

The Internet and local governance: Towards the creation of a community *habitus*

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From continuous space to virtual city

The city is the place that gives rise to the characteristic traits of any era, as Florence and Venice did for the Renaissance or London and Paris did for modernity: today the paradigm of the city is globalization. But this applies not only to cities that concentrate global political and economic power within a defined political and administrative jurisdiction, such as New York, London or Tokyo (Sassen 1991), it applies as well to all those cities that are able to transcend their boundaries and exist on the Web, so that physical and virtual presence, local and global horizons, constitute the two dimensions of their citizens' lives.

In research on urban issues, the city is generally treated as a physical and social space, not merely as a collection of streets, parks, buildings and infrastructure but also as a set of social practices and relationships that produce and reproduce it and that are unique to a given space and time. Yet in the context of the "macro processes" of globalization, "informationalization" and urbanization that characterize our era (Borja and Castells 1998), the dizzying speed with which the latest generation of information and communication technologies (ICTs) are spreading calls into question such a conceptualization, for it incorporates a new dimension of the city, that of virtual space.

From this perspective, the city is not only a physical and social space, it also has an intangible space in which social practices and relationships unfold and influence the production and reproduction of this space, just as they do with physical space. New ways of producing goods and services, new habits, innovative kinds of association and lifestyles, affective and sexual relations, approaches to managing infrastructure and urban services, administration and citizen participation are just some of the practices that are increasingly to be found. "Teleproduction", "telebanking", "teleworking" and "telestudying" are the names applied to these new forms of interaction and production.

Virtual space, in contrast to presential space, is totally artificial, a human creation. For Javier Echeverría (1999), “it is a new form of supernature resulting from the technoscience that has emerged in countries that have made the greatest progress in technology and science”. ICTs are the infrastructure of this space, just as urban road and utility networks are for physical space. In this artificial space of reticular structure, it is bits and not atoms that circulate (Negroponte 1995). It is the “space of flows” (Castells 1998), and not the space of places, nor that of “non places” (Augé 1996).

This new territory has its own spatial and temporal dimensions. In physical territory, space is continuous, while in virtual territory it is time that is continuous. We have neither day nor night, neither winter nor summer, there are no vacations or holidays, and for this reason we speak of continuous time – time is always, it is Internet time. Another aspect, no less important, is that this is a self-regulating and borderless space, where the logical tenets of modernity, primarily that of the nation-state and its political and administrative jurisdiction, are nowhere to be found (Schiavo 1999).

The information society is our condition, but what kind of information society are we heading for? Are ICTs an instrument for a new kind of development, or the source of new inequalities? Will they reinforce the model of the dual city (where wealth and poverty are contrasted in a shared space), or will they foster physical and social integration?

In developed countries, the Internet is used increasingly in cities’ knowledge management, and it has already demonstrated its power to transform cities in positive ways, both to generate new kinds of community and local development and to offer an alternative channel for communication and citizen participation. There are many examples. The town of Jun near Granada in Spain has gained international recognition as one of the first places in the world that guarantees Internet access for all its residents, and this has brought about significant changes in the local economy and way of life <<http://ibrujula.com/news/noticia.php3?id=9954>>. Another example is the network of cities embracing Castellón, Valencia and Alicante, which are part of the InfoVille project <<http://www.infoville.net>>. Among larger cities, we may point to the experience of Bologna <<http://www.comune.bologna.it>>, spearheaded by the Hiperbole organization, in which community organizations work as partners with the public and private sectors of the city. A further example is the digital city of Amsterdam <<http://www.dds.nl/dds/info>>, which was inaugurated in 1994 and in which all urban social players are increasingly involved.

Less developed countries have not seen developments of this kind. Indeed, more than half of the world’s people have never made a single telephone call in their lives. “The new network society is not a society of classes, but a society of inclusion–exclusion and of meaning–vacuum,” said Manuel Castells in a recent interview (2001). The separation of humanity into two spheres of existence, the so-called digital divide or the division between “info-poor”

and “info-rich”, represents a defining moment in history – it is a new divide that has been introduced in the world. What is clear is that these technologies, like most others, are neither good nor bad in themselves – that will depend on the political and economic system in which they are inserted – but neither are they neutral (Finkelievich and Schiavo 1998), by which we mean in this case two things: “ICTs cannot perhaps make up for the lack of basic urban utilities or problems of malnutrition or basic health service coverage, but if we fail to incorporate them this will not only deepen the technological and socioeconomic gap between rich and poor countries, and between regions, between cities and between rich and poor neighbourhoods within those cities, it will also imply the creation of a new category of outcasts (in the literal sense of the word), not only in terms of differentiated access but these new outcasts will be condemned to live in only one dimension (the presential, and not the virtual) of our world as it enters the new millennium” (Schiavo 2000).

The network society as a new field

Emilio Tenti Fanfani (1994) maintains that the structuralist constructivism of Pierre Bourdieu is one of the most fertile and creative sociological theories of our day, since it allows us to construct an image of a society that is more nuanced and flexible, more articulated by multiple mediations and more sensitive to social diversity. From this viewpoint, we can consider players, their practices and their products as situated in specific fields, but these fields are not free-floating particles exempt from general rules: they are elements of a society that is one and at the same time multiple, diverse and articulated through mediations.

For Bourdieu (1997), the definition of “field” must be understood in relation to the concept of “*habitus*” and the “capital” that it contains. “A field may be defined as a network, or a configuration, of objective relations between positions. These positions are objectively defined, in their existence and in the determinations they impose upon their occupants, agents or institutions, by their present and potential situation (*situs*) in the structure of the distribution of species of power (or capital) whose possession commands access to specific profits that are at stake in the field, as well as by their objective relations to other positions (domination, subordination, homology, etc.).”

“Capital or a species of capital is that which is efficient in a given field, as a weapon and as object of struggle at the same time, it is that which permits its owner to exercise power, influence, i.e. to exist in a given field.” *Habitus* is a way of perceiving, thinking and acting, of incorporating one’s capital into the way one does things.

