



Enterprise Applications: A Conceptual Look at ERP, CRM, and SCM

Abstract

The telecommunications industry, like many others, is experiencing a watershed. No longer can customers pursue technological advances just for technology's sake. Technology must support real, measurable, and innovative goals of the enterprise. The technologies and terms in every major provider's portfolio are starting to look and sound alike. New product offerings appear almost identical to existing products in the same market. The terms VPN, MPLS, convergence, the ubiquitous "IP," service level agreements (SLA), single points of contact, managed network services, and global footprints are important in the telecommunications market, but we have heard them all before.

The competitive differentiation that service providers desperately seek will not occur on this homogenous slate of technology and service offerings. Only when service providers truly understand what is happening from the customer's perspective will real competitive differentiation take place. Providers must realize that they do not drive the networking and telecom environment; the customers' strategic and tactical objectives drive it. If service providers wish to position at higher levels in the corporation, they must change the way they communicate. Such communication should not only show an understanding of the enterprise applications themselves but also an understanding of how the applications relate to the service providers' product set.

This paper will outline three (of the many) enterprise applications and business drivers service providers can use to differentiate themselves. We will examine the concepts of data warehousing and data mining for the purpose of effective enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM). We will define the major aspects of each, examine the drivers and impacts of each, and consider how each relates to the service providers' product sets.

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Ah, the good ol' days...

Back in 2000, while at an industry tradeshow, attending a one-day tutorial on optical networking, the woman sitting next to me struck up a conversation, and after the initial pleasantries, I asked her what she did for a living. She told me she was a manager at a venture capital firm. Figuring that she was more interested in financials than the current quantum physics discussion, I asked why she was attending.

"Well," she said, "We opened up a round of funding for an optical company that supposedly has revolutionary technology, but we had to shut it down in three days because too much money came in too fast! We raised 73 million in three days. So, I thought I would see what optical networking was all about."

We then discussed the basic merits of the technology, but I was amazed at how much money was being thrown at technology simply for the sake of technology. Venture capital funding before 1995



accounted for about 4 percent of telecom’s R&D dollars; in 1998 it accounted for 40 percent. That is huge growth, and who could complain? Times were good, and stocks were up.

Then, of course, the bubble burst. Volumes could be written on why, but one principal effect is that technology providers now must clearly demonstrate how their technology positively impacts their customer’s business. There is no more technology for technology’s sake.

As we start to come out of our economic funk of the past several years, providers of transport, hardware, software, and consulting services must be able to position higher in the organization and more effectively than they have before. In an environment where technology offerings look alike and service levels are marketed with the same language, the providers’ thorough understanding of what an organization is trying to accomplish is the true competitive differentiator. To stand out, providers must understand the following issues: What is it that the technology will do for them? How will it enable them to accomplish an increase in profitable revenues, an improvement in productivity, a reduction in capital expenditures, or perhaps a shift from CapEx to OpEx?

Data Warehousing and Data Mining

Businesses generate an enormous amount of data every day. A recent report on storage discussed how the Chicago Mercantile Exchange’s data retention requirements have increased from 4TB to 180TB in just 30 months!

Each transaction, each contact with a customer, supplier, or employee can yield valuable data that might become useful to the enterprise. How does a business collect, store, and analyze all of the data that flows in, out, and through the organization? The diagram below illustrates the concept of data mining, which involves three steps: 1) Capturing and storing the data, 2) Converting the raw data into information, and 3) Converting the information into knowledge.

At the left, we have data. Data in this context comprises all the raw material an organization collects via normal operation. Spread throughout the organization, these data collection points can consist of the website, POS applications, servers, manufacturing systems, or even employees. At this point in the data mining process, the data is still meaningless. Today, storage is most likely physically distributed. When we create a data warehouse or a data mart, we create a virtually centralized database that contains all the raw data collected throughout the organization. All of the data “appears” to be in one common database. This is critical for providing the macro view of organization.

