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# Impact of New Technologies on Public Organisations

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### 1. Information Society, Economy of Information, Management and Public Organisation

#### 1.1 A new context for the public sector

"For the time being, the basic feature of world economy consists in quick development towards globalisation and use of Information and Communication Technology..."<sup>2</sup>

The focus on globalisation is determined by the structural, qualitative and quantitative changes of the economic processes.

"The technological progress, bringing flows of information and changes less controlled beyond frontiers, the consumers and users' expectations versus the most attractive goods in terms of quality/price have contributed to introduction of the possibility of new options in numerous sectors of activity, where there was nothing but the low offer of the monopoly public service. Consequently, the users choose and the public services, within a difficult economic context, should align their prices and services in order to resist to this new challenge. The public sector is preoccupied to identify the dimensions of world competitiveness" (Korten, 1997:148)

The economic, social-cultural, legal, geopolitical shifts and last but not least the technological shifts, facing our contemporary society reveal transparently, a destabilising impact on public sector, define a new role for the state, and make public administration to be citizen and services-oriented (Matei and Matei, 2000: 9).

The information society (basis of new society), concept elaborated in 1980 by the Japanese researcher Yomeji Masuda) reveals the following characteristics: principle of "theoretical codification", new relations set up between science and technology, between innovation and social change. The logic of general interest enables the equality access of all beneficiaries at "modernity", fact that leads to entrusting some public interest services, such as water, gas, electricity, telecommunication, transport to a new society, society of 21<sup>st</sup> century, "electronic society", ( Matei, 2001: 131).

In the information society, the national governments play the following roles:

- a) Determining the adequate policies and structures (*e-government*).
- b) Informing citizens about governmental services (*e-administration*).
- c) Using the information about infrastructures in order to improve the administrative practices.
- d) Interface with citizens within the framework of the democratic process of governance (*e-democracy*).

The information society, based on information and knowledge, as "sources of economic performance, rationality, coherence and synergy of social action" (Dobrota, 1999: 434) has contributed to improving productivity, effectiveness and quality of services in OCDE countries by the end of 20th century.

#### 1.2. Information - Principle of Organisation

More and more we speak about management reforms in public sector and support provided by information technology.

We ask ourselves the question: how can we benefit of information technology in public sector, taking into account the "changes induced by explosions of spirit of initiative". (Drucker, 1999: 245). The first "explosion" was produced in the area of mechanics, the steam engine, invented by Denis Papin at the middle of 17<sup>th</sup> century. The second "explosion" of the spirit of initiative was marked by "industrial revolution" in the middle of 18<sup>th</sup> century. During the second half of 19<sup>th</sup> century, we faced the third "explosion" that started up in new areas and products: electricity, telephone, electronic goods, steel, chemical and pharmaceutical products, cars and planes. The fourth "explosion" was provoked by information and biology in the 20<sup>th</sup> century (in 1946, it was produced the first computer ENIAC) and it continues in present.

This moment with great impact on civilisation, marks the information era, and the information becomes the principle of organisation for labour. The decision-making process in the organisation, the organisational structure

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<sup>2</sup> Agenda 2000, For a Stronger and Wider Union, COM (97) 2000 final, Brussels, 15 July 1997, vol. I, p.12

and the ways for achieving the activities, all are changing. We know that the organisation is based on information.

The computers have been popular in '80s, thus we do believe that the first decade of 21<sup>st</sup> century might represent a fruitful period for collecting results on one hand, and transforming the public organisations into "society of high quality public services for citizens", on the other hand.

The same period of 80's reveals the redefinition of state organisational structures, of the state role in economy, of the relations between civil servants and politicians, politicians as citizens and civil servants and citizens.

The rigid, hierarchical, bureaucratic form of public administration, which dominated especially the 20<sup>th</sup> century, is changing into a new flexible form of public management (Owen, 1994). That change is produced at the level of governance in society and the relation between government - citizens.

The managerial reforms have meant a transformation, not only of public management but also of the relations: market-government, government-bureaucracy, government- citizens, bureaucracy - citizens, representing a result of New Public Management ideas.

"Information and communication will become the dominant forces that define and shape the actions, interactions, human activities and institutions".

### ***1.3 Information and Communication Technology - Strategic Option***

The modernisation of administration has represented a continuous process for decades.

In the public sector, a fundamental change is produced, being results-oriented, under the form of service efficiency, effectiveness and quality, and on the other hand the hierarchical, centralised structures are replaced with decentralised managerial environments.

The involved changes aim, more or less, the response to three major objectives for the organisation:

- capacity to adjust (which turns into account the flexibility);
- capacity of anticipation (that turns into account the supervision);
- capacity to understand and manage (that turns into account the assessment).

Flexibility, management and assessment become keys of change at the organisation level and involve activities of re-organisation, a strategic process, a social project etc.

A radical change in the culture of public administration is needed. The change in culture is required by the ideas of new public management:

- concentrating on leadership process, and not on policy, public sector orientation on efficiency and effectiveness;
- desegregating the public bureaucracy within agencies that establish relations on the user-payment basis;
- using multiple markets and contracting, as result of competition;
- reducing the costs;
- "target" service, contracts with fixed term, monetary incentives, and freedom of management.

