

A Survey of Existing Platforms for Automation of Communication Between Phone Users

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ABSTRACT

The products of the Interactive Voice Response technology develop actively and find application in power engineering, health care, telecommunications, banking, finances, etc. This paper makes comparison analysis of the three most often used platforms of this technology: VoiceXML, CallXML, CCXML.

Keywords

IVR technology, VoiceXML, CallXML, CCXML

1. INTRODUCTION

With the introduction of voice application platforms the creation of services for plain telephones will soon become so simple and understandable, as it is the creation of web sites now. This became possible thanks to the huge number of services, especially for wireless network users. The products of Interactive Voice Response (IVR) technology develop actively and find their application in power engineering, health care, telecommunications, banking, finances, etc. Today various software and hardware configuration are offered. The common IVR characteristics include:

- servicing incoming and outgoing conversations;
- modularity of telephone services;
- integrated customer database;
- integrated information system;
- IVR technology.

This is the technology used for automation of telephone users' communication [2]. The big companies welcome this technology, because it helps reduce the services price.

Firstly only pre-recorded sounds and tones, menus, some options for giving information to users were used. The only way of communication for the user was the tone keypad on which they typed their requests. In the modern IVR solutions it is already possible to use voice recognition.

The IVR technology allows the users to receive information as bank statements, flight schedules, etc. only by phone. With the possibility of outgoing call information could be send about forthcoming meetings, non-paid taxes and events, which are critical in regards to time.

2. IVR TECHNOLOGY

The IVR technology includes: IVR platforms, IVR applications and a built infrastructure.

2.1 IVR platforms

The IVR platforms are the hardware and software environment in which the applications run. They ensure: the possibility to play and record audio messages, conversion of text in voice messages (text-to-speech), voice recognition of the user, the connection to each telephone and call center and collecting the necessary information from the keyboard.

2.2 IVR applications

The IVR applications are the programs, which control and reply to the calls in the actual IVR platform. They control the IVR platform when connecting to users, collecting input information and transfer to other telephones. The applications also maintain the connection to the databases and application servers to receive the necessary information about the current session.

2.3 Infrastructure

One of the advantages of the IVR technology is that it uses a already built infrastructure, included telephone lines, equipment and all Automatic Call Distributors (ACD's). The telephone lines can be standard analog, digital T1, as well as digital ISDN lines. These lines are connected on one hand with the IVR platform and on the other hand with the standard equipment – switches of the telephone company, VoIP gateways or directly to the ACD.

3. EXISTING PLATFORMS

The three major platforms, on which the XML based telephone applications are developed, are wide range, flexible and work very well combination with the most often used web platforms.

3.1 VoiceXML

VoiceXML is a XML standard, developed by Lucent, Motorola, IBM and AT&T and is a special mechanism for building voice communication systems [3, 4]. Apart from the voice recognition technology it also includes the text-to-speech technology (TTS). This standard ensures integration of the telephone technology in the Web area. The speech is a voice interface giving users access to Internet. Using VoiceXML the developers can create automatic voice systems using the same technology as when developing graphic sites, and in this way the expenses are significantly reduced.

VoiceXML allows users to work with Internet through a voice-recognition technology, instead of the traditional browser, in which there is a combination HTML, mouse and a keyboard. Here a voice browser is used which most often is the phone itself. VoiceXML is developed for creating audio dialogs, which are characterized with synthesized speech, digital sound voice recognition, etc.

The architectural model of VXML (Figure 1) is equivalent to those of CallXML.

