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IT MOOSE Management — 20 Best Practices

by Andrew Bartels and Phil Murphy
for CIOs

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How CIOs Should Measure IT Maintenance And Ongoing Operations

by **Andrew Bartels and Phil Murphy**

with Marc Cecere, Jean-Pierre Garbani, Peter O'Neill, Galen Schreck, and Heidi Lo

EXECUTIVE SUMMARY

How does a CIO judge whether he or she is using IT resources in the most effective and efficient manner? If the CIO is successful, how does he or she demonstrate this to the CEO and senior management? While IT spending benchmarks are commonly referenced, using them may raise more questions than they answer. Do differences reflect wholly different computing environments, staff skill levels and competencies, management practices, processes, or some combination? To help CIOs answer those questions, Forrester has developed a checklist of 20 best practices to enable CIOs to score themselves on their ability to control their IT MOOSE costs (spending to maintain and operate the organization, systems, and equipment).

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This report has an underlying spreadsheet online detailing the scorecard in Figure 2. The online version of Figure 2 is an interactive tool to allow a company to score its own IT MOOSE management practices.

Related Research Documents

[“Topic Overview: IT Spending And Forecasting”](#)
June 4, 2007

[“US IT Spending Benchmarks For 2006”](#)
November 20, 2006

[“Defining The MOOSE In The IT Room”](#)
October 18, 2005

GOING BEYOND IT SPENDING BENCHMARKS: CALIBRATING IT MOOSE MANAGEMENT

CIOs are under constant pressure to demonstrate that their level of IT spending is at the right level for the organization, driving the need for a measurement vehicle that can establish whether they are effectively and efficiently using the organization's IT resources. CIOs must demonstrate to CEOs, senior management, and board members that the amount of IT spending in their IT budget is appropriate for an organization. Today, CIOs:

- **Benchmark IT spending — but that may raise more questions than answers.** Of the popular IT spending benchmarks — e.g., IT spending as a percentage of revenues, IT spending per employee, IT staff as a percentage of total staff, etc. — Forrester has recommended that companies use IT MOOSE as a percentage of revenues as the best benchmark.¹ However, IT benchmarks are problematic. If a company's IT MOOSE ratio is higher than that of peers of its size and in its industry, is that because it has invested more than its peers in technology to create more efficient and effective business results or because it has done a poor job of managing IT spending? If a company's IT MOOSE ratio is lower than that of its peers, is it because of highly effective IT MOOSE management or underinvestment — raising the risk of broad-based system failure or inadequacy?
- **Benchmark enterprise total process or unit costs — but that may be too difficult.** Some firms benchmark a company's total process or unit costs (including technology) against those of peers. This exercise provides the most definitive answer as to whether a company is getting good value from its technology investment. Unfortunately, it is very difficult and time-consuming. First, a company has to assign a team of finance specialists and process experts to calculate process costs and unit costs. Then, it has to find peer company data of this kind, generally relying on consulting companies that have done process re-engineering projects at multiple companies. Even then, the myriad differences in technology bases, transaction volumes, staff skills, and computing environments may produce a misleading result.

Assess IT MOOSE Management Practices — And Set A Course For Improvement

If benchmarking business process and unit costs is too difficult, how can CIOs demonstrate that their IT MOOSE costs are reasonable and appropriate? We believe the best option for the CIO is to determine whether the IT department has done everything feasible to control IT MOOSE costs. By evaluating current practices to control IT MOOSE against a set of ideal best practices, CIOs can identify specific areas for improvement. If a CIO can demonstrate that the IT department has adopted and used the full portfolio of technology tools and process best practices, then logic dictates that the company's IT MOOSE metrics cannot be the result of poor IT MOOSE management. Instead, they must be caused by other factors, such as the degree of technology adoption by the company, globalization requirements, the IT consequences of multiple acquisitions and mergers, or scale economics.