To increase the expectations of citizens belonging to local communities in public institutions and organisations, means to improve the managerial system, the research, evaluation and activity improvement (Matei, 1999: 110 - 113).

To get knowledge about citizens' needs will represent the key pillar in order to use the top information and communication technologies, knowledge management and complex systems. In the 21<sup>st</sup> century, e-government, e-business, e-learning, work, transport etc. will represent arguments that lead to increasing public trust in the electronic modalities of interaction with citizens. Efficiency and economy remain the objectives of good governance. The use and application of ICTs have as purpose the accomplishment of activity in order to improve service effectiveness and quality.

ICTs impact is important on organisational structure and organisational culture. IT offers options for the design of organisational structure, the interaction by means of new modalities, joint functions and objectives, facilitating the set up of working groups with a determined term, as well as communication on large areas. The use of effective IT could provide an attractive work environment, and could motivate the employees by means of job enrichment.

At the same time, ICTs could support the basic values of organisational culture, such as service responsiveness and quality.

The changes required by the public management system are on the following levels:

- a) organisational level;
- b) human resource level;
- c) results evaluation level;

- d) financing level.

**\*\*Fig. 1\*\***

The level of changes in the management system

The public organisations focus on the stake "performance", fact supported by ICTs applications and determined by the existence of the following factors:

- a) strategic planning;
- b) performance of ICTs investment;
- c) active citizen participation;
- d) accountability for ICTs budget management;
- e) project management.

**\*\*Fig 2\*\***

The relation: ICTs - public organisations strategy

The implications of change, especially concerning a genuine change of the organisational culture mean the reform of both external conditions and internal conditions, in the following manner:

- shift from policy to management;
- shift from pyramidal administrative systems to "chester" administrative systems;
- shift from planned and hierarchical enforcement of decisions to a dichotomy between core activities and operational adopted services;
- shift from process-oriented administration to results-oriented administration (benchmarks, evaluations, quality improvement);
- shift from collective delivery of public or social services to flexible delivery of individualised services;
- replacing the concept "money spending" with "cost cutting";
- cultivating the concept of "ownership management".

## **2 Public sector and Information and Communication Technologies**

### ***2.1. The catalyst of change***

Information technologies aim the improvement of access to information and services, 365 days per year, 24 hours per day, by means of information kiosks, specially established in public sites, communities centers, other public places, at home etc.

ICTs play an important role in achieving the objectives of policies in the area of education, work, health, justice etc.

ICTs applications enable the dissemination of a large range of information from the public administration institutions, such as: pre-edited documents, information for social assistance, job search, facilities of payment by credit cards, updating the driving licence, tax and charges payment.

The use of ICTs supports the delivery of integrated service, based more on the concept of citizen/user, and less on the administrative service. Consequently, the service delivery is improved, the current expenses of public administration are cut, efficiency, control and effectiveness are improved. For the citizens, the costs are reduced. In OCDE countries, interactive systems are developed, facilitating the civil servants to provide useful information and services to the citizens/users. There are situations that combine information from the public sector with those from the private sector.

There are well known the cases with data bases that stock information about users and provide opportunities in order to adapt the service to the users' needs within the framework of defined limits. The on-line access to the data bases, the intensive use of already stored information and the better integration or systems connection reduce the time for completing the documents and enable faster and effective responses.

ICTs support the users' participation in the identification of their needs, as well as in the systems design and feedback after service delivery<sup>3</sup>.

"The electronic service delivery could lead to current service improvement, and also to methods of analyse concerning the organisation of governmental programmes and delivery mechanisms"<sup>4</sup>.

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<sup>3</sup> *Governance in Transition. Public Management Reforms in OECD Countries*, OECD, 1995, p. 85-87

<sup>4</sup> Technology Evaluation Office, USA, 1993 in *Governance in Transition*, p. 87

The British experience emphasises the "advanced personalisation" of public services, placing a greater value on public services and their users.

Other countries support the typological development of ICTs systems, such as INFOCID - the Portuguese inter-departmental information system for citizens<sup>5</sup>; INFOCALIFORNIA - the system from California state that provides a portal with multiple services for all state departments; MINITEL from France and VEREDA from Spain, combining information from the public sector with those from the private sector.

## **2.2 Citizen-Public Service**

We ask ourselves the question: how do we benefit of Information and Communication Technologies in the relation between citizens - public services?

We often assert that the quality of public services depends on costs and large number of employees in the public sector. Efficiency and economy remain key objectives, but service effectiveness and quality become the object of information technology. In this context, the real benefits of information technology consist in improving the interaction at the level of the entire administration and cutting off the administrative expenses. To introduce ICT means to involve the strategic planning process, and the objectives of the public organisation are defined and listed related to priorities.

**\*\*Fig 3 \*\***

Integrating the concept of strategy within public services

### **2.2.1 The map for e-public sector**

The map for e-public sector<sup>6</sup> is designed on the basis of the representation of state and local communities, public institutions and structures of private law under the control of public authorities (taking into account the social object, the rules of organisation, the ownership of capital), as well as of the public sector objectives.

**\*\*Fig 4 \*\***

E-public sector Map

It might be configured by:

1. dimension of citizen as "client", the receiver of public services and the transmitter of feedback;
2. dimension of public service (e-business);
3. dimension of institution/public enterprise, supplier of public service (e-administration);
4. dimension of public management (e-management).

