The Importance of ICT for Cities:
e-Governance and Cyber Perceptions

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Abstract

This paper offers a critical review of current debates on the importance and the potential of ICT for modern cities. Much attention is given to the opportunities offered by local e-governance, as a systematic strategy to exploit the potential of ICT for the public domain in European cities. Since the views of many experts and elected policy-makers in cities (so-called 'urban frontliners') is coloured by subjective expectations and perceptions, we examine in particular the extent to which the expected influences of ICT, as perceived by urban frontliners, affect their perceptions of the relevance of ICT to mitigate contemporary urban challenges. The final (empirical) part of the paper addresses the issue of the systematic study of cyber perceptions of cities in Europe.

PN290GCB

1. ICT and e-Governance

The digital revolution – as a fruit of ICT usage – has not only exerted a profound impact on modern business life or on our daily ways of working or living, but begins to enter also increasingly the public domain. Governance and administrative institutions – ranging from local to national - are gradually adjusted to the new potential offered by modern cyberspace (mainly Internet-based). Cities in particular, where the interaction between citizens and government is rather direct, have recognized the efficiency gains of the electronic age. Consequently, in recent years the social science literature has been enriched with new terms like 'digital government', 'cyber government', 'virtual government' and 'e-government'. Clearly, the pace of acceptance of such concepts differs per country and per city, but there is an undeniable trend that the modern ICT is gradually imposing its footprints on the domain of public governance. It is clearly recognised in the modern digital research community that in an networked world – be it global or local – ICT offers many opportunities and venues for the public domain to realize many efficiency gains and to enhance the democratic interaction with citizens. In this paper we address in particular e-governance, as a modern usage of ICT opportunities - in particular the Internet – in order to judge the opportunities for better government. In addition to a review of these new opportunities, we will also study empirically the perceived importance of ICT in cities by investigating in more detail the 'cyber image' of cities in Europe.

Research on e-governance is nowadays booming and addresses many challenging topics such as information intelligibility and accessibility of information in a democratic society, digital democracy through ICT use, open source and privacy issues in an e-society, digital divide and democratic access, computer software and digital archives in a local democracy, data security and anonymity, awareness creation and public watchdog systems in an e-society, local process organizations of e-democracy and so forth (see e.g., Berra 2003, Chadwick and May 2003, and Fountain 2001). The challenges are indeed numerous and cover all domains of public policy, such as security, socio-economic policy, health care, education, transportation, technology transfer, market governance, contingency management, environmental monitoring or resource management. The e-society has just entered its initial stages and its evolution will certainly be governed by many learning experiments, when technological, socio-political, legal and psychological determinants will influence its pathway (Docherty et al. 2001, and Hood and Lodge 2004).

The growing importance of ICT in everyday life, business activities and governance prompts the need to incorporate it also in local democracy. Clearly, ICT policies at the local level are still in an early stage (Servon and Horrigan 1997; Cohen and Nijkamp 2005). Urban administrations are just beginning to wrestle with the wider economic and societal implications of the information revolution (Evans 2002). There is much talking about e.g. e-administration, but this is often more a wishful concept than a reality.

In several countries new research initiatives are planned to explore and exploit the benefits of e-governance, such as NSF's Cyberinfrastructure Program (see Arens et al. 2005) or the EU

Intelcities program (see Curwell et al. 2005). The Cyberinfrastructure Program aims to address the potential of electronic infrastructure to enable more ubiquitous, comprehensive knowledge environments that provide complete functionality for the science engineering research community (in terms of people, data, information, tools and instruments) using modern ICT opportunities. The Intelcities Program is an EU program in the domain of networked businesses and governments and aims to explore and create a new and innovative set of e-government services to meet the needs of both citizens and businesses by providing interactive local on-line applications and services to citizens from the perspective of social inclusion and broad access.

