

**Has CTI Failed to meet its Market Expectations?
Will it be Replaced Internet-based IP Switching?**

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The first CTI products were shipped in the United States in 1990. As the market started to understand the CTI concepts, beginning in 1993, the promise of this technology was lauded – CTI companies were founded; one of the largest trade shows for call centers was founded and still keeps its name. In fact, companies are still being founded around CTI.

Some of the early promises that we hoped for were about moving the interface with the telephone to the personal computer. We envisioned pervasive screen-based telephones, with linked personal, corporate and national directories enabling us to search by topic or dial by name using our screen-based phone resource. This has not happened. The closest is the Email directories available from major software players as well as softphones available within the scope of some recent manufacturers Web-enabled PBXs and ACDs. We also hoped for the next generation of associated applications personal organizers, automatically populated by incoming calls, generating Emails instead of message slips for call-back lists, providing us a dialing list, ready to choose with a click of the mouse!

As far as productivity is concerned, we felt that the combination of caller identification, whether via ANI or the IVR, combined with screen pop would at least be a start, providing between 5% and 10% productivity gains. The real win, however, was to come from better routing, based on the customer profile, pre-fetching data from slow legacy databases, using the caller's id in order to provide them with custom announcements, for instance on the status of an order or their service. These activities would stop the calls from going to the expensive service representative and be worth an additional 10% to 40% productivity increase.

We hoped that the evolution of data warehouses, profiling our customers needs, would be used for routing to the right person, or small group, enabling us to bond with our customers, increase revenues through better service, etc., enabling us to compete on customer relationships.

We also were looking for a new generation of packaged applications which would use CTI links to better support their needs. The applications that arrived, however, offering CTI Middleware solutions, were only partially packaged. They all required significant systems integration projects in order to provide their benefits. There were a few exceptions, offering caller id and screen pop with only a week or two of work, but the benefits available were focused on the least important of the productivity opportunities. Recently, some packaged applications have arrived, in particular from the outbound dialing companies supporting blended environments, from agent quality management solutions and from workforce forecasting, scheduling packages, and network routing solutions, but these hold only small market share.

In summary, the CTI players, whether computer companies, PBX and ACD companies, or software start-ups:

- Never gave us a viable set of personal computer-based telephone automation solutions
- Succeeded in obtaining productivity gains, but only for the market segment that could handle complex software integration projects; and
- Only recently has given us some packaged applications addressing a small part of the current market.

This state of the market is confirmed by the CTI market share study being released by the Pelorus group. For the customer service center market, only 10% of the ACDs of under 50 agents has CTI, the mid-size market is where the success lies, with 35% of the systems using CTI, but the large systems with over 150 agents, only 10% use CTI.

When we look at general telephony in corporations or in home offices, CTI is basically non-existent. There are indications that this share may grow, but no evidence is apparent that CTI will ‘sweep the market’ in the next two years.

Summary of Polaris Group’s CTI Market Analysis

Customer Service Center Size	Percent of ACD-based Service Centers which have acquired CTI
Up to 50 Agents	11%
50 to 150 Agents	35%
Greater than 150 Agents	10%

Table: CTI Productivity Opportunities

Opportunity for Productivity	Typical Productivity Improvements	Proportion of the Market which could use this feature
Call Center CTI		
Caller ID and Screen Pop	3% to 10%	60% - 80% of call centers
Voice & Data Transfer		
CTI-based Call History Database and Reports	N/A	Enables management to understand and modify their work, leading to major productivity changes

Data Pre-fetch	10% - 20%	10% - 30% of call centers, for those whose database, or multiple databases, performance is slower than 5 or 10 seconds to populate database upon initiating the data query
Caller-specific Announcements, before reaching the Agent	10% - 20%	20% - 50% of call centers, for those who can prevent calls from going to agents by informing callers of the status of their accounts, deliveries or service
CTI for General Users		
Non-call center CTI-based telephony - software features, directories, messaging, etc.	None	There don't seem to be any significant productivity opportunities

What happens with some market innovations?

Let's compare the deployment of CTI to other innovations in the telephony industry. Looking back, least cost routing was initially deployed in the late 70's. In the first several years after availability, it was a stand-alone technology sitting between the telephone system and the telephone company lines. Within several years it was a feature offered as part of the telephone system. Seven years after its availability, it was being used by 90% of the systems of over 100 lines.

When the digital PBX was made available, within five years almost all new sales of PBXs were digital, analog systems were only being sold at the low end (key systems) of the market, with an occasional high-end sale.

