss of time.

As a consequence we are faced with completely new situations, due to this dramatic growth of technological potential: global multimedia access to information, from our own desks; telepresence, teleworking, and

telecooperation; intermeshing of information systems of public agencies and those of their clients; new ways for citizens to access public administration; new ways to inform the population about public affairs; and new ways for citizen participation - to name but a few.

The main message to be derived from this is, that it is no longer sufficient to transfer administrative procedures, more or less on a 1:1 basis on ICT systems - we can do much better! However, this implies to see ICT as the “enabling technology” mentioned before, and to utilize the new ICT potential to do administrative work in ways different from the past.

In the last analysis this means to integrate the strategies of PA and the strategies of its ICT systems! In other words:

- people in charge of developing strategies for public agencies must take ICT potential into account,
- and people in charge of developing ICT systems must consider these as extensions of the development plans of the respective agencies.

This proves again that professional systems development must involve three groups:

- users,
- decision makers,
- and IT experts.

6. *“Information Society”*

To get users, leaders and ICT experts involved in the development of ICT systems for the public sector, is necessary for yet another reason: many societies find themselves in the middle of a paradigmatic transformation from “industrial societies” to “information societies”. Since Professor Vintar has elaborated on this notion already, let me just briefly remind you of the dramatic changes in the international division of labor which are going on, and which are caused partly by a globalization of economic affairs. This new situation implies opportunities and risks for businesses and employees at traditional locations, unknown so far, and it also implies different ways of how we educate and entertain ourselves, how we organize our health care, transportation, or environmental protection systems, and so on.

Here, amongst other things, the state is taken to task as a “development agency”. The state must:

- organize a social dialogue concerning the directions to be taken,

- guarantee the technical infrastructure (which is more than building the so-called “information highways”),
- further develop the legal framework,
- remove obstacles,
- create incentives,
- and contain risks.

As can easily be seen: PA is deeply involved in all of this, and the knowledge necessary for these new tasks must be reflected by the AI curricula we are discussing here. One consequence seems to be obvious to me: among other topics, AI curricula must address the management of ICT systems in three fields - public agencies, ICT units, and politics. Here, all people involved in decision making about information systems in public administration must know the important problems at stake and how to solve them. This know-how is often neglected in curricula dealing with informatics and, therefore, lacking in public administrations. I strongly suggest this know-how to be included in AI curricula, and shall conclude my paper by listing some fields of management knowledge necessary to develop information systems in PA.

7. Management in Public Agencies

Public administrators should:

- have a vision and a strategy with respect to the development of the respective administrative unit;
- integrate those strategies with plans to further develop the ICT systems in, and for, those administrative units;
- be ready to “reinvent government” which is but a modern phrase for what Joseph A. Schumpeter used to name the “process of creative destruction” of traditional structures on the part of innovative entrepreneurs. Schumpeter described the history of the economy as a “history of revolutions”, of a technical and organizational kind, as the “process of industrial mutation..., which constantly revolutionizes the economic structure from within, which constantly destroys the old structure and constantly creates a new one”.¹ In my view, when we talk about “redesign” or even “reinventing” our organizations today, we are talking about the same context with different words. Indeed, we are

¹ Schumpeter, Joseph A., *Capitalism, Socialism, and Democracy*, Bern 1986, Chapter 7, pp. 134-142.

always called upon to redefine our role and our possibilities in the context of social and technical change;

- decentralize responsibility for resources, and that means here: Not only for finance, for organization, and for personnel, but also for ICT, because this is a prerequisite if one wants to avoid the danger of “software concrete” imposed upon an administrative unit by centralized ICT units, and reducing the leeway for innovation;
- provide for central frameworks and service at the same time, however, because decentralization is not supposed to create chaos, of course, and because decentralization does not preclude help desks and other kinds of centrally organized support;
- consider management of the ICT units within their jurisdiction as part of their overall management efforts. For example, this could mean budgeting and contract management (“resources for performance!”) and competitive tendering, maybe outsourcing, with respect to management relations between an administrative unit and the respective ICT units;
- qualify themselves in ICT matters in order to be able to communicate efficiently with ICT experts. For, it seems no longer to be tolerable that ICT experts have to use “Kindergarten terms” in order to make themselves understood when communicating with agency heads.

In short: public managers must give up their lack of interest or even apathy for ICT, and they must instead take on responsibility for ICT. Otherwise the “productivity paradox of ICT” is not going to disappear; we will continue to spend much money on ICT although we should know that “just to throw money at a problem” normally doesn’t solve it; rather, in the field of ICT, this attitude has often created “ruins of investment”.

8. Management in ICT Units

Similarly within ICT units, effective management must be executed. Managers here should:

- develop visions and strategies, too, and integrate those into the development strategies of the respective administrative units;
- define their clients and products, install cost accounting systems, apply controlling;
- be ready also to “reinvent” the existing ICT systems. A striking example is New Public Management, the principles of which are applied by more and more public agencies, which implies that proper information

systems are available, e.g. data warehouse systems, data mining, executive information systems, cost accounting, product information systems, budgeting, controlling, benchmarking - to name but a few;

- be aware of the change of roles which has been imposed on ICT units recently: from computer centers to service providers;
- release standards in order to secure an open ICT infrastructure; the Internet technologies have created a new potential in this respect and should be taken into account;
- consolidate and modernize the ICT equipment (“rightsizing”, client/server systems, workflow systems, graphical user interfaces and many other concepts can be utilized here);
- look for strategic alliances and joint ventures with third parties in order to utilize “economies of scale” (e.g. for software projects, for computer centers);
- develop new services for the administrative units which, in the wake of New Public Management, are given more responsibility for their ICT systems; among those services are:
 - procurement, installation, maintenance, and back-up of decentralized systems
 - procurement, verification, and integration of software offered by the market
 - user support, help desks, etc.
 - qualification of users with respect to new application packages and new releases, respectively;
- take on the new concepts of data modeling, workflow and process modeling;
- develop concepts and strategies for security management necessary for their clients; there are very sensitive areas and less sensitive areas of public administration in this respect, and for each level of security, appropriate means are available like encryption, firewalls, electronic signature, etc.;
- really manage software projects which, again, involves many concepts which must be known, and above all, applied; for example, software development methods, user participation, change management, quality management, software testing (not only at the end of a development process, but preferably as early as possible), organized learning from

software mistakes (e.g. what were the procedures that caused a software mistake?), documentation of software quality (because otherwise improvements could not be measured), and many more aspects;

- apply modeling software in order to guarantee proper communication between users and ICT experts; analogously to the acronym WYSIWYG (“what you see is what you get”) WYGIWYW is necessary (“what you get is what you wanted”);
- apply methods for software adaptation like re-engineering, migration, or the redevelopment of software;
- qualify the ICT experts; several aspects are important, here: adaptation to the extremely fast technological progress, and to the changed needs of public agencies (more systems analysts, less programmers); in addition, ICT experts should be trained in public affairs because there is no effective communication with public administrators as long as matters of public administration must be explained to ICT experts in “Kindergarten terms” as well.

9. Management in the Sphere of Politics

Last but not least, there must be effective management in the sphere of politics, too. Politicians in charge should:

- develop visions and strategies for their countries: considering the approaching “information society”, where do we want to be in the year 2020?
- liberalize the telecommunications market;
- promote societal acceptance;
- emphasize education and training, necessary in an “information society”;
- guarantee equal opportunity by avoiding a gap between information-rich and information-poor;
- prevent the criminal misuse of global communication facilities;
- protect intellectual property in a world of ubiquitous information, through the further development and enforcement of copyright laws;
- protect consumers in economic transactions with virtual businesses;
- and last but not least, guarantee a sufficient number of employment opportunities by charting the proper course at the proper time in areas of research, development, economy, employment, and education policies.

10. Conclusion

These are some of the aspects and topics, I would like to see included in the curricula for AI - the theme we are going to discuss in depth during our workshop.

The need for education and the training of civil servants in the areas mentioned above, seems to be obvious. Someone has to take care of this. So why not us, when we teach Administrative Informatics?

PART II

2.1. Teaching ICT in Public Administration: The Problems of Curriculum Design

*Milena Dobрева **

Keywords

Curriculum Design, University Education, Applications of ICT in Public Administration

Abstract

We will present the problems in curriculum design of ICT courses in the M.Sc. and B.Sc. programmes in Public Administration at the New Bulgarian University.

The M.Sc. and B.Sc. in Public Administration programmes of the New Bulgarian University were created with the participation of ICT experts in 1992-1995. According to their advice, several courses containing ICT elements were included into the programmes. The New Bulgarian University, established in 1990 as an autonomous, non-governmental institution, was the first university in Bulgaria to propose programmes in the area of Public Administration.

The main difficulties in the process of creating the programmes were connected with the challenge of establishing innovative training curricula in areas where we had no previous experience. This specific difficulty was a general one for all experts working on the programme. However, in the area of ICT components in Public Administration training, in addition to the lack of experience in creating and working on similar curricula, we also had to overcome the problems caused by:

- the necessity to clarify the educational goals - a task which is very difficult in the areas of Social Sciences and the Humanities;
- the difficulties in proposing a structure for ICT courses, intending to train students for future employment in different levels of Public Administration;
- the necessity to find appropriate cases for the training process.

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1. Overview of the Institution

The M.Sc. and B.Sc. in Public Administration programmes of the New Bulgarian University were created with the participation of Information Technology experts in 1992-1995 [Georgiev et al., 1992]. According to their advice, several courses containing ICT elements were included into the programmes. The New Bulgarian University, established in 1990 as an autonomous, non-governmental institution, was the first institute in Bulgaria to propose programmes in the area of Public Administration.

The main difficulty in the process of creating the programmes was the challenge to create innovative training curricula in areas where we had no previous experience. This specific difficulty was a general one for all experts working on the programme, not only in computing. However, in addition to the lack of experience in creating and working on similar curricula, in the area of Information Technology in Public Administration training, we also had to overcome problems caused by:

- the necessity to clarify the educational goals - a task which is very difficult in the areas of Social Sciences and the Humanities;
- the difficulties in proposing a structure for ICT courses, intending to train students for future employment in different levels of Public Administration;
- the necessity to find appropriate cases for the training process.

We present briefly our solutions to these problems in the following sections.

2. Goals of ICT Curricula

The educational goals, on which the courses were structured, were formulated at the beginning of the programmes, and are as follows:

- the students should be acquainted with the most popular software applications in office technology;
- they should be able to distinguish tasks which require computer support;
- they should be able to explain to their staff and colleagues their expectations for the results of tasks which will be supported by computer;
- they should be trained to use computer tools for data analysis and to be well-oriented in the field of different types of data representation, and to use them for any data, in any form they work with.

Although we did not change the educational goals in our future work, we were open-minded about keeping them adequate to meet the needs of our students.

3. Problems, Limitations, Open Questions

3.1. The Structure of the ICT Courses

In the beginning of our work, it was supposed that the students already had some computer literacy.

For this reason, the M.Sc. programme, which was the first of its kind, was created without any introductory computer literacy courses, but included a Data Analysis course, which is computer based (all cases are modelled in computer environments, using spreadsheets software, e.g. Microsoft EXCEL).

In the second year of the M.Sc. programme, the students can choose from a number of Information Technologies courses, presenting new information technologies and their applications in Public Administration, basically in the areas of decision making and team work organisation.

Although the work with the students was successful, two basic problems should be solved in the near future:

1. The students were not necessarily able to use computers and different software packages, which slowed up the work on the core topics in the specialised courses, such as Data Analysis.
2. There was a lack of specialised cases from the area of Public Administration, because all lecturers have a background in ICT, Mathematics and Information Technologies, but not in the area of Public Administration.

These specific problems could be solved very satisfactorily with on-site work in a Bulgarian local government unit, and with EU partners who already have greater experience in this area.

After the first year of training, it was planned to create a new introductory course in ICT, mandatory for all students in the M.Sc. programme. It was supposed that the course will be moved to Bachelor level by the time it begins.

The course was planned to consist of 2 parts:

- basic concepts in Information Technologies;

- up-to-date applications of ICT in Public Administration (Text processing; Data bases; Spreadsheets) based on field cases.

Another group of specialised courses included elective units in the area of computer applications to Urban planning, including the use of specialised geographical information systems for urban planning, and data bases for collecting and processing information about the units in urban planning.

Thus, after 3 years experience, we have one introductory course aimed at establishing a common level of computer literacy; one specialised mandatory course in Data Analysis, and several elective courses in New Information Technologies and Applications of Computers to Urban Planning. The elective courses are aimed at specialising in the different levels in Public Administration - local, governmental and international.

3.2. The Case Studies problem

The use of appropriate case study material in all these courses is estimated to be one of the core problems for organising efficient training for our students. For different courses we have a different case study needs. For example, the courses in Applications of Computers to Urban planning, which are based on the use of concrete software systems with real data, have completely different requirements to the Data Analysis and Introductory ICT Literacy courses, which still suffer from a lack of appropriate case study material.

The problem with finding appropriate case study material is the fact that the trainers do not have real on-site experience in Public Administration Units. Even all articles in the local journal in Public Administration, "*Administration*", treat the problems in the area from an ICT point of view. At the same time, there is a danger that the needs of the Administration units are being misunderstood (this was why one of our educational goals was formulated as "they (the students) should be able to distinguish tasks which require computer support").

Unfortunately, even at seminars for instructing trainers in similar areas (like the *Public Administration seminar* organised by the J.F. Kennedy School at Harvard University in Warsaw, Poland, in January 1993), ICT training is being underestimated. Perhaps the basic reason for this is the fact that computers are being regarded solely as an instrument. The real situation is that using every instrument requires knowledge about it and its work, but in the case of computers two additional problems arise: (i) how computer models of objects from the real world are being created, and (ii)

what are the advantages and disadvantages of different modes of representing a piece of information. These two questions are not routine for people working in the Humanities and Social Sciences, who are being trained to use computers, because in the process of computer training they are sometimes not being touched on at all, so that the specialists in a concrete domain are not able to place their own work in a computer environment. For these reasons we are looking for case studies which will illustrate the work on concrete problems in the area of Public Administration.

We are planning in our future endeavours to work jointly on this with a local government unit and, if possible, with partners from the European Union. Such contacts would be especially important given the transition period in our country.

4. Conclusions

We are sharing our experience because we believe it may be interesting for the following reasons:

- similar problems could arise in all countries in a similar situation (i.e. a transition period, where new educational programmes are started without any prior experience);
- these problems could be observed in all areas of Social Sciences and the Humanities where training is being established.

We also hope to find colleagues who may have overcome these problems in their own work.

Because of the problems of establishing ICT courses, for the needs of Social Sciences and the Humanities, training is always prompts discussion, such as how students should be trained. We, therefore, would like to share our own experience. It shows that training given by computer science specialists is successful in cases where they try to find a common language with their students. That means that they should forget about typical cases used in 'pure' ICT programmes and should concentrate on appropriate cases and problems in the field where their students are being trained. The ideal solution in some cases is to co-ordinate with other lecturers, and to use some of their examples in the ICT cases.

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2.2. Specific Difficulties in Teaching Information Technology to Public Administration Students

*Ivan Koychev **

Abstract

Our basic aim is to present some of our findings after 3 years' experience of teaching Information Technology and Communication subjects to students at M.Sc. and B.Sc. in Public Administration, at the New Bulgarian University.

Teaching Information Technology-related subjects to Public Administration students is difficult, for a number of reasons. We do not have a very clear idea what is the minimal and, respectively, the maximal set of skills and theoretical knowledge our students will need in their future work.

In addition to the different background of students, they are expected to work at different administration levels where different hardware/software platforms are currently in use. This situation makes it very hard to combine in one course topics which will be interesting for the students and will be really useful in their future work.

Our experience, based mainly on teaching general computer literacy, word processing and spreadsheet software led us to some interesting conclusions:

1. one of the most difficult course elements for our students is related to operating systems;
2. in discussing a concrete case, students often have difficulties which tools for computer processing will lead to the best/fastest results, and which presentation of final results is most clear and understandable for other people;
3. it is difficult to make students critical of the computer output they receive, especially from spreadsheet software, including statistical tools.

Overview of the Institution

The New Bulgarian University (NBU) was established in 1990 by group of Bulgarian intellectuals as an independent non-government institution for higher education. In 1991 it was officially recognised as an education

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establishment with university status. Today the NBU has four Schools, 28 Departments which offer more than 80 educational programs.

The Department of Public Administration was founded in 1992 as an independent department of NBU. It elaborates and carries out teaching programs for students in the field of public administration, gives expert advice, and carries out surveys in the field of state and local administration and, laying.

Public administration is a new curriculum in our higher education system in Bulgaria. Its special formation was related to the beginning of decentralisation and democratisation during the period of transition.

Goals of ICT Curricula

Information and Communication Technologies has become the most important factor for the rapid development of society in recent decades. That is why having knowledge and skills about the computer applications related to our work becomes crucial for more and more specialists. According to this conclusion we can distinguish the following main goals of ICT Curricula:

- the students should be acquainted with the most popular application of ICT in office automation;
- they should be able to distinguish tasks that require the application of ICT;
- they should be able to use computer tools for data analysis.

Problems, Limitations, Open Questions

See enclosed case study.

1. Case Study

1. Introduction

Information Technologies has become the most important factor for the rapid development of human society in recent decades. Many specialists use computers in their jobs and can not imagine working without their help. Information Technology takes a central place in our society, which is a very good reason to call it the New Information Society. This situation is somehow different in East-European countries, where the whole range of computer applications is not utilised, due to many reasons, including

economic difficulties, lack of global computer networks, personnel training, etc. That is why having knowledge and skills about computer applications to our work becomes crucial for more and more specialists.

Most universities in Bulgaria, and abroad, have in their curricula department course(s) related to the use of IT. According to this reality, teaching IT to students with different backgrounds is a complex process which requires careful planning. The lack of experience and the rapid changes in the field of IT are among the problems associated with organising such courses.

We would like to present, briefly, the history of teaching computer science related subjects in the Bulgarian universities. It started about 1-2 decades ago, when the practice in Bulgaria was oriented towards organising mandatory courses devoted to the basics of computer programming (in the case of Bulgaria, BASIC was the most popular programming language). This model was influenced by the wide opinion that computer users in the future should be able to write their own small scale computer programs to facilitate their work. This point of view, which could be estimated as a relevant one when it appeared, unfortunately persisted as a general tendency for years, when the general orientation about existing applications and the skills, could be estimated as the most important outcome from an IT course.

A university professor teaching in such an area, must take care of teaching students the knowledge and skills which will be adequate for a longer period of time and will be useful in their work.

In this generally described situation in Bulgaria, we would like to present the experience of the IT lecturers of the Public Administration department in the New Bulgarian University. They had to do a large amount of innovative work because they were engaged in the creation and development of university programmes, of which there was no previous generation in Bulgaria. The content of the courses was elaborated by a team of three lecturers who used their previous experience in teaching IT-related subjects, to students involved in Humanities programmes, with the idea that such students have, in addition to the usual difficulties, some psychological problems in studying computer-related subjects.

2. Specific Difficulties in Teaching Information Technology to Public Administration Students

Teaching Information Technology is always a challenging experience. The field of IT has some specific features, which makes it different from other university courses:

- The field of IT has been developing extremely fast. Usually the hardware and software are changing rapidly (presentations of new platforms are performed several times per year). The problem here is how to teach the students to use computer applications when they are changing so often. There is a real danger that at the end of the course some of the course elements they will have learned will already be out of date. Since this rapid change also influences the budgets of the organisations, one important detail here is to create in the students a general ability to estimate which computer platforms can serve sufficiently for performing the IT support in their organisations, and when the buying of new hardware and software becomes a must.
- Teaching IT is not only teaching students to work with computers, but it is also about teaching them how to work with the information. In our point of view, the information and information processes are the core objects for study. Modern hardware and software are powerful tools which help the quick and effective processing of information, its use and dissemination. The high level of competence in the area of modern IT tools are the most significant for the successful use of the modern IT. But we should not forget the real information problems which we have to train our students to solve. These tasks should be clearly described, and it should be explained how the existing IT tools could help us in finding quick and effective solutions.
- The development of user-friendly interfaces was one of the areas where a huge amount of work was performed in recent years. However, the knowledge and skills which should be taught, are still close to those taught in computer-oriented university programmes. This fact is the basic reason why students in the Social Sciences and the Humanities have sometimes psychological difficulties in feeling that the technical devices are difficult to use. Sometimes such students have the feeling that computers are too complex, and therefore difficult to work with. This is especially true for people working in Administration for several decades, who have never previously used computers. Overcoming such psychological problems is of special importance in IT teaching. At the

end of such a course, one should feel confident that he, or she, is able to solve real problems for information analysis and processing in the relevant application area, using existing modern IT.

These characteristic features of IT teaching should be taken into consideration by the lecturer, because any preliminary planning which does not take this into account may lead to formulating aims and preparing plans which will not be achieved.

We would like to formulate explicitly some basic principles based on the above-described observations.

3. Basic Principles in IT Teaching to Public Administration Students

The planning and teaching of IT-oriented courses for Public Administration students should be based on the following principles:

1. Clear defining of real problems from in a concrete application area, which could be solved lastly and efficiently with the use of modern IT. We use for this purpose the work in an actual administration department, and analyse the **information processes** which can be observed in the work organisation there. The students should actively participate in this analysis and should be provoked to define the information objects, processes and underlying activities, and to discuss the technical tools used in the traditional administrative technologies. The aim is to help student to find and define the information objects, processes and activities and to think about the efficiency of the existing, and previously used tools and technologies, and to suggest where and how the tools of automation tools can improve the current situation. Before deciding on a concrete solution, we would like to provoke an analytical work which could lead to significant economies of time and effort in the future work of our students.
2. Following this, we make a *brief survey of modern IT, oriented towards its application in public administration*. The use of modern information technologies is clearly presented - which classes of problems can be approached by them, and what concrete instrumentation we can apply. Real examples of IT applications are presented with the idea to encourage the students to give certain examples. Trends in future IT development are discussed. The purpose is to make students feel the real benefits of using modern IT in their future work, which should motivate them to participate more actively in any future study.

3. Overcoming problems caused by the rapid development of hardware and software is of major significance. The newest platforms offered on the market become out of date in a couple of years. The existence of different types of computers, and the problems of compatibility of hardware and software, requires special attention in the teaching process. Hence, the concrete tasks of the lecturer are *to present the situation to the students and to give them some orientation on the use of IT, independently of the concrete platform*. It is especially important to emphasise that the use of computer resources, created in the previous decades in our institutions, may cause problems when new computer platforms are being introduced into the organisations. The solution chosen by us is to emphasise the more fundamental notions which are not being influenced, principally by the concrete platforms. For example, when the students are being acquainted with an operating system, they should be made aware that other operating systems exist. Although they are different at first glance, the functions they support, and the way they are being used, are without significant differences. This means that we introduce to our students the abstract notion of an operating system, and use as a concrete example which is installed on the computers in the lab. This approach makes the students more confident to start work on a new platform, having the general idea about the possibilities they should look for. When the students understand the described principle, this improves their motivation during the course, because they realise that they receive notions which will be helpful for their further work. The teaching approach in this case should include permanent shifts between the general concept and the concrete example, and vice versa.

In conclusion, we could say that the general trend in our work is to give the students:

- knowledge and skills which will be useful for a relatively long period;
- a real picture of the use of modern IT;
- high motivation and willingness to use modern IT;
- self-confidence in the use of computers.

4. Choice of Applications for Presentation during the Courses

The choice of concrete applications which should be presented to the students, during the courses, depends to a great extent on the specific features of their future (or current) work. This means that we would like

to present applications which will be really useful in their work, alongside those which the lecturers use in their own. It is recommended they follow the tendencies of recent developments, and to present to them the newest products which will not be redundant in several years. In addition, we should present the current situation in the administration units in Bulgaria, which could be seen as a very hard task, because it is not systematically studied and described, and the IT solutions and computer platforms vary in the different governmental units, even on the same level.

The presentation of the concrete applications should be based on the principles described in the previous section. We would like to emphasise here again the importance of the presentation of the general notion, compared to the concrete example used in the course.

In our concrete courses the students from the Public Administration Department are trained to use integrated office tools (like MS-Office) with an emphasis on the text processing tools and spreadsheets. We also present basic concepts and skills related to databases and information systems.

Special attention should be paid to the modern IT tools of data analysis. The relevant and precise information extracted from a set of data is primarily the source for decision making. The students should understand the real applicability of such instruments, and to analyse any piece of information they use in their work, from a deep and sober perspective.

In the practical work on this course, the students should solve practical concrete problems, in the area of their future specialisation. They should also work in small groups, on concrete cases, which they choose and solve with the help of the lecturer, and present to their colleagues.

