

Critical Steps in Storage Management: How Business Requirements Shape Policy Decisions

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Introduction

The term “drowning in data” is particularly apt in describing the growing volumes of data being collected by corporations today. As storage hardware costs decline, information technology (IT) executives in these data-intensive corporations have felt no need to rationalize their storage costs, and so storage policies and procedures have evolved in a haphazard manner. Unfortunately, many of these IT executives are only now beginning to realize that while hardware costs have fallen, overall storage costs – of which hardware costs are but one part¹ – have increased at a rate that parallels the growth in the volume of data.

In an attempt to cut costs, hardware vendors have continued to focus on total cost of ownership (TCO) but this largely ignores the issue that TCO is a symptom of a larger storage environment problem – TCO itself is not the problem. An assessment of the storage environment in many corporations would reveal that the true problem is a lack of appropriate storage policies and procedures, or in particular, a mismatch between business requirements and the policies and procedures that are put in place to meet those requirements. An example of this can be seen in the backup procedures implemented by many corporations, where failure to segment data according to its value has given rise to significant waste and inefficiency as data is backed-up onto inappropriate media or worse still, critical data is not backed-up in a manner that reduces business risk. Inappropriate procedures, such as this, are at the heart of the cost explosion that many corporations are only now beginning to acknowledge. Fixing these procedures is non-trivial, however. As shown in the following diagram, procedures such as provisioning or backup and recovery are an outcome of a process that extends all the way back to business requirements and business strategy. The execution of each step in this process is what will ultimately determine the success of storage management.

¹ Hardware costs account for only 20% of total storage costs (Gartner Report: Com-13-1217, 2001). Costs related to administration, downtime, hardware management and backup / recovery procedures account for an additional 66% of total storage costs.

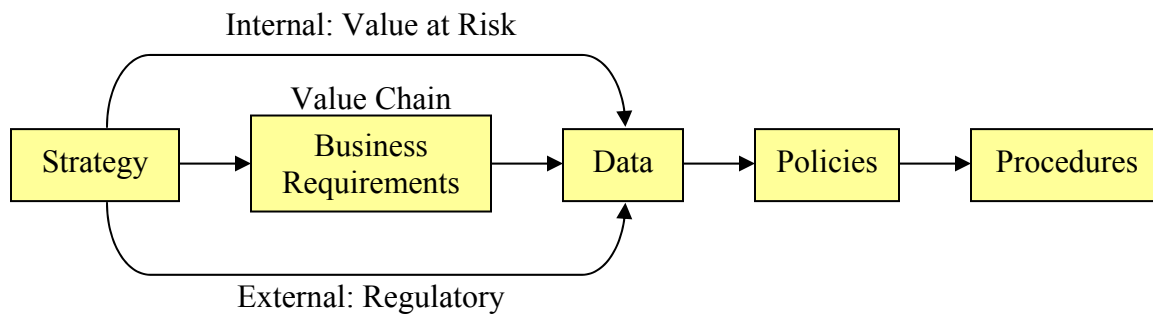


Figure: Critical Steps in the Storage Management Process

The Link Between Business Strategy, Business Requirements and Data

The issue of business strategy may seem very remote from a discussion of storage management but as IT executives are increasingly seeing, data ultimately serve business needs that are linked to the activities in the business strategy. For example, in describing strategy through the lens of value disciplines², we can see that each discipline (operational excellence, product innovation or customer intimacy) can be mapped into the processes in the value chain. A decision to focus on any one discipline will create a priority listing of processes, which will, in turn, define business requirements around data. For example, corporations pursuing customer intimacy can expect to focus on two core processes: sales and marketing, and service. Data generated within these processes will, therefore, be more important than data generated in inbound logistics, for instance. Business requirements will, therefore, vary throughout the value chain and so data collected at each point need not be treated in a consistent manner. Some of these data will be critical to the success of the business – other data, while important, may be of secondary value only.

Choice of strategy and the nature of the industry may also bring some external factors to bear on business requirements. For example, regulatory requirements for firms in the healthcare and biotechnology sectors means that data must be stored for specific periods of time. The possibility of a data audit, particularly in the biotechnology sector, where historical data on clinical trials and other forms of testing are required for FDA approval, means that business requirements are particularly stringent.

Business requirements can also be shaped by internal factors. The loss of key data for any extended period of time can pose a significant problem to business continuity, leaving open the possibility of bad press and the loss of competitive advantage. Value-at-risk – a technique from the field of financial

² “The Discipline of Market Leaders” by Michael Treacy and Fred Wiersema, Addison-Wesley, 1995.

management that models the value that a firm stands to lose in the event of a disaster – can be used as an input into business requirements. Companies who are unwilling to accept high levels of value-at-risk, either because of strict regulatory needs (e.g., FDA mandated periods of data retention) or because of strategic concerns (e.g., the loss of data at a point along the value chain could have serious ripple-effects on processes elsewhere in the value chain) will face very different business requirements from companies where value-at-risk is low or of no consequence. Interestingly, corporations who tried to move towards a lower TCO environment may have run foul of their desire to maintain value-at-risk at an acceptable level³. Also, the implementation of storage policies and procedures may have been inconsistent with value-at-risk requirements; for example, valuable data is backed-up infrequently, is not replicated or is stored in an insecure location.

