The Business Value of Effective

Infrastructure Management

By Jim Metzler

Kubernan
Guiding Innovation

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Introduction: The Value of IT

During the dot com era, few Information Technology (IT) organizations were under much pressure to show the business value that they provided. During that period, it was implicit in the thinking of most companies that IT provided immeasurable value since it would allow them to quickly and easily enable fundamental business transformations.

Given that the dot com era belief about the incredible business value of IT is now widely seen as being simplistic, it is not surprising that following the dot com implosion equally simplistic claims that IT affords no strategic business value began to appear. In both an article in the Harvard Business Review [1] as well as a subsequent book, Nicolas Carr presented just that view. In the article, Carr stated, "IT has become a commodity. Affordable and accessible to everyone, it no longer offers strategic value to anyone." He makes the analogy between IT and electricity and infers that companies should manage IT the same way that they manage electricity. Carr states, "Now that IT is ubiquitous, however, we must focus on its risks more than its potential strategic advantages."

Carr's writings have had the affect of driving a serious ongoing discussion of the business value of IT. Emerging from that discussion is a consensus relative to the business value of IT. One part of the consensus is that a number of Carr's assertions have some validity. For example, there is no doubt that a number of components of the IT infrastructure (i.e., Switched Ethernet Local Area Networks and Frame Relay Wide Area Networks) do indeed resemble a utility and need to be operated and managed as such.

Another part of the emerging consensus is that Carr overlooked some very fundamental concepts. What he got right is that IT unto itself does not matter. However, what he missed is that just because a lot of the components of information technology are a commodity that does not mean that every IT organization is equally adept at planning and managing information technology. Also, and perhaps more important, while technology itself does not matter, what a company does with technology matters greatly.

The goal of this white paper is to demonstrate the business value of effective infrastructure management. To achieve that goal, this white paper will discuss the chal-

1 "IT Doesn't Matter", Nicholas G. Carr, Harvard Business Review, May 2003

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lenges associated with application management as well as the role of the IT infrastructure. Referring back to the Nicolas Carr discussion, it is clear that network management unto itself does not provide business value. Network management, however, enables an effective IT infrastructure and acceptable application performance, both of which are required in order for an organization to be able to achieve its key business goals. Put in this context, network management provides significant business value.

Methodology

As part of the research that was done to create this white paper, Ashton, Metzler & Associates interviewed three IT organizations. One of these interviews was with Michel Danon the CIO of two of the divisions of the Danaher Corporation. The other two interviews were with the Vice President of operations for a financial services organization and the Vice President of global network operations for a company that provides outsourced customer support services. These two interviewees will be referred to in this white paper as The Financial Services VP and The Support Services VP. The companies that the interviewees work for will be referred to as The Financial Services Company and The Support Services Company.

In addition, Kubernan[2] surveyed hundreds of IT professionals on topics that included business process change, application management, and the role of the IT infrastructure. The pertinent results of these surveys will also be included in this white paper.

Business Agility

After 9/11 the primary goal of most businesses was to reduce cost. Reducing cost is still an important business goal. However, research recently conducted by Kubernan indicates that for most organizations a variety of other goals are as important as cost reduction. One of these goals is the requirement to become an agile organization. An agile organization is an organization that can respond in a *real time enough* fashion to situations that impact the health and well being of the organization and its stakeholders. The phrase *real time enough* refers to the fact that the required speed of the organization's response depends on the environment in which the organization functions.

For example, the University of South Florida (USF) was recently feeling growing pressure from the University of Phoenix which was attracting an increasing number of Florida students to its distance learning based degree programs. To respond to this competitive pressure, USF went through a process that took multiple semesters and that resulted in USF's increasing its own use of distance learning. In the case of USF, real time enough can be as long as two or three semesters.

Another example is Wal-Mart. At the end of every day Wal-Mart knows what is selling in each of its stores. If Wal-Mart notices that a certain item is selling unusually well in one or more of its stores, it can readjust its supply chain within a couple of days to ship more of that item to the appropriate stores. In the case of Wal-Mart, real time enough is a matter of a couple of days.

