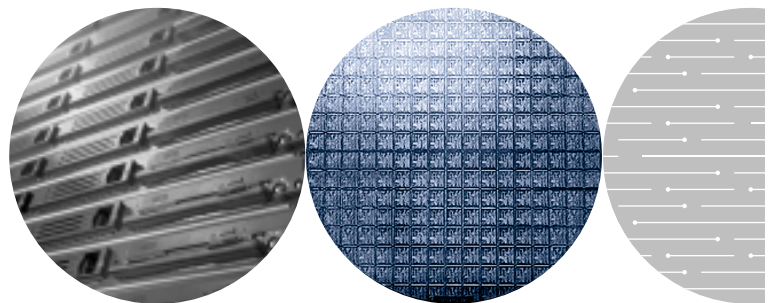




The Cross-Media Contact Center

The Next-Generation Replacement for the
Traditional Call Center

Intel in
Communications



Executive Summary

Because call centers are a principal point of contact between the enterprise and its customers, it is critical that the call center experience be an overwhelmingly positive one. As the popularity of new media such as email and Web-based services grows, solution providers face the challenge of integrating these media as seamlessly as possible into their applications so that the contact center continues to provide responsive and timely service. To support a wide variety of media effectively, a new cross-media queuing architecture is needed. Integrating such an architecture allows a solution provider to develop applications that enhance customer service and deliver increased cost savings. Email and Web-based services are significantly less expensive than live agent interaction. The number of live agents in a cross-media contact center can often be reduced, and the time of the remaining agents used much more productively. Management of the cross-media contact center is also easier and more effective, because of improved tracking and reporting. Intel provides hardware and software communications building blocks and services to help solution providers quickly build and deploy cross-media contact center solutions with a cross-media queuing architecture. These building blocks can enable faster time to market, longer time in market, and increased revenue opportunities.

Introduction: From Call Center to Contact Center

The call center has always been one of the most important ways in which an enterprise interfaces with the world. A positive call center experience gives the impression that an enterprise is well run and encourages callers to do business with such an organization. The need to provide this positive experience creates important opportunities for service providers.

Not long ago, call centers were expected to handle only telephone calls. Today's contact centers—as the name implies—do a lot more. The ubiquitous presence of the personal computer, the growth of the Internet, and advances in networking technology now allow customers and agents to communicate over multiple channels, using both circuit-switched voice transmission and Voice over Internet Protocol (VOIP). These new “cross-media” contact centers are concentrated areas of communication, where agents receive and process thousands of calls, emails, and other forms of communication daily, from all over the world. It is critical that all of these contacts be handled efficiently.

Contact centers also occupy a key position in today's communications infrastructure because they form the principal point of interconnection between telecommunications systems and back-office business systems. It is this unique position that makes them the focal point of e-commerce. With the right solution, the entire process of ordering, fulfillment, inventory, and billing can be integrated from end to end within the domain of the cross-media contact center.

As more people become comfortable with newer forms of communication such as email and e-commerce Web sites, the number of online buyers is growing rapidly. At the same time, customer expectations are changing. Customers are demanding the same kind of personalized service online that they receive over the phone. The issue is how to integrate all of these media options into a single workable system. The pressures to adapt are great, but so are the opportunities.

In addition, the variety of media that customers are now using makes it much easier for companies to learn more about customer behavior and establish lasting relationships. Contact center technologies are a potent force in today's customer relationship management (CRM) solutions.

The movement away from strictly phone-based services can also reduce costs substantially. Self-service strategies, such as those provided by Web-based services, can significantly reduce the amount of time agents spend on the telephone. In addition, new methods of reporting on contact center performance allow contact centers to be run more efficiently.

Cross-Media Contact Center Architecture

Looking at a typical contact center from a structural point of view allows us to gain insight into important design issues. Generally, the contact center can be divided into three functional layers.

- **Basic Infrastructure** – The lowest layer is the basic infrastructure, which includes features that control the way calls and information are moved from place to place such as intelligent routing, cross-media queuing, computer-telephone integration, and interactive voice response. These features are the basic building blocks of any contact center, and their functions do not vary much between companies or between industries.
- **Interaction Management** – Interaction management takes place in the middle layer and includes the systems and processes used to handle email, Web services, workforce scheduling, and the monitoring and reporting functions used to evaluate contact center efficiency. Here some differentiation between industries and between contact centers is apparent, but functions at this layer are becoming increasingly commoditized as developers discover the most effective ways to implement this layer.
- **Context** – At the top layer, interfaces to particular business systems as well as specialized business rules and analytical processes determine the kind of support available to customers trying to reach the contact center. Product differentiation is marked here, and choices vary considerably from company to company and industry to industry. For example, two banks may choose different business systems, different interfaces to these systems, and different rules for how to support different customers.