From this perspective, ICTs give rise to new particularities in the field that shapes the current network society, with its own structure of inter-positional relations, with the determinations indicated and with a distribution of power that is not yet definitively established, which means that it responds

not to the political logic of the continuous city but to a new mode that has yet to be completely appropriated (Schiavo 2000).

Echeverría (1999) points out that the capital needed to “dominate” this new field consists of three variables: networks (hardware, software and telecommunication links), users and information. He concludes that, at least until now, the dominant players are the transnational “teleservice” companies and that states are entities in decline. Yet there is a significant distance between “existing” and “dominating”: the former is a necessary condition of the latter. In this paper, we attempt to define the specific “capital” (economic, cultural, social and symbolic) that all urban players (public, private and collective) must have in order for a particular local community to “exist” as such in the network society, and the modes needed to innovate, strengthen and find new forms of development through the use of ICTs.

Each field has its own species of capital. In the field of the network society, the specific capital would be composed of the variables indicated by Echeverría. If we look at the variables in relation to cities, we might say that cities already have a portion of this capital: on one hand, they have not only information but knowledge about their local space, and, on the other hand, all of their citizens are potential users. How can we put this initial species of capital to work so that cities can exist in this new field?

Online government at the local level in Argentina

Using this theoretical framework, we began by examining local governments with sites on the Internet to see how and for what objectives they were using the Internet, to identify the features of the types of “capital” at their disposal. Our intent was to look for new forms of community and to see how they appropriate ICTs and how they occupy virtual space.

From this perspective, we established three conditions and then analyzed the Internet initiatives of municipal governments in Argentina.

The first condition has to do with the “basic function of the municipality” and with the use of the potential of this new platform. We looked for sites that were using the platform in order to enhance and broaden the provision of services to the public, especially those that took advantage of interactivity and the ability to provide continuous service online, as well as those that promoted new channels of communication and citizen participation over the Internet.

The second condition seeks to identify the relationship between municipal initiatives and what they contribute to popularizing Internet use among all local players, “the construction of an Internet for all”. We were primarily interested in efforts targeted at diminishing the digital divide by publishing e-mail addresses, encouraging public access to the Internet (free or not), sponsoring forums and discussion groups of interest to the citizens and community organizations, or offering some kind of training in Internet use.

The third condition refers to the “promotion of local development in global space”. We looked for sites that not only provided specific local information but that used the platform to expand and diversify approaches to the promotion, production and marketing of economic, social and cultural goods and services.

Table 1. Municipalities with official web sites

<i>Total</i>	<i>With web site</i>	<i>% of total</i>
1,931	190	9.84

Source: Department of Municipal Affairs, Ministry of the Interior, August 2000

Table 2. Population of municipalities with official web sites

<i>Total</i>	<i>With web site</i>	<i>% of total</i>
32,615,528	13,443,263	41.22

Source: INDEC (1991)

In August 2000, only 190, or 9.84 percent, of the 1,931 Argentine municipalities had their own web site. Yet, in population terms, those cities account for 41.22 percent of the total. This situation shows that cities with the greatest demographic concentration (which in the case of Argentina tend to be the most important government centres and therefore have the greatest economic, social and cultural capital) are those where the bureaucracy is most inclined to the use of ICTs, reflecting the need for more efficient administration as well as pressure from civil society. If we look at the list of official sites by province, we see that the two most populous provinces of the country, Buenos Aires and Córdoba, together accounted for 60.52 percent of municipalities with official web sites in 2000.

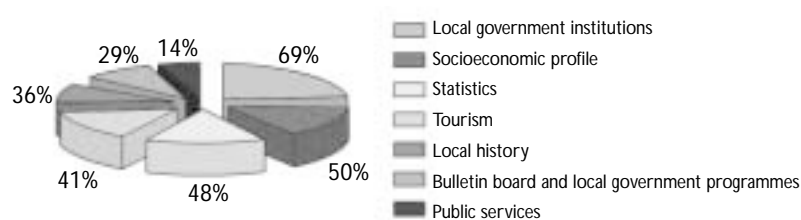
In terms of the topics covered at the sites, 86 percent of those analyzed were restricted to information on the municipal government (and in most cases on the city itself), thereby failing to explore the broader possibilities for interaction that this hypermedia support allows. Moreover, in 69 percent of cases, the information was designed to enhance the stature of local government officials, something that, when we think of *habitus*, suggests that the conventional practices and approaches used by governments in presential space have simply been transferred to this virtual space.

Table 3. Distribution of municipal web sites, by province

<i>Province</i>	<i>Number of municipalities with web sites</i>	<i>Province</i>	<i>Number of municipalities with web sites</i>
Buenos Aires	55	Misiones	2
Catamarca	1	Neuquén	1
Córdoba	60	Rio Negro	6
Corrientes	1	Salta	4
Chaco	2	San Juan	1
Chubut	8	San Luis	1
Entre Ríos	7	Santa Cruz	3
Formosa	1	Santa Fe	12
Jujuy	1	Santiago del Estero	–
La Pampa	1	Tierra del Fuego	1
La Rioja	18	Tucumán	1
Mendoza	2		
		Total	189

Source: Cravacuore (2000)

That the genesis of *habitus* in the use of ICTs is incomplete can be seen in the breakdown of topics covered: only 14 percent of the web sites offered services to the public and in no cases did the service function meet the three conditions specified above.

Table 4. Web site topics

Source: Cravacuore, 2000

If we examine the kinds of services offered in these 14 percent of cases and measure them against our first condition, i.e. using the potential of the platform to improve and expand service to the public, while all the sites offered information on how to conduct various procedures, the actual process could

be accomplished online in only three cases. One of these, the Urban Municipality of La Costa, allowed taxes to be paid online, reflecting the fact that a portion of the population is transient. As to the second condition, “building an Internet for all”, only three sites, and they were not the same as the previous three, offered free e-mail and links to discussion forums.