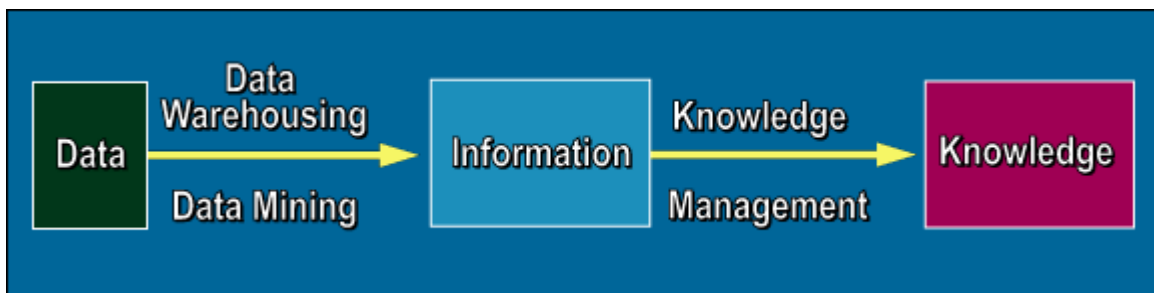


Figure 1: Data Mining

Capturing and storing the data is the first step, but it is worthless without the analytics—the process of applying complex mathematical and statistical formulas to “mine” the data warehouse. Here, the



organization is trying to uncover hidden trends. Mining the collected raw data from the entire organization, not just by department, provides new information as to how customers, suppliers, and even the company's own processes really perform.

Converting the raw data into information is the second step of data mining. Remember, information is worthless unless it impacts the way an organization functions. This is a prominent theme in all of these applications. Organizations are beginning to understand that data mining is less about technological complexities and more about business complexities, which can be more difficult to overcome, primarily due to two reasons.

1. Deriving real knowledge about the way in which an organization functions can be painful because business processes are often rooted deeply in the corporate culture.
2. Looking internally means admitting that business operations are not optimal; this can lead to finger pointing within the organization, which is not productive.

The final step of data mining is applying the knowledge gained, which should lead to wisdom. Corporate leaders constantly seek this wisdom. Data mining or warehousing is an underlying theme in all three of the enterprise applications we focus on in this paper—ERP, CRM, and SCM. Whether it is a focus on efficiencies within the enterprise, customer relations, or supply chain management, the need for knowledge before action is critical.

Enterprise Resource Planning

Almost any discussion of enterprise resource planning (ERP) starts with material requirements planning (MRP) and MRP II systems of the 1970s and 1980s. In the manufacturing environment of old, the original focus was on the “widget”; the ability to produce the product was the focus. Organizations commonly asked the following questions: How many widgets do I need? How long does it take to produce that many widgets? How can I make more widgets? These, of course, were valid questions, but as manufacturing evolved over time, the number of difficult questions increased. Such questions largely focused on the areas of component procurement for the finished widget and on storing the material necessary to make the widgets. Organizations were trying to understand both the finished manufacturing totals and how to get to the finished product.

MRP II added a focus on the planning aspects of this process. These systems integrated capacity, design engineering and management, costs, and long range planning of the enterprise into the equation. Many organizations that implemented this approach instituted mechanisms to correlate the planning and forecasting process with the actual production numbers. This allowed the organization to achieve a higher level of overall efficiency in the manufacturing arena. The real issue is that while the organization had a better handle on the manufacturing aspect of the business, it was still missing integration to other components of finance, sales, marketing, customer satisfaction, and distribution, to name a few.

ERP is a massive software engine that seeks to provide one seamless interface to all departments, systems, and existing data within an organization so that each department understands how it fits within the organization's macrostructure and how it impacts that macrostructure. Such understanding is crucial in facilitating enhanced communication between departments, better knowledge management, and improved processes. Such enhancement is the foundation for fundamental business changes.



Although there is a huge focus on the technological aspects of an ERP deployment, there must be an equal focus on changing the way an organization functions. Deploying ERP for the sake of ERP can be dangerous. ERP is not simply reengineering systems; it is reengineering the way organizations do business. In a recent CIO Magazine case study, Jeri Dunn, CIO for Nestle USA, said it this way, “If you weren’t concerned with how the business ran, you could probably [install the ERP software] in 18 to 24 months. Then you would probably be in the unemployment line in 19 to 25 months” (Worthen).

