

E-COMMERCE AND THE WEB-ENABLED CALL CENTER

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ABSTRACT

The Internet's explosive growth has provided corporations with a new delivery channel for both electronic commerce and customer service. Electronic commerce (e-commerce) transactions are expected to grow from \$1 billion in 1997 to an estimated \$1.3 trillion by 2003 (White 2000).

Businesses have created web sites as "click-and-mortar" storefronts where web visitors can browse through the store and purchase products using a virtual shopping cart. The owners of these electronic stores are discovering that having the ability to provide personal help to their cyber shoppers is as important as it is in traditional "brick-and-mortar" stores. In a study done by Yankelovich Partners, 63 percent of respondents said that they will not buy over the Internet until there is more human interaction (Pleasant 1999).

To address this concern, corporations are linking their web sites to call centers where large pools of trained agents are available to assist, in real time, Web shoppers that need help. This article provides an overview of how this new e-commerce technology of web-enabled call centers is being implemented.

CALL CENTERS

Call centers are an integral, and growing, segment of commerce around the world. In addition to over \$850 billion of sales originating in call centers, telecommunications usage and labor employment has been significantly impacted by call centers. Estimates of the number of call centers in the United States range from 60,000 to 90,000, with as many as 3.5 million people working in these call centers

(Kim 1997). AT&T reported that on an average business day about 40 percent of their more than 260 million calls were to toll-free numbers, adding up to 24 billion calls per year (AT&T 1998). The United States government has seen a nearly 60 percent increase in the usage of 800 traffic over the last four years, with an estimated 3.25 billion minutes of toll-free usage in fiscal year 1999 (Mitretek Systems 1999).

Call centers are where corporations talk directly to their customers, discovering their requirements, persuading them to do business, and ensuring that their demands are satisfied. To build customer loyalty, companies are now giving customers multiple channels for accessing corporate and product information, service support, and product sales. To reflect this evolution, the term *call center* is, in some instances, being replaced by *contact center* or *customer care center*. These terms reflect the convergence of multiple forms of customer communication — phone, fax, e-mail, and the Web (Slater 1999).

E-COMMERCE CUSTOMER SERVICE

For most companies today, the primary electronic commerce role of the Internet is to provide an electronic storefront to the public. This has resulted in a large number of casual visitors to corporate Web sites, very much like shoppers walking into a store in a shopping mall. Most businesses view these visitors as potential customers and want to provide multiple options for these guests to access information and purchase products or services.

However, Web sites are not always complete or as intuitive to the prospective customer as the company might like. A significant portion of the populace is still reluctant to complete a transaction over the Web without first talking to a live agent. A study of the 25 top e-commerce sites showed that 67 percent of the on-line

shoppers abandoned their shopping cart prior to actually making a purchase. The primary reason given for this abandonment was the lack of real-time customer service on the Web site (Call Center Magazine 1999). Another study, performed by Andersen Consulting during the 1999 holiday buying season, showed that 88 percent of Web shoppers abandoned their online shopping carts at some point during their gift buying (Spiegel 2000).

In addition, most retailers view customer service as a problem-solving action after the sale. In e-commerce, however, customer service begins the moment a customer enters the Web site. A report from Forrester Research indicated that online shoppers expected Web sites to have customer service readily available and that exceptional customer service strongly increased future sales through repeat visits and positive word-of-mouth (Spiegel 1999). The report identified four basic times that customer service was needed during the online buying experience:

- During shopping – customers used service to find products and inquire about product attributes
- During buying – customers had questions about billing issues, receipts, and the check-out process itself
- After order – customers checked the status of their order and the status of shipping
- After product receipt – customers had questions about returns

TALK-TO-AGENT ALTERNATIVES

To provide Web visitors with instant customer service, retailers are providing a “Talk-to-Agent” button on their Web pages. When a visitor presses the button, the Web site will present the caller with several options for actually talking to an agent. These options include:

- Text chat
- Agent callback
- Internet telephony (Voice over IP)

Today, most call centers are only able to support text chat and agent callback. Internet telephony is beginning to appear in pilot and trial implementations.

New call center technology can automatically detect whether or not the caller’s computer is able to place an Internet call. Then, based on the

capabilities of the caller’s computer, the system will present the caller with options available for completing the call.

