

# I D C   E X E C U T I V E   B R I E F

## **Storage Economics: Assessing the Real Cost of Storage**

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### **Introduction**

As pressure increases on storage managers to deliver ever-higher levels of utilisation, security and flexibility, a new generation of highly efficient storage architectures will be required, one that can deliver significant cost savings across a wide range of whole-life operational costs.

The storage vendors have not been slow to react to this challenge and a plethora of technologies are now available to enhance storage performance, efficiency and manageability, including various forms of virtualisation, deduplication, thin provisioning and tiering. All have the potential to deliver significant operational benefits when implemented correctly.

The challenge for the user is in quantifying the real financial benefits delivered by these technologies during the complete life cycle of the solution. Users know that it is increasingly untenable to evaluate storage infrastructure investments in terms of simple metrics like cost/GB, and they are looking to vendors to provide better financial tools that can deliver a clear assessment of the real return on their storage infrastructure investment.

One such vendor that has risen to this challenge is Hitachi Data Systems (HDS), a Japanese manufacturer and vendor of storage solutions used primarily in enterprise and midsize companies. The company has developed a range of methodologies, tools and practices aimed at saving operational costs of high-end storage systems, which will be described and assessed in this paper.

IDC believes that in the current climate of economic slowdown and capital constraint, it is increasingly important for customers of high-end storage to evaluate the whole-life operational cost benefits of a proposed storage architecture, in addition to the usual capex considerations. Buyers should develop a detailed TCO baseline analysis of their current storage infrastructure, and make best use of new ROI and TCO modeling services in order to establish a strategic roadmap for driving down the overall cost of storage infrastructure.

## In This Executive Brief

This document is aimed at IT decision makers of large and medium-sized companies who are looking to provide a financial justification for their storage investments and initiatives. It provides an overview and assessment of the "storage economics" methodology employed by Hitachi Data Systems with its high-end storage hardware solutions. It is primarily aimed at companies with at least 70TB of storage under management.

The paper includes:

- A view of the whole-life costs of storage systems and the need for a better understanding of the economic impact of the storage architecture and operational characteristics
- An assessment of the storage economics approach employed by Hitachi Data Systems for its high-end storage business
- Future outlook, challenges for HDS and conclusions

## Situation Overview

Managing the rapid growth of data while keeping it secure, protected, compliant and resilient is a challenging task that is subject to a complex set of changing user priorities, SLA requirements and regulatory directives. Add in the budget and staff restrictions that are now commonly seen and the scale of the challenge is even greater.

Faced with these restrictions, many customers can no longer buy storage capacity "by the yard" in order to meet the company's growing demands. Each additional TB will be subject to a broad range of operational costs, which can be summarised as follows.

- **Data protection** — Includes the cost of the company's backup and business continuity infrastructure, which may include tape, replication, mirror sites and all related planning and operational activity.
- **Maintenance** — The cost of hardware and software maintenance is linked to the capacity deployed, whether it is in use or not. Also it may rise as hardware warranties and bundled service deals come to expiration.
- **Staff costs** — A significant portion is taken by the labour cost of storage administration, particularly in complex heterogeneous environments that may have multiple management interfaces and distributed architectures.
- **Environment costs** — Power, cooling and floor space costs are increasingly important as companies strive to meet efficiency targets that are often driven as much by a corporate and social responsibility agenda as the need to save money. A significant number of companies are reaching or have reached absolute limits on their datacentre growth and power consumption.

- **Outage cost** — Will vary widely depending on the company type, industry sector and application concerned. A realistic estimate of outage costs is a key element in planning the company's business continuity arrangements.
- **Information governance** — An increasingly important element in the total cost of storage, with its obligations for companies to hold data for longer periods of time with a demonstrable search and recovery capability.
- **Migration** — Bringing new capacity online, taking old arrays out of service or moving applications between platforms can involve migration projects that may be time consuming and expensive, particularly in non-virtualised environments.
- **Performance** — Extra costs are incurred by the need to deploy storage systems of sufficient performance and scalability to meet the requirements of the SLAs agreed with the IT users, and thus defer the need for further investment as user capacity needs and productivity grow.