When we come to the third condition, we found no sites using the Web to promote local development beyond their borders: most of them provided specific local information, but they did not use this knowledge to expand and diversify interaction in global space. We did, however, find some official sites that were moving in this direction. An outstanding example is the Pinamar Telephone Cooperative, Telpin <<http://www.telpin.com.ar>>. Pinamar is a city on the Atlantic coast, where the main business is tourism; and the cooperative’s site represents an innovation in that it looks beyond its own activity, which is to provide telephone services, and offers a platform where the city can promote tourism. It began by listing hotels ranked by categories and services, and hotels were invited to sign up for an online reservation system.

If we compare the Telpin site with that of the Pinamar municipal government <<http://www.pinamar.gov.ar>>, we see that it is the telephone cooperative, and not the local government, that has taken the initiative to promote local development in global space. Its specific activity gives it the capital to act in this field: it has the networks, the users and some of the information. But it also has *habitus*, which is what leads it to innovate, to find new ways of offering services over the Internet and to go beyond the confines of its own activities and functions to promote the existence of its city in the network society.

Education as the key

Based on our analysis of the web sites of Argentine municipalities, we can rethink the specific “capital” that all urban social players (public, private and community-based) would need in order for a particular local community to “exist” as such in the network society, recognizing that the factors they have in common are an unawareness of the potential of this new platform and a lack of *habitus*.

The transition from the industrial society to the information society also implies a change of knowledge systems, and one of the dimensions of this transition is the crisis of the traditional categories with which we think about the world we live in. In the sites examined, reticular space is treated as if it were continuous space. The key is to understand what the space generated by ICTs is so that we can then think about how to “exist” in the network society – the question boils down to seizing the opportunities that these technologies offer for adapting to the changes that they themselves generate.

This requires us to come to terms with ICTs because knowing how to interrelate through telecommunications devices is the new form of

Table 5. Services to the public, by type

<i>Type of service</i>	<i>Municipality</i>	<i>Address</i>
Free e-mail	Gral. San Martín Las Rosas Río Gallegos	http://www.sanmartinvirtual.com.ar http://www.las-rosas.com/municipalidad.htm http://www.mrg.com.ar
Forums, etc.	Gral. San Martín Río Gallegos	http://www.sanmartinvirtual.com.ar http://www.mrg.com.ar
Online procedures	Gral. Pueyrredón La Matanza	http://www.mardelplata.gov.ar http://www.matanza.mun.gba.gov.ar
Payment of taxes	La Costa	http://www.costa.mun.gba.gov.ar
Information for citizens	Baradero Gral. Pueyrredón	http://www.baradero.com.ar http://www.mardelplata.gov.ar
Procedural guide, official bulletin, digests, by-laws, etc.	Gral. San Martín Junín La Costa Malvinas Argentinas Morón Tandil Zarate Agua de Oro Huinca Renancó Formosa Río Gallegos Las Rosas Rosario Villa Gob. Gálvez	http://www.sanmartinvirtual.com.ar http://www.junin.mun.gba.gov.ar http://www.costa.mun.gba.gov.ar http://www.malvinasargentinas.gov.ar http://www.moron.gov.ar http://www.tandil.mun.gba.gov.ar http://www.zarate.gov.ar http://www.aguadeoro.gov.ar http://www.huincarenanco.gov.ar http://comunidad.ciudad.com.ar/argentina/formosa/ciudaddeformosa http://www.mrg.com.ar http://www.las-rosas.com/municipalidad.htm http://www.rosario.gov.ar http://www.coopvgg.com.ar/municipio
Information on municipal accounts, budget, etc.	Zarate Huinca Renancó Laguna Larga Las Vertientes Formosa	http://www.zarate.gov.ar http://www.huincarenaco.gov.ar http://www.municipalidad.com/llarga http://www.municipalidad.com/lasvertientes http://comunidad.ciudad.com.ar/argentina/formosa/ciudaddeformosa

Compiled in November 2000.

socialization in the network society. We must master “the language of the machine”. It is not enough to know the language or languages with which we interact in our social sphere. We must learn a new language: as Echeverría (2000) says, we must learn to read and write images, to read and write computer programs, to read and write web pages, to establish links between text, images and sounds. As he sees it, an educated person should know how to gesture in front of a television camera, work with a computer, navigate and protect himself, design his own identity symbols and so on. And not only must he know how to do all these things, but he must have a degree of skill in all the semiotic processes, just as one now has to be able to speak, write or do mathematics well. If a person is semiotically competent in the language of machines, then things that seem chaotic, such as the Internet, will no longer appear so.

From this perspective, “digital illiteracy” becomes a key factor. A person who knows machine language, who has the capacity to discern and transform information into knowledge, will be an active player in the process, creating new channels of interactivity and relating creatively to change.

Mastering the language will become as important as knowing how to calculate, speak, read, write and even walk. The degree to which a local community can work with it will expand its capital and its *habitus* and will determine its existence in the network society.

On the basis of these findings, we can say that urban players as a whole do not yet have the capital to exist in this new field, which brings us back to the need to generate *habitus* as a necessary condition for possessing capital. Consequently, “to be or not to be” in the network society will be determined not only by presence (given by the web address) and access (through an Internet server) but also by capital and *habitus*. The first two factors relate specifically to the possibility of accessing the structure without worrying much about training, since any individual can make it work. The other two have to do with education, with early schooling, with acquisition of a worldview in which it is not only possible but normal to live in two dimensions simultaneously, where being connected to the municipality, to other social players or to the world via the Internet is part of daily life.

The model site: the municipal government and its city on the Internet¹

What should be the features of a model site that would promote the existence of a local community in the network society? How should it articulate with education systems (formal and informal) to help generate *habitus* among citizens? What role should the municipal government play?

There is a broad range of information technology available, and telecommunications infrastructure is improving and expanding swiftly. The key issue has to do not with the availability of these technologies but with how citizens and organizations appropriate them. Nor is it a question of

providing every citizen with a computer, or shouldering the costs of point-to-point connection lines in access centres. These are merely implementation problems. The real issue is to conceive a new mode for the city and its government.

The potential of the Web as an instrument for planning and managing the many aspects of urban life is complemented by the possibility of converting it into a channel for citizen communication and participation. Because it has an interface that is specifically designed to be understandable, it can be used as a platform for managing city information with a high degree of participation.