With the advent of the Internet for non-university and research users, the entire country is aware how it has exceeded all other previous communications technologies in not only business but also residential use – in a period of only a few years.

Although CTI was not anticipated to be as successful as Internet, it most certainly was expected to fare much better than it has. As a marketplace, CTI has succeeded; the demand is still there for integrated voice and data. Unfortunately, as a set of customer benefits balanced with the ability to create a solution ready to be placed in production, CTI has failed – only the sophisticated customers, able to manage complex projects requiring multiple disciplines have implemented CTI solutions – even they have had difficulties.

The Competition facing a CTI Project - why hasn't it obtained more market share in its core market, the customer contact center?

CTI has obvious benefits, but it also has issues. In order to understand why in so many cases, CTI has not made it 'above the line' in many management group's decisions about which projects to pursue, we need to look at several factors.

Today there are so many opportunities available for improving your customer contact center. Ten and fifteen years ago, there were only a few possible avenues to pursue. You could acquire an ACD, create a voice response application, change a network carrier, or pursue training programs or outsourcing for labor.

The rate of innovation in the service center industry has been so fast that now in the areas of technology, management information and labor practices there are an immense number of opportunities to understand. With such a rich world of opportunity available to the management staff of the center, several questions arise about the nature of decision-making in this group of people.

- ***How many new projects can a management team seriously consider in a year?***

This answer varies with each contact center and management group, but when the final budget process determines what's 'above the line' versus 'below the line', typically there are ten or fifteen line items that maintain forward movement on existing projects and a few slots open for new activities.

This means that a CTI project is competing with a range of other opportunities vying for one of only several slots on the approved list.

The following table provides a summary of the major entries in the competing list – a detailed list, with each item requiring management attention, is significantly longer.

**What is Competing with CTI to 'Get Above the Line'
in Customer Service Centers?**

Workforce Projects	Existing Infrastructure
Agent Compensation Identify, define and implement new skill sets Agent Training Programs Agent Retention Programs Outsourcing Workforce Scheduling & Adherence Workforce Quality Management	Database upgrades, new databases CIS upgrades, new CIS solutions Reporting Applications IVR applications and upgrades Upgrades to ACD, new ACD ACD Networking and Network Routing ACD Skills Routing

Quality of Service & Revenue Opportunities

New Marketing & Sales Campaigns

Customer Profile Databases

Customer Relationship Mgmt (CRM)

Expanding the scope of the service center

Merging or consolidating service centers

Knowledge Databases

Web Development

Adding Customer Support to the corporate Web Site

Introducing Web 'VRU' to help users to find information

Web Chat to appropriate service reps

Email receipt, sorting and processing

Web Knowledge Database and self-support tools

Web Monitoring and Measurements

Contact Center Strategy, Growth, and Facilities

Merging, centralizing, de-centralizing and restructuring the contact center in the company

Acquisition and continuous upgrading of facilities, equipment and services

- ***How hard is it to do the research and prepare the CTI business case for the management team?***

It is difficult to understand and define a CTI project. The project plan requires multiple skills, a detailed understanding of hard-to-differentiate companies, and a detailed understanding of workflows.

In order to ensure the plan's technical feasibility, one has to understand how to accomplish the systems integration with voice response scripts, customer databases, agent user interfaces as well as the ACD routing scripts. They must all work in a single coordinated manner in order to successfully deploy a CTI application. In many cases the agent's new software phone application needs to be changed modified.

On the business side, an understanding of the voice response application, the workflow and user interface of the agents, the data available in the database, telephony activity such as call duration, transfer percentages, ANI repeats and the time savings associated with all of these must be understood, modeled and then summed in order to understand the likely productivity savings and rate of return.

In addition, an understanding of the impact on quality of service needs to be addressed, to ensure it improves as opposed to going in other directions.

Lastly, one needs to understand the project itself, in order to estimate costs and time frames, as well as understand that the actual deploy will often be in stages over a period of months to ensure testing is accomplished properly.

In summary, properly preparing a CTI business plan to the point where there is a good chance of succeeding on the project is very difficult. Not many contact centers have the personnel who can create such a plan without finding significant outside help from consultants, vendors and corporate skills.

- ***What skills does the management team currently have, and how does this influence the projects they choose?***

All contact centers understand their business, their personnel requirements, basic management measures and the content of their workflows. Only some have a full time MIS operations person on their staff, much less a programmer. Many need to request support either from their corporate MIS, thereby competing for attention with the other major corporate functions, or acquire consultants with the proper project management and software engineering skills.

