

Accelerating Return on Investment for Storage

A White Paper
Prepared for Tivoli
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ENTERPRISE MANAGEMENT
ASSOCIATES

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Accelerating Return on Investment for Storage

Executive Summary

Enterprise Management Associates (EMA) examined the benefits that were received by users of Tivoli Storage Manager. Analysis indicates that key value was delivered in the areas of improved productivity of IT personnel and capital equipment; improved efficiency of network usage; and improved levels of service. This was achieved because of the product's:

- Built-in automation and simplified user interface, which enabled less-senior IT staff to assume greater responsibilities, thus freeing more senior staff for other, more cost-efficient, duties.
- Reduction in the hardware and media required to achieve near-total data recoverability, while allowing retirement of expensive backup hardware.
- Reduction in the amount of data traffic on the LAN, in environments without storage area networks (SANs).
- Virtual elimination of data traffic on the LAN, in environments with storage area networks.
- Limiting the impact of planned and unplanned outages, and facilitating rapid and sure recoveries when such were required.

Perhaps most significantly, data at risk was reduced to near zero, providing both the tangible benefit of assured business continuity and the less tangible but frequently referenced benefit of reduced stress for IT management. Our analysis indicates that use of Tivoli Storage Manager preserves the integrity of customer data, and thus ensures the viability of key business systems.

The above points are of considerable importance, but their real value is best appreciated when viewed within the context of the financial value received for the companies' storage investment. EMA's approach uses standard calculations to determine return on investment (ROI). Results from the sample population of large IT installations indicate that in many cases purchasers had payback periods of less than one year—an extraordinarily short period of time when compared with typical IT investments.

Obviously, a company's return on investment will depend on the efficiencies (or inefficiencies) of the products and the operations being replaced. Based on the experience of users interviewed however, we find clear indication that purchasers of Tivoli Storage Manager should anticipate extremely rapid payback on their investment.



The Value Proposition for Storage Technology

Enterprises now look to their IT operations as an opportunity to provide competitive advantage in their various marketplaces. Successful and pervasive use of Customer Relationship Management (CRM) and e-commerce software, for example, provide a revenue pipeline that few companies can afford to have halted.

Corporate IT organizations are accountable for maintaining the viability of such business-critical resources. While tending the hardware has always been the most visible part of their function, backing up data—and rapidly restoring it when needed—are typically viewed as among the most important services these groups render. Historically however, backups have been time- and labor-intensive, and recoveries have been both slow and, in many cases, of varying reliability.

Today's data centers are often expected to ensure data availability 24 hours a day, seven days a week, 52 weeks a year. Fundamental to fulfilling that responsibility is the necessity of a completely trustworthy system of backup and recovery. Given this requirement of 100% reliability, IT organizations must look to their vendors to provide increased efficiencies in all areas associated with the backup and recovery process.

While many companies will place special demands on their storage management software, a certain set of fundamental expectations applies across all environments. These expectations are that storage management software will provide:

- High data availability
- Backups that have limited impact on systems in use
- Rapid, easily available, and completely reliable data recovery
- Ease-of-installation, including personnel training and “ramp-up” time
- Ease-of-use in daily operation
- Reasonable purchase price and downstream costs, all of which will contribute to efficient on-going business operations.

The relative importance of these items will vary between companies, but all will certainly appear in a company's assessment of its own efficiency of operation. **In the final analysis, companies evaluating backup and recovery software must identify products that will preserve the integrity of their data and guard against the loss of key business systems, while at the same time increasing operational efficiency by minimizing the amount of backup data needed to achieve this goal.** IT organizations must therefore use some variation of the following process when they evaluate a vendor:

Step 1. Identify vendors whose solutions offer complete data recoverability.

Step 2. Identify those areas in the backup and recovery process that, when costs or productivity are improved, will have the greatest impact on the organization's efficiency of operation.

Step 3. Within the set of vendors identified in Step 1, select the vendor offering the greatest efficiencies in the areas identified in Step 2.

