The Emergence of Electronic Customer Relationship Management

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Today's online consumer has more complex needs and much higher expectations than ever before. Customers not only want to shop and get customer service through multiple communication channels, such as the telephone, Web text chat, electronic mail, and the Web, they desire the ability to move seamlessly from one medium to another. To support this capability, Customer Relationship Management (CRM) is evolving into electronic CRM—"eCRM." This paper presents the evolution of eCRM, describes several current trends, and looks at the future of eCRM.

Introduction

Customer Relationship Management (CRM) is a term for methodologies, processes, software, and systems that assist an enterprise in managing customer relationships in an organized and effective manner. In this context, the term "customer" can include suppliers, sales leads, employees, as well as paying customers. The goal of CRM is to optimize profitability, revenue, and customer satisfaction by organizing the enterprise's processes toward providing consistent high quality service to the customer. To support these "customer-centric" processes, a set of CRM software and systems is typically implemented which has traditionally supported four main corporate functions: [1]

- Automating and streamlining sales and customer support functions
- Managing the flow of information in and out of the departments that handle customer transactions
- Analyzing customer data gathered throughout the enterprise
- Planning and managing marketing and sales strategies and campaigns

The worldwide market for CRM products and services is increasing despite the general downturn in non-government information technology spending. A study by Gartner Dataquest released in 2002 showed that CRM sales were $22 billion in 2001, a 10.6 percent increase from revenue of $19.9 billion in 2000. [2] This report also forecasted CRM sales growth to continue and reach $47 billion in 2006. The authors, in a separate report, indicated that the industries purchasing CRM products were led by financial services followed closely by manufacturing and communications. [3] This report also indicated that 48 percent of CRM sales were located in North America followed by Europe with 32 percent.

Traditional Customer Relationship Management

The development of CRM applications began in the early 1990s. The first generation of applications was typically single-function solutions designed to support a specific set of employees such as a help desk, the sales and marketing department, or a particular function within a call center. [4] These applications were defined as "inward-facing" in that they helped employees do their jobs better, but were not directly accessible by the corporation's customers. The applications were predominantly designed as a three-layer client/server architecture where a CRM middleware application aggregated data from disparate backend data repositories and presented the combined data as a single view to the client software.

The second generation of CRM applications began to increase the functionality of the software to include what was termed a "360 degree view" of customer relationships. These applications were typically offered as a suite of interoperable modules that included marketing, sales, analytics, customer service, and call center support functions. The goal of these suites was to enable corporate employees to provide a full

range of services to customers by using a common set of CRM-integrated databases and third-party applications. These second-generation CRM applications were still inward-facing in that they supported employees and were not accessible directly by the customers. Figure 1 illustrates the multi-tier client/server architecture of these CRM suites.

Emergence of Electronic Customer Relationship Management

With the advent of the Internet, the growth of electronic (e)-commerce, and the trend toward online services, customers desired the ability to serve themselves without having to interact with a corporate or call center employee. To address this demand and to provide enhanced capabilities to their customers, CRM vendors began to provide the ability for customers to access the same features and functions that internal employees received.

For Internet access, Windows-based proprietary client applications were replaced with a HyperText Markup Language (HTML) interface that was accessed by standards-based thin-client Web browsers. In addition, the CRM applications expanded in functionality to handle, track, and record transactions across the multiple channels that a customer could utilize to contact a corporation. For example, an application could support and track all interaction-related information as a customer purchased a product through an automated phone line, tracked the shipment on a Web site, and requested installation information using text chat or instant messaging on a customer service Web site.

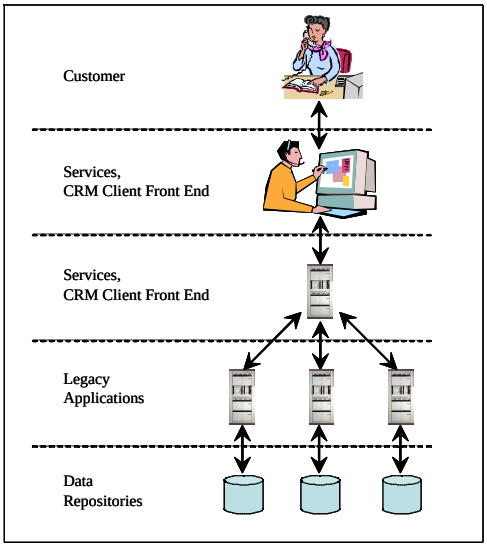

Figure 1. Traditional Multi-Tier Client/Server CRM Architecture

This new generation of CRM products is called eCRM, because it supports the multiple electronic channels that are now available to customers. Since these products allow customers to directly access services, they are classified as "outward-facing" or "customer-facing" as opposed to the previous inward-facing CRM products.