Although there is a great deal of variation at the top layer, many of the other elements in building a contact center are standardized building block components, which is the type of technology Intel offers for creating cross-media contact centers.

Work Distribution—Old and New

The traditional call center was voice based and relied on an automatic call distributor (ACD) within the telephone system to sequence and distribute work. Such a technique will not be effective in a cross-media contact center, because work can come from a variety of media besides the telephone. To sequence work in a meaningful way in this new environment, the sequencing must be done outside of any single media subsystem (phone, email, Web, etc.). This is the major challenge within the contact center industry: the premise on which many current systems are built is out of date.

One inescapable consequence of the use of multiple media is that the phone system must revert to its original function—switching. The ACD is outmoded, because contact center work can no longer be sequenced inside the phone system. Work sequencing logic must be implemented elsewhere, and this represents a radical shift for the vendors who have traditionally supplied contact center systems.

If we compare the old and new methods of “work sequencing,” we can easily see how these methods affect workflow and work distribution.

Traditionally, every communications subsystem has had its own work-sequencing module. The telephone system has an ACD module that sequences and distributes phone calls according to its own preprogrammed logic; the fax system handles inquiries differently; and the email system has another way of keeping email in order and available for retrieval. At the same time, the Web server has its own special method of tracking and reporting callback requests from customers who click the appropriate link on a Web page. None of these interfaces work in the same way, and using three independent ways of sequencing work creates conflicting priorities when the requests for service reach the contact center agents. When multiple independent queues are used, there is no centralized way to prioritize jobs so that work can be distributed in a uniform and consistent way. See Figure 1.

With cross-media sequencing, workflow control is handled differently—in a single, central work sequencing system. The telephone system feeds calls into the sequencing system; the email system feeds email into it; the Web server transmits information into it, as do all the other communications media that are supported. This unified work sequencing system decides who will be served next, and it tells the various communication systems when it is time to submit their respective communications to the customer service agent. The result is that work arrives in an orderly flow, regardless of its source. See Figure 2.

