Unified Self-Service: Delivering on the Value of Multi-channel Customer Interactions

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Abstract: Consumer expectations for speed, convenience and on-demand information have skyrocketed. While speech and touch-tone driven self-service phone portals are now commonplace, few companies have adapted their communication and support strategies to take advantage of the widespread adoption of additional interaction channels such as SMS, IM, video, the mobile web, and even social networks like Twitter. Learn how your company can enhance service, lower costs and increase revenue by expanding the ways in which you communicate with your customers.

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1 Introduction

It's estimated that there are now more than 4 billion mobile phone subscribers worldwide. The majority of these users have Short Message Service (SMS) capable devices and an increasing number are adopting web-enabled smart phones. Couple this with reports that 700,000 customers abandon their landline telephones each month and it becomes clear that for many, the phone is no longer just about voice calls.

In the midst of steady mobile device and network advancements, consumer expectations for speed, convenience and on-demand information have skyrocketed. While speech and touch-tone driven self-service phone portals are now commonplace, few companies have adapted their communication and support strategies to take advantage of the widespread adoption of additional interaction channels such as SMS, IM, video, the mobile web, and even social networks like Twitter.

Global smart phone sales were up 27% in Q209 according to Gartner, Inc.

The changing pace of communications is not the only cause for rethinking customer self-service strategies. The rising popularity of mobile text channels is largely fueled by the younger generations. A 2009 Nielsen survey found that the average American teenager is sending and receiving more than 2,800 text messages per month. This average is even higher for teens in other areas of the world. Clearly, texting is second nature to your next generation of consumers.

This whitepaper addresses how your company can enhance service, lower costs and increase revenue by expanding the ways in which you communicate with your customers. Equally important, we'll show you a clear path towards reaping the rewards of multi-channel support – without the expense and complexity of piecing together disparate solutions.

2 Self-Service Beyond Voice

ABI Research forecasts mobile messaging revenues to grow to $212 billion by 2013. More people are incorporating messaging services like SMS, IM and mobile IM into their daily personal and business communications. For some, these immediate and effective non-voice channels are often the preferred mode of communication.

By supporting messaging services and the mobile web where applicable, businesses address two conflicting customer support goals: improving service and keeping costs as low as possible. This is especially important in highly competitive markets where customer acquisition costs are high and margins are tight.

Short Message Service (SMS)

In-Stat reports that more than 2 trillion mobile messages are sent per day globally. While teens account for a large portion of SMS usage, they are not alone. A study by Limbo, one of the largest mobile social networks, reported that SMS continues to transcend the generational divide, with 50% of SMS users age 35 or over.

SMS is a killer call center application. It is ubiquitous, user-friendly and personal, yet relatively inexpensive. Using SMS for customer interactions costs a fraction of the amount of agent-assisted communications. UK-based call center analyst firm ContactBabel reported that live agent service calls average about $12 per call, while SMS costs pennies per message. Additionally, many routine inquiries and outbound notifications are particularly suited to SMS. Some companies already offer applications that make it possible for customers to obtain information such as their bank account balance, order status, mobile minute usage, the amount of a utility bill, or the nearest store location.

For the customer, the obvious benefit is the ability to quickly get the exact information needed. SMS saves time, enables multi-tasking and is convenient – especially in a loud environment, a weak coverage area, when privacy is needed, or simply when they aren't able to make a voice call. SMS can also provide the customer a record of the response including confirmation information or associated URL links so they can refer back to the requested information at a later date.

Instant Messaging (IM)

Gartner predicts that by the end of 2011, IM will be the de facto tool for voice, video and text chat with 95 percent of workers in leading global organizations using it as their primary interface for real-time communications by 2013. Mobile IM is also on the rise with the increasing adoption of smart phones and the availability of handsets with QWERTY keyboards that resemble a traditional computer keyboard.

Most people think of person-to-person or group chat when they think about instant messaging. While this is IM's primary use, its built-in presence features and basic text interface also make it a perfect solution for enhancing existing web applications with real-time communications. Customer self-service via Interactive Instant Messaging is accomplished with intelligent IM "bots," or automated agents, that provide real-time responses to customer inquiries. IM bots enable customers to bypass menus for real-time access to information, including package tracking, emergency notifications, interactive games, customer surveys, identity verification and more.

Following is a simple example of an IM bot. Add the bot as a contact using the screen name for whichever IM service your prefer, enter a US zip code (for example, the zip code for Voxeo's Orlando office is 32801), and receive the local weather.