The European Commission (2005a) has argued that Europe needs efficient, effective, inclusive and open governments in order to offer high quality services for citizens and business. It is foreseen that the introduction of e-governance will generate significant or even massive benefits. For example: the economic impact of moving towards electronic public procurement is generally assessed to be considerable, in terms of increasing efficiencies and reducing procurement costs, so that – given the size of public procurement (some 16% of GDP on average in EU countries) and even assuming that only half of the saving would be realized – this saving would represent over 40 billion per annum in the EU. The expected revenues of e-governance[1] are indeed sky-rocketing and this expectation prompts research issues of various nature (Staples et al. 2002).

After the avalanche of new e-services in the private sector in Europe, we witness nowadays a formidable rise in e-governance services. At present, 90% of public service providers in Europe offer already an on-line presence, while approximately one half of all basic public services (e.g., social security benefits, tax revenue services, elections, car registration, enrollment in educations) are fully interactive (see European Commission 2005b). It is expected that all these new e-services will generate high benefits for citizens and businesses in Europe and that e-governance will enhance the quality and efficiency of public services in Europe from local to European level. Of course, for such benefits to be realized it is necessary that the European 'information space' is open and efficiently organized, is ensuring an enhancement of the innovative and socio-economic potential in Europe and is favouring sustainable development in a participatory society (cf. Lash 2003).

The public sector itself will only be a major beneficiary of e-governance, if the interaction with citizens is improved, if governments use e-services as an enabling technology for enhancing the quality of public services, if governments are pro-active partners in socio-technological innovation (e.g., as a launching customer) and if they develop new concepts from the perspective of a knowledge-based innovation society (OECD 2005). Consequently, there is a need for a systematic e-governance architecture which would ensure productivity and quality rise in the

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[1] In the sequel of this paper we will use the term e-governance, which will be interpreted as the use of ICT, combined with organizational change and new skills to improve public services, increase democratic participation and enhance public policy-making, sometimes in combination with private sector initiatives.

public sector on the basis of solid benchmark analysis, shared good experiences and lessons, and an efficient and non-bureaucratic organization of e-services.

Generally speaking, the benefits of e-governance – as a result of technical performance and organizational improvement – may be assessed on the basis of an improvement in efficiency (e.g., cost reduction or costs avoided), in effectiveness (e.g., higher client gains and opportunities) and in good governance (e.g., gain in trust of citizens due to de-bureaucratization). But the value analysis of each of these three items is a complicated matter characterized by an abundance of uncertainty, where the feasibility, the necessity, the risk-orientation and the acceptability by the public play together a major role (cf. Graham and Martin 1996). Since public authorities operate normally under strict budget constraints – and less under revenues constraints - , it is difficult to judge the social and financial viability of e-governance projects. Unfortunately, the field is full of unjustified rhetoric, as witnessed by the following quotation: "78% of Information Systems projects failed to realise even 50% of the originally identified benefits" (*Management Today*, 2001).

Admittedly, the high expectations on the public benefits of ICT are often based on vision, expectations and sometimes irrealistic assumptions. Views on ICT and its impact on urban and everyday lives may sometimes create a biased perspective affecting the willingness of urban frontliners to promote ICT policies. Against this background, the present paper aims to test the extent to which the local leadership's perception of ICT impacts affects their views of the relevance of ICT policy. The study is based on extensive data collection at local levels in Europe. After an overview of various issues related to e-governance in Europe and to cities in Europe, we will address more specifically the expectations on the 'cyber' potential of cities in Europe and test statistically the above hypothesis. The paper will be concluded with some policy lessons.

2.   e-Governance in European Cities

ICT is an enabling technology that is – like any other technology – subjected to a normal life cycle, with one exception: in the public domain it is often linked to principles like democracy or equity. This may cause a hype in the initial stages of the technology, followed often by a period of disillusionment on the actual performance of ICT-services in the public domain, with at the end a collapse or an incorporation in existing mature markets in the domain concerned. e-Governance presupposes open and interactive communication channels, leading to deliberative democracy. If this condition is not met, it will end up with a misinformed democracy with information overload, loss of trust and quality of official information sources and media, and emerging trends towards new forms of e-bureaucracy. There is a major challenge for governments – from local to global levels – to ensure a balanced and efficient set of e-mechanisms that stimulate the trust and accountability of the public sector (see also Abramson & Morin 2002, and Van der Meer & Van Winden 2003). As Salomon (1998) stresses, technology, in general - and ICT in particular - is not merely a collection of hardware. Technology is a socially perceived construct. Moreover, ICT is not neutral and may, depending on specific