In positioning itself on the Internet, the city cannot simply transfer its current structure to reticular space: there has to be a structural change (and not only in the support medium) in the way information is circulated, one that will embrace both internal functioning and the modes of local and global articulation.

One of the key terms for thinking about the new logic that ICTs imply (not as a point of arrival but as a takeoff platform) is perhaps that of electronic government. The concept of electronic government is to provide continuous service and information to the public through the Web. While the demand for electronic services is growing, governments must accept the challenge of providing them. The Internet is important here, of course, as an interface between government and citizens, and so is the design of privacy policies, but the language and the environment in which they will operate are just as important because the very *raison d'être* of the site is to construct an environment that facilitates and promotes relations with the government for community-based players and for the private sector alike.

Bearing in mind the current stage of transition between knowledge systems, and with the desire to help transform institutional cultures and to create the three conditions discussed, we have proposed a model site for the city and its government, structured at three levels:

- Intranet: a domain similar to the internal procedures used today, equivalent to the bureaucratic dimension of administration
- Extranet: the sphere of service to the public, queries, complaints, payments, participation in elections and public meetings
- Internet: the space for global articulation, for interrelating beyond political and administrative boundaries

These three levels are articulated through two information systems. The first is the information management system (IMS), based on a digital management unit within the municipal government. It consists of networks connected to the Internet where it is possible to prepare and receive documents, to communicate internally and externally and to produce timely information for all players in the system (citizens and public employees), involving centralized records, statistics, remote consultation of files, etc. This involves a file management system with the following general characteristics:

- It must offer hypertext services (which are important for the proper classification of complex and voluminous files).
- It must allow integration with communication tools such as e-mail and web access for all system users.
- It must allow digital documents to be sent and received, with assured standards of delivery, integrity and confidentiality.
- It must allow the general public to consult information through the Internet and through the internal network.
- It must issue reports needed by management.
- It must include an automatic statistics system.
- It must generate digital documents in non-proprietary format so as to permit subsequent migration and to be compatible with software available on the market.

The second is the geographic information systems (GIS), structured from geo-referenced databases containing complete information on the city. It will offer localized statistical information for identifying zones, point-specific information (such as data on a property or on facilities and services in a given *barrio* or district) and recurrent information (such as transit routes, the shortest distance between two points, or the location of utility networks). GIS is an information organization system that can be used for planning and evaluating local management, but it is also a communication system that allows users to conduct personalized consultations. As an example of its many uses, we may cite the case of the Elections Commission in India, which in 1999 used GIS to process and post online returns from every electoral district and to update them every 15 minutes.

The idea is that the municipality, or any other local player (in the case of Amsterdam it was a community association, in Bologna a joint undertaking of public and private players), can take the initiative and generate the conditions for the city to exist on the Web. For this reason, the three levels (intranet, extranet, Internet) structured by the two information systems (IMS and GIS) constitute the basic system for managing knowledge not only for the municipality but also for the urban players concerned in the experiment, and, to the extent that each player builds its own intranet, it will be able to provide information and to interact locally and globally.

As a place for interaction, the site is the virtual “campus” of the city. At this site, each participant’s extranet is linked via the Internet with its respective intranet, and to these are added distinct spaces for discussion and dealing with matters of common interest (through forums or discussion group lists), which will likely include local non-governmental organizations (NGOs), development societies, neighbourhood centres, cooperative schools, clubs and retiree centres. The “campus” allows different levels of access, depending on the user’s status (resident or tourist) and interests.

If such a site is to function properly, it must have more access points and it must operate 24 hours a day. The following features would be desirable.

First, it should be possible to navigate free of charge through computers installed in municipal centres or community telecentres.

Second, all citizens, community organizations as well as public and private players should have an e-mail address provided by the city with a unique and dedicated user name (which could be the same as the e-mail address) and an identity code that guarantees confidentiality.

Third, the objective of the site should be to allow for management of city knowledge by the players in the network society and also, to ensure that this happens, to help generate *habitus* among those players by turning the site into a training tool for using the Internet. Indeed, using the site as an educational tool is a key consideration. To ensure that it can be used in this way by all urban players, the didactic material is designed not only for the different levels of formal education but also for informal education. As it is implemented, it will be appropriated in various ways, depending on the infrastructure, technology and sociocultural basis in each place.

In order to identify a possible test site, we analyzed the formal and informal education spheres in Argentina.

ICTs and informal education

We identified an interesting experiment in the field of informal education. In 1998 the Ministry of Communications² launched a programme known as Argentina@Internet.todos to provide Internet access to residents of isolated rural communities and low-income urban areas unable to obtain or afford it on their own. With the agreement of the International Telecommunications Union (ITU), a plan was adopted to establish some 1,600 community technology centres (CTCs) that would serve as introductory points to ICTs: they were to be equipped with the latest-generation hardware, offering e-mail, fax, videoconferencing, virtual libraries, public telephone service and other data processing technologies.³

The CTC project is based on two systems: the Permanent Training System (SPC) and the Content Development System (SDC). Work on the first system was headed by a group of state and private universities in the country,⁴ which formed a committee to define the content of the courses, the schedule of planned activities, supervision and evaluation methods, and other matters.

With the change of government in December 1999, the programme was shifted to the Ministry of Planning for Technology, Science and Productive Innovation, and the CTCs were renamed Centros Inform.ar. Currently, the training development team has completed its work and, at least for the present, the contracts between the national government and the universities have not been renewed.

To assess the feasibility of using the CTCs for a pilot experiment, we selected and analyzed those in Quilmes. They were selected for their geographic proximity,⁵ because although they had ICT equipment, we could not find them on the Internet. We identified them, carried out participatory

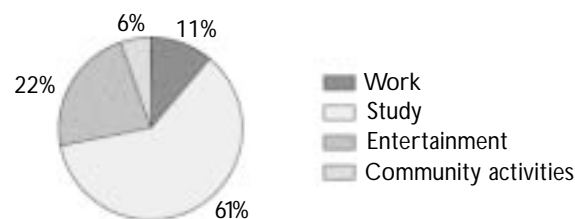
observation, interviewed key players and distributed a questionnaire to all of them (12 cases). Our analysis of the information obtained pointed to the following shortcomings.

