



Research Advisory

CIOs: Are You Selling Your CEO Short?

Executive Summary

Clabby Analytics believes that some chief information officers (CIOs) are selling their chief executive officers (CEOs) short by not examining mainframe technology as a means to greatly reduce operating costs; to reduce exposure/risk; and to open-up funding for new initiatives. Mainframes are uniquely suited to attack expenses related to the cost-of-operations (particularly power, cooling, and management-related costs) – and mainframes also offer superior security, virtualization, and data management when compared to any other type of commercial server in the marketplace today.

If all of these claims are true, then why are some CIOs not jumping on the mainframe bandwagon? When asked “why haven’t you evaluated mainframe technology?” many CIOs responded that “mainframes are old technology”; “we can’t find mainframe resources”; “mainframes are too costly”, and/or “we just plain don’t like IBM”. *Clabby Analytics* suggests that it may be time for a strategic rethink of these positions...

This *Research Advisory* calls for CIOs to become more familiar with mainframe technologies. It recommends that CIOs conduct a thorough total-cost-of-ownership study to assess mainframe costs versus current distributed systems costs. And we suggest that CIOs pay extremely close attention to projected costs for power consumption and cooling, as well as systems management, when making their evaluations. We are convinced that, by undertaking such a study, CIOs will find that mainframes are better suited than distributed systems to address CEO initiatives related to governance and compliance, security, decision support/data warehousing, and reduced operational costs.

The CEO’s Agenda

The CEO’s charter is clear: drive stockholder value. The CEO does this by:

- Balancing/containing/reducing variable and fixed costs,
- Expanding business growth;
- Improving customer service; and,
- Effectively managing risks (especially those pertaining to compliance and security).

In short, the CEO’s job is to run a given enterprise, while finding creative ways to increase business and manage risks.

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To be clear:

- Running the company means ensuring that all departments (financial, human resources, sales, marketing, distribution, manufacturing, et al) work together in tandem to produce optimal results. Running the company also means finding ways to contain fixed costs, while also being prepared to handle fluctuations in variable costs. Effective information systems and flexible infrastructure can go a long way to simplifying these tasks for the CEO.
- CEOs expand business growth through partnerships and acquisitions; through improved sales and marketing tactics; through better customer service; and by finding innovative ways to create competitive advantage. Again, effective information systems and flexible infrastructure help simplify these tasks for the CEO.
- In addition to running-the-business, CEOs need to have plans in place to mitigate risks. And risks abound. Typically, CEOs need to be prepared to meet and deal with compliance requirements, security threats, diversity problems (sexual harassment/discrimination), patent infringement, class action suits, and more. Policies and procedures need to be put in place to deal with these contingencies — and information systems can help manage some of these risks.

In short, the CEO's agenda calls for highly-integrated, highly-optimized information systems in order to run their enterprises optimally, as well as the systems flexibility to introduce innovative change rapidly. This agenda also points to the need to exploit information that already exists within enterprise databases in order to improve enterprise business performance as well as to find new ways to generate sales or improve customer service. Finally, to manage risks better, this agenda identifies the need to ensure that their enterprise systems are secured and protected – as well as to ensure that policies and procedures are in place to protect an enterprise from internal as well as external litigation.

The CIO's Role

The CIO's charter is to:

- Build optimized, efficient IT environments that ultimately will support the transparent flow of business processes across the enterprise;
- Put in place an enterprise information systems infrastructure that allows for easy introduction of new applications (including business intelligence and data warehousing applications); and,
- Ensure that these IT environments are secure, reliable, and available for all enterprise constituents (human resources, manufacturing, sales, distribution, etc.) – and that they meet expected service level requirements.

CIOs are also called upon to provide technical guidance; to find ways to use technology to create competitive advantage; and to find new ways to lower operating costs.

CIOs are generally executing their charters by:

- Attacking the IT cost structure by finding ways to increase systems/storage/-network utilization (usually through consolidation, virtualization and provisioning);
- Automating systems/storage/network management wherever possible in order to lower labor costs;

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- Introducing standards-based infrastructure (improving business flexibility by moving toward a service-oriented architecture using Web services and XML);
- Introducing enterprise performance dashboards (such that CEOs can get a snapshot in time on how his/her enterprise is performing in the areas of sales, manufacturing, and distribution);
- Introducing business intelligence and data warehousing projects that enable the CEO to drill down into existing data in order to analyze business performance as well as potentially mine that data for new business opportunities;
- Using applications accelerators to provide maximum performance;
- Ensuring that data is protected over telecommunications lines (using encryption methods) – as well as within an organization through proper monitoring, control, and defense mechanisms;
- Ensuring that business continuity plans are in place to recover from potential disasters; and by
- Ensuring that governance systems are in place to ensure compliance with regulatory commissions.

