forward taguig

City of Taguig, Philippines

UNIFIED CITY-WIDE TELECOMMUNICATIONS

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SUMMARY

The city of Taguig, known for its openness to technological innovations, has recently implemented the newest available technology for its whole city: **wireless unified telecommunications system.** The unique implementation of the latest technologies of VoIP and wireless networking, the first in the Philippines, had led this city not only at the forefront of technology, it had also brought 50% decrease in city costs while increasing city productivity up to 100%.

Communication within Philippine Municipalities

The City Hall is the main center for administrative operations for the whole city, with the Mayor heading city operations. It is generally an area where people can seek help involving health services, legal counsels, business permits, and other public services.

Cities are divided into smaller districts called *barangays*, which are each led by corresponding Barangay captains. Aside from Barangay Halls, which are smaller counterparts of the City Hall, cities also have other public units that the City Hall should always have constant communication with -- fire stations, hospitals, schools and police stations.

Almost all municipalities are connected by physical leased lines provided by private telecommunication companies (Telcos). These leased lines, also called Public Switched Telephone Network (PSTN) lines, are costly in terms of installation because of trenching and layout of physical cables. Aside from the installation cost, private Telcos charge monthly operating costs. Phone lines are also allocated depending on the budget of a certain department or unit. Thus, there are some units that have too many phone lines, while others definitely need more phone lines.

In addition, these leased lines do not even provide centralized communication between municipal units and no direct connection to the city hall. People must always have a telephone directory on hand or have the phone numbers memorized, which is usually a sequence of 7 or more numbers.

Problems of traditional telephone systems:

- no centralized communication
- no dynamic allocation of phone lines
- monthly service charges
- dependence on physical infrastructure and private Telco providers

If not, people may suffer being mindlessly passed from one call to another. For city officials to send announcements and orders to everyone, they have to call each and every office. As an alternative, memorandums and letters, or sometimes even messengers, are sent to every office. However, snail mail will never arrive as fast as telephone calls.

In addition to tropical rains that occur throughout the year, typhoons visit the Philippines at an average of 20 per year. The constant rain and strong winds may bring down the whole telephone system of the city hall, or any other unit, for days. Since emergencies often happen also during typhoons and rains, it is very important that communication between municipal units should always be up, 24/7.

VoIP: Voice over IP technology

Voice-over-IP (VoIP) allows voice communication over the Internet, or any IP-based network. It offers a myriad of features not available with the old telephone system provided by telephone companies. VoIP can be built on any existing local data network allowing efficient, cost-effective and reliable voice communication, without the need for subscriptions and recurring monthly costs.

A VoIP telephony system can easily be implemented by using an IP PBX equipment, connecting it to the network and configuring the extensions that will be used. Once configured, all units connected to the telephone network can now communicate with each other without the need for individually leased telephone lines.

WiMAX: Extending the capabilities of VoIP telecommunications

Installation and connection of remote municipal units to the City Hall using physical cables may very well take 1-2 years. What is the fastest way to connect and disconnect units? **Wireless.**
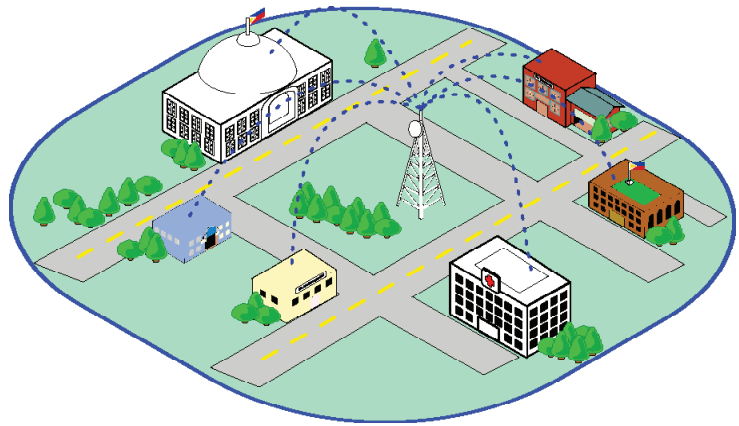
WiFi is the wireless Internet connection often available in coffee shops, malls and residential houses. WiFi is great because you can be anywhere within its range (about 150-180 meters) and be able to connect your laptop or cellphone to the Internet easily. Nowadays, people just don't want to be limited by physical cables and lines.

This concept can also be applied with cities. Some cities either have too many buildings and other physical infrastructure developed that there is too much investment involved in trenching and the physical layouting of cables and telephone poles; or they have buildings that are so far away that it is not possible for telephone lines to be connected. WiFi, however, has its limitations. Since it can only cover a small area, a newer technology, WiMAX, is more capable of covering an area that are as large as cities.

Wireless networking gives us the ability to be connected **anytime, anywhere.**

WiMAX uses an omnidirectional spread of signals, providing reliable and robust wireless connectivity regardless of topography, building cover and natural obstructions. WiMAX base stations, which can be likened to a WiFi access point, can cover a maximum radius of 20km. For Taguig, which has an approximate area of 44 square kilometers, the whole city can be covered by using only three base stations. Compare that to a hundred telephone poles and kilometers of telephone lines.