5. Conclusion

The methodical ideas and proposals, presented in this paper, aim to achieve following objectives when used in a concrete course:

- motivation of the students to use IT in their future work;
- self-confidence of the students in their ability to use computers;
- obtaining useful knowledge and skills which will be applicable for a longer period of time;

- a general ability of the students to analyse the information objects, processes and activities in their organisation, and to improve some elements through the use of IT.

We cannot present large-scale results of our work, based on the described principles, because despite our 3 years of experience in the M.Sc. programme, we still have only one year of experience in the B.Sc. programme, which involves a substantially greater number of students.

We would appreciate any feedback on the principles presented in the paper, which will influence our work in future years.

6. Acknowledgements

Thanks to my colleagues M. Dobrova and V. Todorov for their helpful comments on earlier drafts on the case study.

2.3. Lectures and Labs on Information and Communication Technology at the Faculty of Management of the University of South Bohemia

*Jan Plešinger **

Abstract

This is a short case study of the current and required state of computer related subjects at our university. The basic lectures take place in the first two semesters and cover a wide range of topics, from basic OS skills (DOS, Windows) through e-mail, WWW and text editors, to spreadsheets and relational databases. The course aims to educate students to work with standard office software (like MS Office). The course is completed by a credit test at the end of each semester and an exam at the end of the third semester. Skills obtained in this course serve to provide the students with a necessary background knowledge for other advanced courses: information systems (introduction to databases, transaction information systems, excursion); data analysis and presentation (real-world data analysis and their presentation); computer science for management (management information systems, modern data analysis methods, logical programming, artificial neural networks); information and knowledge-based systems (enhanced information systems, expert systems). The achieved results are presented together with some proposals for improvement.

Overview of the Faculty of Management

The faculty was established in 1992 as a branch of the Pedagogic Faculty, and after two years it became autonomous. There are three study specialisations: *Public Service Management*, *Business Management* and *Business English and German*. We teach economics, management, mathematics and other supporting and related subjects. The third specialisation is focused on teaching languages. The studies consist for the Bachelor level (6 semesters) and for the Masters level (4 semesters).

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Goals of the ICT Curricula

As the title of this contribution indicates, it concerns computer related subjects only. The subjects are governed by the Department of Computer Science. After a general introduction in the subsequent paragraphs a description and an analysis of the subjects follows in subsequent chapters.

The basic question is: what the students are expected to know when they leave the school? We have concentrated on the following skills:

- preparing neat printed results of produced work, for example, letters, tables, graphs etc.
- ability to make an attractive presentation
- using the advantages of the Internet
- using various information systems
- managing databases
- having an overview of various methods of data manipulation and processing

Once the goals are established, we then have to choose the necessary educational tools to achieve the desired results. Our model consists of three parts:

- WHAT are the goals, or what is the expected output of the work, e.g. tables, graphs etc.
- HOW to achieve them, i.e. methods, procedures and tools
- WHY it works, as it works, i.e. theory and research

We should also mention Information Technology, e.g. what technical tools are used, but we consider this to be continuously upgraded to a certain commonly understood level (of course within the limits of one's budget).

These three parts are not independent, but influence each other in a cycle (or in a spiral, depending upon some improvements, or conditional changes). Here is an example to flesh out this idea: Imagine you need to tabulate your company sales. You do it manually with a lot of mistakes, and besides, it bores you. Someone has heard about your situation and has developed a spreadsheet editor. You start to use it and you like it so much that you also begin to produce some additional tables, for instance: sales over product name vs. time, sales over location vs. time, sales over product name vs. location, etc. When an inventory analyst notices that

some data are duplicated in the tables, he/she starts thinking about improvements. He/she probably gets an idea of a multidimensional spreadsheet and sectional representation, and develops OLAP technology.

The purpose of any university is not only to teach WHAT and HOW, but also to stimulate research and development, to think about assumptions and consequences. During the educational process, the teacher should take into account different students' reasoning. Fig. 1 displays a model of human behaviour. The horizontal axis represents the way of thinking (or information processing), the vertical the source of new facts and experiences. There are four categories of characters in this model, but people's behaviour mostly matches more than only one of them. Let's make some characteristics of the categories:

- **Synthetic, empirical person (SE).** These people use proved algorithms for certain situations, e.g. cookbook, directions for use, advice, own experiences. In unknown situations they try to use already known procedures or refuse to try anything at all. Students of this character prefer lectures where the teacher gives them a list of situations and definite instructions on how to solve them. Many activities in real life fit this category.
- **Synthetic, theoretic person (ST).** People of this category behave like a SE, but in unknown situations they try to use directions or experiences of other similar situations and also apply general theoretical directions. Lectures for this category of student should contain theoretical advice of type what-if (what happens, if I do ...). Economics can be taken as an example.

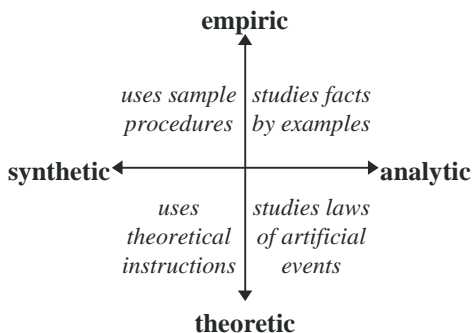


Fig. 1. Model of human thinking and behaviour in new situations.

- **Analytic, empirical person (AE).** People thinking analytically are able to generalise concrete facts. An AE obtains the experiences by his, or her own or extrinsic examples, and extracts general rules for them. Students of this type like lectures where an example is given, deeply analysed and generalised to a theory that matches other examples. Physics is a good example of this category.
- **Analytic, theoretic person (AT).** These people are pure theoreticians. They study models of unreal situations and construct a theory for them. In real-world situations they often don't know what to do. They prefer lessons with artificial presumptions and consequences, like "Let's suppose that ... than ...". A typical example is mathematics.

For some subjects (economics, physics, mathematics, ...) a certain way of thinking and behaviour is essential, or at least helpful. In fact, students attend a lot of subjects that do not correspond with their category. Therefore, the teachers should not only use their way of reasoning in lectures, but also combine them with the categories described above, i.e. show some examples as well as the theory, present exact directions together with the general consequences of behaviour.

Problems, Limitations, Open Questions

Since the budget of our faculty is strictly limited, we cannot afford the latest Information Technology. We operate with two computer rooms. The older one is equipped with 9 computers (386DX/33), the other with 10 computers (486DX4/100, diskless). Nineteen computers for 500 students seems to be insufficient to fulfill all the demands of individual subjects (not only ICT-related subjects use computers).

We are running a *Novell 4.1* server (PentiumPro/200), a *Linux* FTP and WWW server (386/66) and *Windows for Workgroups 3.11* on the stations, but the workgroup protocol is not in use. The standard software package *Microsoft Office* is used, thanks to discounts within the program *Select*. As soon as it becomes available we would like to run also a *Windows NT* server with the *Oracle SQL Server* and the *Microsoft Internet Information Server*.

All the computers are connected to the local Novell network (Ethernet 10, BNC) and to the Internet (64kbps direct line). Nevertheless, approximately one half of the teachers have no computer at their office, or have an access only to a PC 286.

Analysis of Subjects: Bachelor Level

To become a Bachelor usually takes 3 years. We would like a Bachelor to have the following skills:

- basic file management
- text & graphics processing
- ability to use spreadsheets
- ability to use databases
- ability to use the Internet
- be able to perform presentations

In this chapter a list of subjects that occur in the Bachelor level is give, with the subjects' description and a short analysis. The attributes are: semester, lectures per week + labs per week, c=credit, cc=classified credit, e=exam.

Computer Science 1

Attributes: 1st semester, 1+2c.

Content: hardware (PC components, peripherals), operating systems (DOS—file system and management, basic commands, Windows), text & graphics editors (Czech popular T602, Word for Windows, Paintbrush, CorelDraw!), basic network utilities (printing, file sharing, mail).

Positives: some students seem to be very interested in the subject; there is significant progress observable even with students who have never used a computer before; the network environment is used from the beginning—there is no fear of the net which occurs in some people when changing from a local computer to a network.

Negatives: the students have very different knowledge at the beginning, some are bored, and some are depressed during lessons.

In order to minimise the negatives we raised the requirements of initial knowledge for this subject, and introduced a voluntary course this, before the first semester began. Results of this arrangement will be known at the end of this year.

Computer Science 2

Attributes: 2nd semester, 1+3c.

Content: Internet (ftp, gopher, www, BBS, e-mail), spreadsheets, database applications.

Positives: students are mostly excited with the Internet, some of them even became BBS-maniacs; e-mail is appreciated as well and is used in everyday practice.

Negatives: there are many problems with absolute and relative references in spreadsheets and features of database tables (sorting, using a key field, generating grouped reports), probably due to a large amount of new terms and functions the applications offer.

This year a new subject is included in the 3rd semester (Computer Science 3) in order to have more time to discuss databases and algorithms.

Computer Science 3 (new)

Attributes: 3rd semester, 0+2e.

Content: database management, data security, algorithms, multimedia.

Expectations: we expect some progress in database management, basic algorithmic skills and in some new fields of data manipulation.

Information Systems in Organisations

Attributes: 5th semester, 1+1cc.

Content: relational databases, SQL, information systems, a brief overview of management information systems, managing information systems.

Positives: we co-operate with a local company developing information systems.

Negatives: there are very uncertain requirements on information systems in our transforming economy; current managers have a substantial gap in their insight of computer utilisation possibilities; there is a lack of experience and practical examples in the economy; foreign practises cannot be easily adopted; the students in the 5th semester were not well prepared for the subject.

We await better results this year because the present students are more experienced in computer science than those from a year ago, and the teachers have improved their knowledge as well.

Data Analysis and Presentation (new)

Attributes: 6th semester, 0+2c.

Content: spreadsheets–advanced, goal seeking, what-if analysis, presentation.

Expectations: this subject was newly introduced in order to support presentation skills that are so important for a manager; various techniques of data manipulation will be presented; co-operation with teachers of psychology is also expected.

Analysis of Subjects: Masters Level

The two year Masters level follows up the Bachelor level. Students with a Bachelor degree from other schools are also accepted. We expect that a Master will enhance their Bachelor skills of:

- database & IS management
- methods of information processing

The legend of the subjects is the same as in the previous chapter.

Information Systems for Managers 1(new)

Attributes: 7th semester, 1+1c.

Content: overview of artificial intelligence methods in knowledge processing (knowledge-based systems, language processing, image and speech processing, fuzzy logic, neural networks).

Expectations: this new subject is an introductory course to modern techniques of information and knowledge processing, and is based especially on methods of artificial intelligence.

Information Systems for Managers 2(new)

Attributes: 8th semester, 1+1cc.

Content: modern methods of information processing, logical programming, artificial neural networks.

Expectations: this subject is designed to deepen the knowledge and skills acquired in the subject Information Systems for

Managers 1, especially in the fields of problem solving (state space), planning, logical programming and artificial neural nets and genetic algorithms. Examples and tools from these fields will be presented in the lectures.

Information and Knowledge-Based Systems (new)

Attributes: 10th semester, 1+1c.

Content: methodology of information, expert and knowledge-based systems.

Expectations: the latest techniques of knowledge representation and management will be presented in this new subject. Students will be forced to use them in some teaching examples (building trivial knowledge-based systems in an ES shell). We would like to improve their ability to work with information.

Conclusions

The computer related subjects at the Faculty of Management are demanding, especially in the first year of study. As a result, students operate with computers quite well. There were some difficulties with the early years (students who entered the faculty in 1992 and 1993), but the situation is much better now. Four new subjects, oriented to data manipulation, have been introduced (one at Bachelor level and three at the Master's level), and one basic subject has been extended from two to three semesters. The changes should help to expand the amount and quality of the subject matter.

Acknowledgement

I am greatly indebted to Dr. Pudil for his participation in, and support of, the grant Multidisciplinary Approaches to Decision-Making in Economics and Management. I kindly thank my colleague and chief Mr. Jelínek, who guarantees most of the subjects, for help in analysis of the lectures, and Eva Munk for the English corrections.

2.4. INFORMATION AND COMMUNICATION TECHNOLOGY AND ITS IMPACT ON PUBLIC ADMINISTRATION

*Rene Tönnisson **

Abstract:

This paper has two parts. The first part deals with the teaching of ICT related subjects, within the Public Administration curriculum, at the University of Tartu. The second part of the paper consist of a case study about formal public (governmental) bodies and structures, which deal with promoting the use of ICT in Public Administration. This paper stresses the need to integrate the teaching of ICT into already existing disciplines, as much as possible, in order to effectively prepare future public administrators in Estonia. There are no direct ICT courses taught within the Public Administration curricula at the University of Tartu, as students should not be experts in ICT, but rather be able to understand the role of ICT in Public Administration, and to know how to use it.

Overview of the institution

The Department of Public Administration at Tartu University was established in 1995 as part of Faculty of Social Sciences.. More than 100 students are currently enrolled in the programme. Public Administration is taught as a programme by the Chair of Public Administration, together with the Chair of Social Policy. The degrees offered are BA in Public Administration (4 years), MPA in Public Administration (2 years), MA in Public Administration and Social Policy (2 years), PhD in Public Administration and Social Policy (3 years). Public Administration can also be taken as a primary and secondary minor. The BA is, according to Estonian tradition, a general liberal arts degree with a professional qualification, which prepares the graduate for civil service work. The MPA is an advanced professional degree, the MA and PhD are advanced scholarly degrees.

When in 1632, the University of Tartu was established, the intentions of King Gustavus Adolphus were to have a university where students would be “prepared seriously and solidly, so that they could be useful for God

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and Man". And when, by Imperial Ukase of 1802, the University was refounded, it was expressly stated that this was done in order to create an institution where public administrators, for all levels of the civil service, and for all areas of the Empire, would be trained. In that sense, PA is the original field of study at Tartu. Since then, Tartu has always had a strong PA tradition: almost all civil servants of independent Estonia, and previously very many Imperial Russian public servants were Tartu graduates.

Goals of ICT curriculum.

The Public Administration curriculum at the University of Tartu includes very few subjects directly related to ICT. It is balanced between theoretical and practical subjects. The teaching of ICT has been integrated into as many practical subjects as possible. More theoretical aspects of ICT, which do not require practical experience, are taught through different courses, such as information and government, system analysis etc. Teaching aims to prepare and familiarise PA students with practical ICT applications in different fields of Public Administration. To teach students basic computer skills should not, preferably, be the task of the university. Everybody entering university should, in principle, already be computer literate. It is important for students to learn how to use ICT's in Public Administration, and how PA could be made more effective through the application of ICT's. However they do not necessarily need to know, in more detail, about the technicalities of how ICT's work. A Public Administration person should not necessarily be an ICT expert but he or she must know how to get best out of it.

Problems, limitations, open questions

The possibility to teach ICT under even more disciplines is limited, given the small number of teachers who have the competence to integrate ICT into their field. Also, the expectation that all students are basically computer literate does not always hold true. The proportion of theoretical subjects related to ICT, such as system analysis and information systems, should be higher. The new aspects of ICT usage, such as ICT ethics, should have some place in the PA curriculum.

Conclusions:

ICT has had an enormous impact on Public Administration. Students of Public Administration must know how to use and apply ICT in their future

work. That is why the teaching of ICT's must be included, as much as possible, into typical PA subjects. No special courses within PA curriculum are necessary. If some students lack basic ICT skills they must take introductory courses, taught by the computer science department.

Case study

With the emergence and development of the information society nothing will probably remain the same. This seems to be pretty clear. Still, it is difficult to predict what exactly will happen, and how great the changes will be. The big question is also whether these changes caused by the information society will have a positive or a negative effect on human society, culture and ways of communication. So far we can only speculate about the possible consequences of the information society. Concrete outcomes remain to be seen.

New information and communication technology continues to drastically change our ways of acting and working. With the help of mobile communication and global information networks, such as the Internet, the traditional office based approach to work has almost become a thing of the past. New ways of teleworking, where the physical location is of secondary importance, are rapidly becoming more and more accepted and widely used.

These new technologies also offer many possibilities, as well as challenges, for Public Administration. With the help of these new technologies Public Administration might become much more transparent and democratic, in the sense that it will be easier to check what has been done and why, and also more effective, through the replacement of current organisational and functional patterns, with more adjusted ways of meeting people's demands.

There are very few things which can be changed overnight. Public Administration certainly does not belong to this category. It tends to be rather conservative towards change. The following case study will provide information about the different ways in which Estonian Public Administration is planning to keep up with the demands of current changes. It does not concentrate on the training side of the issue, but concentrates rather on the institutional aspect of it. It goes without saying that in order to carry out any reform the appropriate training and know-how is required from the civil servants. They need to be generally computer literate, as well as

be able to handle very specific information systems in their relevant fields. In order to achieve this the Public Administration curricula must be adjusted to those demands, as well as providing appropriate in-service training. But most importantly, civil servants must become a part of the lifelong learning society in order to be constantly prepared for changes. In this respect much still has to be done in Estonian Public Administration. First steps in this direction have already been taken - the Public Administration curricula in Estonia includes courses in informatics, which are compulsory. The launching of the Open University offers possibilities of distance learning for working public administrators, etc.

This case study will look at what has already been done, and what will be done institutionally in Estonia in the near future, due to the development of new information and communication technologies which are the driving force of change in Public Administration, according to the title of the seminar for which the paper is prepared.

There exists several state institutions and management structures of information technology, which have been created to modernise and prepare Estonian Public Administration for new ways of acting. The Estonian state plays a co-ordination and directorial role in this process, rather than direct management of IT activities. The main function of those institutions is to provide support and know-how to those who are directly in charge of developing national administrative information systems. By directing the resources between different areas the central IT management structures can influence the development in those fields it considers important. Through this kind of decentralised and goal oriented approach, it is possible to have a more flexible IT strategy, depending on new developments, both worldwide and nationally.

In 1995 a management approach was launched which gave the responsibility for developing information systems, and related activities in ministries and local governments, to the informatics managers. Thus, most of the activities related to IT occur in a decentralised manner. The central structures have only a co-ordination and support function, in order to create an environment favourable for the development of information systems, human and financial resources, legislative issues, training, framework contracts, standardisation, etc. This approach has of course its advantages and disadvantages. The biggest advantage is that all PA institutions can determine for themselves, according to their needs, what kind of technology, training and other IT resources they would like to

have. On the other hand, if the informatics managers are not competent enough, or if there is strong opposition to new ways of acting within the organization, nothing will happen.

As the decentralised approach was started only last year it is not possible to say yet whether it has proven to be effective or not. At the same time, one can now take a closer look at those central structures responsible for IT development in public administration.

The Estonian Informatics Council is one of those central structures which is under the auspices of the State Chancellery, headed by the Secretary of State and consisting of 18 members who represent ministries, government agencies, universities and the IT industry.

The main goal of its activities has been the development of a national informatics policy. The council meets on a monthly basis. Among the issues under regular consideration are the development strategy of governmental and municipal information systems, coordination of the development of national data registries, the structure of the national budget in the field of informatics, illegal use of software and its prevention, the introduction of IT standards, the evaluation of draft legislative acts, etc. The Informatics Council has the most strategic role for IT development in Public Administration.

Another institution, called the Estonian Informatics Fund, was established by the Estonian government in 1990. The fund is a non-profit organisation, and has the purpose of promoting and supporting the development of information technology and state information systems. The funding of EIF is provided from the state budget. Income from commercial activities is also used to finance the fund's activities. The fund organises public IT procurement tenders, and concludes agreements about the bulk purchase of software licenses. According to the agreement with the Standards Board of Estonia, the fund bears responsibility for IT standardisation, coordinating the development of standards, and representing Estonia in international standards organisations. The Informatics Fund also has several commercial activities, such as publishing the Computer and IT journal, organising computer and IT fairs, etc.

The third important institution is the Department of State Information Systems of the State Chancellery. Its primary task is to coordinate the development and operation of national information systems in Public Administration. The department focuses its attention on monitoring the

planning and formation of IT expenses in the state budget, analysing the application of resources, and supervising the use of budgetary resources. The department also participates in the steering groups of major IT development projects for Public Administration. Special attention is given to the recruitment of informatics managers for PA, elaborating their duties and dealing with issues concerning their motivation, training and cooperation. Training courses and study trips for IT specialists from Public Administration are also being organised. The Department of State Information Systems is also involved in the process of public IT procurement, with the main objective to implement an overall technology policy. Thus while the Estonian Informatics Council has a strategic role in IT planning in Public Administration, the Department of State Information Systems deals with more tactical issues on a daily basis.

The Estonian Higher Education and Science Network (EENet), which acts under the Estonian Ministry of Education, has an important role to play. Its primary goal is to build up basic Internet links and infrastructure, first of all for educational institutions, but also for some governmental institutions, counties and municipalities. Without this basic infrastructure, IT applications, which require access to the Internet, would become useless for Public Administration and the whole concept of the information society would lose its meaning. EENet also provides relevant training for system operators and Internet users. It is also a main actor in the ambitious “Tiger Leap” project, which aims to integrate IT usage into the curricula and teaching practices of Estonian high schools, as well as to provide all Estonian schools with at least one fully equipped computer class and Internet connection. This project also has extreme strategic importance for future Public Administration in Estonia. If someone graduates from high school who is computer literate, then much time could be spared from teaching the basics. Consequently, that time could be used more effectively for training the specific skills needed in some concrete area of Public Administration.

In order to coordinate activities in specific fields of Public Administration several work groups have been formed. The national Registers Development and Coordination Work Group coordinates national basic registers. It also deals with the mapping of required legislative acts and standards, at the central and county level, as well as with the development and unification of the technological environment. The group includes representatives of the register keepers and local governments. The data communication

Target Work Program deals with the coordination and organisation of data communication related activities in state agencies. It is also elaborating an overall data communication concept: The Work Group of Data Administration in Counties. The work group consist of county informatics specialists with the intention of preparing a county data administration system. The Work Group of Administration Information Systems organises cooperation in matters related to the information systems of various agencies, and also makes recommendations for the choice of software interchange formats and data security requirements. The state security Target Program Work Group concentrates on activities connected with IT applications at border crossings, and the creation of relevant information systems for border crossing points.

The Ministry of Transport and Communication has responsibility for elaborating a national communication policy, planning development programs, drafting legislative acts, issuing licenses for public networks and services, as well as representing the Estonian government in international organisations such as ITU and CEPT.

The State Classification Center is a state agency which operates under the Ministry of Finance. The Centre organises the creation of national classifiers in the fields of economics and administrative information, and their unification with international classification systems. The Classification Centre also organises the application of international classifiers, either by judicial acts, or in the form of Estonian standards, directs the activities of the regional classification agencies, and provides information services on classification. During the next couple of years the Classification Centre, in cooperation with the Statistical Office, is planning to apply a number of European Union classifiers in readiness for Estonia's plans to join the EU. Because of this, the Centre has established close working relations with relevant international organisations.

Thus, there are many governmental structures and bodies in Estonia which deal with the questions of IT in Public Administration. The need for implementing new information and communication technologies in Public Administration seems to be clear to everybody. At the same time, it seems that although much discussion is going on about this topic, the concrete results are so far mostly quantitative. This means that all Public Administration institutions, more or less, have been equipped with computers and basic software, many of which are also connected to the Internet, but the know-how to use computers effectively is still lacking. This is one of the

problems which our various governmental structures are trying to overcome. There seems to be a lot of coordinating activities taking place, but little in the way of fresh, new ideas on how to improve the situation in concrete terms. Of course, one must admit that it is very difficult to force something like IT on people who are not willing to accept it. The mental resistance towards new communication and behaviour patterns is perhaps the most serious hindrance for changes in Estonian Public Administration. However, nothing stands still, and even life itself makes people change. Let us hope that the whole energy within Estonian Public Administration will not continue to coordinate and standardise IT developments, but rather that the implementation of new information technologies will help to carry out a qualitative change towards more open and effective Public Administration in Estonia.

2.5. THE METHODOLOGY OF ICT TRAINING FOR CIVIL SERVANTS

*Andžela Klaučane, Agita Gulbe **

Abstract

In providing more efficient work in state administration institutions, one very important issue is the use of the latest possibilities in data technology and to realize the flow of information within an organization. Therefore, it is obligatory for civil servants to take a course in computer skills. Training methodologies are worked out for trainers in humanitarian subjects. Such methodologies, in the field of IT, cannot be uniformly applied to people with different working backgrounds, and skills. For the new generation of students who have recently graduated from high schools or university it is very easy to develop their skills and knowledge PC applications. Unfortunately, older people have psychological barriers and are somewhat fearful of the modern technology, therefore, training them is more a more complicated task.

Latvian School of Public Administration

The Latvian School of Public Administration was established on December 7, 1993 with the mandate to train civil servants, and to prepare them to become more knowledgeable and efficient civil servants.

