Towards Electronic Governance – A Case Study of ICT in Local Government Governance

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ABSTRACT

The objective of the paper is to contribute to the discussion about the ideas and concepts of electronic governance. In the first section, the paper describes the authors' conceptual model of electronic governance and its theoretical underpinnings. The second section of the paper presents the cases of the city of Tampere (Finland) and Issy-Les-Moulineaux (France). The two cities are considered as key examples for implementing the eEurope Action Plan objectives. The paper closes with a comparative discussion of each city's approach towards electronic governance and some clues as to how to pursue this effort.

Categories and Subject Descriptors

The content of the paper does not fit into the ACM Computing Classification Scheme.

Topics of Interest

Citizen Interaction, Social Science Research, Government Application Domains, Governance

Keywords

Electronic governance, state transformation, local government

1. INTRODUCTION

In order to fully appreciate the role played by ICTs in the public sector today, one has to examine how the State and other public actors (e.g., regional government, cities, municipalities, and international organizations) have evolved over the past 20 years and how they are likely to evolve in the years to come. [1, 6] This evolution is a process in which the State in general, and the local government in particular are adapting to globalization and other related changes (e.g., cultural changes, and global environment changes). [7] To understand this evolution process, the paper focuses on the institutional and organizational adaptations of the State, where the ICTs are part of, and to a lesser extent on the substance of the State.

The driving question of the research presented in this paper is therefore how the State and public actors are using ICTs along their own transformation process, both in order to adapt to the changing environment and to shape their new roles and functions, which arise in this adaptation process. On a high level of abstraction, the question might be: to what extent the State and the public actors are using the ICTs in order to improve the lives of their citizens or its own economic environment? In a more detailed level and pragmatic stage, the research question is: to what extent the State and public actors can really, thanks to ICTs, improve their operations (e.g., increase efficiency and effectiveness), better regulate the transformation process and improve the decision-making process while increasingly involving the private sector and civil society?

In the paper, the authors present their conceptual model of electronic governance as an approach to describe, understand, and anticipate the utilization of ICT in governance issues, i.e. e-government programs but also, on a wider scope, multi-actor, multi-level developments of e-services and the negotiations, coordinations and learning they require. The paper takes the example of local government, more precisely the case of the two cities, Issy-Les-Moulineaux (France) and Tampere (Finland) in order to outline how the electronic governance model (e-governance model) can be applied. In the conclusion, the paper tries to anticipate possible scenarios and paradigmatic shifts thanks to which cities can make use of the ICTs to shape governance schemes in the future. Sources for documenting these cases consist of, on the one hand, written (gray) literature produced within the development of e-government and e-governance scheme in the two cities and on the other hand, interviews carried out with key actors of the two cities' "e-" programmes, in addition with some, but limited direct observations.

2. THE THEORETICAL FOUNDATION

The following section outlines the authors' framework to conceptualize the transformation of the State. Hence, the objective of this section is to describe and explain the theoretical underpinnings of the electronic governance model, which is used to analyze the case studies presented in this paper.

2.1 State Transformation

The numerous e-related activities, which are currently being launched in the public sector (e.g., e-administration, and e-service delivery) cannot be fully understood, appreciated, and assessed if they are not placed within the much broader framework of State transformation. The underlying process of State transformation enables the information and communication technologies to take root in the public sector and government agencies. [8, 9] The following paragraph briefly outlines this underlying concept of State transformation.

As a result of the globalization having taken place in the last two decades, the State is changing. This change has three distinct dimensions.

- **Non-State actors**, such as transnational corporations (TNCs) and non-governmental organizations (NGOs) are increasingly gaining influence. The State has to share its power with these non-State actors.

- **Multiple political levels** of managing public affairs are emerging. Such levels differ from the Nation-State level in so far as they represent the above- (European, global) and below (local, and regional) national levels.

- The **functions of the State** are increasingly differentiating into three main areas, namely service delivery, policy-making, and regulation. These three functions can increasingly be treated as being relatively separate from each other and therefore being shifted to the different levels and the different actors.

Taken all together, the three dimensions lead to an increasing fragmentation (functions), dilution (levels), and outsourcing (to non-state actors) of managing public affairs. [9, 10]

Information and communication technologies (ICTs) are part of this change process. On the one hand, ICTs are actively driving the evolution of the State, through favoring more non-State actors to engage in public affairs or through facilitating the multiplication of political levels. On the other hand, ICTs are a means for the State to react and adapt to such changes. ICTs provide solutions to link the different types of actors; they are able to bridge the various levels of public management, and offer new ways of performing the various functions of the State. [11, 12]

As said above, collective problem solving processes are increasingly worked upon through State and non-State actors. Such processes are not dependent upon a single political level, but often occur in all the three different functions/missions of the State (see below, emphasized in bold). With the combination of various variables (levels, actors and functions), the paper thus envisages the State as being more and more part of a governance

system. For the processing of the State's three functions, the following conclusions can be drawn.

