

# Guayaquil Harnesses IoE to Offer Telemedicine and E-Government Benefits to Citizens



## EXECUTIVE SUMMARY

### Objective

- Improve the lives of residents, and help them succeed in the new information economy

### Strategy

- Partnered with private companies to mitigate challenges
- \$2.5 million investment to initiate program, with no federal government support
- \$2.5 million per year for next five years to complete Internet access program for the whole city
- \$5.25 million yearly to provide students with tablets and computers
- \$100,000 in 2014 for hospital and clinic telemedicine and government information kiosk programs

### Solution

- Initially, 50 free Wi-Fi hotspots; eight connected kiosks (similar to ATM machines) to provide Internet access to residents; telemedicine program that allows patients to receive remote diagnoses and treatment by specialists

### Impact

- Citizens with limited economic and physical mobility no longer need to travel across the city to see a specialist
- Free Internet access and telemedicine program have given citizens more confidence in local government
- Program investment will eventually benefit municipal coffers

## Background

In January 2014, Cisco released the results of an in-depth analysis of the economic benefits of the Internet of Everything (IoE) for the public sector. Cisco's model revealed that some \$4.6 trillion in "Value at Stake" would result from the adoption of IoE capabilities across 40 key public sector use cases over the next 10 years, including smart water, smart buildings, smart energy, smart parking, and more (<http://bit.ly/1aSGIzn>).

As a next phase of its analysis, Cisco engaged Cicero Group, a leading data-driven strategy consulting and research firm, to undertake a global study of IoE capabilities across these 40 use cases – how the best public sector organizations are "connecting the unconnected," as Cisco terms it. To that end, Cicero Group conducted interviews with dozens of leading public sector jurisdictions – federal, state, and local governments; healthcare organizations; educational institutions; and non-governmental organizations (NGOs) – to explore how these global leaders are leveraging IoE today.

The research examined real-world projects that are operational today, are being delivered at scale (or through pilots with obvious potential to scale), and that represent the cutting edge of public sector IoE readiness and maturity. The aim of the research was to understand what has changed in terms of the jurisdictions' people, processes, data, and things, and how other public sector organizations can learn from (and replicate) the trail blazed by these global IoE leaders. In many cases, these jurisdictions are Cisco customers; in others, they are not. The focus of these jurisdictional profiles, therefore, is not to tout Cisco's role in these organizations' success, but rather to document IoE excellence, how public sector entities are putting IoE into practice today, and to inform a roadmap for change that will enable the public sector to address pressing challenges on multiple fronts by drawing on best practices from around the globe.

## About Digital Guayaquil

Guayaquil, Ecuador, a city of 2.5 million with up to 300,000 daily itinerants, faces a number of educational and poverty challenges. Only 44 percent of citizens have Internet access through local telecommunications companies, but its forward-thinking mayor is investing in technology and connectivity to make Guayaquil the first large metropolitan area in South America to be a digital city. The city is growing its free Internet access for citizens, connecting hospitals and clinics, providing e-government solutions, and investing in computers, tablets, and Internet access for public schools and universities.

Mr. Xavier Salvador is director of the Informatics Department in Guayaquil. He started his career as a teacher who studied computer science to help students learn technology and computers. In May 2003, the mayor of Guayaquil appointed Mr. Salvador to his current position.

“The mayor wants every citizen converted into a digital citizen. We have information from economists, newspapers, and IT consulting firms saying that there will be some sort of disruption because of the new technology. Many people will be unemployed in the future. The mayor is really concerned about that, and he’s trying to [give people] the instruments, so the people in this city will be better prepared for the future.”

Xavier Salvador,  
Director of Informatics Department,  
City of Guayaquil

## Objectives

The overarching goal of the city’s efforts is to improve the lives of residents and to help them succeed in the new information economy.

