

# What is VoiceXML?

## The Voice eXtensible Markup Language

### Introduction

Businesses are striving to create new and better means of communicating and conducting business with their customers. Therefore, companies are investing significantly to build and improve their customer service infrastructure. In the past, offering convenient, easy-to-use and cost effective customer support to all potential customers has been difficult. Customers want anywhere, anytime access to information through any communication device. New voice technologies are emerging that will allow businesses to leverage the Internet and telecommunications infrastructure in order to effectively and efficiently interact with their customers.

### Growth of the Internet

The Internet has offered businesses a new global communications medium for efficient sharing of electronic information and transactions. Businesses have made massive investments over the last few years to enable their information to be delivered and transactions to be conducted over the World Wide Web. In the past decade, the Internet has fundamentally changed the way consumers and businesses obtain information, communicate, purchase goods and transact business. The Internet also provides a great potential and opportunity to route telephone calls over the medium at low costs through Voice over Internet Protocol i.e. VoIP.

"there were approximately 361 million Internet users worldwide at the end of 2000, and forecasts that by December 2004, the number will grow to more than 741 million."

-The IDC Report

### Telephone and Business Online

Despite the Internet's growing acceptance, the telephone network is still more widely and readily accessible. Telephones are simple to operate and use the most natural form of communication, the human voice. The proliferation of the wireless phone has made access to the telephone network even easier. Businesses have been using Telephony based technologies like IVRs for communicating with customers and conducting business (ex: Contact centers, Tele marketing, help lines etc). But these technologies are mostly proprietary in nature. They are made for a particular application using high level programming languages and are difficult to customize. Also, the traditional IVRs use DTMF for collecting user input, which greatly limits the applications they can support.

### Need for Enhanced Access to Business Online

The growth of the Internet as a global medium for communications and commerce has been driven, in part, by the increased availability of personal computers, distributed architecture and a common standard for application development which hides the intricacies of creating the Graphical User Interfaces from the developer. However, access to the Internet over a personal computer is limited because consumers must have access to a computer and a working Internet connection. Wireless access to the Internet over cellular telephones and other handheld devices has the potential to resolve the mobility and Internet connectivity issues presented by Internet access over a personal computer. However, while the number of these devices has increased in recent years, display screens on these devices are small and the ability to input information using portable keyboards is constrained, limiting the usability and convenience of this solution. Therefore, the goal of anytime, anywhere access to a wide variety of information services has not yet been fully realized.

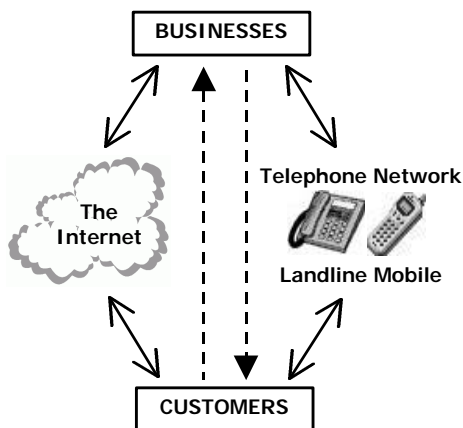
#### **Businesses**

Businesses are looking for more widely used, simple to operate, new & better means to communicate & conduct business or interact with customers

Vs

#### **Customers**

Customers want access to information and services anytime, anywhere and through any device



#### **The Opportunity**

Opportunity for a telephone based user interface capable of delivering information and conducting commerce in a cost effective, convenient and easy to use manner

Leverage the Internet & Telephone Networks to effectively efficiently interact with Customers

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### Convergence of the Internet and Telephony

Access to businesses and information over the telephone is somewhat easier than access over the Internet because of the greater availability of landline and wireless telephones and the ease of use. So there is a need for a telephone-based voice user interface capable of delivering information and conducting commerce in a cost-effective, convenient and easy-to-use manner using the existing investments made in Internet technologies.