contextual and image factors, accommodate either dispersion or concentration trends (Nijkamp and Salomon, 1989). Moreover, the use of the technology is regulated, on the one hand, by the expected value it provides to the potential user and, on the other hand, by various rules and norms, and these uses and regulations determine the impacts of ICT on society and their spatial structure. This policy may have two forms. The ICT sector is either viewed as a final goal in itself, which has to be achieved through the implementation of proper policy incentives (e.g. fiscal policy, land use policy or educational policy as instruments to achieve ICT goals). Or it views ICT as a vehicle to achieve higher-order goals for the public domain (such as a strong international recognition or a recognized local democracy).

Since the mid 1990s we witness an avalanche of publications on the barriers and benefits of the digital revolution. It was suggested that we were all going to live in cyberspace, mainly Internet-based. These visions were sometimes based on irrealistic expectations or subjective images. This cyber revolution would not take place everywhere on the globe, but would have its origin in the modern city. Such cities were called digital cities. Clearly, in a virtual world many cities would have to seek for a new competitive position by exploiting the potential of new communication technologies. Such cities would have to orient themselves towards new telecommunication infrastructures, new modes of working, living and interacting, and new forms of policy-making (see also Boyer 1996). This development may lead to the emergence of various groups of citizens (see Graham and Aurigi 1997), viz. the information users, the information used, and the non-plugged population. This would also have a great impact on the public domain and the functioning of democracy at local level. In any case, the digital city is not yet reality; it is largely based on visions and beliefs.

There are many metaphors trying to capture the futuristic and far reaching consequences of ICT for the city and society at large (Graham and Marvin 1996). Urban planners and decision-makers may agree or disagree on these varied visionary thoughts, but surely cannot ignore them when policies for the future have to be developed. Expectations and concerns on ICT expressed in many respects (economic growth, social segregation, environmental issues and so on) may motivate decision-makers to employ different policies related to ICT. Thus, the intensive ICT debate raises the question on how urban decision-makers assess the opportunities from ICT policies and the relevance of such policies for their city, while recognizing that many views are based on unjustified perceptions or expectations.

Urban e-governance had been given much attention in recent policy debates in the EU, in particular in the context of the so-called Intelcities programme referred to above. Its aim was to develop an urban e-governance model, that would specify the benefits and the objectives for the users, address the challenges of delivery and success, highlights the special concerns of cities in Europe and map out policies that guide implementations. The final goal would be to foster a better city government, to offer better urban (e-)services, to enhance local democracy and to improve urban decision- and policy-making from a participatory perspective (see e.g., Conroy and Evans-Cowley 2006, Di Maria et al. 2004, Di Maria & Micelli 2004). The analysis of e-

governance opportunities and limitations was based on field work in various European cities, where a systematically designed questionnaire was used to obtain a comprehensive view of local e-governance by various key groups such as citizens, businesses, governmental officers and professionals.

General research findings on the potential of e-governance for cities are:

- presence of alternative approaches to e-governance, with quite opposite trends between northern (bottom-up) and southern (top-down) countries of Europe;
- evolutionary trends in the adoption of technologies by governments from back-office reorganizations (focus on efficiency) to effective and interactive relationships with citizens and businesses (focus on communication);
- existence of a primary interest of (local) governments in improving existing services through ICT and then enlarging the scope of the on-line services provided, ranked among the most important priorities (before e-democracy);
- significant efforts made by all the European countries towards developing common policy frameworks, through *ad hoc* legislation, in the domain of e-governance, within the European general Information Society framework;
- existence of a digital divide between European countries (and cities) in terms of ability and capacity to exploit information and communication technologies to achieve policy goals, with strong differences between northern and southern countries, although with some exceptions.

