Strategic IT Initiatives: Moving ERP to SQL Server Yields Substantial Savings

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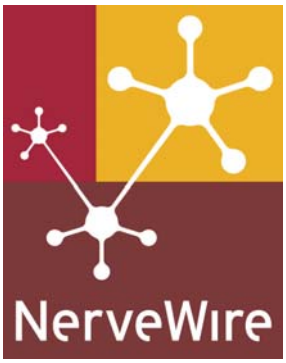

NerveWire study reveals 61% ROI from five successful ERP platform migrations to Windows and SQL Server

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This study was commissioned by Microsoft Corp. and conducted by NerveWire, Inc., a management consulting and systems integration firm focused on Collaborative Commerce Integration. NerveWire helps its Global 2000 clients integrate their customers, channels, and suppliers to attain new levels of shareholder value. Serving the Financial Services and High Tech sectors worldwide, NerveWire is headquartered in Newton, Massachusetts and has 200 employees. For more information, please visit www.nervewire.com.

REALTECH provided operating system and database migration services for the SAP migrations featured in this study.

REALTECH is a SAP Global Technology Partner, Global Alliance Support Partner, Certified Software Partner and Certified Service Partner with over 400 projects and 1000 software customers. REALTECH performed the first SAP R/3 OS/DB productive migration worldwide in early 1998 and since then has completed over 100 SAP R/3 OS/DB migration projects. More information about REALTECH can be found at www.realtech.com.

Strategic IT Initiatives: Moving ERP Systems to SQL Server Yields Substantial Savings

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Executive Summary

In this study, NerveWire analyzed five enterprise organizations that migrated their ERP database platforms to SQL Server from a leading competitor's product. During the database platform migration, four of the organizations also migrated from UNIX to the Windows operating system. The combined changes generated major savings for each company. All of the migration projects were viewed as successes, both operationally and financially. Enterprises can expect a return-on-investment of 61%, while exceeding the service levels achieved previously on the competitor's platform. In fact, one company in the study was able to achieve a 268% ROI.

The table below summarizes the survey's key findings:

ERP Migration: Summary of Savings[1]

	SQL Server / Windows 2000	UNIX Platform/ Competing Database	Savings
Five-Year Operating Costs[2]	$2,365,977	$2,683,503	$317,526
Cost Avoidance[3]			$525,825
Migration Costs			$(442,440)
Net Present Value (Five-Year Net Savings)			$400,911
Five-Year Return (Annualized IRR)			61%[4]

Notes: 1. *All figures in present value calculated using 10% discount rate. Figures include upgrades and maintenance of operating system and database platform; exclude ERP software purchase and licensing (which does not vary between hardware platforms)*
2. *Calculated using present value of five-year operating cost savings*
3. *Includes price of new UNIX hardware*
4. *IRR (Internal Rate of Return) of migration project stated as annual rate over five-year period. Migration costs are considered the initial investment and cost avoidance is considered a benefit in the first year. IRR shown is less than that of individual participants due a reduction in UNIX hardware prices since the migrations.*

Source: *NerveWire Inc.*

Notably, the participants spent far less on their platform migrations than might be expected. The migration cost for those companies surveyed averaged just under $500,000, and ranged from $369,000 to $542,000. In addition, three of the five organizations achieved further savings thanks to expenditures they were able to avoid: each of the three had faced a significant UNIX hardware upgrade. For those three organizations, the migration provided savings from the outset, since the UNIX upgrade cost was higher than the cost of the new Windows-based environment.

The table below highlights the areas that drove the study's results. The biggest savings contributor is the lower hardware cost for Windows-based systems. Other benefit areas include lower operating costs for systems management and database management, as well as higher system availability. On average, IT managers can expect to devote fewer of their resources to routine administrative tasks in a Windows/SQL Server environment than in the UNIX/competing database platform.

Savings Drivers

	Impact	Savings Driver
Cost Avoidance / Hardware Savings	High	UNIX hardware substantially more expensive to acquire
Software Maintenance	High / Medium	Costs of ongoing database maintenance lower for SQL Server platform than for competing database
Routine Maintenance and Administration	Medium	Fewer personnel required to manage Windows / SQL Server platform

Source: NerveWire Inc.