"by 2005, there will be 128 million users of speech applications, with nearly 50 percent of those users considered regular users of speech-enabled applications."

-The Kelsey Group

### What is VoiceXML?

VoiceXML or the Voice eXtensible Markup Language is a scripting language for writing Voice enabled IVR and web services and applications. VoiceXML is the 'HTML' for telephony based speech applications. It hides the complexities of the telephony platform from developers and provides an easy way of developing feature rich and media rich speech applications. It uses Speech Recognition and DTMF for user input, and prerecorded Audio and Text-to-speech for output.

VoiceXML is proposed by the VoiceXML forum (<http://www.voicexml.org>) and is an international standard for writing telephony based Voice Applications. The VoiceXML forum is a group of about 500 companies worldwide and still growing.

### Features of VoiceXML:

- Application Logic is separated from the Voice Interface. This has two main advantages
  - + This enables businesses to use their existing investments in web technologies and infrastructure.
  - + Businesses can outsource the Voice Interface Design and hosting while having full control on the application logic.
- VoiceXML being an international standard lets you write the application once and run anywhere.
- VoiceXML is independent of Speech and Telephony platform. This gives flexibility to choose the platform of choice.
- VoiceXML is a simple scripting language. Application developers can develop application with ease without worrying about the complexities of the platform.

### Business Advantage of VoiceXML

The impetus to migrate to standards-based "VoiceXML Architecture" may comprise all or some of the following:

- **Additional Revenue Opportunities**  
Telcos and ISPs can use VoiceXML Technology to provide innovative personalized information services, content based value added services or transaction based services and generate additional revenues from extra talk-time or monthly basic monthly subscription fees.
- **Additional channels for customer care**  
Businesses have been using different channels like email, chat, web and phone to interact with their customers. Of these channels, the telephone is the most popular and costly way of communication. Through the use of voice technologies, businesses can provide personalized and consistent support to their customers in a cost effective manner.



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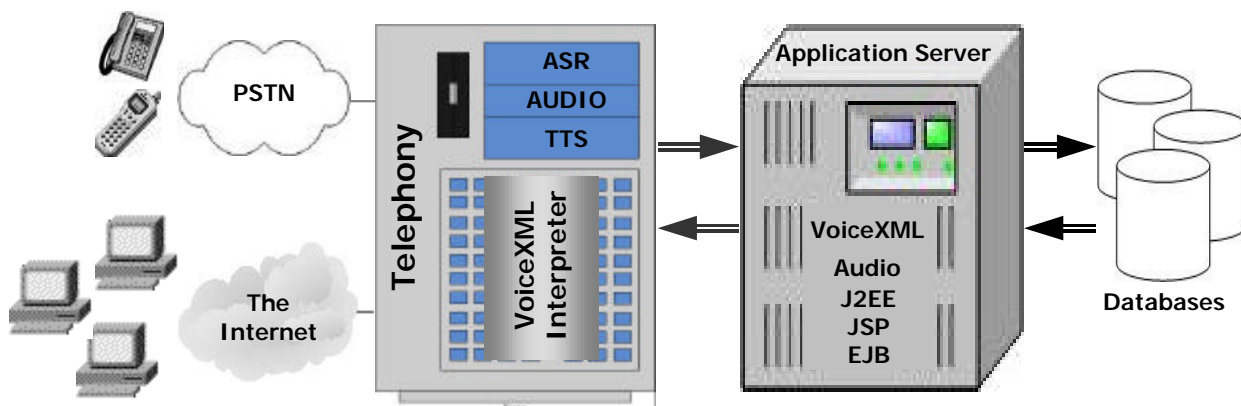
## The Voice eXtensible Markup Language

