Quantifying the Value of a Modern Archive Powered by EMC InfoArchive

An ESG Economic Value Analysis

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Contents

Introduction

Executive Summary

Analysis Highlights, Typical Enterprise Use Case for InfoArchive:

- Modeled 246% ROI over five-year time horizon.
- Estimated ~8 months until InfoArchive investment is cost neutral.
- Nearly $2.9M in operational benefits beyond avoided costs.

ESG was engaged by EMC to develop a detailed economic value model and analysis to estimate the financial implications for an organization choosing to invest in its InfoArchive solution. The EMC InfoArchive investment scenario is compared with the "status quo" scenario of keeping an assortment of legacy applications in production for compliance reasons as well as retaining all application data for non-legacy applications in production, including any static data within those applications. The economic value model builds upon in-depth interviews with EMC technical stakeholders, relevant product demos, additional ESG market research related to typical enterprise application and data retention requirements, and ESG's general familiarity with the myriad of storage solutions available in the market today. The goal of the economic value analysis is to provide potential customers with a comprehensive picture of the direct and indirect costs and benefits that they should consider when evaluating an investment to meet their storage and data retention needs.

As discussed in the following pages, EMC's InfoArchive offering represents a financially superior approach to data retention compared with approaches that do not allow for application decommissioning or right sizing (through the archive of static data). Not only does the utilization of EMC InfoArchive allow for significant cost reduction compared with the status quo, it empowers significant incremental benefits for IT operations. In fact, ESG's analysis of a typical enterprise application environment in which EMC InfoArchive is introduced yields an estimated 246% ROI over the baseline—lowering TCO by more than $14M while adding incremental economic benefits in the range of $2.9M over a five-year time horizon. For organizations looking for an economically efficient way to manage all their applications—whether data-oriented or content-oriented—while still enabling long-term data retention, EMC InfoArchive offers an extremely compelling value proposition. This report summarizes the rigorous research ESG conducted to quantify the costs and benefits for EMC InfoArchive and communicates the results of this analysis.

Market Overview

In the midst of the rampant discussions on the impacts of exponential data growth upon the IT storage community, often a key element of the organizational churn—the lifecycle of the application—gets lost. As organizations mature, applications do not just drive data growth. The applications themselves change and evolve as well. As new departments come online and lines of business evolve, new applications are deployed and old applications are often retired. Amid the churn of application evolution, data growth acts as an overriding force adding complexity and ultimately cost. While a business may be able to move away from an application, often that same business is unable to separate itself from the data. For many organizations, restrictions on how data is retained are driven, whether internally or externally, by compliance or security concerns. The result is that maintaining, storing, and protecting critical application data often extends well past the lifetime of the application. This added dimension, the longevity of data, serves to further accelerate the amount of digital capacity that must remain accessible. Managing data that outlives applications and even storage hardware lifecycles burdens IT budgets and adds business risk to organizations.

The combined impact of application lifecycles and data growth manifests in a number of ways, including the challenge of retaining access to information contained within a decommissioned application and the burden of the stale data within an active application on the storage infrastructure. After decommissioning an application, organizations are often forced to choose between several bad options, including losing the information, manually inputting the old data into the new application, and maintaining the old application on its outdated infrastructure in essentially a "read-only" mode. Attempting to select the lesser evil, organizations often opt to maintain the

application as read-only. While the application may no longer be "in commission," it cannot be truly retired. This fact has numerous implications. IT systems and infrastructure remain dedicated to the application in case the data needs to be accessed. Often times these systems are obsolete, at higher risk of failure, and difficult to replace. Additionally, as the application remains a part of the infrastructure, it will also likely take up backup resources as well. As the data will experience little change, incremental backups will likely not be impacted, but full backup processes will continue to be burdened. Security enhancements for the decommissioned application often continue to be released, adding an incremental software qualification and maintenance cost burden. Finally, maintaining the tribal knowledge of how to access and retrieve information within the organization is not trivial. Someone within the organization must maintain these best practices, even though the need to use the application may occur rarely, potentially only once in a few years.

In cases where applications are not decommissioned, the sheer amount of data stored in active applications can overly burden resources. Active applications, especially those serving transactional workloads, often occupy the higher performing and more expensive storage resources. Almost all workloads, however, experience a correlation in probability of data access with how recently that data was created. In other words, older data is accessed far less often than new data. In many cases, access frequency can reduce to essentially zero after a set timeframe. That timeframe will vary based on the application and the use case, and could be 60 days, six months, or even up to a year. The takeaway is that in many cases, this stale data continues to unnecessarily eat up higher performing storage resources and over burden backup processes.