The Purpose of this Study

Enterprise Management Associates (EMA) recently undertook an ROI study on storage management to help end users better understand the potential operational and financial benefits. During the course of this study, EMA collected and analyzed data from the Tivoli Storage Manager's installed base of information technology organizations – primarily consisting of large North American corporations. This study was conducted to identify the cost-related and productivity-related variables associated with backup and recovery. Respondents were questioned on their operational practices, efficiencies gained, and investment in storage management related products both before and after Tivoli Storage Manager was installed. This study was undertaken in order to:

- Identify areas where improved efficiencies are needed in the management and implementation of backup and recovery operations.
- Quantify how a company's business processes can be improved because of increased efficiency of the backup and recovery operations.
- Determine if firms can achieve a superior return on investment (ROI) by investing in storage related technology.

Key Results

Analysis of the data from the Tivoli Storage Manager customer base yielded several important findings:

- Payback on the investment was rapid—and in some cases, extraordinarily short. This finding assumes added significance when the storage investment is compared dollar-for-dollar with other potential corporate investments.
- Improved revenue generation opportunities resulted from increased efficiency and reliability of the restore process.
- Staffing investment was optimized due to a decreased need for senior storage staff, and the lower number of staff required to support backup operations.
- Capital requirements were reduced for tape drives and supporting media.
- Data-at-risk was significantly reduced. This was identified as particularly important to enterprises doing business in segments such as banking and finance, where federal mandates exist regarding data availability and integrity.

Overall, customer satisfaction was uniformly high, particularly so when compared to satisfaction levels associated with the products that were replaced.

Return on Investment – EMA's Methodology

Return on Investment has been a popular way of proving and comparing the value of capital acquisitions for many years. It has the virtue of providing a metric that can be used to compare different acquisition opportunities within a common framework of business impact. EMA has developed an approach to ROI analysis for software solutions that is granular, with a unique perspective focused on the areas of most significance to IT management. Using information from actual customer cases, as well as default values established through experience, insight is provided into the true value of potential IT management purchases, allowing business buyers to properly gauge the impact of those purchases on the organization and its revenue-generating capability.



EMA's Return on Investment Process

EMA uses a three-step process in return on investment studies. During the process end users are interviewed and their operational practices are reviewed.

Step 1 – Collecting the Data Points

EMA's analysts first collect data through a series of conversations with end users. These conversations provide information in the areas of implementation, operations, efficiencies, and business impact.

Step 2 – Analyzing the Data

Gleaning meaning from the inputs is the second step. EMA uses many proven formulas to aggregate the data and extract meaning from them. In addition, EMA's analysts understand the context of each situation, and use that contextual insight to derive useful information from collected data.

Through analysis, EMA determines the impact behind the inputs – in areas like end-user productivity, operational efficiencies, and business impact.

Step 3 – Calculating the Return on Investment

Using the collected data points from Step 1 and the analysis from Step 2, EMA's analysts then calculate the ROI by first normalizing the inputs for time periods and personnel numbers, then grouping the inputs into the following categories for use in the ROI formula:

- Savings: operational costs, process costs, improved performance, greater efficiency of business services
- Incremental income: newly enabled business services, more efficient business services
- Cost of investment: product purchase price, implementation costs

In addition to the ROI calculation, EMA also considers several other accounting formulas, including Payback and Net Present Value (NPV), to provide a comprehensive perspective for use in purchase decisions.

Storage Management – A Recent EMA ROI Study

EMA recently undertook an ROI study on storage management to help end users better understand potential operational and financial benefits. During the course of this study, EMA interviewed customers in the Tivoli Storage Manager installed base, questioning them on their operational practices, efficiencies gained, and investment in storage management related products both before and after Tivoli Storage Manager was installed. The major findings of this study are contained in this paper.

Where to Find ROI in Storage Management Products

To most people, storage management seems like a “behind the scenes” process, part of the infrastructure. Most companies realize they need it, but few understand the impact that a good storage management solution can have on their environment. During the course of this storage management study, EMA found that the users of the Tivoli Storage Manager derived superior benefits in both timesaving of their storage management staff and in productivity benefits for their corporate users.