Digital Guayaquil started in 2004 with the vision of extending digital literacy and Internet availability to residents by providing computers and Internet access to high schools and universities; giving hospitals telemedicine capabilities; and connecting residents of Guayaquil to the Internet through city Wi-Fi projects and government kiosks. In addition, the city of Guayaquil is offering government services over the Internet. In October 2013, the city announced a goal to provide Internet coverage to the entire city of Guayaquil within five years.

“The mayor wants every citizen converted into a digital citizen,” said Mr. Salvador. “We have information from economists, newspapers, and IT consulting firms ... saying that there will be some sort of disruption because of the new technology. Many people will be unemployed in the future. The mayor is really concerned about that, and he’s trying to [give people] the instruments, so the people in this city will be better prepared for the future.”

## Strategy

The Digital Guayaquil program is operated by the Guayaquil City Government. The Informatics Department, headed by Mr. Salvador, consists of 62 employees, with some positions staffed 24 hours a day to provide network support.

Mr. Salvador says that bringing Internet access to the citizens of Guayaquil has been challenging. To mitigate this, Guayaquil partnered with private companies whose experience Mr. Salvador characterizes as invaluable.

The city is investing \$2.5 million to initiate the program, with no federal government support. The amount covers technicians; security; operators for servers, routers, and equipment; and employees based directly at City Hall. “We have a development department for our program. Many times we buy, but some things we have to

develop ourselves,” Mr. Salvador explained. In addition to the \$2.5 million in initial funding, the city has budgeted another \$2.5 million per year for the next five years, totaling \$12.5 million, in order to complete its citywide Internet access program.

Mr. Salvador indicated the city is further spending about \$5.25 million per year to provide public school students and high schools with tablets and computers. In addition, according to Mr. Salvador, the hospital and clinic telemedicine and government information kiosk programs will cost the city about \$100,000 in 2014.

## Solution

With Internet penetration at roughly 44 percent of the population, the city decided to increase Internet access by providing 50 free Wi-Fi hotspots around the city. “Most of these are educational sites,” said Mr. Salvador. “The motivation is to have students get access to the Internet for study purposes.” The hotspots have filters to limit access to violent and pornographic content. Additionally, the government has a program to provide tablets to secondary-school students.

Next, the government placed eight connected kiosks (similar to ATM machines) around the city to provide Internet access to residents. These kiosks allow residents to conduct business with the city, such as making payments for city utility services and purchasing land-use and other permits. Citizens can also find information about city government structure and processes. Based on the initial success of the program, Guayaquil plans to install 12 more kiosks throughout the city.

Guayaquil is also connecting municipal hospitals in the city to expand medical services via telemedicine capabilities. In full operation for the past eight months, this program allows patients at local clinics to receive diagnoses and treatment by specialists at major hospitals, eliminating difficult journeys and wait times.

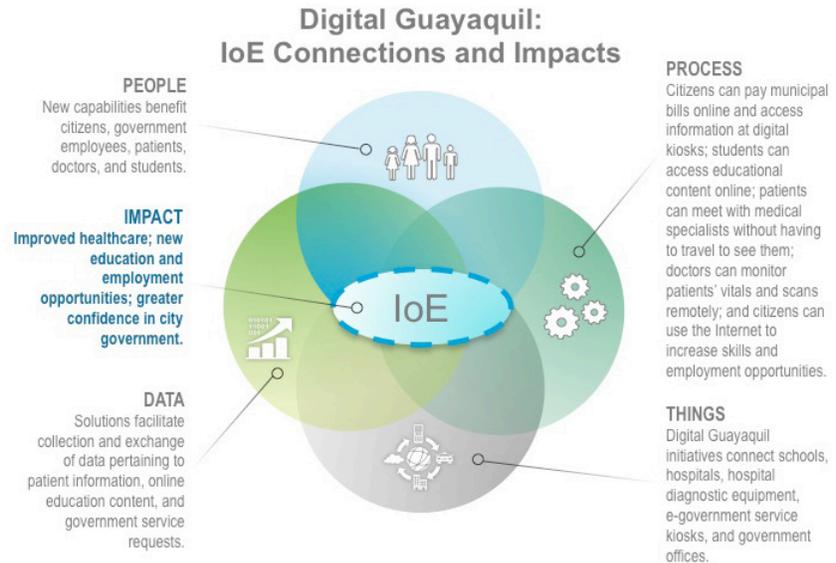
“[Patients] can be reached by a specialist from another hospital and no longer have to travel to see the specialist,” Mr. Salvador explained. “It is a connection between the eight hospitals of the municipality. [Doctors] can monitor blood pressure, heart rate, and other signs remotely.” Doctors also have the ability to perform certain types of internal tests.