Management represents the key element for a model of e-public sector, meaning:

- defining the objectives and priorities;
- delegating responsibilities and assignments;
- informing, being acquainted to the real situation and the capacity to provide solutions;
- capacity to respond to challenges of environment related to changes;

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<sup>5</sup> It is based from the technological point of view on multimedia systems, that comprise image, text and sound. The equipment is available to users and it can be easily accessed in the central areas.

<sup>6</sup> Conceptual sentences:

The design of a map for e-public sector is based on a set of methods and instruments, placing e-administration, e-democracy, e-management, e-governance, e-business into the open system.

*e-democracy*

- using the information technologies in the relation: citizens - elected persons, or, citizens- public authorities;
- expressing on-line their vote.

*e-governance*

- providing information and services to citizens and business environment (external applications) and using them inside the public institutions (internal applications).

*e-administration*

- using the information technologies in changing public services from public services for citizens into public services of citizens and delivering on-line services
-

- capacity of permanently adjustment and optimisation.

The core of public services consists in the relation with the citizen/user. When we introduce the component of e-business in that relation, we shall feel the need to turn into account the principle from the private sector, namely fidelity and prospective relation.

When we are searching solutions for the management system of e-public sector we remark the change produced by the operational instruments at the strategic management board. The management system is global, it integrates the dimensions of the relation with the citizens/clients, the internal audit, the inter-administration relations etc. This system combines two factors derived from the private sector: profitability, based on increasing the turnover and absolute or relative cutting the costs, and client satisfaction, built on the contribution of services, personalised with the company.

The analysis of the differentiating elements between the public and private sector, respectively the strategy of traditional approach and the client-oriented one emphasises the following issues:

- 1) necessity of user's (citizen's) existence, considered the "target" of the public service;
- 2) entire definition of public service;
- 3) reorganised public enterprise;
- 4) rationalising the information received from the user;
- 5) knowledge about all the processes that could optimise the activities;
- 6) developing user's autonomy related to public service supplier, in order to obtain information or certain type of services by means of: internet, telephone, fax, videophone etc.

\*\*Table 1 \*\*

Characteristics of public and private sector and approaches of traditional and market strategies

Within this context, we emphasise the necessity for creating the "Citizen/User Portal" at the level of the administrative unit.

Thus, we achieve the flexible use of the information, providing opportunities in order to liberalise the agreements for service delivery, as well as opportunities for a service closed to client and for the transfer from "the organisation on the basis of functions" to "organisation on the basis of client groups" (Bellamy, 2002:18). Project management, the modular approaches concerning the relation with citizen/user, the elements undertaken from e-business strategy, "which divided each group of users in 'client segments' in order to determine the specific mix of electronic channels, most adequate to each segment", aim to improve the clients' choice; they represent only one part of the conditions designed to improve governmental effectiveness.

### **2.2.2. The Model "Citizen Portal"**

The model "Citizen Portal", (Gerbod, Paquet, 2001), operational in France at the level of territorial local communities is build on four pillars:

- 1) dividing the citizens/users into segments and setting up the "target group";
- 2) developing the relation: management-citizen within the process of "single service" delivery;
- 3) using multimedia equipment;
- 4) ensuring the dynamic structure for the "citizen portal", aimed to personalise the service.

The above mentioned model raises two problems for public administration authorities:

- the boundaries for the proposed services, both in the public and private sector;
- legitimacy of the institution that promotes the activity aimed to create the Citizen Portal.

If the portal is achieved in relation to citizen, the ideal portal aims, mainly, the contribution of proximity services, with a powerful added value, measurable in terms of quality, time and money for the respective services. When creating a portal that unifies the public or private services, INFOVILLE model – Spain, there will be problems related to financing sources and operation for that portal.

A Citizen Portal, as above defined, means at the same time, a greater capacity to gather an ensemble of partners having the same objective, namely to serve the user and also a critical mass, enough important so that the individual is able to adhere to it. The response could belong to variable geometry.

The user benefits of the portal contribution, mainly, as service, under the conditions of personalising the portal and if it is integrated in administration. At the same time, it provides a certain capacity of services at any time, facilitating the citizen stability, by means of the autonomy related to community and administration.

The stake is significant for the organisations that are service suppliers. It means to manage the process, a greater capacity to respond to requests in due time and at the level of the expectations. It is a successful factor for the process.

The Citizen Portal can be considered a means for development, using multiple channels that acquire knowledge about users, their needs and expectations versus administration.

## **2.3 Portal for access to e-government services**

The shift to Information Society represents one of the strategic objectives of Romanian Government during 2002-2005 period.

The strategic objectives defined within the framework of “*e-Europe+*” Plan and its own plans reveal the following aims: modernising public administration and public services, use of ICTs in health, environment protection, transports, education etc.<sup>7</sup>

During 2002 – 2004, a series of pilot projects are developed, such as:

- Portal for online administrative documents.
- Portal for online requests in order to update the driving licence.
- Developing the information system of Authority for Regulating and Supervising the Suppliers of Certification Services.
- Portal with information concerning health services.
- Portal for access to e-government services.

In this context, we mention the accomplishment of two information systems, very important for Romanian society, namely:

- electronic system of tenders for public procurement, *e-Procurement*;
- information system for searching jobs, *e-job*.