The main tasks which were set are:

1. to work out the content and regulations for civil servants through preparation, upgrading and examination;
2. to provide assessment through examination;
3. to work out special courses for civil servants, to serve and improve their professionalism, with the aim of providing knowledge for those who are going to begin a career in PA, or are seeking promotion in the civil service system.

The school manages and coordinates the process of training civil servants in Latvia, at training centers in Riga and in the regions. We use a unified system of training and this system serves well for civil servants to carry on learning by themselves.

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Goals of ICT Curricula

As a result of basic knowledge training a civil servant should know:

- the main principles and methods of using a PC;
- to understand computer devices which a user should exploit;
- to know the task for each component of a computer: what kind of parameters detect the potentiality of the computer, and the preparatory work involved;
- which programs are usually utilized of the two groups of programs: the program for exact task and the work environment.

The programme for civil servant training in computing consists of five themes:

1. General conception of PC and data processing;
2. Programming packages for PCs;
3. The activities of beginners in activating the system of operations;
4. The MS WINDOWS environment;
5. The use of computers in office work.

The main topics are as follows: compiling office-work documentation, developing data bases, and creating different calculations, finding information, saving and sending, etc. Work with the computers is on an autonomous basis, using network conditions and information.

Problems, limitations, open questions

1. Most trainees do well and progress quickly, while some older people say they do not need training, and have difficulty in overcoming their fear of using a PC.
2. If a civil servant's office is not equipped with a PC, the acquired knowledge and skills quickly deteriorate without constant practice.
3. Training is complicated by the language barrier, for those selected civil servants who have little or no knowledge of English.
4. A problem that poses difficulties in designing the syllabus, is the varying degree of prior knowledge each civil servant possesses in a given subject. When assessing each participant's level upon entry to the course, a set of elementary questions, based on the content of the lectures, should be worked out. Additionally, the students' prior

knowledge and skills should be measured and accounted for. Such a diagnosis can lead to the following practical results:

- 1) the largest group of participants who possess basic knowledge;
- 2) the largest group of participants who do not have measurable basic knowledge; and
- 3) a group which is composed of a mixture of the first two categories.

In the first two cases, the trainer should adapt to the group's characteristics, that is - he or she should be prepared to conduct either of the two training scenarios. But the most serious problems arise when the group is of mixed ability, with participants having some previous knowledge and those who do not. How then should a trainer construct his training strategy in this case? In order to avoid loss of interest, on the part of the participants with previous knowledge, whilst simultaneously giving the necessary input of information to those participants without any previous knowledge, the lecturer should develop a special methodology based on the following:

- to present basic notions about the topic, without detailed analysis of possible cases;
 - any explanation of these notions should be clear and understandable, and should correspond to the questions included in the final test;
 - to illustrate the application of the notion with simple numerical practical examples; and
 - with reference to existing literature, with page numbers, which should correspond to each particular notion.
5. Mixed ability classes demand of the trainer to adopt a more individualized approach and greater flexibility. There is a strong geographical factor that determines the motivation to use a PC. Civil servants from Riga are more motivated than their provincial colleagues, because of the better equipped offices in which they work.
 6. A lecturer can encounter two problems during the theoretical part of a lecture:
 - I. Civil servants of lower and medium level do not need any sophisticated knowledge about PC's. It is sufficient to simply give them a short orientation introduction.
 - II. For top level civil servants, more detailed information is necessary to enable them to make well-informed judgments about PC capabilities,

when doing procurement and when staffing the information technology units with experts. They should be able to make the best choice of what is available on the market, so that civil servants should feel comfortable with the technical parameters of PCs, and be able to freely operate with the software, hardware, etc.

7. One of the obstacles facing trainers in adopting an efficient methodology is found in their long tenure, which interferes with a working stereotype targeted at college students. As they now train civil servants, the heritage of their previous employment becomes a problem, where the trainers mechanically reproduce their methodology formerly addressed to students, but under new circumstances. That is, training civil servants with quite a different degree of experience, maturity and ambition than that of students. Consequently, the response to the information on the part of civil servants is quite different from that of young inexperienced youths.
8. Currently, lectures on Information Systems are not given to civil servants in Latvia. Similarly the organization's information policy is not discussed, and the technical level is not very advanced. There is no unified government electronic information network in Latvia.

If a trainer prepares the lecture on the use of Internet or World Wide Web, he/ she encounters problems. Therefore, more sophisticated issues are normally not included in the syllabus. In time, the syllabus should be re-structured to take better account of the new requirements. In spite of all the technical limitations and financial constraints, administrators should be trained through a PC network. Relevant technical experts for public service institutions should also be trained to provide technical support. Following the changes in the syllabus, corresponding changes in the training materials, and training technology, should be introduced. As for future PC training, the School of Public Administration should assess civil servants' needs, what they are likely to encounter in the future. The challenges for improving the training of civil servants in information technology should keep pace with technological advancements, such as the use of telecommunications in the day to day training process, and in communication. An example could be special distant learning classes or video-conferences.

The possibility of introducing new specialized PC courses is also conditional on the availability of financial resources, and the identified and expressed demand on the part of civil servants.

An important objective of the Latvian School of Public Administration is to overcome the barrier towards effective learning on the part of the trainees, and effective training on the part of the trainers, which has evolved over previous routine educational experience. It will take time before civil servants, who have served for 10 to 20 years, under a different socio-political and economic environment in their present or similar positions, to leave the civil service. Before this happens, the previously evolved stereotype of the government worker will prevail. Unfortunately, this stereotype, which now controls the behaviour and attitudes of civil servants, will not disappear by simply transferring information. And these conditions and circumstances will predominantly affect the choice of the training methodology.

2.6. MUNICIPALITY IMPROVEMENT THROUGH THE APPLICATION OF THE INFORMATICS THEORY IN AN MPA PROGRAM

*Edvard Jasaitis **

Abstract

This paper deals with the integration of informatics theory and practice into the curricula of a Master of Public Administration Program (MPA) at The Kaunas University of Technology (KTU). It discusses the need for information and communication technology in the management of public organisations and provides rationale for its inclusion into the program at KTU. The paper also discusses the MPA program at KTU and its structure.

MUNICIPALITY IMPROVEMENT THROUGH THE APPLICATION OF THE INFORMATICS THEORY

Introduction

The primary objectives of this NISPAcee workshop were to explore and understand the processes and issues involved in the realm of information and communication technology (ICT), how they relate and can be applied to bring about change and improvement in the public service of the Central and Eastern Europe and how we can integrate the teaching of these concepts and processes into our university public administration curriculums. My specific topic in this general theme was “how to integrate informatics theory and practical skills into the overall curricula of PA.” In this paper, I will attempt to present the Kaunas Technological University’s (KTU) approach to teaching ICT in its MPA program, and the rationale on which this approach was based.

Overview of the institution

In September 1994, the Faculty of Administration (FA) began a Master of Public Administration Program. This was the first program of its kind in Lithuania, although prior to the Soviet Occupation fifty years ago, some studies in public administration and management were conducted at the Lithuanian Universities. In June of 1996 the first eleven students graduated

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from the program and received MPA diplomas. Currently the program has 18 graduate students in its second year and 28 students in the first year of the two-year program.

In the design of the KTU MPA program, the following considerations were used to establish its curriculum. First, the following concept and scope of public administration was accepted as a basis for the design. The field of public administration was considered as being concerned with the management of public programs, assisting in the formulation of public policy, and interacting not only with the citizens but with executive, legislative, and judicial officials at all different levels of government. It was also assumed that in the performance of their tasks public officials are involved in all political and managerial complexities of government. Second, from the above concept, public administration can be considered as the accomplishing side of the government, and therefore being composed of processes, organizations, and individuals associated with the implementation of laws and other rules enacted by the legislature, such that executives, courts, and public officials need to know the techniques and tools available to modern managers, as well as the personal and interpersonal skills to make things happen in the bureaucratic hierarchies of the government.

Adjunct to the Department, there is a Municipal Training Center (MTC) which provides an interface between the PA Department, governmental agencies and local communities. The MTC using the PA Department's professors and MPA students, conducts training and development programs for government officials, and conducts studies and projects to improve the government's performance. The Center serves the students and the local governments in two ways: First, utilization by the students of the city's political and government institutions, as learning laboratories, and by the governments' as a resource for studying their problems. And second, by providing opportunities for professional contacts and networking. The Department's Municipal Training Center, through its outreach programs, brings together government officials, scholars, and graduate students to focus on a broad range of policy issues, including the training of government officials, policy making, health care and government efficiency and effectiveness. The Department also has a study group which conducts research in the contemporary issues of governmental and national development.

When comparing the KTU program with other European programs, it can be seen that it is based more on administrative theory than on

economic, legal or political theories. The administrative or functional approach of the KTU MPA program was chosen because it seems best suited to meet the needs of the Lithuanian public administration system.

Concepts associated with ICT

I believe that before we begin the discussion of ICT and its aspects, we need to establish some frame of reference so that we are talking about the same thing. The following are some definitions associated with the subject. These definitions will apply as I continue my presentation.

It is generally agreed that we live in an information age which involves an explosion of information created by the expanding ICT. The Information Technology revolution is upon us. Everyday new ways are found how to transmit and store information, creating many new jobs which involve information processing, or requiring existing ones to include it in their processes. In the USA, for example, as many as 50% of all workers are involved in some way with information processing.

The rate, speed and complexity of change in today's global environment present us with the need for organizations capable of understanding and appropriately responding to these changes. However, many of our current organizations are structured and operate in such a way that prevents them from effectively responding to these changes, because of lack of access to the information, and, or the ability to process for application in decision making process or customer service. The following are some definitions that must be understood when addressing ICT concepts:

Communication: the process of transmitting ideas, information, and messages. An important feature of modern society, which involves rapid transmission and access of information over long distances.

To inform: to give character or essence to, to make known, to communicate knowledge to, to impart information or knowledge. Synonyms: appraise, acquaint, notify.

Information: the communication or reception of knowledge or intelligence (Webster).

Information retrieval: the technique of storing and recovering, and often disseminating recorded data, especially through the use of a computerized system.

Information science: the collection, classification, storage, retrieval, and dissemination of recorded knowledge, treated both as a pure and as an applied science. The study of the ways in which organisms process information. It contains such various topics as the genetic information processing in cells, the individual use of information concerning the environment, and the methods of human learning and information generation. The dominant emphasis of information science today is the human information processing at the conscious level. Information science combines applicable aspects of other disciplines such as biology, physics, computer science, sociology, psychology, and library science.

Information theory: a theory that deals statistically with information, with the measurement of its content in terms of its distinguishing essential characteristics, or by the number of alternatives from which it makes a choice possible, and with the efficiency of processes of communication between humans and machines (Webster).

An information system: is any mechanism for collecting, organizing, and distributing data to an organization's employees. Any such system must have five basic components:

1. Inputs: are the raw data which is entered into the information system, i.e. numbers of people, crime statistics, driver license holders, businesses, etc.
2. Processing: the ability to manipulate, organize, sort, and perform calculations on the data.
3. Storage: a system where the data are stored in an organized manner for future use.
4. Control: usefulness and relevance to the user's ability to change and manipulate output.
5. Output: reports and other organized information produced for the user.

Need for ICT

The structures of Lithuanian local governments have been changing since the restoration of Lithuanian independence on March 11, 1990. The changes were mainly brought about by new regulations passed by the Lithuanian parliament which tried to pattern the local governments according to the mandates of the Lithuanian Constitution.

Centralization was one of the main features of the Soviet regime prior to Lithuanian independence. This insured that all decisions were made at the top levels of the government, and local government officials were simply informed about them and required to implement them. Such a system did not need intensive communication networks because feedback or new ideas from citizens and public officials were not encouraged or expected. This is the legacy that is hard to overcome in Lithuanian public organizations, even today. In fact a survey of municipality workers in Kaunas confirms this, by the finding that over 50% of employees are the same as under the Soviet system, and that over 50% of the employees had no additional training or education in the last seven years.

Many public administration people do not receive the right information at the right time, or when they needed it. In many cases this information has not been collected or it has is not been made available to them. In other cases, even though this information exists, they are not aware of the fact, or do not know where to look for it.

This type of situation exists in almost all local government levels in Lithuania. The fault is not with the workers or the management. Several factors contribute to this situation. First, is the lack of understanding of what information is needed, how it can be collected, stored, processed, retrieved and used. Second, is the lack of computers (hardware) and their linkage, so that they can be used for communication and decision making. Third, the programs or systems which would allow networking, retrieval and processing of the data are inadequate. Fourth, knowledge and skills among the management and workers about the information and communication technology and its application are deficient. Finally, the need for ICT managers within local government organizations, or external consultants, to advise and train on how to establish, use and manage the ICT systems.

This so-called lack of understanding and application of information science, among public organization managers and employees, prevents a more efficient and effective service provision to the citizenry. Information science in this case provides an understanding of the processes, practices and means on how much needed information is generated, stored, made available, and used to improve the operations of a city or a county. The concept on which the dissemination of this information depends is that of the data base, a body of computer stored information which can be searched and manipulated for a variety of needs and purposes.

Many of problems faced by the City of Kaunas could be attributed to poor communications between the municipality and community and among the departments of the municipality. The major problems impacting on effective and efficient service provisions, and community satisfaction with the administration, were identified as:

1. Lack of a strategic plan for the development of the city.
2. Lack of coordination among the city departments.
3. Lack of effective communications with the community.

ICT management competencies

In teaching or integrating ICT as a course or a topic in Public Administration University curricula, or in-service personnel training programs, it is necessary to insure that the instruction about information and communication systems is understandable and useful to non communication and information specialists. It also should show ways in which communication and information systems can assist individuals, groups and government organizations to solve problems and make information available wherever it is necessary. The three main categories of knowledge which should be covered in the PA programs are as follows:

Computerized Information Systems

Transaction Processing Systems (TPS): designed to capture and store transactions.

Management Information Systems (MIS): a mechanism that collects, organizes, and distributes data. It provides data for specific management problems.

Decision Support Systems: designed to help managers with unstructured problems - to ask questions and receive answers, "what if" questions, comparisons, projections.

Telecommunications. The use and integration of all the available communication systems such as Electronic Mail, FAX, Voice Message Systems, Videoconferencing, Electronic Bulletin Boards, Internet and others which become available.

ICT Adoption. The planning and adaptation of ICT should be based on the analysis of the answers to the following questions.

1. Does it fit your strategy?

2. Will it provide information needed by your people?
3. What new service will it help to implement?
4. How long a wait before results begin to appear?
5. How have we prepared the organization to receive it?
6. Have we considered fundamental changes this will bring on how we do business?
7. Are we making change for the sake of change?
8. What are the real costs?
9. Is this a customized application?
10. Does it improve the service to the citizen?
11. Does it bring government closer to our citizens?

MPA PROGRAM AT KTU

We do not teach a specific course on ICT in our program. The concepts, processes and practices of ICT are integrated into most of our courses. These courses are underlined in the KTU MPA program shown below. Computer skills are considered to be a prerequisite for admittance to our program. For those students who are not computer literate there are sufficient computer laboratories in the faculty to learn these skills early in the first semester.

COURSES KTU MPA

1st SEMESTER

Principles of Public Administration
PA Research Methods
 Administrative Law
 European Integration Process
Applied Research

2nd SEMESTER

Public Organization Theory
 Human Resource Management
 Policy Development and Analysis
Computer Based Project Analysis
Applied Research

COURSES KTU MPA

3rd SEMESTER

Public Financial Management
 Ethics in Public Administration
 Elective
 Elective
Applied Research

4th SEMESTER

Master's Thesis

ELECTIVES

Environment, Society and Technology
Strategic Planning and Evaluation
Inter-governmental Relations
Leadership in Public Organizations
Contemporary Issues in Lith. Pub. Adm.

Methodology

The approach through which we try to impart ICT concepts and knowledge to our MPA students at KTU is based on integration of the ICT techniques which complement the managerial processes, but do not replace it. Our program does not consider ICT as taking the place of, or driving public administration. At the KTU PA Department, we do not accept any assumptions that ICT drives or changes public administration. We see it as technology change which allows, if properly used, to provide improved and more effective service to the society. ICT, besides speeding up the gathering of data, provides the information and manipulation needed for more effective decision making. We do not teach a specific course on ICT in our program. The concepts, processes and practices of ICT are integrated into most of our courses. These courses are shown in italics in the KTU MPA program above.

General Computer skills. One of the entry requirements of the MPA program is general computer competency. Those not possessing this competence are granted a four month waiver to acquire it. There is a modern, twelve work-station computer laboratory in the Faculty and three computers in the Department available to students. The requirement to have all course work typed also forces the student to use word processors. In the *Principles of Public Administration* course there is a three hour block of instruction devoted to the use and application of ICT to management in public organizations. *Public Administration Research Methods* and the three semester course requirement in *Applied Research*, further teaches the students the use of statistical analysis using computer programs such as SPSS and spreadsheets. Internet and e-mail are used extensively to gather data, do research or interface with other scholars in the field.

The *Public Financial Management* and *Computer Based Project Analysis* courses introduces and requires the student to use computer programs in project analysis, decision making and briefings. These courses prepare the

student to apply ICT technology to managing public programs and imparts real life experience for on-the-job application.

Conclusion

ICT theories and applications are essential to the field of Public Administration. Current day public servants must have computer knowledge and skills, and managers of public organizations must be able to apply ICT theories to the operations in their organizations. To be effective in today's environment public employees and public organization managers must know and use ICT capabilities. At KTU, however, we believe that teaching computer skills per se are not the objectives of our programs. These skills are to be learned or taught at baccalaureate level programs, or to be learned through some other means.

At KTU Public Administration Department, we treat ICT as one of the competencies necessary for successful public organization managers, and which he or she must be able to apply and use in every day operations. Use of computer programs and data for specific management problems, and quick communication made available through computer systems, we consider as a normal practice in today's public organization management. In our MPA program, therefore, we incorporate the teaching of such practices and theories as part of a normal managerial process. We do not teach or provide courses in specific computer skills, this we consider to be the basic skills necessary for every manager, and most employees to be learned outside the program.

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2.7. Administrative Information System of the Government of the Republic of Lithuania: Public Servants' Training

Evaldas Kulbokas *

Eugenijus Telešius **

Regina Valentukoniene ***

Abstract

The conceptual model of the Administrative Information system of the Government of the Republic of Lithuania (VADIS) is proposed. This model is based on Computer Supported Cooperative Work benefits, and enables VADIS public servants to create, share and create leverage corporate knowledge. All properties of the VADIS conceptual model focus on administration processes, design and re-engineering methodology. Our approach requires VADIS public servants to be much more involved in VADIS design, especially in the improvement of organisational processes.

We define professional competency in groupware, not only as the knowledge of how to use software in one's work place, but as active participation in the creation and use of information, rather than simply viewing it. Thus, traditional courses of computer literacy need to be supplemented or even replaced with alternative courses of groupware. There is also a move in our curricula towards a more integrated approach with administration practices and techniques. We would like to train VADIS institutions' staff to participate in VADIS along the lines of internal re-engineering consultants.

Overview of the project

After the re-establishment of its independence in 1990 Lithuania began the transition from a centralised to a market economy, with a developing democracy and a state governing culture. The **directions of the public administration reform** in Lithuania have been recently developed and approved by the Ministry of Public Administration Reforms and Local Authorities of the Republic of Lithuania. One essential goal of the reform

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is the administration process, the re-engineering and restructuring of central government organisations and institutions, based on the improved training of public servants and officials, by introducing new information and communication technology (ICT). The **importance of ICT development** is recognised in Lithuania as playing a key role in leading it towards a modern, democratic nation and full integration into the European Union.

On November 13, 1991 the Supreme Council and Government of the Republic of Lithuania announced the official launch of the programme “Lithuania 2000”. The goal of this programme was the **development of a nation-wide Lithuanian Information Infrastructure** (LII). The Ministry of Communications and Informatics (MCI) of the Republic of Lithuania is responsible for implementing this programme.

The LII is regarded as an integrated system of information and communication technologies, standards, regulatory framework, organisational structures and procedures, that provides the electronic means to manage and use major national information resources. This is vital in order to efficiently solve problems in government, business, society, economy and other areas.

The LII includes over 80 various databases, registers, and computerised information systems. Among them, about 50 systems are directly related to the activities of state Government and administration institutions. Through a high-speed data exchange highway the State Institutions Computer Network (VIKT) provides users with the ability to correspond with each other via e-mail, create their own information systems and receive Internet services. VIKT provides the technological base for all state information systems’ developers and users. The most important state information system in Lithuania is **the Administrative Information System of the Government (VADIS)**.

In 1995, the Government of Lithuania issued a decree which called for the creation of the Administrative Information system of the Government of the Republic of Lithuania (VADIS). VADIS implementation will be based on the VIKT computer network (see Fig.1).

The VADIS mission is to provide effective means, based on the use of contemporary information technology, to serve for the execution of functions attached to the Government, Ministries and other governmental institutions of the Republic of Lithuania. At the same time VADIS must provide more

rational use of the State administration budget and will increase the effectiveness of State administration.

The main goal of the VADIS project is to manage, in regular manner, the flow of information available from State registers, Municipalities, Tax and Customs systems, the Department of Statistics, and other public authorities. This system will aid the functions of data/document management, information access and monitoring, standardisation of office work and document handling, facilitate the growth of professional skills and the experience of public servants. The system will help automate, by means of Information Technology, the work done by the Ministries, the Prime Minister's Office, other governmental institutions as well as the Administrations of the Districts' Governors, Regional Government Representatives, Commissions and Consultants of the Government (VADIS subjects).

VADIS technical requirements were prepared in the middle of 1995. UAB Sekasoft, in cooperation with two Kaunas Universities, won the tender for its initial development, and was involved directly in the preparation of the draft project. This phase ended in September 1996, when a new tender for the General Designer of VADIS was announced, and **UAB Sekasoft, together with the IBM Representative office in Lithuania**, were declared the winners. In 1996 the **Ministry of Public Administration Reforms and Local Authorities, as VADIS governor**, was appointed. **The Lithuanian Information Institute** was obliged to carry out VADIS project supervision and coordination functions.

VADIS is designed as a decision support oriented information system. **Decisions are made and executed by people.** So in the VADIS design process it is necessary to estimate the 'human factor' in all problem definitions. The essential mistake of widespread methodologies is the assumption that a person is only one of the means used in information transfer. This assumption is incorrect when talking about the processes of activities (business processes) in organisational systems. The VADIS conceptual model focuses on business processing design and re-engineering methodology. This methodology is known as the Flores - Winograd approach [1] and recognises that work is accomplished by people delivering on commitments, not through merely moving documents around an institution. All formal relations among the VADIS participants are described, not as traditional workflows, but as a complex web of person-to-person interactions (commitment web). We do not focus on traditional Information System

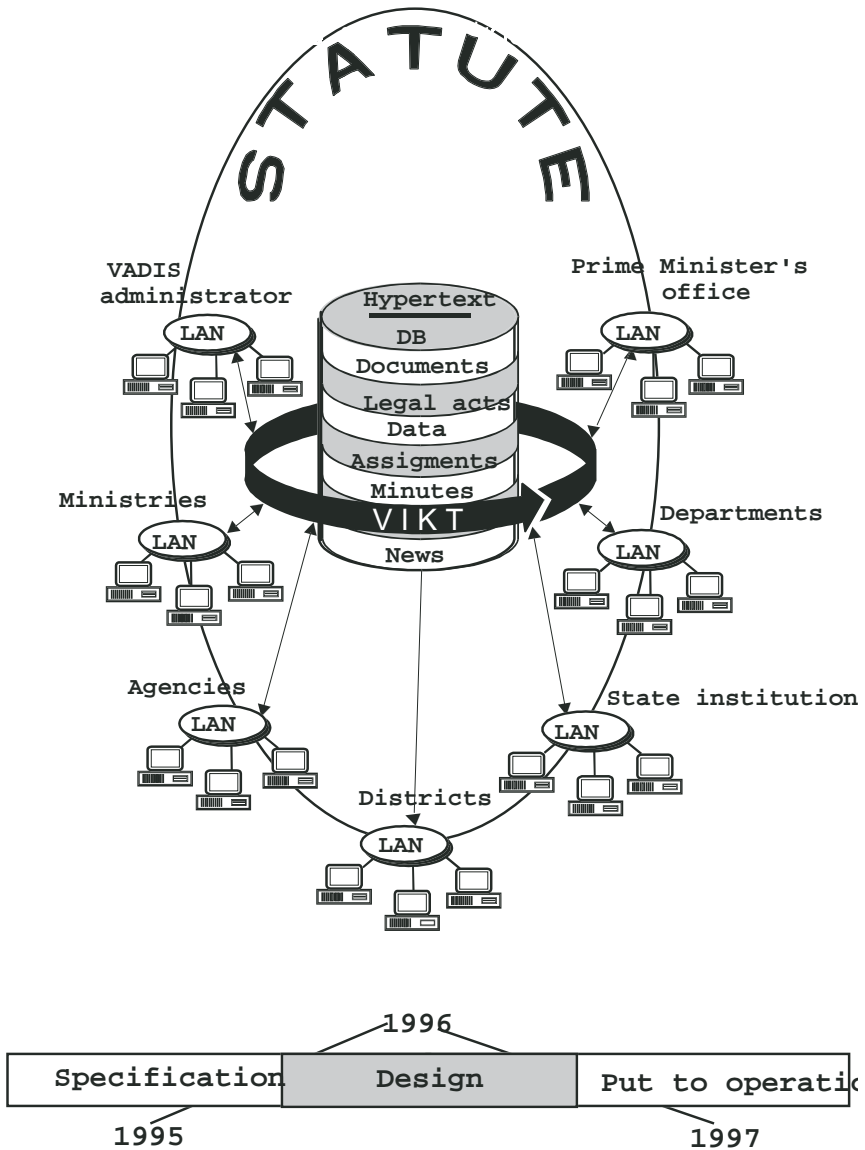


Figure 1.
VADIS - the Government Administrative Information system

Analysis, where the Input-Process-Output model is essential, and by which the efficiency of document flow within the institution is increased. The emphasis of the methodology chosen is the assumption that the 'human component' in VADIS operations is mainly because people connect events, synthesise solutions and manage their work.