> **Weather bot**
> Jabber/Gtalk: myweather@bot.im
> AIM: imifiedweather
> Yahoo: imifiedweather

IM offers companies significant cost savings. On average, an IM interaction is one-tenth the cost of IVR and one-hundredth the cost of a live agent phone call.

Unstructured Supplementary Service Data (USSD)

Like SMS, USSD is a capability of all GSM phones. It enables users to send short commands from their mobile phone to the GSM network. USSD applications are accessed by calling a number that starts with the asterisk or hash characters, followed by three digits and another hash character. Unlike SMS, USSD (Phase 2) is session-based, allowing for text-based caller interactions ("text browsing"). SMS communication is asynchronous and persistent similar to email while USSD communication is synchronous and transient like IM.

USSD allows users to interact with an automated system on a purely textual basis, but with the look and feel of SMS. The interactive nature of USSD allows an application to give a subscriber options in the form of menus with prompt/answer sequences. The advantage of this channel is its availability on all GSM-based handsets, the simplicity of the user interface, and the possibility to collect both numerical and alphanumerical input – which makes it more versatile than IVR for certain use cases such as address capture or entry of names. Response times for interactive USSD-based services are generally much quicker (i.e. 1-2 seconds) than those experienced with SMS.

USSD services have been widely adopted around the world (primarily in EMEA and APAC) by GSM-based mobile carriers, giving their prepaid and postpaid subscribers free and simple access to mobile services such as settings, rate information, call forwarding, and service status, as well as value-added services such as airtime top-up and call-back requests. Third party content such as weather forecasts, traffic, travel information, news, and directory services can also be offered to subscribers on a GSM network.

Mobile Web

In 2008 the total number of mobile Internet users topped 1 billion. Usage will continue to be driven by smart phone and 3G network advancements.

Self-service on the mobile web will follow many of the patterns of online self-service adoption. It's not surprising that mobile banking is one of the first applications to take off. Balance requests are cited as the number one type of mobile banking transaction today, followed by fund transfers. A recent report from Informa predicts that by 2013 over 977 million people will access banking services via their mobile phones, performing an estimated 300 billion transactions.

Unlike PCs and laptops, the four billion mobile phones deployed globally are with consumers at all times resulting in a much larger window of engagement. With faster and richer mobile browsers, more consumers will turn to the mobile web to check product availability, track orders, find store locations, confirm travel plans and more.

According to Nielsen, current mobile data users expect to increase their use by 58% in the US and 55% in Europe. In addition, 27% of European and 28% of U.S. mobile subscribers who do not use mobile data services now intend to start using them in the next two years.

Video

Modern 3G mobile phones not only support voice calls and Web surfing, but also are capable of displaying streaming videos, allowing for a new level of interaction. The self-service video channel is similar to the voice channel, but an application typically uses prerecorded or dynamically generated video files instead of audio files to interact with the caller. Customer data is still gathered using voice response or touch tone (DTMF) input.

Beyond the Mobile Web Browser – Rich Clients for Mobile Handsets

Building on the success of the mobile web browser, a new generation of mobile clients with richer user interfaces is making its way to smartphones (e.g., the iPhone, Blackberry, Android, etc.) as well as more traditional cell phones (Symbian, Java). The success of the iPhone App Store is just one indication of the business potential of these new solutions. Users can expect a more compelling, differentiating, brand-aware mobile customer care experience that leverages the computing power available on mobile devices today, accompanied by evolving mobile technologies and their pervasive nature.

Rich client solutions provide a range of novel multimedia and multimodal applications for mobile handsets. Built on native SDKs and making smart use of client-side processing power, these clients allow for a richer and slicker user experience than the average web browser. They are typically started using call interception technology: When the user calls the phone number (or USSD service code) of their carriers' call center, for example, the client application is launched instead, providing multimodal access to self-service, multi-media content, value-added services and more.

Like all the other self-service channels mentioned above, these rich clients rely on a server-side architecture that allows for provisioning of content, services, integration with back-end and reporting solutions, and more.

3 Voxeo Unified Self-Service™

In the same way that Voxeo has reduced the cost and complexity of IVR and speech platforms, we remove the barriers that hinder consistent self-service across multiple interaction channels – not just voice. Voxeo helps companies unlock the value of their VoiceXML self-service applications by extending them to work across additional channels with no additional development costs and little incremental effort. We call it Unified Self-Service and the business case is compelling.