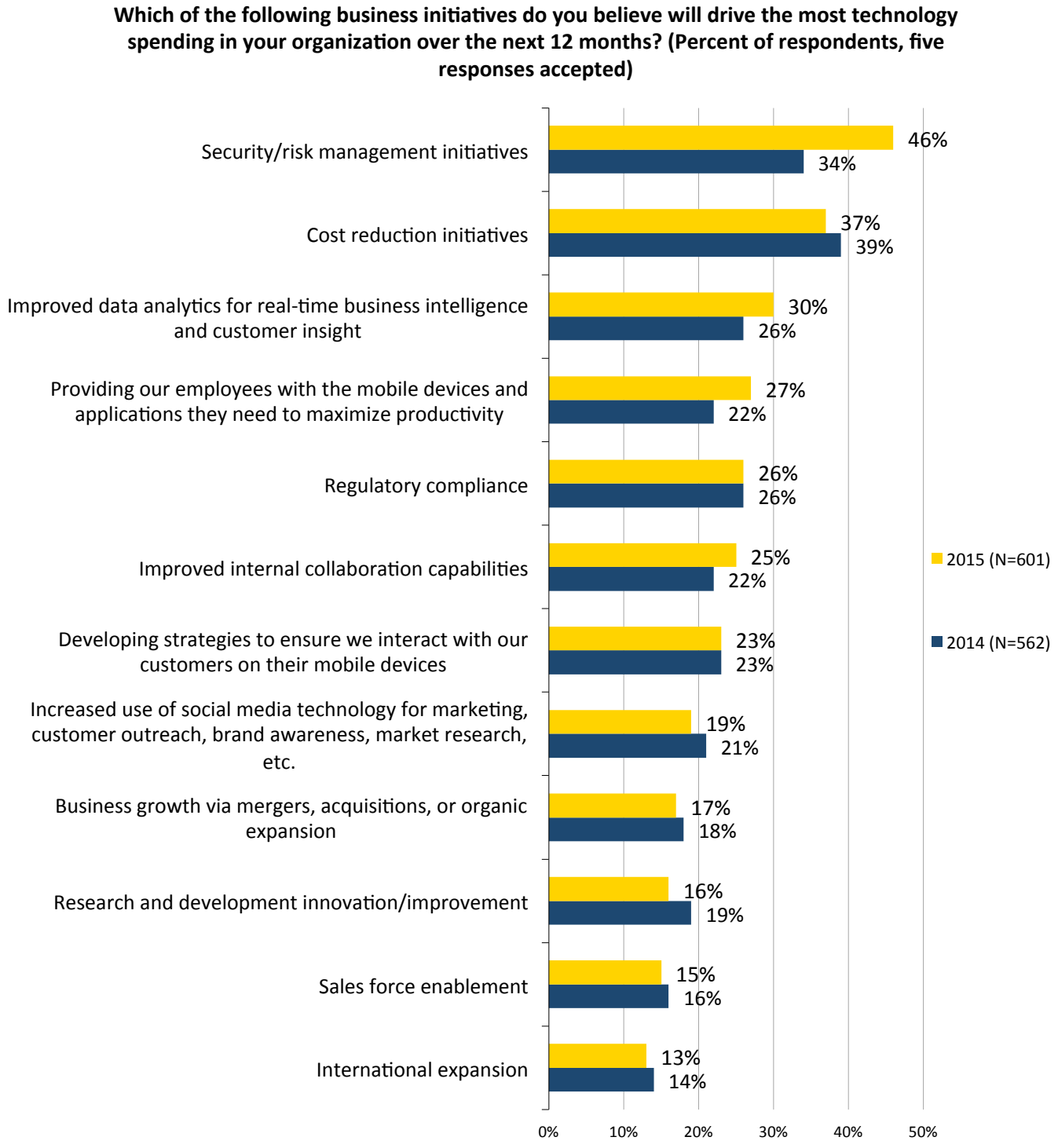
EMC's InfoArchive software is designed specifically to address these challenges. The solution allows organizations to consolidate, store, and protect stale data from both active and decommissioned applications in a single scalable archive. In order to support data from a variety of applications, InfoArchive provides the ability to ingest multiple types of structured and unstructured data. According to EMC, InfoArchive, designed for scale, is able to store and manage 100s of billions of individual records. InfoArchive optimizes production IT infrastructure by freeing it from the burdens of stale data and decommissioned applications. IT budget savings resulting from fewer application licenses to manage, less data to back up, and the more efficient utilization of higher tiers of storage can be reallocated to other and potentially more strategic value-generating projects.