- Today, the **delivery of public services** is increasingly being outsourced or sub-contracted to other actors than the State. Thus, the governance structure of such public service delivery is changing. Public services are delivered by a combination of market and non-market actors. The provision of public services requires more complex governance structures than simple market structures. Such complex governance structures involve, for example, partnerships between public and private operators, as well as all kinds of subsidies and other mechanisms of public intervention into the market.

- As a matter of fact, and as a result of the transformation of the public service delivery, regulation issues are emerging. Such regulation has various aspects, and concerns not only the regulation of the (imperfect) (public) services market, but also all kind of technical regulations resulting from the fragmentation of the public services chain, as well as regulation of public policy objectives. The **regulatory function** of the State is due to the fact that numerous actors with highly diversified and often incompatible goals have to collaborate in order to solve the problem of (public) service production and delivery.

- With the background of outsourced public services and technocratic regulation, public **policy making** is particularly challenged to produce legitimation and viable solutions to collective problems, existing or anticipated. Policy making thus becomes an increasingly complex process by which State and non-State actors interact, often across different levels (e.g., from the European Union level via Nation-States to the local level). Governance is a particularly useful concept here, especially when it comes to describing and optimizing such highly complex processes of interaction among actors, who generally pursue different, if not contradictory goals.

In summary, all the three functions – with their respective own governance problems, mechanisms, and structures – need to be articulated in order to produce optimal collective problem-solving process in a complex governance system. [1] Neither in each of the above functions, nor in this more aggregate articulation, is the State any longer totally in charge. Most of the time, the State is simply one of the actors who has to share its power with firms, non-governmental organization, below-national public entities such as for example cities, but also above-national public entities such as, in Europe, the European Commission.

2.2 The Role of ICTs in a Governance System

The next step towards better understanding electronic governance is to examine how information and communication technologies relate to governance. The following paragraph therefore focuses upon the institutional use of ICTs in organizations. [15, 16]

The role of ICT in organizations is manifold. Enterprise resource planning applications such as SAP R/3 are chosen to mirror the existing reality. The software primarily describes the physical reality of the surrounding body (e.g., an enterprise, or a government agency) within an ICT-based system. The ICT

system can be either web-based or stand-alone. The objective of such mirroring process lays in describing and controlling material or monetary flows within an organization.

Business intelligence systems represent another example. Chief Information Officers and IT executives of both, public and private entities are currently facing the challenge of having to be cost-efficient on the one hand and coping with the pressure to innovate for the future on the other hand. They are forced to manage the discrepancy between short-term cost saving and complexity reduction and the need for future oriented investments in IT systems. [19] To improve an organization's decision making processes, business intelligence systems are increasingly used to collect, analyze, and manage all kinds of information flows. [20] The range of applications of business intelligence systems is wide and ranges from helping the U.S. Navy to monitor the readiness of its fleet of 4'052 aircrafts until the analysis and reporting of sales, marketing, supply-chain management, and financial data of the the Stockholm-based maker of *Absolute Vodka*. [21, 22] However, the objectives remain the same in all the different kinds of applications. Business intelligence systems aim at mapping and afterwards enhancing the steering and controlling mechanisms of the organization.

When it comes to the notion of *organization,* one may consider multiple definitions. According to WordNet, an organization is a group of people who work together or persons (or committees or departments, etc.) who make up a governing body. [23] The Oxford English Dictionary defines an organization as *an organized body of people with a particular purpose, as a business or government department*. [24] Both definitions describe a system of actors, envisage organizational levels and functions, based on a set of rules and regulations, which implies in all cases to make provisions for such issues as membership (who belongs and who does not belong to the organization), adequate behavior and goals. Hence, the notion of "particular purpose", mentioned in the second definition can, in turn, be regarded as a governance system.

As a matter of principle, ICTs can either mitigate or exacerbate the challenges which governance systems are faced with. New institutional economists for example, highlight numerous governance problems resulting from imperfect contractual relations among actors. In particular, there is information asymmetry, asymmetry of pre-contractual beliefs, risk non-neutrality, as well as cost non-neutrality of contract execution. By using ICTs, information asymmetries for example can be significantly reduced, provided that both contractual parties have access to these technologies. Otherwise, if such access is unequally distributed, the same information and communication technologies will worsen information asymmetries, and thus make governance problems more severe [3, 4, 5].