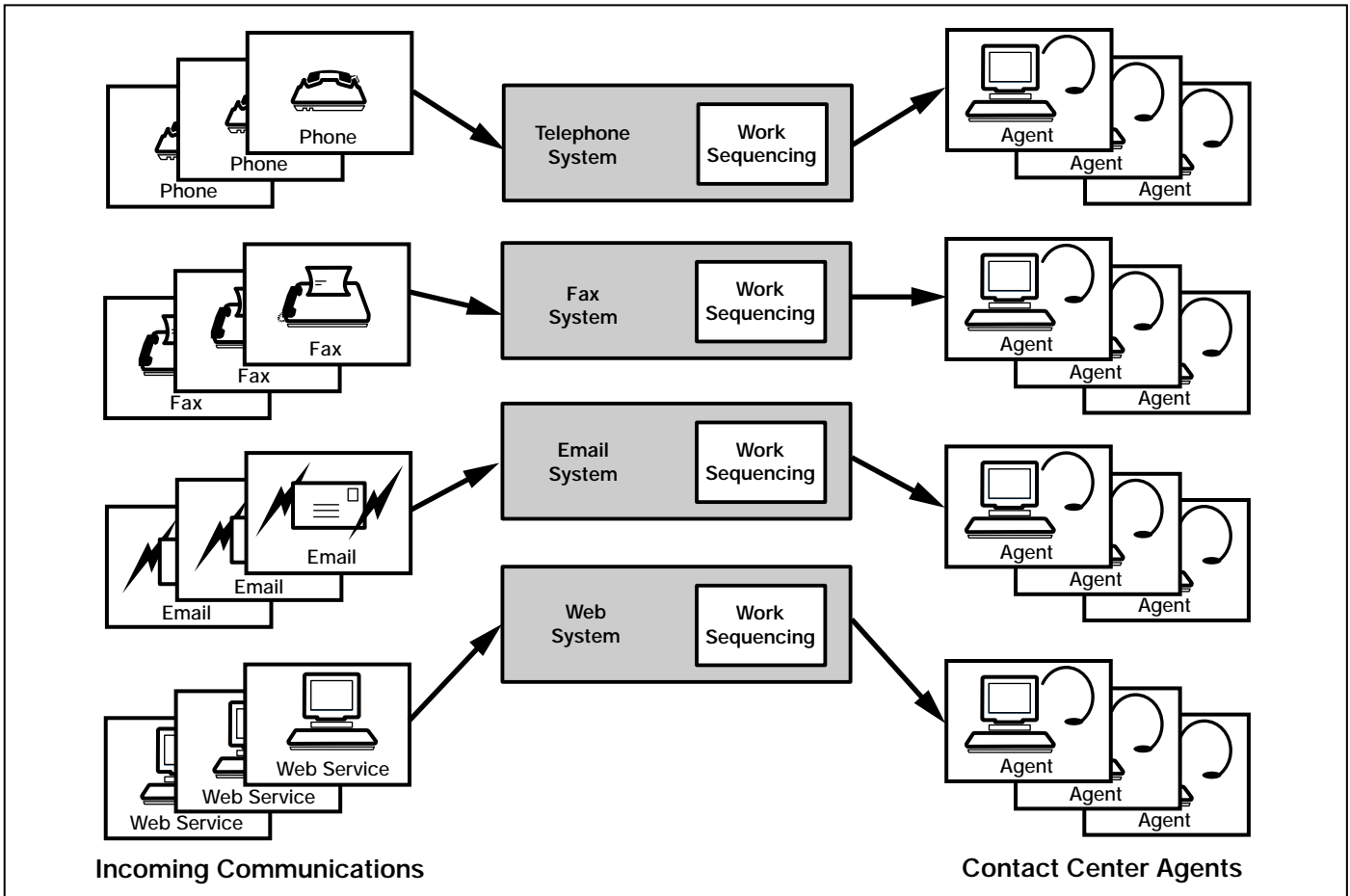


Figure 1: Per-Media Sequencing

New Functions and Features Needed

To work efficiently, today's cross-media contact centers must provide new functions and features. For example, a new queuing architecture is required that is capable of handling and distributing work requests from different communications media in a logical way. All inbound inquiries would be processed by this new work sequencing system.

Supporting a wide variety of communications media including phone, interactive voice response, email, Web services, fax, and document handling is critical. To handle all this variety, the system can be divided into subsystems, one for each type of media. The subsystems announce incoming communications to the work sequencer, and retain their communications until informed by the work sequencer that it is ready to route them. The subsystems then send the communications to the appropriate agent or device as instructed by the work sequencer.

Self-service options are also important, such as speech recognition for voice calls, expert system query interpretation for text chats, referral to other pages or to a search engine for Web clicks, and character recognition for faxes. Each subsystem provides these options to customers during wait times.

In many ways, the central work sequencer is like a maitre d' in a restaurant. Regardless of whether reservations are made by phone, fax, or email, customers are put on the same list in a logical sequence, and must wait until their tables are ready.

A New Queuing Architecture

At this point, the question on most contact center solution providers' minds is "How do we get there from here?" How do we make the theory of the new cross-media queuing architecture into reality?

A cross-media queuing application needs five types of components:

- **Queue engine** – Handles all customer interaction, according to the business rules established by a systems manager. The engine is the central coordination point.
- **Media interaction modules** – Receive customer communications from various media channels and release the communications to agent applications when directed by the Queue engine
- **Agent application modules** – Automate the handling of customer communications when they arrive at the desktop. These modules are written by the system developer to integrate specific desktop applications.