There was inadequate geographic distribution. The programme's methodology for distributing the CTCs called for negotiations with the local authorities. In our interviews, we found that this approach was compromised by cronyism, with the officials involved dividing most of the centres among their "old boy" lists. The distribution therefore bore little relation to the quality and capacity of the recipient organizations, and geographic coverage was far from equitable in terms of the socioeconomic characteristics of the population they served. In our research, we found CTCs in some barrios and not in others, and we compared their locations on local maps showing population density and socioeconomic levels.

Moreover, Internet connections were inadequate. Thirty-six percent of those interviewed said they had no access to the Internet, in most cases because they could not afford touchtone telephones and connection to a server. The other 64 percent were able to pay for the service with the help of the recipient entity (school cooperatives, neighbourhood development societies, associations, etc.).

Another problem was ambiguity in activities. Only 11 percent of users devoted their online time to any kind of work-related activity, and even in these cases it was nothing as concrete as electronic commerce or "teleworking". The people we interviewed said that in general they would simply post their résumé and register as a job seeker with employment agencies that had web sites. Students were the most frequent users (62 percent). Their primary activity, both for elementary and secondary students, was downloading information from the Web or from hypermedia encyclopaedias for help with their schoolwork. In many cases, the CTCs had established timeslots which people can use according to their interests and tastes: 22 percent used their time for entertainment or for seeking general information and reading newspapers (Figure 1). Among children and teenagers, most used it to download software and play video games. While nearly all the host entities were engaged in some kind of community activity, almost none of the CTCs were used for these purposes. Only the Padre Luis Farinello CTC

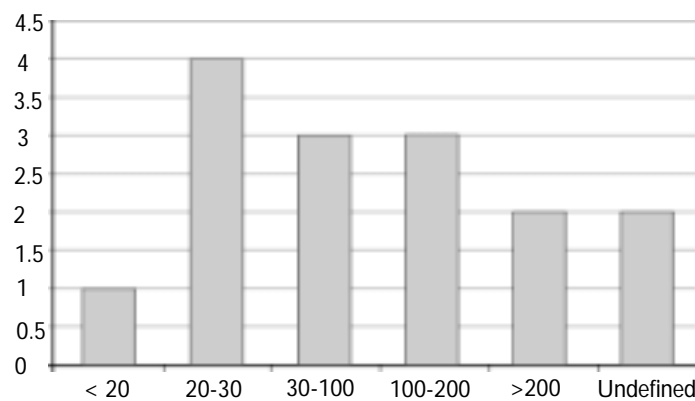
Figure 1. User activities in CTCs



used the Web in its community activities, but in this case the web site was developed by the Padre Luis Farinello Foundation and did not arise from the CTC.

There was little effort to popularize the CTCs. The CTCs had a fairly low profile in their immediate community. People interviewed noted that neither the CTC managers nor the government made much effort at public promotion. Those that had the greatest numbers of users were installed in or near schools. Most received between 20 and 50 users a week (Figure 2), which indicates an average of fewer than 10 users a day. Comparing the number of users to the number of computers per CTC, we find that each computer was used by only two people a day.

Figure 2. Average number of users per week



In addition, the CTCs faced economic and technical problems. The most widespread problem was economic constraints (91 percent), followed by technical problems. Because the government had no policy for advising the centres on how to obtain new sources of financing, they relied on the host institution (through grants or special fund-raising events). Moreover, many of the technical problems resulted from software failures, which could have been readily fixed if the coordinators had had basic training in installation and programming for the equipment.

The problems indicated above, relating primarily to connection, lack of public profile and absence of community activities, led us to reject the CTCs as the host for our test run. Our decision was influenced by the training deficiencies we found among most of the technical and educational coordinators, which meant that it would be difficult to find valid interlocutors for the experiment. While the design of the programme called for training as one of its main focuses, when it came to actual implementation those responsible for developing the content and application methodologies showed

little skill. Based on data collected during the interviews, we may say that the training courses offered had no thematic modules, schedule of activities or any way of evaluating the particular training needs of the individuals who were to run the CTCs. The criteria for selecting the coordinators, and the gaps in their training, explain why most of the CTCs are still just beginning to exploit the equipment and the potential offered by ICTs.

Formal education

Having rejected the CTCs for our initial stage, we examined the formal education system to see if it would be suitable. For reasons of geographic proximity (since implementation would require lengthy and repeated site visits), we decided that the test site should be located in the province of Buenos Aires. We consulted two sources for our initial scoping: the National Statistics and Census Institute (INDEC) and the National Ministry of Culture and Education, the latest published data from which are for 1997.

Table 6. Student enrolment by level of instruction and sector, 1997.

Province	Total	Initial	Level of instruction		
			Elementary ⁶	Secondary ⁷	Non-university higher education
Total for country	9,119,368	1,145,919	5,153,256	2,463,608	356,585
Buenos Aires	3,422,688	510,577	1,857,973	954,945	99,193

Students in the public and private schools of the province of Buenos Aires account for a third of the country's student population. Ninety-six percent of that population is enrolled at the initial, elementary and secondary levels, and this proportion reaches 97 percent in the province of Buenos Aires. We attempted to cross the data with indicators of the quantity and quality of computer equipment, by level of instruction and by institution, but we could not find reliable data.

In terms of content related to the Internet and local government, since the national education reforms of 1993 a number of technology working guides have been issued both by the provincial government of Buenos Aires⁸ and by various private publishers, but none of these deal with the issue of municipal government and the Internet, as addressed in this paper.

In 2000 a series of experiments were launched to generate educational content on the Internet. Although they have yet to make significant progress,⁹ they at least show that the basic issue is now on the government agenda. The launching of the national education portal "Educ.ar" <<http://www.educ.ar>>

in 2000 and the provincial portal for Buenos Aires in March 2001 provide two examples.