According to the above mentioned examples, the role of ICTs in governance systems can be broken down into four individual themes.

- **Mirroring**: ICTs are used to translate the physical reality into a logical model of the governance system, so as to make possible the processing of partial aspects of this physical reality. This means in particular mapping and disclosing the processes, governance mechanisms and organizational structures of the system.

- **Recognition**: Once the logical model is set-up, the information collected about the physical reality is used to generate valuable knowledge about the current situation of the governance system. The objective of recognition is to assess and quantify the status-quo.

- **Implementation**: On the basis of the created awareness and knowledge in the logical model, ICTs are used to implement corrective and steering measures into the physical reality. Such implementation is either done through the implementation of a new ICT system or through the adaptation of a current ICT system.

- **Support**: The role of ICTs during monitoring is to support the evolution and development of the governance system. Support means applying ICTs to enhance the functioning of the governance system.

These four themes are interdependently linked in a cyclical process. *Mirroring* is directly followed by *recognition*, which in turn is the predecessor of *implementation*. After implementing corrective means, the governance systems evolves *supported* by the implemented ICT systems. [14]

The latter paragraph stressed the institutional use of ICTs as a means to reduce the complexity of a governance system and to thus reflect about the system at a higher level of abstraction.

In the next section, we will see how e-governance claims to be a broader concept, although incorporating or overlapping with e-government.

2.3 The Electronic Governance Model

The model of electronic governance (e-governance), which will be presented in the following paragraph, is conceptual in nature. The model aims at facilitating the understanding, the explanation, and the anticipation of information and communication technologies (ICTs) in governance systems.

The e-governance model uses three distinct and static variables, namely actors, levels, and functions, to capture a snapshot of such a governance system (we will stick to the same dimensions as for governance, already envisaged, with however some slight modifications):

- **Actor**: The actor-variable discloses the *character* and the *objectives* of the actors involved in collective problem-solving processes. Actors can stem from different backgrounds, such as State, non-State, public or private actors. ICT actors are this time part of the game.

- **Level**: The level-variable identifies the various organizational or political levels on which collective problem solving processes take place. Levels can be local, regional, national or above national. ICTs tend to allow swifter and more porous passage from one level to the other.

- **Function**: The function-variable represents three core functions, namely policy-making, regulation, and service delivery. The variable describes the process, which the actors are involved in. E-regulation seems to be as small as regulation compared with service delivery and policy-making, but there is both an urgent need to regulate some aspects of ICTs' development

and to use some ICTs to reinforce regulation capabilities of the State.

The three mentioned variables aim at capturing a snapshot of the governance system at a certain point in time. [17] However, governance systems are not stable but are in a continuous development and change process. As a matter of fact, the e-governance model contains a fourth variable, the **technology variable**. The objective of this variable is to describe the past and to anticipate the future development path of a governance system. There are four different values the variable can have. The values are based on the aforementioned findings about the role of ICTs in governance systems:

- **Mirroring** outlines that in the current status of the governance system, ICTs are used to mirror (and eventually monitor) the existing reality of the system (actors, levels, functions).

- **Governance Analysis** means that the physical reality of the governance system has already been mapped into a logical system and that ICTs are now used to explain the mechanisms, the structures, and the dependencies in this system.

- **Implementation** means that ICTs are currently used to implement revised governance mechanisms or newly created measures of governance back into the physical reality of the governance system.

- **Regulation** means that ICTs are currently being used as a means to steer and control the functioning of the governance system.

The four variables described represent the core of the e-governance model. While the variables *actor*, *level*, and *function* stand for the static snapshot of the governance system, the *technology* variable stands for the dynamic component to the model.

In the model, electronic governance thus means to make use of ICTs to provide an effective and efficient framework in support of collective problem solving. Framework in this context means a set of rules and regulations and governance structures that enable the functioning of the underlying governance system. The various actors engaging in collective problems solving on different hierarchical levels and in the various functions of the State have to adhere to this framework.

3. THE CASE STUDIES

3.1 Issy-Les Moulineaux (France)

The town of Issy-Les-Moulineaux (ILM), a suburb of Paris, has approximately 60'000 inhabitants. The unemployment rate is less then four percent. In the last 20 years, ILM transformed from a worker's city into an information society driven town. In the 80's the city's driving development force has been the significant attraction of enterprises from the media-industry, while in the 90's the city administration was actively engaging in information technologies. At the end of the 20th century, the rapid rise of the Internet came along with the digitization of public services and the process of linking-up citizens with public administration and government authorities.