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Return On Investment for the product ranged from 270% to 4500%, meaning that users experienced an overall potential benefit of up to **45 times their initial investment**. With such a high rate of return, conservative calculations indicate a payback of less than one year, giving investment in the product a very favorable ranking when compared to other potential corporate investments.

Tivoli Storage Manager Walks the Walk at Shoe Retailer

When a large shoe retailer based in the southeastern United States decided to improve their storage management capabilities, Tivoli Systems stepped up to the challenge offered. The shoe retailer was using NetBackup by Veritas, a storage management system targeted to the open systems space. Unfortunately, NetBackup's capabilities were limited from a true enterprise perspective and did not allow for the discipline necessary in a growing retailer that prides itself on using data to move merchandise through its 400 stores. According to the Senior Systems Administrator at the retailer, Tivoli explained that storage management in an open systems environment could and should be disciplined in order to provide confidence in the ability to restore data in a crisis. Tivoli provided the retailer with both the software and the expertise to implement a dependable, automated storage solution – one that will scale with the company's growth plans.

Through every step of implementation and operational learning, this customer reports that Tivoli provided the know-how to make the integration painless, simple, and automated for the IT management staff of the retailer. Today, the retailer's IT department is able to provide storage management for the entire enterprise. In the past, only ¾ of a terabyte of data were backed up. Says the Senior Administrator, "NetBackup was slow and unreliable. With Tivoli Storage Manager's improved throughput, we are able to cover clients that we could not with NetBackup." Today, the product provides storage management for 2 terabytes of data on 20 servers. With an increase of over 250% in data being backed up automatically, comes the confidence that if data ever needs to be restored it will be done automatically by Tivoli Storage Manager with no significant loss.

The Senior Administrator attributes the success of the retailer's storage management implementation to several factors. Top of the list is the functionality of the software itself. "Tivoli Storage Manager is a very broad product – it is not complicated, but very robust." That broad functionality includes automated backups and recoveries, which has had a significant impact on the retailer's staffing requirement for storage management. The Senior Administrator estimates that the storage management staffing needs were trimmed by half – a significant savings for the lean IT shop.

The Senior Administrator credits Tivoli's consultants with helping the retailer plan its use and implementation of Tivoli's many storage management features. By using a disciplined approach, which was not possible with NetBackup, the Tivoli software has automated all aspects of the retailer's storage management – from backups to recoveries to tape management.

In addition, the retailer has increased confidence in their disaster recovery procedures. In the past, disaster recovery tests took a full two days (48 hours straight) in which to restore the company's data at a remote recovery location. With the new software, that recovery time has been reduced to 30 minutes – a significantly short time frame if a real disaster were ever to strike the data-dependent retailer.

"Tivoli's consultants supported us every step of the way – assuring us that our implementation would be a success," said the Senior Systems Administrator. "The software has done exactly what they said it would – which is very rare in my storage management experience."

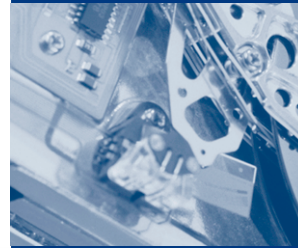
Efficiencies contributing to this high ROI ran across all operational tasks. Overall, companies found that they could do twice as much with half the storage management staff. Another contributor to the high ROI was the potential for capital budget cuts of one half or more in the areas of tape drive expenditures and related media.

Storage management that can effect efficient file restores was identified as having the potential to significantly impact users' productivity. Further, by saving end user time and thus optimizing end user productivity, storage management positively impacts the company's ability to generate revenue.

Why Customers Chose Tivoli Storage Manager

During the course of the study, EMA identified several predominant reasons why storage management customers chose Tivoli Storage Manager after evaluating the alternatives. The most important reason is that **companies realized their data were at significant risk with their current backup and recovery products. In many cases, over 50% of the companies' data were at risk of not being restorable**. Additionally, many companies expressed little confidence in a major competitor's product, even in its ability to verify that data had been successfully backed up. Both situations are clearly unacceptable. Other reasons include:

- Significant capabilities over other offerings' ability to professionally manage open systems environments' storage needs
- Superior ability to support growth through scalability
- Broad platform support



- Ease of use coupled with robust capabilities
- Speed and efficiency of storage management functions
- Overall reliability and predictability of automated operations
- Knowledge and availability of Tivoli consultants to guide implementation and initial operations

Overall, customers in this study were satisfied with the product and with the support received from Tivoli. Respondents feel they are using the automated storage management features to their companies' best advantage.