TWENTY IT MOOSE MANAGEMENT BEST PRACTICES

To help companies pursue efforts to streamline IT MOOSE, we canvassed Forrester analysts to identify the technologies and practices that would collectively represent best practices in IT MOOSE management. Each of these technologies and practices can help companies reduce or control IT MOOSE costs in different areas of IT operations and activities (see Figure 1).

Figure 1 Cost Areas Affected By IT MOOSE Management Best Practices

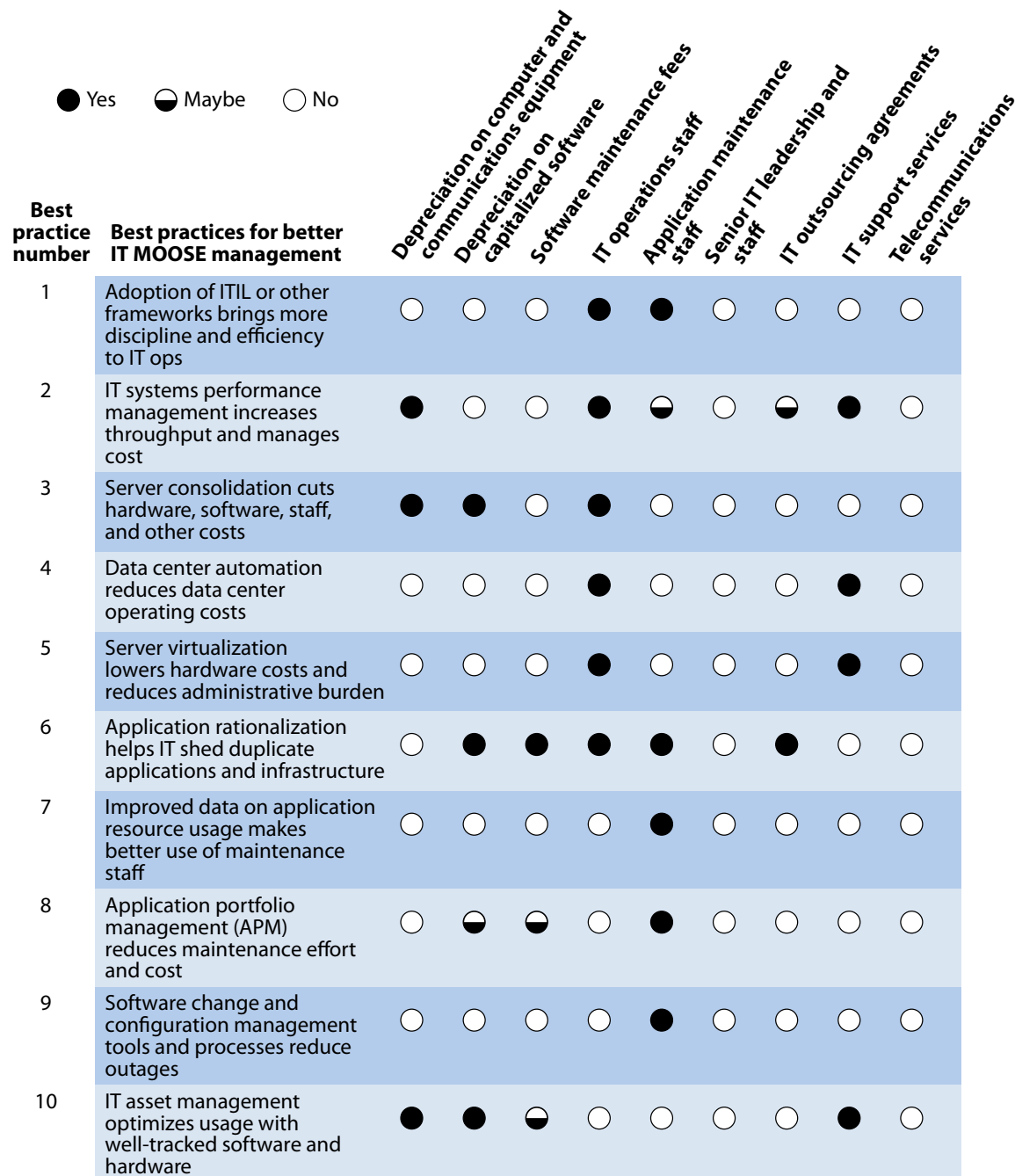


Figure 1 Cost Areas Affected By IT MOOSE Management Best Practices (Cont.)