Only a small minority of contact centers have the skills available to deploy a CTI project, meaning that they must turn to either other groups in their company, consultants, formal system integration companies or CTI vendors for the required custom work. This is a major barrier to accepting CTI projects – the custom work is often onerous and takes management time and funding in order to find and obtain the skills.

What criteria does the management team use to pick and choose among projects?

In general, the management team will focus on projects which are:

- Critical for supporting the business
- Focus on revenues
- Are easy to understand, define and accomplish with moderate to low risk.
- Are easier to approve quickly without major buy-offs required from many other parts of the organization.
- Can be accomplished with as few outside skills as possible, due to additional cost and complexity.
- Does not require an additional, ongoing MIS or other operations activity when it is complete.

Why CTI has failed to obtain 90% Market Share

With these general criteria in mind, one can see that CTI often becomes one of the more difficult projects to justify, because it scores badly on the ‘easy to accomplish’ list of projects. The more complex projects such as CTI are most certainly addressed, but they take much more management effort and time, and may require outside consultants to define and justify the projects. Also, many fewer of the complex projects are considered by management, simply because of the effort to understand and quantify the opportunities.

The present incarnation of CTI products and solutions are failing to get on the list or go ‘Above the Line’, as a consequence of the continuing complexity. In summary, CTI is failing to get 90% market share because CTI projects are:

- Not critical to the survival of the business.
- Complex, requiring many different skills and an understanding of many different vendors
- Require specialized, usually outside, skills in order to complete the project, or a defined project, with plans and contracts, with a system integrator.
- Offering reasonable, but not persuasive productivity, and
- Require ongoing operations talent after the project is complete.

The Table ** on the adjacent page provides a comparison of CTI projects with other projects confronting the contact center. This provides a good impression of the types of issues that the management team struggles with in determining which projects to pursue.

Positioning Alternative Projects from the Management Group's Perspective

	Critical Nature or Strategic Importance	Revenue	Productivity Change	Project Return	Cost	Service Quality	Getting it Approved
Databases & CIS Projects	Foundation of the business	Often	Varies	Varies	Enormous; often \$2 - \$10 million	Critical	Difficult, often requires major corporate involvement
Enhancements to Databases & CIS	Foundation of the business	Often	Varies	Varies	An ongoing staff	Critical to high	A standard process to defining content
Web Development	Very high, often changes the nature of the business	Often	Minor to very high	Varies, but felt to be very high	\$1 - \$5 million and a ongoing staff	A New Access Point	Easy to Moderate, come from CEO
Email Support	None if service center is detached from Web site. Critical if want Web site to become customer focus	Depends on service center	No evident savings over voice calls	No obvious return, unless it leverages the Web Site	Moderate (\$20,000 to \$250,000)	Critical to support a Web Page	Hard to keep from being handed the responsibility
Insourcing/Outsource or hire employees?	Major consequences across most functions of the service center	N/A	Some	Moderate	Very high, but will spend it anyway	N/A	Easy to Difficult, depending on the corporate culture
Employee Churn	Very High, due to a range of quality of service issues	High to indirect	Moderate	N/A	5% - 15% of employee costs	Important	Easy to Moderate
Training	High, due to quality of service & cost reduction	High to indirect	Moderate to High	Varies	Low to Moderate	Important	Easy
Simple CTI Projects (screen pop)	Minor – offers minor productivity improvement	Minor	5% - 15%	1 to 2 year payoff	\$50,000 to \$300,000	Minor	Moderate
Complex CTI Projects	Moderate. In some it supports revenue and quality of service improvements	Some (a few may make it major)	15% to 35%	2 to 5 year payoff	Often \$1 - \$5 million	Some	Very Difficult, involves corporate groups, funding, etc.
Agent Quality Monitoring	Significant quality of service improvements	Some, and in TeleSales	0% - 5%	1 to 2 year payoff	Moderate	Significant	Moderate
Workforce Scheduling & Adherence	Significant Quality of Service	N/A or some	0%-5%		Moderate	Significant	Moderate

The CTI Industry, itself, is partially at fault for making CTI difficult and hard to justify by management!