A final example is the U.S. Department of Homeland security, which is chartered to respond to threatened or actual domestic terrorist attacks, major disasters and other emergencies. Given the short lead-time that is often associated with these events, to the U.S. Department of Homeland security, real time enough can be a matter of minutes or hours.

In order to become more agile, organizations need to modify their business processes. This is typically done in conjunction with deploying some new application and the supporting IT infrastructure. However, whether or not the organization becomes any more agile depends on the ability of the IT organization to manage the technologies that are intended to enable the business process change.

To put this in perspective, consider the situation facing healthcare providers such as hospitals and clinics. Numerous reports have documented that medical errors in U.S. hospitals and clinics are responsible for tens of thousands of needless deaths each year. As a result, improving the

2 Kubernan is a consulting and analyst joint venture of Jim Metzler and Steven Taylor

quality of patient care is the top priority for most healthcare providers.

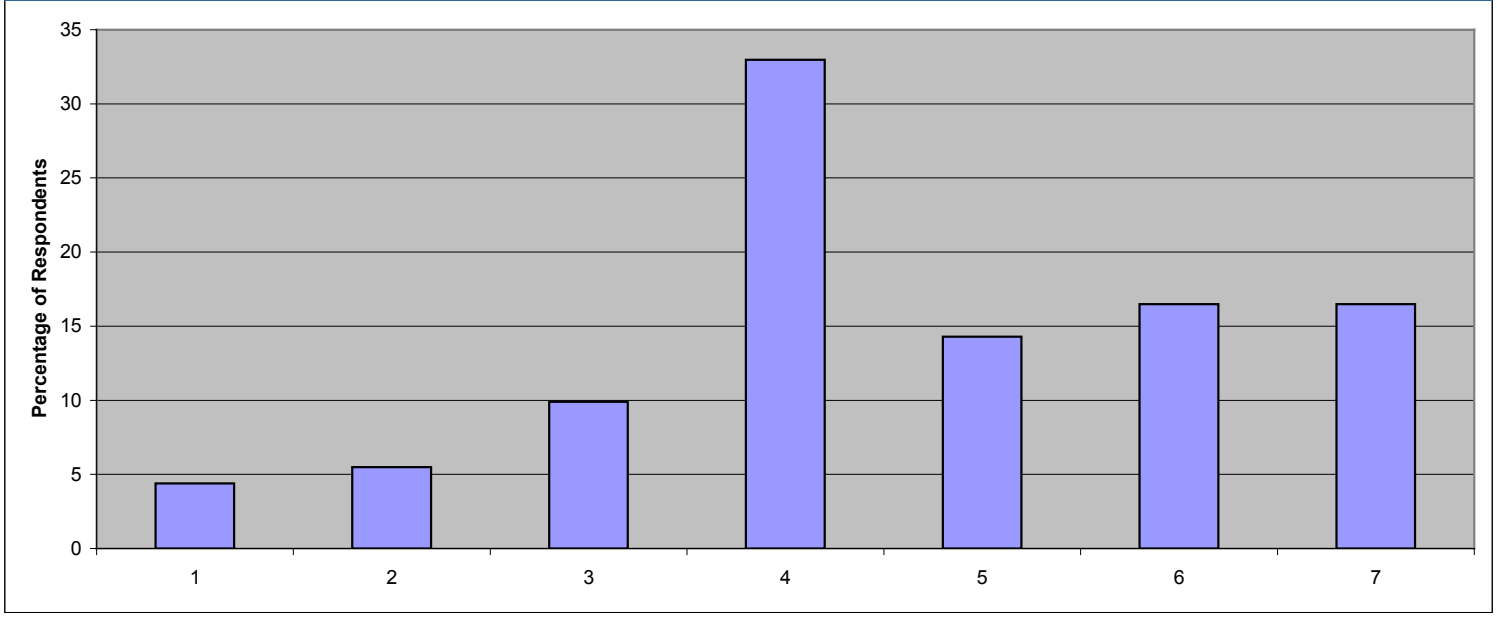
One of the ways that healthcare providers are responding to this challenge is by integrating computer-based practitioner order entry (CPOE) systems into their existing processes. The goal of CPOE systems is to have healthcare professionals enter orders into a wireless device and be alerted to possible adverse consequences of a drug or treatment.