Best practice number	Best practices for better IT MOOSE management	Cost Areas								
		Depreciation on computer and communications equipment	Depreciation on capitalized software	Software maintenance fees	IT operations staff	Application maintenance staff	Senior IT leadership and staff	IT outsourcing and IT support services	IT support agreements	Telecommunications services
11	Current generation service-desk tools keep IT support costs down	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
12	Enterprise architecture groups drive standardization of the software portfolio	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
13	Vendor and contract management teams squeeze more value from vendors	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
14	Contract life-cycle management helps optimize the savings from supplier contracts	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15	Format IT sourcing practices cut ongoing depreciation and maintenance fees	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
16	eSourcing and services procurement tools help secure more competitive vendor bids	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
17	Recurring consideration of selective outsourcing may lower costs and improve IT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
18	Implementation of IT operations scorecards drives improvements and reduces costs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
19	Give IT leaders dual roles as business relationship and IT activity managers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20	Create an investment funding pool to pay for IT MOOSE management initiatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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Source: Forrester Research, Inc.

1. **Adoption of ITIL and other frameworks brings discipline and efficiency to IT ops.** The Information Technology Infrastructure Library (ITIL) standardizes IT terminologies to establish guidelines and a common language for IT operational processes like change management, problem resolution, service delivery, and resolution of customer inquiries. ITIL's adoption has grown since it was first developed by the United Kingdom Central Computer and Telecommunication Agency in the late 1980s and early 1990s. Other frameworks such as COBIT (control objectives for information and related technology) and ISO 17799 complement ITIL.² These frameworks help companies standardize IT operations, management processes, and practices — lowering costs by reducing unplanned and unscheduled work and making it easier to adopt and implement cost-reducing technologies.³
2. **IT systems performance management increases throughput and manages costs.** The operational systems — the runtime configuration of hardware, system software, and applications — are literally the engine that runs the business. An engine that performs poorly will, at a minimum, consume more resources than it should, and may prompt unplanned and premature capacity increases. Additionally, in retail transactions, there is a direct adverse impact on the bottom line when system outages prevent transactions and when tediously slow system performance causes customers to abandon transactions in favor of vendors with better transaction performance. As such, managing the performance of the existing operational systems is a critically important function — firms can't manage what they don't measure.⁴
3. **Server consolidation cuts hardware, software, staff, and other costs.** Distributed computing environments mostly sit idle, with Windows servers typically running at 8% to 12% capacity, and UNIX servers at 25% to 30% of capacity. Collapsing multiple OS images and multiple mixed application workloads onto fewer, more scalable servers lets firms use the total computing capacity more efficiently. Server consolidation also helps cut software costs, by reducing the number of per-server licenses for software not in use, and reduces the number of IT staff needed to administer and support the new servers. Consolidation allows uniform and consistent systems administration and enables reductions in floor space usage, power, and cooling requirements. Consolidation helps IT organizations simplify planning, enables a more consistent backup and recovery strategy, improves staff productivity, and reduces audit and security costs.⁵
4. **Data center automation reduces data center operating costs.** Data center automation (DCA) products have evolved from basic provisioning and software distribution tools into powerful platforms that govern many aspects of data center operations. While many products share a common foundation in configuration management, DCA products have broadened their reach into asset management, compliance auditing, and policy-based automation. By controlling almost all aspects of a server's configuration, including content and data files, the need for — and cost of — administrators to directly manage servers is greatly reduced.⁶