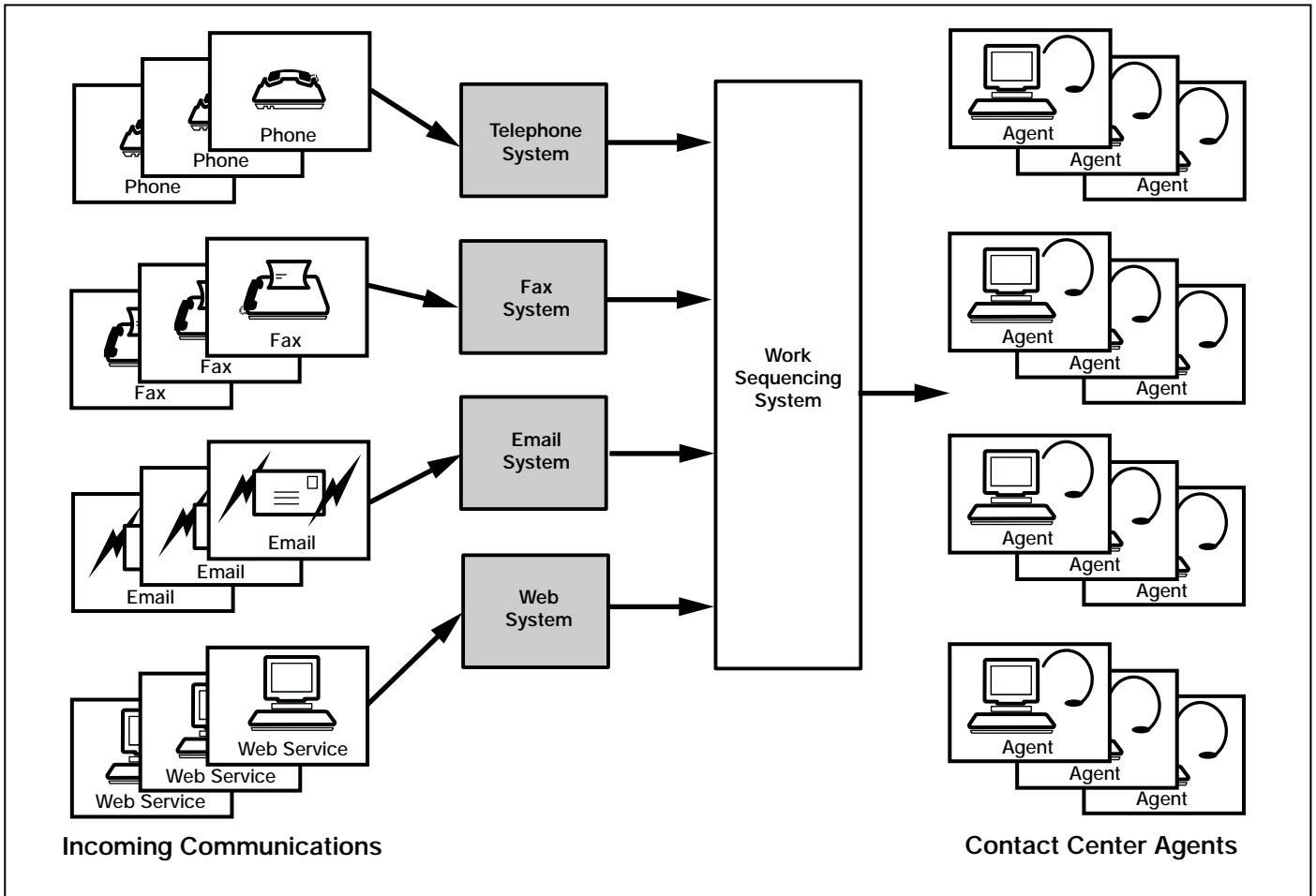


Figure 2: Cross-Media Sequencing

- **Configuration and administration module** – Provides a graphical user interface (GUI) through which system managers can easily configure and manage the various queuing features and business rules for routing communications
- **Statistics and reporting module** – Collects, stores, and reports statistics regarding traffic flow and system performance

Here is a closer look at the first two components:

Queue Engine

The core of a cross-media queuing application is a media-agnostic engine that queues and routes customer requests that arrive at a variety of media channels to the appropriate delivery points for response. It treats every customer interaction request equally, applies business rules and workflow logic across all media channels, permits real-time viewing of system statistics, and makes the statistics available for reports. The media channels are transparent to the engine.

Media Interaction Modules

Media interaction modules are the communication entry points to the cross-media queuing system. Each type of media channel the contact center uses is associated with a different module. These modules detect the customer requests on their channel and present them to the engine.

Using a modular structure allows a developer to start with components for some media channels and add others later, as a business requires. Modules can sometimes be used with minimal changes, or they can serve as foundations for developing additional or more specialized modules.

Here are some examples of the type of media interaction modules that could be used within a cross-media queuing application:

- **IVR**— Customers can use their touchtone phone to receive fast, accurate, automated information, and agent workload is reduced. If a customer requests agent assistance, that request is put into the queue and handled according to priorities established by the system manager.
- **Voice messaging** — Stores voice messages from callers for delivery to agent applications. The stored messages are placed in the queue and handled according to priorities established by the system manager.

