

1 Introduction

Many companies do not have a strategy on how to deal with storing information or have an adequate plan that allows them to address the changing needs. The information of a company is needed for processing for business operations, providing intelligence for strategic decisions, and the many other aspects of day-to-day company business. The information is sometimes thought of as the results of applications that are run in business or research and may turn into the input for other applications. Information is data that is stored and retrieved for a business purpose. A strategy for handling of the information is another critical company business process.

This book will serve as providing background information and a guide in planning a storage strategy. Each business environment has differences in operation and a different set of guiding principles. Because of that, developing a storage strategy requires some localization and this book points out some areas where differences need to be considered. Understanding the differences should help in adapting the planning for a storage strategy to an individualized environment.

The organization for material is first to explain the need for a storage strategy in general terms with some of the considerations involved. The business issues are covered next with the requirements on the storage strategy that will be generated. When dealing with storage, which is where the critical company asset of data resides, risk management must be covered as an individual item for a storage strategy.

Next in the material for planning a storage strategy is an examination of the components to consider. Storage management is the first topic that is covered because it has such long term implications. The storage systems and infrastructure elements and how a strategy needs to factor those into an implementation plan is next. Future technology deployments must be a consideration as well: how they affect the business of storage and the means of incorporating into the environment as well as the expectation of business value.

How to go about making strategic decisions is also part of planning a storage strategy that is covered in the book. This includes where and how to acquire information and assess the validity. A process for making the decisions around the strategy and for selling the storage strategy within the enterprise is incorporated as well.

Finally, some recommendations regarding the storage strategy are made. These include managing the strategy to a process as an ongoing business operation, effecting the implementation plans, and evaluation and measurement for constant improvements. Some guidelines and a Storage Strategy Workbook are included to aid in the entire process.

What is a storage strategy?

Information Technology departments may have a plan or a set of processes defined in which there may be an element that deals with storing and retrieving data. The overall view is a good practice but the specifics of storing and retrieving information with its overall importance and associated expenses warrants a separable strategy that can be included with the IT practices.

The storage strategy is a long term vision of the role of storage within an enterprise. Storage is the simplified term for storing and retrieving data with the associated infrastructure, storage elements, methods, and management. It is an inclusive term that is sub-defined many times for specific, detailed usages. For the purposes of developing a working storage strategy, storage is everything to do with storing and retrieving data.

The long term vision in this case is really a three to five year horizon. Less than three years is really a tactical plan that is in some stage of deployment or planning that has relatively clear goals and measurable results. A strategy for the three to five year time frame for implementation requires planning now and must build on the tactical plan currently in progress. Storage needs beyond the five year time frame will continue and extrapolations may provide some adequate guides so that some degree of planning can be done based on demand. The complicating factor is one of technology change. In a three to five year time frame, technology that is just becoming available can be introduced without taking excessive risk. Beyond five years, a new technology will probably be applied to some extent. The three to five year strategic plan is to give a reasonable timeframe to deal with demands and the balance of improved current technology integration without taking significant risk in guessing at what may occur. The reality is that a continuing, evolving storage strategy that is updated on an annual basis can put key decisions into context for a three to five year plan. This should avoid excessive work that may not be useful based on outside factors and yet set a direction that can be followed and adapted as developments occur.

Storage Planning Timeframe

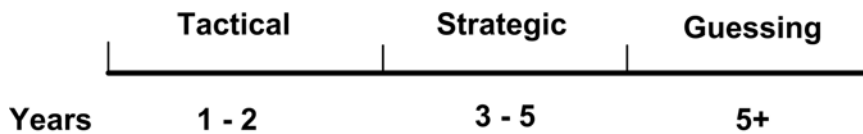


Figure 1: Storage Planning Timeframe

Evaluating and updating a storage strategy must be a regular process. The storage strategy cannot be developed and then put on the shelf to be of any use. It needs to be continuous and evolving based on both changing requirements and changing technology. The implementation of a storage strategy is really a guide for tactical decisions to be made: long-term vision and impact of the decisions. Measuring where an IT operation is currently compared to the strategic target is also a periodic event used to re-enforce the implementation of the strategic plan.