For the city administration of ILM engaging in e-government means simplifying the citizen's and the industry's access to administration and in parallel reducing the complexity of administrative procedures. ILM attracted and is still attracting high-tech companies to invest in the municipality. To maintain this development, the city administration is bound to be as innovative as the enterprises themselves. This in turn means providing a firm and durable political will to reform and transform administrative procedures. ICTs are regarded as one major means to achieve these objectives. For the city administration, e-government is not about replacing a counter with a screen, but hopefully about transforming the citizen's relation to the State and the organization of work and procedures in the administration.

Since 1996, ILM has regularly developed new services for their citizens. The two key priorities for the development of such services have been access to administrative data and services, and the provision of more innovative services. By spring 2003, the following services have been made fully available online:

- Ordering a birth, marriage or death certificate

- Making a reservation for a parking spot in case of relocation

- Paying parking fee using a mobile phone

- Indicating a change of domestic situation for the school file

- Consulting the state of one's account of school special service access (e.g., restoration)

- Making reservations for hotel room, books, and for the multi-media library

- Receiving publications from the city

- Getting access to the kindergarten

- Constituting a wedding file

- Getting access to the deliberations of the City Council

In addition to these "e-administrative" services, the Cube cultural center, which was dedicated to multimedia promotion, offers on-line training and workshops for continuing education.

At the time of the interview (March 2003), ILM has been the only French city being under 'infogérance', which means that all the technical equipment and resources is being taken care of by a private company (Euriware). However, the decision-making process about which technology to choose and what kind of technological solutions to implement is remaining in the hands of the city administration. Due to crucial regulations for workspace provision, new service development, service level agreements, and material supply, the contractual relations are complex, but have proven to be successful for the last seven years (1998 - 2005).

On the participatory level, ILM regularly asks the citizens for their opinions about the ICT development in the municipality and the quality of public services. Besides the constantly improving communication between the public service providers and the citizens, ILM is providing its citizens with the opportunity to contribute and intervene during city administration meetings since 1997. In 2002, two other remarkable initiatives have been launched. The 650 people involved in the 'Citizen Panel'

constitute a representative group of ILM citizens who are consulted via the Internet by the city council when it comes to decision-making on issues of local relevance (e.g. local safety, associations, information technologies and local urban development). The consultation period is of three months (see also for that Santini 2003). The second initiative was the set-up of a participatory budget at the level of district councils. Each year, the district residents are consulted in order to support the city council for decision-making about investment priorities. In 2003, 10% of ILM's investment has been decentralized at the district level

3.2 Tampere (Finland)

With 200'000 inhabitants, Tampere is the third largest city in Finland. Tampere is the centre of the Tampere region that includes the town of Nokia, the birthplace of the well-known telecommunication company. The city has a long industrial heritage (metallurgy and transport equipment). When the industrial ages started to decline, large investments and efforts have been undertaken to modernize the city. In the early 90's the first electronic public services operated in Tampere were reported upon and in 1994 appeared the first website. Until 1998, e-government related activities have been taken up with the Service Information System Project. In 1996, Tampere started to reorganize the administrative workflow by using network technologies, document management solutions, and teamware in order to guarantee a city-wide interoperability. E-Government was seen as way to improve quality, increase efficiency and in the long run generate cost savings. In 1997, the city of Tampere issued its further development strategy under the name 'Information is the key to the future'.

In 2001, the city of Tampere launched the e-Tampere program. One of the core objectives of e-Tampere is to develop the city as the leading developer of Information Society in Finland. The three main themes of e-Tampere are:

- Develop public online services, which are available for all residents,
- Develop a strengthened knowledge base for research and training, and
- The generation of new business related to the Information Society.

Within this newly created Information Society policy, the e-Europe program is the most important above city level program that influenced the cities planning. E-Tampere focuses in particular on the "intersection of economic development and the creation and utilization of knowledge for the benefit of the city" (Anttiroiko, 2003). By 2003, 72% of the Tampere population was using Internet, and 50% used the city online services. In the city, there are over 100 Internet computers in public places, free of charge.

On a more general level, the e-Tampere objectives are mainly economic as there was hope to lower the city unemployment rate by 5%, to create twenty new companies, to increase the number of jobs in the information and communication technology cluster. The e-Tampere program finally aims at making Tampere an internationally recognized, a renowned leader in information society technology research and development.

The development of e-Tampere is the result of an action in which have taken part various institutional actors such as the city, the regional council, the universities and other educational institutions, various research centers, and leading IT firms. The role of the city government has been central. The City manager succeeded to maintain the commitment of both administrative and political bodies for guaranteeing as much continuity and financial resources as possible. The e-Tampere program is directly linked to the City Council. Decision-making is done in close communication with the City Manager and the City Board. In addition, e-Tampere is strongly connected with the Tampere Urban Region and the province business development strategy.