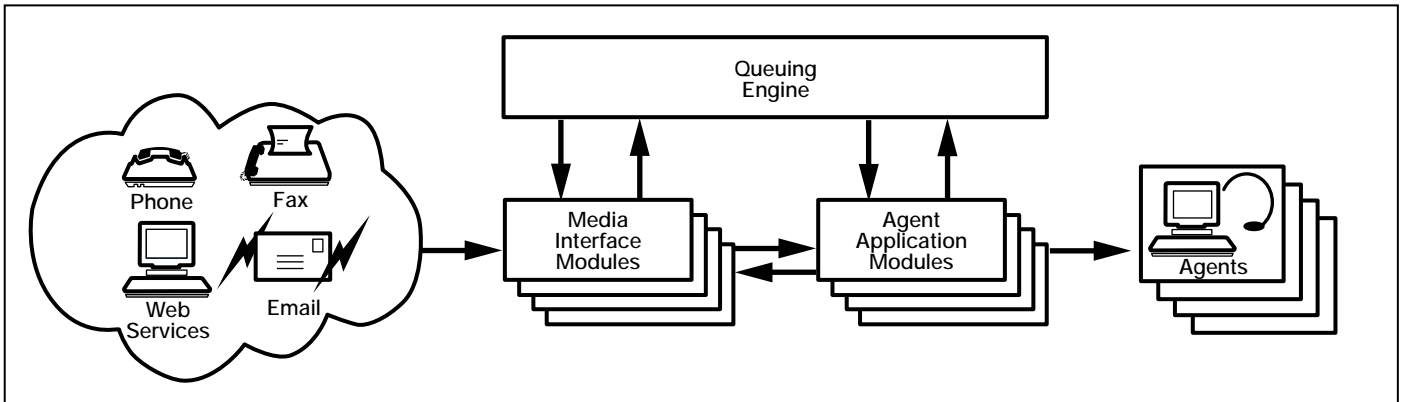


Figure 3: Workflow in Cross-Media Queuing

- **Email and fax** — Stores customer email or fax requests for delivery to agent applications. The customer receives an automated reply, acknowledging the inquiry or answering the specific question. If necessary, the email or fax is placed into the queue for a personalized response.
- **Web chat** — Web-based, real-time application for online customers, which is used to receive live, text-based assistance from agents
- **Web collaboration** — Web-based application that allows customers to request assistance via a Web page. An agent can then guide the customer through a number of Web pages using collaborative page viewing and text chat.
- **Call back** — Creates a call back request for an agent when a customer call back button is clicked on a Web page

In the case of Web chat, Web collaboration, and call back, requests are queued, and the developer can write the applications so that the customers are notified of their relative locations in the queue when the requests are made.

Each media interface module handles a different type of media, and each agent application module can present work to different agents, or automated services, according to business rules. Figure 3 indicates the cross-media architecture workflow, where communications move rapidly so that customer requests are routed and verified quickly. Communications do not physically move through the queue engine, which only regulates the flow of work requests. Rather they move from the media interface modules through the agent interface modules according to the instructions received from the queue engine.

An incoming email may receive priority attention, while phone calls may be directed to an interactive voice response system where the nature of the customer request determines whether a live agent must handle the call. Faxes may be held in queue until an agent is available to respond to a request. Cross-media queuing routes communications according to business rules and not according to media type. This allows important customers to receive priority attention, regardless of the media the customers use to make contact.

Intel® Communications Building Blocks for the Contact Center

Because of the importance of contact center applications to business, Intel offers a comprehensive portfolio of communications building blocks for use in cross-media and multi-site contact centers.

Media Processing Hardware

Boards and servers perform network interface functions and talking and listening functions such as speech recognition and text-to-speech. Intel platforms and components are very flexible and can be configured in many different ways to provide all the services a cross-media contact center requires, including the self-service applications that save so much time and money.