Who is responsible for the storage strategy?

The easy answer for most is the IT manager responsible for storage – often times designated the storage manager. The reality is that the storage strategy is so critical to the success of the company that the storage strategy has many people involved and responsible with the ultimate responsible party being the CIO. With the CIO being ultimately responsible, developing and implementing a storage strategy will have the endorsement necessary to get the involvement of others. Certainly those specifically responsible for storage have a big stake in the storage strategy but also those that have ownership or needs for the information to be stored or retrieved. The impacts of problems with storage can be so great that everyone in the company has a vested interest. Those directly involved are the owners or users of the data, the storage professionals, and IT management.

Individual roles in the development and implementation of a storage strategy can vary somewhat but the important issue is the content of the strategy and the process in arriving at the strategy. A subsequent chapter will examine the content and the responsibilities in more depth.

Storage is more than just devices

For most people, when they think of storage of information, they think of a “box.” Storage to them is just a device that is connected to their compute facility and is the location where data resides. Worse yet, a more detailed consideration of storage for most is what attributes the device has. The very basic attributes of capacity, maximum I/O’s per second (usually represented as 4K transfers from cache), and maximum potential bandwidth (called speeds and feeds) are presented by vendor marketing and become the focus for many when storage is considered.

Storage consideration should be about storing and retrieving information. The storing and retrieving must include the considerations of integrity, availability, protecting data, and security.

Basically, a storage strategy is about how information is handled and is inclusive of all the requirements around handling information. Information in a storage environment is called “data.” **Data is information without context – meaning without understanding of the application and usage of the information.**

The Ins and Outs of a Storage strategy

There are many inputs in creating a storage strategy. The most important one is the company business strategy. This will dictate much of what will be required and understanding how the business strategy translates into demand for storage capabilities is needed. Rarely is there a “green field” or start from scratch opportunity. Consequently a strategy must take into account the current environment and operation and factor in what incremental changes as well as new technology must be employed to implement the new strategy.

Many companies have optimized their operations to make the best use of resources to meet current demands for storage of information. Requirements change over time and operations must change accordingly. Another input to a storage strategy that interests many in Information Technology is in understanding what the best practices are in a specific industry. While a best practice may not be a blueprint for implementation, it may give some new ideas and a target to shoot for in the implementation of a strategy.

Sidebar: Best Practices

A common question from customers when implementing new storage infrastructures is whether what is being implemented represents industry “best practices.” This question is an indication that the customer is not sure what is being done is optimal and wants some form of benchmark

against other companies in a similar situation. Best practices are a somewhat relative term but can be useful as a set of examples that show what has been done, why it was done, and the ultimate result.

Where do best practices come from? This is really the hard part. If they come from a vendor, then there must be a healthy dose of skepticism around what is being touted as best practices. Obviously the vendor will represent the best practices that are using their products and whether that is really an optimal solution or not will not be incorporated into what is presented. Some vendors will abstract these implementations and call them “blueprints.” That should be perceived with the same jaundiced view as a vendor best practices implementation.

What about a “best practices” implementation document from an analyst or research firm? That also requires some degree of skepticism. Was the firm that produced the information commissioned by a vendor to do this or is the firm subsidized in some way by a vendor. If so, then that may be a method to get the vendor “best practices” view of the world to a customer without having it appear to come from vendor. Another qualification that needs to be looked at for validity of best practices should be whether the person making the claim and the report really is qualified (with real-world experience) and the sample size of investigations that were done.

Another source for “best practices” may be from an industry organization that is user driven with only the user group doing the research and making the claim. This has much more validity but is also probably the rarer circumstance. Since this is probably volunteer work from dedicated industry professionals, it will have the beliefs and reputations of the individuals involved.

When asking about best practices, the source of the information that is used needs to be looked at closely. It may be an opportunity to look at other possibilities and see how effective they were. Whether it is really best practices is a question that remains.

Overall, the storage strategy is driven by requirements. The requirements are driven by business strategy at a high level but on a more granular level are the application and individual user/business process needs. These must be considered individually and then in the aggregate. The requirements will be covered in more detail in a later chapter.