Introduction

Enterprise Resource Planning (ERP) systems are the lifeblood of many organizations, providing vital operational support. They move products, book orders, assist in decision-making, track projects, and support numerous industry-specific needs. During the 1980s and 1990s, many mid-size and large organizations implemented ERP systems—often spending significantly to do so, and struggling with implementation. Today, however, most organizations have their ERP environments firmly in place. Aside from managing their ongoing operational requirements, IT managers must chiefly decide when and how to upgrade the core infrastructure supporting their ERP solutions.

This research white paper analyzes five organizations that all made substantial changes to their ERP systems. All changed their database platform, and four replaced their operating system platform as well.

Key Decision Factors. Why would anyone risk swapping out the core components of their ERP systems? The organizations in our study did so for these reasons:

- Avoid the purchase of expensive new UNIX hardware
- Generate efficiencies in ongoing database management and support
- Exploit relative ease of making the change
- Take advantage of the utility of the Windows 2000 / SQL Server platform

In fact, the IT managers we spoke with pointed out that ERP database migrations are not very complex. ERP software is built to run on a variety of database platforms, and is designed with most of the logic at the ERP application level. The organizations in our study spent, on average, about 290 person-days migrating their ERP platform, with their labor costs totaling slightly more than $100,000 each. Elapsed time for the migration ran about six months without staff needing to be fully dedicated during that time.

Another major decision factor was in-house experience. Four of the five organizations either did not have the desired level of in-house experience with the competing database platform, or felt that those skills were harder to acquire. The IT personnel interviewed provided anecdotal evidence that there are more available individuals skilled in working on the Windows / SQL Server environment than those versed in the UNIX/competing database platform.

Two factors helped make the migrations successful. First, each company employed a consulting firm to provide technical expertise, including assistance with project planning. Secondly, the organizations mitigated conversion risks by using standardized conversion utilities to help move the data from one platform to the other.

Methodology & Survey Summary

Five Real-World Migrations. Four of the five organizations migrated from one of the leading databases on the UNIX platform to the Windows 2000 Advanced Server/SQL Server 2000 Platform. The fifth organization, already on Windows, had only to change its database to SQL Server. Four of the study's participants were running SAP databases while one ran PeopleSoft.

Company Profiles. The organizations included in this study are mid-sized, with between 400 and 3,500 employees. Named users of the ERP systems ranged from 61 to 3,500. The organizations spanned a variety of sectors – three industrial companies, one service firm, and a public sector agency. Based on our study and the accompanying in-depth interviews, we believe that the organizations fairly represent the medium-sized ERP customer.

Interviewees. We spoke with managers who were thoroughly familiar with their company's ERP systems. They also had responsibility for the migration, and were involved with the initial planning and business-case analysis. Drawing from their experiences, we were able to reconstruct the business cases for each migration and understand the key drivers for their migration projects.

Study Participant Profile

Area		Firm 1	Firm 2	Firm 3	Firm 4	Firm 5
Company Profile	**Industry**	▪ Commercial Printer	▪ Public Sector Research Agency	▪ Steel Manufacturer	▪ Energy Company	▪ Temporary Staffing Services
	Country	▪ U.S.	▪ Canada	▪ Saudi Arabia	▪ Canada	▪ U.S.
Migration Details	**Previous Platform**	▪ UNIX/ Competing Database	▪ UNIX/ Competing Database	▪ UNIX/ Competing Database	▪ NT/ Competing Database	▪ UNIX/ Competing Database
	Migrated to Platform	▪ Windows 2000 Advanced Server/ SQL Server 2000	▪ Windows 2000 Advanced Server/ SQL Server 2000	▪ Windows 2000 Advanced Server/ SQL Server 2000	▪ Windows NT/ SQL Server 7[1]	▪ Windows 2000 Advanced Server/ SQL Server 2000
ERP System Statistics	**Total Number of Named ERP Users**	295	3,500	1,400	400	61
	Maximum Number of Concurrent Users	155	400	600	50	200[2]
	Daily Business Transactions[3]	4,500	7,000	12,000	49,600	3,000
	Database Size (GB)	116	50	150	140	18
	Availability After	99.995%	99.99%	100%	99.99%	100%
	Availability Before	93%	99.99%	80%	99.90%	98.5%
	# Months Operational on New Platform	10	7	14	28	9
	ERP Usage	Finance, HR, Logistics, Order Management, and Project Planning	Finance, HR, Procurement	Finance, HR, Logistics	Finance, Plant Maintenance/Materials, Sales & Distribution	Finance, HR

Notes: 1. Company already used Windows platform, so did not make operating system migration

2. Named users less than maximum concurrent due to high number of users accessing the system through Web interface

3. Refers to single complete unit of work, such as placing an order which could include several system- level transactions such as checking stock, assessing creditworthiness, etc.)

