

Medellin (Colombia): A Case of Smart City

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ABSTRACT

In this paper we analyze the case of Medellin, using the methodology of the Smart Cities Service Integration Project, led by Smart City Consortium [1,2]. Externado University of Colombia as member of this Consortium, carried out in 2013 Medellin's case study. Medellin was voted as the innovative city of year in 2012 by the conquest organized by Wall Street Journal Magazine, the Citi and the Urban Land Institute, due to its efforts and results in reduction of CO2 emissions, construction of cultural spaces and reduction of crime [3]. In 2014 we will study the case of Bogota in order to characterize smart cities in Colombia.

In the first part of this paper we provide some basic data of the Medellin in order to contextualize readers about this city. Then, we provide background information to justify the implementation of smart city initiatives in Medellin. After that, we highlight differences and complementarities of these initiatives. Finally, we identify lessons learned during the implementation of Medellin's smart city initiatives, and how they could be avoided to resolve problems and to successfully implement similar initiatives in their own cities. These lessons are organized according to factors of the Smart City Initiatives Framework, defined by Chourabi et al [2].

Categories and Subject Descriptors

K.4.1 [Computing and Society]: Public Policy Issues.

General Terms

Documentation, Economics, Human Factors

Keywords

Smart cities, Government innovation; Urban Innovation

1. INTRODUCTION

Medellin is the capital of Antioquia, one of 32 departments of Colombia, as shown in Figure 1 [4]. Medellin has a population of 2'488.080 habitants in urban area and 3'592.100 habitants in metropolitan area. It's the 2nd biggest city and economy of Colombia. In 2010 Medellin's GDP was 17.069 million USD.

Medellin is the 15th best city in Latin America for making businesses, and the 12th city with greater visibility in Latin American.

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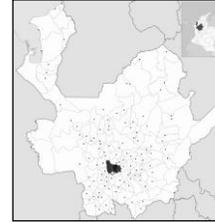


Figure 1 Map of Antioquia and Medellin

According to one of interviewees, the current transformation process of Medellin started in 2004 when Sergio Fajardo (current governor of Antioquia) became Mayor of Medellin. During Fajardo's administration, Mayorality started implementing high impact projects centered on education, culture and social inclusion. The program Digital Medellin was one of these initiatives. This program was created in 2006 in order to promote digital inclusion, specifically in education, government, entrepreneurship and culture. Next Mayor continued this program and led the implementation of others projects related to smart cities in different sectors as mobility, economic development, health and safety. Most of these initiatives were formulated in a context of local technological backwardness and global consolidation of sustainable and smart cities as city models [4].

2. SMART CITY INITIATIVES IN MEDELLIN

For the study of Medellin as smart city case, we selected four initiatives, two of which are analyzed in this paper. These initiatives are Medellin Smart City and Route N Medellin's Corporation - Strategic Plan of Science, Technology and Innovation (onwards STI Plan). We selected these initiatives because they are long term efforts guided by a strategic vision of the city. Medellin Smart City was established in 2007 and its recent strategy projects until 2020. Route N STI Plan was formulated for the period 2011-2021. In this way they are state policies which transcend government periods.

We also selected these initiatives because they tackle innovation from complementary approaches. They also have been recognized as flagship programs for present government. Anyway, it should be remembered that these initiatives are part of a broader set of projects like Medellin's Intelligent Mobility System or the Integrated System of Metropolitan Emergencies and Safety, among others.

Medellin Smart City is City is the continuation of the program Digital Medellin. Medellin Smart City aims to improve the quality of life through smart city services as well as using ICT as means to potentiate opportunities in 12 fields like education, safety, mobility and environment. On the other hands, Route N is an initiative created to transform Medellin's economy into a new

knowledge based economy, through the development of business from three industries: ICT, energy and health.

Medellin Smart City is an initiative institutionally integrated to Medellin's Mayoralty, specifically within the Vice mayoralty of Science, Technology, Innovation, Economic Development, Internationalization and Public Private Partnerships. By contrast, Route N is a corporation separate from Medellin's Mayoralty. Government still has influence in the direction of Route N due to Mayor has a seat in its board of directors. However, this board is also composed by managers of other private, public and mixed companies like the Chamber of Commerce for Antioquia, the Private Competitiveness Council of Colombia, EAFIT University, Antioquia University, EPM (Medellin's Public Enterprises) and Une (Medellin's Telco).

Medellin Smart City Program coordinates the implementation of projects to provide connectivity, to develop electronic services and to appropriate ICT within the city. Instead, Route N co-funds innovative projects, and seeks the establishment of knowledge-intensive businesses, to promote economic growth, creation of jobs and competitiveness of Medellin's economy. This fact makes that Medellin Smart City and Route N involve different stakeholders. While Medellin Smart City Program interacts with directors, students, and teachers from public schools, common citizens, small businessmen and public entities of local and national level, Route N interacts with research centers, universities, local and global companies and entrepreneurs as well as public entities of regional and national level. In the same way, Medellin Smart City is smaller than Route N, in budgetary terms. According to the interviewees, the budget of Smart City Program for 2013 is around 3,5 million dollars, while the budget of Route N is six times that amount (around 23,2 million dollars).