Cost savings and infrastructure efficiency are not, however, the only advantages of InfoArchive. By centralizing archive content in a single platform, organizations with compliance and regulatory demands can more efficiently find and isolate compliance information. To better aid in this effort, InfoArchive offers the ability to layer greater contextual information onto digital assets, assisting with centralized search capabilities and helping ensure auditability. For organizations demanding regulatory compliance, InfoArchive supports a number of certifications including HIPAA, Dodd-Frank, and EMIR. In many cases when an organization is audited, a set timetable to comply is provided. Failure to meet the compliance window can result in significant penalties. A centralized and searchable archive, such as InfoArchive's, can provide peace of mind that data retrieval can be done quickly and efficiently, significantly reducing the risk to the business.

ESG recently conducted an in-depth research survey of 601 IT professionals concerning their organizations' IT spending plans and priorities for 2015 (see Figure 1).[1] In response to a question about the business initiatives that would drive the most technology spending over the next 12 months, four of the five most-cited initiatives fell into areas targeted by EMC's InfoArchive solution. How do I keep data secure? How do I keep costs in check? How can I store my data in a manner that opens up options for additional analysis? How do I meet regulatory compliance? The ability of InfoArchive to help reduce business risk and free up budget and resources aligns with the top initiatives IT leaders report facing today.

[1] Source: ESG Research Report, *2015 IT Spending Intentions Survey*, February 2015.

Figure 1. Business Initiatives that Will Drive the Most Technology Spending in the Next 12 Months



Source: Enterprise Strategy Group, 2015.

In this age of extreme data growth, the status quo is unsustainable for many organizations. Keeping information isolated within a decommissioned source application isn't cost efficient, scalable, or generally accessible to analytics engines. Unnecessary storage silos add preventable business risk as compliance and regulatory demands increase. Inefficient storage management prevents IT resources from being allocated to potentially more beneficial projects. InfoArchive offers an answer to these challenges, and ESG recently conducted a detailed economic value analysis to validate its capabilities and the resulting benefits.

EMC InfoArchive: Economic Value Analysis Overview

Methodology

For this project, ESG adhered to the following research and modeling methodology:

- ESG conducted initial market research to assess current market trends, vendor value claims, and the purchase considerations that are most important and relevant to enterprise customers as they relate to streamlining application portfolios and retaining data for compliance and regulatory requirements.
- Based on the results of this initial research, ESG subsequently identified a "present mode of operation" (PMO)—effectively, a traditional approach that customers may take to meet their data retention requirements—against which the costs and benefits of utilizing EMC InfoArchive was to be compared.
- ESG then conducted a series of in-depth interviews with systems engineering, service and support, and technical marketing representatives from EMC. The data collected in these interviews was used to refine assumptions built into the model related to current customer environments and the direct and indirect costs and benefits attributable to EMC InfoArchive and the PMO. Product marketing collateral, EMC-provided pricing material, and case studies of EMC InfoArchive use cases were also used to identify specific costs and IT workflows, as well as the labor burden in both time and cost, associated with those workflows. These findings were then compared against the results of ESG's qualitative and quantitative market research with organizations currently using a PMO-like approach. This research helped to inform ESG's understanding and analysis of archive solution adoption drivers, usage trends, and the operational and financial benefits that customers can realize.
- Once the economic model was finalized and all validation was complete, ESG modeled a default scenario designed to demonstrate the relative costs and benefits of EMC InfoArchive in a hypothetical enterprise environment. Those results were then compared with model outcomes for a similar-scale PMO approach. The results for this default scenario are described in the remainder of this paper.

Please note that the data and conclusions presented in this report regarding the costs and benefits associated with implementing and utilizing EMC InfoArchive compared with the PMO reflect the output of ESG's economic value analysis based on the specific use case and default scenario assumptions modeled for this report. ESG acknowledges that changes to these assumptions will lead to a different set of results and, as such, advises IT professionals to use this report as one validation point in a comprehensive financial analysis process prior to making a purchase decision. Non-EMC equipment and labor cost assumptions were obtained from publicly available sources such as IT vendor and channel partner websites, published price lists, and online salary estimation tools.