Review of Findings

EMA found that the new software provided improvements across the board in storage management operations and staffing savings. However, the most important finding of this study is that *Tivoli Storage Manager virtually eliminates many organizations' risk of data exposure*. This risk includes, but is not limited to accidental deletion, hardware failures, natural disasters, computer viruses and sabotage. Especially in large financial institutions, this study found that data was at risk over 50% of the time before Tivoli Storage Manager was put into use. This means that at any given time, if an outage were to mandate total data restoration, over 50% of the data would not be available for the company's use. With the software from Tivoli, the amount of data at risk dropped to less than 1%.

Reduction in Data at Risk

One of the most common ways that Tivoli Storage Manager reduced data at risk was by enabling backups to complete within the company's predetermined backup window. In every case, respondents reported that backup windows were not being met before the use of Tivoli Storage Manager. One respondent stated that the time needed to accommodate backups decreased significantly—from 16 hours to 3 hours—after the Tivoli software was put into use.

Before Tivoli Storage Manager was implemented, if backup windows were not met, respondents reported that backups were often left 'missing' in order to allow company workers to access the data. In many cases when backups were not complete, storage management personnel had to 'negotiate' with the departments owning the data – determining the balance of risk to the data vs. user productivity. When decisions were

Meeting Regulatory Requirements and Saving Money at the Same Time – Tivoli Storage Manager Makes Financial Sense

When you're one of the world's largest financial institutions, how do you assure regulators, as well as customers, that the data underlying your financial transactions is safe and secure? At one of the largest insurers in the United States, IT management turned to Tivoli Storage Manager to help provide the assurance that records were properly backed up and could be restored in any contingency scenario.

When the technical team lead for storage faced the fact that his organization's outstanding growth (which had resulted in three major insurance centers and scores of regional offices) had outstripped the capabilities of their current storage management system, he participated in an exhaustive search for a new storage management system. They needed a system that would support their broad open systems environment, while at the same time scaling to meet growing demands on IT due to mergers, acquisitions, and a healthy market for the company's products.

Three years ago, their search showed that Tivoli Storage Manager was the best of breed. That result is constantly under reevaluation in a permanent test environment where performance tests, recovery tests, and operational ease-of-use are evaluated as new products enter the market. Tivoli Storage Manager has stood the test of time and remains the incumbent.

Storage management assures the integrity of the financial data. Before installing Tivoli Storage Manager, data integrity was often threatened when backups could not be completed within the designated backup window. Tivoli software's reliability has eliminated that risk.

Additionally, Tivoli's automated features let the existing storage staff back up systems that support the company's 87% growth in personnel, assuring data continuity both for in-house staff and for the company's growing team of mobile workers.

Tivoli Storage Manager's built-in efficiencies paid for themselves in just a few months: the tape handling budget was trimmed to less than 10% of its previous level, and the capital equipment budget for tape drives was reduced by 75% annually. With these types of savings and the on-going commitment to remaining best of breed, Tivoli Storage Manager ensures that this insurance company can meet regulatory requirements for data availability and still add to the company's profitability by holding costs down.



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made to continue backups in order to protect data, freezes during working hours potentially rendered whole departments unproductive.

Reducing data at risk is key, especially in financial institutions that have strict regulations mandating data availability and integrity. Respondents at large financial institutions—banks and insurance companies—identified data as being at risk up to 60% of the time. Where the data is critical to operations, this level of risk is clearly unacceptable. The new software reduced the amount of data at risk to less than 1%.

Improvements in Staffing Levels and Span of Control

Across this storage management ROI study, companies using Tivoli's software experienced staffing efficiencies resulting in the need for 50% less staffing for storage management operations. In addition, the lower staffing level was able to handle increased corporate personnel growth of 20 to 87%, and backups were increased 303% to 2300%. Improvements in efficiencies were found in all areas of operational tasks, with the greatest improvements found in tasks related to backups, restores, storage server expansions and disaster planning. Improvements were also seen in restarts, capacity planning, and tape handling.