ERP: All Things Considered, the Benefits Are Real

Let’s look at the classic example: order fulfillment. In traditional environments, the customer would place an order, which the customer representative would enter. That system might output to a warehouse where the inventory would be set aside (if available) for the customer. Then, the information from the warehouse would be reentered into a shipping system for delivery, and the inventory system would have to be updated, so that the output would be accurate when it was input into the manufacturing system. Next, the information would be entered into a billing system, which might or might not tie directly into the corporate financial systems. Throughout this whole process, the sales and marketing departments are trying to determine forecasts, funnel management, and determine future marketing plans. In the meantime, when the customer called back to check the status, the representative could not access the appropriate systems to answer the customer accurately. Needless to say, the customer was frustrated. Such frustration leads to unsatisfied customers, which leads to lower sales.

Now imagine that the above example takes place in an organization with a successful ERP system. ERP sits between all of the systems and users regardless of where they are in the pipeline. It knows all the different data collection points, and it must interface with all of the different formats of the particular data (from legacy 3270 to 5250 to Windows to proprietary formats). It also intelligently routes the order to the appropriate department at the appropriate time; reducing the number of times a human has to enter data can dramatically reduce errors. ERP also takes all the data and formats it so that each department can perform its required function. For example, customer representatives can see everything associated with the order to fully satisfy the customer.

While the benefits of ERP are impressive, deploying an ERP system is a major undertaking for any organization. The surface level reasoning of better order tracking and management aside, some of the real issues that occur during an ERP deployment are related to job function. Changing the mentality of the organization’s employees is critical to changing the business process. The corporate goals must be communicated, socialized, and supported. Otherwise, the organization will spend millions of dollars in time, software, and hardware with negligible results.

Generally, the goals revolve around integrating information, perhaps financial or customer-related. Sometimes the goals reflect the desire to manufacture more efficiently. At any rate, many vendors have specialized their ERP offerings for a particular vertical market, and most have modularized their offerings, so that customers do not have to endure the headache of an all-or-nothing approach.

Several companies have implemented ERP, with varying costs. Meta Group reports that the total cost of ownership (TCO) for the average ERP implementation among 63 companies ranged from \$400,000 to \$300 million. Although the range was pretty wide, the bottom line is that the costs can



be extremely high. Meta Group also estimates that the “heads-down” user (i.e., customer representatives who can access all order details) costs around \$53,000. Additionally, implementation timeframes vary widely, from eight months to several years. However, even with high costs and long implementation timeframes, companies are seeing the benefits of ERP. Jeri Dunn of Nestle says its annual savings are approximately \$325 million, and the implementation is not even complete. Diana Near from The Principal Financial Group reported to CNN.com that it is saving \$165,000 alone in salary for reduced staff requirements.

Ultimately, the goal of ERP is to change current ineffective business processes. Despite all of the well-publicized failures, companies are still spending money in this environment. Why? Companies that perform better, know their business better, and react more effectively are in a better position to survive.

Customer Relationship Management

Customer relationship management (CRM) is the most talked about of the three enterprise applications that are the focus of this paper. CRM seems to have its roots in three areas: call center systems, help desk applications, and sales force automation. Most of us are probably familiar with one of these three. In the mid 1990s several companies like Siebel and Clarify (now Amdocs) offered consolidated functionality across the “front-end” sales perspective, while the “back-end” providers of software like SAP and Oracle mostly focused on functions related to finance, supply chain management, and ultimately, e-business.

When the economy was mostly sluggish in the early part of the decade, and customers were cautious, the need and desire to get closer to customers seemed a primary means of differentiation in the marketplace. Companies seeking this differentiation must ask the questions below.

1. What does getting “close” to customers mean?
2. How do we get close to customers today?
3. How do I drive or extract new revenue using CRM?

The first question has many possible answers. Indeed, the companies that explore all possible methods are uniquely positioned to get a better picture of a customer. For our purposes, we will only focus on a few critical aspects. The first is to uncover patterns of buying from the customer base. Uncovering these trends is fundamental to any business. One might argue that an expensive CRM system is not required to do this. To a certain extent, this is true. However, analysis of buying patterns is different from that of buying history. A customer’s buying history is only one component of the pattern. Others include the financial market, demographics, geography, recent marketing messages, and other parallel actions such as sales, new product introduction, competitive offerings, positioning tactics, and pricing. In *The Cluetrain Manifesto: The End of Business as Usual* Weinberger and Searls make the following point.