Economic Value Model Overview

As previously noted, ESG's EVV methodology compares two scenarios. The profiles for each scenario are:

- **EMC InfoArchive scenario:** In this scenario, the customer elects to streamline its application portfolio by decommissioning static legacy applications and archiving the static data in applications that cannot be decommissioned. This is accomplished with an archive—powered by EMC InfoArchive—which meets the organization's regulatory, compliance, and other retention requirements. EMC InfoArchive is modeled to be licensed by the TB and archive-grade storage is the presumed media for the archive. The model takes into account impacts to the storage environment, its backup requirements, and the impact on application licensing and maintenance over time. Costs are segmented into hardware, software, data center infrastructure, professional services, and support and maintenance categories. Related IT labor efficiencies for the ongoing administration of the storage and application environment are also within the scope of the model.

  The key IT operational areas estimated to be improved by EMC InfoArchive and used in comparison of both scenarios include:

  - Value provided to the organization enabled by repurposing a significant amount of production storage capacity that is no longer dedicated to housing static data.
  - Storage system administration and management over time, including system tuning and adjustments, tiering, and time and effort allocated to responding to break-fix events. Estimated as a function of usable capacity.
  - The impact of streamlining application infrastructure beyond reducing the production storage footprint. Includes reducing the server and mainframe infrastructure in the organization's data center as a result of it no longer being required to run decommissioned applications.

- **Present mode of operation scenario:** In this scenario, the customer elects not to decommission static legacy applications. Rather, the organization keeps those applications' data on production storage and also incurs the ongoing backup, maintenance, and support costs associated with those applications. Additionally, all data—including any static data—associated with applications that are not candidates for archive is also retained on production storage as well as backed up per the organization's retention policies. Once again, costs are segmented into hardware, software, data center infrastructure, professional services, and support and maintenance categories.

Simply put, ESG's model estimates the likely cost and potential benefits—according to the areas outlined—of retaining application data either by placing static data in an archive supported by EMC InfoArchive or by choosing to keep applications and their data in production.

Default Scenario

To illustrate the relative costs and benefits of leveraging EMC InfoArchive against the PMO, ESG developed a set of model inputs representative of a typical enterprise use case, including both legacy application decommissioning and "active archiving" (i.e., archiving the static data from an otherwise active application) components.

To describe a possible application decommissioning use case, ESG first assumes five applications, which occupy 20 TB of production storage, are candidates for decommissioning. Additionally, it is assumed that the organization currently allocates $2M annually in application support and maintenance to keep those applications in production. Finally, it is assumed that one mainframe system and eight production servers could be decommissioned if those five applications were retired.

To describe a possible active archive use case, ESG assumes that a 30 TB data store currently resides on high-end production storage. However, data over 12 months old—estimated as 80% of the store—could be archived. Additionally, it is assumed that when the archive is initially created, 35% of the data will be deleted rather than archived. Looking to the future, the data is expected to increase in volume by 30% annually. Finally, any data in the archive that is more than seven years old is eligible to be deleted, as long as it has been in the archive for at least one year, allowing the archive storage capacity and EMC InfoArchive licenses purchased to be reused.

These and other key assumptions can be reviewed in tabular format in Table 1.

Table 1. Key Default Use Cases and Assumptions for a Typical Enterprise Archive

Parameter – Application Decommissioning Use Case	Assumption
Number of legacy applications that are candidates for decommissioning	5
Average age of these applications	7 years
Amount paid annually in support and maintenance fees for these applications	$2,000,000
Number of mainframe systems retired due to decommissioning applications	1
Number of physical servers retired due to decommissioning applications	8
Total capacity of data associated with these applications	20 TB
Number of times data associated with these applications is replicated	1
Cost per TB of storage for these applications	$2,900
Frequency of full backups to tape for these applications	Weekly
Parameter – Active Archive Use Case	**Assumption**
Years of application data to be actively archived	5 years
Approximate age of data when it is a candidate for archive	12 months
Total current production capacity of data	30 TB
Number of times data is replicated	3
Approximate percentage of data that can be deleted rather than archived	35%
Forward-looking growth rate of file data	30%
Cost per TB of storage for these applications	$8,320
Frequency of full backups to tape for these applications	Weekly
Parameter – Additional Assumptions	**Assumption**
Time horizon of the analysis	5 years
Average annual salary for an IT administrator	$80,000
Number of mainframe systems an IT FTE can administer	5
Number of physical servers an IT FTE can administer	50
Number of TBs of production storage an IT FTE can administer	150
For every dollar spent on enterprise software, the number of dollars modeled to be spent on professional services	$1
The period of time over which professional services costs are incurred	Start up, Year 1

Source: Enterprise Strategy Group, 2015.