Text Chat

Real-time text chat is a non-voice option that can be very effective in facilitating Web-based customer service. In a “chat session”, the agent and caller exchange typed messages back and forth as if they were verbally talking to each other. In many cases, a targeted and instantaneous text response to a question will satisfy a customer.

Agent Callback

With an agent callback, the agent calls the customer back on a telephone number that the customer has entered on the Web page. With this technique, software on the Web site communicates with a telephony application server in the call center to identify an agent that is both available and skilled in the subject about which the customer inquired.

Having found this agent, the telephony application server sends a message to a PBX to launch a call (callback) to the customer over the Public Switched Telephone Network (PSTN). The agent and customer are then connected as a normal telephone call. This process has limited practicality since it can only be used if the caller has two phone lines, one for the Internet connection and one for the telephone, and both the computer and phone are located close to each other.

Internet Telephony

Most people who surf the Web from home are likely to be using the only phone line that they have so they cannot accept an agent callback and still be connected to the Web site. If the customer’s PC is equipped with an Internet phone client that accepts Voice over IP (VoIP) calls, such as Microsoft NetMeeting or Netscape Communicator supporting the H.323 standard protocol, then the customer can make a voice call through the Internet. The caller’s PC must also have a speaker and a microphone or headset.

CALL CENTER VOIP TECHNOLOGY

There are two main technologies utilized in a call center to implement VoIP telephony. The first technology enables a traditional call center that has circuit-switched based systems to support VoIP calls. The second technology is the implementation of an all-IP call center infrastructure.

In the traditional call center, the customer's Internet call is terminated on an IP gateway in the call center. This gateway converts the VoIP call into a circuit switched call and routes it to a traditional Automatic Call Distributor (ACD) where it is queued for an agent. This is known as a PC-to-phone call because the voice call originates from the customer's PC and is terminated on the agent's telephone set.

With an all-IP call center infrastructure, the customer's VoIP call is terminated directly on an IP call server. An IP-based ACD directs the IP call to the agent's PC-based Internet phone over a local area network. The advantage of this PC-to-PC call is that there is no IP-to-pulse code modulation (PCM) conversion and it allows for a

more sophisticated coordination between the voice connection and the Web session.

Web-Enabled Traditional Call Center

Most established call centers will enhance their existing technical infrastructure with Internet technology to enable integration with the Web. This enhancement typically means providing bandwidth access to the Internet, installing a VoIP gateway and an Internet call manager, and adding software to the existing ACD, CTI application, and agent stations. Figure 1 depicts an example of this type of Web-enabled call center.

When a customer clicks on a "Talk-to-Agent" button on a Web page, a sophisticated set of processes is launched across the Internet. These processes include actions that take place in the customer's Web browser, in multiple systems in the call center, and between the customer and call center. These processes, based on the call center implementation depicted in Figure 1, are described in following steps:

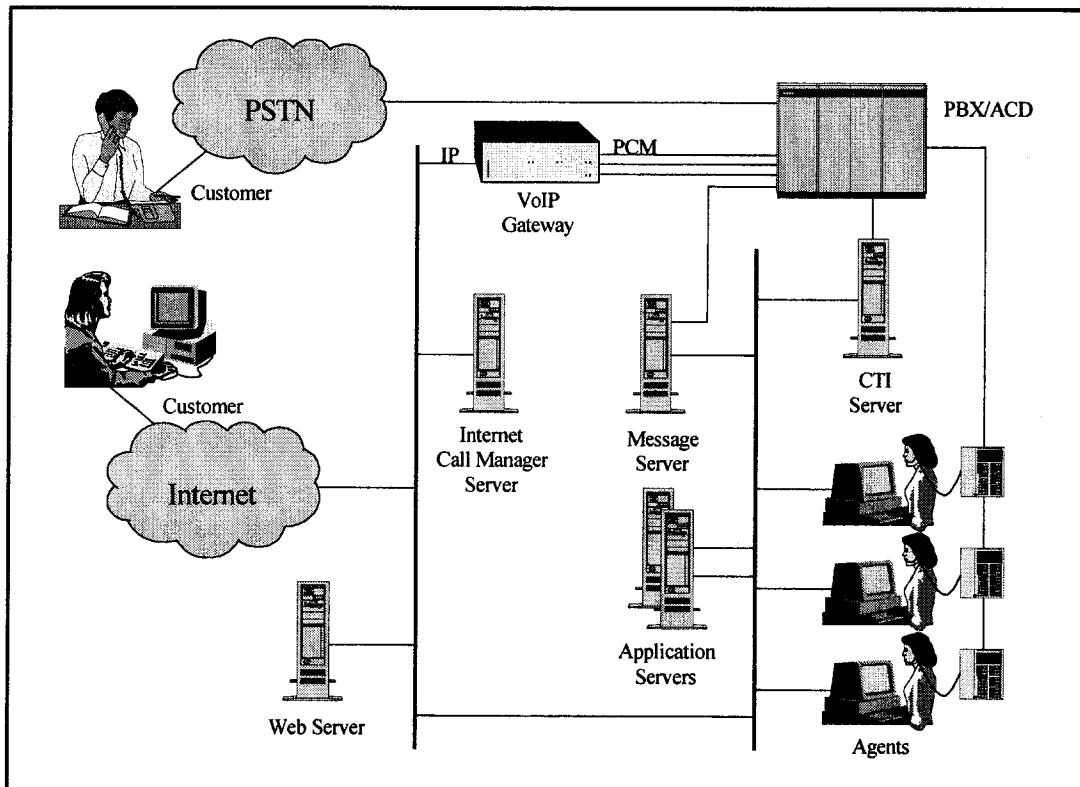


Figure 1: Web-Enabled Traditional Call Center

- While browsing a Web site, the customer needs assistance or additional information. The customer clicks on a “Talk to Agent” button on the Web page. The Web server notifies the Internet Call Manager (ICM) server that a voice call has been requested from a specific page.
- The ICM sends to the caller an overlay window that appears on the Web page. This window contains a form requesting certain customer information as well as allowing the customer to select the type of call (Internet voice call, text chat, or a call back) that he or she wants to initiate. Suppose the customer selects to speak to an agent using an Internet voice call.
- By selecting the Internet voice call option, the ICM downloads a call control applet to the customer’s PC. The applet provides the customer with call status messages as well as the interface through which the customer ends the call.
- As the call control applet is downloaded to the customer’s browser, the ICM also launches a call to the call center’s ACD through the VoIP gateway. The gateway converts the call from IP to 64 kbps PCM where it is terminated on a standard trunk card on the ACD. To the ACD, the call appears as a traditional voice call that has a caller ID (ANI) associated with it. In this case, the ANI is the Web page Uniform Resource Locator (URL) and the call is queued according to the routing parameters associated with the initiating Web page URL.
- The ACD routes the call to the pool of agents that have the proper skill level based on a database of agent profiles.
- If an agent is not immediately available, the ICM can direct the Web server to send multimedia clips, ad banners, expected wait times, product service information, and promotional announcements to the customer during the queue time.
- When an agent with the proper skill levels becomes available, the call is delivered to that agent who handles the Internet voice call using the same suite of equipment as an ordinary voice call. The agent communicates to the customer using a headset while the customer communicates through the PC’s microphone and speaker, or a headset.
- When the call is delivered to the agent’s voice terminal, the CTI server simultaneously sends a Call Answered message to the ICM. The ICM then tells the Web server to deliver the URL to the agent’s PC to display a “screen pop” of the Web page from which the customer initiated the call. If the customer is not on that page, he or she is returned to the same Web page.
- From there, the customer and agent can begin conversation and while the customer and agent converse, Web page collaboration can take place. This escorted browsing allows the agent and customer to surf the corporate Web site with synchronized browsers to view the same page simultaneously. The agent can follow along as the customer moves to different corporate Web pages, answering questions or helping the customer place an order, and receive data entered on the customer’s page. In addition, the agent can lead the customer to related pages to provide more information, show a product photo, or point out where additional material may be found.
- The agent also utilizes information passed via the CTI link to review account status and other customer-related information that is already present in the corporate database, which allows the agent to provide more personal service.
- At the end of the session, the customer clicks on the “End Call” button on the Call Control window to terminate the voice call.

Web-Enabled All-IP Call Center

A new type of call center has recently been implemented that utilizes an all-IP packet switching infrastructure. This architecture is primarily a software solution that makes use of standards-based computer hardware and WAN/LAN IP network infrastructures. All of the agents have IP phones as part of their desktop computers and do not have separate telephone sets. Figure 2 depicts this type of all-IP call center.