Traditionally, the main trend in information systems development was the improvement of the user's workplace. All efforts were directed at making the workplace of the end-user as effective as possible, creating the information and operating comfortably. Today, the technologies for improvement of cooperative, collaborative work are spreading. The global change is from "the organisation as a simple, stable machine" to "the organisation as a complex, evolving organism". Only a corporate ICT infrastructure institution is treated as a **free association of creative personalities** [2].

Following the selected methodology, based on principals of groupware, VADIS is defined as the global corporate ICT infrastructure, the essence of which is conveyed by three basic components: communication, collaboration and coordination.

Due to the **communication component** information exchanges between information users and their groups are possible. In VADIS there are three layers of information users: institutions, departments of institutions and public servants. Information is transferred via networks sending an entire information object (document), or alternatively, using the 4th generation information messaging technology, when the object is stored in a shared database and only a dynamical pointer to this object is sent.

The **Collaboration component** ensures the integrity of activities of system users. In VADIS this component is based on collaborative shared document databases. These databases store the information entered, modified and retrieved, by VADIS users, in the processes of their administrative activities. The information storage and retrieval in shared document databases comprise the axial part of groupware, enabling the capture of institution knowledge, handling and subsequent leverage for decisions making.

The **Coordination component** ensures management and control of structured, semi-structured and unstructured processes of activities. During the activity process in the VADIS infrastructure, one or several workflows, are proceeded. These workflows consist of separate steps, corresponding

to a single action of the end-user. All information about decision-making oriented activities' processes and information, used in individual steps as soon as the actions are performed in these steps, are captured by the VADIS administration data bases.

Proposed implementation of the VADIS groupware infrastructure will facilitate **institutional processes re-engineering** [3]. The concept of re-engineering needs changes in VADIS participants' mentality, as well as in the structure of Public Administration organisations. Thus, we understand the role of education in the VADIS institutions.

VADIS ICT CURRICULUM: A CASE STUDY

Much academic work has been undertaken in public servant **computer literacy education**, often by Universities, using office automation software (MS Office, Lotus Smart Suite, MS Works,...). We compared examples of training courses in Lithuanian Universities and the private sector and concluded that although insignificant differences existed, there were many similarities. There is also software developed for VADIS institutions for local needs, such as accounting systems or those which provide guides to legislation (LITLEX,...). The use of computerised information retrieval skills, word processing, electronic mail and software for a local VADIS institution, needs must be as usual a thing as pen and paper. It often happens that VADIS public servants gain computer literacy qualifications before being employed in governmental structures. Thus, some applications such as word processors, spreadsheets, databases do not require specific courses.

Much has been written about the ICT learning process. Many courses have been implemented and evaluated. The main thing is – all the software and system solutions were focused on making the public servant work more productively and comfortably, with some modest performance improvement in communication (e-mail, Internet). After finishing such courses public servants are not equipped to collaborate, or even to communicate very well. The skills we most often see lacking are the ability to communicate and participate in the coordination and collaboration processes. These skills are not being widely trained.

Now, however, the attention is focused on **transformative technologies** of all workgroups and down-sizing, right-sizing and cap-sizing of all collective efforts. New technologies foster the workflows in organizations. These technologies are often called organisational technologies and Lotus

Notes is the most commonly known representative of high-performance team software. Communication, coordination and collaboration are the processes of high performance teams, not individual public servants. The main idea during VADIS design is to transform the technical potential of Lotus Notes into a force that will transform the role of public servants in VADIS institutions.

In accordance with the VADIS conceptual model traditional courses of computer literacy need to be supplemented or even replaced with alternative courses in groupware. There is also a move in our curriculums towards a more integrated approach with administration practices, approaches and techniques. We will train VADIS institution staff to work more like internal consultants. They will act as exclusive groups of experts facilitating the transfer of structured groupware skills in VADIS institutions. These two elements dominate the curriculums for ICT learning.

What do VADIS public servants need to know about ICT? We organise the curriculum into four stages:

- the first stage provides computer literacy taught by all the academic institutions;
- the second stage is for management, social, human service and public administration modules to integrate into ICT courses;
- the third stage is the advanced courses, covering groupware products in a technology-focused approach;
- the fourth stage is groupware system development, and a series of business practices, approaches, techniques and tools that help VADIS institution re-engineering. These courses introduce general supervisory and office management skills through groupware and teamwork aspects.

Traditional application development programs deliver solutions near the end of a project. We propose to produce prototypes (typical VADIS solutions) in short cycles. Public servants evaluate project solutions, realise the benefits and can formulate their needs again. Thus, the goal of training courses is **not only Lotus Notes skills transfer**. We need to integrate VADIS public servant knowledge with software engineering and collaborative work. Public servants will be much more involved in VADIS design, and in the direct improvement of organisational processes. Both information technology professionals, and users, will be active participants in VADIS design, but users' strong quality is that they know the institution from the inside.

Decision Support Systems (DSS) assist public servants in making complex decisions. They differ from systems which provide information to inform public servants and produce recommendations. They model the whole decision making processes and contain coordination and collaboration components. DSS are relevant for VADIS public servants, for whom decision making is a key task. If we create a larger population of collaborators within the VADIS institution, we radically affect the performance of that institution. As repeatedly noted, the main goal is VADIS institution re-engineering. Each institution should change into a community of professionals, all engaged together in the pursuit of a common objective.

Conclusions

We recommend **moving away from computer literacy concepts by integrating them into groupware professional competency courses.** We define professional competency in groupware, not only as knowledge on how to use software in one's workplace, but as active participation in the creation and use of information. **We are stepping away from a technology-focused approach.** Our approach considers human, societal and technological factors together, in the development of new re-engineering solutions.

Through information exchanges by NISPAcee members it is possible to develop a common understanding on what should be taught and how. Thus, the development of a **common groupware core curriculum across East Europe** for public servants is quite possible.

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2.8. FORMING KNOWLEDGE ABOUT COMPUTER APPLICATIONS

*Dainius Urbanavicius **

Abstract

VDM trains adults, who never learnt about computers in secondary school. It is always a problem to start using something for the first time, and computers present an even bigger problem, because they appear to be very complicated, with their own thought processes, which requires specialist knowledge. Furthermore, this knowledge must be upgraded every time something new appears in ICT.

So, how do we solve this problem, regarding adult education for ICT in the Lithuanian economic situation? Has anyone tried to solve it? How should it be solved in our particular situation? What curriculum should we develop for this issue? And what are the principles of teaching or teaching methodologies that suit our situation?

These are the main questions that I will try to answer in my work. Also these are open questions for Lithuanian society that have not yet been fully addressed and answered.

School of Democracy and Administration (VDM) was established as a NGO/NPO organization, registered in Neringa in May 1994.

In autumn 1994 a regional 3-week TOT course '*Training for Elected Leadership*' was organized in co-operation with UNCHS in Ukraine for trainers and elected officials from neighboring countries. The workshop "*The Development of Local Democracy: Problem Solving in Transition*" was held on behalf of PLDD in co-operation with the LGMB on June 9-10, 1994. The '*TOT Seminar for Training Agencies in Eastern Europe*' was arranged in cooperation with the LGMB in February 1995. From February 28, 1995 the Centre began as one of the partners in the PHARE Democracy Programme for Lithuania and Latvia, in co-operation with the International Institute of Administrative Sciences (Brussels) and the Training Centre for Local Governments of Latvia. Three 5-days seminars, under this project, are to be held in the School of Democracy and Administration (VDM), Neringa. The VDM Training Centre in Nida is fully equipped for providing up-to-date management training (150 m², 4 rooms, special furniture, TV camera

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and recorder, projectors, flipcharts, radio equipment for simultaneous interpretation, computer with CD ROM, copy-machine, etc.). These facilities have been effectively used since May 1995 for training courses for top political and executive staff of local governments, also for business managers.

Goals of ICT curricula and problems, limitations, open questions to reach it

As I have shown in my abstract, ICT curricula should deal with adult training. The main mission of ICT curricula is to dispense computer knowledge computer for adults. The problem is, how we can do it?

Anyway, ICT is a kind of subject, that can not be taught without practice. Practice also requires technical support and that is hard to obtain. Technical facilities require quite a lot of money to obtain. It is a long term strategic decision to spend money on such unrealistic business. Also in Lithuania there is no governmental strategy about how society should educate adults in ICT. At present there are only private educational courses in ICT, which are very expensive to attend and administer. So this overall lack of money is the first problem that can be identified. And nobody cares whether this money could be received from external or internal sources, as ICT also relates to democracy, sustainable development, etc.

These private educational schools are so costly as to keep more than half of their potential clients away from this service. Demand for ICT teaching in Lithuania is also very high because of the English language barrier that disables a lot of people from learning and using simple 'help' commands. Intellectual products and services in Lithuania are not popular (companies do not like to invest money in them) because of two reasons:

1. People usually start a business which is simple for them to do, or
2. An intellectual product is one that requires from a company a lot of resources and does not give immediate feedback.

The market is the market and despite such problems the existing gap should be filled, maybe not as well as possible, but, even so, there are companies that work with ICT. The second difficulty is the equipment that these companies have for training. Usually for this purpose they only use a '386' microprocessor, or if it is a good school they may use a '486' model, but never more than 4Mb RAM. In other words, the computers are slow and the software is not the latest version. Additional training with good hardware and software costs a lot of money.

The government is trying to solve the existing problem with a project called “Lithuania 2000”. The goal of this programme is the development of a nation-wide Lithuanian Information Infrastructure. So, by upgrading certain abilities, they force individuals to demand it, and this will also encourage people to buy training in ICT. That is problem-solving from the top. Another is from bottom: the computerisation of Lithuanian secondary schools, so that every student has the opportunity to learn about ICT. But the government is not solving the situation that we face today.

Let’s return to our curricula problems that we also have. We know that future computerisation will demand more and more knowledge about computers as a system. That is the main standpoint for building up the curricula for teaching adults ICT (you can find some more information about this in my case study). Narrow specialization will work only in the short term, because of the imposed limitations. The end-user should be a computer trouble shooter, too.

How do you set up curricula for teaching computer applications like a systemic existing organism? That is the main question. My proposals for the Lithuanian situation are briefly described in my case study.

Forming knowledge about computer applications

Today in Lithuania, as a few years ago, the main tendency is that almost all computer users are used to working with computer applications and programs that are specially designed for each purpose. If somebody knows more about the computer as a whole working system, that person starts to work in a private company as computer expert or salesman. Usually computer users do not understand what a computer is, and really know only the application that they use in their daily work. They are not capable of using all the different computer applications because of their low level of knowledge about the computer’s potential.

In Klaipeda city, Lithuania, in 1990 (for the first time in Lithuania) something happened which was like an experiment: The municipality bought 15 computers without any application programs for special purposes. All 15 computers were engaged into a local network. There were no computer specialists to help or special applications to install. So everybody was forced to begin to make his acquaintance with the computer from the basics, because they had no ideas about computers at all. Staff learnt through reading books and learning what a computer is and how it works.

After the initial learning process they understood that a computer is not a toy or a miracle, so personnel began to create applications by themselves. They started to feel computer-friendly or as a personal secretary. They made their own information base and Informational Management System. Which was really amazing! The municipality did not spend any extra money on specially designed applications and yet the knowledge of the staff was impressive. They had a basis to build their own future knowledge about computers and that is more important than being an expert on only one application.

I suppose that every user should think about PC as his own secretary, book-keeper, tax accountant, art editor, printer, music teacher, and entertainer all rolled into one obedient, 24-hour servant. Once you buy the PC system you want, then you can perform unlimited tasks on your computer. Your only limitation is your imagination. The PC is really a tool of unlimited uses. Yet there are only a few areas in which people use their PC to the full extent. If you have an idea for an application, you can develop or buy a software program for it.

For example, if you are learning how to use Word for Windows 6.0 you must understand Windows too. If you already know Windows then the second question arises - how the computer works and what is inside the computer's (like human) mind? That should not be reversed. As I said, every user should begin from the first step and form not a separate knowledge, but knowledge about the computer as a system. It is possible to do this only if we begin from basic things and applications, whose function makes possible to work on other applications.

If you want to be a good driver you need to know how the car works. Why should you start to drive only in first gear?

This standpoint should only suit a very narrow specialization, but a computer is for all your daily work. It is irreplaceable for saving time and money, which is why every user should learn how to use and develop more of the computers' abilities. Future computerisation will demand more and more knowledge about the computer as a system. From the foundation of basic computer skills and knowledge it is possible to build comprehensive computer knowledge in almost every application. In this way the process of learning becomes perpetual and has the potential to expand, rather than put into rigid frames.

Conclusions

1. Teaching ICT in Lithuania is still encountering big problems.
2. To users the computer is usually seen as a toy.
3. Today's situation could be many times better if the government could finance ICT installations and provide teaching for budget organizations.
4. The private sector tries to fill the gap that has arisen because of Lithuania's backwardness.
5. The private sector's teaching methodology, according to my case study, is not progressive, so it will not improve the situation quickly. To use progressive teaching strategy for the private sector is impossible because of financial reasons.
6. ICT teaching could also be financed by external and internal International funds, if it could be organised.
7. The teaching of ICT for adults could improve the Lithuanian economic and political situation, because it has an impact in information flow, which could allow more people be involved in foreign relationships, etc.

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2.9. Case Studies in Teaching Informatics

Oleg Bulgaru *

Abstract

This article describes a specific situation connected with the teaching of informatics at the Academy of Public Administration of Moldova.. The goals, the plan, the content of the informatics course, some methods of training are given herein.

The use of case studies, whilst teaching informatics is analysed, with the help of a concrete example. A modality of description (formulating) a case study for the informatics course is also proposed.

Introduction

Informatics as a science, as a subject of investigation, and as technical and data processing technology, were developed in Moldova in accordance with former Soviet Union norms and legislation. After 1991, when Moldova became independent, data processing politics became the area of the Ministry of Communication and Informatics. The Programme of Society Information, the Decision on the Establishment of the Republican Network, the Law on Telecommunication, etc. were approved. But in practice the approved decisions and laws are followed with difficulty because of lack of financial sources, and a lack of understanding of the effectiveness of informational technology by government and management.

In Moldova informatics is taught in schools (a basic knowledge of data, algorithms, programs, programming language), in higher education institutions (programming and applied programs), at various training and retraining courses (a basic knowledge of computers, operating systems, editors, spreadsheets, databases etc.). Unfortunately, the training process is hindered by poor technical resources within schools and universities.

The Academy of Public Administration of Moldova was founded in 1991. It is a postgraduate educational institution and its goal is to train and retrain civil servants.

There are three departments at the Academy: Public Administration, Management and International Relations. The course programmes are two-

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year full-time, and three-year part-time. Every year two hundred students are admitted to the Academy (one hundred students for each course programme), most of whom are civil servants, specialists from Ministries, Departments, Executive Committees and Mayoralty. The curriculum contains such subjects as: Economy, Law, Administrative subjects, Foreign Languages (English, French) and Informatics.

The retraining courses last from one to four weeks and are organised for different categories of civil servants.

Informatics is one of the most important subjects of the curriculum and it is taught for three semesters on the full-time programme (150 hours) and four semesters on the part-time programme (76 hours). There is an examination at the end of the course.

The goals of the course are to teach the students how to use computer data processing, to make them acquainted with the management of informational systems.

The informatics curriculum is for an homogeneous group of students (most of whom are beginners) and contains the following components:

- Introduction to Informatics (hardware, software, DOS, Norton Commander, Windows 3.11) - **60 hours**;
- Computer Applications for Public Servants (Word 6.0, Excel 5.0, Power Point 4.0) - **60 hours**;
- Management of Computer and Information Systems (the role and the place of informational systems, analysis, design, elaboration, implementation and administration of informational systems) - **30 hours**.

In future some new topics will be introduced in the curriculum dedicated to E-mail and Internet. There are two computer classrooms in the Academy and in accordance with the curriculum, 65-70 per cent from the total number of hours are allocated to practical lectures.

Different methods are used during the process of teaching: theoretical and practical lectures, laboratory and individual works, case studies, competition classes, etc.

Among **the problems in the field of informatics** and the use of computers, in the process of teaching, we'll mention the following:

- a lack of interest towards Informatics, because some of students have no computers at their place of work;

- a bad knowledge, or even ignorance of, new technologies of training, as computers are not allowed during such courses as Economy, Management, Law, etc.;
- lack of textbooks in the field of management of informational systems, it is difficult to prepare and to teach the respective components of informatics;
- lack of financial resources necessary for the re-equipment of the Academy, making it difficult to keep up with developments in informatics.

Case Study Description

Case studies have been one of the most successful ways of practical training, which allow the students not only to identify with real, understandable situations, in which they are placed, but also to understand the possibility and efficiency of computers in relevant situations. Thus, the students can improve their working skills in concrete situations, and enable them to choose the necessary programmes for solving concrete tasks and problems.

Unfortunately, there are few examples of case studies in computer literature, a fact which hinders the teacher during the training process, or a standard for formulating case studies.

In the case study proposed below, both are important - the content and the way of formulating. To our mind, the composition of a case study should contain **an introduction** (*the teacher's position, the participants involved, the equipment used, the goal and the proposed objectives*); **the main section** (*the challenged formulation, questions for discussion and a step by step solution of the case study*); and **the final section** (*some conclusions and required literature*). The necessary time for unfolding the case study is established by the teacher, which is dependent upon the students' level of knowledge.

Later, we will demonstrate a case study which allows students to learn the Excel programme. The case study is developed in a computer classroom within 4-6 hours.

The Teacher: an expert in computer science and economics.

The Participants: specialists in local government, informatics beginners, who have a basic knowledge of creating, saving and printing documents in Excel.

The Equipment: IBM PC-486, Microsoft Office (Excel 5.0).

The Goal: To teach students to use spreadsheets for the elaboration of economical documents which need mathematical calculation.

The Objectives:

- a) students should know how to select the right program for document creation;
- b) students should know how to use spreadsheets correctly;
- c) students should know how to elaborate budgets in accordance with existing regulations and legislation;
- d) students should learn to decode budget items in the form of separate tables;
- e) students should know how to make quantity analysis of their results.

Statement of Problem

The current situation at local government level in Moldova is one of good management and success. However, there are several cities or regions that have performed extremely well and several others that have possibly under performed. It would be very valuable for the mayors of approximately forty (40) cities to meet at a seminar to share their experiences.

The seminar would be organised by the Mayor's office of Ungheni and be held in that city. The seminar would last for five days for approximately forty (40) participants, and would provide opportunities for discussions, workshops, the exchange of information, and to share relevant experiences. Several excursions would be planned to factories and other successful businesses and enterprises, for practical observation.

The organisers of the seminar would cover all expenses for accommodation, meals, transportation, materials for the seminar and a cultural programme.

Questions for Discussion:

- 1. What software should be used to make the budget for the seminar?
- 2. What issues compose the budget for this seminar?
- 3. What issues may be developed for the budget, and how?

4. What expenditures for the seminar would be supported by the local Mayor's office (Ungheni)?
5. What is the cost for a single participant in the seminar, in the event they will pay their own costs?

Case Study Solution

1. In collaboration with the students we establish the fact that the budget is a document which consists of information of text and quantity. For its elaboration we need spreadsheets. Excel is one of the programmes which can provide this.
2. Students load Excel and create a new document (page dimensions and orientation, margins, name of document).
3. Students type the information in accordance with Table 1.
4. To establish concrete values of the 1st, 2nd and 4th items students make additional tables (Tables 2, 3, 4). They are placed below Table 1.
5. In appropriate positions in Table 1 they introduce the results of Tables 2, 3 and 4.
6. Students format the tables and in the Print Preview all the tables are placed on separate pages.
7. The result is printed.
8. Following this we can make an analysis of the results.

	A	B	C	D	E	F
1						Table 1
2		Budget for the Seminar				
3						
4	1	Salaries			=E24	
5	2	Social insurance			=E4*0.35	
6	3	Training expenses			=E36	
7	4	Administrative expenses			=F48	
8		Total direct expenses			=SUM(E4:E7)	
9	5	Overhead expenses			=E8*0.25	
10		Total expenses			=E8+E9	
11						
12		For one participant			=E10/40	
13						
14						
15						
16						Table 2
17		Salaries				
18						
19			<i>Price</i>	<i>Volume</i>	<i>Cost</i>	
20	1	Manager	300	1	=C20*D20	
21	2	Assistant	250	1	=C21*D21	
22	3	Secretary	150	1	=C22*D22	
23	4	Lecturers	10	20	=C23*D23	
24				Total:	=SUM(E20:E23)	
25						
26						
27						
28						Table 3
29		Training expenses				
30						
31			<i>Price</i>	<i>Volume</i>	<i>Cost</i>	
32	1	File	10	40	=C32*D32	
33	2	Handouts	5	40	=C33*D33	
34	3	Notebook	3	40	=C34*D34	
35	4	Pen	1	40	=C35*D35	
36				Total:	=SUM(E32:E35)	
37						
38						
39						
40						Table 4
41		Administrative expenses				
42						
43			<i>Price</i>	<i>Volume</i>	<i>Participants</i>	<i>Cost</i>
44	1	Accommodation	25	5	39	=C44*D44*E44
45	2	Meals	15	5	40	=C45*D45*E45
46	3	Excursion	10	3	40	=C46*D46*E46
47	4	Concert	7	2	40	=C47*D47*E47
48	5	Travelling	15	2	39	=C48*D48*E48
49				Total:		=SUM(F44:F48)
50						

Conclusion

The above mentioned Case Study allows student to learn how to work with spreadsheets. This case study is a pattern which may be changed by the teacher (building budget, goods budget, etc.). Moreover, we can study the budget of a village, city, district, state, etc. which has some incomes and expenditures. In this case we should pay more attention to the utilisation of computers for quick alterations and the development of documents. Consequently, this shows students the necessity and effectiveness of using a computer for data storage and processing, and the elaboration of various documents.

2.10. Teaching Informatics at the National School of Public Administration

*Danuta Szczepanska -Wasersztrum **

Abstract

The purpose of the National School of Public Administration (NSPA) is to train top civil servants. The school prepares graduates of various college or university curricula for civil service positions, which require highly qualified professionals. The School's Information and Communication Technologies (ICT) training is one of a number of thematic blocks presented to NSPA students. The ICT training programme aims to accomplish two basic tasks: The first of these is to teach students basic computer skills, and the second is to make them aware of possible computer applications and their uses. In order to achieve these two goals the NSPA provides a number of courses in informatics. The main problem we face in presenting ICT training is mixed ability - the different educational backgrounds and different levels of knowledge in the area of informatics of the NSPA students. The other problems which we face include limited hardware, software and human resources.

I. The National School of Public Administration

The National School of Public Administration was established in 1990 with the primary purpose of training politically neutral, professional civil servants, to work in public administration. Its secondary task is to raise the professional qualifications of civil servants currently employed in Polish administration. The first task is realised through the intramural training of graduates with various college or university diplomas, and the second through intensive training interventions for high-ranking civil servants, which develop their skills and enrich their knowledge.

Every year about 55 - 60 young college or university graduates of various educational backgrounds are admitted to the school. The NSPA training spans about 18 months, with the students residing at the school for about 13 months whilst spending the other five months in practical training in domestic and foreign administration offices (in the USA, United Kingdom, France, Ireland and Germany).

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The intramural curriculum includes a number of thematic blocks: Public Law and Administration, Economics, International Law and International Relations, Public Finance, Management, Public Policy, foreign languages and informatics.