- **Enhance service.** Increase satisfaction and loyalty with communication touch points that address customer preferences while making information access faster and more ubiquitous. Messaging and other visual user interfaces address limitations in noisy environments and other situations where a speech interface is not highly effective. Channels such as SMS are also ideal for sending time-sensitive alerts and reminders without disrupting the customer, as well as closing the loop on self-service voice and agent-assisted interactions with follow-up information and links. By delivering cohesive service across multiple self-service channels, companies can both enhance their image and the overall customer experience.

- **Lower customer service costs.** Voxeo estimates that IM and SMS interactions are one-tenth the cost of IVR and one-hundredth the cost of live agent phone calls. Providing customers with options that fit their needs and preferences increases self-service adoption and automation rates so that fewer customers require agent assistance. Additionally, proactive outbound messaging offers a highly effective way to pre-empt spikes in inbound call volume related to situations such as service outages and travel delays. Other uses for outbound messaging include low-cost, actionable reminders that enable customers to perform transactions such as confirm a scheduled appointment or pay a past-due bill.

- **Increase revenue.** SMS and USSD also offer a non-intrusive, inexpensive outbound channel for delivering relevant, customer-specific marketing campaigns including virtual coupons, loyalty rewards, new product and service announcements, product availability alerts, and personalized up selling and cross-selling.

Voxeo enables Unified Self-Service based on our Prophecy platform and hosting services, and/or using our VoiceObjects service creation environment. With Voxeo you can use one tool, one platform and one team to create, manage and analyze inbound and outbound self-service applications across multiple interaction channels.

Voxeo Prophecy

Voxeo supports multi-channel applications at both the platform level and the tool level. Voxeo's flagship Prophecy platform enables any VoiceXML application to take advantage of multi-channel inputs in order to interact with users via speech and touchtone IVR, SMS, IM, Twitter, web-based live chat services and the mobile web. Using Voxeo, a pre-existing VoiceXML-based order status application can now answer order status questions via SMS or IM with no modification or incremental cost whatsoever.

Voxeo lets VoiceXML applications work via SMS, IM and more by viewing VoiceXML as a "dialog XML" language instead of being voice specific. For example, in an IM world any TTS output gets sent as text instant messages; and any incoming instant messages are applied directly against any speech grammars. This applies both to speech and DTMF (touch-tone) input, and even includes the handling of user input errors that is defined in your VoiceXML application.

Compared to delivering a Web application, sending and receiving text messages is complicated and requires understanding of all sorts of arcane rules and techniques. Voxeo eliminates the need to understand complexities such as proprietary IM networks, short codes, SMS gateways and routing.

One application → **Any text channel**

```
<?xml version="1.0"?>
<vxml version="2.1">
  <form>
    <field name="F_1" type="”boolean”>
      <prompt>
        Hello there! Is a PB and J the
        best sandwich on earth? </prompt>
      <filled>
        <prompt> you said <value expr="F_1"/>.
              I couldn't agree more! </prompt>
      </filled>
    </field>
  </form>
</vxml>
```

Voxeo VoiceObjects

Voxeo VoiceObjects delivers an integrated framework to build, deploy, and analyze phone applications that can run in the voice, video, text and Web channels. Since most of the differences between the channels are at the presentation layer, applications can be generated using the same dialog flow, backend integrations and business logic. As a result, companies can quickly deliver Unified Self-Service – across multiple channels – without duplicating efforts or investment. Customers benefit from consistent and integrated service regardless of which channel(s) or modalities they use. Companies benefit from drastically simplified and accelerated development and maintenance, as well as consolidated reporting and analytics across the different channels.

VoiceObjects enables dynamic, personalized dialogs across multiple channels and languages based on customer types, values, preferences, transaction histories and more.

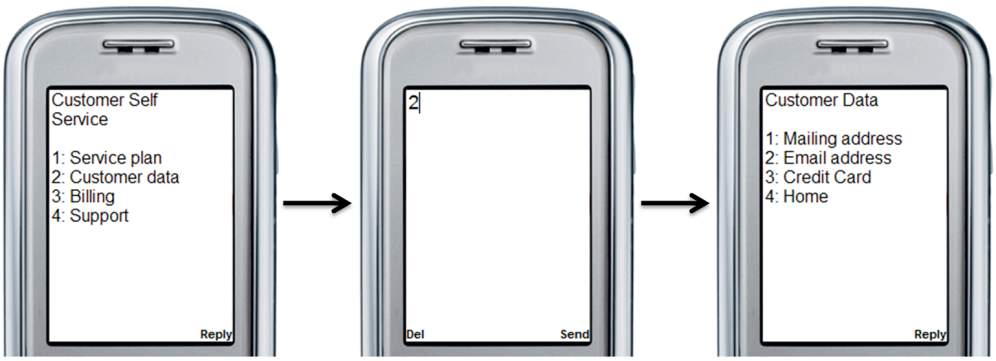
The voice channel is the “traditional” phone channel that customers use for self-service. Interaction takes place through speech or DTMF input and audio or TTS output, powered by media platforms that support VoiceXML.