The specific results from the Intelcities research in the form of policy lessons and recommendations from and for the cities concerned were the following:

- involve citizens and local communities on a stable basis in the use of ICTs through distributed points of access, easy-to-use technologies and services, social programs of inclusion and effective/efficient service responses (increased community value);
- promote public-private partnerships with national and, most importantly, local IT operators to increase efficiency and also achieve tailor-made solutions as well (on a competitive basis, as in the case of re-use of solutions and knowledge developed – local markets for ICT solutions);
- invest in networking (specially among cities and local authorities) to spread and re-use positive solutions and best practices as well as to pool resources for experimentation (sustainability);
- foster qualified knowledge management strategies within governments – and between governments, business and communities – in terms of ICT-based content creation and management, information and process transparency.

Clearly, there is an enormous variety in the type and quality of e-services provided, to both citizens and businesses. Examples of such services offered to citizens are: civil registration

systems, health system, social insurance systems, pensions (retirement provision systems), civil benefit systems, on-line applications, on-line service requests, on-line consultation possibilities, access to local politicians, and so forth. Next, promising and illustrative examples of e-services for businesses are: customer relationship management systems, funds systems, business budget systems, employer development systems, managing resources systems, business accountancy systems, customer declaration systems etc. Thus, there is a great variety of new challenges for governance systems to better serve a client and to create an added value to society.

We may conclude that nowadays a growing public interest in e-governance is arising which leads to policies and strategies to induce ICT development and mobilise it in order to achieve a variety of desired public goals (i.e. national ICT policies, improved local democracy, better public service provision or intervention and deregulation in the IT sector). Several publications on this subject have painted a picture of a future society in optimistic colours, but have failed to provide clear evidence of how to get from here to there and what will be the consequences of the adoption of these technologies on other constituents of society (Melody 1996). Alongside the expectation that the private sector will play a major role in the ICT field, the expected benefits from ICT are encouraging policy-makers and planners to formulate public policies, which favour the development and adoption of ICT in the public domain (Gibbes and Keite 1997, Graham 1997, Graham and Dominy 1991).

ICT is expected to have significant influences on the city, its shape and its metabolism. Therefore, one would expect that urban planners and urban decision makers are likely to be major players in the ICT field. Some scholars are urging and hurrying urban decision makers to act in that field (e.g. Caves and Walshok 1999). However, as Graham and Marvin (2000) argue, despite the central importance of the 'urban' in cyberspace debates, issues of urban policy and planning have often been absent within both the popular and academic sides of the discussion. There are however, several types of urban ICT policies that can be found in cities (Graham and Marvin 2000, Gibbs and Tanner 1997):

- integrated transport and ICT policies (e.g., teleworking programmes, communication corridors);
- city-level new media and IT strategies (city networks, local services, infrastructure);
- information districts and urban "televillages" (enabling advanced IT infrastructure to attract firms);
- integration of marginal groups in the city through ICT initiatives and better access.

A specific area that has attracted a great deal of attention is the provision of municipal information and services through ICT applications (mainly via the Internet). The first goal is the improvement of services to the citizens, and the supply of more efficient services. A second goal is supplying information about the city to potential investors, inhabitants or tourists (unfortunately many municipal web-sites in Europe are available just to native-language speakers). A third goal is to increase public participation in local processes by better information

and possibilities to react, on-line, to proposals in the city agenda (e-governance). Rouillard (1999) explores the possibilities of ICT as a tool for public participation and concludes that e-governance can make the policy-making process both transparent and vague, so it is not a guarantee for an informed public.

Pratchett (1999) stresses that ICT have the potential to fulfil three complementary roles of local authorities: local democracy; public policy making; and direct services delivery. However, as Pratchett claims, there is a systematic bias which favours service delivery applications and overlooks applications regarding the other two roles. The reason for the bias, according to Pratchett, is that the decision-makers who initiate the ICT policy are not active in the other policy areas.

Another important initiative is to increase access to the Internet in public places as part of the overall strategy to increase access to the Internet. Other cities have built community tele-centres, which are supposed to deliver public access to marginalised populations. In these centres (which also can be schools), in addition to access to Internet and other ICT services, there are often also training and support services. Clearly, without the appropriate skills, the availability of equipment and infrastructure is worthless.