In order to integrate CPOE systems into their processes, the healthcare provider must have a robust WiFi infrastructure as well as the ability to provide sophisticated management of that infrastructure. The requirement for sophisticated infrastructure management comes from many sources. For example, as will be discussed in a subsequent section of this white paper, the healthcare provider must perform pre-deployment as well as ongoing network monitoring and analysis to ensure sufficient wireless coverage and performance. In addition, all healthcare providers are required to conform to the Health Insurance Portability and Accountability Act (HIPAA), which requires them to ensure the confidentiality of patient information. This requirement means that healthcare providers must ensure that their wireless LAN infrastructure does not have security vulnerabilities such as the presence of rogue access points.

As previously noted, becoming increasingly agile is of key importance to virtually all organizations and that becoming more agile requires companies to modify their business processes. In order to quantify the extent to which organizations are changing their business processes, a recent Kubernan survey asked the survey respondents to indicate the amount of change that their company was making to their key business processes. The question used a seven point scale, where an answer of "1" meant no change. An answer of "4" meant a moderate amount of change. An answer of "7" meant a very significant amount of change. The answers to that question are depicted in Figure 1.

As can be seen in Figure 1, eighty percent of organizations are making at least a moderate amount of change to their key business processes. In the majority of cases, organizations are focusing on making changes to revenue facing processes such as sales and customer service.

Figure 1: Amount of Change to Business Processes



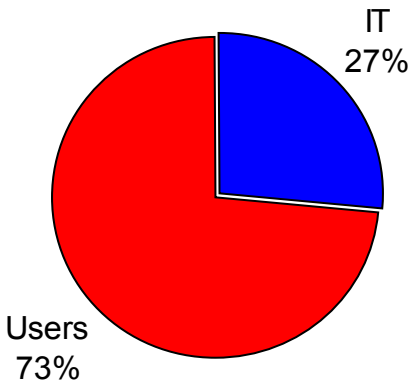
Managing Application Performance

As noted in the preceding section, one of the primary ways that organizations are becoming more agile is by implementing new applications, such as CPOE systems. Due to a number of factors[3], ensuring the acceptable performance of these applications is becoming increasingly difficult. These factors include the:

- Centralization of IT resources
- Decentralization of employees
- Increasingly distributed nature of applications
- Deployment of chatty protocols such as CIFS (Common Internet File System), dense protocols such as XML (eXtensible Markup Language), and computationally complex protocols such as SSL (Secure Sockets Layer)

In a recent survey, Kubernan asked, "If the performance of one of your company's key applications is beginning to degrade, who is the most likely to notice it first – the IT organization or the end user?" Their answers to that question are contained in Figure 2.

Figure 2: Who First Detects Application Degradation



As shown in Figure 2, roughly three quarters of the survey respondents indicated application degradation is noticed first by the end user. IT organizations will not be able to effectively support key business processes until they develop the management capability to identify and resolve application issues before they impact the end user.

Another question that Kubernan recently posed to hundreds of IT professionals was, "When dealing with issues such as application access, performance degradation and/or latency issues, which components of IT have you found to be the greatest source of issues?" As part of that question, a network application was defined to be an application such as DNS (Domain Name System) or DHCP (Dynamic Host Configuration Protocol). A non-network application was defined to be an application such as SAP or Oracle Financials. The phrase *shared equally* was defined to mean that more that one component of IT was responsible for the issue.