5. **Server virtualization lowers hardware costs and reduces administrative burden.** The proliferation of smaller Wintel and Linux servers has started to escalate the costs of scale-out/scale-up efforts, driving greater staff costs to administer and provision the burgeoning number of individual servers. With virtualization, the decentralize/recentralize pendulum swings back toward centralization as small mainframes, such as the Baby zSeries and even larger Unix servers, become the new platform on which to consolidate hundreds of virtual servers — thereby lowering software licensing costs and server administration staff costs.⁷

6. **Application rationalization helps IT shed duplicate applications and infrastructure.** Firms must determine how to streamline the application portfolio and ensure that their current application maintenance dollars are well spent. This application rationalization process depends on metrics gathered about applications to drive decisions about their fate — whether to keep, modernize, retire, or replace them. The rationalization process provides a foundation of application information to improve decision-making capabilities and re-apportion maintenance spending in light of the business importance of the application — starving commodity business functions to feed core-competency applications that provide competitive advantage. Ideally, the metrics are developed by application portfolio management (APM) tools and fed continuously into a repository for management analysis. These tools enable better decisions about which applications warrant more investment, which should be curtailed, and which should be retired.⁸

7. **Improved data on application resource usage makes better use of maintenance staff.** Even when apps are rationalized and a knowledge base is established, firms still worry whether they are spending too much on app maintenance. Differences in the definition of an application, a valid application size metric, base technology, complexity, frequency of change, staff skills, etc., all conspire to prevent companies from effectively benchmarking. Forrester client inquiry about legacy modernization is often about how to better understand, quantify, and reduce the cost of existing applications. Some of the best answers will come from tracking the effort expended to maintain application artifacts across time to show improvement trends. Large, complex artifacts that change frequently *should* have higher costs, and small, simple artifacts that seldom change should not, but trends for both types should improve over time.⁹

8. **APM develops metrics to drive maintenance effort and cost reductions.** Mature IT organizations have applications that range in age from a few years old to a few decades old. These span monolithic, client-server, and Internet technology genres; the tribal knowledge about how they function has been lost — greatly increasing the effort to maintain them. The lack of knowledge extends to management metrics. Which applications run the core business? Which are candidates for outsourcing? What is the impact of an outage? Does the application align to business needs, to future technology directions? APM tools help build a knowledge base of metrics that provide analysts, developers and other constituencies a single source of truth about applications that offsets the loss of tribal knowledge. Companies using APM typically report overall MOOSE savings in the area of 10% to 20% of the MOOSE budget.¹⁰

9. **Software change and configuration management tools and processes reduce outages.** IT has a fiduciary duty to protect the artifacts that comprise both the applications and the production environment, preventing unauthorized or malicious changes. IT organizations waste staff time when software controls are poorly managed, so an efficient IT organization must secure the source code against erroneous change, prevent multiple concurrent development efforts from accidental overlay, and be able to recreate any application on demand in the event of the loss of the production environment. Even authorized changes to the production environment can result in unintended consequences and cost. Without adequate change and configuration control, firms waste unnecessary resources as source code thrashes in and out of production environments for changes related to process errors.¹¹
10. **IT asset management optimizes usage with well-tracked software and hardware.** Enterprise executives, shareholders, and regulatory organizations all require an accurate record of software and hardware licenses to enable financial control, information security, and compliance. These assets can account for 50% of the enterprise asset base and sometimes as much as 80% of capital expenditure. Proper IT asset management (ITAM) reduces MOOSE by identifying unused software and hardware licenses and effective life-cycle management of the licenses and helps IT by providing adequate documentation. A complete ITAM system supports the full life cycle of an asset, contains a history of asset characteristics and configurations, and manages all cost and contract data related to the asset. While it may be tempting to use a general asset management solution for IT assets, these general purpose software tools lack the ability of ITAM tools to identify and track IT assets connected to the network.¹²
11. **Current generation service-desk tools keep IT support costs down.** Calls to the Help Desk for support are inevitable, but proper management of them can have direct cost-reduction implications for IT MOOSE. Many organizations are overspending on maintenance of an old, highly customized help desk/service desk management tool — and stumbling over implementing process improvements as a result. Rather than nursing an application along or simply upgrading to a current version, firms should consider re-implementing a service-desk management suite on one of the current generation platforms. These can cut maintenance costs on an older, more costly product; add formal process frameworks; and better prioritize incidents based upon business impact — enabling more responsive IT and lowering MOOSE.¹³
12. **Enterprise architecture groups drive standardization of the software portfolio.** The enterprise architecture function designs the future state of the computing environment, maps the current state of the computing environment, and maps out a path between them to ensure that the company is moving forward with architectural improvements that will support the future growth of the organization. Good planning will work in conjunction with APM and application rationalization efforts to ensure that obsolete technology is retired when it has reached the end of its useful life, and prevent new applications from using it wherever possible. While the EA function serves many other purposes, this selective pruning of technology will have the most impact on MOOSE.¹⁴