Improvements in Operational Tasks

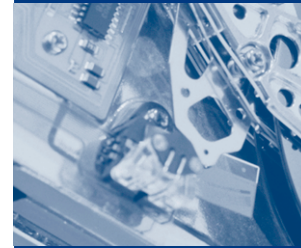
For the task of backups, users reported significant efficiencies in staff due to the use of Tivoli Storage Manager. Users claim the time spent by staff related to backups dropped an average of 26 times. This timesaving has been applied to other areas of IT management. In addition, users are backing up increasingly more data than they were before Tivoli Storage Manager—at a minimum, two and a half times more—with no incremental staffing required.

Many respondents cite the area of restorations as another huge potential for efficiencies, reporting that time for restoration has been cut to less than one-tenth of the original time. One financial institution translated this savings into one head count per year.

Users identified restarts as another area of improvement. All respondents reported that before the Tivoli software was installed, restarts were virtually impossible. With previous storage management solutions, either the restart capability was lacking, or the restarted procedure would not allow for a full backup within the designated window. In these cases, backups were aborted. All respondents stated that with Tivoli Storage Manager restarts, when necessary, they are fully automated and the task time for restarts was reduced to zero. One respondent said, "I expect not to wake anyone to do a restart. With Tivoli Storage Manager, I have accomplished that."

In large shops especially, huge efficiencies were reported in the area of tape handling. One institution reduced tape-handling personnel from 150 to 10 because of automation. In addition to the salary savings, that shop also realized benefits from reduced training time – previously, each tape handler had been brought into the corporate office once a year for storage management training. After Tivoli Storage Manager was put into use, travel expenses and training time for 140 people were eliminated.

Respondents at larger institutions also spoke of time delays attributed to finding the proper tape for restorations – a process that disrupted business and often required a wait of more than a day to locate and bring in the tape for restoration. If the wrong tape were brought in, the process started over again. With the software from Tivoli, such delays were eliminated and staffing budgets for 'tape handlers' were trimmed, sometimes significantly.



Storage server expansions, which generally caused respondents anxiety in the face of downtime, were reported to be 13 times faster with Tivoli Storage Manager. In addition, server expansions can now be performed during operating hours rather than waiting for weekends or third shift non-peak times.

Respondents that take part in disaster recovery simulations reported that data was restored and available for use 14 times faster than with previously installed systems. Many cite this as a point of relief – feeling less stress about the ability to perform should a massive recovery ever need to be undertaken. In addition, this has significant implications for the business and its ability to maintain continuity of operations in the face of a crisis. One respondent said that corporate disaster recovery simulations previously had to be conducted with six teams of IT management personnel – one team for each type of platform in their open systems mix. With Tivoli Storage Manager, the annual simulation is now handled in one week by one centralized team covering all platforms. Not only is the recovery scenario simpler, but the company also saved five weeks (one week for each team that is no longer needed) of disaster recovery exercise time and reduced the need for staff to be off site.

Impact of Automation

Tivoli Storage Manager's extensive automation had a huge impact on the users and their organizations – from allowing restructuring of storage management tasks to reducing the overall time spent on storage management. The automated progressive backup process was credited with the bulk of savings related to operational tasks. Adaptive Differencing, which makes intelligent choices about whether to transfer data at the file, block or byte-level, also contributed to those savings in some cases, by improving backup performance up to 10 times. In one case, a respondent stated that Adaptive Differencing saved him the cost of doubling the number of tape drives that would otherwise have been needed to handle the increased volume of data under management.

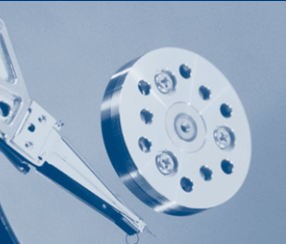
Another feature of the software, Dynamic Multi-Threading, which improves performance by dynamically managing complex (multi-threaded) operations, received credit for helping backups meet designated backup windows. According to respondents, such performance features aid in getting backups and restores done faster and thus reduce the risks to which their data had previously been exposed.