Within e-Tampere, there are four remarkable sub-programs focusing on economic development:

- **eAccelerator**: channels state-of-the-art know-how and resources to support economic growth.
- **eBusiness Research Center**: fosters team- and project-driven research initiatives between State and non-State organizations.
- **Technology Engine Program**: achieves genuine and world-leading research and know-how in the technology domain (e.g., adaptive software components, user interfaces and broadband communication).
- **Research and Evaluation Laboratory**: raises a world-class test and research laboratory for the development of Information Society technologies (IST), providing companies and public sector agencies with access and insight to key IST resources.

On the demand side, there are two important e-Tampere sub-programs: **Infocity** and **the Information Society Institute**.

Infocity aims at making Tampere a model city in the European development towards an Information Society. The project is carried out in close collaboration with the public administration, the third sector and private parties. The objective of Infocity is to provide the citizens with public online services and the required access to such services. Infocity key projects includes:

- **Library Services**: a comprehensive and interactive application enabling the client to check-in, check-out, and get informed about available resources at any time.
- **Map Services**: map services with address search, roadwork, and zoning.
- **Moving**: the housing market mirrored in the Internet. application for new apartments can be dealt with via web-based interactive forms. Movement activities are automatically monitored through the city administration.
- **Social Services and Job Applications**: informative online services inform about open positions and interactive online application procedures.

In parallel to e-Tampere, the Information Society Institute (ISI) is to be implemented between 2001 and 2005 as a joint effort of the two Tampere universities. The central function of the institute is to conduct and promote research on the Information Society.

In terms of political involvement and citizen participation, the city is using the web to make inquiries about the municipality

decisions. It also takes into account citizens' answers when preparing new projects or planning. In addition, four initiatives have been launched:

– a web-based participation and intervention in city administration decision-making;

– citizen surveys which link the municipal budget with the citizens' priorities;

– digital proposals and follow-ups;

– online debates.

Tampere today is one of the key initiators and promoters of information technologies and the Information Society in Finland.

4. CROSS-CUTTING ANALYSIS

The objective of the following section is to conduct a cross-cutting analysis of electronic governance in the two cities of Tampere and Issy-Les-Moulineaux.

The main aims of this analysis are first to show how local governments are using information and communication technology (ICTs) for steering and controlling services, both internally and towards the citizen. Second, the analysis aims at outlining what enormous development perspectives local government still have ahead albeit the two cases are already exemplary cases for the development of the European Information Society.

The analysis starts out with the static analysis of each city's status quo in 4.1 and continues with the analysis of future development paths in 4.2. (dynamic analysis)

4.1 The Static Analysis

The static analysis is organized into three different sections: Tampere, ILM, and the comparative analysis between the two cities. The objective of this static analysis is to capture a snapshot of each e-government/e-governance system. (Tampere and ILM)

4.1.1 City of Tampere

According to the model, the snapshot of the governance system Tampere from an actor point of view looks as follows.

Actors	Role	Objectives
Citizen	Recipient of Public Services	Improve quality of life
	Responsible City Stakeholder	Contribute to the city development
City Management	Decision-Maker	Drive the City Development
	Regulator	Provide an effective and efficient framework
	Manager	Maintain the Governance System Tampere
City Council	e-Tampere Monitoring	Supervise the e-Tampere program
Regional Council	Policy-maker	Promote development strategies
Private Sector	System integrator	New Business Dev.

	Sponsor and spin doctor	Contribute to the City development
Education and Research Centers	Think Tank	Promote Information Society Development

Table 1. Actor analysis (Tampere)

In terms of level analysis, the following results can be drawn from the case study.

Actors	Level
Citizen	Local
City Management	Local
City Council	Local
Regional Council	Regional
Private Sector	Local, Regional, National
Education and Research Centers	Local, Regional, National

Table 2. Level analysis (Tampere)

In terms of functional analysis, the following results can be drawn from the case study.

Actors	Level
Citizen	Service recipients
City Management	Decision-making, regulation
City Council	Policy-making
Regional Council	Policy-making
Private Sector	Service delivery
Education and Research Centers	Service delivery, policy-making

Table 3. Functional analysis (Tampere)

4.1.2 Issy-Les-Moulineaux (ILM)

According to the model, the snapshot of the governance system Issly-Les-Moulineaux from an actor point of view looks as follows.