The answers of the survey respondents to that question are depicted in Figure 3. One conclusion that can be drawn from Figure 3 is that while the network is the single most likely cause of application performance issues, that each component of IT can have a negative impact on application performance.

The Role of the IT Infrastructure

One of the ways that Danaher achieves business agility is through acquisitions. Danon noted that in order to maximize the value of these acquisitions, the Danaher IT organization needs to be able to quickly extend the IT infrastructure and the relevant core applications and business processes to the acquired company.

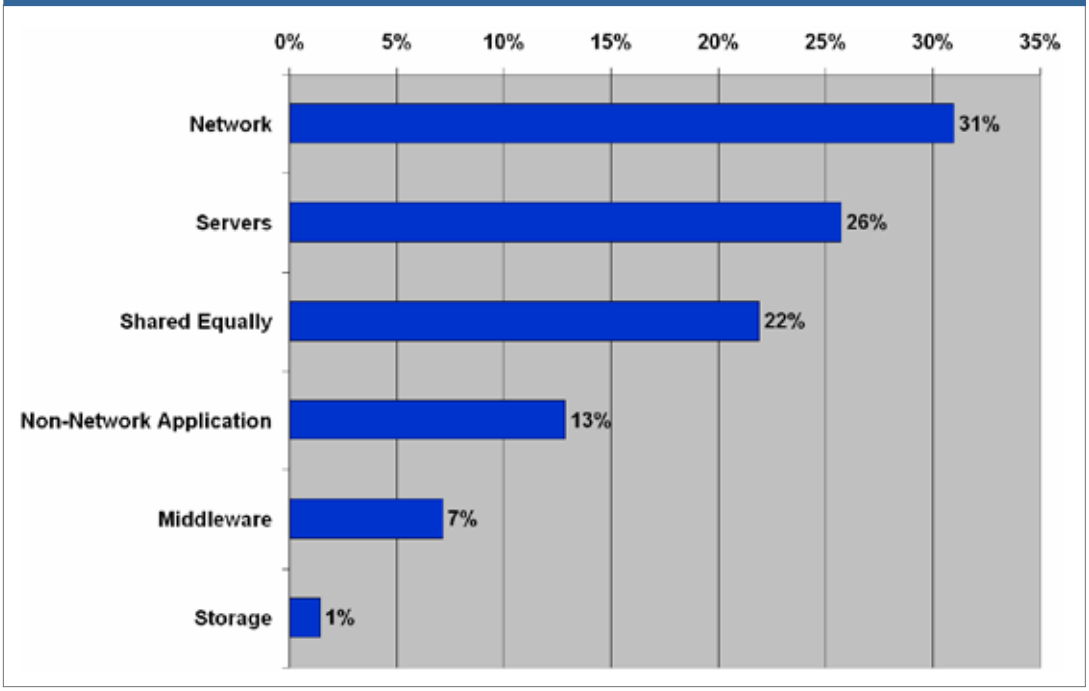
The Support Services VP pointed out that his company is in the business of enabling companies to re-engineer their business processes by providing outsourced customer support services. He stated that during the sales process, his company has to convince perspective clients that they have the technology that will enable them to provide excellent customer service to the client's clients. An example of this that resonates with most clients is that his company has implemented technology that enables them to intelligently route a call from a customer to an agent based on a variety of factors including the cost to service the call in a

3 **The Handbook of Application Delivery, Chapter 4, www.kubernan.com**

particular country, as well as the agent's skill set, availability, and native language.

In order to better understand the overall linkage between the IT infrastructure and business agility, Kubernan asked a set of survey respondents to indicate how committed their company was to leveraging technology to enhance key business processes. The question used a seven point scale, where an answer of "1" meant no commitment. An answer of "4" meant a moderate amount commitment. An answer of "7" meant total commitment. The answers to that question are depicted in Figure 4.

Figure 3: Sources of Application Degradation



As seen in Figure 4, approximately 90% of companies have at least a moderate commitment to leveraging technology to enhance business processes.