Tivoli Storage Manager's Web-based enterprise console won much praise during the course of the survey. It received high marks from administrators both in ease-of-use and in time spent monitoring. With the Web-based console's ability to access storage information from any location, users reported timesavings equivalent to three head counts per year.

Other automated functions that won customer accolades were the enterprise functions: enterprise command routing, enterprise reporting, enterprise configuration and policy management, and enterprise logging. One site suggested that enterprise command routing alone saves their operation 1/3 of a person 24x7, or the equivalent of over one man-year. Others reported savings of up to 2 man-years by using enterprise configuration.

Efficiencies Gained in Storage Resources

Tivoli Storage Manager's economical use of storage resources has led customers to realize savings in budgeting for those resources. For instance, a 50% reduction in the need for planned tape drives was ascribed to the implementation of the product. For large companies, the average savings was over \$1M per year in tape drive expenditures. The lessened demand for tape drives also reduced the number of tape drive failures, leading to reductions in the amount of data at risk.



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Use of progressive incremental backups, which only back up files that have changed since the last backup, meant less wear and tear to tape drives, fewer tapes needed, less network traffic, and more efficient tape handling and backup granularity. Tape media expenditures were cut by over 80%.

Availability – Impact of Outages and Service Degradation

Outages and service degradations impact both the users of those services and the IT personnel that have to rectify the situation. In storage management, EMA separates outages into two areas. The first is outages of services—LAN outages, server outages, etc.—both planned and unplanned. The second is data outages, where data has to be recovered via the storage management system.

Using Tivoli Storage Manager, respondents reported the elimination of many of the outage and degradation situations that compromise the integrity of their storage management programs. Chief among these is the ability to perform storage server upgrades quickly, without taking the servers down. For many shops, this means not having to schedule weekend storage server shut downs, reducing related IT personnel burden, and reducing the associated risk to which data is put when businesses depend on data seven days a week.

Many respondents reported restore outages before Tivoli Storage Manager use. Such outages proved costly – ranging up to over \$2M per year in lost user productivity, as well as the business impact of lost revenue potential.

Although respondents were largely unable to quantify many outage situation improvements, all reported the Tivoli product improved network usage in relation to past storage management systems. Some reported that before Tivoli Storage Manager, all storage management tasks requiring network resources had to be scheduled outside business hours due to the drain on the network. Storage management tasks such as restores, previously impossible due to the overload on network resources and the consequent impact on end user productivity, now take place during working hours.

Data outages, where data has to be recovered by the storage management system, eventually fall into two categories: outages where data is unrecoverable, and those where data is recoverable. With Tivoli Storage Manager, data was recoverable. Furthermore, *recovery times were reduced to a fraction of previous times*. This resulted in eliminating time needed to recreate data, and in timesavings for staff previously required in the attempt to restore unrecoverable data. In addition, using this product eliminates an area of negative business impact: lost revenue generation opportunities ascribed to unrecoverable data.

For unrecoverable data events, significant savings were seen in large organizations, especially large financial institutions. At one institution, user productivity savings were estimated at over \$300,000 per year, while the business impact of that productivity loss was estimated at almost \$3M.

For recoverable data events, Tivoli Storage Manager users indicated that IT time spent on each event was reduced to less than one-tenth the amount of time spent with a previous storage management system. That equates to savings in IT personnel and user productivity, and to reduced stress. Before the Tivoli software was installed, users were sometimes idled while waiting for restorations, resulting in reduced productivity valued in the hundreds of thousands of dollars per year, and a business impact generally double that. **One financial institution reported having experienced a major crash resulting in the need to restore 180GB of data over a weekend—business-critical data used by thousands of workers. With Tivoli Storage Manager, the task was completed successfully. The respondent feels the data would not have been recoverable with the old system.**



Business Impact

Over the course of the study, respondents repeatedly reported that using Tivoli Storage Manager resulted in a positive business impact. User productivity was improved at every company interviewed, resulting in a positive impact not only in the salary savings related to those productivity improvements, but also in the related opportunity for the company to increase revenue. Customers with e-business and e-commerce data being controlled by storage management will realize even more potential for benefits in this area.

