The root cause of IT complexity in business is easily identifiable, and its elimination from IT systems, including those concerning IP telephony, is highly plausible. Yet, extenuating factors among leading technology providers remain an obstacle.
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1. The cost of IT complexity

A much-discussed white paper, “The IT Complexity Crisis: Danger & Opportunity,” set off alarm bells when it posited that the cost of IT failures tops more than $1 trillion annually in the U.S. alone.

IT failure is a worldwide phenomenon, wasting huge sums of money that could otherwise be channeled into economic growth. More than half of IT projects were “at risk,” the 2009 report said. Unfortunately, in the years since the report’s publication, nothing much has changed, said Roger Sessions, the report’s author, who is CTO of ObjectWatch and an expert in IT complexity analytics.

“I’d like to say that the paper has made a big difference in how IT is being developed, but unfortunately, we still have not successfully addressed this issue,” Sessions said in an interview earlier this year.

Sessions, then and now, paints an ominous picture, saying that although he identified poor internal communications between business and IT as a potential culprit, he did not see it as the primary driver in the rise of such failures. He believes that there is no real evidence of such a dramatic worsening of communication between these two bodies in the last three years.

On the contrary, in qualitative research ShoreTel has conducted and in many articles in the business and IT press, there is good reason to believe that the IT/business relationship has greatly matured, with IT professionals more attuned to their strategic role and more aligned to the business goals than ever.

No. There is one major culprit leading us to a potential meltdown in IT, according to Sessions:

“The almost certain culprit is complexity. Actually, complexity is indirectly related to functionality, in that a 25 percent increase in functionality increases complexity by 100 percent (Glass’s Law). However complexity is even more impacted by system organization. So complexity goes up as functionality increases, goes down as functionality is partitioned, but then goes up again as connections are made between systems. The overall complexity of a system is a delicate balance between all three of these factors.”
His analysis points out that complexity has a linear relationship with system failure, concluding that the more complex a system, the more difficult it is to work with (and the more difficult it is, therefore, to leverage its potential capabilities). Logically, complexity drives up the cost for a business to operate such a system. Presumably, this cost is not only attributed to IT failure, but to the resources required to support the system’s complexity, as well as to the service and support provided by the originator of the complex system—the vendor.

However, Sessions challenges Glass’ law, pointing out the absence of one important variable: organization of the functionality. He submits that there are many examples of highly functional systems that are organized more simply than others with less functionality. This premise, he believes, correlates to the day-to-day experience of IT professionals: i.e., that the level of complexity is driven upwards by how the functionality or functions are organized in the system.

Rather than seeing this as a pessimistic scenario, the author draws attention to what he sees as the good news. His optimism is palpable: he posits that our ability to identify the culprit shows that addressing the problem is equally possible. Once we can rise to the challenge and remove complexity from systems, he sees a number of benefits, both in terms of financial reward and in how we work:

- Reducing procurement complexity
- Helping small and midsize companies compete on more projects
- Increasing business agility
- Improving collaboration in the workplace
- Delivering IT systems on time and within business expectations

2. IT complexity’s strong hold on businesses

In his area of expertise, Sessions’ remedy is a software design process called Simple Iterative Partitions (SIP), which partitions business functions into subsystems to make the whole system as simple and reliable as possible and aligns more closely to business goals.

Since the root cause of the problem is now identified, it follows that taking this type of philosophy forward and applying it to build simpler systems would lead us out of the rut. Simpler systems that are better aligned with business objectives could, in fact, bring a boon to the world economy. When it comes to analyzing why businesses and the industry have not had this epiphany and acted on it, Sessions’ is much less forthcoming. In the white paper, he admits to being uncomfortable pointing to what might be perpetuating IT complexity. However, as industry reports and analyses tend to indicate,
The problem stems chiefly from how business operates and how it approaches IT in the first place. The
three factors he cites as most likely to prevent the simplification of systems are purely internal:

1. Fear of adopting new processes—risk adversity in general.
2. Fear of managing multiple vendors—the reluctance to manage multiple simpler systems, in favor of
   managing a more complex system from one traditional vendor.
3. Political realities within an organization—lack of cooperation across business groups and strained
   communication between business management and IT.