The first markets were markets, not bulls, bears...not demographics, eyeballs or seats. Most of all, not consumers. The first markets were filled with people, not abstractions or statistical aggregates; they were the places where supply met demand with a firm handshake. Buyers and sellers looked at each other in the eye, met, and connected....where people came to buy what others had to sell—and to talk.



While Weinberger and Searls were trying to make a bigger point about the Internet and its role in current market philosophy, the germane point here is the notion of connection. More than anything, strategic companies are trying to figure out how to more effectively connect with customers. They believe that will be a sustaining factor in their survival.

The second question above is equally important. Making customers feel unique because you understand their likes and dislikes is difficult but critical. CRM systems allow a vast amount of input about a customer in order to build a comprehensive profile. The simplest example (and one of the most common) is the contact manager concept. There are many sales tools for contact management. An integrated CRM tool can add real-time integration to other systems (e.g., financial, order management, and quality control). Giving the pre-sales team, customer representatives, and post-sales team the ability to input information about a customer cycle over time builds a profile that enables each team member to serve the customer better. Giving sales management “one-click” reporting capability on leads, problems in the pipelines, breakdown of revenue by product, or other metrics can ensure a more successful forecasting and market strategy implementation.

Many of us have experienced the power of an understanding of buying behavior trends when we use Amazon.com. But Amazon is far from unique in using CRM. The hospitality industry also uses CRM systems to get closer to customers. Customer loyalty programs like frequent flyer and preferred guest programs can record recurring customers’ preferences and then target specific services to specific customers. Grocery chains monitor purchases to effectively market specific products or offer discounts. Also, if such monitoring identifies that a customer has moved, they will send a “moving special” coupon book to the customer. Even in the restaurant industry, companies like Union Station in New York track patterns to record favorite tables, bottles of wine, and health concerns for patrons. These efforts help businesses know their customers better in order to better serve them.

The third question, however, requires more complex analysis. How can a business derive new revenue opportunities from this data? Sometimes customer buying patterns can offer new streams of revenue. This complex field of analytics is the most difficult aspect of CRM engines, but it can reveal important data. For example, one retailer found that if it lowered the price of a can of tennis balls by \$.25, the sale of tennis rackets (a higher margin item) increased. In addition, grocers can track not only the brands customers like within a given product set, but they can correlate that information to the shelf position where it is stocked. By measuring trends over time, grocers can determine the impact of shelf position on customers’ buying habits. Using this information, they can broker better deals with the suppliers by marketing “premium” shelf space.

To increase customer satisfaction and effectively manage distribution, many businesses tie their distribution systems into the National Weather Service because a major weather event could affect operations. To keep customers satisfied, businesses that supply rock salt and snow shovels must be well stocked for that first, possibly unexpected snowstorm.

Examples abound, but the point is that knowing your customers today is as important as ever. No so-called “new economy” will ever change that. However, we have new, complex tools to help us do this; they collect and analyze information to help us gain closer relationships to customers, derive new revenue opportunities, and target marketing initiatives for maximum impact.



We must also realize that these customers have more ways to interface with organizations today— websites, sales reps, cashiers, and call centers to name a few. Using a method (such as CRM) to get a macro view of the customer is invaluable in today's fragmented communication environments. However, like ERP systems, CRM systems will only be effective if organizations socialize the project goals and actually use the tools. These are a CRM implementation's biggest challenges today. It is not the software; it is establishing use of the software. Many corporations still struggle at this. CIO Magazine recently reported, "One Fortune 500 organization is on its fourth try at CRM because the sales force has rejected all previous attempts at sharing customer information" (Koch). Changing mindsets must be a top priority.