The system for public procurement by means of electronic tenders operates at national level since 4 March 2002. The e-job project is a part of the process for implementing the e-government concept, recently launched by the Ministry of Communication and Information Technology. It is achieved a virtual fair of jobs, providing facilities to the persons looking for employees and to the persons searching jobs, in order to meet their expectations concerning the profile of the adequate candidate, respectively of the job.

The accomplishment of a “one-stop-shop” portal ensures the access to e-government services and the exchange of information and documents between public institutions.

#### *Advantages:*

- Transforming the system of organisation for public sector and improving the public services.
- Making the public services more efficient, adapting them to citizens’ requirements,
- Reducing the bureaucracy;
- Increasing the transparency;
- Developing interactive services.

The system enables the citizen to be authenticated just once, when entering into the system, whenever accessing multiple public services offered by electronic means.

When accessing a certain department or institution, the citizen needs certain services and information, and it is not necessary to know the complex structure of administration.

The system ensures the achievement of the following issues:

- a) to provide information to citizen by electronic means concerning the available public services;
- b) to provide e-government services, by “back-office” systems, existent already in departments or institutions participating or benefiting of this project;
- c) exchange of documents or information between institutions, departments;
- d) to supply a joint platform for the interdepartmental exchange of documents.

The specific information will be updated permanently, being organised on types of services, institutions etc. The system ensures the confidentiality of information and guarantees the integrity of the transmitted data. Each public institution will transmit the information corresponding to its own interaction with the citizens and business environment, by means of a specific interface with the system and at the same time it will update them regularly.

The first stage was launched and implemented in 2002 by the Ministry of Communication and Information Technology together with the Ministry of Public Finance, Ministry of Labour and Social Solidarity. Thus, the companies have access to the following online services by means of information technology:

- 1) Ministry of Public Finance  
Statements for the transfer of value added tax.
- 2) Ministry of Public Finance  
Statement concerning the payments to the state budget
- 3) Ministry of Labour and Social Solidarity  
Statement concerning the nominal register of insured persons and the payments to the state insurance budget.

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<sup>7</sup> National Programme for Accession to European Union, volume I, June 2002, p.305-308

### 3. ICTs role in civil servants' training

The Romanian public administration is facing a period of profound structural changes, determined by the necessity of reform, and it has to acquire the standards of effectiveness for a modern administration, aligned to experiences and practices, already accredited in democratic countries of Europe.

The recent decisions of Romanian Government reveal the idea of the shift from "a directed, descended, segmented administration" to a "horizontal, service-oriented administration, with powerful exchange of information between its components, between its institutions etc. Such change corresponds to the organisational change, determined and facilitated by new technologies"<sup>7</sup>.

Within this context, the word of *e-administration* reveals major practical significances, designed to determine a thorough involvement of all educational structures, with tasks in basic and continuous education of human resources for central and local public administration.

The categories of actions implied by *e-administration* aim the following objectives:

- introducing informatics in order to improve the operational efficiency for central and local public administration bodies;
- introducing informatics in services oriented on citizens and companies, fact that often involves the integration of the services delivered by central and local public administration;
- ensuring the access to information by information technologies for the final users of central public administration services.

The fast development of Information and Communication Technologies and the increase of potential users in both public and private sector requires a long process for application within the framework of the respective organisations, a process of re-organisation and change of the organisations into organisations with configurations using ICTs.

To understand the need for introducing IT and to apply the systems using new technologies, respectively in public administration, represent objectives of modern governance, contributing to improvement of effectiveness of governance.

It should be understood that the information systems in the broad sense cannot be represented by a single discipline within the specialisations of informatics, cybernetics, computer science, and they may represent independent disciplines at the specialisations of administrative sciences.

In our opinion, the discipline of informatics for public administration, developed within the undergraduate, postgraduate education, master programmes facilitates the interdisciplinary and multidisciplinary thought, aimed to improve the profile of the modern civil servant.

**\*\*Fig. 5\*\***

Curriculum design

The education and training in ICTs provides a broad area of education. One of the main objectives of ICT courses in universities is focused on encouraging the students to become creative, innovators in use of new technologies and to understand the new opportunities and possibilities of the organisation based on functional procedures. (Vintar, 1996: 16)

Thus, we could identify the following qualitative levels of users:

1. Core level - the typewriting
2. Second level - use of programmes
3. Third level – those who apply and shape ICT
4. Innovative level

**\*\*Fig. 6\*\***

Levels of knowledge

The objectives of the "Informatics" course, from the curriculum of Distance Learning Department for Public Administration - within the framework of National School of Political Studies and Public Administration aim basic and continuous education in order to ensure to the current and future civil servants the possibility to understand and act according to Government Strategy for introducing informatics in public administration.

The idea of aligning the Romanian authorities efforts to *acquis communautaire*, specific for public administration imposes with necessity own standards for education, criteria that are already used in European Union.

In this context, we would like to present *European and Computer Driving Licence* programme. The preoccupation for civil servants training in informatics is revealed by Strategy of Romanian Government,

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<sup>7</sup> Government Strategy on introducing informatics in public administration, O.J., no.705/6 November 2002



Government Decision no. 1007, 4 October 2001, which support the introduction of IT in public administration by means of civil servants training as users of IT.