Economic Value Analysis Results

Summary of Results

With the model parameters tuned to the default assumptions in Table 1, ESG's economic value analysis concludes that the net benefits (including avoided costs) of implementing an EMC InfoArchive-powered archive greatly outweigh the associated costs. Table 2 shows the return on investment (ROI), payback period, average annual total cost of ownership (TCO), average annual avoided costs versus the PMO, and average annual incremental benefit enabled by EMC InfoArchive. The following sections detail the most compelling findings from this analysis as they relate to both the costs and benefits associated with these solutions.

Table 2. Economic Value Summary, EMC InfoArchive

Solution	ROI	Payback Period (months)	Average Annual TCO	Average Annual TCO Avoided Versus PMO	Average Annual Incremental Benefit
EMC InfoArchive	246%	8	$989,138	$2,843,625	$574,937

Source: Enterprise Strategy Group, 2015.

ROI

ROI is a financial ratio that compares net benefits (including avoided costs) against TCO and helps makes sense of the cost and benefit numbers estimated by the model. As displayed in Table 2, the ROI for EMC InfoArchive in ESG's default scenario is 246%.

Payback Period

ROI is not the "be-all and end-all" of financial metrics for determining the viability of a project or investment. Another important metric is the payback period, which is an estimate of when customers will see a positive return from their investment. As displayed in Table 2, the payback period for EMC InfoArchive, as modeled in our default scenario, is 8 months—a compelling breakeven point for a five-year time horizon.

Average Annual TCO of EMC InfoArchive and Avoided TCO versus the PMO

This ESG analysis considers five cost categories for both the EMC InfoArchive and PMO scenarios in its model: hardware, software, professional services, maintenance and support, and data center infrastructure.

- To calculate hardware costs, the model considers both the application decommissioning and active archive use cases, as well as how they are expected to scale over time. The model then estimates costs tied to the growth in production, backup, and archive storage capacity based on ESG-researched procurement costs for each tier of storage. The model also considers tape carrying costs and server sprawl over time as components of each scenario's hardware TCO.
- The chief components of software costs estimated by the model, per the use cases described in Table 1, include InfoArchive licensing costs (if applicable), backup software costs, and the portion of storage procurement costs estimated to be dedicated to the storage system OS and data services.
- Professional services are derived formulaically in the model. For every dollar estimated to be spent in either scenario on enterprise software—whether on InfoArchive licensing , backup software, or storage system OS licensing—it is assumed that one dollar will be spent on professional services. However, the model also assumes that all professional services costs will be realized at the beginning of the time horizon, specifically during the startup phase of the project and throughout the first year of the time horizon, while incremental licensing in subsequent years is assumed to not carry with it material services charges.

- In both the EMC InfoArchive use case and the PMO, maintenance and support costs are also estimated formulaically based on industry norms and cumulative hardware and software capital expenditures. Hardware maintenance and support is estimated as an annual cost equal to 10% of cumulative hardware CapEx. Similarly, software maintenance and support is estimated as an annual cost equal to 23% of cumulative software CapEx. Additionally, the assumption that $2M is spent annually to support static applications in the PMO scenario is a key assumption as this cost is eliminated when those applications are decommissioned.
- Three data center infrastructure costs are within the scope of ESG's model for both EMC InfoArchive and the PMO: power, cooling, and data center rack space. The model estimates wattage consumption for each solution's hardware configuration and assumes 24x365 operation, along with a utility rate of $.13/KWH to generate power consumption cost estimates. Similarly, the model estimates the BTUs dissipated by each solution's hardware configuration and the wattage needed to negate that amount of heat being introduced into the data center. Finally, ESG's model assigns a value of $12,000/rack for data center space. This cost can be viewed as either an opportunity cost (for example, every rack used for storage cannot be used for another purpose) or as a hard cost (for organizations renting space from a hosting or colocation facility).

By aggregating all of the cost categories, the total cost of ownership (TCO) of each solution for the default use cases presented in Table 1 is estimated by ESG's model. Both the average annual TCO in the EMC InfoArchive scenario and the avoided TCO (i.e., savings compared with the PMO) are displayed in Table 2. A transition from the PMO to EMC InfoArchive is expected to result in a 74% decrease in the annual TCO.

Average Annual Incremental Benefit

This ESG analysis considers two primary benefit categories for an investment in EMC InfoArchive: IT efficiency, and the financial return assumed to be earned on reduced costs compared with the PMO.