The CTI industry consists of several major players – the ACD and PBX manufacturers, the computer manufacturer's offering CTI APIs, software product companies offering CTI middleware and solutions, and systems integration businesses or independent consultants. What factors have made CTI solutions so complex and expensive? Why can't one just go 'buy it' and have it installed in a week or two like you can for many other technologies. In many worst cases, it may take a month or two to understand a package software solution, but it requires only minor systems integration work and a normal employee can learn how to use it. Reasons for failure include:

The Lack of a Serious Effort to Create a Standard

In my view, a useful standard for end-users means I can install the solution in about 95% or more of the target customer base, without worrying too much about the internal parts of the solution. Although the CTI market broadcast its message about standards to the users, in retrospect it appears that these messages weren't really for end-users audience. Rather, the standards were for engineers and product managers to create a common language and understanding. The PBX and ACD companies then determined which features they would implement as the standard, which they would add as 'special add-ons' offering important features beyond the standard and which features to vary from the standard in order to create barriers of entry to the CTI application houses. After all the ACDs didn't want to look 'transparent' to the end-users and get in a price war.

Currently, the end-user often has to understand what type and version of ACD or PBX they have, which CTI Link software is on the computer platform, which CTI middleware they need, what IVR they have, etc., etc. This is not easy nor does it sound like a useful standard for end-users.

The lack of packaged applications

Rarely are CTI solutions packaged to offer a high proportion of productivity benefits under a simple user interface that a non-engineer can learn and use in a few days. If one could obtain VRU integration, caller ID, basic routing, screen pop and a call history with one or two days of installation, and a few days of training, and enable the current contact center personnel to run and modify the solution easily, at a price of \$30,000 to \$50,000.

Too many players

It takes three or four players for each CTI solution – the ACD/PBX, the CTI Link, the systems integrator or packaged solution with systems integration, the user interface and the IVR system. Each player needs to make some revenue out of the CTI solution or they loose money. Think how easy it would be if there were only one or two players.

The competition from Internet – does this spell the end to CTI's ambitions?

Six months ago I was talking to the manager of a large, sophisticated customer contact center several months ago. They had sites around the world providing 7x24 service on a range of technical support and other issues, a relatively high volume of call transfers, a stable customer base (ie, they knew who was calling them automatically) and liked to collect information about what was happening in their customers access to their resources. They were also technically quite capable, with sophisticated engineering and project management talent. The ACDs they used were Lucent – ready to go with CTI. Basically, you can't find a better 'suspect' for a successful CTI project.

I asked whether they had implemented CTI. No. Why? They had examined the question in detail and believed that the complexities of implementing, coordinating and maintaining a CTI environment were too high and too expensive to maintain. The surprise came when they told me that they believed that IP-based switches and the Internet, by the Year 2000, would be able to supplant their internal circuit-switched resource and that they would use Internet switching to provide all of the features available from their ACDs as well as CTI.

Why would they believe this?

Speeding towards the IP-based Telephony

Along with the massive growth in the Web, there has been a major set of innovations in Internet telephony. Two years ago, we were treated at major trade shows with the first displays of Voice over IP. My reaction at that time was 'neat technology' but it is going to be awhile before it is useful due to bandwidth and performance issues. Two years ago, PCs and the Internet were also much slower than they are now.

Late last year and early this year I got excited. At the trade show there was a rash of what I can Web ACDs, with varying degrees of Internet telephony on the inside of their boxes. Companies such as Interactive Intelligence could already be viewed as the seasoned players. WebLine, Atios, NetDialog and others were adding competition or specialty facilities to the concept. ServiceSoft jumped into the game when they acquired BaliSoft. They provided a single platform, management environment and queuing facility handling voice, Email, Web Chat, and push and pull Web facilities for the service rep to work with a 'caller' who was also using the Web.

Most recently, announcements are being made about 'fully IP-based telephony' platforms supporting general telephony features as well as ACD features, for instance, CosmoCom claims that it is a fully IP-based call center solution.

What's even more interesting about these companies is that they now have an installed base of production systems – I have visited some of these sites and the systems work well; the customers are generally pleased.

What does Internet Telephony offer that CTI Does Not?

Internet Telephony offers simplicity compared to CTI. Let's examine some technology that all of us can buy, install and use without much effort – the standard telephone. When I get a phone, I can plug it into the wall and it works. I may have to order certain features from the phone company, for instance call forwarding or voice mail, etc., but it's easy and I get benefit right away. I don't have to pursue a major selection process, figure out which features work with one set of linked products versus another, test the solution to find bugs, fix them, and then slowly roll out the production environment, installing software on each PC, knowing I'll find a few more bugs. Each time there is a modification or update to any of the software components, it is necessary to go through the entire testing and roll-out procedure again.

Internet Telephony is offering something similar to the features offered by the telephone. Its banner is to offer a seamless Internet switching environment that:

- Enables an end-user to link their Web Site with their Web ACD using packaged software products and standard technology. In general the link is accomplished via the Web Page addresses of the sites.
- Enable agents, whether local or remote, to become part of the environment using the standard browser solution on their personal computer. When an agent (or a customer) wants access, they simply indicate their request on the Web page offering connectivity.