The conflicts that global networking generates in the education field are inherent in any social organization; and while there are relatively few cases of practical innovation in Argentina, the issue of the Internet and education is a subject of debate and, as in other countries, it is being addressed by increasing numbers of authors, and not only specialists in the area.¹⁰

Internet Educativa

A programme called Internal Educativa was introduced in the municipality of Pinamar (province of Buenos Aires) in 1999, sponsored and financed by the Pinamar Telephone Cooperative (Telpin). It is aimed at all local public and private schools, at all levels and streams of instruction: general and special; initial, EGB (General Basic Education), and secondary/polymodal. Sixteen schools have now been given connectivity and training. The programme was subsequently expanded to include a broad range of public associations: libraries, environmental groups, museums, parish groups and para-cultural centres <<http://www.telpin.com.ar/interneteducativa>>.

All the installation costs, including the telephone line, the server, the hardware and software, were donated by Telpin. At the same time, a programme of stipends was introduced to attract senior students in technical schools with an interest in information technologies, as an incentive for taking over monitoring and maintenance of the network, and this was supplemented with training for teachers, also provided and financed by Telpin. This is the only experiment of its kind in the country that is totally financed by a cooperative. To date, the investment has amounted to some US\$200,000¹¹ and in just over one year a total of 60 computers have been installed.

Teacher training is a key aspect of the experiment. This training was initially planned as a 40-hour module including classroom time, but at the end of that first module the teachers asked for further training. The programme now consists of three successive modules.¹² The objective is to train teachers in the use of the Internet for educational purposes. For this reason, it does not start with computer training (Word, Excel, etc.), as do most courses, but rather with the tools that will allow them to exist in reticular space (e-mail, HTML, etc.).

The training programme was assessed and approved by the education inspectors, supervisors and principals of the schools in Pinamar. The teaching methodology was developed in a series of seminars and continuing education workshops for teachers, complete with supporting material, and permanent monitoring and evaluation. It was conducted in three cycles:

- April/July 1999. Introduction to the educational use of the Internet: classroom use, field projects, exhibition of projects and evaluation
- August/December 1999. Web site construction for teachers

- April/December 2000. Publication of pedagogical content on each school's web page, prepared by teachers and students

By December 2000 all the schools had been equipped, and they now have technical maintenance, connection and free navigation, with touchtone telephone service available full-time at no charge. The programme now serves more than 300 teachers and 4,950 students. Thanks to this experiment, Pinamar is the first and only city in Argentina with 100 percent of its schools connected free of charge to the Internet.

Currently all the schools have their own web page, produced by the teachers. Setting aside considerations of aesthetics or content, which were not a priority at this stage, it is interesting to observe how each web page differs from the others and how effectively the tools have been mastered, since many incorporate image, sound and animation in addition to text. The secondary schools have begun to work online, with the objective of developing content in two areas: one pertaining to history and local identity and the other to driver education.

This experiment has produced some unexpected results and is beginning to generate new practices and social relations as well as to popularize use of the Internet among the local community. In some cases, the teachers are developing web pages for neighbourhood community organizations. At one school, the students worked on the concept of Internet "solidarity" or user ethics: they worked out an agreement with other schools that when one is not using the Internet one should disconnect, so as to avoid overloading the system and to ensure that everyone has an opportunity to use it.

The National Ministry of Culture and Education recently contracted Telpin to expand this experiment to other cities. In April 2001, a pilot experiment was launched in the city of Trenque Lauquén (province of Buenos Aires), with a "semi-presential mode" using videoconferencing, e-mail and discussion forums.

Thanks to its technological grounding and the positive attitude of the community, which had already been sensitized to the use of ICTs, we selected Pinamar as the most promising site in the country for testing the application.

Pinamar and the Pinamar Telephone Cooperative (Telpin)

The district of Pinamar consists of the localities of Cariló, Valeria del Mar, Ostende, Pinamar and Montecarlo. It covers a total area of 6,720 hectares and has a seafront of 21 kilometres, including an urbanized sector extending along 12 kilometres of the Atlantic coast. The total population of the district is 24,379. Thirty-nine percent are economically active: of these, 64 percent have steady jobs, while the rest are unemployed or underemployed.¹³

The main economic activity is tourism, and this is reflected in the urban structure, which is divided in the conventional manner between the "served city" and the "serving city".

The founders of Pinamar were also involved in creating its telephone cooperative. For this reason Telpin, in addition to being one of the oldest cooperatives in the country, is deeply rooted in the local identity.¹⁴ What is of interest here is the cooperative's policy of popularizing the Internet through the education system as a social service.

Telpin has consistently sought out technological innovations and has at the same time returned its profits to its members. It was the first provider to offer International direct dialing. Thanks to such services, and the high summer consumption resulting from the influx of tourists, it generates profits that are returned to the membership through discounts (subscribers do not pay for service during the summer) or to the community in the form of new services (Internet Educativa).

Telpin subscribers can obtain a second telephone line at a minimal cost of US\$1; and since local calls are free, the only cost inherent in having an e-mail account and accessing the Internet is that of the server. In October 2000, Telpin had 1,180 subscribers to its server, of whom 50 had free service, 850 paid US\$30 (full Internet services) and the rest paid US\$9.90 for six hours of access daily.¹⁵

The cooperative's board of directors decided to develop the Internet Education programme to provide Internet links for schools and community associations with the intention of promoting the service and at the same time fulfilling a social function. In addition to this programme, it offers Internet service to private parties with a free three-month trial period.

Educational content on ICTs and the city

Having selected Pinamar as our test case, we examined the curriculum provisions of the Federal Education Act to identify content that relates to ICTs and the city. This led us to select the Common Basic Content, which covers ethics and citizenship, social sciences and technology at the EGB and polymodal levels, and social sciences, natural sciences and technology at the initial level, on the basis of which we established the objectives for these content¹⁶ at each level.

Initial level

Conceptual content:

- Location in one's own and neighbouring geographic spaces: barrio, neighbourhood, city, town, etc.
- Local architecture, with its various construction methods and building materials.

Objectives:

- The student should be able to locate and identify familiar places on the Internet, and specifically on the municipal web site.