eCRM Integration with Call Centers

One of the first applications of eCRM has been in call centers. Multimedia technologies, such as e-mail, Web collaboration, text chat, and Voice-over-Internet Protocol (VoIP) telephony are being integrated with conventional voice-only call centers to provide more effective sales and customer service. Most established call centers will enhance their existing traditional infrastructure with multimedia 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 automatic call distributor (ACD), computer-telephony integration (CTI) application, and agent stations. The Internet Call Manager provides the call control function between the Web callers and the existing call center systems. The VoIP Gateway converts VoIP calls from the Internet into circuit-switched calls and routes them to a traditional ACD, where it is queued for an agent. Figure 2 illustrates this traditional architecture multimedia call center with eCRM capability.

eCRM applications in a multimedia call center can be integrated with each channel to allow agents to provide service to "callers" regardless of the channel that was used to access the call center. It is anticipated that by the year 2005, 70 percent of all call centers will support multimedia contacts in addition to traditional voice calls. [5]

In call centers that utilize the new generation of server-based IP products, a single-vendor suite that supports all of the communications channels can be implemented. With an IP-based call center, the architecture is primarily a software

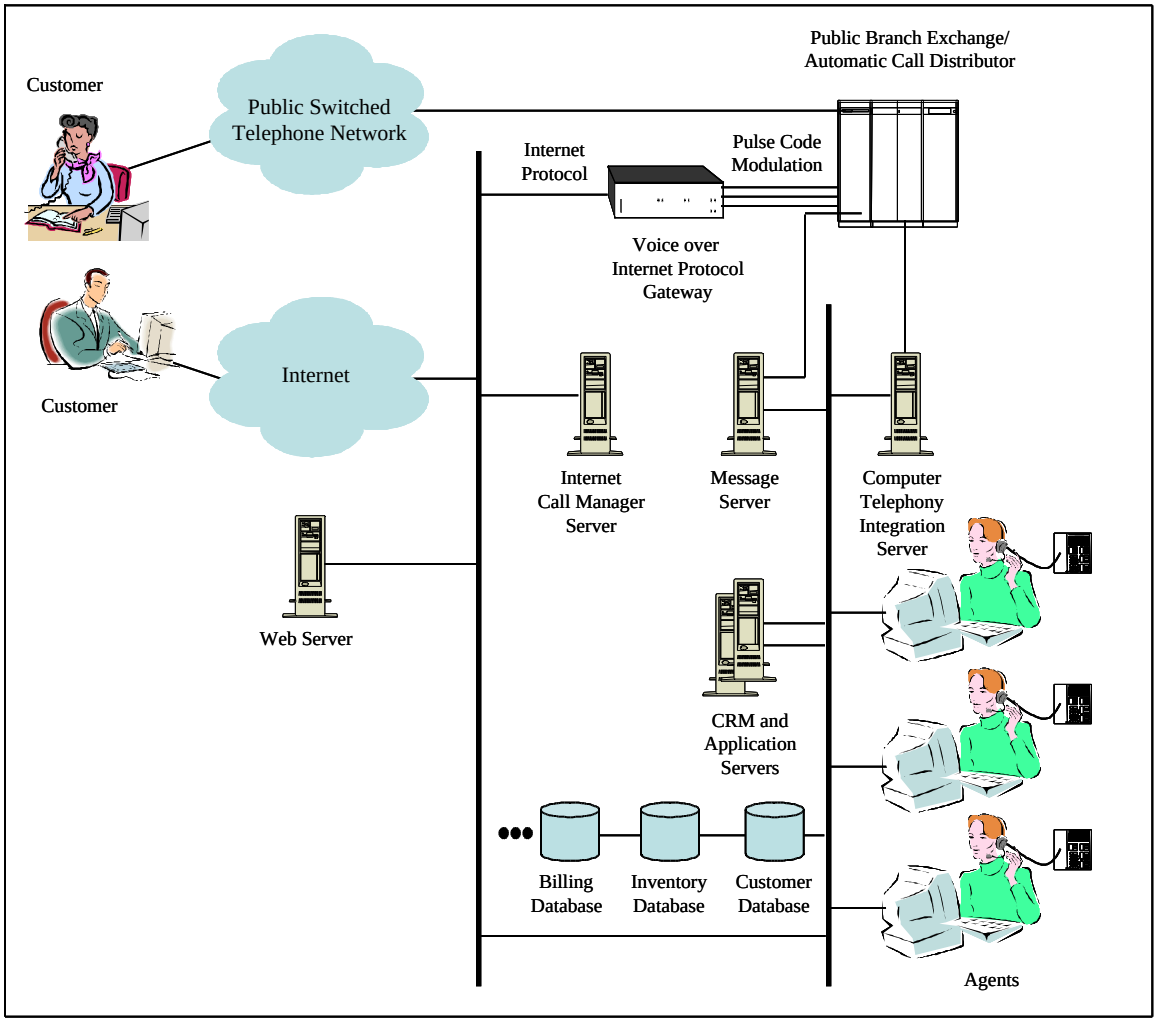

Figure 2. Traditional Call Center with eCRM

solution that uses standards-based computer hardware, the Transmission Control Protocol/ Internet Protocol (TCP/IP), and wide area network/local area network (WAN/LAN) infrastructures. In this type of call center the functions of the application servers, Web server, and message server are almost identical to those in a Web-enabled traditional call center. However, the ACD server, Internet Call Manager (ICM) server, and the Public Switched Telephone Network (PSTN) server are new.

The ACD server performs the functions of a traditional circuit-switched ACD, except that it does not have to physically switch calls, which 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 ICM establishes the 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 ICM then connects the call to the assigned agent. Since the call is not switched through the ACD server, the ICM creates the link between the caller and the agent.