Other tele-activities that are stimulated by the municipality aim to serve the disabled or other disadvantaged groups in order to help them overcome physical barriers. In some cities (e.g., Berlin), there are tele-video services to pensioners, to enable them to get help and guidance through the videophones. ICT may thus be a tool to enhance e-governance on the one hand and to reinforce the cyber image of cities on the other hand. In the next section we will pay more attention to the formation and perception of cyber images by cities.

In conclusion, information and knowledge have become critical success conditions of cities and regions in a modern economy (Oakey 1996). It is no surprise that many cities have started to acquire a new ICT-oriented profile in a globalizing and competitive economy (Drennan 2002). Urban administrations were keen on this new development and started to design city images which would emphasize the ICT potential of their cities.

The process of policy-making has an uncertain nature, both with regard to the future and the effectiveness of the policies that are implemented (Dror 1986). Moreover, the assessment of future situations is based on the way decision-makers evaluate the current situation and the picture that they have in mind. Thus, both expectations on the future and the assessment of reality serve as an important input for the policy-making process. Especially in the case of ICT, which is, as been said earlier, full of metaphors, it is important to include visions (values) as explanatory factor in the assessment of different policies.

It is thus critical to understand the extent to which urban policy makers perceive and assess the relevance of ICT for coping with contemporary urban challenges. Consequently, one should study their beliefs about the ability of ICT to affect both urban trends and their expectations about ICT influences on urban administration and urban governance. In our empirical part we will now

test the relationships between the expected influences of ICT and the perceptions of the relevance of ICT policies.

3.   Cyber Perceptions: Database and Methodology

As part of the European project TeleCityVision[2], an extensive survey has been held targeting urban decision-makers (both politicians and responsible administrative staff) in more than 200 cities in 7 European countries. The survey was conducted between May and September 1999. The questionnaires were sent to various departments in the municipality that were supposed to have a direct or indirect influence on ICT related activities in the city, as well as to elected officials of the city (politicians). The effort to include various municipality department members in our sample was due to the fact that ICT policies and strategies do not have one recognized responsible body. In contrast to fields like transportation or education, where there is a clear address that is responsible for policies in the field, ICT tends to be a fragmented activity and there is no single clear address in the municipality responsible for all relevant information. A full analysis of the Dutch survey can be found in Cohen (2004).

The respondents were asked to evaluate extensively a variety of attributes and aspects related to their city, the urban policies and their opinions about ICT, as well as their personal use and satisfaction concerning ICT applications. Most of the answers to these questions are given on an ordinal scale, measuring the relative degree of agreement or disagreement with different statements, or the relevance of different issues for the city. Table 1 presents the distribution of respondent's views on the expected influences of ICT on various urban aspects. Table 2 present their views about the effect of ICT on urban governance.

As Table 1 indicates, most of the respondents view ICT as having considerable influence on the importance of their city and the competitive position of the city. They also attach high influence to ICT in attracting service companies to their city and in enhancing the business attraction to their city. There are more sceptical opinions about the ability of ICT to affect spatial trends (such as suburbanization) or social aspects (e.g., social segregation).

Table 2 indicates the suspicious attitude of a large part of the respondents with regard to ICT-instigated improvements in urban governance. Most of the respondents believe that ICT improves citizens' access to useful information and will improve services given to citizen, but are more sceptical about the ability of these technologies to solve social problems or to improve the urban decision-making process.

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[2] The survey was part of the European research project "TeleCityVision", funded by the European Commission. The partners are: BIS (Germany), COMTEC (Ireland), CTS (Norway), ESI (The Netherlands), FHC (Spain), ICCR (Austria), THEMA (France) and ZTG (Germany).