When companies redesign business processes, they are typically looking to accomplish at least one of the following goals:

- Reduce the time that the process takes
- Reduce the cost of the process
- Increase the quality of the process

As will be discussed in the next section, Danaher deployed wireless LANs in order to reduce the time associated with some of their key manufacturing processes.

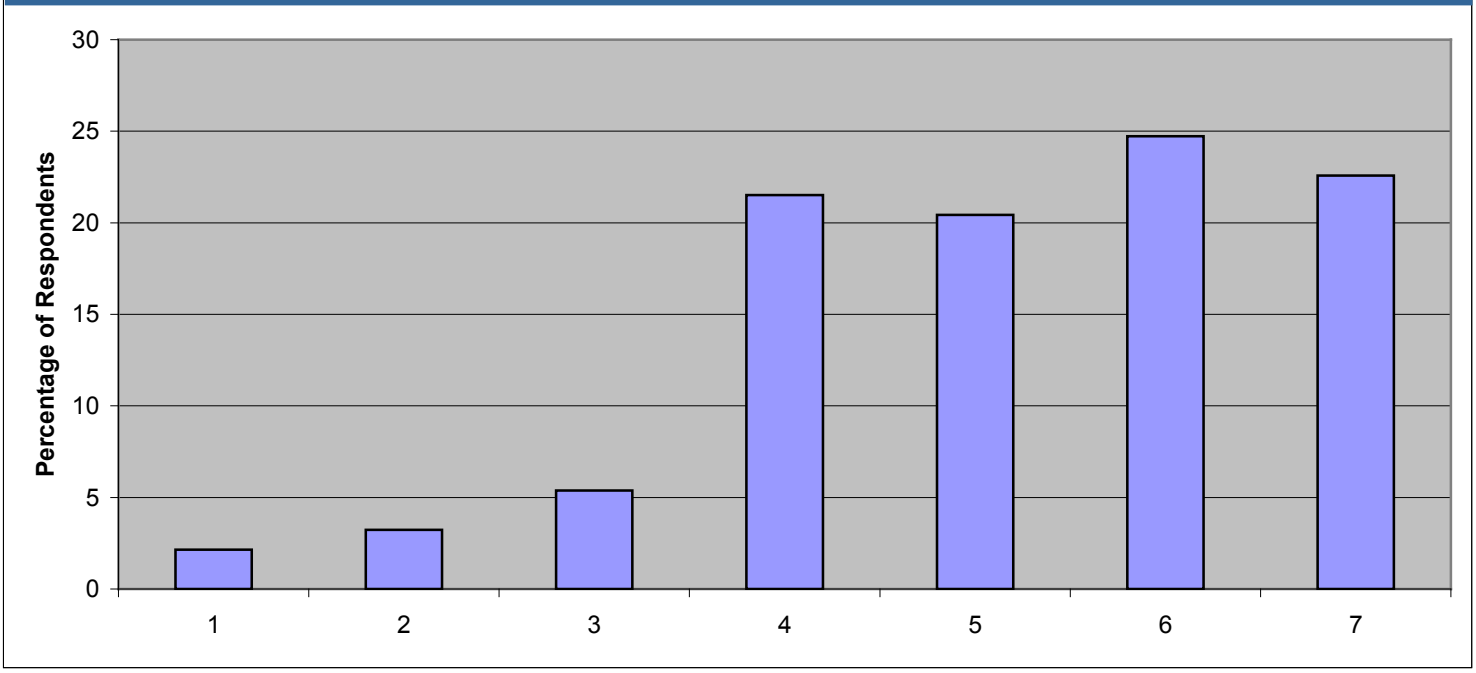
The Role of IT Infrastructure Management

This section will discuss the management of some of the key components of IT.