In this type of call center the functions of the application servers, Web server, and message

server are almost identical to those in the traditional Web-enabled call center. However, the ACD server, Internet Call server (ICS), and PSTN server are new to the all-IP call center.

The ACD server performs the functions of a traditional circuit switched ACD except that it does not have to physically switch calls, since this is an inherent capability of the IP network infrastructure. The ACD server manages the calls and agents and communicates actions and status to the other servers in the call center.

The ICS performs many of the functions of the ICM in the PCM-based call center. The ICS establishes the voice connection to the caller and communicates with the ACD server to identify the first available agent that has the appropriate skills to serve the customer. Based on the instructions from the ACD server, the ICS then connects the call to the assigned agent. Since the call is not switched through the ACD server, the ICS creates the voice link between the caller and the agent.

The PSTN server converts PCM calls from the PSTN to an IP protocol. Since a PSTN caller

does not go through the Web site, this server also performs an Interactive Voice Response (IVR) function to request information from the caller so that the call can be delivered to the appropriate agent. The IVR responses, as well as any other call-based information such as DNIS and ANI, are passed to the ACD server to determine which agent should handle the call. Similar to the ICS, the PSTN server establishes the voice link between the caller and agent.

THE FUTURE

The explosive growth of e-commerce over the Internet has seen corporate Web sites mature from electronic versions of glossy brochures to full service storefronts. To support this new environment, call centers are being integrated with Web sites to provide real-time customer service.

The technology to implement web-based call centers however is very new and technical barriers will have to be solved before high quality Internet voice communications becomes ubiquitous. In addition, IP-based call center

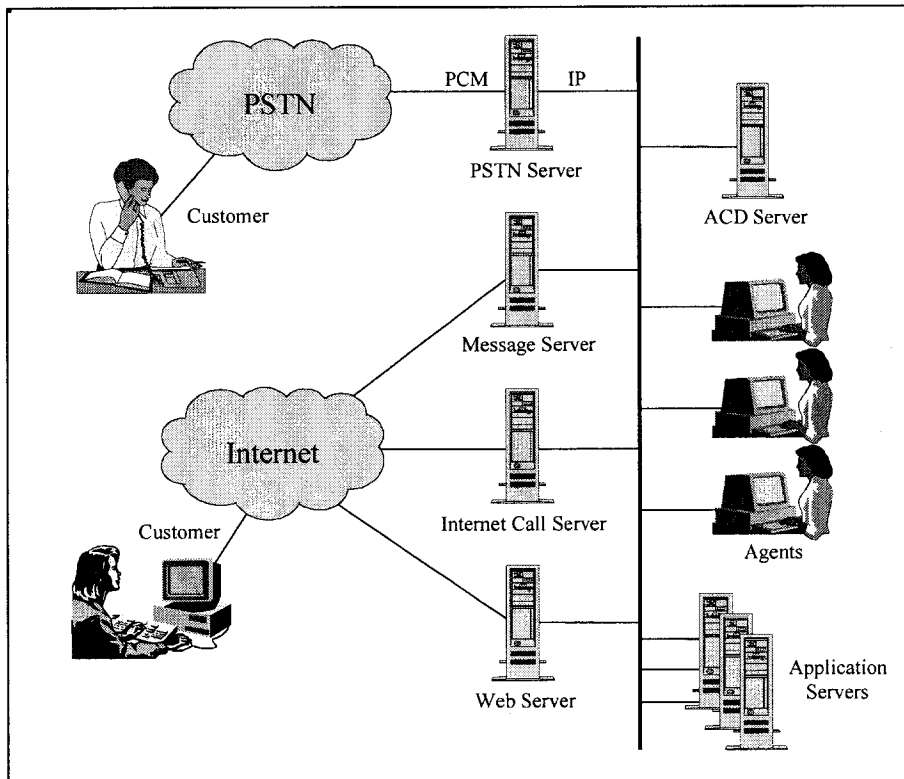


Figure 2: Web-Enabled IP Call Center

products are just emerging and issues related to reliability, features, voice quality, and connectivity to existing systems need to be resolved.

These technical issues will be solved as more corporations provide real-time customer service through their Web sites utilizing text chat, agent callback, and Internet telephony. As IP technology advances, driven by the demands of the Internet, the first large-scale all-IP call centers should be in operation by 2001 which will usher in the next stage of call center evolution.

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