II. The topics and the goals of educating future civil servants in ICT

Teaching informatics in the NSPA aims to accomplish two basic tasks:

The first task is to teach every student the basic computer skills necessary in completing his/her studies.

We require our students to become familiar with computers from the very beginning. They must be able to create documents using word processors, to perform simple calculations and analysis, to create graphs and charts etc. To fulfil this goal we instruct them in using computers and basic software, including local networks, word processors, spreadsheets and electronic mail.

Following this, we instruct our students on the possibilities of using computers to access information. We show students how to use world-wide networks (such as the Internet) and how to access information available through them. It is very important for novices to understand the meaning of unrestricted access to information and to learn how to use it.

This task is accomplished through courses which do not differ very much from the computer training offered to students of any university department, and constitute part of the general curriculum.

The second, and perhaps the more important task, is to instil our students with general knowledge about the possibilities of computer applications, the methodology of storing information and of applying information and communication technology. Understanding the possibilities available through informatics, and its impact in effective communication and information processing, is a fundamental part of good civil servant education.

Graduates of the NSPA will take high positions of responsibility in public administration, perhaps as executives in ministries. Because of the widespread use of computers and information technology, it is very important that their knowledge of applied informatics be much wider than simple practical skills in using word processors and other office programs. Of course, NSPA graduates do not have to be experts in informatics, but

they should have a general knowledge in its scope of possibilities and the limits of applying it. They are supposed to propagate the proper use of computers in administration. We must also remember that they could be forced in the future to make decisions on installing computer systems and, therefore, they must be able to communicate effectively with computer professionals.

This task is much more difficult to accomplish than the first one. Teaching such topics requires many hours of lectures and training, well educated lecturers of informatics, and adequate equipment. The hardware and software used must enable presentations of possibilities in the field of information processing , such as using wide area networks, multi-user and multi-access data bases, and systems of information and electronic document exchange. It is important that we be able to demonstrate the information technology for large organisations and provide examples of analysis and the design of large computer systems.

In order to realise the second of our main educational goals we must teach the students the following topics:

- the use of wide area networks,
- problems in security and information protection,
- methods of analysis, design and implementation of multi-access data bases,
- problems in building and incorporating large information systems,
- possibilities in using information technology in organisations,
- applying informatics in management.

III. Courses dealing with ICT at the NSPA

Before presenting the way in which we teach informatics in the NSPA, some background information about our Computer Centre will be presented.

Hardware and software at the NSPA

The School has a Novell network with approximately 60 computer workstations (PC computers with 286, 386, 486 and Pentium processors), 20 of which are accessible by students. For teaching purposes the School has a computer laboratory equipped with 8 computers for students, one for the teacher, an overhead projector and an LCD Projection Panel.

We also have 2 Novell servers, an Oracle server running on Unixware and Internet server.

The most commonly used programs in the school are MS Windows 3.1, MS Windows 3.11 for Workgroups, MS Office (Word, Excel, and Power Point) and MS Works. The students can also use some statistical packages and text processors (QRText, Word Perfect). To access the Internet we use the browsers Netscape, Mosaic and Gopher and the programs Telnet and FTP. Two years ago an Oracle 7.0 database system was donated to the School and is used for internal (local data bases) and teaching purposes.

The courses

The courses are given by the staff of Computer Centre and some guest lecturers, including professionals in computer science and from the staff of ministries and public offices.

Lectures dealing with informatics offered by the NSPA are carried out in two stages corresponding to the two main tasks mentioned earlier and are presented in Fig. 1.

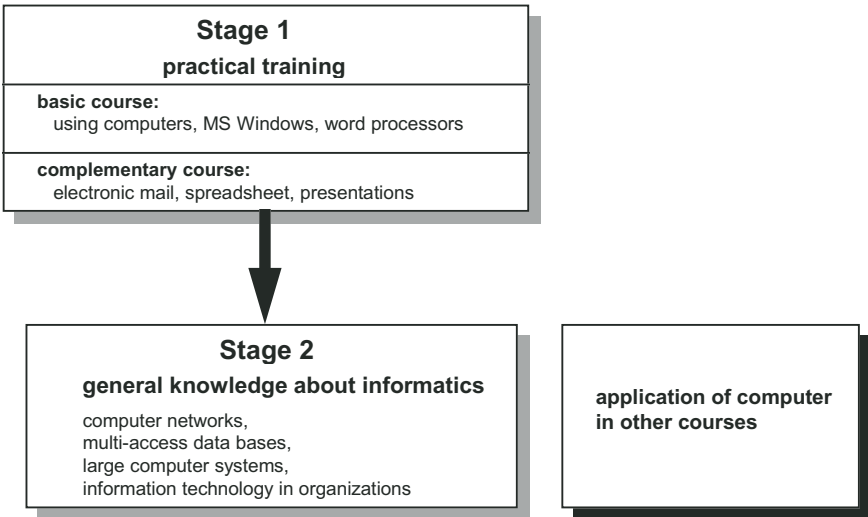


Fig. 1.
ICT courses at the NSPA.

Stage 1: practical training

The first step of the course familiarises students with computers and facilitates the use of basic possibilities offered by the School's computer infrastructure.

We divide the first stage of the training into basic and complementary courses. The basic course is held in the beginning of the September. It is a fast, intensive training programme, to instruct students how to use basic software (the Novell network, MS Windows, word processors, spreadsheet, simple card-files, electronic mail and applications for browsing the Internet). The goal of this training is to impart to all students the basic skills necessary to complete the work required during their studies, mainly creating documents and graphical presentations and performing simple calculations and analysis.

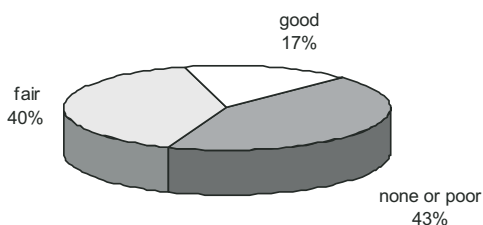


Fig 2.

The level of computer skills of NSPA students admitted in 1996.

The basic course has the character of practical training and is given to small groups of students in the computer laboratory. Because the students differ greatly in their level of computer competence (see Fig. 2) they are divided into groups corresponding to their practical computer skills.

The **basic training** for beginners consists of 16 hours of classes and contains the following topics:

- | | |
|--|----------|
| (1) introduction to using the local computer network | 2 hours |
| (2) using the MS Windows system | 4 hours |
| (3) using the MS Word 6.0 word processor | 10 hours |

For the intermediate groups the basic training contains 8 hours of classes, and for the advanced group only 2 hours (on using the NSPA's local computer network).

The **complementary course** consists of 10 hours of practical training in the computer laboratory. The following topics are covered:

- (1) using electronic mail and browsing Internet resources 2 hours
- (2) using MS Excel 5.0 spreadsheets 4 hours
- (3) advanced topics of MS Word 6.0 2 hours
- (4) the MS Power Point graphics presentation program 2 hours

This course is obligatory for all students with the exception of the advanced group, which is excused from the Excel sessions.

Stage 2: general knowledge about informatics

The second stage of the training is designed to accomplish our second teaching task: to present a broad view of informatics and its applications in public administration. The courses offered in the NSPA are presented in the following table:

subject	teaching methods	# of hours
computer networks (Internet), implications of unrestricted access to information, effective ways of browsing network resources, security and data protection	practical training	4
information on designing and using multi-access relational data bases	theoretical lectures and practical training using Oracle 7.0	4
information technology in large organisations, problems in incorporating computer systems, examples of large computer systems	invited lecturers	4 to 8

The number of presentations by invited lecturers varies depending on the needs, the availability of lecturers and the time available for such courses.

IV. Problems

From the very beginning of the course we were presented with the following problem: the knowledge of the students in the area of informatics, and of their educational backgrounds, are extremely diverse (only about 20% of the students are graduates in economics or technical studies). We therefore must initially divide the students into groups based on the questionnaires they complete. Different groups have courses of different length and scope. We are aware that the computer training is too short, especially for the beginners (26 hours), but we cannot increase the number of hours, because of the limited time allowed for a very extensive curriculum. The problem of initial differences in the students' computer literacy diminishes as they have more exposure to computers during their courses and independent study time.

Much more serious problems appear in the more theoretical, general courses, when the students often have difficulties in understanding many issues. They are sometimes not interested in general knowledge, because they don't see the immediate advantages of it, such as the ability of using a certain computer program. The lectures held during the second stage of the training programme are rather popular, but we provide relatively few of them (up to 16 hours) and only in some cases can they be complemented with presentations of programmes in practical training, due to the limitations of the School.

There is one other way in which students can be imparted with knowledge in the area of informatics, which has not yet been discussed: the use of computer programs and systems in other courses, such as management or statistics. Unfortunately, this method of computer training is not yet widely used in the NSPA, but we hope it will develop in the future.

In addition to the limited number of hours which we can devote to courses dealing with different aspects of informatics, we have several other problems.

The NSPA, as in other similar schools, has limited hardware, software and human resources. We can give the courses in the first stage of our training in a satisfactory way, but the second stage presents us with more difficulties. We are not able to present the latest achievements in the field of management, information processing and information exchange (for instance Lotus Notes or Microsoft Exchange). It would be advantageous, as

well, if we could offer students the possibility of witnessing some systems used in management or decision making “in action.” Unfortunately, this is currently impossible, due to the high cost of such software. Similarly, the problems of information technology in large organisations, and incorporating the computer systems, may only be presented in lectures which present the subject matter on a surface level.

2.11. The Role of Information and Communication Technology in the Education of Public Administrators in Slovakia

*Stanislav Košina **

*Robert Rodgers ***

*Katherine Yuracko ****

A. ABSTRACT

The authors herein present their opinions on the role of information and communication technology in the education of public administrators. A growing number of activities in governmental and non-governmental institutions requires effective information processing before qualified decisions to be made. The latest progress in information and communication technology can help to promote administration in the public sector if used extensively. To achieve extensive use of ICT a new generation of public administrators has to be nurtured.

A comparative study on the education of public administrators at the Academia Istropolitana in Bratislava, and the Martin School of Public Administration at the University of Kentucky, from the point of view of how the latest trends in information and communication technology are incorporated in the schools' curricula, is presented.

Specific features and conditions, at both schools, are discussed and some conclusions and recommendations are offered.

B. THE ACADEMIA ISTROPOLITANA

Overview of the Institution

The Academia Istropolitana (AI) is an institute of advanced studies, in Bratislava, Slovakia. The institution was established in 1990. The structure of the institution was derived from similar institutions in Europe (The

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Vienna Institute of Advanced Studies, the European University Institute, etc.). Until 1995 AI was a budgetary institution under the auspices of the Slovak Ministry of Education. Since 1996, however, it has been a semi-budgetary institution with some contributions from the state budget. The rest of the AI budget comes from in-service training (short time activities) and grants. Since its establishment, AI has been receiving relatively high financial support from abroad. The institution has very close links and contacts with many European and overseas schools. The partner schools also provide AI with visiting professors. In the academic year 1996/97 more than 50% of the students have come from foreign countries, mostly Eastern European countries, but also from Western countries and the United States.

The students admitted for study must be the graduates from home or foreign universities. Currently there are five study programs at AI.

- Public Administration: a 2-year postgraduate multi-disciplinary programme, designed to educate top officials in public administration.
- Professional Programme in Applied Economics: a 2-year postgraduate programme, for training professional economists, financial and system analysts.
- Environmental Planning and Management: a 1-year postgraduate programme for decision makers and policy makers, for governmental and non-governmental sectors.
- The Architecture and Urban Heritage Conservation Programme: 1-year postgraduate programme, for professionals in the field of maintenance, preservation, restoration and reconstruction of architectural monuments.
- European Studies: a 1-year postgraduate programme, with the goal of educating teachers, university assistant professors, journalists, administrators, politicians and young researchers.

The students who successfully complete their studies receive certificates after graduation. Certificates are signed by an international committee and list the courses and lectures completed. Public administration students receive additional certificates of graduation, from the European Institute of Public Administration in Maastricht. The total number of students in all programmes does not exceed 100, and varies between 10 and 20 students per programme, per year.

C. GOALS OF ICT CURRICULA

The goals of the ICT curricula should reflect all the main activities of a public administrator in his office. Depending on the candidates' level and position the activities may include:

- communication
- information processing
- presentation
- management
- planning
- decision making

To provide the administrator with the necessary skills and knowledge for the above presented activities, the ICT curricula should include the following topics:

- basic knowledge of computer hardware
- working with electronic files (create, copy, erase, virus protection, etc.)
- electronic e-mailing (simple message exchange, various attachments - coding)
- electronic search on the Internet - browsers
- word processing, spreadsheets, databases
- special software (statistics, personal management, decision making), which can be optional
- information system architecture - elective

It can be determined by the school whether all those topics can be included in one or more courses, whether within a special course listed in the study programme, as a course on ICT, or whether it can, to any great extent, be integrated within other courses that can build the content on a specific software application.

D. LIMITATIONS, QUESTIONS, PROPOSALS

Depending on the school's specifics many limitations can occur. First of all, there may be equipment limitations - not enough hardware and software, no Internet connection. This limitation can be gradually overcome - it is mostly a question of money. The second type of limitation emerges from the insufficient number of hours that are allocated for the ICT courses. In

this case the whole load can be divided into two levels. Basic knowledge and skills can be provided in an ICT course, and some special topics can be integrated into other classes. The third type of limitation can emerge from students' negative attitude towards computers - psychic stress, fear of technology, etc. In this case some kind of psychological training may be applied.

E. EDUCATION OF PUBLIC ADMINISTRATION STUDENTS IN INFORMATION AND COMMUNICATION TECHNOLOGY, AT THE ACADEMIA ISTROPOLITANA, BRATISLAVA, AND THE UNIVERSITY OF KENTUCKY

Comparative study

Introduction

Government may be the biggest and the oldest industry in the world, but the statement "I am from the government and I'm here to help you" is universally considered to be a bad joke. Increasingly, people don't believe that governments know how to help or even want to care. They find concepts such as "total quality", "customer driven" and "continuous improvement" foreign to everything they know about what government does and how it works. They wish government would be more like a well-run business, but most have stopped hoping it ever will be so.

Today fortunately, a new channel has opened, through which business and progressive practices can have an impact on cost, efficiency and the overall quality of government. This channel is quality movement - the rapidly growing acceptance of the management practices that were first used in Japanese industry after World War II, and now increasingly implemented in US industry, leading to higher profits. The question is whether it is possible to develop a public sector that offers taxpayers and citizens the same quality of services they have come to expect from progressive businesses like Motorola and Westinghouse. There are examples [1] which confirm that the answer to this question may be positive.

Suppose we believe that the public sector can be as efficient as a well-run business. What has to be done to achieve high efficiency in the public sector? Further questions like "Does the public sector employ people who can run their "business" highly efficiently? or "What knowledge and experience do they need to accomplish such a goal?" might be addressed in connection with the first question. These questions are aimed at the

education of public servants. The National Association of Schools of Public Affairs and Administration (NASPAA) has formulated standards for accreditation of Masters' level programmes in public affairs and administration. NASPAA requires that the curriculum common to all programmes should "provide each student with the ability to deal with techniques of analysis, including quantitative, economic and statistical methods". More specifically, NASPAA criteria calls for students to develop competencies "to define and diagnose decision situations, collect relevant data, perform logical analysis, develop alternatives, implement an effective and ethical course of action, and evaluate results." In addition, students should acquire the ability to organise and communicate information through various formats, such as oral presentation, written memoranda and technical reports, and statistical charts, graphs and tables. The NASPAA publication "Curriculum Recommendation for Public Management Education in Computing" [2] has reinforced the emphasis on analytic methods in curricula in graduate programmes in public affairs and administration.

Fast progress in the development of computer hardware and software, as well as accessible prices of the equipment, enables government offices, at all levels, to be equipped with powerful tools for information processing and communication. The question is "How are the civil servants prepared to use all the high-tech information and communication technology?". It is generally understood that overall computer literacy of government employees in Slovakia is relatively low. To illustrate the point of computer literacy, or illiteracy as the case may be, we need only point out that a simple T602 word processor is mostly used in Slovak and Czech government offices.

Furthermore, it appears that this experience is more widespread in other Eastern and Central European Countries. Our experience with a group of 26 participants of the Eastern and Central European Scholarship Programme from Poland, Hungary, the Czech and Slovak republics, who were trained at the James W. Martin School of Public Administration and Public Policy at the University of Kentucky in Lexington, Kentucky (further on MSPA) in 1996, fully confirmed this assumption. Therefore, we think it is not a question whether information and communication technology should be included in study curricula at the schools of public administration, and become a part of the (re-)training of the civil servants who already work in governmental offices. The question is rather to what extent, and at what level, should this be applied

The primary goal of this contribution is to describe ways how postgraduate students of public administration at the School of Public Administration at the Academia Istropolitana, which is an institute of advanced studies in Bratislava, should learn how to use computers for information processing and communication, and compare it with the approach in the US - a graduate study of public administration at the MSPA in Kentucky. Analysing the data from these two schools, which work under very different conditions, we will try to suggest alternative ways to promote the education in information and communication technology at schools of public administration in Eastern and Central Europe.

I. Postgraduate Study of Public Administration at the School of Public Administration, the Academia Istropolitana, Bratislava

Public Administration Programme: A Brief description

Studies are focused on intensive course work in the following areas:

- Law
- Economics
- Public Finance
- International Relations and European Integration
- Political Science
- History of PA
- Management
- Policy Analysis
- Information Technology
- Statistics
- European Negotiations
- Sociology and Psychological Training
- Central and Local Government
- International Relations
- Analytical Technique
- Formulation of Legal Administrative and Financial Documents
- Decision Making
- Language Training (English, German, French).

Students complete two internships. The first is a 2-month internship in Slovakia, and the second internship is arranged abroad. The programme concludes with writing and defending a thesis.

INFORMATION AND COMMUNICATION TECHNOLOGY EDUCATION

The students admitted for study come from various domestic and foreign universities, and have different backgrounds with extremely varying computer skills. It is often the case that some of them are graduates from the faculty of electronics and informatics who are professionals in computers, while the graduates of law or human sciences have virtually no knowledge of computers, whatsoever. As a matter of fact, students need computer skills from the very beginning of their studies. They have to write essays, prepare spreadsheets in economics, and use computer software in statistics. In order to help students, two courses in information and communication technology (ICT) are offered in the first and second trimester.

We can resolve three levels of ICT courses:

LEVEL 1 - introductory ICT courses

The course (with 1.5 credit hours) is listed in the first trimester study programme as “*Information technology I*”, and includes the following:

- basic computer skills - MS DOS
- simple word processors
- a spreadsheets program
- a simple database program.

To achieve a more individual approach the students are divided into three groups - beginners, advanced and “professionals”. A different approach is used for each group. The course concludes with a final project in all three groups.

The second course (also with 1.5 credit hours) is listed in the second semester program as “*Information technology II*”, and includes the following:

- Windows environment (MS Word and Excel)
- communication software (e-mailing)
- Internet browsers.

The course concludes with a final project similar to the previous one.

Both courses are compulsory, and may represent the first basic level of education in information and communication technology. Students can acquire basic knowledge and skills.

LEVEL 2 - ICT integrated into other courses

In some courses, such as “*Statistics*” and “*Economics*”, a knowledge of specialised software is required. For example, the *Statistics* course covers inferential statistics, fundamental principles of measurements - scales, indicators, validity, reliability, decision-making models. Students use a PC version of a special statistical software package (SPSS). In *Economics* a good knowledge of EXCEL is required. In the second level courses, a knowledge of information technology and computer skills is integrated into a part of the course. Such courses may significantly contribute to the education of information technology. However, such courses require highly professional instructors, who besides being good specialists in the study field, must also be particularly good with computers. The latter requirement is not always fulfilled.

LEVEL 3 - special ICT courses

At the third level, specialist knowledge in information technology can be offered. It can be information management, information system architecture, etc. Such knowledge may very useful for some public administrators or public managers. It can be provided as an elective course. However, there is no such course at the Academia Istropolitana.

COMPUTER NETWORKS AT THE ACADEMIA ISTROPOLITANA

The institute has two NOVELL networks. One network is located in the students microlab and has 10 computers. The other network serves for AI employees and accounts for about 40 computers. Both computer networks are interconnected. Networks are connected through a PC router and an IBM radio line to the nearest computer node at the Faculty of Electronics and Informatics. The transfer rate of the router is 19.2 kbit/s. Students and employees can use the software installed on network servers. A LINUX server serves as an e-mail server and a WEB server. Employees can communicate among themselves via internal e-mail, and with international subscribers through the external e-mail. The same software (PEGASUS - for Windows) is used for both e-mails.

The AI Library

The AI library is equipped with the automated information system, *PARIS*. The system allows acquisition, catalogues, searching and loans for the whole collection of books, periodicals and abstracts. *On-line Public Access Catalogue (OPAC)*, as a part of the database system CDS/ISIS, is used for searching the library database. OPAC software is installed on the network so the database can be accessed from all computers in the network.

Three *CD ROM* databases are currently available

- EconLIT - the database for economics books, periodicals and abstracts
- JURIX CD - an electronic database for all published laws valid on the territory of Slovakia.

In addition to CD ROM multimedia the library is also equipped with two *CD interactive* players. This computer based multimedia presentation platform is ideally suited for self-paced study. The collection of CD interactive disks contains:

- language interactive courses (English, German, French)
- an Interactive Encyclopaedia
- various courses on career building, decision making , report writing, communication skills, etc.

Shortly after registration students are instructed on how to use all the information media in the library, and on how to use the network as well.

Internships

Top national institutions including various ministries, the Slovak National Council, the President's Office, etc. are mostly chosen as institutions where students are placed during their home internships. These institutions are very well equipped with computers and create good opportunities for students to learn new skills.

Conclusions

- Initial computer skills of AI students depend very much on their previous field of study, and as a rule they vary from the beginner's level to professional level.

- Two courses on information technology are mandatory parts of the programme. They represent the first basic level of education in information technology.
- At the second level - information technology knowledge is integrated into other courses. There are several courses represented, including *Statistics* and *Economics*.
- There is no elective, more specialised computer course offered at AI.

II. Graduate Study of Public Administration at the Martin School of Public Policy and Administration, University of Kentucky, Lexington

INTRODUCTION

As already pointed in the introduction, it is difficult to compare education in information technology at the two reviewed schools as they work under very different conditions. Firstly, the Martin School of Public Administration (MSPA) is a part of a large US state university - the University of Kentucky. Secondly, the study programme at the MSPA is a graduate study. Thirdly, the US education system is very different when compared to the Slovak education system. In addition to these major differences, other social and economic factors influence the entire field education in both countries.

Basic computer skills and a certain knowledge of word processing programs and spreadsheets, is taken for granted in the case of US graduates.

It is expected that students acquire computer skills, either during their undergraduate studies, or during college years. As a matter of fact, the majority of students are able to use computers, and many of them have their own PCs that are connected through modems to the Internet. These students can access the university network from their homes.

Shortly after college registration all graduate students obtain their own e-mail accounts as well as their user IDs for the university computer network. Good conditions are provided for those students who need help in computer skills. Usually during the first semester the university computing centre, and the main library, organise several instructional meetings. Students can acquire basic information on various topics concerning the use of hardware and software.

There are 13 microcomputer laboratories for students at the university. The labs are located in various buildings within the campus. All computers in the labs are connected to the network and the labs are open 16 or more

hours a day. For the home user, students can download free the most important software from the network, or obtain it from the library if they bring their own diskettes. It is in the student's interest to find the best place where he or she can use a computer, as well as to learn the basic skills.

Information and Communication Technology Courses

LEVEL 1 - introductory ICT courses

At the beginning we want to emphasise that there is no introductory course in information and communication technology as a part of the curricula for graduate students of public administration at the MSPA. As already mentioned above, basic skills and knowledge of certain software applications, such as MS WORD or WORDPERFECT and EXCEL is taken for granted.

LEVEL 2 - ICT integrated into other courses

There are several courses that require knowledge of special software at MSPA. During the first and second year the MSPA graduates have to take the following three courses:

- *Quantitative Analysis 1: Research Methods (3 credit hours)*

The course focuses on understanding and using descriptive and inferential statistics. Some aspects of the philosophy of science, notably questions of the nature of "proof" and evidence in science, are discussed in the course. Criticism of existing research and the proposing of improvements in research is stressed in the approach. The course requires a lot of individual work (homework, assignments and research projects) as well as team work whilst carrying out research. The course requires a knowledge of statistical program packages - SAS and SPSS, both in the UNIX environment, as well as on PC machines.