13. **Vendor and contract management teams squeeze more value from vendors.** Implementing a centralized vendor management (VM) function is a key means of ensuring that vendors live up to contractual commitments. And it is a primary path to reducing IT costs — primarily through consolidation of vendors, the application of greater buying leverage, and the use of more sophisticated techniques for managing vendors and their contracts. Vendor management leverages the total relationship, enabling firms to secure initial discounts when buying more technology from a vendor or to revise or replace existing contracts when conditions change. This is especially important as M&A in the marketplace consolidates vendors or when the IT organizations consolidate after their own firms merge.¹⁵
14. **Contract life-cycle management helps optimize the savings from supplier contracts.** IT departments and key suppliers execute contracts that dictate prices that organizations expect to pay, products that they plan to buy, the level of service they should expect from the supplier, and key terms and conditions. However, when contracts are paper documents in filing cabinets, it is difficult to verify whether suppliers are complying with these terms. Contract life-cycle management (CLM) applications automate the monitoring of supplier compliance with contracts, streamline the process of creating and negotiating contracts with vendors, and provide analysis and reports of contract obligations and rights. CLM applications should be applied to all contracts in a firm, not just IT contracts. So, a CIO should look at CLM solutions to first reduce MOOSE for the IT department, then as the starting point of adoption for the whole enterprise.¹⁶
15. **Formal IT sourcing practices cut ongoing depreciation and maintenance fees.** To keep down the costs of depreciation on capital equipment and to reduce the overall maintenance fees paid on software and for outsourced contracts, IT organizations must aggressively source the products and services at the time of purchase. Effective sourcing cannot be conducted as an ad hoc activity though, nor can it be delegated to the corporate purchasing department. Sourcing is a skill and a discipline that is acquired through focus, training, and practice. Yet the purchasing department, which has this expertise, may lack information about IT's requirements and perspectives on what makes a good IT vendor. Create cross-functional sourcing teams that combine sourcing process expertise from the purchasing department with IT spend category expertise from IT. If there is no purchasing department with this expertise, then the CIO needs to create a small group of sourcing experts who know best practices in sourcing and who will work with IT unit heads to ensure that they are followed.¹⁷
16. **eSourcing and services procurement tools help secure more competitive vendor bids.** eSourcing tools allow cross-functional sourcing teams to work together to create sourcing requirements; draft requests for proposals (RFPs), quotes (RFQs), or information (RFIs); conduct reverse auctions; and evaluate vendor responses to select the best vendor(s) for a category of IT goods or services. Services procurement solutions can help IT staff reduce the cost of verifying that vendor work was done to requirements by tracking and recording

vendor performance through service completion. As with CLM tools, eSourcing and services procurement products should not be purchased just to solve IT purchasing requirements. Instead, they should be used enterprisewide for more effective sourcing of key spend categories and to manage the purchase of all categories of services.¹⁸