CRM systems continue to evolve. A January 2006 article in CIO Magazine posed the question, "Is CRM dead?" The author contends that perhaps one of the greatest shortcomings of CRM is that it never really was about directly helping customers. Rather, solutions were apparently sold to executives as a way to wring out inefficiency, force standardized processes, and gain better insight into the state of the business. Indeed, out-of-the-box products exist that can marginally increase an organization's effectiveness. But, what most CRM systems provided was a way to track customers, route and facilitate inbound communications, and report on the progress of various marketing, sales, or support activities.

But what all of these solutions generally did not address was the need to help organizations resolve customer problems, answer their questions faster or help customers solve their own problems. As a result, the industry is seeing a slow but steady shift in focus and investment from automating core internal front-office functions to streamlining edge processes like online customer support, product returns, or account management.

The next generation of CRM is trying to integrate more effectively with an organization's ERP initiatives to see how customer buying patterns affect manufacturing, human resources, finance, and long range planning. At the same time, there appears to be a renewed interest in areas like knowledge management, business intelligence, and what some are calling service resolution management (SRM). As defined by leaders in this sector like Knova Software, SRM aims to improve access to corporate knowledge by breaking down silos, simplifying the authoring and capturing of new content, and providing more consistent answers across all sales and service channels.

In this environment, the data warehouse is key; collecting, storing, and analyzing information effectively is critical to an organization's success at recreating that market of old where buyers and sellers meet, look at each other in the eye, and connect.

Supply Chain Management

Supply chain management (SCM) helps businesses better understand the activities that provide component level material for their finished product. For example, in the retail sector, wholesaler relationships are key, and in the automotive industry, part supplier relationships can affect the manufacturer's ability to build a car on time. By focusing on SCM, corporations can greatly improve operational efficiency. SCM seeks to help businesses control costs by uncovering the difficulties in their key relationships (e.g., with internal suppliers and external vendors).



The fundamental issue is the need to understand customer demand and align it with the supply side of the business. By doing this, organizations can reduce or even prevent costly overruns and/or product shortages.

SCM software achieves these outcomes in a variety of ways and a variety of implementations. Basically, SCM links suppliers to databases that show forecasts, current inventory, shipping, or logistics timeframes within the customer organization. By giving those suppliers such access, they can better meet their customers' demands. For example, the supplier can adjust shipping to ensure that their customers have the inventory necessary to meet their customers' needs. Suppliers can download forecasts into their own manufacturing systems to automate their internal processes as well.

Some in the industry categorize SCM into two fundamental components—supply chain planning (SCP) and supply chain execution (SCE). SCP is the software that produces the numbers for production, inventory, etc. based on input about customer sales and forecasts. SCE is the automated process that deals primarily with routing pieces of information to the appropriate systems, departments, and vendors. We could also link the SCM systems to the ERP systems to integrate invoicing. The variations are limitless. It all goes back to that interface into the data warehouse. That data, mined effectively, can produce information and knowledge to streamline the organization.

Cisco Systems Inc. is a good example of a company effectively using cutting edge SCM. In May 2001 Cisco experienced a well-publicized write-down of over \$2 billion. The SCM platforms were designed to handle growth pretty well, but when the bubble burst, Cisco had \$2 billion in inventory it could not move. There was a disconnect in the supply chain between Cisco, the contract manufacturers that assembled the Cisco product, and the component level providers that provided parts to the manufacturers. Lack of communication and information from the top of the supply chain to the bottom created forecast overlaps that fueled inflated forecasts and expectations. In the March 2002 issue of *Business 2.0*, Paul Kaihla documents some of the problems this has created.

Suppose Cisco projected sales of 10,000 units of a particular router. Each of the company's contract manufacturers would compete to fill the entire order, and to gain an edge. They often tried to lock up supplies of scarce components. Suppliers would be swamped with orders, but Cisco's supply-chain system couldn't show that the spike in demand represented overlapping orders. If, say, three manufacturers were competing to build those 10,000 routers, to chipmakers it looked like a sudden demand for 30,000 machines.

This problem snowballed, and when the technology market dried up, the results were devastating. The answer to the problem was to reevaluate the Cisco supply chain initiative, or eHub, to provide a macro view to the component level participants.

