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Information and Telecommunications Project for a Digital City: A Brazilian case study

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ABSTRACT

Making information and telecommunications available is a permanent challenge for cities concerned to their social, urban and local planning and development, focused on life quality of their citizens and on the effectiveness of public management. Such a challenge requires the involvement of everyone in the city. The objective is to describe the information and telecommunications project from the planning of a digital city carried out in Vinhedo-SP, Brazil. It was built as a telecommunications infrastructure of the kind of "open access metropolitan area networks" which enables the integration of citizens in a single telecommunications environment. The research methodology was emphasized by a case study which turned to be a research-action, comprising the municipal administration and its local units. The results achieved describe, by means of a methodology, the phases, sub-phases, activities, approval points and resulting products, and formalize their respective challenges and difficulties. The contributions have to do with the practical feasibility of the project and execution of its methodology. The conclusion reiterates the importance of the project, collectively implemented and accepted, as a tool to help the management of cities, in the implementation of Strategic Digital City Projects, in the decisions of public administration managers, and in the quality of life of their citizens.

1. Introduction

The availability of information and communication technologies is a permanent challenge cities concerned to their social, urban and non-urban, planning and development focused on the quality of life of their citizens and on the effectiveness of public management. Such a challenge requires the participation of everyone in the city, from municipal servants to the occasional dweller. Also, the permanent social, financial and political challenges faced by cities have demanded from city managers search for innovative solution in order to propitiate the suitable quality of life required by their citizens. On the other hand, the participation of citizens in the decision making process of a city is an unquestionable need. When facing these challenges, collective participation can be achieved by having an information strategic planning, to collect, organize and

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synthesize all sorts of information (social, economic, political, environmental, etc.) as pre-requisite for the organization and management activities of the city.

The Municipal Information Planning can become one of the main tools for managing cities. In Brazil, because of insufficient financial resources in city budgets, obedience to the specific constraints and legislations, such as the Fiscal Responsibility Law, and pressures exerted by citizens and other social actors of the city (NGOs, investors, enterprise stakeholders, etc.) governments can be trapped into an intense pressure to assure good social and economic results for the city. This pressure can be minimized by the implementation information planning in the cities, propitiating the collective engagement of the "citizens for the city" with the implementation of a true participative governance model.

The development of broadband communication networks and the adoption of information and communication technologies (ICTs) are important factors for the economic growth of a country and, therefore, its municipalities. The *Global Competitiveness Index*, annually published by the *World Economic Forum* in the *Global Competitiveness Report*, takes into account the technological readiness of each country (Schwab and Sala-I-Martin, 2013). Qiang et al. (2009) show in their work, from an empirical analysis, that the increase of broadband penetration rate in developed and developing countries had a positive impact on the GDP. Firth and Mellor (2005) also defended the importance of broadband infrastructures for developed countries. They claim that ICT infrastructures are capable of generating economic growth and contributing to digital inclusion processes. These ideas have led Europe to the decision of building up a common policy for the implementation of an "Information Society".

That policy, debated in the eEurope (2005) and in the i2010, defined the investment in broadband infrastructure as a priority (Alexiou et al., 2009). The challenge is that the construction of high speed communications networks demands massive investments, thus the interest of private investors will not be attracted unless business opportunities are equally devised in the enterprise. Therefore, it is up to governments to create conditions, both through regulation and as a major consumer, which may incentive the deploy of such investments from private organizations and, therefore, lead to the construction of worldwide broadband communications networks which are universally available to the public. Several European governments started to invest in broadband infrastructure through the establishment of Open Access Metropolitan Networks (Open Access MANs). The initiative of creating "open" communications networks of municipal proportions has turned out to be attractive to various governments. Beyond pulling new investments to the city, the "open" networks have implemented a telecommunications service network of its own, which results, at once, in money-saving with telecommunications servers. Along with those networks, other services can also be achieved, which reflects in efficiency gains and costs saving to the citizens (Qiang et al., 2009; Gómez-Barroso and Feijó, 2010).

In Greece, for instance, the city of Patras (third biggest Greek city) and the city of Messatida are the two main examples of success of those initiatives (Bouras et al., 2009). Similar cases are being debated and implemented in several other cities from countries such as Sweden (Alexiou et al., 2009), Ireland (Alexiou et al., 2009), Canada (Bouras et al., 2009), Spain (Ramos et al., 2009; Ganuza and Viecens, 2011), Denmark (Tadayoni and Sigurðsson, 2007), Chile (Hawkins, 2005), USA (Gillett et al., 2004; Fuentes-Bautista and Inagaki, 2006; Reinwand, 2007; Hudson, 2010), The Netherlands (Sadowski et al., 2009), New Zealand (CITYLINK, 2012), England (Sedoyeka and Hunaiti, 2011), Tanzania (Sedoyeka and Hunaiti, 2011), Korea (Lim and Kim, 2002; Lee and Lee, 2003; Picot and Wernick, 2007), and also Brazil (Mattos and Coutinho, 2005; Inocencio et al., 2008; Mendes et al., 2010; Breda et al., 2011).

Brazil still has a significant part of its population without access to Internet (Brasil, 2013). One possible alternative to contribute to the solution of that problem is the construction of the Open Access Metropolitan Area Network (MAN). Such networks can promote the universalization of the access to the population, counting on resources provided by a municipal multimedia network. Through the Open Access MAN, thousands of citizens and municipal organizations could have the opportunity to be included in the so-called *Information Society* (Lemos, 2005; eEurope, 2005). A relevant Brazilian initiative has been developed by the LaRCom (Laboratório de Redes de Comunicações) from the State University of Campinas (UNICAMP), Brazil. This group has been developing studies on Open Access Metropolitan Networks and Smart Cities, being responsible for optical high speed broadband communications networks deployment in several Brazilians cities, including the city of Vinhedo which is the one of the objects of our studies (Mendes et al., 2010).

Another problem is the inexistence or inadequacy of municipal information and telecommunications resources in its external and internal environment, corroborating the difficulties to manage cities and count on the respective participation of citizens in the city management and also in the urban and regional development.

The objective of this paper is to describe the Information and Telecommunications Project from the planning of a Digital City carried out in Vinhedo-SP, Brazil. Has as one of its main initiatives the development of the city's Open Access Metropolitan Network. This project enables the integration of the citizens in a single communications and e-Gov online services environment. The project has embraced the City Hall, its Municipal Secretaries, a Municipal Water and Sewage Company and other municipal institutions such as schools, health centers, and social squares for citizen attendance. With the project, the city has become able to structure, storage and make widely available a large amount of the information generated in and by the city.

The reason for this project is mainly related to structuring, storage and availability of all information and the sharing of knowledge mediated by telecommunications, which surely do not happen overnight and require short, medium and long term actions in the cities.

Recent studies reiterate efforts in projects of digital city to improve public policies and governmental programs by making information widely available to citizens (Weitzman et al., 2006). An US e-govern project has been trying to enhance the