Source: NerveWire Inc.

Modeled ROI. To create a baseline view of a migration to Windows/SQL Server, we modeled the migration's costs and its associated benefits. The ROI analysis relies on the survey results and presents the savings a company could expect from such a migration.

Present Value & Other Assumptions. To account for the time value of money, most of the financial data in this white paper are in present-value dollars, using a discount rate of 10%. Also, wage rates are assumed to increase by 5% per year.

Modeling the Savings

Because each organization's situation is so different, it is not possible to simply average results across a survey sample. For example, one employs several database administrators for its ERP system while another dedicates just 15% of an individual's time to those functions.

Instead, we aggregated the survey data into a modeled view. This approach provides IT managers with a perspective on the anticipated costs and likely benefits of switching platforms.

The table below shows the main assumption behind the model, using a composite view of the interviews:

Model Assumptions

Area		Modeled Input
Migration Factors / Goals		▪Avoid new hardware upgrade on UNIX platform ▪Reduce ongoing software licensing expenses ▪Reduce ongoing support FTE (Full-Time Equivalent Employee) requirements
ERP System Stats	ERP Modules	▪HR, Finance
	Number of Users	▪1000 total (400 web/light), 200 peak
	Number of Transactions	▪7,000-12,000 average daily; 2,000-3,000 peak hour
	Availability	▪99.995%
Hardware	Number of Servers	▪2 Application servers (load balanced at the application level), 1 database server and 1 database server on standby for fail-over (to guarantee high availability)
	Database Size	▪200-250GB
	Migrated From	▪UNIX / Leading database product
	Migrated To	▪Windows 2000 / SQL Server 2000
Implementation Requirements	Time for Migration	▪6 months elapsed, 300 person-days (slightly higher than the 290 person-day average from the interview sample)
	Number of Staff Deployed (FTE)	▪1 Project manager, 50% dedicated for 6 months ▪1.5 staff focused on system/platform migration for 1 month ▪2 staff and 1 consultant focused on data management for 1 month ▪1.25 staff and 1 consultant focused on application migration for 1 month
Ongoing Staff	Number of Staff for Ongoing Support (FTE)	▪0.68 system operator ▪0.70 database administrator ▪6.2 ERP application specialists
	Number of Staff on Previous Platform (FTE)	▪0.75 system operator ▪1 database administrator ▪6.2 ERP application specialists

Source: NerveWire Inc.

Modeling 99.995% Service Levels. Three of the surveyed organizations had problems meeting service levels using the previous platform, and those challenges accelerated the upgrade/migrate decision. (One had difficulty managing the relationship with a service provider; the others simply had performance problems.) Although the organizations showed better service levels on the new platform, we felt that in several cases, the stated availability requirements were not built in to the system's architecture. In our view, the 99.995% reliability target (equivalent to about 30 seconds of unscheduled downtime per week) requires a design that includes fail-over. With that in mind, our modeled numbers below reflect clustering for fail-over, allowing the system to meet its desired service level requirements.

Model Results

Our modeled results show savings over five years. The savings include the cost of the initial migration, the cost avoided by not upgrading the old platform, and the change in ongoing system-management costs. As shown in the table below, the SQL Server migration projects were very successful for the organizations in this study, easily qualifying as good capital investments.

Migration Savings Summary

Cost	Windows / SQL Server $	UNIX / Competing Product $	Savings	Share of Overall Savings
Hardware	269,000	525,825		
Operating System /Database Software	73,600	n/a		
Migration Labor	99,840	n/a		
Migration Cost / Cost Avoidance	**442,440**	**525,825**	**83,385**	**21%**
Ongoing System Operations	135,475	215,167		
Ongoing Data Management	200,822	286,889		
Ongoing ERP Management	1,849,636	1,849,636		
Ongoing Labor Costs	**2,185,934**	**2,351,692**	**165,758**	**41%**
Software Maintenance & Upgrade	**50,270**	**106,749**	**56,479**	**14%**
HW Maintenance /Upgrade[2]	**129,773**	**225,062**	**95,289**	**24%**
		Total	**400,911**	**100%**

Notes: 1. All dollars in present value using 10% discount rate
2. Hardware maintenance and upgrade include cost of hardware upgrade for each platform in Year 4. Upgrade assumed to be internal server upgrade (adding processors). Total upgrade cost assumed to be 50% of cost of new hardware.