Before, if Celestica, Flextronics, and Solectron all came to Philips at the same time, and each said they wanted 10,000 of a certain chip, that was a total of 30,000 chips... Now, Philips can say, 'Hold on, I'm on eHub. I know that total aggregated demand is only 10,000.' (Kaihla)

Cisco is merely one of many industry examples that have increased the connectivity and the exposure of their supply chain among all chain participants. The eHub strategy is critical to its future success.



The Rubber Meets the Road

Over a three-year period, PRTM Consultants compared certain performance metrics of various “best in class” companies’ supply chains with supply chains of average companies in the same industry segments.

PRTM’s survey results in 2001 clearly show that the best-in-class companies have a critical advantage over their competition by more effectively managing their supply chain. As mentioned in the ERP and CRM sections, SCM is also about changing the way companies do business. Complex technology and software implications aside, a significant paradigm shift can occur in the way a business operates during implementation. Since SCM involves vendor relationships, this area involves many corporate cultures, which can create a more challenging implementation.

This survey was updated in 2003; newer data still indicates that mature companies that have deployed SCM can achieve improvements in reporting accuracy as well as order management, material acquisition, and inventory control (to read the complete survey, see http://www.prtm.com/pdf/signals_of_performance/supply_chain_management.4.1.pdf).

In the typical retail/supplier relationship, the retailer has traditionally been responsible for inventory management (including monitoring customer demand, inventory on hand, and placing orders to the supplier). Giving the suppliers access to the retailer’s inventory and sales activities shifts some of the responsibility for inventory management to the supplier. Why would a supplier take on that responsibility? To more efficiently manage its product manufacturing and to better monitor its supply chain.

Understanding SCM is not easy, and there are many challenges. Corporations must try to understand where the inefficiencies exist first before they try to fix them; that process alone can kill some implementations. Persuading employees to share information across the corporation is also difficult. Finally, organizations are being asked to change the way they do business. However, the benefits can clearly outweigh these challenges.

Service Providers and ERP, CRM, and SCM

For years, service providers have struggled to communicate at the higher level of the organization. They have struggled to link these Application Layer initiatives to their products that typically sit at Layers 1-3 of the traditional OSI Reference Model. Six ideas for making that link appear below.

1. Learn how to communicate differently. You don’t have to be an expert in any of these application sets to understand their overall importance to the organization. The ideas of integrating the various departments within an enterprise, getting close to the customer, and streamlining the supply chain are all very nebulous concepts. A cursory understanding of how these applications give teeth to these concepts is essential if you are to have any real conversations at the higher level. Read case studies, articles, and examples. If you work within a particular vertical, get the trade rags from that industry. Learn to meet customers on their terms.
2. Remember that connectivity is critical for these applications to be effective. The concepts of data warehousing and data mining take the need for connectivity to a whole new level. Where will the data be stored? Where are the collection points? Must we increase those collection



points beyond the existing plan? When are the systems updated? Batch? Near real-time? Real-time? How do you collect or distribute to outside organizations? How easy and cost-effective can your partners and suppliers connect to these applications? Is your extranet infrastructure private, or does it use the public Internet? Where are suppliers and partners located? How will future M&A activity impact the current plan? How scalable is the infrastructure? What about remote access to the systems? Has the organization done a feasibility study to see how additional traffic will impact the existing network? These are a sample of the questions that can revolve around deploying these applications. Your conversations will never get to these if you do not thoroughly understand the organization's goals in these areas.