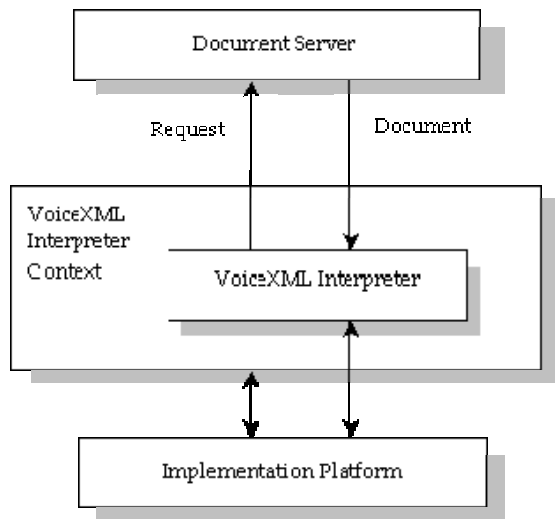


Figure 1. Architectural model of VXML

VXML is a language which:

- minimizes client/server interaction, while ensuring a set of completed tasks in a document;
- separates the user interaction code from the servicing logic;
- ensures portability between different platforms.

The features of this platform are much more, but the listed ones make it competitive with the rest two.

3.2 CallXML

CallXML platform was developed by Voxeo and is specially oriented to telephone call control as well as to manipulating Web applications through the telephone keypad [1]. CallXML is a mark-up language with an easy syntax and is significantly simpler than VoiceXML when using traditional telephone applications which require keypad operation. It is ideal for the needs of most telephone applications which use a tone dial (DTMF) and do not use voice recognition, although the latest version addresses this, too. CallXML ensures the fastest development of a concept and is mainly used for describing telephone user interface, VoIP, or multimedia application in CallXML browser.

3.3 CCXML (CallControlXML)

CCXML is a declarative mark-up language used for control on the telephone call. It is developed to ensure the control of telephone flow in dialog systems (such as VoiceXML) and in this way improves the functionality of these systems. CCXML is compatible with every dialog platform and with the ability to

process media events. Since CCXML was created as a compliment to the VoiceXML it encompasses a set of links oriented towards VoiceXML. However both languages can be used independently and in combination with other traditional IVR systems.

Figure 2 exhibits telephone architecture, which contains the three main components which shows that CCXML can be used as also a side in this architecture:

- User (together with the telephone network)
- Dialog system (in this case VoiceXML)
- CCXML part which controls the communications between the first and the second component.

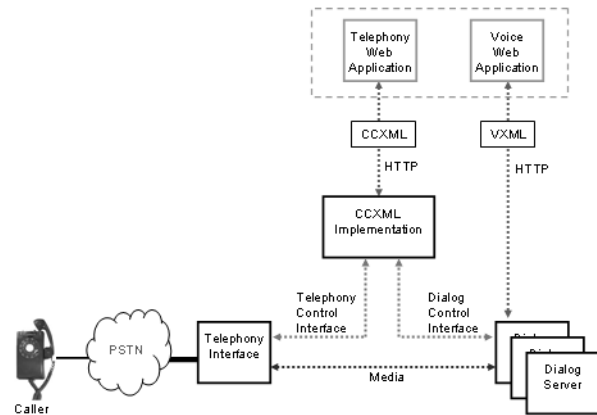


Figure 2. The three main components in the telephone architecture using CCXML

The improvements, which CCXML brings as functionality, are:

- maintenance of a multi-session conference with much better possibilities for control;
- improved processing of several call as well as control over these calls;
- processing a higher class asynchronous events. CCXML contains a significant number of improved operations, a set of various reliable signal, event state and much more improved message transmission. To compare VoiceXML does not support processing of external asynchronous events;
- possibility to receive events and messages from external computing devices. The operation of a call queue as well as localization of given calls using a document server means that VoiceXML is limited in regards to the interfaces;
- routing the calls to the next available line in the group;

Both VXML and CCXML were approved by W3C.

3.4 Microsoft WTE

Microsoft WTE is a WEB technology, which is a part of Windows 2000. It allows development of wireless applications which will exist independently or via WEB using tools as ASP. Each of these tools can be used efficiently to develop wireless applications.

4. CONCLUSION

Although some of the functions of the enumerated platforms overlap, each one of them has its own individuality which makes it different to the others. The common between all these platforms is that their main tool is the human speech. Their purpose is to unite to very quickly developing areas in communications – Internet and telephony.

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