The Training Center for Public Administration – National School of Political Studies and Public Administration (TCPA) is accredited as the first ECDL Test Center in Romania, for training and testing in ECDL, providing certificates acknowledged in European Union, (since May 2002).

*TCPA expertise in organising ECDL training and testing programmes*

- Since 2000, the Training Center for Public Administration – National School of Political Studies and Public Administration has initiated projects on IT use in training the public employees, aimed to bring their education in line with the exigencies of public administration reform.
- In this context, “The European Virtual City for Education and Training”, developed in “Leonardo da Vinci” programme together with EUC NORD consortium from Denmark and universities from Spain, Germany and Scotland, represents the most relevant project.
- ECDL programme implementation in Romania constitutes an important objective,
- Understanding the complex contents of curriculum, adapting the training materials and methods, establishing the specific infrastructure.
- ECDL programme management.

The managerial team for ECDL programme comprises teaching staff and specialists in IT, holders of ECDL certificate, graduates of online international ECDL tests.

**\*\*Fig 7 \*\***

Logistics for ECDL programme

The ECDL courses are designed according to the European Licence model, adopted as standard by governments of many countries.

ECDL Certificate is a means of indicating that its holder has acquired the basic skills to use a computer in a wide variety of applications.

ECDL is a certificate of knowledge and proven competence and is based on a single agreed syllabus.

The ECDL Certificate indicates the fact that its holder graduated a theoretical test on basic concepts on Information Technology and 6 practical tests that evaluate the competencies to use the computer and to achieve computer applications.

*Description of the modules*

Module 1

Basic concepts on IT – acquiring knowledge and understanding the basic concepts of IT

Module 2

Using the Computer and Managing Files – knowledge and competence in using the basic functions within the desktop environment.

Module 3

Word Processing – word processing application and advanced features associated.

Module 4

Spreadsheets – basic concepts of spreadsheets and demonstration of the ability to use a spreadsheet.

Module 5

Access database – basic concepts of databases and demonstration of the ability to use a database.

Module 6

PowerPoint – competence in using presentation tools

Module 7

Information and Communication – basic Web search tasks using web browsers and available search engines, bookmarks, demonstrating the ability to use electronic mail software.

The training and testing offer comprises special programmes (PSPT):

- ✓ PSPT I – ensures basic training and acquiring ECDL contents
- ✓ PSPT II – complementary modular training for the persons that have already the basic concepts
- ✓ PSPT III – tests for obtaining ECDL Certificate.

Quoting Joseph A. Schumpeter, “public administration should be ready to “reinvent government”, “the process of creative destruction” of traditional structures on behalf of innovative entrepreneurs, in my opinion, we are talking about “redesign” or even “reinventing” our organisations today, we are talking about the same context with different words.

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 does not solve it; rather, in the field of ICT, this attitude has often created “ruins of investment”.

The need for education and training of civil servants in ICT area means:

- ability to use ICT as an everyday tool for solving different administrative and substantive tasks;
- understanding a new information environment and ICT potential;
- understanding new organisation behaviour to meet the needs of new ICT challenges.

## Conclusions

ICTs represent a catalyst for the public sector, in order to improve the decision making process, efficient management of resources, to increase productivity in the public sector.

In my opinion, we can synthesise the actions undertaken in order to achieve the objectives for good governance, from the prospect of e-administration, e-government and e-governance:

1. Using information technologies in order to redesign and improve the administrative processes.
2. Promoting project management in ICTs.
3. Providing a better access to quality information.
4. Creating the team of specialists, a multidisciplinary one in order to introduce and manage information technology.
5. Intensifying research on economic, social, legal and political implications of the new opportunities in IT.
6. Evaluating the experiences.

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Table 1  
 Characteristics of public and private sector and approaches of traditional and market strategies

Model of public sector	Model of private sector
Public choice Need for resources Openness for public action Equality of needs In search of justice Citizenship Collective action as instrument of policy	Individual choice on market Demand and price Stop for private action In search of market satisfaction Client sovereignty Competition as market instrument.
Traditional approach	Client oriented strategy
Anonymous client Standard services Media publicity Dialogue with client Market segment Target groups	Personalised client Personalised offer Individual message Dialogue with clients Client segment Niche