Investment in Storage Technology

Across the board, investments in Tivoli Storage Manager were similar to investments that could have been made in other storage management solutions. Large financial institutions invested an average of \$1.2M in Tivoli Storage Manager software and maintenance for the first year. This expenditure dropped by more than half the second year, and then leveled off at maintenance levels for years three and beyond. For smaller firms, the leveling off to maintenance came in the second year, with average expenditures around \$60K the first year.

Improved Storage Management = Improved Productivity

The data indicates several significant areas where improved management of storage resources results in major productivity improvements. EMA identifies the metrics associated with these categories as particularly significant in the calculation of return on investment for storage management products.

Regardless of whether the main consumers of IT services are internal corporate users or end users, key contributors to improved productivity may be categorized as:

- Factors contributing to increased efficiencies in the use and deployment of personnel.
- Factors contributing to increased efficiencies in the use and deployment of capital equipment.
- Factors contributing to increasing or guaranteeing the level of service provided to users.

Variables that contribute to these categories include those associated with savings in process and operational costs, variables that identify savings affected through improved performance, and indicators of where incremental revenues have been enabled by improved service levels.

Improving IT Personnel Productivity

This category aggregates variables relating to the hiring and use of staff. Obvious improvements in this category come from opportunities to reduce manpower associated with certain backup and recovery tasks. Less obvious but equally important benefits derive from reducing the time and expense of training (variables associated with the “learning curve”), and with the capability of a well-designed GUI to manage highly automated tasks, thereby enhancing the capabilities of less-senior staff members. Simply stated, productivity improves when fewer staff can accomplish more, and when junior staff can assume duties that formerly required more expensive personnel.

In many IT shops, senior people are very expensive and frequently in short supply. In all IT shops, staffing is a major expense. All respondents to EMA’s study reported that implementing the Tivoli product resulted in either the ability to reduce staff, in decreased time required to perform basic tasks (such as tape

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movement and location), in the opportunity to release senior staff to more demanding and cost-efficient tasks, or in some combination of the above. Startlingly, one company with multiple distributed computer rooms reported an opportunity to reduce staff supporting backup operations from 150 to ten.

Improving Capital Equipment Productivity

This category aggregates variables relating to the deployment and use of storage-related capital equipment. In our analysis of backup and recovery, we include here tape drives and their media, but *not* the switches, routers or other infrastructure that in some cases might be seen as integral to these operations. Disk drives are also not included here, although some would have been included had any of the study's respondents utilized disk-to-disk backups.

Productivity gains in capital equity derive from optimizing the use of existing equipment. Such optimization may result in getting more done with the same equipment, in the opportunity for early retirement of previously required equipment, or in the opportunity to delay expenses that would have arisen with the purchase of new equipment. All respondents received value in this category.

Productivity gains in the capital equipment category are a very visible justification of the benefits of improved management of storage resources. One Tivoli Storage Manager installation spread across four data centers reported that it was able to remove 38 tape drives from service, moving them to a "surplus" designation where they are now held in reserve against further corporate needs. As these were high performance drives costing approximately \$27K each, savings were calculated by the enterprise in excess of \$1M. Due to the reduced requirement for tape drives, *two respondents reported savings in the first year that essentially equaled the purchase price of the Tivoli Storage Manager software.*

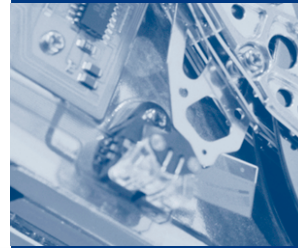
Improving Levels of Service

This category aggregates variables that relate to managing, delivering and improving service levels to stakeholders of storage-related IT services. Quantifying the impact of improved service levels is complex, and involves both variables that could lead to added cost (such as increased staffing requirements needed to achieve a higher level of serviceability) and variables that enable improved revenue opportunities (for example, a more efficient network enables greater customer access).