- *Decision Analysis (3 credit hours)*

The course surveys some basic statistical techniques relevant to decision analysis - such as regression analysis, time series analysis, forecasting models, qualitative choice model, stochastic decision theory and linear programming. Students are required to read newspapers and professional journals during the semester and computer assignments are given during the class. Two research papers are required. Similarly, as in the case of the *Quantitative Analysis* course, this course requires the use of statistical

program packages - SAS and SPSS, both in the UNIX environment, as well as on PC machines.

· *Public Programme Evaluation (3 credit hours)*

The course provides students with an overview of key conceptual and methodological issues involved with the evaluation of public programmes. Strong emphasis is put on the topic of measurement in programme evaluation. Students have the opportunity to develop their own survey instrument, generate their own data, and practice using relevant statistical data. A group evaluation research activity is required during the course. There are many assignments that require a lot of reading, also designing a questionnaire and two research projects are also required. Students have to use both SPSS and SAS statistical packages on PCs and mainframes.

In addition to the use of the above mentioned special statistical software, for statistical evaluation of various data, all three courses require a great deal of individual search activities, both from WWW sources and from university library sources, to obtain data for analysis. Students must also be able to use word processors and spreadsheets to write up their projects. It is increasingly the case that students use special presentation software (like MS Powerpoint) for their final project presentation.

LEVEL 3 - special courses

As a special ICT course *Public Management Computer Applications* is listed in the U.K. catalogue, although the course was not offered in the Academic Year 1995/96. The course includes special computer software packages, design and implementation of large scale information systems, the concept of databases and public sector computer issues.

The University Computer Network

The majority of computers within the campus are connected to the network. The most important mainframes - IBM 9672 and the Convex MetaSystem - provide the computers, connected to the network, with a lot of power, enabling those computers to access all the software installed in the network. Only the Convex MetaSystem has 80 Gbytes DASD memory and 10 Tbytes of near-in line storage. Every student can choose his or her most favourite platform - Windows, Macintosh or UNIX in each microcomputer lab.

In addition to the standard software for word processing, worksheets and databases, there is also very powerful statistical and mathematical

software, graphical and communication (e-mailing, access to the library sources) software available. All Internet communication programs - Netscape browsers , TELNET, FTP are available on all microcomputer lab machines. In each microcomputer lab there is at least one machine equipped with a scanner.

The students at MSPA can, in addition to the 13 microlabs that are managed by the main library, also use one special microcomputer lab that is located in the school rooms, and is equipped with the special statistical software SAS and SPSS, installed as a PC version on stand-alone machines.

University Library Information System

The University of Kentucky library system includes Margaret M.I. King Main Library and 14 branches, 13 microlabs and 2 information centres. There are over 2.5 million print volumes, 5 million microforms, 1000 computer files, 1.1 million governmental publications, 1 million technical reports, 200 000 maps, 600 00 audiovisuals and 26 000 periodical subscriptions. The libraries use a computerised catalogue that is accessible from all microlabs, as well as from external sites by modems. Books and governmental publications are accessible by the NOTIS on-line catalogue. On-line catalogue terminals provide access to numerous CD ROM and on-line databases (ERIC, BUSI, INNI, TRAC, MedLINE, PsychLIT, MLA, ABI Inform, EconLIT, MathSci, NTIS, NTDB, 1990 Census, etc.)

To help students become familiar with the library information system the main library organises several instructions early in the semester.

Internships

An internship, approximately 6 weeks after each semester of study, is a part of the curricula. Internships are arranged by the university in various governmental or non-governmental institutions. When students begins their internship a workplace, equipped with a computer, is allocated to them. The most used software includes word processors (currently MS WORD or WordPerfect for Windows), spreadsheet programs (MS EXCEL or LOTUS) and database programs (MS Access, DBase IV, Paradox, etc.). Communication software, particularly electronic mail programs, are used daily as well. Many institutions have their own home pages on WWW and students may be involved in work on Internet publishing.

Conclusions

- There is no introductory course in ICT in the MSPA graduate study program. It is of the utmost importance for students to learn computer skills for themselves.
- There are several courses that require intensive use of computers and special software (statistics).
- Students are required to do a lot of research, where they need to search for information using local library electronic catalogues, and distant information sources on Internet.
- The use of computers and basic office software is also required during internships.

F. FINAL CONCLUSIONS AND RECOMMENDATIONS

- Despite the fact that AI is relatively well equipped with computer hardware and software, as well as other ICT platforms that are used for learning and the dissemination of information, AI students are not challenged to acquire the latest information technology, to the same extent as their peers in the US. This can be explained by the overall higher social and economic situation in the US, compared to Slovakia. While this situation persists it is appropriate to offer introductory ICT courses at AI.
- In addition to such courses as *Economics, and Statistics* it can be recommended to integrate ICT issues into further courses where information and communication technology stimulates progress (decision making, financial management, personal management, public programme evaluation, etc.), and to think of a specialised elective course on public management information systems.
- It seems reasonable to exchange knowledge and experience among the various schools of public administration in Central and Eastern Europe, and not only in the field of information technology. The latest progress in information and communication technology allows the opportunity to establish electronic links among partners. New, cheaper and more flexible educational methods could be used. Internet communication is fast and cheap, and the published information, inclusive learning materials, can be easily updated. Some US schools of public administration should also be invited to co-operate.

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2.12. Teaching Information and Communication Technology at the School of Public Administration in Slovenia, in Response to Technology Changes

*Anamarija Leben **

Abstract

This article describes the present situation in teaching ICT at the University of Ljubljana, and especially at the School of Public Administration in Slovenia. Some general information of both institutions is given. Results from a survey about teaching ICT at University of Ljubljana are presented. These results are further interpreted within the syllabi of ICT courses at the School of Public Administration. In addition the article deals with some problems connected with teaching ICT subjects. Finally, some directions on how to include the use of ICT within other subjects are given.

1. UNIVERSITY OF LJUBLJANA AND SCHOOL OF PUBLIC ADMINISTRATION

1.1 The University of Ljubljana

The School of Public Administration is an integral part of the University of Ljubljana, which was founded in the year 1919. In its first year, the University comprised five faculties with a total of 57 professors. Today the University numbers some 30 faculties with approximately 1800 professors.

A great number of eminent scientific institutes, founded by the University of Ljubljana, are engaged in scientific research. The University has an established Research and Development Centre and University Computer Centre.

The main University library is the National and University Library, which has a tradition spanning 200 years. It is ranked among the 300 largest libraries in the world, with a stock of over one million volumes, and also shelters an important part of Slovene cultural heritage.

1.2 The School of Public Administration

The School of Public Administration in Ljubljana was founded in 1957. According to its original programme it was intended to train senior civil

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servants. The institution was conceived and organised in a pointedly classic way.

In a view of new challenges and possibilities, the institution slowly started to open up to new ideas and concepts. Already in the early 1970's many non-legal subjects (political economic, statistics, etc.) were introduced. Even more important changes occurred in the early 1980's, when various novelties in the fields of informatics and computers were introduced.

The School of Public Administration in Ljubljana also gradually introduced appropriate subjects from the above-mentioned fields, such as informatics, computer techniques and administrative routines. To meet the needs of increasing changes the two-year educational programme in the academic year 1990/91 was substantially altered.

A year later, great changes occurred in the political and economic structure in our country. Slovenia achieved its independence and international recognition between 1991/1992, after the disintegration of the former Yugoslavia. Soon it became obvious, that major reforms in the public administration sector were inevitable as a response to the transition from a socialist system and economy to an effective market economy and political democracy. But there was probably an equally important reason for reform, given the fact that Slovenia was transformed from one of the federal republics of the former Yugoslavia into an independent statehood overnight. Consequently, some sectors of administration had to be built from scratch, while the majority of existing agencies and authorities on the state and local level had to be restructured and modernised.

In these circumstances a modern and efficient educational and training system of civil servants, public administrators and managers, at all levels and sectors of public administration, was of central importance if the extensive reforms in these sectors were to be successful. In the autumn of 1992 the Slovenian Ministry of Justice and Public Administration and the School of Public Administration founded a special project dedicated to the renewal of the existing educational and training systems in the field of public administration.

The most important question was how to organise appropriate studies at all levels of higher and continuing education to guarantee a steady inflow of capable civil servants and administrators into all segments of public administration. From the survey mentioned above, it has been

concluded that three complementary segments of educational system had to be developed in Slovenia and these were as follows:

1. New curriculum for the study of public administration at undergraduate level (to replace the existing system) leading to the first academic degree in public administration;
2. Curriculum for the study of public administration at postgraduate level;
3. A coherent system of follow-up courses to form the backbone of a system for continuing education of public servants and senior top-level administrators.

At present, the curriculum of public administration, as a specific study at the undergraduate level in Slovenia, exists only at the University of Ljubljana's School of Public Administration. As far as in-service training is concerned, there are few short courses available to provide some kind of relevant follow-up knowledge to public servants.

1.3 Three-year academic programme

As a result of the research a new three-year academic programme in public administration was developed and launched in 1995/96, with the first year for full-time students in Ljubljana, and the third year for part-time students in educational centres throughout Slovenia.

The programme is now more practically based, whereby graduates on the programme receive appropriate legal, administrative-managerial, economic and general humanistic knowledge, to be able to carry out various tasks and jobs in public administration. Since we are aware of the important role of the information and communication technology in everyday work, graduates are provided with substantial insights into the topics of computers, informatics and communications, enabling them to get employment in numerous different areas, specifically in the public service, public utility and private sectors.

The programme is markedly multidisciplinary, covering different aspects from various areas (legal, economic, technological, etc.) which enables graduates to collaborate with other professional groups.

In the first two years all courses are obligatory. In the third year there are five core subjects and three elective modules with four courses each. One of these modules is the Organisational-informative Module. Within obligatory and core subjects, courses dealing with information and communication technology, comprise approximately 20% participation.

2. PRESENT SITUATION OF TEACHING ICT AT THE UNIVERSITY

In the beginning of 1996 the Chair of Organisational Sciences and Informatics, at the School of Public Administration, made a survey about teaching ICT at both Slovenian universities.

The results of the study can be summarised in the following points:

1. There are two types of academic programmes regarding teaching ICT:
 - The study of informatics and computer science - these programmes are specific and were of no particular interest for the purposes of the survey;
 - Other study programmes, which generally speaking also include elementary informatics and computer science, stresses the role and use of ICT in their respective areas.
2. 90% of the faculties have a specific course "Informatics" in the first year of the study programme, whilst others offer some aspect of using ICT included in other courses.
3. The themes can be divided into three categories, as Figure 1 shows:
 - *Software systems*: operating systems, word processors, spreadsheets, basic graphic programs, programming languages, database systems, expert systems, specialised applications;
 - *The use of communication technology*: basic local area networks, groupware and workflow, e-mail, basic wide area networks, electronic data interchange, public domain databases;
 - *Information technology*: IT basics, planning and developing information systems, CASE tools, planning the information resources.
4. Almost all faculties have at least one computer laboratory with 15 to 20 personal computers, which are connected to a local area network; each laboratory has access to INTERNET and is freely open to students if not occupied by classes.

3. TEACHING ICT AT THE SCHOOL OF PUBLIC ADMINISTRATION

The main goals we plan to achieve with our students, in the field of information and communication technology, are:

- Ability to use ICT as an everyday tool for solving different administrative and substantive tasks;
- Understanding a new information environment and ICT potential;

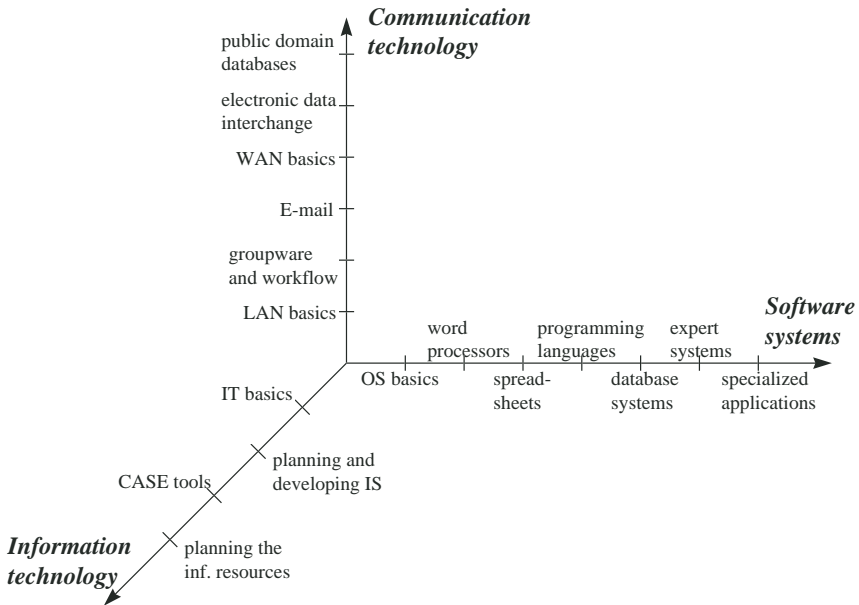


Figure 1.
The main categories of teaching ICT

- Understanding new organisation behaviour to meet the needs of new ICT challenges.

In comparison with the general situation at the university (as Chapter 2 shows), we have divided themes in our subjects into three main categories:

1. *Computer skills* covering basic software knowledge needed for successful work with computers: basic operating systems, word processors, spreadsheets, database systems, electronic document and image processing, document management systems, specialised applications etc.;
2. *ICT as a tool for communication* within an organisation, with other PA organisations and the outside world. Themes cover basic local area networks, groupware, e-mail, exploring INTERNET, electronic data interchange, public domain databases, etc.;

3. *Information systems and resources* to include rules and knowledge dealing with the organisational problems through the information point of view: planning and developing information systems, CASE tools, planning and managing information resources, etc.

In the first year students receive some basic knowledge in the field of informatics and computers and in using ICT. In the second and third year this knowledge is upgraded respectively to the each course and in the context of PA. For a better insight into what we are teaching a summary of ICT courses is given.

3.1 Informatics

obligatory, 1st year, 90 hours

Aims and objectives

The aim of this course is to present the characteristics of informatics as a scientific discipline, a field wherein the basis lies in the practical use of information technology, and where the role in the infrastructure of administrative systems is gradually increasing. The main aspect of the subject illuminates the role, the fundamentals and formation of information systems in contemporary administrative organisations. The starting point is the system theory. Basic methodological approaches, as well as methods and techniques of analysis and design of information systems, are shown. Attention is paid also to the presentation of basic characteristics of modern information technology, as a technological base for the development of informatics.

Syllabus

1. Introduction to the discipline
2. Basis of general system theory
3. Basics of information systems
4. Information and communication technology
5. Main hardware elements and concepts
6. Data telecommunication and teleprocessing systems
7. Software systems
8. Office automation concepts and systems
9. Information systems development methods

10. Examples of some typical information systems in public administration

3.2 Computer Workshop

obligatory, 1st year, 120 hours

Aims and objectives

This workshop was designed in order to train students for active and efficient use of modern information equipment, on the operational level, as well as solving advanced analytical and other professional problems in administration. Students should be able to use ICT during their study, and later as an efficient every-day tool in their work. The course is based on practical work with computers.

Syllabus

1. Basic operation system (DOS, Windows)
2. Text editors (MS Word for Windows)
3. Spreadsheets (Excel)
4. Graphic applications (basis)
5. Mixing application through clipboard
6. Basic local area network (Novell NetWare)
7. E-mail
8. Exploring INTERNET (FTP, WWW, TELNET)

3.3 Use of ICT in Public Administration

obligatory, 2nd year, 90 hours

Aims and objectives

The main objective of this subject is to give students an insight into the use of information technology in the public sector, with special emphasis on the practical side of its application by users. Relevant information systems in Slovenian government and public administration, and also in some international organisations, especially in European Commission and European Parliament, are presented. An important part of the subject is devoted to data security and protection and respective legal solutions in Slovenian government and public administration (protection of personal data).

Syllabus

1. The role of information and communication technologies in planning, building, and using information resources (global telecommunication networks, databases, hypertext, archiving of documents, electronic mail and electronic data interchange, information resources in decision support systems);
2. Information infrastructure (definition of basic terminology, description of national - Slovenian information infrastructure, international information infrastructure, standardisation);
3. Planning and building of information systems (relational and document databases in government and public administration, interlocking of information resources, data protection, standards);
4. Description of relevant information systems in Slovenia (Legal information system, governmental databases, statistical information system, geographical information system, relevant information resources of some ministries and government agencies, relevant information resources in the business sector);
5. Description of relevant information systems in international organisations (databases of the European Commission and European Parliament, United Nations, and OECD);
6. Data protection in information systems (technological aspects, legal aspects, protection of personal data, situation in Slovenian government and public administration).

3.4 Information Systems

obligatory, 3rd year, 90 hours

Aims and objectives

Information systems are increasingly playing a more strategic role in the development and management of modern organisations. In order to be able to use the full potential of modern information and communication technology, the development of information systems should be regarded as a permanent activity aiming towards increased efficiency, productivity and quality of services in public organisations. Students, as future managers, have to understand the role of information systems in contemporary organisations as well as basic methods and techniques of their planning and development.

Syllabus

1. The role of IS in modern organisations
2. Approaches to the development of IS
3. Modelling of information systems
4. Implementation and maintenance of IS

3.5 Management and Application of Information Resources

elective (within Organisational-informative Module), 3rd year, 60 hours

Aims and objectives

The objective of this course is to give an insight into the basic principles related to the creation and management of databases, which serve as a principal source of information in administrative systems. Emphasis is given to the content and use of databases. Some consideration is given to some of the more important sources of data used in Slovenia and abroad, in the field of public administration. Particular attention is given to hands-on computer practice conducted during the practical element.

4. Analysis of our experience so far

Some of the most important problems that we are dealing with are described in this chapter. We also want to provide some answers on how to solve them.

4.1 Heterogeneity of the students in the first year

In October 1995 a survey was conducted among full-time students in the first year at the School of Public Administration. We wanted to determine what kind of prior knowledge they possessed about ICT, or what practical computer experience they may have had before they entered the school. Table 1 summarises some most interesting results.

University students are expected to have acquired a certain level of knowledge about computers after finishing secondary school. As the results of the survey show, approximately 7% of students did not have any knowledge or any practical experience with computers following secondary school, and that approximately 13% of students had only some theoretical knowledge. Hence, they had to start from the beginning, with the very basics. Some students, on the other hand, were already very familiar with computers. This heterogeneity represents a great problem in teaching terms, because it is very hard to define an optimal syllabus.

1. Have you ever worked with computers? On what system?	
answer	percent
NO	6,7
YES	93,3
PC, LAN	87,2
HOST	0,00
other	6,1

2. Do you have a computer? Where?	
answer	percent
NO	64,4
YES	35,6
at home	23,9
at other place	11,7

3. Did you have computer classes at secondary school? About what?	
answer	percent
NO	6,1
YES	93,9
operating systems	62,2
word processors	44,4
spreadsheets	20,6
programming languages	13,3
theory	12,8

4. What software systems do you know (did you ever work with)?	
software	percent
operating systems	84,4
word processors	79,4
spreadsheets	38,9
programming languages	13,9

Table 1.
Results of survey conducted among first-year students

How could the above-mentioned problem be solved?

One possible answer is to organise an introductory workshop of 10-15 hours, where students would be able to receive some basic computer skills. This workshop should not be obligatory and should be held before regular classes start.

The other answer lies in the project called "computer literacy". This project is now running at primary and secondary schools in Slovenia and was launched by the Ministry of Education and Sport. Its main objective is to provide satisfactory conditions for the appropriate educational process in the field of informatics and computers, at all primary and secondary schools. As a result of this, a more homogeneous population, with a higher level of knowledge from secondary schools, could be expected.

4.2 *Hardware and software equipment*

All ICT subjects include a lot of practical work and presentations. Thus, extremely versatile equipment is needed. We have managed to establish two computer laboratories, each equipped with 16 personal computers (with Pentium or 486 processors) connected to a local area network. Each classroom has one scanner. Both local networks have access to a central HOST system at the University Computer Centre and to the INTERNET.

Workshops and presentations are designed for groups of 20 to 25 students, which means 1-2 students per computer. This is not the ideal proportion (one student on one computer), but compared to some other schools and faculties within our university, our working conditions are quite satisfactory.

Providing the appropriate software represents a greater problem. Buying licensed software, or even a license for using it, for each computer is still very expensive. Vendors are not very willing to give products at a reduced price or even free for educational purpose. Institutes within the universities should agree on standard software (operating systems, office automation packages, etc.), interest value for the majority of users and then try to buy the software together. Such an approach would make standard software cheaper and more accessible to schools and faculties.

The situation with specialised applications is different. We try to demonstrate to students some applications and software systems used in PA services and institutes. These organisations are interested in getting employees who already know something about computer applications. That's why we usually get these programs and applications for free.

4.3 *ICT in teaching process*

In conclusion I would like to stress one aspect of using ICT at schools and faculties, which is, according to my opinion, very important. That is, using ICT as a tool within the overall teaching process. Unfortunately it is ill-developed in our school and in our country. There are some attempts in this field in Slovenia, but they are still in the experimental phase.

Using computers at lessons within non-ICT courses would show our students how ICT could be used in other fields and it would make classes more interesting. This could be introduced in two stages:

1. *Using standard applications*, e.g. word processors for seminar work on paper, spreadsheets in statistics and economic skills, programs for presentations, etc. This would not require any further investment in

hardware and software equipment. However, there is one problem related to this: we should first educate our colleagues towards this way.

Nevertheless, we have already practised some of this. A seminar paper in statistics is obligatory for students in the first year. During the statistics course they receive instructions about what they should do, and during the computer workshops we show them how that can be done. Within this course they have four weeks to complete their seminar papers, which have to be done on computer with the use of the word processor and spreadsheet programs.

2. *Specific educational applications*, that lead students through the respective subject and where multimedia is used. This is a more advanced way of using ICT in a teaching process and it requires investment, especially in software. Programming tools for developing such applications are already available and they can be used even by users who are not specialists in informatics. We have no experience of this kind at our school, but some applications have already been developed in Slovenia in the field of physics and biology.

Tele-learning is another way of using ICT in teaching. It requires the appropriate equipment in school and at the user's work place (at home or at work) and, of course, the appropriate infrastructure. But what is more important is a mental break-through in our heads, which is the most hardest to achieve. Some experiments, which are now going on in Slovenia, show that tele-learning is most interesting among part-time students. In my opinion there will be some time again before tele-learning will become a reality.

5. Conclusions

We are all aware of enormous changes that are taking place in the field of ICT in the last few years. There is no doubt, they will continue in following years. There are two questions related to this problem:

1. How to provide up-to-date technology. It is very expensive and its prices drop to acceptable levels only when the technology is almost out-of-date.
2. It can easily happen that some products will be out-of-date in three-four years, when students complete their studies. Why bore them with that anyway?

What we are trying to achieve with our students is that they should not be afraid to use information and communication technology. We do not want our students to be specialists in the field of informatics and computers, but they should be able to communicate with ICT-specialists. Using ICT will become their every-day life at home and at work. Hence, we show our students some basic principles and inform them how to use the present technology, as well as about new technologies and changes connected to them. For that reason perhaps we do not need the very latest technology.

2.13. Approach to Teaching Information Systems Development Methodologies at the School of Public Administration

*Bojan Pecek **

Abstract

This article describes goals and methods used for a subject entitled "Information Systems Development". This subject is part of an undergraduate curriculum at the School of Public Administration, University of Ljubljana. The main goal is to demonstrate to students of public administration the process of the development of information systems. Every student works on an individual basis, using the basic techniques and methods of information system development. We have to take into account that our students are not entirely versed in the use of information and communication technologies. ICT is only a tool for more efficient work. The first results we achieved are very optimistic.

1. Introduction

The important role of information and communication technology (ICT) has become recognised in Slovenian Public Administration. A lots of finance has been invested into ICT equipment in the last five years, so that there is now approximately one PC for every three employed servants. Furthermore, changes in ICT nearly always involve changes in the sphere of the organisation.

In public administration in Slovenia, at present, several projects dealing with information and communication technologies are taking place. They all tend to modernise the whole government structures from the lowest level of local self-government to the top level of ministries and the government itself. The reorganisation is taking place at three different levels:

1. Development of common computer applications, as an e-mail communication between all the public administration participants, tax accountancy, documentation management system, etc. The most remarkable results are expected in the reduction of cost, unique standards and electronic communication between all participants of the government.

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2. Involving the group-work and work-flow technology in the everyday work of public servants and officials. The project aims to re-organise the work methodologies and administrative procedures, the co-ordination between several officials, etc. The basic idea is to determine and rationalise procedures, such as issuing passports, driving licences, building permits, etc.
3. The use of ICT to support working procedures for individual workplaces. The new communication technology is replacing traditional working habits which were mainly paper oriented. This demands new knowledge which we do not possess within our traditional work culture.