Actors	Role	Objectives
Citizen	Recipient of public services	Improve quality of life
	Member of the Citizen Panel	Participate in political decision making
City administration	Decision-maker	Drive the city development
	Service provider	Provide public services to the stakeholders of city
District Council	Service provider	Provide public services
	Decision-making	Investment monitoring

Public sector	Service provider	Provide online training and workshop
Private sector	System integrator	New Business Dev.
	Service provider	"Infogérance"

Table 4. Actor analysis (ILM)

In terms of level analysis, the following results can be drawn from the case study.

Actors	Level
Citizen	Local
City administration	Local
District Council	Local
Public sector	Local
Private sector	Local, Regional

Table 5. Level analysis (ILM)

In terms of functional analysis, the following results can be drawn from the case study.

Actors	Level
Citizen	Service recipients
City administration	Decision-making, service delivery
District Council	Decision-making
Public sector	Service delivery
Private sector	Service delivery

Table 6. Functional analysis (ILM

Considered together, the comparative analysis between the two cities reveals the following result.

Variable	Value	Tampere	ILM
Actor	Citizen	X	X
	City administration		X
	City management	X	
	Public sector	X	X
	Private sector	X	X
	Regional Council	X	
	Education and research	X	
Level	Local	X	X
	Regional	X	X
	National	X	

Function	Policy-making	x	x
	Regulation	x	X
	Service delivery	X	X

Table 7. Comparative Analysis (Tampere-ILM)

The table outlines schematically the functions and the levels where the various actors, in each city, engage. As it can be seen in the table, the Tampere has a broad variety of actors contributing to the economic and ICT-driven development of the city. The general level of the actor's engagement is not only limited to the local or regional level, as in ILM, but also to the national or even above-national level. The city of Tampere wants to strengthen its exemplary status not only in the region but also in Europe. According to the analysis, almost every actor involved contributes to reaching this objective. In terms of State functions, the city of Tampere and ILM are engaging in all three areas.

4.2 The Dynamic Analysis

In order to determine the future electronic governance development paths for the two cities, a dynamic analysis needs to be done. This means that for each city the value of the technology variable needs to be assigned.

The following paragraph outlines the process of filling the variable and determining the cities' future development paths. The key questions to be answered are as follows:

- **Mirroring**: Are the ICTs currently being used mainly to *translate the existing governance system* into a logical and effective system of actors, levels, and functions?

- **Governance Analysis**: Are the ICTs being used to *analyze, discuss and arbitrate issues and workflows concerning the physical structures* of the city within an existing logical system which consists in actors, levels, and functions?

- **Implementation**: Are the ICTs used to *implement a discrete setting* of steering measures in order to enhance the governance system from an economic or quality of life point of view?

- **Regulation**: Are the ICTs part of *regulatory measures* that steer, control and manage the governance system's development?

By answering the above mentioned questions, one is able to position the cities of Tampere and ILM in the cyclical electronic governance model as described in 2.3.

4.2.1 City of Tampere

The analysis of the city of Tampere reveals the following results:

Question	Policy Making	Regulatory Function	Service Delivery
Mirroring	X	X	
Governance analysis			

Implementation			X
Regulations			

Table 8. The technology-variable (Tampere)

In the service delivery function, the city of Tampere is currently implementing rich online services, such as the library services, the map services, the moving monitoring and the social services. The city management has "mirrored" this part of the public life into a web-based ICT system. In the governance analysis, questions like 'who needs which kind of services' or 'what are the most popular online public services', have been answered. According to those results, the above-mentioned online services have been and are currently being implemented.

For both the policy-making and the regulatory function of the State, the city of Tampere is still in the mirroring phase. Tampere has started to translate the readiness of the citizens' participation for political involvement into a web-based and broader political system. The system directly links the citizen with the decision-making authorities in the city administration. This linkage can be followed in the ICT system. In terms of regulatory functions, Tampere has only few ICT-supported capabilities. With the eAccelerator and the eBusiness Research Center, there are regulatory capabilities already observable. However, the use of ICTs in such regulatory capabilities remains on a very low (modest) level.

4.2.2 Issy-Les-Moulineaux (ILM)
The analysis of ILM in turn reveals slightly different results.

Question	Policy Making	Regulatory Function	Service Delivery
Mirroring			
Governance Analysis	X		
Implementation			X
Regulations		X	

Table 9. The technology-variable (ILM)

In the service delivery function, ILM is implementing a wide range of public online services (beyond mere digital government translations). Comparable to Tampere but seemingly in a much more proactive manner, the city of ILM has "mirrored" the part of the public life where citizens and city administration are in close interaction, with some additional inputs (innovative services). In the governance analysis, the same questions as in Tampere have been answered ('who needs which kind of services' or 'what are the most popular online public services'), emphasizing some already interesting level of citizen empowerment (the governance layer).