- **Reduced Staffing, Operating and Maintenance**  
In typical contact center and customer care environments, skilled agents constitute a large portion of the total expenses. Using voice technologies, trivial and frequently asked questions can be answered by the Voice enabled IVR system and the agents are left to handle more complicated and revenue generating calls. In general, a simple call handled successfully by a VoiceXML Platform costs approximately 10% of the cost of an agent-handled call.
- **24/7 Self-service Applications**  
Often customers get different answers to the same query depending on the time of the day, because human agents work in shifts. Automated agents can work round the clock and answer the calls accurately and consistently.
- **Leverage existing Web Technologies and Networks**  
In a traditional IVR environment, applications are closely tied to the system using proprietary technologies. This makes it difficult to customize and add new functionalities to the IVR. VoiceXML based IVRs can use existing enterprise applications (EJB, JSP, Java beans) and provide flexibility in application design and content delivery. Also, unlike IVR applications, VoiceXML applications are simple to write and existing web development staff can easily learn VoiceXML.
- **Improved Customer Satisfaction and Customer Retention**  
Speech recognition systems dramatically reduce customer "on-hold" time and eliminate irritating DTMF menus. Further, a reduction in hold-time leads to lesser Toll Charges. Callers receive consistent, dependable assistance in a fraction of time from any phone by using the most natural form of communication - speech.

### VoiceXML Architecture

A typical VoiceXML based system contains the four main components.

- **Telephone Network:** Can be a PSTN network or VoIP packet network.
- **VoiceXML Gateway:** VoiceXML gateway consists of a VoiceXML interpreter integrated with Media resources (Speech Recognition, Text-to-speech, Audio playback) and Telephony resources (DTMF, Call Control). VoiceXML Gateway downloads the applications from Application Server and interprets it.
- **Application Server:** Typically a Web Server that hosts the VoiceXML application and business logic.
- **TCP/IP Network:** LAN, WAN or public Internet. VoiceXML connects to Telephone Network on one side and TCP/IP network and Application Server on the other side.



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### Application of VoiceXML and Opportunities

Given its open architecture and simplicity, VoiceXML can be used by Telcos, ISPs, Call Centers and Business Enterprises to provide "feature rich" value added services along with the existing technologies and networks infrastructure, allowing end-users to access and manage information and stored content from any website or database using a conventional mobile phone or a telephone. VoiceXML has eliminated the use of special WAP, WEB or touch-tone alternatives.

Alternatively, applications can supplement live human agents and attend common customer queries related to billing and assistance.

Some of the important applications of VoiceXML

- **Enhanced calling services:** Email-by-Phone, Personal Assistant Service, Contact diary, Appointment reminders, Voice activated dialing and Voicemail
- **Content services:** News, Horoscope, Stock quotes, Sports scores, Movie listings, Train and flight timings and Weather reporting service.
- **Productivity Applications:** Sales force Automation, Call centers and contact centers, Unified messaging
- **ECommerce applications:** Financial and banking transactions, billing, travel reservations etc.

The fact that VoiceXML separates business logic from Voice User Interface opens up new opportunity, a new line of business called Voice Service Provider (VSP). Customers can develop and deploy applications on their premises (or optionally they can be hosted by the VSP), which will be accessed through a phone number assigned by the VSP. As the VoiceXML technology catches up there will be a huge demand for such services, because small-medium sized businesses cannot afford to deploy and maintain such solutions.

### About Phonologies?

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Phonologies (India) Private Limited was founded in July 2001 with a vision "to constantly provide VOICE to the next generation of TECHNOLOGY breakthroughs". Phonologies develops and markets Core Voice Technologies based on VoiceXML and SIP and customized voice application solutions for Call Centers, Information Centers, Telcos, ISPs and Enterprises to provide enhanced 24/7 self-service applications. Phonologies' flagship product InterpreXer 2.0, a 100% VoiceXML 2.0 Compliant Voice Browser which supports distributed Speech Recognition, Text-to-Speech and IP based communication components. Phonologies has a strategic alliance with the Indian Institute of Technology, Mumbai to carry out research and development. An incubation unit has been set up at the Kanwal Rekhi School of Information at IIT Campus.

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