17. Recurring consideration of selective outsourcing may lower costs and improve IT.

Companies that have broadly outsourced IT have sometimes found savings to be illusive, with painful side effects of reduced flexibility and responsiveness — some of the very issues they sought to resolve by outsourcing in the first place. But outsourcing is an option that should be reconsidered and re-evaluated on a periodic basis — especially for functions like help desk support, application maintenance, or Web site hosting.¹⁹ Even when deciding against outsourcing of a specific function, the exercise of reviewing outsourcing options can identify areas for improvement and encourage internal IT staff to improve in order to *avoid* being outsourced. For these reasons, leading firms regularly review whether to outsource specific IT functions every two to three years. Too frequent a review cycle will increase the costs of the review process and demoralize IT staff, but too infrequent a review cycle leads to complacency.²⁰

18. Implementation of IT operations scorecards drives improvements and reduces cost.

Implementing an IT operations scorecard as part of the IT Balanced Scorecard process is a powerful tool to drive breakthrough performance by linking the day-to-day operations activities to the overall IT strategy. Research has demonstrated that a key problem for many IT organizations is the amount of unplanned work. Much of this unplanned work is the result of sloppy, inconsistent operational processes regarding areas such as release management, configuration management, and change management as well as in operational controls (or lack thereof), and problem/incident resolution. The IT operations scorecard can focus IT management attention on where improvements are needed in these areas, enabling reduction of MOOSE.²¹

19. Give IT leaders dual roles as business relationship and IT activity managers. The practice of designating IT executives to serve as relationship managers (RMs) with key business units has become an IT management best practice. RMs have a solid line reporting relationship to the CIO and a dotted-line reporting to a business unit head. They participate in the business unit's executive team meetings, serving as the alignment agent between a business unit's needs and IT's capabilities and priorities. The downside of creating and staffing these appointments as additional positions is the added overhead costs for IT and a seemingly duplicate function with existing IT application management. Moreover, experience has shown that relationship managers who have no direct IT management role tend "to go native," i.e., become advocates for business desires rather than alignment agents between IT and the business. Leaving relationship managers as managers of IT activities — but at a level above day-to-day activity — ensures that they play their alignment role effectively, and it also saves money. However, it requires that RMs coach subordinate staff to step up and take a much larger portion of the day-to-day management activities — to avoid RM burnout as they try to manage these two demanding roles.²²

20. **Create a funding pool to pay for IT MOOSE management initiatives.** An old saying states that “you have to spend money to make money.” Sometimes you also have to spend money to save money. Many of the proposals outlined above are process changes that do not require new capital investment. Even though tools may not be necessary for a given change, don’t underestimate the cost of process and workflow changes and the training required to implement a new IT management discipline. Other recommendations may require an investment in supporting technology (e.g., applications portfolio management, IT asset management, eSourcing tools, CLM tools, server virtualization, data automation tools, etc.) and/or increased spending (if the software is expensed or purchased on a software-as-a-service basis). Look to case studies of the savings realized by organizations that have already implemented these functions to build business cases for management approval. Although spending increases upfront, near-term spending results in lower IT MOOSE.

An IT MOOSE Management Best Practices Scorecard

We have collected these 20 best practices into a scorecard, which a company can use to assess itself. A key factor in the scorecard is not simply adoption of a technology tool or practice in a single unit of a company, but its usage for a long enough period to have become skillful and across the full IT organization to have an impact. Thus, we have scored adoption of each technology on a zero to five scale, with zero (or no score) being no adoption, one being piloting, and five being usage across the whole IT organization. Note that progress along a scale over time is the primary goal, though comparison to external organizations may also be possible.

To use the scorecard, the CIO should place an X in the column that best represents the tenure and breadth or adoption. A maximum possible score across all 20 criteria would be 100. In practice, a very good score would be in the 80s (see Figure 2).