Figure 1  
 The level of changes in the management system

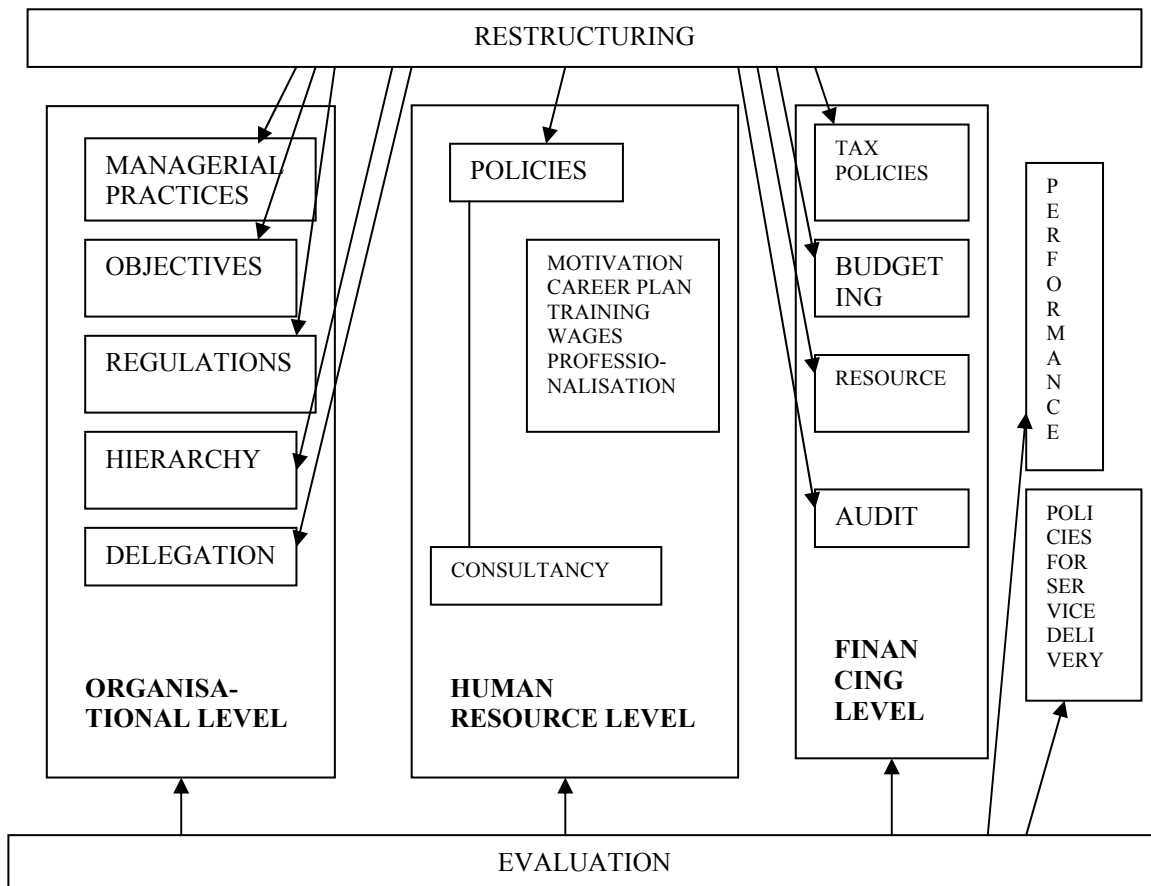


Figure 2  
The relation: ICTs - public organisations strategy

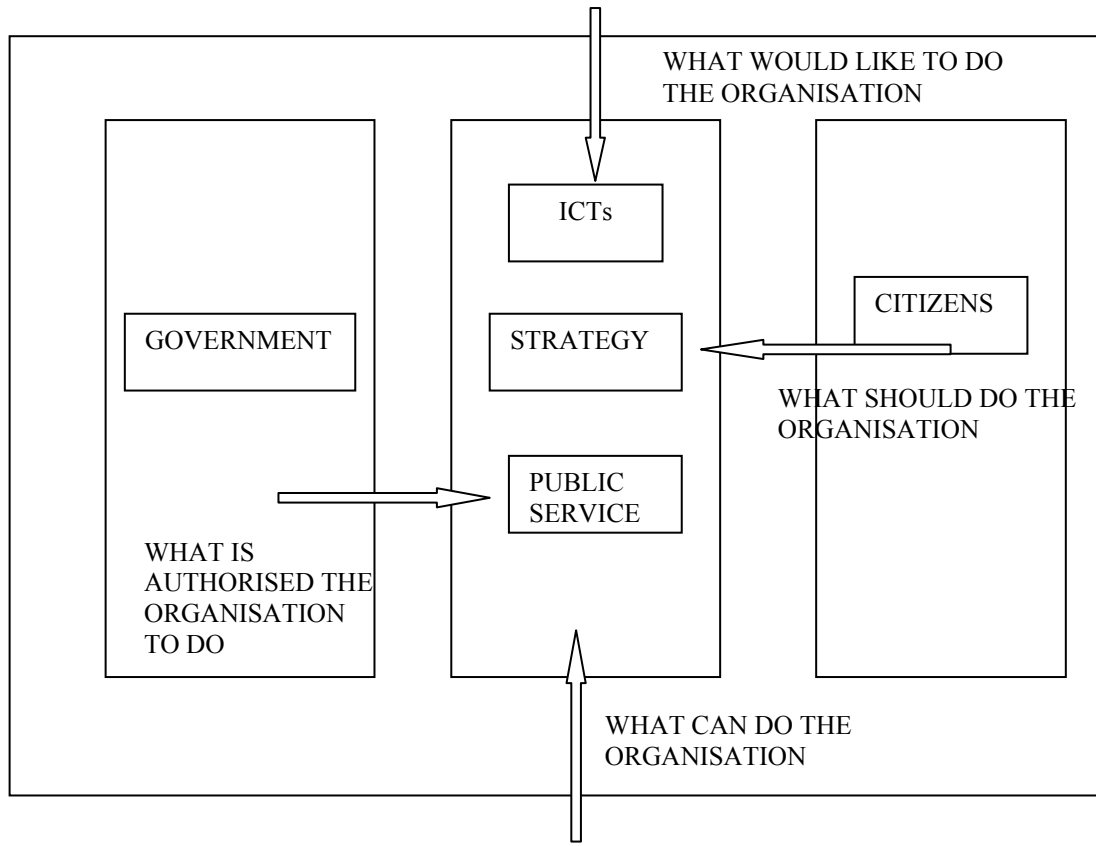