Unified Communications: WiMAX + VoIP
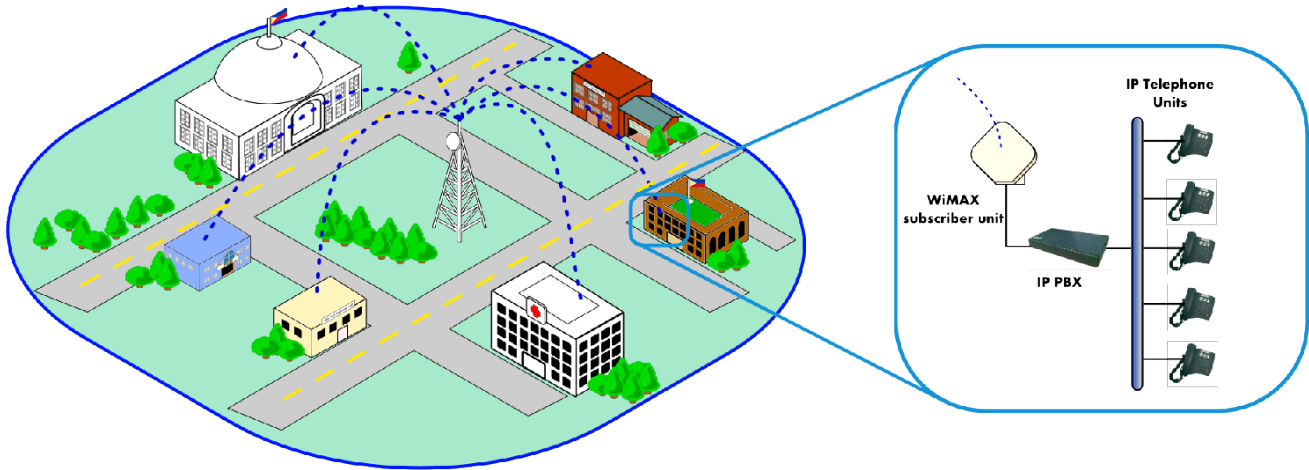
Using VoIP as the new telephone setup and WiMAX to connect one unit to another, cities could benefit from so many features that were previously limited in traditional telephone systems.

Virtually unlimited phone lines. Using VoIP, you can have an almost unlimited number of phone connections without having to pay for individual leased lines. Aside from this, setting up a VoIP system allows the city to have their own telephone directory, where the numbers or extensions can be configured systematically. For example, the city mayor can be given the telephone number of 1001 and the vice mayor 1002 and so on. This would allow the users better recall because of systematic number assignment on different units and with less numbers compared to leased lines.

Centralized communication. Using VoIP and WiMAX, every unit's telephone system is connected to each other, and all units are connected to the City Hall. With the amount of calls going in and out of different units, setting up a Call Center unit can effectively monitor and filter each call is beneficial to the city administration and officials. Call details and individual calls can be recorded and retrieved for review, allowing better call management and response. Calls can also be filtered and forwarded to the proper department, instead of being passed from one department to another. By monitoring call usage, the city can properly allocate phone lines to those in need, and minimize to those

24/7 Inquiry and Emergency Hotline service. Normally, people come personally to the city hall to ask for legal questions, business permits and registration procedures. By setting up a Call Center, a special hotline can be manned by staff that are trained in certain aspects of city administration. They can immediately answer basic inquiries instead of forwarding it to administrative staff. This can lessen the work of the administrative staff and increase their productivity. Emergency calls can effectively and quickly be responded to by call agents, alerting the nearest police or fire department closest to the site where the call originated.

Why choose VOIP + WiMAX?

Security & Reliability. WiMAX signals are proven to withstand hard rains and winds. The whole network is also divided into several subnetworks called Virtual LANs (VLAN), which can control voice and data traffic for different applications. Thus, the IP PBX systems also act as independent networks. When the main network from the City Hall is down, other units (for example, hospitals and police stations) can still contact each other through VoIP. When the telephone system of one unit goes down, it does not affect the whole city communications system.

Scalability & Extensibility. This system is not just limited to telephone communications, because of the high bandwidth WiMAX provides (54Mbps) and the low bandwidth consumption of VoIP (~1Mbps). The system can be extended to video communications, traffic surveillance, fire detection systems, and more. Cities can add more lines when needed, or dynamically allocate phone lines to those particular units in need.

Faster Deployment and Ease of Operation. The VoIP system can easily be implemented on any site within the range of the wireless network. One would just need a WiMAX subscriber unit (SU) that connects to the wireless network, plug it to an IP PBX system which provides the telephony features and connect it to IP telephone units. Telephone lines can easily be added, removed and configured according to the a certain unit's need. The system can also easily be upgraded, providing better reliability and security. This provides a telephone system *that will never go out of style.*

The city of Taguig have reduced the number of their leased lines down to 50%, but they have already deployed VoIP telephone systems to over 73 sites, with still over 200 phone lines. They now have two hotlines numbers for people to remember, one for general inquiry and one for emergency purposes, where all calls are answered and filtered by trained staff. There is an increase in productivity for administrative employees in Taguig's City Hall because they do not have to be interrupted by unnecessary phone calls. Aside from centralized telephone communication, the city of Taguig had incorporated video surveillance to detect traffic collisions, fires, and any other problems within the city. Once problems are detected, the call center itself immediately calls the nearest fire or police stations. The city of Taguig has provided its people **effective public service** through **reliable unified communications.**

NEXT|ix *is the pioneer in advanced telephony and VoIP solutions and is the major provider of the unified city wide telecommunications system implemented in Taguig.*