The more interesting function of regulatory capabilities has a very interesting and advanced status in ILM. The concept of the 'infogérance' allows the city administration on the one hand to free itself from the administrative burden and costs of taking care of technical equipment and resources, but on the other hand still leaves the decision-making power in is own hands. The first cycle

of mirroring, analysis, and implementation has already been completed successfully. ILM is currently in the phase of running the 'infogérance' while critically assessing and regulating this specific concept.

In the policy making function, ILM significantly tries to integrate the citizens into the city's policy-making process. Currently, various ICT-based means have been implemented (e-participation, citizen panel, participative budget), which are critically analyzed by the city administration of ILM.

4.2.3 Comparative Analysis (Tampere - ILM)
The service delivery function is very advanced in both cities. Both city administrations have gone through an intensive mirroring and analysis process and are currently implementing a rich variety of online services for the stakeholders of the city, mostly citizens and enterprises. Both cities possess effective ICT-enabled mechanisms to steer and control the further development of online public services. The key drivers of this development process are economic improvement and the enhancement of the quality of life. However, the regulatory development phase needs to be awaited. Although indications have clearly suggested the existence of a tremendous need for online public services, it has to be reassessed whether online public services alone can ensure the focused economic and quality of life related success.

Although very "online public service oriented", the city of ILM turned out to have a well functioning regulatory competence. With the ICT driven concept of the 'Infogérance', ILM regulates the utilization of ICTs to provide effective Information Society technologies to its stakeholders.

In policy-making again, ILM turns out to be a little more in advance compared to the city of Tampere. ILM has mirrored the democratic participatory system into a semi-web-based environment, where citizens can actively contribute to decision-making and policy development. Although not fully ICT driven, ILM has again effective means to provide an appropriate participation framework to the city's participants.

In summary, the city of Tampere has more diversified actors involved in the ICT driven development of the city (E-Tampere). The actors are not only active on the local, but also on the regional and national level. In turn, ILM involves a smaller group of actors on the local level in more than just the service delivery function. Both cities will have to monitor and regulate the provision of online public services in the future in order to ensure that the objectives will be met (economic and quality of life). In terms of policy-making and regulatory competences, both cities have a big potential to make use of the ICTs in order to effectively adopt new policies and implement them in efficient regulatory mechanisms.

5. CONCLUSION
This paper is based on a thorough description of the transformation process of two cities which are currently making comprehensive use of ICTs. The electronic governance model allows examining where ICTs are currently being applied in order to improve local government and public sector governance. It also allows seeing that ICTs are currently playing and in the future will increasingly play an important role not only in online public service delivery, but also in policy-making and regulation of

public affairs. The fact that in the paper two e-European exemplary cities have been chosen does not allow making general statements about the relevance of ICTs in governance, of course, but one can see nevertheless that the importance of ICTs in governance at city level is significantly increasing.

In addition, the study does not allow making specific links of causality, but certainly some general hypotheses on such linkage, presented in the conclusion (they remain hypotheses, for other studies to explore in-depth, confirm or reject). So far, as a matter of fact, the strict correlation between ICT development and State transformation is not so clear. The fact that ILM and Tampere are quite advanced cities in this domain can lead to the conclusion that the active use of ICTs by the political authorities does indeed convey a certain power of transformation. Nevertheless, the analysis of the two cases also shows that the active use of ICTs by political authorities is the direct result of "a city in crisis" which then uses ICTs to help solve its economic and quality of life problems.

This research thus leads to three questions, one pertaining to further research, one to the practical implications of this very research, and the other one to the further development of the electronic governance model:

- In terms of further research, one should analyze how and to what extent the usage of ICTs does indeed change governance in both terms of form and content. To what extent citizens start to behave differently politically as a result of actively using the ICTs? To what extent, for example, the city government changes the way it governs? Strong indications have been observed in the field that there is indeed some empowerment taking place, beyond mere e-service consumption. Just the same, our understanding is that for the moment, such stimulation of inhabitants' participation is mostly indirectly the result of ICT use (ICTs alone do not generate any "meta-substance" such as governance capabilities), i.e., vicarious learning rather than specific, instrumental learning steming from an e-service, a tutorial or a training programme.

- In practical terms, this research should lead cities and other political actors to make much more active usage of the ICTs. As a result of the analysis, one could see that in terms of regulation or policy-making the potential which ICTs offer is enormous. The gradual shift in both cities from mere e-service delivery to increased (direct and indirect) citizen involvement, as well as private actors participation, is not a matter of how efficient are the ICT-based service, but how they are promoted and monitored as a series of conditions, resulting in a meaningful environment for modified and diversified interactions, problem-solving and decision-making processes.