Table 1: The extent to which ICT is expected to affect urban trends (%)

	High	Medium	Low	None	No opinion
The importance of our city	54.6	34.5	10.1	0.7	0
The importance of *small cities*	28.3	43.7	23.4	1.6	3.1
The importance of large *cities*	58.5	31.4	7.4	0.6	2.1
Competition between our and other cities	44.4	39.0	14.5	2.2	0
The potential of our city to attract service companies	56.8	33.9	8.3	1.0	0
The potential of our city to attract *industrial enterprises*	23.7	38.6	31.9	5.8	0
The potential of our city to attract new residents	17.4	40.3	33.4	9.0	0
T*he importance of the central business district* in our city	20.4	34.7	36.4	8.5	0
Suburbanisation	7.7	27.4	42.5	15.5	6.9
Socio-spatial segregation in our city	4.0	20.6	45.4	22.4	7.6
Traffic in our city	13.3	36.5	41.1	9.1	0
The flow of goods	16.2	34.7	38.0	9.2	0
The flow of people	13.1	39.1	37.8	9.1	0.9
The *effectiveness of environmental protection* in our city	13.2	40.5	34.7	11.6	0

N=1391

Table 2: The extent to which ICT affects urban governance aspects (%)

	Strongly agree	Agree	Disagree	Strongly disagree	No opinion
ICT changes the policy making process in our municipality.	22.9	50.0	22.8	4.4	0
ICT makes the political decision-making process more efficient.	21.7	45.3	25.9	7.1	0
The implementation of policies is more efficient with ICT.	21.1	52.8	21.2	4.8	0
ICT improve communication within our city administration.	53.8	40.8	4.5	0.8	0
ICT improves the ability of our city administration to serve the citizens.	54.9	41.0	3.7	0.4	0
ICT improves citizen access to *useful* information.	61.7	35.5	2.4	0.4	0
ICT gives the administration better access to public opinion.	31.0	48.7	18.0	2.3	0
ICT leads the administration to take greater account of public opinion in forming policy.	14.2	42.2	32.4	6.0	5.2
ICT increases citizen participation in the policy process.	15.6	52.5	26.9	5.0	0

N=1391

Finally, Table 3 presents the distribution of the respondents' views about the relevance of ICT to various urban challenges. It shows that economic goals (such as general economic development, business attraction and competitiveness) are perceived as more relevant challenges to ICT compared with governance challenges.

Table 3: The perceived relevance of ICT for urban challenges (%)

	Strongly agree	Agree	Disagree	Strongly disagree
Economic development is a very important area for the deployment of ICT.	42.1	51.2	6.0	0.7
Attracting new enterprises is a very important area for the deployment of ICT	38.6	48.2	12.1	1.0
The application of ICT is intended to render the political/administrative process more transparent for citizens.	25.5	52.2	20.1	2.2
Improving citizen-municipality relations is a very important rationale for the municipality's deployment of ICT.	24.6	54.1	18.1	3.2
ICT is deployed in urban planning to improve planner-citizen communications.	17.2	55.6	22.7	4.5
ICT enables better networking with other cities.	36.7	55.2	6.5	1.6
ICT can make our municipality more competitive vis-à-vis other cities.	43.2	48.0	8.1	0.7

Next, we will use the respondents' expectations on the nature and direction of ICT impacts on urban trends and urban governance to detect their beliefs about the ability of ICT measures to solve urban problems and promote urban development.

4. Cyber Perceptions on Urban ICT Policies

As shown in Section 3, urban frontliners assess differently the influence of ICT on various aspects of urban future trends and urban governance. Now we will test the hypothesis that the more an urban frontliner believes in ICT influences on different urban features, the more he/she considers a variety of ICT policies as relevant to his/her city. In order to test this hypothesis, three aggregated variables were constructed on the base of the data discussed previously.

(1) The dependent variable, the perceived relevance of ICT to meet urban challenges (ICT goals), is the sum of all variables presented in Table 3. The minimum value of ICT goals is 7 (none of the seven goals mentioned in Table 3 is relevant) and the maximum value is 28. Figure 1 shows the distribution of this ICT variable.