When considering the total cost of storage ownership, the combined impact of this diverse and sometimes inter-related set of operational costs typically far outweighs the initial purchase price. In order to make a successful application for investment funding, an IT manager will increasingly be required to submit an objective and detailed analysis of the projected return on the investment, taking into consideration both initial capital outlay and a comprehensive view of the life-cycle operational costs.

### ***Applying an Analytical Approach: Storage Economics***

Two approaches are used to assess the financial value of a storage investment: TCO and ROI. These are sometimes combined in people's minds but each has a distinct application and required outcome.

- TCO (total cost of ownership) is used to compare two or more investment proposals by means of a comparison of their whole-life costs including initial outlay and operating costs. In a storage context, TCO may be used to compare a number of storage expansion options, where the underlying status quo is maintained.
- ROI (return on investment) is typically used to evaluate investments that may introduce savings through new ways of working. An ROI analysis is designed to answer three questions — how much will be invested, how quickly will this be repaid and how much overall saving can be expected.

Both are established approaches that are routinely used in financial analysis. However, if they were simple to execute, they would be widely used to evaluate proposed storage investments. The reality is that for many companies, the IT manager may be adept at evaluating new hardware and software technologies, but less confident in presenting a detailed financial model of the solution.

Also, the cost information required to make such an analysis may be partially unknown, out of date or the responsibility of another department in the company.

Whether or not the data is available, a thorough financial assessment of the proposed investment is increasingly a prerequisite of major storage investment. HDS has risen to this challenge with its "storage economics" methodology and toolkit offering, which seeks to help customers overcome these obstacles.

### ***The HDS Approach to Storage Economics***

HDS has evolved an approach to storage economics based on some hundreds of TCO and ROI analysis studies that it has conducted with high-end storage customers around the world. The company has developed a set of tools and methodologies that can be applied to a broad range of customer types across a range of industry sectors. A key outcome of this work is the ability to "profile" operating expenses, such that industry-average values can be used as proxy estimates in the analysis in the event that the real cost values are missing or unknown.

HDS has established two main approaches to storage economics analysis: the quick estimator model and the consulting-based analysis. Let us consider each in turn.

#### **HDS ROI Quick Estimator**

When considering the merits of a proposed investment in storage infrastructure, the customer will typically focus on three questions: how much is the investment, how quickly will they see a payback and how much is the net saving on the investment. The ROI Estimator tool provides a means of answering these questions, even if much of the data required for such an analysis is missing. The model contains about 50 variables that have default values based on industry average values observed by HDS.

The model is designed to provide an ROI comparison between a fixed or "static" tier architecture as the customer may be using, and one that employs storage virtualisation, thin provisioning and dynamic tiering of data. Thus the combined impact of three characteristics offered by the HDS USP platform can be evaluated.

The tool is in the form of a graphical application with input values that reflect the configuration in question, and a graphical output showing capacity growth projections, payback period and return on investment. The minimum information required to start using the tool is the user's total usable capacity. A wide range of industry-average default values are adjusted from the capacity but can be overwritten with the user's own data to improve the accuracy of the model. Selecting the geographical region adjusts power, cooling, labour and other factors to suit the user's location.

HDS positions this tool as an estimator with an accuracy of the order of 80%, but its flexibility and ease of use will be of significant value to those customers looking to ascribe a financial value to the new storage architecture under consideration. The model underlying the tool is complex but does contain restrictions for the sake of simplicity, which include a fixed four-year term of analysis, fixed type of savings commonly seen with the virtualisation/tiering/thin provisioning solution set, and no differentiation between hard and soft savings. HDS is planning to extend the family of ROI Quick Estimator tools to include other forms of storage solution.