3. Learn the value of Internet connectivity beyond the public website and email. Most of the time, separate private networks are set up for the reliability, inherent security, and performance profiles they bring to these strategic application sets. Given that many of these systems are being developed with web interfaces, how do transport products like VPNs play into the mix? Will they be accessed via secure websites that utilize SSL? What performance parameters must be considered within the server architecture? Does the organization have an Internet strategy, and can these applications play into that? Can a VPN mitigate the need for pervasive connectivity and also address the privacy and security required by the information in these applications?
4. Recognize that new opportunities related to a new, third network—the storage network—will be where money is spent in 2006. All this data needs to be stored somewhere. In the past, data centers were the domain of the customers. The natural disasters of 2005 (the Indonesian tsunami and Hurricane Katrina especially) together with a continuing rise in data being compromised is resulting in a new, hard look at where all this data is stored and managed. According to the 2005 Global State of Information Security Report, published September 15, 2005 by CIO Magazine and PricewaterhouseCoopers, business continuance is the number one action item for 2006. Now with bandwidth becoming a commodity, storage costs decreasing, and new applications requiring multiple access to information, storage networks are expected to grow at 11 percent CAGR through 2007.
5. Understand the stakes of the game. Collectively, corporations are spending in the billions of dollars for these implementations. How heavily is that investment protected in the case of a catastrophe? Are there disaster recovery services that you can offer to help protect these initiatives? Remember, the key to all of these is an effective data warehouse. That data may be the single most important asset to whole project. Internet data center services and other outsourcing functions can be a value-added service when corporations consider the investment.
6. Help your customer focus on its business. Management services hired to monitor the health of the customer's network supporting these applications can take some of the headache away and bring the TCO down. Gartner estimates that companies who outsource can lower the TCO by an average of 34 percent. Many organizations will suffer a performance drop when these applications are implemented because of the change in job function among all who interface with the systems. Ensure that the customer's network performance is not a contributing factor. Management and monitoring services can greatly contribute to achieving this goal.
7. Positioning breadth can be as valuable as positioning depth. Some of these applications will have a greater impact on certain departments than others. While the IT organization is responsible for the details, other areas might provide strategic direction. For instance, meet



with Sales and Marketing to talk about CRM initiatives. Meet with manufacturing to discuss ERP and SCM. Also, some corporations will have entire departments dedicated to these initiatives, so do not just think deep, think wide. The more you know about the business, the more prepared you will be for those higher-level conversations.

Conclusion

James C. Collins and Jerry I. Porras in their best-selling book *Built to Last* said:

Intentions are fine and good, but it is the translation of those intentions into concrete items—mechanisms with teeth—that can make the difference between becoming a visionary company or forever remaining a wannabe.

Enterprises have long made grandiose statements about getting closer to their customers and streamlining operations. The ERP, CRM, and SCM applications and the organizations implementing them are at least in part, “bringing teeth” to those lofty intentions. It is not an easy process, though. In fact, the highly publicized failures of these initiatives have in some minds tainted these applications and their possible benefits. However, more and more organizations are moving forward with these initiatives, and the successful organizations will benefit from higher margins, better customer relations, and improved back office operations.

Technology for technology’s sake is long gone. Organizations are only interested in deploying tools and applications that have a measurable impact on customer relations, supplier relations, and internal efficiency; this paper outlines three such tools. The market at large views the product sets that comprise service provider portfolios today as simply transport, not as inherently strategic. To change this, providers must communicate on the customers’ terms. Providers must be able to converse with customers about strategic issues and show the link to their own product sets; then, and only then, will they be able to truly position at the higher levels of an organization and be viewed as the strategic solutions provider.

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About the Author

Mark Steinberg has spent more than 20 years in the business of technology. The telecommunications industry has been experiencing dramatic changes over the past three decades. Mark often provides consulting services regarding the strategic implications of technological change.

In addition to teaching the Hill Associates core curricula, he facilitates interactive discussions with a variety of audience types. These have included middle and senior management of Hill Associates' client companies and training partners. Over the past several years, he has used his expertise in communications and business strategy to create and deliver courses that focus on the issues facing companies involved in the communications marketplace. Business leaders rely on Mark's insights as they determine their business and technology strategies. His knowledge of convergence, both voice and data and wireline and wireless, has allowed him to create a variety of programs that address these business strategies. His engagements have been with companies such as CANTV, Telstra, AT&T, Qwest, Global Crossing, BellSouth, Verizon, Cingular, Ernst & Young, and Sprint—in the U.S., South America, Europe, Asia, and Australia.

A dynamic and energetic presenter with a broad perspective on technology and business, Mark is capable of dealing with technology and learning challenges in the classroom. Mark often combines real world analogies and humor to help explain the technical details. He has developed educational programs for technical and non-technical audiences that range from five days to over sixty days. A Senior Member of the Technical Staff, Mark has been with Hill Associates since 1994.

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