- **Voice processing** – Provides different voice-port-per-slot densities for optimizing system configurations
- **Network interface** – Allows deployment on networks around the world: SS7, ATM, ISDN, PRI or BRI, analog loop start, T-1/E-1 digital, and IP
- **IP telephony** – Supports a PSTN network interface, media stream processing, and Ethernet connectivity on a single card
- **Speech technology** – Enables automatic speech recognition, text-to-speech, speech compression, and voice verification in a variety of densities
- **Conferencing** – Supports multiple conferences, large numbers of conferees, and sophisticated features such as active talker status, on board DTMF detection/clamping, coaching, and individual volume control
- **Fax** – Offers high fax-port density in a single PC slot
- **Custom platforms** – Supplies a wide range of telephone network platform Network Equipment Building Standards (NEBS) products that meet Local Access and Transport Area (LATA) Switching System Generic Requirements (LSSGR) requirements for fault detection, alarm notification, and rugged construction
- **Development tools** – Allows cost effective testing, troubleshooting, and debugging

Software Components and Tools

Intel supplies software building blocks and tools to help develop applications and add features and functions that increase the value of communications solutions:

- **Intel® NetMerge™ Call Processing Software** – A product suite that provides the link between the computer and telephone switch, enabling applications to manage, monitor, and control calls across single and multiple locations within mixed PBX/ACD and H.323 telephony switching environments
- **Intel® NetMerge™ CT Application Development Environment** – A set of development tools and programming interfaces that help developers rapidly build portable communications applications, simplifying development and speeding time to market

Consulting services are also available to help with the implementation of applications developed with the Intel communications building blocks listed here.

Consulting Practice for Contact Centers

Because developing contact center solutions is a complex task, Intel has a consulting practice focused on contact centers. Intel consultants can help throughout the solution lifecycle – from planning and design through development and deployment. Services include consultation on technical strategy, architecture, design, platform and network configuration, call and media flow analysis, lab testing, application development, and site implementation.

Consulting services are available to help with the implementation of applications developed with the Intel communications building blocks listed here. Intel also offers consulting services that are especially helpful in implementing cross-media queuing systems in contact center applications.

Why Build A Cross-Media Contact Center

Because of the widespread use of email and Web-based services, the move to the cross-media contact center seems inevitable. Fortunately, the investment that enterprises must make results in substantial benefits far beyond merely keeping customers happy:

- Customers will receive faster and smarter responses from a cross-media contact center.
- Contact center management can prioritize interactions with customers and prospects to maximize return on investment. The best customers and most promising prospects can be identified and serviced first.
- Operating costs can be reduced considerably because phone calls and 800-number charges are minimized. Web-based services are far more cost effective than phone calls because they do not require live agent interactions.

- Productivity is maximized, because many routine communications can be handled much more efficiently in self-service media. Staffing can be reduced, and the reduced staff used much more effectively.
- Because agents will have more information about customers, agents will have an opportunity to cross sell and up sell.
- Easier and more effective management is possible through improved reporting and tracking.

Summary: Integrating New Media into the Contact Center

Contact center technology is changing due to the popularity of alternative methods of customer access such as email and Web-based services. In addition, the use of new media and technologies allow cross-media contact centers to provide compelling cost savings and other benefits.

The movement toward cross-media contact centers has necessitated a change in the architecture of contact centers. These changes include:

- Support for a wide variety of communications media in addition to the telephone
- The removal of the automatic call distributor and the return of the telephone system to its original role as a switching device
- The development of a new queuing system in which all inbound inquiries are processed using the same work sequencing system, regardless of the media that are used to handle them
- A new building block approach to developing the underlying features and functions used by all contact centers that permits greater efficiency and allows developers to concentrate on higher-level issues such as product differentiation

By taking up the challenge of building cross-media contact center applications, solution providers can help their customers deliver better service at a lower cost. The number of agents that staff a contact center can often be reduced, and the remaining agents are more productive because they can work more efficiently. Managers have better control of contact center resources because of improved reporting and tracking.

Intel offers hardware and software building blocks and services to help developers build cross-media contact center systems. These building blocks enable faster time to market, longer time in market, and increased revenue opportunities.

Get Started Today

It is easy to find out about contact center technology from Intel:

- Read more about contact center solutions at http://www.intel.com/network/csp/solutions/contact_cntr/index.htm
- Learn about Intel communications building blocks at <http://www.intel.com/design/network/products/telecom/index.htm>
- Access information about Intel® consulting services at <http://www.intel.com/network/csp/products/4383web.htm>

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Intel Corporation

1515 Route Ten
Parsippany, NJ 07054
Phone: 1-973-993-3000
Fax: 1-973-993-3093

For more information

To learn more, visit our site on the
World Wide Web at www.intel.com

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