### **HDS Storage Economics Consulting Service**

This consulting service is designed to help storage managers and CxOs gain a deeper understanding of the operational expenses in their storage infrastructure and to help them establish a roadmap for future cost reductions. The methodology provides a deeper analysis, combining a set of reports with structured customer interviews. This allows for an assessment of the storage infrastructure's operations and costs in light of the individual business objectives. The methodology follows three key stages:

- **Establish a TCO baseline** — What does it cost the customer to own and operate 1TB of storage per year? The answer is derived from an understanding of the unique set of costs that apply to that storage customer. HDS has identified 33 different cost areas, ranging from power and cooling to labour charges and outage cost. By selecting and quantifying the key cost areas a TCO baseline cost per TB per year can be established.
- **Map the costs to a set of strategic and tactical cost-saving initiatives** — What are the cost-saving initiatives that are needed to drive the costs? These may be strategic or tactical initiatives, for example consolidation, tiered storage, chargeback or SRM, and will vary widely depending on the customer's environment. The user maps the costs identified in the first step to the cost-saving initiatives, so that the multiple relationships between costs and investment can be established. This process also helps to identify the areas of technology investment that are the highest priority.
- **Compile a cost reduction roadmap** — What will be the impact on the TCO baseline over the near and medium term? With a rollout plan for each of the cost-saving initiatives, a roadmap can be built that shows the impact on each of the key cost areas year by year.

By following this three-stage approach, a tactical plan for addressing the key cost areas and driving long-term TCO reduction can be scheduled and executed.

## Future Outlook

It will come as no surprise that the pressure to lower operational costs and drive up storage efficiency is set to continue. For every TB of usable storage space, there is a significant overhead of stranded storage, duplicated files, RAID parity information and over-provisioning, which suggests that storage efficiency improvements still have some way to go.

Datacentres face ever-closer scrutiny over the way they use power, cooling and floor space. New directives such as the Carbon Reduction Commitment will oblige companies using more than 6,000MWh/year to disclose their energy consumption to the government, further increasing the incentive to deploy more highly utilised and efficient storage infrastructure.

The storage hardware industry continues to make great strides in driving down the cost/GB of storage by around 30% per year, such that the initial capex outlay is becoming a diminishing portion of the whole-life costs of storage. There is therefore an increasing need for users to understand their TCO and opex base and to put increasing pressure on vendors to deliver more detailed and accurate ROI and TCO analysis of the financial benefits delivered by the technology.

## Challenges and Opportunities for HDS

HDS is a major vendor of high-performance storage solutions and its engineering and technical excellence is long-established and widely acknowledged. The company's engineering DNA, inherited from its 98-year-old parent company, inclines it to focus primarily on product quality and reliability, sometimes at the expense of elaborate marketing or promotional activities that may be seen from other vendors.

HDS pre-sales financial specialists have used the storage economics methodology for six years or more to conduct hundreds of professional-services analysis engagements. Deploying the technique as a front-line sales tool marks a strategic shift and a more aggressive stance in the market.

In rolling out the storage economics sales tools, HDS should consider the following:

- Sales people must be trained to use the tools correctly and objectively — the results must be meaningful. It is also essential that the default cost estimates used in the model are kept up to date, particularly in the current period of volatility in energy, floor space and labour costs.
- Current tools are designed for high-end solutions of 70TB or more but most midsize customers are facing similar pressures and would also benefit.
- The current estimator tool will compare a fixed or "static" tier environment to one using dynamic tiers, thin provisioning and storage virtualisation. While this will be useful for many customers, new or improved tools will be required to include other technologies such as deduplication and VTL.

The estimator tool, with its many industry-average defaults, is designed to deliver an ROI projection of about 80% accuracy. This will be good enough for many customers and HDS should set customer expectations accordingly.

## **Conclusion**

The need to understand the overall financial impact of a large-scale storage solution has rarely been more pressing, but it remains a challenge for many users. Incomplete or inaccurate information about the users' cost structure can compromise the analysis and force a return to a simplistic assessment based on \$/Gb or other considerations based primarily on the initial outlay. The HDS approach helps IT managers overcome these challenges and allows stakeholders to consider the financial benefits of a multitiered, thinly-provisioned and virtualised storage architecture, which hitherto would have been a significant undertaking for some users.

HDS' approach to storage economics helps demonstrate the true value of relatively complex storage architectures and allows ROI analysis to become a routine part of the storage investment decision-making process. Users are recommended to develop a detailed understanding of their TCO baseline in order to get the most from the ROI and TCO tools and to demand solutions from vendors that directly address the operational cost issues they are facing.

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