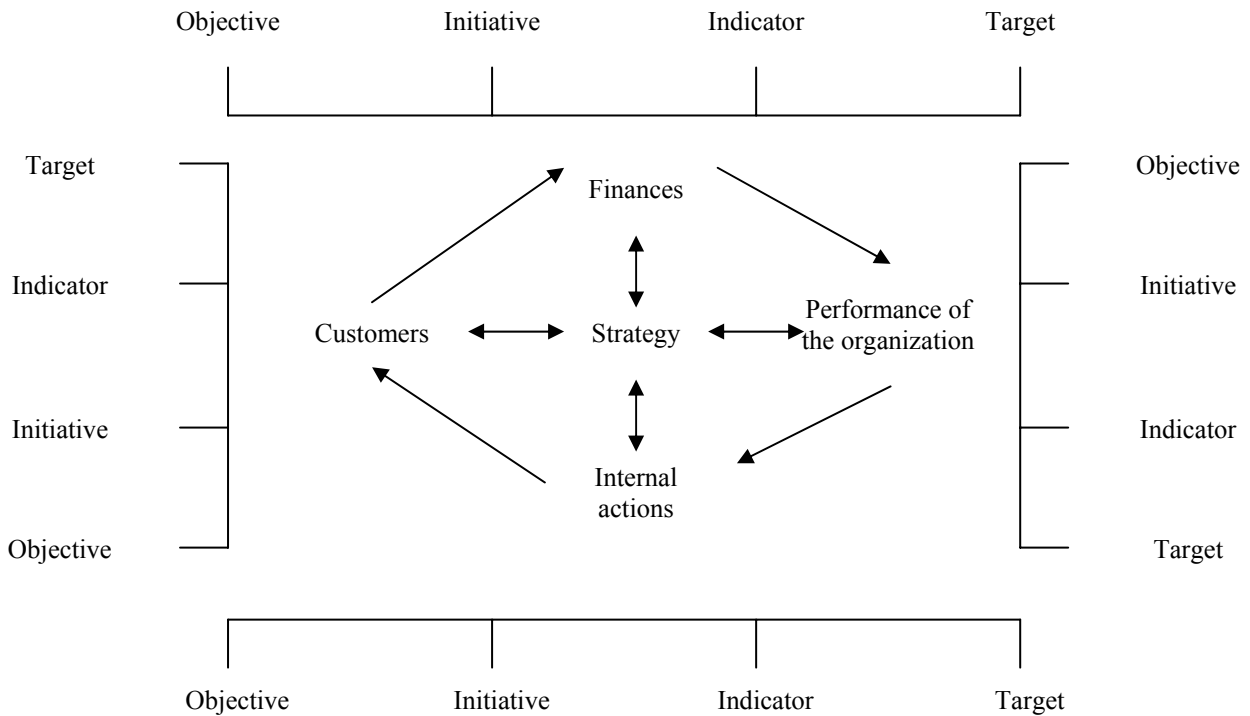


Figure 3  
Integrating the concept of strategy within public services



Source: Fig. 8.2, p.183, Olivier Lagrée, Laurent Magne, e-management, Ed. DUNOD, Paris 2001