- In terms of research methodology, the electronic governance model in its current status provides a very good approach to describe, and understand the utilization of ICTs in governance systems. But still, the model is on a very qualitative level and needs additional adjustments in terms of analysis precision and explanatory potential. In particular, more should be explored about the role of intermediary actors (deeply involved enterprises, key local figures and organizations, or on the contrary "beyond-city-level" actors), in the transformations taking place.

6. ACKNOWLEDGMENTS

7. REFERENCES

[1] Matthias Finger and Gaelle Pécoud. From e-government to e-governance? Towards a model of e-governance. in 3rd European Conference on e-government 2003. 2003. Dublin, Ireland

[2] Barbara Ann Allen, et al., E-Governance & government on-line in Canada: Partnerships, people & prospects. Government Information Quarterly, 2001. 18(2).

[3] Oliver E. Williamson, Prologue: The Mechanisms of Governance, in The Mechanisms of Governance, I. Oxford University Press, Editor. 1996, Oxford University Press, Inc.: Oxford. p. 3-20.

[4] Oliver E. Williamson, Visible and Invisible Governance. The American Economic Review, 1994. 84: p. 323-326.

[5] Oliver E. Williamson, The Economics of Governance. 2004, Oliver E. Williamson: University of California, Berkeley. p. 57.

[6] Robert O. Keohane and Joseph S. Nye Jr., Governance in a globalizing world, in Power and Governance in a Partially Globalized World, Routledge, Editor. 2000, Routledge: London and New York. p. 193-218.

[7] Daniel Kaufmann, Aart Kraay, and Pablo Zoido-Lobatón, Governance Matters. 1999, The Worldbank: Washington. p. 61.

[8] Elaine Kamarck, Government Innovation Around the World. 2004, Faculty Research Working Papers Series: Harvard University, John F. Kennedy School of Government. p. 51

[9] William W. Boyer, Political Science and the 21st Century: From Government to Governance. Political Science and Politics, 1990. 23(1): p. 50-54

[10] B. Guy Peters and John Pierre, Governance without Government? Rethinking Public Administration. Journal of Public Administration Research and Theory, 1998. J-Part 8: p. 223-243

[11] Gabriele Abels, Experts, Citizens, and Eurocrats - Towards a Policy Shift in the Governance of Biopolitics in the EU. European Integration Online Papers (EIoP), 2002. 6(19): p. 27

[12] Christoph Knill and Andrea Lenschow, Modes of Regulation in the Governance of the European Union: Towards a Comprehensive Evaluation. European Integration online Papers (EIoP), 2003.(1): p. 23

[13] Adrienne Héritier. New Modes of Governance in Europe: Policy-Making without Legislating? in Neue Instrumente der Europäischen Politik: Politik ohne Gesetzgebung? 2001. Vienna: Institut für Politikwissenschaft, Universität Wien

[14] Niko Schlamberger, Measuring Information Society. 2003, Technology Foresight Summit Budapest: Technology Foresight Summit Budapest. p. 16

[15] Kiril Boyanov, Some Trends in Information and Communication Technology. 2003, Technology Foresight Summit Budapest: Technology Foresight Summit Budapest. p. 9

[16] Jos Leyten, Directions for Future Socio-Economic Research on ICTs. 2004, European Commission: TNO-STB. p. 14

[17] Thomas Zwahr, Matthias Finger, and Philipp Müller, More than Digitisation - The Transformative Potential of E-Governance: An Exploratory Case Study, in 3rd European Conference on e-government 2003. 2004: EPFL, College of Management, Chair MIR. p. 9

[18] Robert D. Carlitz and R.W. Gunn, Online rulemaking: A step toward E-governance. Government Information Quarterly, 2002. 19(4).

[19] http://www.businessintelligence.com/ex/asp/code.136/xe/article.htm

[20] http://www.businessintelligence.com/ex/asp/code.123/xe/article.htm

[21] http://www.teradata.com/t/page/128376/

[22] http://www.informationweek.com/showArticle.jhtml?articleID=57701774

[23] http://dict.die.net/organization/

[24] http://dictionary.oed.com/cgi/entry/00333672?single=1&query_type=word&queryword=organization&first=1&max_to_show=10

[25] Santini (2003) *Issy-Les-Moulineaux and CyberVote: An innovative way to modernize elections*. In The IPTS REPORT, Institute for prospective Technological Studies, No. 75, p. 6