To allow the call center to handle traditional phone calls, such as inbound 1-800 calls, the PSTN server converts pulse code modulation (PCM) calls from the PSTN to an IP format. 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 Dialed Number

Identifications Service (DNIS) and Automatic Number Identification (ANI), are passed to the ACD server to determine which agent should handle the call. Figure 3 illustrates how a set of eCRM applications can be implemented in an all-IP multimedia call center.

Hosted eCRM

Business service providers are offering hosted eCRM solutions as an alternative to purchasing and integrating eCRM applications in-house. Although the business model for application service providers (ASP) that provide a wide range of services has not been successful, providers that offer specific niche applications, such as CRM, have been gaining market acceptance. In addition, companies that provide conventional customer premises-based eCRM applications are beginning to host applications from their facilities.

These eCRM service providers integrate CRM, Web collaboration, text chat, e-mail, telephony, fax, and business analytic applications into one preconfigured eCRM solution. The eCRM host vendor maintains, supports, and delivers the applications which results in nominal internal administration and minimal costs for hardware, customization, or development for the buying organization. Traditional CRM software licenses, as well as the need for large computer hardware investments and CRM-trained information technology (IT) support staff, are replaced with CRM subscription or hosting fees. [6]

The hosted eCRM architecture allows multiple customers to be supported on the same computer resources and share a partitioned infrastructure. This "multi-tenant" architecture results in a more efficient use of computer resources, provides for greater scalability, and makes hosting an application far more economical. The Aberdeen Group calculated that a company could save, in a 30-user sales force automation CRM application, 44 percent in total cost of ownership in the first year, dropping to 13 percent in subsequent years by using a hosted solution compared to buying and installing the application themselves. [7]