Figure 4  
e-public sector Map

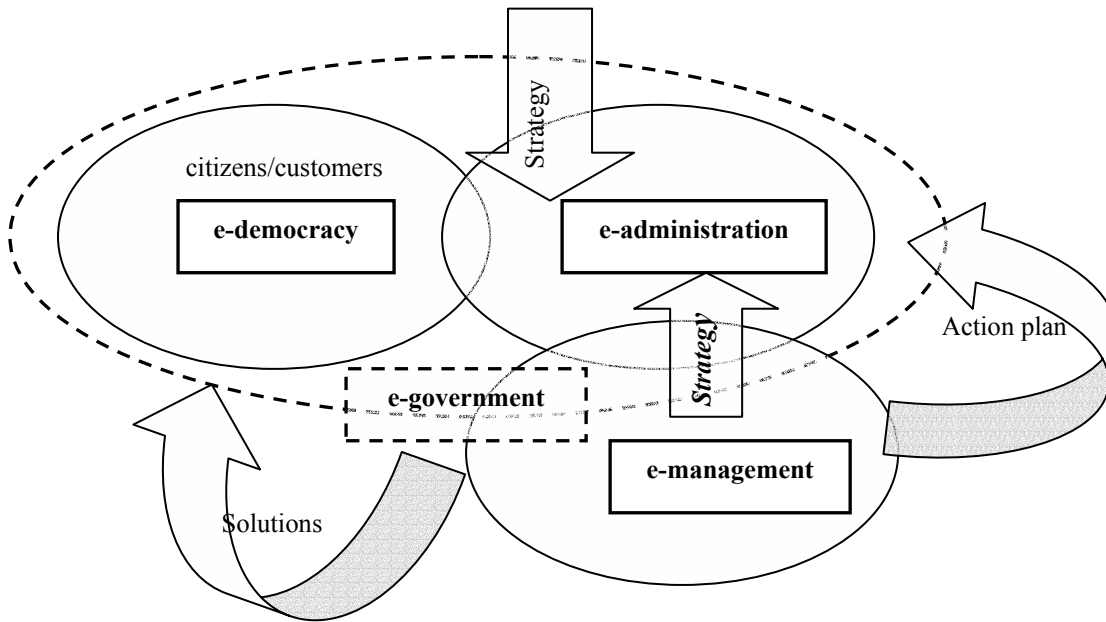


Figure 5  
Curricula design

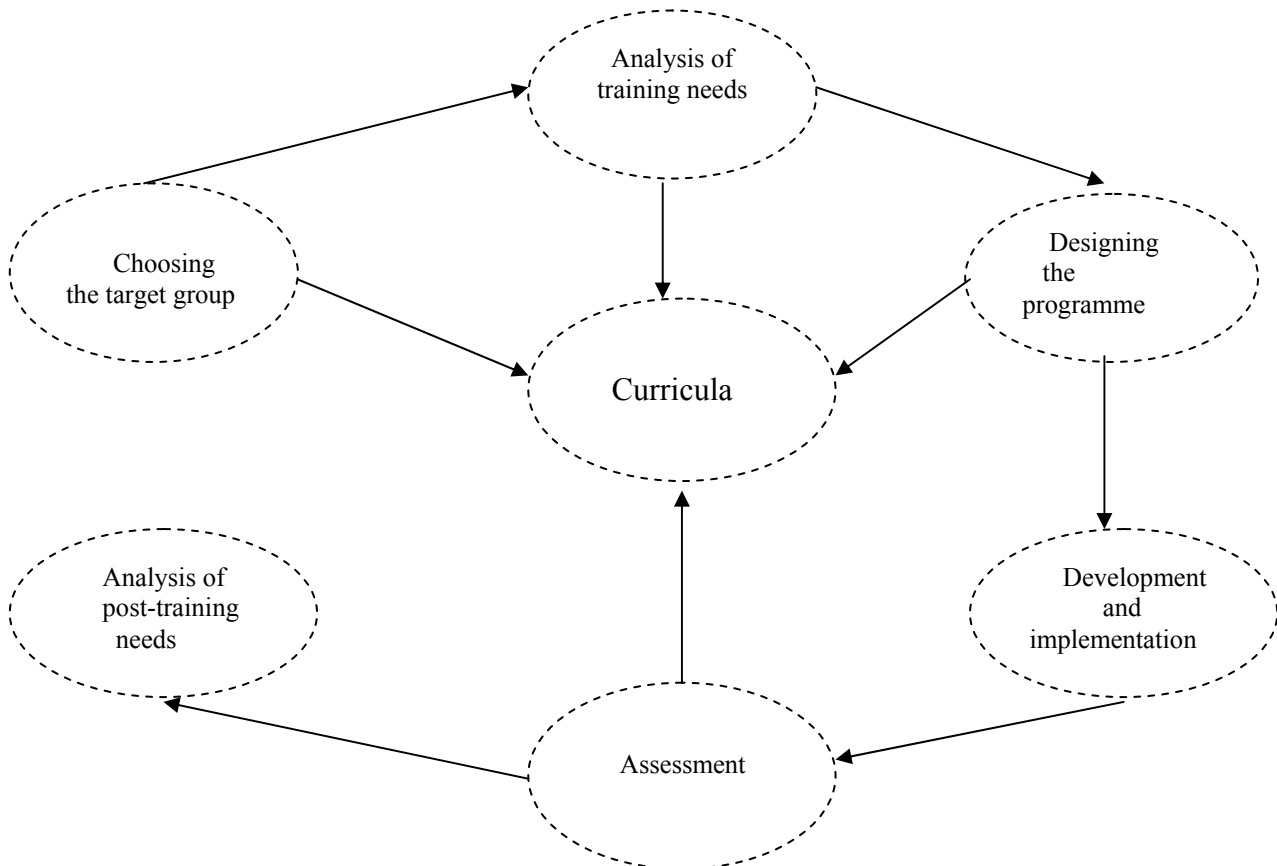


Figure 6  
Levels of knowledge

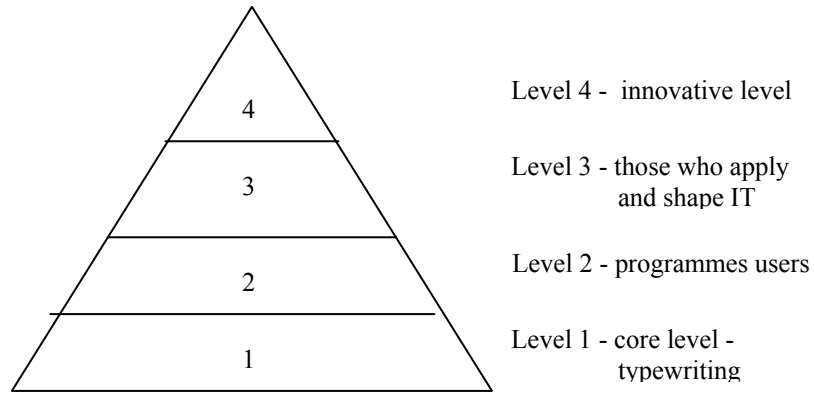


Figure 7  
ECDL Logistics