- The student should be able to describe the materials used for his own house or dwelling and relate them to concepts and experiences of private and shared spaces.

First grade EGB

Conceptual content:

- Immediate geographic spaces: orientation, distance and location. Living space.

Objectives:

- The student should be able to locate and identify familiar places on the Internet, and specifically on the municipal web site.

Second grade EGB

Conceptual content:

- Basic local institutions (educational, health, economic, political, religious, cultural) and their functions.

Objectives:

- The student should be able to locate geographically the various institutions in his barrio.
- The student should be able to communicate over the Internet with institutions in his barrio and receive a response to his concerns.

Third grade EGB

Conceptual content:

- The principal authorities and their main functions.

Objectives:

- The student should be able to read an organization chart for the municipal government and other organizations in the city.
- Using this organization chart, the student should be able to identify the responsibilities of various municipal officials.

Fourth grade EGB

Conceptual content:

- Urbanization and political boundaries (municipality, province, country).

Objectives:

- The student should be able to identify the political boundaries of his municipality on a map and understand the difference between geographic and political boundaries.

Fifth grade EGB*Conceptual content:*

- The public and private spheres.
- Basic social institutions.
- Forms of organization.

Objectives:

- The student should be able to identify those aspects of city life that belong to the public and private spheres.
- The student should recognize and identify the various social institutions in the city, distinguishing them as governmental or non-governmental, and classifying them by their activities and functions.

Sixth grade EGB*Conceptual content:*

- Urban spaces. Principal activities, their distribution and articulation within the urban space.

Objectives:

- The student should be able to identify and understand the different kinds of activities conducted within the physical territory, as well as their correlation with virtual space.

Seventh grade EGB*Conceptual content:*

- Means of transportation: networks, movements, transit flows. Spatial and temporal distances.

Objectives:

- The student should be able to identify the different kinds of urban physical networks and their spatial and temporal dimensions.

Eighth grade EGB*Conceptual content:*

- Social service units, from the local to the national levels.

Objectives:

- The student should be able to participate in social service activities of an NGO, evaluate them and communicate them.

Ninth grade EGB

Conceptual content:

- Forms and channels of citizen participation.

Objectives:

- The student should be able to experience citizen participation in a digital environment, through contact with other citizens.

Polymodal level

Conceptual content:

- Social constitutionalism and the meaning of modern citizenship.
- Examples of social participation: NGOs, labour unions, professional associations, currents of opinion.
- Urban and rural spaces.
- The meaning of “urban”.
- Urban networks.
- Political spaces. Political organization of the world. National, provincial and local planning.
- Forms of interactive and intermedia communication: multimedia, databases, data networks.
- Computer applications and communication in society. Positive and negative impacts. The relationship between individuals and machines. Ethical questions on intellectual property and privacy of information.

Objectives:

The student should be able to do the following:

- Identify community problems and participate in efforts to resolve them.
- Participate in activities organized by the school to meet specific community needs.
- Formulate problems and provisional explanations.
- Design a research project and collect, organize and record information.
- Participate actively in the design of school research.
- Interpret the information.
- Communicate the information.

Having defined the conceptual content for each level, we reformulated the procedural content¹⁷ and began work on designing the multimedia application for the Internet platform. The instructions included in the application suggest at least one activity for each level. At the same time, we tried to identify the best level to begin implementing and evaluating the experiment. We selected the initial level (five-year-old kindergarteners) for two reasons: first, work at this level has a greater impact on the local community, since families of children at that age tend to participate more in

school activities; second, because the teachers at that level are not subject to strict curricular rules, they generally have a less structured approach and are more willing to experiment.

Internet application on ICTs and the city for kindergartens

In the content on social sciences, natural sciences and technology at the initial level, it is recognized that children are the subjects of activities with others, with objects and with natural components, they are consumers and users of technology of varying degrees of sophistication, and their daily social habits as well as the information they receive comprise a set of knowledge that will be compared, enriched and deepened in the school.

Starting from these premises, we selected the unit on the natural and social environment, which proposes that “recognition of the most significant places in the barrio and the zone will allow children to establish relationships among the components of the environment, and to recognize and appreciate what does and doesn’t belong”, which we felt was possible to achieve through activities in a virtual environment.

The specific content developed refers to one’s own and other nearby geographic spaces, which in the case of Pinamar at the initial level, in this application, consists of locating the different localities (Pinamar, Ostende, Valeria del Mar and Cariló) on the map of the district and pinpointing within those localities the kindergartens, first-aid stations where children regularly go, parks and various institutions.

This activity allows for observation and the selection of information, by navigating within the application, and for recording information in drawings and tables; it also allows children to communicate, to explain ideas in their own words or with drawings, to exchange information with others, to organize this information, to communicate it and to draw conclusions. As well, it encourages an open working attitude towards investigating reality, in order to spark their curiosity.

The tool was constructed in two environments: programming on Flash 4, a dynamic environment that permits high interactivity, produces a design of great aesthetic quality, and offers relative economy in the packets of bytes to be sent over the Internet; and HTML programming, as an alternative, since the Flash environment requires a plug-in (although simple, free and readily obtainable) that must be installed in the students’ computers.

For mapping, we used a GIS provided by Telpin, which also contributed the interactive database for map searches. The software, which is compatible with CAD applications, requires a visualizer (WIP5.exe), which comes with the application. It also allows working in different layers that can be activated or not, depending on the user’s need, for which it was decided that the application should be distributed in full (containing all educational levels) so

that the teachers could use it freely both for the activities in the formal curriculum and for other activities outside the content module.

For the communicational design, we worked specifically with an iconographic language adapted to each level in accordance with conventional guidelines of cartographic representation. For the initial level, we used a child-friendly iconography that would allow students to recognize the places they were working with for each activity. The icons have links to photographs, videos and information in different formats (including formats that teachers and students may add) on the places indicated.

An operational online test was conducted and was rated very good in terms of the speed of downloading the map and images. The application can concurrently be found on the Telpin web site <<http://www.telpin.com.ar/interneteducativa/proyectoung/ung/web>>.