- Increases in IT efficiency include savings in storage administration labor, reduced server administration labor, reduced mainframe administration labor, and the benefit of freeing up and repurposing production storage capacity.
- The financial return earned on avoided costs is included to account for the fact that while saving is beneficial, investing those savings in other projects and initiatives is doubly so. The model assumes that every cumulative dollar EMC InfoArchive allows the organization to save in terms of TCO (for example, by reducing storage spend, backup software costs, and backup tape procurement and carrying costs over time) earns a 5% annual return for the remainder of the time horizon.

The sum of these two categories equals the total incremental benefit delivered by EMC InfoArchive compared with the PMO. The average annual benefit is the sum of all the benefit categories included in this analysis averaged over the time horizon of five years.

Quantifying Relevant Cost and Benefit Differences

Economic models are, by definition, abstractions from reality. In any model, numerous estimates and assumptions must be made. ESG's methodology leverages rigorous secondary market research and in-depth interviews to estimate material differences between two fundamentally different approaches to data retention and application lifecycle management. This section discusses important estimates incorporated into ESG's economic value model.

Comparative Cost Analysis

For the default customer scenario described, the subcategorized TCO for EMC InfoArchive and the PMO are displayed in Table 3.

Table 3. Subcategorized, Five-year TCO, EMC InfoArchive versus the PMO

Cost Category	EMC InfoArchive	PMO
Hardware	$1,063,227	$4,946,236
Software	$1,325,768	$632,930
Professional Services	$925,176	$71,928
Maintenance and Support	$1,458,694	$12,862,940
Data Center Infrastructure	$172,827	$649,780
Total	**$4,945,691**	**$19,163,815**

Source: Enterprise Strategy Group, 2015.

Key TCO estimates and assumptions, which drive economic differences between EMC InfoArchive and the PMO in ESG's model, follow:

- **Hardware:** In both investment scenarios, hardware costs are dominated by production, backup, and archive (if applicable) storage costs. The modeled assumptions that drive differences between the InfoArchive and PMO scenarios include:

  1. **Production capacity purchases:** In either scenario, new production storage purchases will only occur due to the growth of data in the active-archive use case because applications that are candidates for decommissioning are assumed to be completely static. In the PMO scenario, the original 30 TB data store, growing at 30% annually, increases to over 111 TB by the end of the time horizon. Additionally, this data is replicated three times, resulting in a total of nearly 450 TB of production storage purchases over the time horizon at an assumed hardware cost of $7,072/TB. By contrast, when an organization is able to actively archive its data, storage purchasing is modeled to be significantly reduced. To start, the organization archives all data older than 12 months, which is assumed to be 80% of the initial 30 TBs. As each year passes, data continues to grow at the same rate as the PMO scenario. However, by the end of a given year, the data that resided in production storage at the beginning of that year is modeled to have been archived. The result is that in the InfoArchive scenario, the active archive data store begins at 6 TB and grows to only about 26 TB at the end of the time horizon—after replication a total of 103 TBs are expected to be required. The result is a 75% reduction in production storage growth and costs compared with the PMO ($2,203,010 versus $557,412).

  2. **Backup storage costs:** In ESG's model, backup storage costs include two major components: tape purchasing for full backups and the cost of ongoing tape retention. By default, the model assumes that each tape can hold 1 TB of data, is procured at an average unit cost of $112.50 (which accounts for 25% of new tape needs being met by reusing old tapes), and is retained at a monthly cost of $.23/tape. These assumptions do not change across the InfoArchive and PMO scenarios. What does change is the amount of data retained in backups in each scenario. For example, in the PMO scenario, ESG assumes that seven years of weekly full backup data is, and will continue to be, retained for applications that could be decommissioned. In the InfoArchive scenario, it is assumed that backups are no longer retained once the applications are archived and retired, significantly reducing retention costs over the time horizon. Additionally, since production storage is modeled to grow much faster in the PMO scenario, future tape purchasing for weekly full backups in the PMO scenario outstrips future tape purchasing in the InfoArchive scenario commensurately. The delta between the two scenarios in future tape purchasing is then compounded over time by tape retention costs. The end result is ESG estimates that, for the scenarios outlined in Table 1, utilization of InfoArchive could reduce backup storage costs by 83% ($2,743,226 versus $460,278).