To make matters even more complex, CIOs are often asked to “do more with less” – meaning that CIOs are often given flat budgets or budgets with minimal increases and asked to implement this wide range of agenda items.

Figure 1 shows how the aforementioned CEO requirements are currently being implemented and addressed by CIOs.

Figure 1: CEO Requirements and Corresponding CIO Implementation Actions

| <u>CEO Requirements</u> | <u>CIO Implementation</u> |
|-------------------------------|---|
| Optimized Information Systems | Consolidation Virtualization Provisioning Advanced Sys/Stor/Net Management High-availability Specialty Engines |
| Information Management | Enterprise Performance Dashboards Business Intelligence Systems Data Warehouses |
| Business Flexibility | Standards-based Infrastructure Application Accelerators |
| Governance/Risk Management | System/Network-level Security Business Continuity Strategy Compliance Policies and Procedures & Supporting Information Systems |

Source: Clabby Analytics – April, 2007

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The Big Disconnect: How Some CIOs Are Falling Short

Clabby Analytics agrees with every one of the above mentioned approaches being used by CIOs to implement their CEO's agenda. Consolidating, virtualizing and provisioning resources are absolutely the right approaches to improve systems and storage utilization. Deploying dashboards, building data warehouses, and using business intelligence software are definitely the right things to be doing to support CEO information management initiatives. Rearchitecting infrastructure to accommodate service-oriented architecture will ultimately result in increased business flexibility. And improvements in security, combined with business continuity plans and compliance policies and procedures will definitely serve to minimize risks.

But, although we agree with the actions that most CIOs are taking, we don't agree with the way several CIOs are going about implementing the CEO's agenda. For instance, although many CIOs have:

- Moved to commodity hardware, wherever possible, to lower systems acquisition and maintenance costs — attacking systems acquisition costs only solves a small percentage of overall systems operational cost — the hardware related cost. Commodity-based hardware has its purpose (primarily to run Windows application/database/file/print servers and Linux edge servers — as well as to provide supercomputing services) — but distributed commodity hardware is comparatively complex to manage versus monolithic mainframe environments. Further, acquisition cost savings can be quickly consumed by additional costs related to the management of multiple, distributed systems;
- Consolidated many servers into fewer servers (consolidation) — it can be argued that consolidating workloads onto a single mainframe may be the most efficient way to go about server consolidation. Mainframes are the ultimate consolidation server environments — especially when it comes to Linux server consolidation;
- Pooled computing systems/storage/network resources using virtualization technologies — it should be noted that some virtualization technologies are less sophisticated than others. It can be readily substantiated that no other commercial architecture offers better, more integrated, more sophisticated, more secure virtualization and provisioning capability — as well as well established best practices — than a mainframe ;
- Started the move to standardized, open infrastructure (more specifically, Web services-based service-oriented architecture [SOA] in order to improve business flexibility and lower integration costs) — most CIOs appear to be going about SOA deployment in a piecemeal fashion. Mainframes offer a completely integrated SOA environment — turnkey and off-the-shelf;
- Purchased a myriad of original equipment manufacturer (OEM) and third-party management software products to manage systems, storage, networks, applications, and databases — it can be argued that after almost fifty years of development, the mainframe has no rivals in the depth of its management environment. Further, IBM is investing heavily in making its management environment more Windows-like graphically oriented to simplify management using a common, graphical user interface across its product line;
- Implemented security best practices and have purchased OEM-supplied and/or third party security software — it is a well known fact that mainframes offer the highest levels of network and systems-level security on the market today. Mainframe security includes up-to-date IPSEC encryption and the absolutely

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highest levels of United States and European security certifications (for instance, last September, IBM became the first server vendor to achieve Common Criteria Certification Evaluation Assurance Level 5 — a prestigious in-depth international security standard). And, finally, if any budget remains, CIOs have the option to leverage the cryptographic features of the mainframe (IBM offers several cryptographic hardware and software solutions).

- Purchased point product, third party software to perform business intelligence and/or data warehousing activities — but, in many cases, these packages do not work well with different data types. IBM promotes the use of a mainframe-centric data hub that can federate different data types — making data mining more efficient, reducing integration costs, and producing more meaningful data.