The School of Public Administration in Ljubljana is involved in all activities of the reorganisation. We are providing the main initiative in the project of re-engineering PA, and the development of a computer application for the documentation management system, for practically all government agencies and organisations.

In giving special attention to the last level - the training of students for the individual innovative work with computers, this is one of the most important goals included in the curricula of our school.

2. Starting Points And Environment

A subject titled "Analysis and Design of the Information Systems" is included in the third year of the undergraduate curriculum of our school. In the first two years students gain elementary knowledge about work with personal computers and ICT within the PA context. They are able to use the basic tools like word processing, spreadsheets, databases, e-mail, Internet, and to combine various applications through the Windows operating environment. Hence the named topic has three major aims:

1. Developing students' ability to communicate with an ICT specialist. Through practical work they become familiar with the most important "knowledge and skills" needed for system development. Consequently, they realise which data about their work is the most important for an ICT specialist, and they become able to take an active role in the process of developing the information system.
2. Developing organisational skills and techniques. This is expected to be achieved through practical work on system analysis, and functional decomposition of the system. Students become able to describe the system functionality in a new way.

3. To train students to prepare the necessary starting points for system development. It is known that system analysis and design are the most important and problematic areas of any information system. The new modern application generators are now so simple and user-friendly that they are very easy to use. The major part of a problem represents the organisation and design of the system.

To realise the stated aims we were aware of many disadvantages we have to share. Our students are not specialists in ICT. It is only a part of their curriculum. Subjects dealing with law, sociology, economy, etc., are for many students much more attractive. Current software has resulted in more user-friendly solutions. Techniques about system design and specifications have been known since the late '70's and now they are well developed and simplified. This makes our job easier and more simplified. In conclusion we can say that it can now be used by non ICT specialists.

3. Presentation of Approach

3.1 Methodology

The major aim of the subject is the introduction and presentation of the basic methods of the analysis and design of the information system, and determination of the information needs. When dealing with the information system development we are trying to focus on the initial concept and logical phases of the development. Namely, we suppose that our students will understand and play an active part in the activities related to these phases when they work with the PA agencies. Meanwhile, we expect that the later phases of the development, for example, the realisation of the system, will be done with the ICT specialists.

Students have to work on and use practical examples. They have to develop an example system using presented methods and techniques. Students are requested to produce the design of the selected information system and present it on a paper of approximately 12 pages. The main aspects of the paper are:

- *Description of the system.* Students must describe and write down major goals and aims of their system and present the main problems they have discovered during their work.
- *Drawing the organisational scheme of the system.* This is the easiest part of the whole task. Every environment has its own scheme. Our experience shows that this schema has the main influence on the

students minds. It is obvious that students perceive the system only through this structure. It is somehow logical because prior to our course they have never been presented with any other view on the system.

- *Functional decomposition of the system they are dealing with.* For the presentation students draw a data flow diagram and a structured chart. This is very good training for developing organisational skills and techniques. Students must decompose their system into processes. For each process they define the input data flow needed to begin and complete the task, and the output flows as a result of the transformation process.
- *Describing the information demands.* When the system is described and drawn on the data flow diagram, information demands are easy to define. It is clear which data are needed to complete a task and for which processes applications are needed to be developed.
- *Entity-relationship diagram.* This diagram needs to present a data model covering all the information demands previously described. On average students develop 5 to 10 entity types.
- *Entity type description table.* This table presents the first part of the data dictionary. In this part only a list of attributes for each entity type is listed. Students need to determine primary and secondary keys. Special focus is given on the foreign keys.
- *Attribute definition.* This is the second part of the data dictionary which defines attributes listed in an entity description table. For each attribute the name, type of the attribute (numeric, character, date, money, etc.), length, domain and null occurrence are defined. The completed data dictionary covers all data needed to create a database system.

Somehow we can say that the main point of the overall work is to present the three different views on the system:

- Organisation schema is the most known, and mostly the only method known to the students. It is the most frequent reason for mistakes and a misunderstanding of the whole task for the students. They draw organisations, departments, sectors and other concepts into the entity-relationship model and data flow diagram.
- Data flow and information connecting work processes. This view of the organisation helps to develop the organisational skills of our students. They effectively and practically train the functional decomposition of

the system. It is somehow an application knowledge of the system organisation. With this aspect of the work students often recognise that their previous knowledge about organisation was only through an organisational scheme. When they try to draw down the data flow diagram they often discover that the information flows in their organisation are not formally defined anywhere. The reason is very simple: no one has ever thought about the processes. It has always been the hierarchical scheme which organisers construct at the definition stage or the reorganisation of the system. Information sharing and exchange is in most cases left to individual workers.

- Data model schema is the most difficult part of the system. Even students familiar with the database and application generator tools do not have the courage to start the development of the application.

One of the most pleasant surprises was the students' adaptability to the CASE software, with which they became immediately familiar. They were able to draw data flow diagrams, entity-relationship diagrams and organisation structured diagrams. Once the student finishes his/her work the database can be immediately created. It can be realised through exporting the database schema from the data dictionary and then importing it into the application generator.

After creating the database schema in an application generator, the next stage is to create queries and data entry forms. Query constructions, form designing and other necessary tasks are the topics of the other subjects in our curriculum. Anyway, the major problem represents the organisation and design of the data structures. As we have already mentioned before - more complex systems realise ICT specialists.

3.2 Experiences so far

It needs to be stressed again that our students are not computer specialists. They do not have any special attitude to working with computers. Therefore, they make many mistakes that are not common to ICT professionals.

- *Organisation scheme mixture.* The most common problem is the perception of the system only through the organisation scheme. The consequence is that students mistakenly mix the organisational scheme with the data flow, and especially the entity-relationship model. The frequency of this error is about 20% of the first draft of their paper.

- *Information demands do not match the described system.* In nearly all previously described cases information demands do not match the described system and the drawn data flow diagram. It is obvious that the students working on their paper are developing an imaginary system or they undertake the paper simply as part of the whole curricula without any serious purpose to building a live system. Full time students make this error much more often because they are not familiar with a real live situation.
- *Misuse of the verb with the noun.* On the data flow diagram a 'classical' system fault is the confusion of the verb with the noun. Connections between the processes or between the process and the external entity are described as some kind of activity. For example a data flow between a citizen and an authority is labelled as 'Fulfilling the Form'. The receiving process is then described as an 'Administrative Department'. Even though we stressed this mistake and explain it in the lectures, more than 10% of the papers were refused due to this kind of mistake.
- *Unclear titled processes.* On the data flow diagram some processes are confusedly declared. It is not clear what kinds of activities some processes present i.e. 'Activities of the Organisation Committee'. It is obvious that students have a problem with the organisation chart mixture.
- *Oversimplified relationship.* On the data flow diagram students very often trace only one single occurrence of the action. For this reason they create the relationship between two entity types only in the relationship one against one. For instance a citizen reports one tax and the servant receives only one report from this citizen. The right way of thinking is that the next year the citizen will report another report while the servant will receive many reports from other citizens. So the relationship type should be many against many. Over 15% of the mistakes are caused by this fault. We call it 'classical students misunderstanding that they build a system for about 2 million citizens for at least ten years'.
- *Multiplication and thus redundancy of the attributes.* Certain attributes occur in many entities. For example name and surname is a part of many entities instead of only one - the consumer or customer, etc. Obvious joining of two tables and mapping the attributes is more or less still taboo for the majority of candidates.

3.3 Student Response

When students start their paper they find this subject as one of the most difficult in the curriculum. It is far from anything they have worked on before. Questionnaires show that at the beginning they have no idea how to start the work. The majority of them change their mind when they finish the task. Usually when they comprehend the idea and become a little familiar with the methods they use, they want to solve all the problems they find at their work. We often suggest to them to shorten the paper and focus only on one smaller part of the system rather than dealing with the whole system that would be beyond their knowledge. In such cases their becomes unclear and students make too many mistakes.

One of the most serious doubts we had before beginning with our syllabuses was the fear of the heterogeneity of the applications produced for similar jobs at the different locations. To our surprise we have established that the officials, working on similar jobs around the country, produce nearly identical data models. This is especially true for the systems, that are later realised with the application generators.

In conclusion, we would like to stress that the systems developed by our students are very simple and far from being optimised. Many of the solutions can be a matter of discussion. We can say that the lack of optimisation can be covered by more productive hardware. The future hardware will even more effectively hide the lack of the optimisation.

But the best advantage is that students gain techniques to overview and analyse the system. Through the data flow diagram they learn organisational knowledge and practically enable the functional decomposition of the system.

4. Conclusion

One of the very important and unexpected benefits is also a great number of procedures we have gained from everyday work in public administration. We have received a large number described and well-documented work procedures especially from the more experienced students.

This is the third academic year we have provided and practised this subject. According to our experience and feedback we can conclude that this subject is very useful and effective. For the future we plan to give even more focus on the organisational skills. We are going to include the state transmission diagram in our paper. This will give our students more

opportunity to separate the organisational scheme of their work from the data model. For the future release of the subject we are thinking about the methodology of the object approach. But this is a matter for future discussion.

Appendix: The Main Topics of the Sample Paper

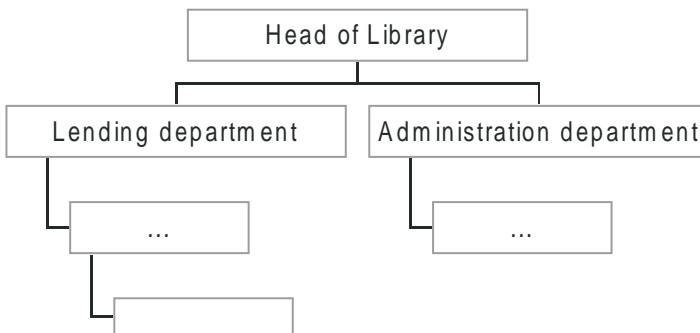
For the sample paper I have chosen a paper dealing with a public library system. It is simple enough and not under the influence of any special procedure. The solution is of course naive, but it will suit our purpose to highlight the main points of the paper produced by our students.

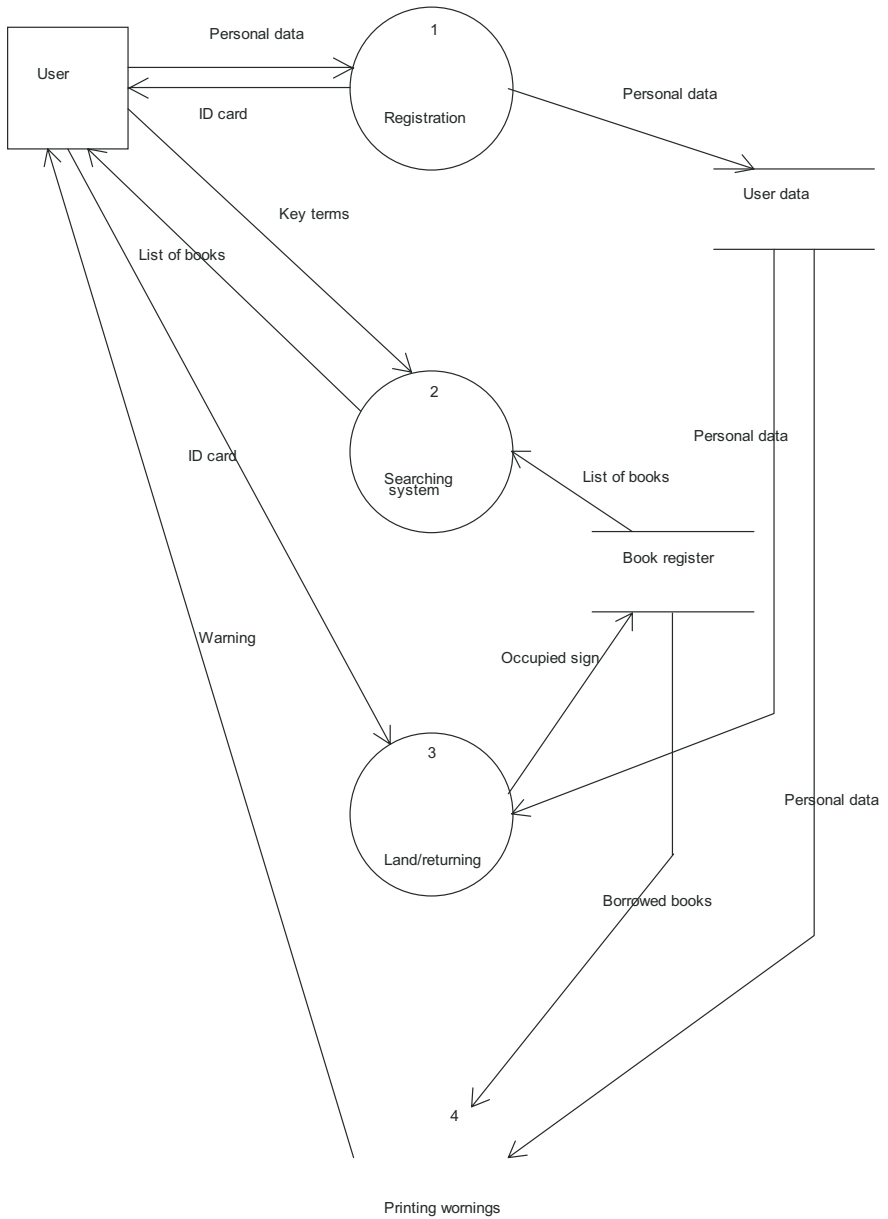
A1: Description of the System

The main activities in the public library are:

1. Registration of a new user. A user gives his personal data and staff issues the user with an identification card.
2. Searching the catalogue. A user gives keywords, the system returns the list of books. Searching keywords can be author, title or literary domain.
3. Lending/returning system. The user shows his identification card. His actions - either borrowing or returning the books are recorded.
4. System of reminding. According to the current date a list of not-returned-on-time books is produced.

A2: Organisational Scheme

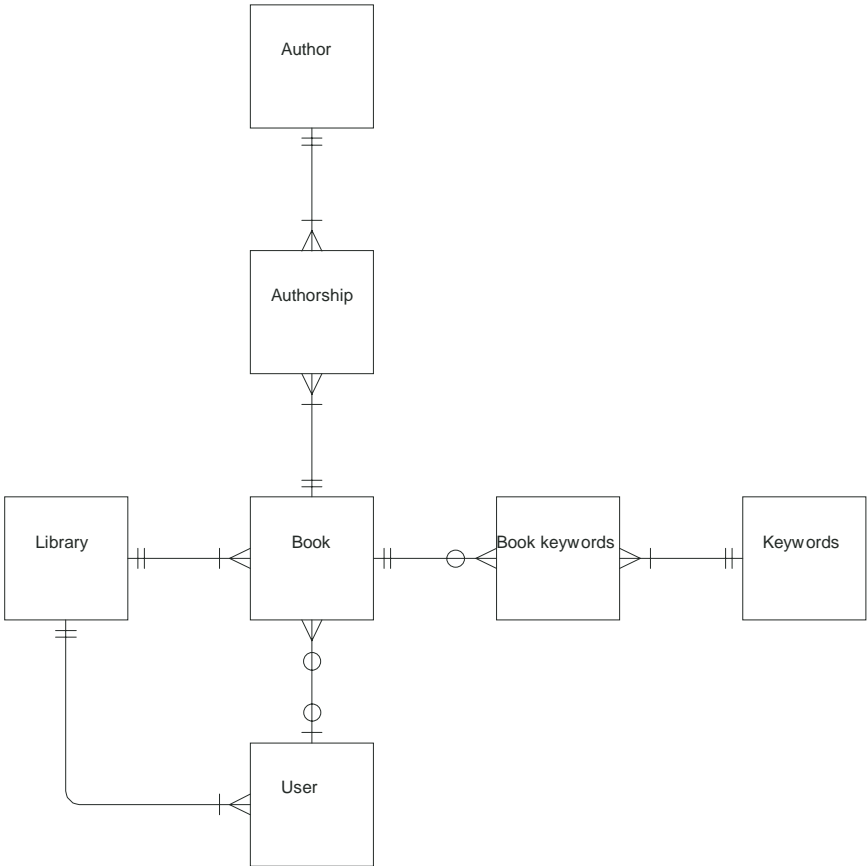




A4: Information Needs

Presented requires the following information demands:

- File of users of the library: User ID, Name, Surname, Address
- Book register: Signature, Title, Publisher, Year of publication, Language, Format, Authors, Keywords
- Lending file: Book signature, User ID, Date of the loan



A6: Entity Type Description Table

Entity name	List of attributes
Authors	Author ID , Name, Surname
Authorship	Author ID + Signature
Books	Signature, Title, Publisher, Year of publishing, Language, Format, Library ID, USER ID, Date of borrow
Book keywords	Signature + Keyword ID
Keywords	Keyword ID
Library	Library ID , Address, Telephone no.
Users	USER ID , Name, Surname, Date of birth, occupation, Address, Library ID

Legend
Primary key
Secondary key - indexed attribute
Foreign key

A7: Attributes Definition

Attribute	type	length	Control module
Address	char	35	
Author_ID	num	6	
Date of birth	date		date
Date of borrow	date		date
Format	char	10	
Keyword_ID	char	25	
Language	char	3	pre-defined
Library_ID	num	3	on_existing
Name	char	20	
Occupation	num	3	on_existing
Publisher	char	20	
Signature	num	8	
Surname	char	20	
Telephone.	num	12	
Title	char	50	
User_ID	num	5	on_existing
Year of publishing	num	4	pub_year

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2.14. SOME PSYCHOLOGICAL ASPECTS WITHIN ICT TEACHING

*Sergey P. Fomin **

*Sergey M. Serjogin ***

The article addresses the causes and possible methods of overcoming negative attitudes to ICT amongst middle-aged and more senior PA managers of the former states of the USSR. In particular three main problems are examined: The first problem is the lack of modern computers and information nets in PA; the second problem concerns the dread of using computers, as experienced by middle-aged and more senior administrators; and the third problem area looks at attitudes in the work place, where PA managers maintain an authoritarian and bureaucratic approach, typical under the Soviet regime. Attempts to rectify this, through teaching, encounters problems for trainers, and requires of them a great deal of psychological awareness and pedagogical skill.

The world has entered into a transition period which may continue for another 30 to 50 years, before arriving at a completely different society than was formerly experienced. A society with different material and spiritual values, new political structures and changed forms of institutional behaviour. And central to these changes will be a rapidly evolving technological base, which will influence the way of life of every country and culture. The duration of this transition process will be defined not only by the potentialities of information systems but also by resistance to ICT.

The training of managers for local Public Administration (PA) in the Ukraine, is carried out, at present, by the Academy of Public Administration of the President of Ukraine. Each year 50 students enter the Dnepropetrovsk Branch. The seminar "Information Technology and Decision Making in Public Administration" is one of the subjects which are being taught to them over a 2 year academic period. In the beginning, the key aim of this seminar was the introduction to future administrators of the practicalities

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of local and global computer nets, the use of E-mail, various databases, and engaging in teleconferences with staff and high level administrators. However, our first experience in organising these seminars revealed the fact that we had to change and revise the pattern and methodology of the course, in order to accommodate our main objectives and purpose.

There were several factors that forced us to make such significant subject changes, which may, however, be considered unimportant in the field of computer technology. And our main considerations were of a psychological nature, the mental attitude of PA managers influenced by the dogmatic forces of the former USSR, and which still prevail today.

So, in this aspect we met with a certain negative perception towards computer technology amongst administrators. A probable reason for this is even at present in Ukraine the provision of computers, in Public Administration is scanty. For example, only 40% of the work places, in the administration of the Dnepropetrovsk region, is equipped with computers, 25% of which are connected to the local network, and only 12% have access to the INTERNET or other global nets. In the Dnepropetrovsk city administration, 35% of the work areas are equipped with computers, of which 35% are connected to local networks and only 10% are connected to global nets. Dnepropetrovsk, itself, is divided into 7 districts, and in one of these city districts only 30% is computer equipped, 10% of which are connected to the local network and only 5% are connected to the INTERNET. In rural areas the availability of computers in Public Administration is even worse, where the majority of computers used are IBM PC/AT with an INTEL 286 processor. It is obvious that this sub-standard level of equipment is completely incapable of utilising modern software. In teaching terms, it is our opinion that imparting IT skills is of little relevance, if these skills will not be used in practice. Evidently then, it is necessary to teach administrators and staff within PA without discontinuing key work, and to do this only when their personal work places will be equipped with modern computers connected to local and global nets.

The second obstacle is quite closely bound up with the first, that the majority of students become acquainted with computer technology only at the Academy. Therefore, the practical dichotomy, mentioned above, also becomes a psychological one. On the one hand they must overcome their fear of computers, and on the other hand they are exposed to the technology in an artificial environment, in which they may achieve a degree of success, which, in itself, brings a certain sense of self achievement. Then,

there is the transfer of these acquired skills to the work place, where the practicalities and expectations of their particular job will be incompatible with their training, or with colleague integration. This is particularly the case given the fact that, with present levels of demand, only civil servants up to the capacity of deputy chief, within public administration, have been accepted by the Academy. Also, it must be realised that administrators are often not required to have an intimate knowledge of computer applications in their work place, as this aspect of their work is undertaken by assistants or secretaries.

These apprehensions are not expressed directly, but are manifested through a sceptical and ironic attitude, usually during the first lectures. However, such concerns are not insurmountable, and in some ways can stimulate methodological challenges, especially with experienced teachers of computer technology. And, of course, given the fact that modern IT interfaces are user-friendly, so that after a number of lessons most initial fears are dissipated. Of course, these problems are encountered by many groups of students, who are unfamiliar with the new technology. But in our particular case we have the added problem of training management administrators - team leaders. That is, people who do not like to change their opinions, or enjoy being told what to do, especially in front of other people, and when they perhaps do not see the importance of the target knowledge.

In conclusion, we must add another psychological setback which creates a negative response from some of our administrators towards ICT. Firstly, as we have mentioned, many of the administrators developed in PA under the debilitating influence of the Soviet way of thinking, which was greatly authoritarian and bureaucratic. Such a system operated on the basis of concealing information. In the world of computer networks the opposite is true. So, it is difficult to persuade these old style administrators of the importance of accessing information in the PA sector, and not only for administrative staff but for the general public. Yet, this is the task we face with our workshop "Information and Communication Technology as Driving Force of Public Administration", namely to try to change these outmoded attitudes to meet the future needs of PA management, in accordance with the democratisation of our society. Therefore, our objectives are not only the teaching of computer technology and the use of networks, but also to address issues which are of a philosophical, moral, ethical, social, political and economic nature.

So, what is the best way to organise seminars effectively? Obviously the skill and experience of the teacher is an important factor, as is a consideration of how each group of students are affected by the above mentioned problems. To this end we do not adopt a general approach, which is why we begin with preparatory discussions, by trying to instil the positive advantages of using ICT in Public Administration, especially amongst managers. Although opponents of ICT will attempt to uphold personal superiority over the importance of using ICT, we can only hope that they will begin to see its importance in reality, furthermore, how ICT can contribute to an improvement in their work, through better and more effective style of PA management. At least this is what we hope to achieve.

Teachers are aware that if group leaders perceive the aims of training, in full, then the training of other students will be more successful. Therefore, to enable more effective teaching of ICT, it is important to identify potential leaders in a group, and then to determine their attitude towards using ICT in PA. To this end we have devised a method of detecting an individual's level of ICT knowledge, in the same way as a written test, by using the "MS Access" package. With the aid of "MS Access" we can quickly analyse the attitude of students towards computers and ICT, and then apply the correct strategy for teaching. This is not the end of our investigations, however, but an on-going process that determines the direction of the course. At present we are designing, along with psychologists, the next stage of student assessment, which will, hopefully, detect the psychological nature of students and reveal potential group leaders. Already we have interrogated some PA administrators from the Dnepropetrovsk region (mostly heads of departments), with the result that some of our misgivings have been confirmed. We discovered that their attitude to information technology is twofold: some administrators understand the significant advantages of ICT, whilst others fail to grasp its full importance. To overcome the latter attitude amongst PA staff, we are planning several seminars with the aim of applying our developing method.

PART III

3.1. POINTS AND THOUGHTS OF INTEREST

*Heinrich Reinermann **

Vintar: The complete change of system has influenced administrative schools in many different ways. Before this change public administration, as a scientific discipline, was largely neglected and there were no educational and training institutions. Practically all schools and institutes dealing with public administration were established after 1989 and, therefore, have very little experience in the field. Further problems included insufficient teaching staff who could properly understand PA, equipment, personnel and curriculum.

Reinermann: In this respect Continental Europe is, however, not entirely different, since we, unlike the Anglo-American countries, have had no tradition of administrative science at the university level since the decline of cameralism.

Korobko: ICT does not stand alone, it rather needs to be wisely combined with traditional information and communication media (see also “Organizational Intelligence”, “Knowledge Engineering” etc.).