These three reasons might be absolutely valid. However, we believe that the industry—providers and
manufacturers of technology—must bear some of the blame. Research for viewpoints, articles, or
academic theses reveals a dearth of information. This lack of commentary doesn’t ring true for the
simple reason that the systems that lead to complexity were built by providers in the first place.

So what does this mean? Why is the cause of complexity so identifiable, and yet the action to eliminate
is not as forthcoming?

We’re at a watershed time in the development of business technology, with a handful of leading
providers poised for overall market dominance. Each leader is making its claim coming from its area
of particular expertise—networking, systems, software, search or telecommunications. Winner-takes-
all is a great motivator. All the pieces of the technological landscape (communications, collaboration,
information, business processes, mobility, cloud computing) are merging, fulfilling a long-promised vision
and benefit to business as a whole.

The investment of these leading players has been immense: they have continued to win market share,
evolving their solutions over time and acquiring multiple technologies. In many ways, each has relied
primarily on a kind of tunnel vision to stay focused on protecting their own investments, while paying
little attention to many of Sessions’ concerns or to what he depicts as the cause of IT complexity. Few
have had the will or the wherewithal to start over and put their solutions on a simpler development path.
Many of them continue to re-engineer their legacy technologies, merely adapting them to provide new
capabilities. This approach of cobbling together technology—either from their portfolios or through
acquisitions—makes IT complexity inevitable. The entire culture of these providers has been shaped by
the very effort that evolving their solutions requires.

The cost of complexity for a business is driven further upward by the amount of resources it has to put
behind supporting complex systems. This is on top of the billions of dollars organizations spend each
year on expensive service and support programs that go into the pockets of the providers.
The service and support side of IT has grown exponentially with the evolution of technology. Given the typical application’s mission-critical nature, an established pattern has evolved where selling a system goes hand in hand with service and support contracts. Conspiracy theories aside, without intrinsic complexity the scale of revenue earned from service and support would diminish considerably. Inherent IT complexity has created its own fertile economy where every leading player’s earnings are bolstered by their service and support activities. And unlike the positive financial effect that reducing IT failures would have on the economy, the revenue generated by services from the provider is not distributed as equally.

IT complexity has become the accepted and unquestioned reality, with analysts and the industry feeding a general acquiescence and tolerance. The only solution regularly proposed within the industry is the development of best practices for managing the complexity it has created. This acceptance has also given rise to battalions of IT consultants who have carved out a niche in one area or another—all of whom could credit IT complexity for their existence.

Perhaps Sessions was uncomfortable in exploring the reasons why IT complexity is not being addressed. However, he speculates that the widespread customer fear of managing multiple vendors, while not an inciting factor, is an exacerbating one. This primary—or primal—concern would explain the power of leading technology providers to create a kind of codependency with their customers. In our focus group research, we often hear the refrain: you don’t get fired for buying IBM, or more recently, you don’t get fired for buying Cisco.

These big IT providers show no sign of re-evaluating the current dilemma, or of offering solutions for how to get out from under it. Although they may acknowledge IT complexity, they may not take responsibility for it, as seen in the Web site copy for HP’s enterprise services:

“No one planned for things to get this bad. But regardless of how we got here, the fact remains that the complexities we face are not going away [emphasis added]. That’s why HP has commissioned a report to provide you with insights into managing this complexity.”

This notion, rather—that it is categorically easier and less costly to manage one vendor rather than to manage three vendors who might have much simpler solutions—is often a cornerstone of the sales process. Recently a soon-to-be ShoreTel customer, while evaluating various offerings, was told by Cisco that they could not guarantee the efficacy of their telephony solution because the underlying network was not Cisco’s equipment, but that of another networking manufacturer. Additional examples reveal the preference of mainstream providers to create a world unto their own. As they get bigger, they pay even less attention to the potential technology realities of the marketplace, seeing only an ecosystem based exclusively on their solutions. They become increasingly driven by the aspiration of creating a proprietary landscape.
The Case Against Complexity

Such conditioning runs deep in the psyche of the business technology industry. In a research paper published by Forrester Research¹ about reducing the cost of IT complexity, conclusions can be taken in different ways depending on perspective. Regardless, the remedy, as the paper puts it, rests on three approaches:

1. Standardization: making assets and processes look the same.
2. Centrally located resources: equipment, applications, staff and other appropriate resources are moved together.
3. Eliminating redundant capabilities: those present in hardware, software, and duplicate staff functions.