Data-driven Storage Policies

Once corporations have an understanding of their business requirements, they can design policies to meet those requirements. A critical problem here, however, is translating the language of business requirements into appropriate policies. This is perhaps the most critical point in the storage management process as it is here that a handoff takes place between business personnel (who determine business requirements) and IT personnel (whose policies are meant to align with these business requirements). Communications failures at this juncture can mean that business requirements are unattended, leading to serious risk of data loss, or inappropriate storage policies are enacted, leading to excess storage costs and waste of IT resources.

A first step in solving this problem is to recognize that bi-directional communication is needed to design a suitable set of storage policies. For example, customer data must be backed-up at hourly intervals to a data center while payroll data need only be backed-up at the end of each workday, or all demands for increased storage capacity must adhere to the following approvals process. Policies, such as these, are a part of what might be termed, a *storage strategy*. Of course, the dynamic nature of business requirements may change to reflect changes in the industry or operating environment such as new regulatory requirements or a focus on a different part of the value chain, and so there is every possibility that storage policies (and the storage strategy) may need to be periodically appraised and revised if necessary.

³ For a more detailed discussion of the relationship between TCO and value-at-risk, see Glasshouse Technologies white-paper, "Beyond TCO – Designing Storage Strategies through 'Value at Risk'."

Procedures – Where the *Rubber Meets the Road*

Policies of course must be implemented and so it is at this point that costs begin to accumulate. Decisions must be made around hardware, software, connectivity, storage-media, retention, replication, etc. If costs appear excessive, there may need to be a discussion with the business manager whose data is in question to ensure that TCO and value-at-risk are aligned. This may be especially relevant if a change-back system is in place so that users understand what level of service they are getting, and the price of that service. If costs are invisible to the user, there may evolve a mentality of “storage for free” which inevitably leads to a problem known as the “tragedy of the commons” in which everyone eventually loses. There should also be some system of metrics to inform IT management of whether procedures are being performed to a pre-defined level. It may even be worth considering if the compensation of storage personnel should be linked to these metrics.

Responding to Changes in the Value of Data: The Need for a Data Migration Policy

It may appear from this discussion that storage decisions cascade from business requirements all the way down to procedures. Certainly, there is a logic to this top-down flow, but the fact that the value of data can change over time introduces some new complexities into the determination of suitable storage policies and procedures. An example of this can be found in the biotechnology sector where corporations routinely capture data at each step in the drug discovery process. As a drug passes through successive stages leading to final FDA approval, the value of the drug to the firm – based on expected future sales – increases. Each time a drug moves to the next stage in the discovery process, the value of data captured at each preceding step in the process increases, and so the value-at-risk of that data also increases. Failure to appreciate this can create a mismatch between the revised value-at-risk and the as-yet unchanged cost of storing that data. What this then means is that IT managers must be cognizant of changes in the value of the data held inside their storage environments and implement a migration policy so that as the data increases in value, there is an attempt to protect that value by migrating the data to a more secure storage environment, even if this means an increase in TCO.

Avoiding the Pitfalls of Best Practices

A discussion of what corporations should, or should not do, to build a link between business requirements and storage policies and procedures naturally leads to the question of what constitutes best practices. As is often the case, corporations may feel compelled to follow best practices as regards storage policies in their industry. There is some legitimacy to this decision but the problem is that best practices

do not always fit with the business strategy that the corporation has decided to follow. There may be some intricacies in the business strategy that require something different from best practices. Equally, a benchmark number for TCO could be highly misleading if there is no consideration of the underlying value-at-risk. What we can conclude from this is that the ultimate effectiveness of a storage environment must be made with reference to the business strategy and to the corporation's ability to support its business activities. There may still be valuable lessons to be learned from applying best practices but management must be careful to recognize that their business needs are not the same as those for all other firms in their industry.

Conclusion

As we reflect on the increasing demand for storage capacity, we are reminded that for every dollar spent on hardware, at least four dollars are spent on software and services⁴. Optimizing a storage environment is critical to being able to meet the storage needs of the business, and while hardware optimization might be a way to initiate optimization, it is only one step in a longer process that extends from an assessment of business requirements all the way down to storage policies and procedures – a process that brings together both organizational and technical imperatives. Understanding the relationships between the different steps in the process (as shown in our earlier figure) is essential to being able to meet the needs of the business at a reasonable cost and without exposing the corporation to an unnecessary or unsafe level of business risk.

The pace of business has increased significantly in recent years. Product lifecycles have fallen, customers have become less loyal and yet more demanding, and as e-commerce enters the mainstream, new forms of competition and business models have emerged. Behind each of these changes lies a mountain of data, some having relatively little value but some containing significant value (e.g., customer sales and pricing data). For businesses to capitalize on their data, there must be some systematic approach to capturing and using this valuable resource. For corporations who are, quite literally, drowning in data, it may come as no surprise to learn that their storage policies and procedures were designed for a company facing a different set of business conditions. As these and other corporations encounter a growing volume of business data, there must be some attempt to enact the ideas suggested in this paper, namely to engineer storage policies and procedures that align better with the needs of the business.

⁴ See Gartner Report: Com-13-1217, 2001.

About GlassHouse Technologies, Inc.

GlassHouse Technologies, Inc. provides services that help organizations solve the business problems of enterprise storage. From strategy through deployment and support, GlassHouse partners with clients to transform storage into a strategic advantage.

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