Monday, afternoon:

Lecture Košina: He points out some policy-aspects (unemployment, security etc.), that justify the need to include management in the development of IS.

Vintar: To what extent are reluctant politicians and managers to be seen as restrictions and to what extent as variables in our curriculum?

Leben: Managers should be taught the possibilities of ICT and what solutions it already offers in schools.

Dobрева: The current division of labour between IT-experts and psychologists results in the separate treatment of these two aspects, although they belong together in a practical ICT-project.

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Tuesday morning

Szczepanska: We, as a teachers of ICTs, have two great aims: every student should be able to use ICT, and also to know the potential of ICT. However, due to time restrictions you cannot teach them as much as you would have wished. The relevant question is: why should we teach everything in the classroom? The students are adults and can study by themselves, with our assistance in the form of a syllabus. The use of ICT in other courses is not a common practice. The differences in their knowledge background presents a problem (over a half of the participants have a degree in human sciences). The political process within administration schools is becoming increasingly obvious: everybody is fighting for an extension of hours. The students seem to show little interest for ICT - so how can we change this?

Plešinger: The aim of personal usage is important but it is not enough, there is an additional new aim: the ability to develop information systems. The teaching methods should be chosen according to the differences in the students' phenomenology (see his diagram with four types, see also Szczepanska with her different entrance requirements).

Different speakers: At this point different speakers pointed out a list of goals in teaching ICTs:

- ability of personally using ICT,
- ability of personally using data,
- ability of personally communicating with others (not being a “cowboy”),
- knowing the potentials of ICT,
- ability to describe one's problem precisely,
- ability of developing IS,
- ability to manage ICT resources,
- *plus some meta-goals, such as self-confidence with ICT, good attitude, responsible handling of ICT etc.*

ICT-courses and their contents are subject to quick changes in themselves (due to quick technical progress, and the changing requirements that students bring along - the threshold between school and high school is important here - etc.).

Košina: In the US students are being forced into the practice of self-learning much more strictly than in Europe (credit system). Using computers is simply a prerequisite (“Look how to get to your knowledge!”).

Lecture Dobрева: She draws a comparison between Achilles and the turtle and the quick pace of technical development with its influence on curricula development. An important aim for her is that the graduates are capable of describing tasks, one doesn't necessarily have to solve them oneself. Being critical towards computer-obtained data is also an important point for Dobрева. Teacher-training presents a problem, as well as the differences in the students' background knowledge. In addition, there are not enough case studies.

Another question that arose here was, whether we still need computer labs, with the students now having access to Internet and the possibility to work with computers from their homes.

Koychev: Is it still important to teach programming and if so, in what language? Because of the fast development of ICT one should teach Windows 95 and other products merely as an example for the actually important fundamental knowledge.

Lecture Gulbe/Klaučane: Here arises the question of the older generation and their alleged computerphobia.

Jasaitis: Our curricula should consider the requirements of the state and public administration as they are specified in the job descriptions of service posts and careers, and possibly exert an active influence upon them, so that ICT-knowledge would become a prerequisite.

Lecture Fomin: The role of information in authority systems is expressed here (see below). He further reflects upon the sceptical, even arrogantly ironical attitude of managers towards ICT (“this is something for assistants and secretaries”). This is coupled with the belief that by passing an exam one has shown to have learned everything - so why additional learning? He then deals with the influence of our teaching and training efforts on the practicalities: Have we achieved anything with our efforts? This should result in the “Curriculum Development Cycle” in the sense of TQM.

Tuesday afternoon

Urbanavicius: ICT-knowledge is in many people's opinion not enough to evoke the interest of students for ICT-courses! We should find certain

stimuli to increase this motivation (e.g. the integration of ICT and traditional teaching units, or perhaps better marketing of ICT-courses).

Further discussion shows that administration students should use ICT to solve tasks that are as near to reality as possible, in order to realize the real advantages for themselves.

Lectures Leben and Pecek: These lectures lead to a discussion of whether the total number of relative hours of many ICT-courses is appropriate. This is surely a question of priorities associated with administrative education (state philosophy (Aristotle), personnel development, public policy - to name but a few; what should be their portion?). Further consideration should be given to what extent is it possible to integrate ICT-knowledge in traditional courses? This influences the total number of hours of ICT-courses as well. The same applies to the threshold between school and university: what part of ICT should universities still teach, if this knowledge was already on the programme earlier, sometimes as early as kindergarten?

The interesting thing about Slovenian courses is that the students are forced through the type and formulation of the task itself (each student must reorganize a field of practice and predict everything, including software requirements) to explore the potential of ICT for reorganization and work with modern software methods (CASE).

Lecture Pecek: Pecek draws a comparison between ICT-education and driving lessons. The automobile used to be a “monster” that needed its own driver, while today we can learn to drive a car in a few minutes, but then need hours to learn how to drive according to traffic regulations. The situation is similar with ICT - it is no longer a matter of mere handling, but rather its usage in the so-called “data traffic”.

Lecture Jasaitis: Among other things he points out the different social circumstances of today’s students, who - unlike in the past - already have families, are older, more independent and self-sufficient, want to enjoy life while they are studying etc. What consequences does this bring for the curricula (evening and weekend classes, a more self-organized learning for the students’ part, perhaps a return to the “Humboldt” ideas of self-responsible learning)?

In other respects his standpoint is strongly in favour of the integration of ICT in traditional administrative courses.

Wednesday morning

Lecture Salillari: As in other previous presentations, a very important issue arises here, namely the role of information in ex-communist regimes. There is however a general feature to this: whenever “thinking and acting” are separated in the sense of the tailored-bureaucratic division of labour, the emphasis lies not on a thorough informing of all workers, but rather on strict control hierarchies, in order to enforce the will of top management, politics and law (Frederick Taylor, Max Weber) or of a single party (the former GUS- and MOE-decision systems). The natural consequence is the fact that information systems do not find much appreciation either - ICT is being neglected in favour of traditional paper media, which are badly organized, so that no information can ever be found, which leads to long reaction times, as well as a lack of communication within public administration or, between the administration system and citizens.

Different speakers: Now we are faced with the interesting role of administrative schools, which is that of promoting the reform of administration and its further development. Apart from this, the discussion did away with “a famous myth” that older people are allegedly reluctant and incapable of learning ICT. The growing percentage of retired people as students at our universities proves that this is not a question of mental ability, but rather of curricula and teaching methods, appropriate for older people (e.g. not “exposing” older administrative workers by way of teaming them with the younger ICT-accustomed generation).

Lecture Telešius: Presents a very active strategy of the Lithuanian state regarding the information society: “Lithuania 2000” or “LII” (the national information infrastructure of the country) or “VADIS” (a very extensive administrative information system) or “Informatization of 2500 schools” which clearly shows that in this country one is, quite correctly, trying to achieve the integration of state and administration development, together with IS development.

A further interesting point is the fact that they firstly, (quasi “from above”), tried to illustrate the administrative tasks with 50 workflow maps, which were based on formal regulations for these tasks. The reaction was not surprising: the users, when confronted with this, started wringing their hands: No, this is not the way we do it in practice at all...

Reinermann: This shows the following:

- formal and informal organization,

- the 80/20 rule (reference models, because one always needs individual adjustments to the place and post),
- that user-participation is indispensable,
- “service knowledge” (Max Weber) beside the norms is important, and other points.

Further to Telešius lecture: Telešius denounces the traditional educational activities in the field of ICT as “cowboy-oriented” - of course, PC (“personal” computer) has been misunderstood often enough in the sense of lonership - on the contrary public administration should in particular be founded on communication, cooperation and coordination (which is why he suggests the term ICCCT.). This discussion shows that regarding CSCW-tools the aspect of cooperation should become the central concern.

Korobko: In police and tax administration it isn't so much a matter of communication and cooperation, but rather of monodirectional information.)

This, however, in Reinermann's opinion doesn't contradict Pecek's emphasis on formalized information and communication, it rather means that both should be fulfilled (it was already pointed out by Korobko that it would be useful to integrate traditional communication media with ICT, which led to Reinermann referring to knowledge engineering and organizational intelligence).

Jasaitis: The role of administration schools shouldn't be confined to “lessons in the classroom” - it is much broader than that in the sense of knowledge transfer. And to fulfill this task it would be necessary to include many additional methods of transfer, e.g. publications, lectures, counselling, further education, creating networks with people in the administration practice - use all possible ways in order to keep them in touch with new developments in the field of administrative sciences.

Reinermann: Such efforts have been very successful for example in Speyer, and they are obviously being realized by the ENA as well (as far as networking is concerned, at least).

Lecture Tönnison: Even stronger than Jasaitis' is his intention to integrate ICT in traditional courses. Here the question comes up, how one can establish whether the lecturers of such traditional courses actually have the necessary ICT-knowledge themselves and really know how to use it as well! One thing is clear:

- we need to know exactly what ICT-knowledge we would like to impress into the heads of future administrators,
- we have to make sure that these aims - no matter how - are achieved,
- whether this occurs before higher education, in our schools in specialized ICT-courses, or as a part of traditional administrative courses, depends on the situation, and is therefore of minor importance.

Tönnison then shows in a case study of Estonia, that this country is preparing itself for development goals and the information society, with the emphasis being put mainly on organizational structures and promotion programmes, rather than on the development of administrative information systems.

Lecture Pavlovič: The discussion shows that the Internet hasn't grown hierarchically "from above", but on an innovative and creative basis from below! Now our task should be the wise implementation of Internet technologies towards administration problems. This is a "wonderful opportunity" for public administration, because Internet technologies are already standardized and merely need to be used sensibly.

Basic activities of Public Administration are centred around data collection, storage, processing, retrieving and provision. If this, and it is correct to a great extent, is the core of public administration, then the great role of ICT is obvious!

Lecture Korobko: He points out serious problems on all levels, that need to be dealt with in a country like Ukraine, if one wants to introduce information systems. The only possible solution would be - management by opportunities, so

- having a vision in mind about the direction of the voyage (Leitbild),
- and then proceeding step by step at every opportunity, so that one gets to achieve this "leitbild". It is clear too, that one should consider supply and demand: "An IS is only an IS until used!" (similar to Wildavsky's "a plan is only a plan until budgeted").

3.2. Conclusions and Some Recommendations for the Future Work

Mirko Vintar *

Heinrich Reinermann **

Discussions during the first three days of the summer school, addressing different questions relevant to teaching ICTs within environment of PA curricula, were very lively and, especially at the beginning, quite diverse. Differences between institutions and conditions in which their work was very much reflected in the positions and opinions taken by the participants representing institutions from different countries. For many participants it was their first opportunity to take part in an international event focusing on teaching ICTs within the context of PA. However, gradually a mutual understanding emerged and a common denominator in practically all areas was developed.

In order to summarise the discussions and develop some guidelines and recommendations for future work, three working sessions were organised focusing on the following groups of topics:

Session 1: Development of ICT Curricula

Session 2: Integration of ICT Based Subjects in the Overall Curricula in PA

Session 3: Teaching Methodologies

All participants were divided into three working groups which worked simultaneously through all three sessions and produced results which will be presented.

3.2.1. Session 1: Development of ICT Curricula

All three groups sought answers to the following questions:

1. What are the main goals of teaching ICT in the context of PA according to different target groups of students?
2. What depth of knowledge should be required?
3. *Which are the main blocks of ICT Curricula?*

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3.2.1.1. Recommendations of Working Group 1:

Main goals of education and training in ICTs:

1. Development of personal abilities in ICTs (basic skills in using ICT).
2. Development of the conceptual knowledge in information systems.
3. Development of information resource management policies.

The following table shows the importance of achieving these goals according to different groups of students (users).

goals	study		in-service training	
	under-graduate	post-graduate	professionals	managers
professional abilities	***	**	***	*
conceptual knowledge	**	***	**	***
inf. resources management policies	*	**	*	***

legend: * not so important
 ** important
 *** very important

The basic concepts of ICT, which should represent the core knowledge elements of ICT courses within PA curricula, taking into account the goals defined above, are presented in the following table:

goals	basic concepts
professional abilities	operating systems software hardware networks, telecommunications computer architecture
conceptual knowledge	system analysis IS design databases data and process modelling planning and management of IS
inf. resources management policies	support services system integration management of IS function information resource management

3.2.1.2. Recommendations of Working Group 2:

This group began analysis with the identification of the main activities which constitute the everyday life of an average public administrator, or senior servant, and which can be supported and improved by use of ICTs. The following is a list of activities that could be defined on different management levels in PA:

- 1. Co-ordinating**
- 2. Reporting**
- 3. Organising**
- 4. Planning**
- 5. Staffing**
- 6. Directing**
- 7. Budgeting**

The list is also ranked according to the sense that the importance of activities increases with the level of management in PA. To complete all these activities there are:

1. *different kinds of communication already in use, or which could be used:*
 - verbal (person to person)

- paper / mail, phone, fax
- e-mail, video-conferencing, voice-mail;

2. *different kinds of activities connected with data and information in PA:*

- collecting
- storage / retrieving
- processing
- providing / presenting.

The following table shows basic and advanced skills within ICT that should be taught in order to fulfil the above-mentioned needs in PA:

ICT components	basic skills	advanced skills
hardware	basics, purpose (...)	
operating systems	file management, (NC, GUD)	multi-tasking
word processors	text editors, paragraph, text formatting	advanced (styles, templates, macros,...), hypertext
graphics	manipulation with graphs, images	image processing, creation (PSP, Corel,...)
communication	Internet, browsers, LAN,	
	e-mail	
organisers	e.g. Schedule	
data protection	viruses, antiviruses	
spread-sheets	basic operations	advanced (macros, statistical analysis, ...)
presenting		e.g. Power Point
databases		concepts, queries, local, client-server, distributed
information systems		system analysis, project management

3.2.1.3. *Recommendations of Working Group 3:*

Goals that should be achieved with teaching ICT in PA are as follows:

1. Operational abilities (ICT)
2. Analytical abilities
3. Integrative abilities

4. Life-long learning
5. Positive attitude towards ICT
6. potential ICT utilisation
7. Responsible usage of ICT
8. Awareness of ergonomic usage (be human)
9. Ability to lead projects
10. Communication abilities between ICT people and public administrators

Different areas of knowledge in the field of ICT, and adequate teaching alternatives in each area, are presented in the following table:

Fields of knowledge	Teaching alternatives
“Computer literacy”	- secondary education - courses offered by Department of PA - self organisation - private institutions
Policy issues	
Computer applications	
System analysis	
Management issues of ICT	
New developments in the field of ICT	

3.2.2. Session 2: Integration of ICT Based Subjects in the Overall Curricula in PA

This session was started with rather divergent views about the possible approaches and strategies on how to implement and integrate ICT topics into other subject areas within PA curricula, in order to achieve the best results. Two basic questions arose:

1. Should ICT topics be integrated into other courses comprising PA curricula at all, or should we stay with ICT dedicated courses?
2. In answering positively, then how should we do it?

3.2.2.1. Recommendations of Working Group 1:

After comparing the present situation at different institutions the main conclusion were made (as Figure 1 shows). There are two main directions in teaching ICT in a PA context and both should be used, i.e.:

- dedicated courses - courses which are dealing only with ICT;
- interdisciplinary courses - courses in the other fields, where the use of ICT is included or integrated.

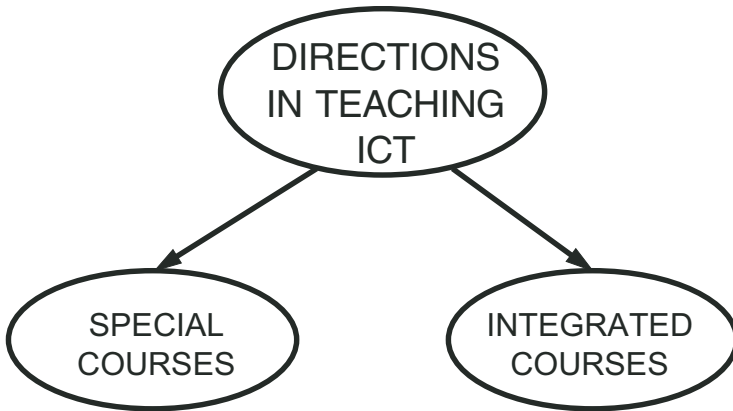


Figure 1.
Directions of teaching ICT in PA curricula

There was a prevailing view that the most important obstacle which slows down the process of integration was a lack of ICT knowledge among teachers of other subjects.

Several possible strategies were suggested on how to overcome the problem and how to integrate ICT topics with other components of PA curricula,;

1. Special ICT seminars for PA teachers.
2. Development and implementation of multidisciplinary courses where teachers of ICTs would cooperate and help the teachers of other subjects.
3. Enforcement of everyday use of computers.

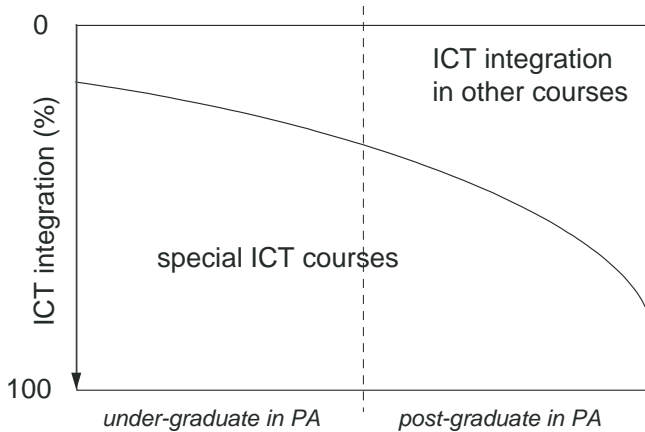


Figure 2.
Levels of ICT integration

The figure shows that the level of integration should correspond, and should increase, with the level of educational programme.

3.2.2.2. Recommendations of Working Group 2:

This group agreed that ICT should be integrated into other courses, especially at a postgraduate academic level of study. Also some special ICT courses at undergraduate level should be presented, dealing with basics in informatics and computers. Levels of ICT integration is shown in Figure 2.

3.2.2.3. Recommendations of Working Group 3:

This group divided the problem of the integration ICTs topics into three main question groups:

1. Why should we integrate ICT into other PA courses?
2. What are the obstacles in achieving this to any greater extent than is the case today?
3. What actions have to be taken to overcome these obstacles?

Reasons for ICT integration are:

- To improve the quality of PA courses;
- To improve PA course organisation;

- Expect some feedback on ICT courses;
- To convince students on the potential of ICT;
- To give students more hands-on experience;
- To train future ICT-oriented public administrators.

The following table describes obstacles which prevent integration, and action which should be taken to overcome each obstacle:

Obstacles	Actions
* Do not have ICT-oriented teachers	√ train √ hire √ increase motivation
* Resistance (Pa trainers - to give up some lecture) ICT trainers - to help)	√ motivate √ curriculum change √ communication between ICT and PA trainers
* Fraud	√ change exam system
* Financial restrictions	√ look for sources
* Control over ICT elements	√ dedicated ICT courses must remain √ small amount of PA courses with ICT elements
* Lack of ICT applications in PA	√ study of the existing situation √ develop automation √ do not be too advanced
* Lack of training materials	√ produce them, make them transparent √ ask other colleagues √ search on the Internet
* In-service programme: resistance of trainers	√ do not integrate ICT elements

3.2.3 Session 3: Teaching Methodologies

Try to give some directions, what teaching methodologies should be used in teaching and training ICT in PA.

3.2.3.1. Recommendations of Working Group 1:

This group first attempted to define memory retention (how quickly a learner forgets the taught activity after training) according to different

target groups (Figure 3), and what should new teaching methodologies take into account.

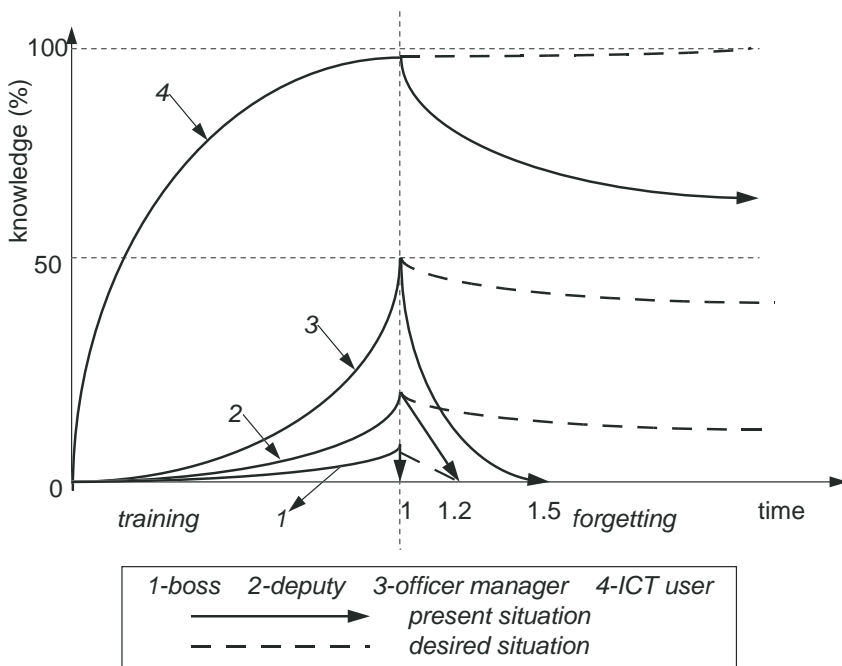


Figure 3.
Diagram of training to ICT in PA

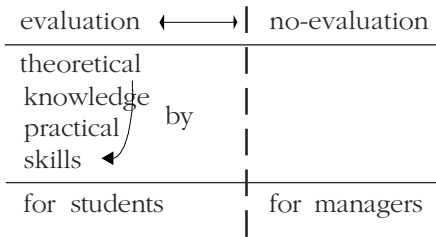
The group stressed the main points to which attention in teaching ICT should be paid:

1. Pedagogical and andragogical training of trainers
2. Ratio between lab and lecture teaching:

lab	←————→	lecture
60-75%	←————	25-40% Now
100%	←————	0% Tomorrow

3. Using modern technology
4. Work should be based on case studies from real life

5. Each workshop should end with a practical product
6. Stimulate self-learning
7. Evaluate or not:



8. Work in computer laboratories should be organised in such a way that each student works on his own computer.

3.2.3.2 Recommendations of Working Group 2:

There are different aspects of teaching ICT that we should pay attention to:

1. LECTURING (THEORY)

- giving main concepts and definitions
- using a variety of presentation techniques
- using handouts
- using syllabuses

2. PRACTICE

- composition of the groups is very important (maximum of 20 students in one group, try to ensure that everyone is working on his own computer)
- to have assistant instructors (just one instructor is not enough)
- structure practice
- materials / requirements
- good equipment
- group / individual practice (ratio = ?, individual should be enabled - make it possible)

3. CASE STUDIES should be presented

- by professors
- by students

4. EQUIPMENT

- computers
- LCD panels, projectors
- printers
- access to the Internet

5. EVALUATION

- pre(init) - questionnaires
- tests

helps to define the level of knowledge for composing groups

- intermediate (during courses and workshops)
- final - exams
- homework
- projects
- presentations

3.2.3.3 Recommendations of Working Group 3:

This group also discussed different aspects of teaching methodologies as follows:

1. METHODOLOGY - IN A BROAD SENSE

- differs according to the level of integration of ICT into PA courses
- promoting ICT in PA
- facilitating organisations
- campaigning
- public relations
- publications
- alumni

2. METHODOLOGY OF TEACHING

- the need of student help is more apparent in ICT courses
- teachers of PA subjects are less willing to help students having ICT problems
- correct balance is necessary:
 - “mute” - ICT communications
 - “live” - human communications
- preparation of ICT instructors is more intensive
- needs to be updated more often (content & methodology)

3. UTILISE ICT

- ICT labs
- campus network
- Internet
 - exchange of experiences with related institutions
 - joint seminars with other schools for PA
- tele-teaching
- CD-ROM
- course organisations / administration

4. LINKING THEORY AND PRACTICE

- case studies
- intern-ships
- action research
- individual real-life projects
- excursions
- public administration assistant unit (practical examples with students)
- guest lectures by practitioners and alumni
- seminars with narrow organisation on practical examples

The following table presents two different scenarios on how to teach an example lecture:

“Tables produced by WinWord”

bad scenario	better scenario
* instructor demonstrates how it's being done using one screen * instructor disappears * 10 students try for themselves to repeat * frustration, no incentive to use ICT	* instructor explains topic without using the computer * 10 students try this on their computer * instructor goes from PC to PC to help * instructor compares traditional and ICT media

Evaluation / measurement of the impact of teaching:

- * of an understanding of what was taught
- * hands-on examinations
- * evaluation of teachers by students, by teachers
- * follow-up programs
- * number of alumni

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