The output of the storage strategy will be the tactical plan that is being executed with any necessary modifications, an implementation plan for the strategy, and a process of how to continue to evolve, adapt and implement the strategy.



Figure 2: Storage Strategy Overview

Storage is a critical business

The price of storing and retrieving information is a very noticeable amount of money. Not only do storage systems cost a great deal of money but the overhead in facilities, administrative costs, and support contracts are continuing expenses that receive a great deal of attention. But these costs are in reality not as significant as the downside of the storage not meeting the business needs.

The storing and retrieving of information must meet business needs for a company or jeopardize the continuation of business. Certainly continuing the normal processing of information is required to continue business operation but also the ability to accommodate capacity demands based on the growth of the business is necessary. Loss of access to information has an impact on business operation that is based on the time it takes to recover. If data access is not restored within a certain period of time, some businesses may no longer be viable. All of the concerns such as security and integrity of the data are part of the critical business elements.

Another part of the critical business of storage is meeting regulatory and business governance requirements. Both legal issues and litigation possibilities exist based on the retention and protection of information. It is up to the storage

strategy to address the requirements here and those involved to understand that they are also of critical importance.

Sidebar: Regulatory Requirements

The need to meet regulatory requirements is driving many decisions in Information Technology. This is especially a problem in the storage area because many of the requirements are regarding retention of data and proof of chain of custody. The controls for much of what is called for with regulatory requirements must be implemented at the storage system.

Regulatory requirements are discussed in general terms most of the time but are really an amalgam of many different sources of requirements. They can come from government legislation pertaining to business data, health records, personal information, etc. Some requirements can be from business entities that are not really government laws such as the Securities and Exchange Commission. There also is a set of requirements that are internal company business governance issues. Even though the business governance requirements may not have an enforceable law behind it, failure to comply may lead to a class action suit against the company from its investors.

The regulatory requirements are not just limited to US federal laws. Some states have their own sets of regulatory requirements. Different countries have laws as well that may have to be adhered to if business is being conducted in those countries. Now it gets really complicated: some of the regulations may be slightly different or even in conflict.

From a storage standpoint, procuring products – both hardware and software – to meet today's regulatory requirements means the customer must understand the requirements. When new requirements come into being (which happens all too often with legislators trying to control business), how to meet them with the existing systems also requires extensive knowledge.

Maybe a lawyer does not have to be part of the storage team but it appears that way. Managing where a company's most valuable asset is stored is difficult. Having to meet a moving target of regulatory requirements is overwhelming.

Meeting the storage needs of business is usually expressed as a "storage architecture" which is really a plan for meeting the business needs for information management. Included in the storage architecture are the methods and elements used in storing and retrieving of data and management of the environment. The elements are part of an overall infrastructure of storage

devices, devices to connect between and among storage, servers, remote transfer solutions, and other types of devices that exist to perform some function in storing and retrieving of data. The management encompasses more than just element management (management of devices) but also includes managing data movement and transformation with business controls. Generally termed “storage management,” it is also called “information management” or “data management” in many contexts. Delineating what granularity the terminology has is difficult due to many marketing definitions that conflict.

The monetary investment by a company and the risk for the business success of the company are clear in reflecting that storage is a critical business. Managing it as a business set of decisions is one of the key premises of having a storage strategy.

Storage doesn't necessarily mean complexity

Storage environments that become complex end up being the greatest impediment to meeting future business needs. Complex environments are difficult to change, to add new capabilities, and to administer. The complexity leads to difficulties in bringing new people in to administer the storage environment and to a much greater “opportunity for error” in administration.

Expanding or adding new capabilities to a storage environment are the norm. With complexity making that difficult (and some might say impossible), then complexity needs to be avoided. It is difficult to resist some solutions that may be quickly deployed that will drive more complexity. In the long run, solutions that make the storage environment more complex will end up being more costly and must be avoided.

It is important to architect a storage environment that is simple and adaptable. The flexibility of the environment allows it to be “re-architected” to meet new requirements. Planning for an adaptable environment and resisting complexity is part of the strategic plan. Adaptable environments must be planned for and not a by-product of execution.