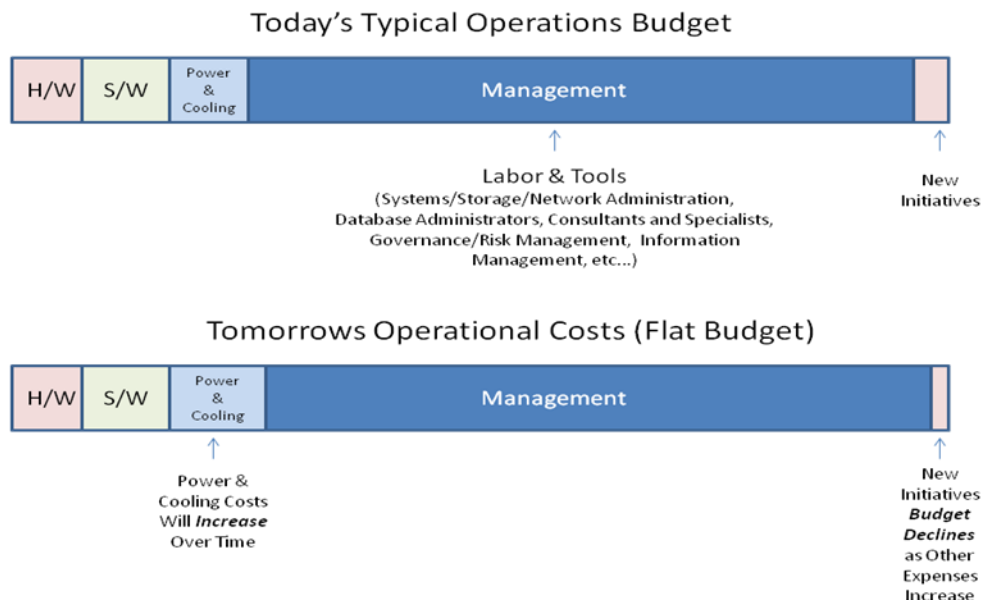
By addressing these issues, CIOs are definitely moving in the right direction. But Clabby Analytics has to ask if due diligence was done when choosing to implement these solutions on distributed systems as opposed to using mainframe architecture. Clearly, mainframe architecture has several super-strong advantages when compared to the distributed systems approaches. Was due diligence done?

Pay Particular Attention to Power and Cooling

As demand for power increases in India, China, and several developing nations, the price of power is continually escalating. Some energy forecasters expect the cost of a barrel of oil to rise from today's \$55/barrel to soon rise to over \$100 per barrel (almost doubling in cost). This cost increase will, clearly, be passed on to consumers.

If energy costs double in the data center, the money saved by consolidating and virtualizing systems and storage may quickly be subsumed by rising energy costs. Further, if budgets remain flat, the only way to pay for this increase may be to curtail new projects on the CEO's agenda. Note that most enterprises devote only a small portion of their annual operations budget to new initiatives (see Figure 2).

Figure 2— Power/cooling Cost Increases May Undermine New Initiatives



Source: Clabby Analytics – April, 2007

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Clabby Analytics believes that power and cooling costs will have a major impact on operational costs in the future. Distributed systems architectures that consist of hundreds or even thousands of individual servers running at an estimated 20% of capacity are particularly inefficient when it comes to power and cooling consumption. In these configurations, each discrete server has its own power supply, its own fans – and, accordingly, burns more energy per unit of than computers that share power supplies and cooling facilities (such as blade systems; racks; and large, scaled-up servers [including mainframes]). Systems that can run at 90% or better utilization (such as mainframes) produce more units of work per watt consumed – and can thus help mitigate energy price increases.

In your TCO analysis, model projected power and cooling costs for existing distributed systems environments versus a mainframe environment. You may find the cost difference to be astounding!

Controlling the Cost of Systems and Storage Management

Management costs represent the single largest cost when running an enterprise computing environment. And as enterprises continue to increase the amount of computing they do, the need for more-and-more systems, storage, network, application, and database managers and administrators increases exponentially. In distributed system environments, IT administrators may be able to run only twenty-five or even fifty servers efficiently. But as some point, when that administrator reaches his/her physical server management threshold, a new administrator will need to be hired. In this scenario, the cost of managing servers increases over time as x# of human beings are able to handle only a limited number of physical servers.

With almost fifty years of management heritage, mainframe tools are deep, highly-sophisticated, and highly-integrated – making it possible for a single systems administrator to manage hundreds (and in some cases thousands) of servers simultaneously).