Wireless LANs (WLANs)

An earlier section of this white paper discussed the use of WLANs by healthcare providers to support CPOE systems. As was mentioned in the preceding section, Danaher provides another example of the use of WLANs to enable more flexible business processes. The Danaher factories are designed around cells, where the actual manufacturing occurs. Over time as the products change, the cells need to change – to either grow, shrink or combine with other cells. Danon stated that historically it has taken up to a week for the IT function to be able to reconfigure the network to enable the cells to change. Now that Danaher has moved to wireless communications in their factories as a standard of work, this delay has been eliminated.

Figure 4: Commitment to Leverage IT



Part of the challenge that WLANs present to IT organizations is the possibility of rogue Access Points (APs). The phrase *rogue AP* refers to an access point that was not approved by the IT organization. Rogue APs create a security vulnerability. In addition, if there is a sanctioned WLAN in place, a rogue AP can cause interference and reduce the performance of the sanctioned WLAN. To control unsanctioned WLANs, IT organizations need tools to detect and locate rogue users and APs.

Another challenge associated with WLANs is the need to perform per-deployment planning in order to ensure acceptable performance. For example, one of the factors that impacts WLAN performance is the distance between the end user and the AP. Another factor involves the signal loss that is caused by the attenuation of various objects such as building's walls, windows and doors. As signal strength decreases, so does the WLAN capacity.

Wide Area Networks (WANs)

There are many important aspects of WAN management. One aspect is baselining normal WAN usage patterns and using this information to identify inappropriate traffic. This is an important task because in many companies as much as half of the traffic that transits the WAN is recreational in nature. This includes music downloads, Internet radio, YouTube, and gaming. Based on the company's policy for what is acceptable usage of IT resources, it is important that IT organizations identify this traffic and either eliminate it or control how much bandwidth it consumes. In addition to identifying inappropriate traffic, the information that results from baselining a company's WAN's usage can be used for other key WAN management tasks such as capacity planning and budget planning.

Another important aspect of WAN management is effective troubleshooting. The Financial Services VP stated that when he joined the company six years ago, the role of network management was limited to just the traditional troubleshooting of faults. Although their primary concern was whether their circuits were up or down, the company's IT organization did have some additional management tools that were more proactive in nature. The Financial Services VP referred to these tools as *shelfware*. By that he meant that the IT organization had acquired the tools, but had never installed them. The company's senior man-

agement was reluctant to approve the acquisition of any new management tools until the IT organization showed the value of the tools they had already acquired.

The Financial Services VP also pointed out that six years ago that the general assumption within the company was that if an application was not performing well, that the network was the culprit. As a result, the network management organization spent most of their time proving that the network was not at fault. To overcome this perception of the network, he installed some of the shelfware and began to use it to show the true causes of application degradation. Through this process, he also built up creditability for the network management organization.

Applications Performance Management

Most IT organizations do not directly measure application performance. Most IT organizations, however, do monitor WAN utilization. The implicit assumption is that if the WAN is performing well that the application is performing well. That assumption is often, but not always true. For example, assume that a WAN link that goes from the east coast of the US to the West coast of the US has 100 ms of roundtrip delay, virtually no jitter and no packet loss. Further assume that one of the applications that transits this link uses a chatty protocol[4] and that it takes 200 round trips to complete a transaction. As a result, each transaction will experience at least 20 seconds of delay even though the WAN is exhibiting excellent performance. The reality is that poor WAN performance is the cause of degraded application performance in only a minority of instances. As such, managing WAN performance is necessary but not sufficient. IT organizations need to also be able to directly monitor application response time as seen by the end user.

The Financial Services VP stated that if the real time transaction processing applications that his company has deployed to its branch offices are not working that it has a significant impact on the company's ability to do business. For example, if these applications are not working it makes it very difficult to manage fraud. The Financial Services VP also stated that his organization has a mandate to identify problems before they impact end users and so they have been working to become more proactive relative to managing application performance. As a result of these efforts, they have gone from where it was always the end user that first noticed application degradation to where the IT organization now sometimes identifies application degradation prior to it impacting the end user. Their goal is to continue to increase the probability that IT notices application degradation prior to it being noticed by the end user.