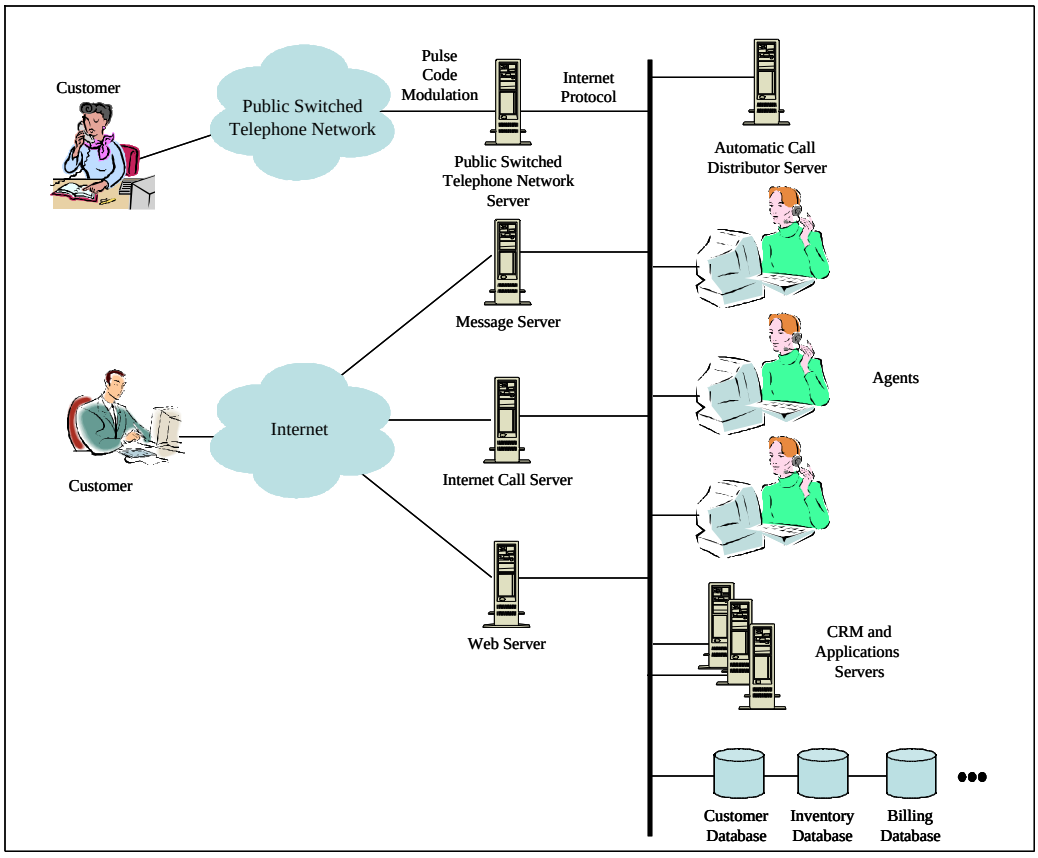

Figure 3. All-Internet Protocol Call Center with eCRM

A hosted eCRM solution is beneficial for corporations that do not have sufficient IT staff resources or are looking for a quick start-up of an eCRM solution. In addition, no matter where a company's employees are located, with hosted eCRM applications they can have access to their company's data, as long as they have access to an Internet connection.

Web Services eCRM

The newest model for providing eCRM is called Web services. These services are Internet applications that perform a specific task, or a set of tasks, that work with other Web services in an interoperable manner to carry out their part of a workflow or business transaction. Web services operate in a language and operating system-independent manner and the architecture is considered "loosely coupled" and modular.

Web service applications exchange data using eXtensible Markup Language (XML). This language provides a framework for creating HTML-like languages that can be used for applications other than Web pages. XML allows data to be marked with "tags" so that a computer program can read and identify specific data in a file or document and interpret its significance. An XML-based application could, therefore, allow other applications access and share its data across the Internet. For example, disparate computer systems could exchange and process XML-formatted purchase orders in order to automatically create XML-based invoices and update XML-enabled inventory records.

An example of this emerging architecture is Microsoft's .NET initiative. This architecture is comprised of three primary layers: XML-enabled clients, XML-based CRM services, and XML-enabled applications/data repositories. Figure 4 presents an illustration of this architecture.

XML-enabled clients include devices such as desktop and laptop computers, Personal Digital Assistants (PDAs), and cell phones. These devices are able to access XML Web services which enable them to interact with data regardless of its location, type, and host.

XML-based CRM services allow applications to share data, and invoke capabilities from other applications without regard to how those applications were built, what operating system or

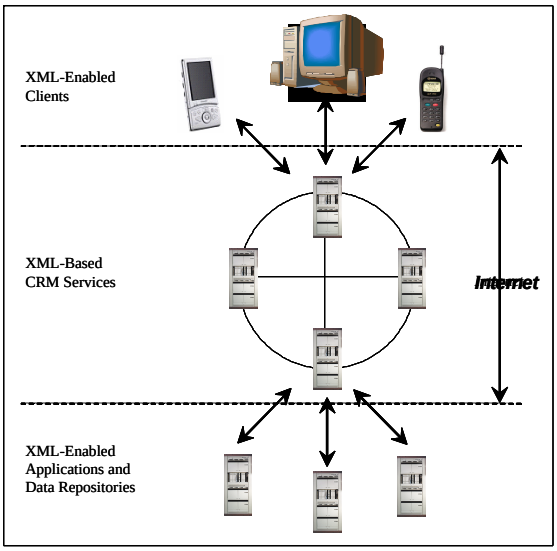

Figure 4. eXtensible Markup Language-Based CRM Architecture

platform they run on, and what devices are used to access them. Although the XML Web services are independent of each other, they can link themselves into a collaborating group that performs a particular task, such as CRM.

XML services are invoked over the Internet, or an Intranet, by means of industry-standard protocols such as Simple Object Access Protocol (SOAP) and Universal Description, Discovery, and Integration (UDDI). SOAP enables applications or services to make requests of other applications and services across the Internet. UDDI is a distributed Web directory that enables services to discover each other and define how they can interact and share information.

The first eCRM application designed for this emerging technology was announced in mid-2002. [8] Additional vendors are expected to release XML-based CRM products in late-2002.

Future of eCRM

CRM remains a priority for corporations, even as economic conditions cause IT budgets to be scrutinized. A survey of retail companies indicated that 52 percent rated CRM as one of their highest business priorities. [9]

The eCRM market is still young; with technology and applications still maturing and vendors consolidating and experiencing growing pains. However, corporations are focused on

providing high-quality multiple-channel service to their customers that will force eCRM vendors to continue provide more mature and feature rich solutions.

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