At this point, they can receive either a phone call, Web chat request, or Email. They can talk with a remote person via Voice over IP (Although, for instance, NetMeeting may need to be started – it is a standard package on most browsers.) and either push or pull Web pages back and forth. The remote person requires no special software, only the standard browser.

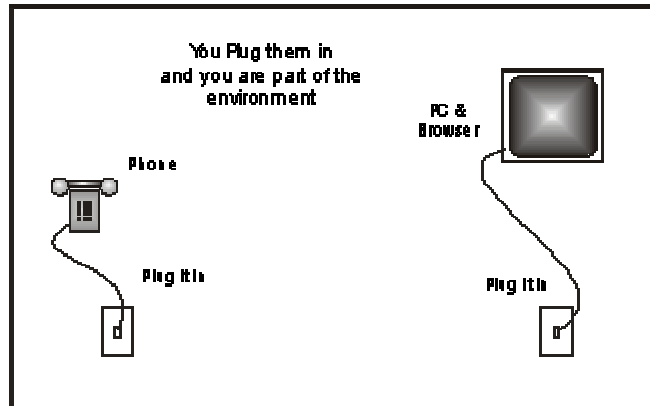
Much of the sharing of the user interfaces is accomplished by pushing Web page addresses into the agent's browser. I can drive not only the Agent's applications, but also the calling party's view. I get a full record of not only calls, but Web Chats, Emails, etc., as well as a history of the Web pages used to solve a problem. If I have implemented a Web VRU in conjunction with the Web ACD tools, I will also know much of the activity of the customer before they reached the agent. To obtain 'screen pop' a similar link is achieved with the customer's database software as is used in CTI.

The ability to installed the Web ACD and link it with a company's Web site fairly easily – it does require some specialized effort and sometimes systems integration if a database link is desired – is a part of the revolution of Internet telephony. Another is the ability to easily transfer the entire customer session – voice, data, etc. – to another agent in a transparent manner.

Let's examine the problem of transferring the session in a multi-site customer contact center. If I am an agent working with a customer and decide to transfer the call to another agent anywhere in the world, I indicate my request in the Web application. It then searches for the appropriate agent and when they are available, passed the Web Page addresses to the remote agent. The Web page addresses push their browser to what I was viewing and they are connected with the customer in real time via Voice over Internet, chat or whatever else.

If the caller is using a standard voice link, it will have been translated into Voice over Internet at the initial Web ACD, therefore the transfer of the voice call is accomplished via the Internet, not by coordinating the telephone network with the ACD and computer network.

This process has by-passed many of the more difficult CTI problems. Systems integration is much simpler and less expensive, and in most cases does not require a software professional. The ongoing cost of ownership in such a facility is much lower since there are fewer directories to coordinate, software releases don't need to go to all of the users and the system testing is simpler.



When will Internet Telephony really be Ready?

It can be acquired and will work now. Internet Telephony-based has made massive headway in the last two years. Solutions are working, in production and receiving successful nods from the users. The issues that remain focus more on access to Voice over IP than anything else. The issues that need to be resolved before Internet voice communications becomes a standard part of our daily lives include:

- Web bandwidth and gateway performance are still an issue for supporting voice calls. In the right conditions it works very well, but there are other times when Internet throughput is still a problem. This is compounded when an international connection is desired.
- Voice over IP is getting better. However, the next generation of chips, expected next year, are to significantly increase performance. These are anticipated to be the turning point towards the general use of this technology.
- Lastly, PC are not equipped, with every system, with headset or telephone sets. But this is easy to fix. Now speakers for listening to CDs are standard in most computers and providing telephone headsets or the equivalent is easier.

Summary

There is a danger that the CTI industry has taken too long; that the promised set of benefits that it offers, and many users would like to acquire, may be solved by the next generation of technology – IP telephony. Unless the CTI players stop providing solutions that are complex, hard to understand and require specialty skills for deployment and operations, it is highly likely that they will only incrementally growth their current market share.

It is also likely that the CTI players may see their installed base begin to shrink as the Internet Telephony solutions become more standard. The same companies that were willing to invest in CTI are examining Internet Telephony now. I know of one case where the CTI solution was replaced.

If Internet Telephony can solve the problem of simplicity, then its market share should exceed that of CTI, and reach the measure of true success – 90% of the target market in seven or eight years. We are just beginning Year 3 for Internet Telephony – we are in Year 9 for CTI.