If your strategy calls for adding tens, hundreds, or thousands of computers over time, expect that human management costs will increase every fifty to one-hundred servers that are added. Excellent workload management software (virtualization and provisioning software that can adjust to changing workload requirements automatically) may help curtail management costs – but it should be noted that mainframes have a huge advantage over distributed systems when it comes down to the ratio of systems managers to servers managed in a given computing environment.

Going Down the List

Power and cooling, as well as escalating management costs, are just a few of the most obvious reasons an enterprise may wish to reevaluate its use of distributed computing architecture and reevaluate the use of mainframes. Other considerations should include:

- Is it better to scatter data throughout an organization – or is it better to centralize that data in a central hub where it can be processed more quickly and efficiently? Further, shouldn't any major data management strategy also call for the federation of data (making data readable despite its source)? And shouldn't this data be supported by the the highest levels of security to protect data for you and your clients?
- Is it better to scatter security across various servers within an organization – or is it better to provide a centralized security hub service that can monitor an

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entire computer environment for security threats, automatically assess those threats, and automatically undertake corrective action based upon a comprehensive series of pre-established policies and procedures?

- Is it better to build a service-oriented architecture using various building blocks from various best-of-breed vendors (potentially taking years to integrate and deploy) — or is it better to deploy a pre-integrated SOA environment on a mainframe hub?

When comparing mainframes to distributed architectures in security, in the federation of data at the central hub level, and in the ability to deploy a flexible service-oriented architecture quickly — the mainframe should win hands-down in all cases.

Summary Observations

The role of the CIO is complex, expansive, and challenging. Not only does the CIO have to be the CEO's technology advisor/partner — but, to do his or her job right, the CIO also needs technology credentials, business acumen, legal skills, negotiation skills, and creative skills (to drive innovation). Being CIO is no easy task.

To compound the complexity of the job, CIOs are often asked to "do more for less". In other words, take on more-and-more of the CEO's initiatives with reduced, flat, or slightly increased incremental budgets. Accordingly, there is strong pressure on CIOs to find ways to reduce IT spending while implementing new initiatives.

Clabby Analytics believes that if some CIOs go back to the drawing-board and do TCO due diligence, they will find that mainframes can be far more cost effective than using distributed Windows/Unix/Linux servers. For instance, mainframes offer special, unique advantages when it comes to virtualization, provisioning, and security. They will also find that mainframes are uniquely suited to help reduce power, cooling, and management costs — especially when compared to discrete distributed system configurations, and systems-in-a-box solutions such as blades and racks. Further, there is no commercial server environment available today that rivals the mainframe in terms of security services.

Mainframes are not, however, the be-all/end-all solution to all computing needs. Mainframes do not run Windows or Unix workloads — nor are mainframes well suited to perform supercomputing activities. Nor should mainframes be used as "edge" servers. There are strong arguments to use dedicated Windows or Unix processors for Windows/Unix-specific application- and edge-server workloads. The point: purchasing a mainframe is not an either/or decision — mainframes can coexist very well with distributed application and web servers — and can provide critical risk management, centralized data management, and business flexibility services for heterogeneous systems.

But, it should be strongly emphasized that mainframes make excellent hubs that can provide centralized security and data services for Windows and Unix application servers. And mainframes excel in large transaction processing environments; in the processing of integrated business applications; and in the processing of modern Java and Linux-based workloads. Further, mainframes also stand-out from the crowd in terms of advanced virtualization and provisioning, security, data management, computation delivered per watt, and easy-to-deploy service-oriented architecture.

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With all of these benefits, why is there reticence to use mainframes as central security and data management hubs, or SOA hubs, or for massive Linux server consolidation? One reason could be that CIOs are letting existing systems infrastructures frame their problems. For instance, if the enterprise consists largely of Microsoft Windows or Unix servers, there is a tendency to try and solve these problems in the context of Windows or Unix. Windows and/or Unix may, or may not be able to solve the problem at hand in the most optimized fashion. Another reason may be an outdated understanding of mainframe technology. Still another reason may be the belief that mainframes are too costly. The logic behind these reasons needs to be reassessed.

The bottom line when it comes to evaluating mainframes as a potential way to better meet the CEO's agenda is this: there is a strong, compelling case to adopt mainframe architecture to control costs, to improve security, to better manage data, to improve business flexibility, and to mitigate risk . And all of these themes are near-and-dear to a CEO's heart.

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