These all seem valid approaches, yet again, they don’t address the crux of the matter – that is, the complexity itself. Nowhere is the fundamental simplification of systems raised. The first approach seems to argue for proprietary approaches (given the tendency to look at standardization as a function of the number of providers in an environment, rather than the true simplification of systems). As Sessions points out, there is not a linear relationship between the number of providers managed and IT complexity. These approaches are tied to a scenario where complexity is accepted as simply being the price to pay for essential technologies; acceptance of this fact is perceived to somehow minimize the damage.

But the level of financial loss from IT failure calculated by Sessions cannot be so lightly minimized. Other organizations, such as the Standish Group, show similarly huge dollar figures of loss, even though the actual calculations are based on different variables. We could argue the accuracy of the numbers, but not the magnitude.

In fact, the notion that the woes of IT complexity tie back to the status quo is not a new one. In 2003 McKinsey was publishing reports with quasi-controversial headlines such as: “Fight complexity in IT: to simplify a company’s information systems, look beyond them.”² However difficult simplicity is to achieve, it has to start somewhere. Unless this status quo is going to persist, change is more likely to come from new players entering or emerging in the market with fresh thinking. The establishment might absorb and integrate some of these innovations (or even thwart their progress), while other players might emerge to become the new guard.
3. The anti-complexity movement

There are a number of examples of these new guard players in the industry. They can be seen as a group of emerging challengers focused on bringing an excellence and simplification to various categories in the technology landscape. Some of these you will be familiar with—Riverbed, NetApps, Netscreen, Juniper—while others are on the cusp of making their solutions more broadly known. What they share in common is a determination of focus. Each saw an opportunity in a given area within the status quo, and went on to rethink the entire approach, unconstrained by legacy solutions or by other interests to protect. In most cases, the results have been significant improvements in the particular area, leapfrogging the category leader from a technological and cost of ownership standpoint.

However, they face an enormous uphill battle, not from a technological perspective, per se, but from a branding and marketing slant. The leading players have very deep pockets to reinforce their brand equity and strengthen their hold on codependency with their customers. Nevertheless, this new guard has achieved the hardest part of the challenge to design elegant and simple solutions through their commitment.

4. The solution is simplicity

“Once we understand how complex some of our systems are, we understand why they have such high failure rates. We are not good at designing highly complex systems. That is the bad news. But we are very good at architecting simple systems. So all we need is a process for making the systems simple in the first place. And this is good news, because complexity is a solvable problem. The solution is simplicity.”

- Roger Sessions,
  “The IT Complexity Crisis”

This “process for making the systems simple” eludes many of the major vendors because such a process requires more than just a commitment to simplicity in all its dimensions (systems architecture, user interfaces, documentation, service and support). Just as critically, it requires building from a starting point that represents a true degree-zero, and not merely an attempt to rein in or reverse engineer an existing complex system.

Independent of their interest (sincere or not) in mastering complexity, for most big IT providers such a starting point is not a possibility; they have cobbled together unified communications systems through acquisition, or have IP-enabled legacy systems, and elsewhere bolted-on technologies and capabilities.
Among providers of business communications systems, ShoreTel is uniquely suited to addressing complexity head-on, having started with a clean sheet. Without complexity to shed or work around, ShoreTel built an optimized solution from the ground up for IP that taps into the full power of IP-based communication and collaboration.

ShoreTel’s open and unique single-image, distributed software and embedded switch-based call routing architecture therefore results in structurally lower capital costs, network upgrade costs, implementation and training costs, maintenance/MACs, system management, long distance charges and energy consumption.

A ShoreTel system is purpose-built for IP. It was developed specifically to be easy to deploy, manage, and scale (across sites and geographies), as well as intuitive to use—for end-users and administrators alike. Since the system is built using open standards, it can easily integrate with a company’s existing infrastructure, and can be trusted to work seamlessly with its business applications and processes. Along with a low total cost of ownership, these advantages empower an organization with their business communication—fostering not just productivity, but also creativity and innovation.