  3. **Archive capacity purchases:** The crux of this analysis is to compare utilization of an archive with the absence of an archive economically. One clear difference is that in the PMO scenario, no archive storage capacity would be purchased. By contrast, in the InfoArchive scenario, the 20 TB of legacy application data is archived upon deployment. Additionally, 80% of the 30 TB of actively archived file data is also a candidate for archiving. However, it is also assumed that 35% of the actively archived file data is able to

be deleted rather than placed in archive. The result in ESG's model is that the organization leveraging InfoArchive must procure 35.6 TB of archive capacity upon InfoArchive deployment and that archive is estimated to grow—even after accounting for capacity reuse over time due to dispositions—to nearly 64 TB at the end of the time horizon. Each TB of archive capacity is modeled to carry a $635 hardware CapEx charge, resulting in a total cost over the time horizon of $40,636.

- **Software:** As noted, software costs included in the scope of ESG's model include the portion of storage procurement costs estimated to be dedicated to the storage system OS and data services, backup software costs, and InfoArchive licensing costs (if applicable). The modeled assumptions that drive differences between the InfoArchive and PMO scenarios include:

  1. **Storage system OS and data services:** As outlined, in the PMO scenario, production storage capacity is estimated much faster over the time horizon when compared to EMC InfoArchive scenario. In addition to each TB of production storage resulting in significant hardware spend, ESG assumes that each TB results in nearly $1,250 in software CapEx dedicated to OS and data services licensing. As such, an investment in InfoArchive is estimated to reduce storage system software CapEx by $290,400 for the use cases described in this report.

  2. **Backup software costs:** As backup capacity grows over time, ESG's model assumes that backup software costs increase commensurately. ESG's model assumes a capacity-based cost structure of $3,000 in CapEx per TB for backup software. With legacy data no longer backed up and the actively archived file store right-sized, the InfoArchive investment scenario is estimated to save an organization nearly $200,000 in the use case examined by ESG.

  3. **InfoArchive licensing costs:** InfoArchive is licensed on a capacity basis and ESG's model incorporates cumulative volume discounts. In the scenario described in this report, $811,680 is modeled as an upfront InfoArchive licensing expense, and an additional $356,006 in licensing is modeled as the archive grows over time. These costs are not incurred in the PMO scenario.

- **Professional services:** Professional services are estimated as an incremental 100% cost over and above any software purchase, including storage system software, backup software, and InfoArchive itself. As the InfoArchive scenario is more software-intensive, the professional services costs are modeled to outpace those in the PMO scenario. For the use cases described in this report, the cost difference is estimated as $853,248 over the five-year time horizon.

- **Maintenance and support:** ESG's model estimates annual hardware and software maintenance costs as a percentage of cumulative CapEx costs incurred—10% for hardware and 23% for software. Additionally, in the PMO scenario, the organization must continue to maintain and support legacy applications (a major differentiator for the InfoArchive scenario) at an annual cost of $2,000,000. In total, for the use cases described in Table 1, an investment in InfoArchive is estimated to save $11,404,246 over a five-year time horizon.

- **Data center infrastructure:** There are two key differences related to data center infrastructure when examining the PMO and the InfoArchive scenarios.

  First, the infrastructure that supports legacy applications is retired in the InfoArchive scenario. By contrast, in the PMO scenario, that infrastructure is still in place, powered, and cooled. Per the inputs in Table 1, this infrastructure consists of eight physical servers—each assumed to occupy 2u of rack space, consume 425 W per hour, and dissipate 1580 BTU per hour—and one mainframe—assumed to occupy 42u of rack space, consume 8,800 W per hour, and dissipate 20,000 BTU per hour.

  Second, an approach that relies more heavily on replicated, high-performance storage is modeled to consume more power, dissipate more heat, and occupy more rack space than an approach that relies more on archive storage. In total, ESG estimates that the InfoArchive scenario will result in data center savings in excess of $475,000 over five years.

Comparative Benefit Analysis

For the default use cases described in Table 1, the subcategorized incremental benefits estimated to be delivered by EMC InfoArchive, beyond what is expected in the PMO scenario, are displayed in Table 4.

Table 4. Subcategorized, Five-year Incremental Benefits Delivered by EMC InfoArchive

Benefit Category	EMC InfoArchive
IT Efficiency Savings	**$1,439,179**
Reallocation/Reuse of Production Storage	*$914,720*
Server Sprawl Avoided	*$43,200*
Benefit from Decommissioning Mainframe(s)	*$54,000*
Storage Sprawl Avoided	*$427,259*
Financial Return Earned on Reduced Costs	**$1,435,505**
Total	**$2,874,684**

Source: Enterprise Strategy Group, 2015.

