

DESIGN AND IMPLEMENTACIÓN DE UN SISTEMA DE CONSULTAS DE CONSUMO DE AGUA POTABLE MEDIANTE TTS IVR, WEB Y MENSAJES DE TEXTO PARA EL GOBIERNO MUNICIPAL DE ANTONIO ANTE UTILIZANDO HERRAMIENTAS OPEN SOURCE

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Summary. The main objective of this project thesis is to present a solution that can improve care users of the Municipal Government and Antonio Ante company thereby Public Water and Sewerage, dare different means of access as They are telephony and the web, thus decreasing agglomeration of users in the municipal, when making consumption consultations sheets drinking water.

By using Asterisk we will step guide step installation, configuration and implementation of PBX, in which we create our TTS IVR which is added value to the central IP telephony. Also see how to achieve the connection with the SQL database SERVER to achieve extraction of the information we need. .

As we will see using web technologies using queries of spreadsheets drinking water

keywords

ASTERISK, PHPAGI, TTS, FREEPBX, FREETDS

1. Introduction

The municipal government of Antonio Ante is an institution public which it is focused on providing services to

the community to improve the way of life of its inhabitants, just so is directly immersed in performing economic collections and information services provided as drinking water, land registers, patents, etc.

Currently the Municipal Government generates Antonio Ante information and inquiries about payments and services provides to the community in a localized manner as the Users need to go to the windows of charging during such nsultations, generating an agglomeration people in rows

With this background of the institution on the state its current information system proposes the design and implementation of a TTS (Text to Speech) based IVR VoIP, and Web technologies using text messages

Open Source tools which automate the process of consultations via phone and web information hich It will also allow users to perform all kinds of queries without having to approach the windows collection

2. Materials and Methods

Asterisk is a free software program that It provides functionality of a telephone exchange. As any PBX, you can

connect a number of phones to make calls to each other and even connect to a VoIP provider or to an ISDN basic both as primary.

FreePBX is a web GUI that allows us simplify the work of basic configuration of Asterisk. Uses PHP and MySQL, and what it does is create a simplest representation of understanding to facilitate the creating users, trunks, extensions and other points basic Asterisk configuration

The dial plan, calling Dialplan Asterisk It could be considered the backbone of the system. As main feature, we could say that is something a scripting language, which features, applications and resources are interspersed to form something like "Procedures" and "programs" in what could be considered.

This oriented programming paradigm channels phone is unique in the world and brings the full potential and flexibility than traditional PBX can not offer, or do so through mechanisms of licensing and sometimes too complex structures

IVR (*Interactive Voice Response*) is, as its name suggests, an **interactive voice menu** that allows automatically interact with the other end of the communication with a particular purpose. Today it is normal to meet an IVR welcome when you call any large company. He most obvious case is that of the big telephone operators IVRs featuring whose sole purpose is to redirect the user department that can solve your consultation but most accurate way to do it with both level detail (submenus) that can be very annoying the end user.

Visual Basic .NET (VB.NET) It is a [language programming](#) or [orientado](#) objects that can be considered an evolution of [Visual Basic](#) implemented on The [framework .NET](#). his introduction turned out very controversial, since due to significant changes in the VB.NET language is not backwards compatible with Visual Basic, but handling instructions is similar to versions previous Visual Basic, thus facilitating the development of more

advanced applications with modern tools. To maintain efficiency in the development of applications. The vast majority of programmers using VB.NET the [integrated development environment](#) in Microsoft Visual Studio some version (from the first Visual Studio .NET to Visual Studio .NET 2013, which is the latest version of Visual Studio for .NET platform), but other alternatives, com [oSharpDevelop](#) (which is also free)

3. Implementation inquiries via ttsivr web

With the implementation of our PBX Asterisk We give added value to implement our application TTS IVR because they do not need to use other equipment Additional and chieve maximize the hardware and reduce costs

Also with the help of our website we will give more scope for obtaining information required by the user to avoid the crush of people in the decentralized government offices of Antonio Ante

Hardware.- for implementing the proposal our Asterisk PBX has been taken into has scalability, the number of users and the number line with the institution which has to size the which type of server use

TABLE I

Hardware	Características
HP ML110 Gen9 E5-2603 v3 NHP-MCA Svr	<ul style="list-style-type: none"> • Modelo de Procesador: E5-2603 v3 Núcleo del Procesador: Hexa-core (6 Core) • Memoria Estándar: 8 GB • Tecnología Ethernet: Gigabit Ethernet • Controladores - Compatibilidad con RAID: Sí - Niveles de RAID: 0, 1, 1+0, 5 - Tipo de controlador: Serie ATA/600
Open vox A800	<ul style="list-style-type: none"> • Tarjeta de 8 Puertos analógicos, PCI-Express más 1 módulo FXO400 con módulo