Following are examples of how the other channels may be presented to users. Consider a self-service portal for Prime Telecom, a mobile carrier, in which subscribers can check and modify data such as their address or bank details, receive information about new products, top up their account, and change their tariffs or service plans.

- **Text channels: SMS and USSD**

  SMS and USSD support free text entry, which allows for an entirely new range of mobile applications, such as change of address, search portals, and more.

  A text interaction might look like this:



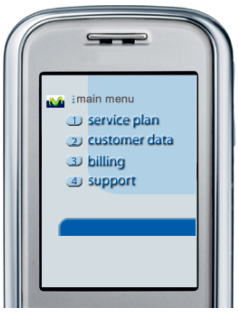
From the main menu, the caller would press the “reply” key on their phone, enter their response (e.g. “2”) and press “send”, prompting the phone application server to serve the next set of menu options.

- **Web**

  The Web channel uses interactive Web pages that are displayed on browsers embedded in modern mobile phones. HTML-based web user interfaces offer textual and graphical output with various means of input, such as activating hyperlinks or filling in forms. The application example from the text channel could look like this on a mobile Web browser:

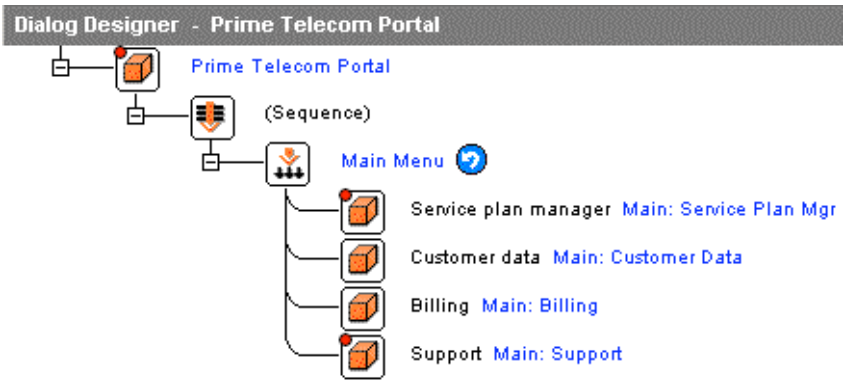
- **Video**

  For 3G video applications, VoiceObjects integrates with a rendering engine to dynamically generate videos based on call-time information. Like an IVR application, video applications run on VoiceXML-based media platforms. The following example shows the same application logic as introduced above, but uses streamed video displaying an animated main menu with background audio explaining the options:



Separating presentation from logic

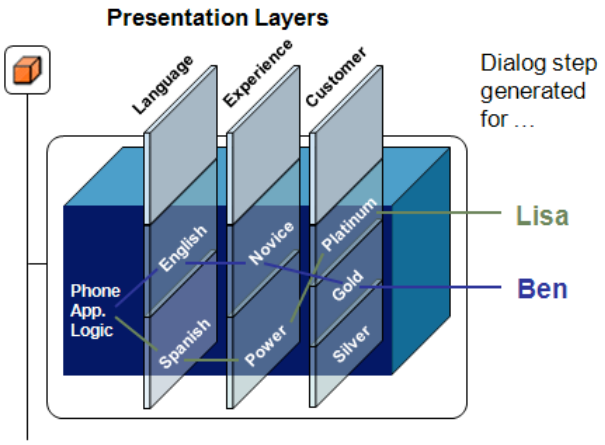
A phone application server like VoiceObjects can generate markup for all of the above-mentioned phone channels. This includes VoiceXML, HTML, and proprietary markup for SMS and USSD gateways (no standard for those has been widely adopted yet). The underlying call flow logic can be the same among all channels, as depicted in the following screenshot:



Using the VoiceObjects software, one single service definition can be developed and deployed across any combination of phone channels. Each object in the call flow manages resources for the respective channels – audio and grammar resources for the voice channel; text, HTML, bitmaps, CSS etc. for the web channel; and static and dynamic video resources for the video channel.