5. Simplicity’s domino effect

From this starting point, ShoreTel’s inherent simplicity informs every aspect of the solution—even before acquisition. For example, while other providers have complex product groupings and permutations, ShoreTel is one solution, which by its very nature, adapts to any environment—easily extending to include call center capabilities that are built into the same core solution. And even at the demo stage with a prospective customer, a live solution can be set up in under an hour to fit the customer’s environment, on their network—an option that is otherwise unheard-of in the industry.

Deployment follows a similarly streamlined model: in a system with 50 users, ShoreTel requires one switch and one server. Cisco, by contrast, only requires one server but that server will only scale to 100 users. More than 100 users require a major forklift upgrade, resulting in additional expense and resource sink.

Scale to 250 users, and the ShoreTel system requires only the addition of just one more switch. All other original equipment is retained. However, Cisco requires a forklift replacement with an entirely new system (as well as training in the new system across the board, creating an even greater resource drain and more business risk of downtime and delay).

At 1500 users with unified communications, ShoreTel allows the customer to keep their original equipment, and requires only the addition of more switches. Cisco requires another forklift upgrade and an entirely new call control platform with additional servers for unified communications.
As Sessions points out, “the difficulty of maintaining a system is much more related to how functions are organized than to the number of functions.” This is no more evident than when the organization in question considers system management. Regardless of the size of the deployment, provisioning a new user for a Cisco system means working with separate interfaces for each application—at least six in some cases, including the phone itself, voicemail, presence, call center, emergency services and conferences. However, a ShoreTel system uses a single interface, ShoreTel Director, allowing for the provisioning of users for all applications at once—management by user, not by individual device or function. By contrast, an Avaya IP Office 6.0 system requires a Windows PC client and is accessible only on installed PCs or remotely through Symantec pcAnywhere. Since ShoreTel Director is browser based, it can be accessed from virtually anywhere.

This browser-based interface is not only easier to access but concretely simpler to use: in a comparison between Avaya IP Office and ShoreTel, an administrator has to read more than 1700 pages of documentation to master the Avaya solution, and only 600 pages for ShoreTel. This is because ShoreTel has been designed specifically for ease of deployment on IP networks. A Cisco UCM admin has to take nine courses, at a cost that could total up to $34,000 (not including time away from the office). A ShoreTel system admin needs only five courses, at a total cost of about half that.

An end-user learning the Avaya system has to learn three different applications and read manuals in excess of 300 pages. The ShoreTel Communicator application is highly intuitive, and comes with just 200 pages of documentation. However, in our customer research few, if any, end users or administrators experience the need to refer to the ShoreTel manuals. Anecdotes abound of IT managers gauging the ease of use of the ShoreTel system by the lack of calls to the help desk.

The common interface across user types with ShoreTel Communicator is an interface where all communication and media can be managed simply (voice, video, data, IM, etc.), extending to all user types whether they are telephony professionals, or mobile users. By comparison, Avaya has three different interfaces to master, and Cisco UCM has two.

6. Streamlining systems and processes

The requirement for growth into new markets and geographies over the past two decades has led to fragmented product portfolios and SKUs, and complex supply chains, systems, and processes. A simpler system not only reduces the number of pages in a manual or the steps required to add a new user: it also has the power to streamline technology in a way that allows it to leverage its human resources more effectively. The case of Topline Credit Union illustrates the increasing recognition over the last few years of how complexity is one of the most significant drivers and inhibitors of a company’s cost-competitiveness.
Topline was in the painful position of seeing its telecommunications system begin to flounder at the same time that its membership and services were increasing. An outdated telephone system had become limited in useful functionality and scalability, and was no longer able to accommodate growth. The credit union wanted to implement a business continuity plan to help ensure enterprise-level reliability and to help meet stringent disaster recovery requirements, but this was not supported by the old system.

In addition, Topline was focused on decentralizing its corporate call center and looking for ways to trim costs and run more efficiently while ensuring excellent member service. An IP communication system from ShoreTel helped the credit union continue to provide superior personal service while reducing operational costs and distributing the call center.

“We compared the ROI of ShoreTel to the old system—the savings of time, support, maintenance and costs is 42 percent,” said Colleen Jakes, Director of Information Services at Topline Federal Credit Union. “And metrics from the new distributed call center show a 78 percent decrease on call wait times and call completions. We used to have trunking in one location, with a modem and POTS line at each site. The old PBX system limited our communications options and required us to factor in support and maintenance costs. With ShoreTel, deployment is easy and we have room to grow—we can add switches, extensions, entire branches, simply and quickly. And we’ve eliminated the POTS lines, which saves $11,000 annually.”