Software.- as mentioned for the part of TTSIVR opted for the PHP language, distribution Linux Centos 6.5, Asterisk 1.8 and the web part isual.net because all the platform web is made of this language and touches us to adapt the guidelines of Antonio Ante municipal government

For the development of our TTS IVR we opted for a step by step installation that is, first our systems operation which will make our platform, which is asterisk our software PBX and FreePBX which will be the front web to help us to our shaping our PBXSo we know that our server phone and then to polish our needs

Portal web.- a means widely used by users today is the use of new technologies such as the websites. In which the

user need not be an expert in technology to manipulate this tool since this page gives you all the facilities for the required information

4. Description del TTSIVR,website consumer consultation system water

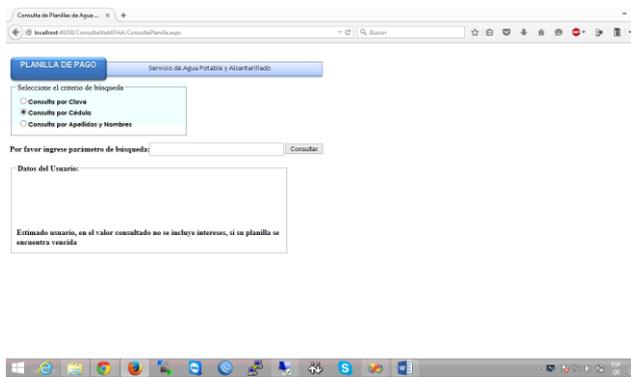
The design of this system queries consumption drinking water for decentralized self-government Antonio Ante. It is for users to avoid agglomerations in the offices of the entity also know the value to cancel, thus saving time and money. For this purpose we will use technologies such as the Asterisk IP telephony and web technologies. Here we will describe the operation of This system queries: TTSIVR.- will define what tts in Spanish testo transformation means to voice. IVR system that is interactive response.

For a better understanding we will explain putting a practical example:

the user performs the call to the number XXXXXX system kicks in and gives you several choices on the menu, digitamos the X option which will make the consultation, digitemos system tells us that our card number followed by any key, if correct key digitamos Otherwise validation return to typing information to be correct, we will ask the same number of meter so we validate this information, with this information our telephony server sends a query to our server database in which we all user information. If the query reads exists values found in the database and transformed into audible for the user to hear, which

We obtain the information requested. How can we understand the system is friendly to all users of all ages so they can use this tool as we all have a telephone Conventional in our homes.

Web.- our web application is very easy since we only know the ID number, the key cadastral and we click and any of them can get our information requested. Next show capture the screen of our application web.



5. Conclusions

- The use of IP telephony, in our case Asterisk allows us to interact with any database that we have using scripts to obtain information an easy way is through a phone call, what with a solution Private cost us a lot of money or not be possible
- There is a cost savings for staff administrative, and we do not need a person on the call the 24 hours a day
- . Using PHP, being a language more programming and is used most frequently

Fits Asterisk allows any type of extraction of data from different databases to be supported them

- By using free tools, we are helping to establish entities Public use these tools which they were enacted into law
- Such projects improve the quality of customer service, since users no They have to go to the municipal offices to query the value owed as well optimize both his time and the employees of that entity

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Bibliographic references

- [1]3cx.es. (febrero de 2013). Obtenido de <http://www.3cx.es/voip-sip/h323/>

- [2]asterisk.org. (mayo de 2012). Obtenido de Why IAX?:
<https://wiki.asterisk.org/wiki/pages/viewpage.action?pageId=4817138>
- [3]Bryant, L. M. (2011). *Asterisk Cookbook*. Gravenstein Highway North: O'Really Media.
- [4]Cisco. (Enero de 2012). Guía del usuario de Cisco Unified Communications Manager 9.0. Enero.
- [5]Correa, E. V. (2011). *Asterisk Desconsolado*. Creative Commons.
- [6]Gomillion, D., & Barrie Dempster. (2005). *Construyendo Sistemas Telefonicos con Asterisk*. BIRMINGHAM - MUMBAI: Packt Publishing Ltd.
- [7]Landívar, E. (2008). *Comunicaciones Unificadas con*
Perez, B. (2014). *Asterisk instalacion, configuracion y puesta en marcha*. Republica Dominicana: SNC IT.
- [8]php.net. (Lunes de Junio de 2015). *www.php.net*.
Obtenido de <http://php.net/manual/es/intro-what-is.php>
- [9]php.net. (lunes de Junio de 2015). *www.php.net*. Obtenido de <http://php.net/manual/es/intro-whatcando.php>
- [10]Russel Bryant, L. ., (2013). *Asterisk the Guia Definitive*. Unite States of America: O'Reilly.

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