Figure 2 A Scorecard For The Adoption Of 20 Best Practices In IT MOOSE

Best practice number	Best practices for better IT MOOSE management	Technology or process?	Piloting (X=1)	Limited adoption (X=2)	Full adoption for less than one year	Full adoption for one to three years	Full adoption for more than three years	Score
					(X=3)	(X=4)	(X=5)	
1	Adoption of ITIL or other frameworks brings more discipline and efficiency to IT ops	Process						
2	IT systems performance management increases throughput and manages cost	Technology						
3	Server consolidation cuts hardware, software, staff, and other costs	Process						
4	Data center automation reduces data center operating costs	Technology						
5	Server virtualization lowers hardware costs and reduces administrative burden	Technology						
6	Application rationalization helps IT shed duplicate applications and infrastructure	Process						
7	Improved data on application resource usage makes better use of maintenance staff	Process						
8	Application portfolio management (APM) reduces maintenance effort and cost	Technology						
9	Software change and configuration management tools and processes reduce outages	Process						
10	IT asset management optimizes usage with well-tracked software and hardware	Technology						
11	Current generation service-desk tools keep IT support costs down	Technology						
12	Enterprise architecture groups drive standardization of the software portfolio	Process						

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Source: Forrester Research, Inc.

RECOMMENDATIONS

EFFECTIVE IT MOOSE MANAGEMENT IS PROACTIVE

Most companies have become proficient in managing and monitoring new projects at the expense of everything else. New projects are more visible, so management takes pains to monitor whether projects meet business requirements, finish on time, meet (or underspend) budgetary guidelines because the business values these as highly visible indicators of a successful IT shop. Conversely, IT MOOSE management has taken a backseat to new projects — it isn't as exciting or sexy as bringing in new functionality, yet it is the lifeblood of the company.

Disregard for IT MOOSE is the primary reason that it consumes the bulk of IT budgets and limits the resources available to new projects. A concerted focus on implementing recurring programs to reduce IT MOOSE is no longer an option; it is an imperative. Quantifying IT MOOSE, benchmarking current metrics against prior-year metrics, and formulating best-practice plans to reduce these costs will enable CIOs to demonstrate year-over-year progress and may eventually enable external comparisons. In so doing, CIOs will be able to respond to the demands of CEOs and CFOs for self-measurement and improvement, and develop benchmarks that compare their company's IT spending against peers and competitors. The 20 best practices identified in this report provide the process and technology tools that CIOs can use to ensure that they drive the waste, duplication, and inefficiency from existing IT MOOSE activity, guaranteeing that costs are on an appropriately aimed, downward path.

SUPPLEMENTAL MATERIAL

Online Resource

The underlying spreadsheet detailing the scorecard in Figure 2 is available online.

The online version of Figure 2 is an interactive tool that allows a company to score its own IT MOOSE management practices.

ENDNOTES

- ¹ Forrester has argued that the best IT spending benchmark is IT spending on ongoing operations and maintenance (aka IT MOOSE) as a percentage of revenues. For more information on our reasoning and industry-specific benchmarks, see the November 20, 2006, "[US IT Spending Benchmarks For 2006](#)" report, and see the October 18, 2005, "[Defining The MOOSE In The IT Room](#)" report.
- ² COBIT was developed by the Information Systems Audit and Control Association (ISACA) and is now administered by the IT Governance Institute as a generally applicable and accepted standard for good IT security and control practices, providing a reference framework for management, users, and IS audit, control and security practitioners. It documents 34 discrete IT processes organized into four major domains, including Planning and Organization, Acquisition and Implementation, Delivery and Support, and Monitoring. See the September 8, 2003, "[COBIT As An Organizational Template?](#)" report, and see the January 5, 2006, "[COBIT Versus Other Frameworks: A Road Map To Comprehensive IT Governance](#)" report.