Beyond these differences, Medellin Smart City Program and Route N complement each other to the extent they address specific needs for the development of a smart city. Medellin Smart City points to include people into the Information Society. For this, Medellin Smart City has developed several projects which approach students, citizens and entrepreneurs to ICT through connectivity and training programs. Additionally, Medellin Smart City Program is developing an open innovation platform for boosting citizen participation and to resolve city problems through crowdsourcing. Medellin Smart City Program also seeks to span open data for the generation of apps, solutions and visualization on Medellin. According to one interviewee, Medellin Smart City Program and Route N are linked by social innovation and innovation platforms.

Route N complements also Medellin Smart City program by directing resources toward the development of projects related to smart cities, specially on smart grids, energetic efficiency, e-health, and digital contents. In this way, Route N articulates the innovation ecosystem of Medellin, being Medellin Smart City an element of this ecosystem, according to an interviewee.

Medellin Smart City and Route N complement each other because they bridge the innovation gaps towards smart cities, which, are digital skills gap, creativity gap and the entrepreneurship gap, according to Komminos[5].

It's also important to note that Smart city Program embraces subsystems, not considered by Route N, which also involve a smart city as health, environment, mobility, security, tourism, emergencies, communities, government, education and culture.

3. LEARNED LESSONS FROM MEDELLIN SMART CITY INITIATIVES

From the experience of Medellin's case it's possible to identify some lessons which could help other cities to implement similar initiatives locally. We have organized these lessons according to the factors of Smart City Initiatives Framework.

3.1 Management and Organization

One of the lessons learned in the field of management and organization is that some legal figures can affect the development of smart city initiatives. According to some interviewees, the lack of legal representative in Medellin Smart City Program occasionally stops its operation because it needs to sign a convention with an operator to spend the resources allocated by government's budget. According to one interviewee, the provision of stronger institutionally has allowed avoid this kind of problems in the case of Route N.

Another lesson learned from the case of Medellin is that the implementations of smart cities projects usually have problems in terms of coordination among entities. Changes in organic structures can contribute to resolve these problems. According to some interviewees, the creation of 6 vice mayoralties which integrated similar secretariats and decentralized entities within Medellin's Mayoralty has facilitated coordination between them.

Another lesson of Medellin's case is that smart city projects can be funded not only by local governments. According to an interviewee, Route N supports the development of STI Plan providing just a portion of the initial capital. In turn, universities, research centers, companies and/or entrepreneurs who formulate projects to be financed by Route N must provide the other portion of capital required for its implementation. In 2013, some projects also applied for receiving funding from National Government to support Science, Technology and Innovation.

Another lesson learned from the case of Medellin is that development of smart city initiatives requires specialized personnel. Cities can meet this need by training programs for civil servants, or outsourcing the implementation and/or operation of some initiatives.

3.2 Technology

One lesson learned from the case of Medellin is that governments can innovate without using the most advanced technologies. Some interviewees agreed that Medellin is an innovative city due to the use of existing technology for non-traditional uses. The cases they cited were the electric stairs and air wagons traditionally used for commercial purposes, to improve mobility conditions of communities who live in slums.

Another lesson from Medellin's smart cities initiatives is that entities usually implement isolated information systems, which restricts their compatibility. According to an interviewee, Medellin's Mayoralty is facing this problem through the accompaniment of the IT sub-secretariat (a cross-agency department) in the development of smart city initiatives which are developed by entities from different sectors.

3.3 Governance

Another lesson learned from Medellin's smart city initiatives is the importance of involving stakeholders in the formulation and implementation of smart city projects. According to an interviewee, there's a high risk that projects fail when people are not involved. Through social media and open platforms, cities can

open spaces for favoring participation of people and communities in the definition and implementation of smart city initiatives.

3.4 Policy Context

One lesson learned from the case of Medellin is that transforming a society and economy takes time. Consequently, it's important that cities propitiate the continuity of policies. One way to do it is establishing long term initiatives as Medellin Smart City Program and Route N.

3.5 People and Communities

One of lessons learned from the case of Medellin is that digital inclusion must be included as a priority for Municipal Mayoralties in the process of building a smart city.

Another lesson learned from the case of Medellin is that the acceptance of technology from people is not always easy, as stated an interviewee. Communications campaigns on different media and pedagogic campaigns can facilitate its acceptance of these initiatives, said the same interviewee.

4. CONCLUSION

Medellin's smart city initiatives are not integrated in a single strategy. However, they complement each other and contribute to become Medellin more equitable, sustainable and innovative city. Most of these initiatives require grater maturity and articulation to show clear impacts on society and economy.

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