Source: NerveWire Inc.

Migration Costs

Hardware. Hardware investments were the most significant cost component favoring the migration to SQL Server. This analysis accounts for any potential savings generated by avoiding an upgrade on the competing platform. As long as there is a price gap between Windows-based hardware and UNIX-based hardware, there's an opportunity for savings. Overall, the organizations we studied had larger cost-avoidance wins than those modeled below. However, the price gap has narrowed based on recent hardware price drops on the UNIX platform, so we have used the new UNIX cost numbers to bring the analysis up-to-date.

Windows Platform: Hardware Migration Configuration & Costs[1, 2]

Server	Quantity	Price	Total
Application Server	2 (4 processors each, 4GB RAM)	$45,000	$90,000
Database Server	2 (4 processors each, 4GB RAM)	$45,000	$90,000
External Storage	300 GB – RAID 5 Storage	$54,000	$54,000
Additional Development / Testing Environment	1 (2 processors, 4GB RAM)	$35,000	$35,000
Web Server	N/a	N/a	Excluded[3]
		Total	**$ 269,000**

UNIX Platform: Hardware Migration Configuration & Costs

Server	Quantity	Price	Total
Application Server	2 (4 processors each, 4GB RAM)	$104,850	$209,700
Database Server	2 (4 processors each, 4GB RAM)	$104,850	$209,700
External Storage[4]	300 GB – RAID 5 Storage	$54,000	$54,000
Additional Development / Testing Environment	1 (2 processors, 4GB RAM)	$52,425	$52,425
Web Server	N/a	N/a	Excluded[3]
		Total	**$ 525,825**

Notes:
1. *Hardware costs based on configurations similar to those of organizations surveyed, and on June 2002 hardware prices*
2. *Network infrastructure assumed to be in place before and after migration, therefore does not require additional cost outlay*
3. *Excluded since some organizations did not provide Web access. For others, the Web server was a Windows-based machine on both old and newly migrated platforms.*
4. *Disk storage costs assumed same across platforms*

Source: NerveWire Inc.

Software Costs. We have excluded ERP license fees, which account for the bulk of a company's ERP system software investment, since they are expected to be the same regardless of platform. Interviewees confirmed that point. Operating system licensing and database licensing, together, account for about 15% of the migration project's cost (breakout in table below.) We assume that the organizations already own the database licenses for their original ERP platforms so we do not include an initial acquisition cost for the competing platform's database product.

Software Costs for the Windows Platform

Area	Price	Initial Cost	Upgrade[1] Year 4
Operating System Licensing – Windows 2000 Advanced Server	$2,400 per server	$9,600	$6,557
Database License – SQL Server 2000	$16,000 per processor	$64,000	$43,713
ERP Software License – Outside scope of study	n/a	n/a	n/a
	Total	**$73,600**	**$50,270**

Note: 1. Upgrade for SQL Server and Windows 2000 Server incorporated in Year 4, taken as present value, discounted at 10%. Competing database software not repurchased; however, maintenance figures considered as cost avoidance.

Source: NerveWire Inc.

Note that organizations implementing an ERP system from scratch will be charged up-front costs for database licensing on the competing platform. IT managers analyzing such implementations are likely to encounter database license fees that are approximately twice the price of those for SQL Server.

Migration Labor Costs. The labor cost of migration is likely to range between 170 and 490 person-days, including consultant personnel, according to the study. Those numbers include everything from configuring the hardware to ensuring that the ERP application runs in the new environment. One of the organizations we surveyed was under a tight deadline to finish the migration so it could bring its ERP system in-house and terminate an outsourcing agreement. The company managed to complete the entire process in less than four months. The others wrapped up their migrations in six months.