Benefits within the scope of ESG's model come in two flavors: First, some efficiencies are characterized as time saved for IT administrators. ESG uses a default average burdened annual cost of $108,000 for IT labor ($80,000 average salary burdened at 35%) as a proxy for the value of IT administrator time. Additionally, ESG's model employs a productivity correction factor, which assumes that only 50% of time saved to IT staff will actually be productive time and thus counted as a benefit. Beyond labor benefits, there are opportunistic benefits in which resources are reallocated and deliver a financial benefit. A detailed breakdown of modeled benefits includes:

- **Reallocation/Reuse of Production Storage:** One key way in which an organization can gain value from implementing an archive is through the freeing up of expensive production storage infrastructure. In the scenario described in Table 1, 40 TB of production storage will be freed up when the legacy applications are retired, after replication is considered. As enterprise storage is inherently fungible—it can be used to support another workload or to avoid future purchases—there is significant value in freeing it up. ESG's model uses the purchase price of this tier of storage, $2,900/TB, as a proxy for this value. Additionally, by archiving the static portion of active application data, an additional 96 TB of production storage is freed up at project startup. This tier of storage is assumed to be valued at $8,320/TB. In total, InfoArchive is expected to offer over $900,000 in economic benefit in the form of reallocated storage resources.
- **Server Sprawl Avoided and Mainframes Decommissioned:** As outlined in Table 1, eight physical servers and one mainframe are assumed to be retired as a result of application decommissioning. Not only does this reduce data center space utilization, power, and cooling—as outlined in the TCO section of this paper—but there is also a benefit to the IT organization that no longer needs to look after that equipment. To estimate this value, ESG's model assumes one IT full-time equivalent (FTE) can manage up to 50 physical servers. Similarly, ESG assumes that one IT FTE can manage up to five mainframes. Considering the computing infrastructure removed after applications are decommissioned, nearly $100,000 in IT efficiency is created by InfoArchive over the five-year time horizon.
- **Storage Sprawl Avoided:** The analog to reducing the IT labor required to manage computing infrastructure is the reduction in IT labor required to manage a slower-growing storage footprint. To estimate this value, ESG's model assumes that one storage administrator FTE can manage up to 150 TB of capacity. For the use case described in Table 1, nearly $430,000 in IT efficiency is estimated to be enabled through the use of InfoArchive over five years.
- **Financial Return on Reduced Costs:** As articulated in this report, an investment in EMC InfoArchive can significantly reduce costs over time. While reducing costs is clearly beneficial, it does not tell the full story for most organizations. In many cases, that capital can be put to work on other projects, investments, or hiring activity. These alternative investments often times earn an incremental return for the organization. To estimate this benefit, ESG's model assumes that every dollar saved as a result of an investment in

InfoArchive earns a 5% annual return over the remainder of the time horizon. For the scenario outlined in Table 1, this return is estimated to exceed $1.4M.

The Bigger Truth

In an ever-evolving world, businesses are constantly challenged to stay competitive. With a renewed industry focus on the potential of data and how leveraging that data provides value, IT organizations are better served using their scarce budget resources to optimize the value of their data instead of wasting it on inefficient data management. Additionally, when compliance is a factor, a centralized archive, such as InfoArchive, can significantly reduce the risk to an organization when complying with an audit request. The conclusion of this study reveals that for the workloads and parameters outlined, EMC InfoArchive can provide significant ROI benefits beyond what many organizations leverage as the "status quo." In review, ESG's analysis conveys that a typical enterprise application environment can achieve an estimated 246% ROI improvement prior to EMC InfoArchive being introduced. Additionally, InfoArchive was found to lower long-term TCO by more than $14M while adding incremental benefits in the range of $2.9M over a five-year time horizon.

ESG's analysis reveals the potential of EMC's InfoArchive, helping IT organizations optimize their storage environment, save expenditures, reduce risk, and free up resources to utilize elsewhere. Ultimately, the goal of an IT organization should be to leverage information to provide value back to the business. For the typical enterprise environment, ESG's analysis found that the deployment of InfoArchive could free up substantial budget and infrastructure resources. The resulting payout presents a disruptive opportunity for any IT organizations looking to focus on leveraging data to create value, rather than simply sustaining it. Overall, this is a remarkable set of findings for EMC's InfoArchive. ESG sees the effective use of data as a critical component for businesses as they struggle to stay competitive in the future. Based on the analysis, EMC's InfoArchive presents an opportunity for businesses to free up enough resources to not only compete, but to also potentially succeed.

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