Tivoli Storage Manager shops see improved service levels as a consequence of decreases in *planned down time*, decreases in *unplanned down time*, faster *recovery*, *elimination of incomplete backups* due to a new ability to complete backup tasks within assigned maintenance windows, and (probably most importantly) *elimination of unrecoverable data* events. EMA calculates the resultant revenue impact at one of these sites at *greater than five times the purchase price of the product.*

Technologies that Result in Improved Storage Management ROI

Several advanced technologies reduce the workload or otherwise improve the efficiency of the IT staff and the supporting network infrastructure. While each implementation of such technologies provides increased opportunities for improved ROI, the advantages to large enterprises multiply when advanced features can be leveraged across multiple platforms within the corporate data center.



Reduced Data Traffic Leaves the LAN Available for Other Tasks

Tivoli Storage Manager's database tracks all new and modified files under management, providing a unique implementation of progressive incremental backups. With the software's **progressive incremental backups**, no full backup is required after the initial full backup. As less data is stored, users see a consequent reduction in tape drive and tape media usage. Less data movement takes place, network traffic is reduced, and data recovery becomes a simple, one-step operation requiring fewer tape mounts.

While all users require backup and recovery services, in many cases it may be necessary to limit the amount of data certain users can send over the network. While this circumstance is most often encountered with dialup telephone lines, corporate policies may dictate limited network access for other users as well. The product's **adaptive differencing** technology installs a backup client on such machines. This client determines whether file, block or byte-level data transfer is most efficient, further optimizing the flow of backup traffic.

Enterprises with Storage Area Networks (SANs) can eliminate LAN data traffic entirely with Tivoli Storage Manager's **LAN-free data transfer** capability, which backs up and restores data directly to and from SAN-attached devices. In this case, the LAN is only used to exchange policy and metadata information about the objects being protected, and as a failover for the SAN.

Simplified Manageability Leads to Efficient Management

Administrators find efficiencies in a number of areas with Tivoli Storage Manager. Schedules and **scripts** can be used to automate staff-intensive functions, and to implement and manage policies. Enterprise-wide management functions allow policies, configurations and commands defined on one server **to be propagated to all other servers**. **Enterprise reporting** and **logging functions** let administrators obtain information about the Tivoli Storage Manager for the enterprise as a whole, and to log events from all clients to a single designated server.

Finally, by using a standard Web browser, administrators may access the Web-based management console to oversee processes on Tivoli Storage Manager backup clients and servers from any platform in the enterprise, including mobile platforms.

Conclusion

During the course of this storage management study, EMA found that Tivoli Storage Manager received high marks from customers for its ease of use, its advanced automation features that increase the efficiency of operational personnel, and the operational and organizational cost savings that contribute to both an improvement of storage resource management and to a very positive return on investment. EMA's assessment is that the average ROI delivered to the companies participating in the study more than meets the most stringent return on investment requirements. In addition, payback periods were low – in all cases, less than one year. Coupling those with a high Net Present Value in the range of 10 to 19 times today's investment, Tivoli Storage Manager deserves careful consideration when enterprise organizations anticipate moving to a sophisticated storage management solution.

Based on the observations in this study, institutions choosing Tivoli Storage Manager will also find that—more important than an excellent return on investment—the software can play an important role in reducing data at risk. This point is important to any organization, but especially financial institutions where the data involves monetary transactions and the expectations for data integrity are heavily regulated.

About Tivoli Software from IBM

Tivoli software from IBM helps enable an IT organization to reduce the total cost of ownership and improve service levels of the IT infrastructure. Tivoli systems management software helps traditional enterprises and e-businesses worldwide manage security, storage, performance and availability, and configuration and operations. Backed by world-class IBM services, support and research, Tivoli software is one of four key IBM Software Group brands: DB2, Lotus, Tivoli and WebSphere. For more information, visit www.tivoli.com/storage.

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Enterprise Management Associates, Inc. is the fastest growing analyst firm focused on the management software and services market. EMA brings strategic insights to both vendors and IT professionals seeking to leverage areas of growth across e-business, network, systems and application management. Enterprise Management's vision and insights draw from its ongoing research and the perspectives of an experienced team with diverse, real-world backgrounds in the IT, service provider, ISV and publishing communities.

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