Migration Labor Costs

Area	FTE Requirements[1]	Migration Cost[2]
Project Management	1 project manager, dedicated 50% for 6 months	$36,000
System Platform Level (System Operators)	1.5 FTE for 1 month[2]	$7,760
Database Level (DBAs)	2 staff, 1 consultant for 1 month[2]	$29,760
ERP Application Specialists	1.25 staff and 1 consultant for 1 month[2]	$26,320
	Total	**$99,840**

Notes: 1. Duration shown to reflect effort required for migration. Elapsed FTE time likely to be spread over longer period, depending on migration project's timeline

2. Includes consultant costs and internal FTE costs

Source: NerveWire Inc.

Breaking out the details of the labor cost, it is clear that system-platform tasks are evenly split between infrastructure architecture and infrastructure testing. The actual hardware configuration required the most time. For the database platform, it took significant time to migrate the data, which included QA and testing activities prior to the actual data conversion cutover.

Ongoing Operational Costs

Software Maintenance & Support Costs. Since ERP software and support costs do not vary based on system platform, we have omitted them. For platform level maintenance, the figures include one upgrade in year 4 for the Windows operating system. (Most UNIX users did not report an upgrade cost for the operating system.) The numbers in the table below show total savings in database licensing, covering both database support and license maintenance. The figures below assume one software upgrade in Year 4. The SQL Server figure reflects an upgraded version obtained in Year 4, essentially re-purchasing the software at that time. The competing platform's annual license maintenance is shown at 22% of the original license cost, and covers software upgrades at no additional cost.

Maintenance & Support Costs

Area	SQL Server TCO	Competing Product TCO	Percentage Savings
System Platform Level[1]	$6,557	$0	n/a
Database Licensing & Support	$43,713[2]	$106,749[3]	59%
Application	n/a	n/a	n/a

Notes: 1. *Included in the initial hardware cost, and captured as part of the system operator's workload. (Refer to Ongoing Operational Costs section)*

2. *Reflects present value of Year 4 upgrade to repurchase new version of database license*

3. *Competing product figure reflects annual database licensing at 22% of original license cost*

Source: NerveWire Inc.

Note that some organizations had very high annual database maintenance and support costs on the competing platform – much higher than those shown above. They dropped annual support for the competing platform after migrating to SQL Server, consequently producing another major recurring source of savings.

Ongoing Labor. The Windows/SQL Server platform generates ongoing savings from both system- and database-management efficiencies. Survey respondents pointed to the ease of setup and the lower resource requirements as important rationales for their decisions to migrate. Two of the five companies trimmed system administration FTE's dedicated to the new platform; one company closed up a skill gap it had suffered by not having a skilled DBA for the competing platform.

The figures below provide a reasonable expectation for ongoing DBA tasks. Since the actual numbers vary—one organization using as little as 10% of an FTE for DBA tasks, another requiring three DBAs—we have assumed that 75% of one FTE's time is dedicated to managing the database. That number is slightly higher for the competing product because of the complexity of the database. Overall, we assume that the DBA

resources are capable and responsible for managing production, development and test environments.

Application-level tasks are the same across both platforms because the ERP application is the same regardless of platform, and associated tasks do not change due to a platform migration.

Ongoing Labor Costs

Ongoing Labor Area	SQL Server 5-Year Cost	Competing Product 5-Year Cost	Percentage Savings
System Platform Level (System Operators)[2]	$135,475 (0.68 FTE)	$215,167 (0.75 FTE)	37%
Data Management (Database Administrators)[2]	$200,822 (0.70 FTE)	$286,889 (1 FTE)	30%
Total Platform Related Labor	**$336,297**	**$502,056**	**33%**
ERP Application Labor	$1,849,636 (6.2 FTE + 0.3 consultant)	$1,849,636 (6.2 FTE + 0.3 consultant)	no change