(2)   The independent variables, i.e., the views about the influence of ICT on urban trends (Table 1) and urban governance (Table 2), were also computed as the sum of all indicators shown in the mentioned tables. Table 4 presents descriptive statistics of these variables.
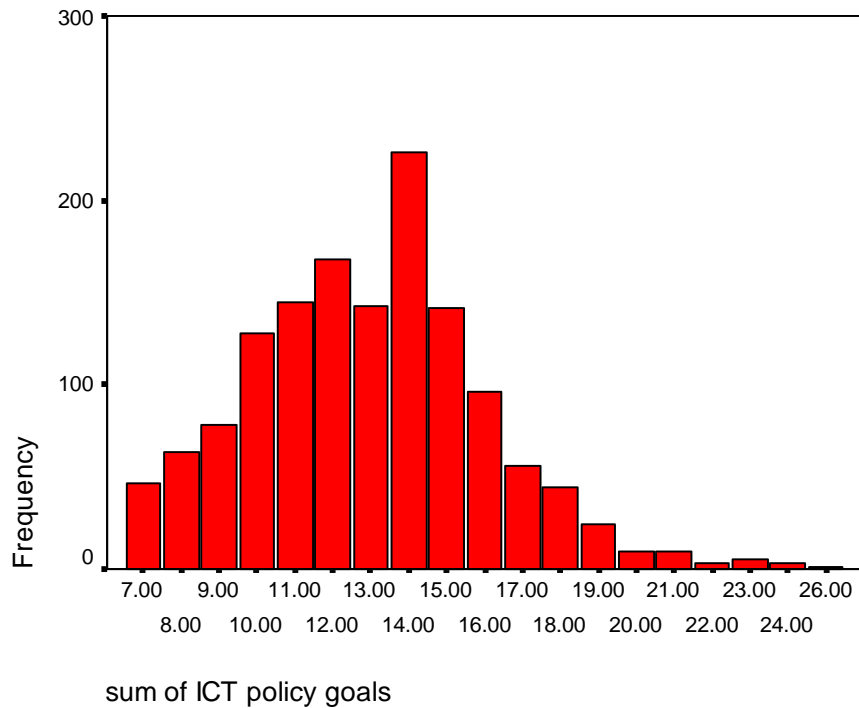

Figure 1: Distribution of Perceived ICT Policy Goals

Table 4: Descriptive Statistics of the Independent Variables

	Minimum	maximum	mean	SDV
Influence of ICT on urban trends	14.0	56.0	30.6	6.5
Influence of ICT on urban governance	9.0	34.0	17.3	4.6

Table 5 then presents the results of a linear regression that was performed to test the above hypothesis about the impact of views about ICT impacts and views about the relevance of ICT as a policy tool to meet urban challenges.

Table 5: Model Results from Regression Analysis

Dependent variable: _perceived ICT policy goals_	BETA _(standardized)_	t value
the influence of ICT on urban trends	0.156	5.724
the influence of ICT on urban governance	0.510	18.774
R^2=0.36		

N=1126

Our model results that are presented in Table 5 show that there are positive and significant relationships between the perceived effects of ICT on the city and the extent to which ICT is considered as a relevant policy tool for various urban challenges. Perceived influences of ICT on urban governance have greater impact on the perceptions of ICT policies, meaning that when an urban frontliner views ICT as having a significant impact on various administrative and decision making aspects, he/she tends to consider ICT as a suitable policy tool for various urban challenges. When ICT is not perceived as having an impact on urban development and urban governance, it is neither perceived as a relevant policy tool.

5.   Concluding Remarks

Living in the 'Information Age' is a rather confusing experience. On the one hand, a growing share of our everyday life relies on electronic streams and invisible bits. On the other hand, the 'real' world exists and it demands physical and visible inputs; face-to-face meetings are still irreplaceable and there is still a growing demand for physical movements of people and goods. Using ICT to promote economic and social goals is therefore based on visions on the one hand, and critical judgment of the ICT potential on the other hand.

This paper has demonstrated that decision makers have different views on the potential and limitation of ICT effects on the urban environment. Such differences are also reflected in their views on the relevance of ICT in promoting urban goals. Therefore, anticipating ICT initiatives in European cities should be done not only by examining pan-European ICT initiatives, but also by studying beliefs and perceptions of local decision-makers and their perspectives. As demonstrated in this paper, local initiatives are likely to take place in cities that are led by frontliners who strongly believe in the abilities of ICT to affect their city in a positive and visible manner.

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