- ³ For more information on ITIL, COBIT, and other frameworks, see the September 21, 2004, “[Implementing ITIL](#)” report; see the June 22, 2005, “[Raising The Bar For ITIL And CMDB Implementations](#)” report; and see the September 1, 2005, “[The Management Process Alphabet Soup](#)” report.
- ⁴ For more insight into the IT systems management solutions, see the June 6, 2007, “[The Server Management Software Market](#)” report.
- ⁵ For more insight into the cost-savings potential of server consolidation, see the October 3, 2005, “[Identifying Server Consolidation Cost Savings](#)” report. However, there are also costs that are incurred on the path to savings from consolidation. See the July 19, 2005, “[Where The Costs Occur In Server Consolidation](#)” report.
- ⁶ For more insight into data center automation, see the February 3, 2006, “[The Future Of Data Center Automation](#)” report.
- ⁷ For more insight into server virtualization solutions, see the July 19, 2005, “[Using Virtualization For Server Consolidation](#)” report, and see the January 9, 2007, “[Decoding Virtualization's Present And Future](#)” report.
- ⁸ See the January 10, 2007, “[CIOs: Reduce Costs By Scoring Applications](#)” report.
- ⁹ For more information on resource management issues, see the February 12, 2007, “[CIOs: Attack Weak Application Maintenance Processes That Stifle IT Productivity](#)” report.
- ¹⁰ For more insight into application portfolio management tools, see the August 7, 2006, “[PPM Vendors Falsely Claim To Offer APM](#)” report.
- ¹¹ For more insight into software change and configuration management software products, see the May 29, 2007, “[The Forrester Wave™: Software Change And Configuration Management, Q2 2007](#)” report.
- ¹² For more insight into IT asset management solutions, see June 8, 2007, “[The IT Asset Management Software Market](#)” report, and see the August 4, 2006, “[The Forrester Wave™: IT Asset Management, Q3 2006](#)” report.
- ¹³ For more information on service desk technology solutions, see the June 28, 2005, “[Thirty-One Best Practices For The Service Desk](#)” report, and see the February 17, 2006, “[The Forrester Wave™: Service Desk Management Tools, Q1 2006](#)” report.
- ¹⁴ For more discussion on the value of enterprise architecture, see the September 12, 2003, “[Case Studies Showing The Value Of Enterprise Architecture](#)” report.
- ¹⁵ For more insight into vendor management team rationales and trends, see the March 15, 2004, “[Building The Vendor Management Function](#)” report, and see the April 19, 2007, “[Trends In North American Vendor Management](#)” report.
- ¹⁶ For more insight into CLM solutions, see the March 10, 2006, “[The Forrester Wave™: Contract Life-Cycle Management, Q1 2006](#)” report.
- ¹⁷ For more on the importance of formal IT sourcing practices, see the February 12, 2007, “[IT Asset Management: IT Asset Sourcing And Fulfillment Best Practices](#)” report; see the November 29, 2004, “[Mastering Cost And SLA Control Through IT Sourcing](#)” report; and see the January 31, 2003, “[Optimizing](#)”

IT Sourcing Strategy: Key Stages And Phases Of The IT Sourcing Process” report. For the rationale behind cross-functional sourcing teams, see the June 10, 2004, “Organizing The Procurement Function” report.

¹⁸ For more information on eSourcing solutions, see the November 17, 2005, “The Forrester Wave™: eSourcing Suites, Q4 2005” report. For more information on services procurement solutions, see the April 20, 2007, “The Forrester Wave™: eProcurement Solutions, Q2 2007” report, and see the September 17, 2007, “Services Procurement Grows Despite Obstacles” report.

¹⁹ Outsourcing certain business functions, such as billing, claims processing, or payment processing may also make sense. In some cases, specialized outsourcing vendors can provide better quality service at a lower cost, thanks to economies of scale, lower labor costs, and specialized process expertise.

²⁰ For evidence of the shift from IT outsourcing megadeals to smaller deals, see the July 5, 2007, “Outsourcing Providers Need A Strategy Rethink To Address Buyers’ Shift To Multisourcing” report. For guidance on multisourcing, see the August 22, 2006, “Reality, Risks, And Best Practices For Managing Multiple Service Providers” report.

²¹ For more information on IT operations scorecards, see the June 20, 2005, “What Are The Components Of An IT Operations Scorecard?” report.

²² For more information on the role of relationship managers, see the October 3, 2006, “From Relationship To Demand Management” report; see the August 13, 2004, “Relationship Managers Extend The CIO’s Power And Awareness” report; and see the July 23, 2001, “Roles And Functions Of Relationship Managers” report.

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