In order to provide these services, the city utilizes a fiber-optic network provided by one of the local telecommunications companies. Outside contractors who operate a Network Operating Center, or NOC, provide network support, which keeps operational costs down.

Guayaquil is also connecting municipal hospitals in the city to expand medical services via telemedicine capabilities. In full operation for the past eight months, this program allows patients to receive diagnoses and treatment by specialists at major hospitals, eliminating journeys and wait times.

Citizens are not only more educated about opportunities Internet access brings, but Mr. Salvador also says the program is an investment that will benefit municipal coffers in the future.

Figure 1. Digital Guayaquil: New and Better Connections.



Source: Cisco Consulting Services, 2014

## Impact

According to Mr. Salvador, the free Internet access program has been received very positively because it is a tangible benefit. Mr. Salvador said that the most basic way to get citizens to take advantage of Internet resources is to personally assist them in navigating to relevant training and educational resources. “Asking people, “What do you want to do with your life? Do you want to be a doctor? Okay, this is the site on the web that can help you .... You want to learn another language? Use iTunes, you will find very good lessons in English for free.’ With this type of training, people will learn where to find things. The internet is a big place, and some people get lost in there.” An educational television program also teaches citizens how to get the most benefit out of the Internet. “We need to educate people to use the technology in the best way,” Mr. Salvador said. “We are working on two TV programs for that .... The people have to use this technology to get a better life.”

The benefit of telemedicine connecting hospitals and clinics is that citizens with limited economic and physical mobility no longer need to travel across the city to see a specialist. Along with free Internet access spreading through the city, this benefit has given citizens more confidence in local government. “We see that the people [are] astonished,” said Mr. Salvador. “Now they have confidence in the way that the mayor is helping them. It’s very good to see the people happy for this – for the technology that we are using to help them.”

Citizens are not only more educated about opportunities Internet access brings, but Mr. Salvador also says the program is an investment that will benefit municipal coffers in the future. “As soon as the citizens know more, they can build their own

According to Mr. Salvador, cooperation from individuals within the government is critical: forward-thinking attitudes and power are needed to ensure a successful project.

businesses, right? In the future, they will provide the taxes that the city collects. It's not a direct [benefit]. The vision of the mayor is to help the people, and that pays later."

## Lessons Learned / Next Steps

According to Mr. Salvador, cooperation from individuals within the government is critical: forward-thinking attitudes and power are needed to ensure a successful project. "First, you have to find people to help because you need people in the local government," he said. "You need to find people who are convinced that this is good for the citizens."

Partnering with private-sector companies whose specializations can guide the process is also integral to Guayaquil's success. This is due to the combined vision of end goals from the city and the experience of tech partners.

Lastly, Mr. Salvador says that having smart infrastructure and services is not enough if citizens cannot take advantage of it. Educating the public about how to utilize the smart technology – whether e-government portals or Internet-connected devices – is vital to the project.

## More Information

For more information, visit <http://www.guayaquil.gob.ec>



**Americas Headquarters**  
Cisco Systems, Inc.  
San Jose, CA

**Asia Pacific Headquarters**  
Cisco Systems (USA) Pte. Ltd.  
Singapore

**Europe Headquarters**  
Cisco Systems International BV Amsterdam,  
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at [www.cisco.com/go/offices](http://www.cisco.com/go/offices).

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: [www.cisco.com/go/trademarks](http://www.cisco.com/go/trademarks). Third party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1110R)