The caller can utilize this service on the different channels: By dialing a phone number in the case of voice or video; typing a USSD short code like *123# in case of text; sending a short SMS message to a specific service number; pinging a bot in an IM network; or entering a URL in case of the Web. For each request, the phone application server dynamically generates the markup required for the respective device and channel.

Having one dialog definition for all channels saves development and maintenance costs and speeds time-to-market for changing business requirements and marketing campaigns. It allows for consolidated, cross-channel reporting on service usage patterns, customer experience, and transaction completion rates. It also enables providers to offer services in different flavors, catering to a variety of customer needs and preferences in a highly cost-efficient way.



Using VoiceObjects, personalization strategies are easily applied across multiple phone channels.

Support for channel-specific features

Each phone channel has unique features that must be supported. For the voice channel, examples include the ability to use prerecorded audio and/or synthesized speech (TTS) for output, the generation of natural intonation when reading back dynamic data such as phone or account numbers, and support for any VoiceXML-compatible speech recognition engine (ASR). The video channel requires dynamic generation of video files at call time, as well as the mixture of text, audio, and other images. Text channels require support for menu-style pages as well as response pages that allow free text entry. One challenge in deploying a text application to different channels (such as different IM networks, SMS, and USSD) is the lack of standards. VoiceObjects' media platform drivers shield developers from dealing with differences in the underlying APIs and markup languages.

The VoiceObjects media platform drivers form the interface between VoiceObjects Server and the media platform (e.g., Voxeo Prophecy or other speech platforms in the case of IVR services). Using the media platform drivers, VoiceObjects Server generates dynamic markup code at run time. This includes:

- Different markup languages (VoiceXML vs. HTML vs. proprietary XML languages for USSD gateways and IM networks).
- Different flavors of the same markup language to make up for differences in the implementation of a common standard. In the case of VoiceXML, most media platforms are not 100% compliant with the specification. Note: Voxeo Prophecy is the only platform to pass 100% of all mandatory and optional VoiceXML certification teams.

- Markup that exploits different features of a language based on the type of mobile device being used. For instance, not all mobile browsers support the full set of HTML tags or cascading style sheets. Using built-in GUI optimization, VoiceObjects Server detects the type of mobile browser and generates HTML code that best utilizes that browser's capabilities and screen dimensions.

While VoiceObjects enables a developer to re-use the exact same service definition across multiple channels, it also supports differences to make best use of each individual channel. For example, developers can adapt user interfaces to their respective channel-specific best practices, as well as add channel-specific content such as graphical content, cascading style sheets, video etc.

Customer Spotlight

T-Mobile International uses VoiceObjects to create and manage voice-controlled and other mobile customer self-service portals in Austria, Czech Republic, and Poland (PTC Era). The VoiceObjects "design once, deploy anywhere" technology approach is important to T-Mobile's initiative because it enables the one-time development of an application that can run on every available phone channel: voice, video, text or mobile Web. This multi-channel approach ensures T-Mobile customers experience fast, personalized self-service over a mobile portal, SMS service, or a voice portal with touch-tone (DTMF) or speech recognition.

4 Migrating to Unified Self-Service

Voxeo provides a simple and cost-efficient path to delivering Unified Self-Service. Our platform and developer solutions enable companies to "design once and deploy anywhere" – multiplying their ROI by reusing IVR investments across multiple interaction channels.

Voxeo enables you to:

- Migrate to Unified Self-Service with ease – all at once or at your own pace. Design your application one time and deploy it across any combination of channels with little to no incremental effort. Voxeo simplifies the process by enabling you to leverage existing application code, dialog flow, backend integrations and business logic
- Consolidate analytics and reporting across multiple channels with no additional effort.

- Improve customer satisfaction and acceptance of self-service, which in turn reduces the load on live agents and lowers overall contact center costs.
- Protect your investment. All Voxeo products and services are built entirely on open standards for true portability. Additionally, Voxeo's VoiceObjects service creation environment enables customers to build applications once and deploy them on over 30 different VoiceXML platforms. Voxeo is committed to leading the market in the implementation of the latest industry standards and innovative functionality.
- Leverage Voxeo's on-demand carrier-grade SaaS cloud to get started quickly and with no upfront capital investment. The same platform that powers Voxeo's worldwide hosting solution is also available for on-premise deployment. You can even use a combination of hosted and premise solutions or easily move between deployment options should your requirements change.

Voxeo customers are realizing the rewards of a multi-channel self-service strategy without the risk of investing in additional platforms, skills sets or draining resources on duplicated efforts.

Visit www.voxeo.com/unifiedselfservice for next steps and links to get started.

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