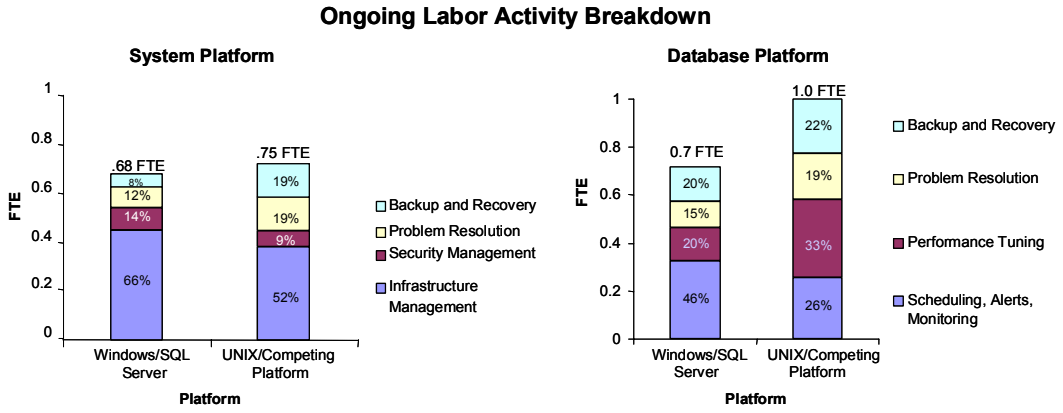
Notes: 1. Standard pay rates based on average rates for two levels of employees across all organizations surveyed

2. Includes support for Production, Development and QA/Testing environments

3. All figures above are present value using discount rate of 10%

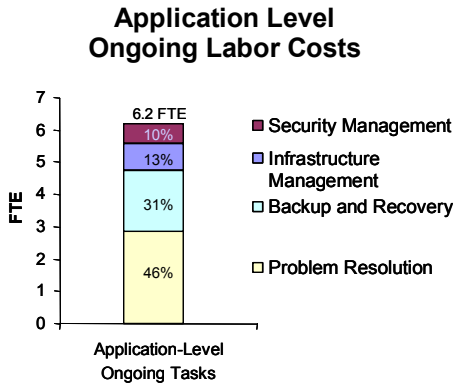
Source: NerveWire Inc.

The system administration task detail below shows that maintaining a set of Windows servers requires slightly less FTE effort than for the competing platform. System operators are busy with infrastructure management tasks for over half of their time; backups and problem resolution were also significant components on the competing database platform. In the case of the database platform, the competing platform needs more attention for performance tuning whereas on SQL Server many of those tasks are automated. Although SQL Server required less labor overall, its scheduling, alerts and monitoring tasks took more time than on the competing platform.



Note: *Task breakdown based on averages across the surveyed firms. Percentages may not add to 100% due to rounding*
Source: *NerveWire Inc.*

Regardless of which underlying database is used, application-level support is identical from one platform to the next. It is important to note that while the platforms may have changed, application tasks and processes didn't change at the application level. After migration, end users saw nothing different in their ERP applications, except for improvements in system availability.



Note: *Percentages may not add to 100% due to rounding*
Source: *NerveWire Inc.*

Conclusion

Enterprise organizations can gain increased ERP performance at lower cost by migrating to the Windows/SQL Server platform from UNIX/competing database platforms. Organizations that have made such moves have found that both operationally and financially, SQL Server is a cost-effective platform able to meet users' high standards.

The questions listed to the right represent some of the potential triggers that could prompt a platform migration. IT Managers who answer "Yes" to two or more of these questions are likely to find major benefits in selecting the Windows/SQL Server platform.

Triggers for Considering an ERP Platform Migration

- ☐ Does your firm/organization lack DBA-skills in your current database platform?
- ☐ Are you facing a UNIX hardware upgrade?
- ☐ Do you already have extensive investment and training in Microsoft technologies?
- ☐ Is your firm paying high database licensing maintenance / support fees?

Organizations considering database and operating system migrations should also review the following success factors:

- Use an integration partner. The expertise of certified integration partners—who are often required by ERP software vendors—was viewed as essential by the organizations surveyed for this white paper.
- Focus on the migration, and avoid mixing in other changes such as a version upgrades or new application capabilities.

Although our analysis was targeted at organizations considering a platform migration, the basic findings apply also to organizations selecting a platform for the first time. For those organizations, there is an additional benefit: the much lower initial database licensing cost of SQL Server compared to the competing database product.

CIOs and other senior IT managers facing a UNIX hardware upgrade have a clear platform choice to make. Given the excruciating IT budget pressures they now face, they would do well to opt for platforms that can cut costs without degrading performance or end-user satisfaction. Our survey of organizations that have successfully moved to new platforms reveals a combination of strong performance gains and solid financial benefits that should make many CIOs reassess their budget priorities.