7. The costs

In order to have a low TCO (total cost of ownership), deploying a simple-to-use, easy-to-manage solution may be the right choice.

In an independent survey, The Aberdeen Group published a 2012 report analyzing the TCO associated with IP and legacy TDM (Time Division Multiplexing) telephony systems, based on interviews with 485 users of both systems. The report, IP Telephony TCO for SME: Think Beyond Equipment Cost, measured categories for TCO, including capital cost, recurring cost, training cost, and planned versus unplanned downtime.

Aberdeen studied Avaya, Cisco, Microsoft, Mitel, ShoreTel and legacy TDM systems. Almost 75 percent of those respondents were categorized in the small-to-midsize (SME) sector.
Implementation Costs

Although ShoreTel has a slightly higher initial implementation cost than the industry average - $691 compared to $636 - when users were queried further about full accounting of implementation costs, ShoreTel had the lowest cost. When adding training, external labor, network upgrades, implementation labor and capital cost together, ShoreTel’s initial costs averaged $944 per IP extension compared to $1,485 for all others. See figure on the figure below:
Recurring Costs

Annual recurring costs for maintenance and upgrades have a longer-term impact than initial cost, Aberdeen said. See figure below:

ShoreTel’s annual recurring cost of $113 was 46 percent lower than the average of $211 of all others, Aberdeen said, examining training and third party management, FTE staffing, software upgrades, software support and hardware maintenance.

ShoreTel users, Aberdeen said, “are clearly benefitting from a lower total cost of ownership and reduced system complexity.”
8. Conclusion

IT failure is a worldwide phenomenon, the cost of which represents a huge sum that could otherwise be channeled into economic growth. Calculations published in Sessions’ white paper—The IT Complexity Crisis: Danger and Opportunity—put losses from IT failure for most developed nations at some 7 percent to 10 percent of their GDP. Much of this IT failure is attributable to the inherent complexity of technologies—a complexity that in turn has created its own economy where every leading player’s earnings are bolstered by their guaranteed revenue streams through costly service and support activities.

As difficult as simplicity is to achieve, it can be done, provided that vendors have both clear objectives as well as an opportunity to begin anew—as opposed to attempting to simplify an existing complex system. As such, change is more likely to come from new players entering or emerging in the market with fresh thinking. ShoreTel is one of several technology providers who have elected to address the issue of complexity in just such a way.

Systems like ShoreTel enable businesses to reduce the complexity of procurement (allowing for IT systems to be delivered on time and within business expectations); help small and midsize companies compete on more projects; increase the agility of organizations, and make the workplace more collaborative.

Quantitatively speaking, there are numerous documented cases of companies who have been able to reduce costs by 15 percent to 30 percent by reducing unnecessary complexity in their businesses. Much can be learned and applied from these successes, and ShoreTel finds itself in a unique position to address these fundamental business challenges.

While integration of technologies and developing ways to manage complexity is the order of the day for traditional leading providers, the new guard has its sights set higher on simplicity as the key ingredient of its more elegant solutions. The future promised by the new guard is one where rather than requiring people to work around technology, technology instead works around people.

Driving this common promise is a belief in customer satisfaction. We have taken a step back, if, as IT professionals claim, the management of fundamental productivity technology is eating into business-building initiatives. IP telephony is a prime example. However, providers like ShoreTel see a need for a continuity of simplicity — for it to run through the entire experience. Complexity should not be the norm when deploying and managing an IP phone system, nor should it come between making unified communications second nature for users.
In a recent interview as part of CIO Magazine's Executive Viewpoint, Rick Parkinson, CIO of ShoreTel, summed up implications eliminating complexity of simple, but powerful technology. Not only would we eliminate the types of IT failures Roger Sessions calculates, but also we might transform IT solutions into the generative and constructive tools we expected.

“Productivity is always harder to measure. But cut out complexity and give users the freedom to merge information and media the way they want, from wherever they want—and you know, productivity might just transform into creativity. Just like when you cut it out on the back end, you might just make room for inspiration instead of frustration.”