Danon said that one of the goals of his organization is to not have a wide variation in the experience that users have accessing an application based on the location of the user; i.e., working from home vs. working from a Danaher site. Another goal of the organization is to ensure that all of the IT disciplines are working collectively to solve any application performance issues. He stated that he does not care if the individual components of the system are all working fine if the company cannot book business and ship products.

One of the ways that Danon achieves these goals is by creating SLAs (Service Level Agreements) that are aligned with the importance of the application. For example, the SLAs associated with ERP (Enterprise Resource Planning) and CRM (Customer Relationship Management) are more stringent than the SLA that is associated with Web surfing. Another way that Danon achieves these goals is by being able to do a root cause analysis of the application performance issues to identify the source of the problem; i.e., LAN, WAN, server.

Voice over IP (VoIP)

VoIP is an example of an application that demands a network that has very low latency, jitter and packet loss. As a result, one of the challenges associated with deploying VoIP is doing an assessment of the IT infrastructure prior to deployment to ensure that the infrastructure can support those demands. Another challenge is to be able to perform ongoing monitoring to ensure that the quality of the voice calls remains at an acceptable level.

4 A Chatty protocol requires tens or possibly hundreds of round trips for a single transaction.

Danon stated that they have been using VoIP for two years. Similar to the way that they have more stringent SLAs for certain applications, Danon stated that they provide a higher level of quality for voice calls that are customer facing than for calls that are not.

Given that the cost of international voice calls is important to both The Support Services Company and their customers, the company was an early adopter not only of VoIP, but also of using VoIP in their contact centers. Prior to deploying VoIP, the company's IT organization simulated the affect of adding voice traffic onto the network. The IT organization continued to use those simulation tools to manage the quality of their initial deployment of VoIP.

Because of the nature of their business, The Support Services Company's customers are very interested in knowing that the quality of the voice calling is acceptable. However, the tools that The Support Services Company used to plan and manage its initial implementation of VoIP could not scale to manage the volume of VoIP calls that the company now supports. As a result, The Support Services Company implemented new systems to monitor and manage VoIP quality. These systems have been so successful that part of the collateral that the company's sales force leaves with the potential customer is information on the tools that they use to manage and monitor VoIP quality.

Summary and Call to Action

In most situations, network management does not get the respect that it deserves. That lack of respect typically comes from the fact that network management organizations have not successfully marketed the value of network management.

The task of *marketing the value of network management* has three components. One of those tasks is the identification of opportunities where network management can add value. Identifying those opportunities is easier for IT organizations if, like The Support Services Company, the products and services that the company sells rely directly on the IT infrastructure. In those cases, the network management organization should continually look for ways to enable the company to differentiate their products and services in the marketplace.

Identifying those opportunities is more difficult for the majority of IT organizations because typically the relationship between a company's products and services and the IT infrastructure is not as direct as it is in the case of The Support Services Company. One way that the network management organization can successfully identify opportunities in those types of situations is to focus on some specific goal that the company is trying to accomplish. An example of such a goal is identifying and resolving application performance issues before they impact the end user. As mentioned in this white paper, that is a goal for both Danaher and The Financial Services Company. Another goal that IT organizations can focus on is the movement to re-engineer business processes. As Danaher demonstrated when it changed its manufacturing processes, business process change typically requires new IT infrastructure.

The next component of *marketing the value of network management* involves implementing the necessary management functionality. This usually involves the deployment of new tools and in many cases, of new processes. The third component of *marketing the value of network management* involves making the appropriate people aware of the business contribution made by network management. This can be done through a number of techniques. For example, if the company has a steering committee that governs the IT function, this committee should be regularly apprised of the contribution of the network management function. If that is not the case, another option is to send a quarterly IT newsletter to the company's business and functional managers. In either case, the contribution of the network management organization needs to be highlighted and put in a business context.