The first experiment

The first experiment was conducted in the kindergarten No. 905 of Valeria del Mar for five-year-olds. We worked in the classroom with a group of 10 children who had no computer or Internet connection at home. We were impressed at the speed with which they appropriated this tool and the ease with which they adapted to the new language (use of such words as *plan*, *mouse*, *download*, etc.), although it was impossible to measure whether the conceptual and procedural objectives of the activity were reached, since to do so we would have to test the content with several classes during the remainder of the school year.

As to the tool itself, we confirmed that the hypermedia design of the interface was user-friendly. To improve its capacity, it was agreed that it be updated every two months during the first year, in light of teachers' demands, and to evaluate it jointly at the end of that time.

We evaluated the experiment with teachers and principals at the initial level and verified that the tool met the pedagogical guidelines for the conceptual content and that the proposed procedural content had been successfully developed: accessing interactive maps of the district and identifying the different icons, as well as "clicking" on the icons that represent each child's home.

It was agreed that for the rest of the school year representations of the various urban spaces would be prepared with different resources and techniques, including mock-ups, plastic art productions and oral expression. The objective was that students should use these constructions to express the knowledge and skills acquired through the use of the application. As a result of the experiment, a parallel activity was also proposed, the sending of e-mail that would carry the signature of each child and that would allow the children to learn the spatial arrangement of the symbols on the keyboard and to identify the letters in their names. This activity would also be conducted and evaluated during the course of the year.

Final considerations

On the day the application was introduced in Pinamar, the Casa Rosada¹⁸ announced a plan for providing electricity to 1,700 schools in Argentina. This coincidence highlighted what was special about our experiment and also said something about the context within which it was conducted. To reproduce it is not going to be easy in the short term, without an adequate technological base and infrastructure. The main bottleneck, however, may lie in a shortage of local players (not only in the education system) to lead the experiment. The national education portal (Educ.ar), which is supposed to provide connectivity, training and content for all public and private schools in the country, is a very recent initiative. If its objectives are fulfilled, this would provide the technology and infrastructure for pursuing themes such as ICTs and the city.

One question that arose in establishing relations with local teachers was the need to secure institutional support at the provincial level, without which the experiment could not have been formally applied, since legal, technical and administrative considerations preclude activities outside the formal curriculum. For this reason, we asked the legislative and executive authorities of the provincial government to approve the project, and it was duly declared to be of “educational interest” and “legislative interest”. This question highlights the special considerations that must be taken into account in any effort at innovation in the formal education system.

Another issue that arose from the relationship with local teachers is the ongoing debate within the education system as to who should develop the new content for the Internet platform. Our interviews revealed a widespread opinion that it is the teachers who should develop this content. We must point out that the teachers we interviewed had some degree of training in the educational use of the Internet, which sets them apart from the general teaching body. Nevertheless, there are some who will maintain the contrary. Echeverría (1999) points to the example of the French Revolution, which called upon its finest intellects and scientists to prepare new educational material. From this perspective, the task of preparing the current material (learning games, telematics and multimedia) is beyond the capacity of the education community and should be addressed by specialists in the sciences, technology and the humanities, while recognizing that involving the teachers can make the difference between success and failure.

Finally, in pursuing further initiatives to create *habitus* among the citizenry in the use of the Internet in formal education, we must not forget that this approach will reach only the school population, i.e. one-third of the people in the country. This fact highlights the importance of continuing to explore approaches that would help to create *habitus* by providing continual training through the channels of informal education.

Notes

1. Apropos this point, an Internet-based application for local management, MO-L, "the municipality online", was developed as part of the project called "Internet and local government: a possible marriage?", sponsored and financed by the National Agency for Scientific and Technological Promotion, Argentina.
2. Decree 1018/98, signed by the then-President Carlos Menem, relating to Decree 554/97, which declared a national interest in ensuring Internet access for all residents of the country, under conditions of social and geographic equity.
3. Source: interview with Dr Ricardo Campero, coordinator of the Electronic Commerce Research Programme of the Ministry of Planning for Technology, Science and Productive Innovation, March 2000.
4. These included the Instituto Universitario Aeronáutico, Universidad Blas Pascal, Universidad Tecnológica Nacional and Universidad Nacional de Río Cuarto.
5. The National University of Quilmes, where the team that conducted this project is based, is located in the district of the same name. Quilmes is one of the five districts of Greater Buenos Aires that have more than 500,000 inhabitants, with more than 20 percent of their population living in shantytowns or substandard housing (INDEC 1991).
6. EGB (General Basic Education) at the primary and intermediate levels, according to the Federal Education Act.
7. EGB at the secondary (high school) and "polymodal" levels, according to the Federal Education Act.
8. General Directorate of Schools, province of Buenos Aires, modules 0 to 8, 1993/94.
9. In general, they amount to content that was originally published in print format and transferred to the Web. No hypermedia applications have yet been verified, i.e. content that has been redesigned for the new platform.
10. Castells (2001), Echeverría (2000), Fernández Hermana (1998), Schiavo and Finkelievich (1999), Terceiro (1996), Tiffin and Rajasingham (1997), among others.
11. Source: Juan Santoiani, systems manager, Telpin.
12. Source: Claudia Gómez Costa, education coordinator for Internet Educativa.
13. Source: Department of Commerce, municipality of Pinamar, December 2000. The figures do not include permanent residents who have not changed their legal address.
14. Argentina has some 300 telephone cooperatives. Telpin was started in 1963 with 92 telephones (source: Pinamar telephone directory, Pinamar Telephone Cooperative, 1998 edition).
15. Source: Juan Santoiani, systems manager, Telpin.
16. This work was done in cooperation with the education coordinator for Internet Educativa, Dr Claudia Gómez Costa.
17. The procedural content included the application instruction book.
18. Official residence of the President of Argentina.

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- <<http://www.infoville.net>> Proyecto InfoVille.
- <<http://www.pinamar.gov.ar>> Municipalidad de Pinamar.
- <<http://www.telpin.com.ar>> Cooperativa Telefónica Pinamar Ltda (Telpin).
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