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The Enterprise Data Management Tipping Point: Improvements CIOs Can Finally Embrace

Introduction

The universe is expanding—the digital universe that is. According to a white paper released in 2009 by IDC,[1] by the year 2012, the digital universe will be 5 times the size it was in 2008. That means nearly 500 billion gigabytes of data for every man, woman, and child on the planet. In a similar 2008 white paper,[2] IDC found that while 70% of the digital universe is created by individuals, corporations are responsible for the security, privacy and reliability of 85% of the data.

As a strategic approach to corralling this expanding data, Enterprise Data Management (EDM) is now rapidly becoming a top business priority for more and more corporations.[3] CIOs are trying to get their arms around data coming from all directions and need a way to effectively host, track, and secure it. They are now turning to EDM as an effective and efficient way to manage data, both internally and externally.

Data is a corporation's ultimate proprietary asset. Each corporation has unique data that, if used strategically, can offer a competitive advantage. Data can provide valuable insights about customer behavior and preferences, helping shape what the company sells and how they sell it. This same data often contains confidential and proprietary information, including customer or financial records, that requires the corporation to comply with external rules prescribed by industry bodies or governments. Therefore, it is essential that decision makers can readily access data and have the tools to interpret, secure, and manage data based on its organizational value. Corporations must strive for an appropriate balance of data availability and data security, based on the sensitivity of the information.

The data explosion

Corporations are dealing with an explosion in data. New data that not only includes text—but images, audio, video, and other types of rich media content—is being created at an unprecedented rate. The 2008 IDC white paper reported that data storage requirements are growing at an annual rate of 60 percent. Currently, there are 45 gigabytes of data for every person in the world, or 281 billion gigabytes in total. However, the white paper predicts the total amount of digital information will balloon to 1,800 billion gigabytes by 2011.[4]

Another contributor to the rapid growth in data is information generated by machines. IT systems generate thousands of alerts, logs, or automated reporting information that need to be managed. Proper management and monitoring of system data can be instrumental in securing information. As the 2009 Verizon Data Breach Investigation Report shows, about 87% of all security incidents leading to a data breach could have been avoided using simple precautions like monitoring event logs from network protection systems.

Data is also being retained for longer periods of time. Regulations often include strict retention requirements about how much data and the level of data detail that should be stored. In addition, there is an increasing interest in using analytics for decision making—meaning corporations are holding on to data longer for historical trending.

Managing the data explosion using today's methods will require CIOs to continually add increased support staff, hardware, energy and cooling resources, and to look for security risks now and in the future.

Stephen Minton, VP of Worldwide IT Markets for IDC, explains that corporations face tough decisions on how to store data, find information, and comply with regulations. "The security and reliability of those IT systems have become so important," said Minton at an IDC briefing, "that the IT department now has a direct impact on the company's top and bottom line."

Given this level of impact and the growing volumes of data, an effective strategy must be put in place to help manage the data properly, avoid unnecessary costs and risks, and create an environment where the value of data can be realized.

Enter EDM

EDM is a strategy for defining, integrating, and retrieving data for both internal applications such as financial, HR, BI, ERP, and CRM, and for external communication with suppliers, shareholders, partners, and regulators. Managing data with an integrated strategy like EDM helps corporations get a better handle on what data they have, where it is, how it is being used, how it should be secured, and how long it should be retained. Efficiencies in these areas can improve business processes, reduce security risks, decrease infrastructure costs, improve speed, help companies adhere to compliance requirements, and offer a competitive differentiation.

Generally, EDM supports the lifecycle of data—from creation and use, through storage and retirement. Activities include managing the metadata (definition, classification, ownership and usage requirements), storage requirements (retention, accessibility, backups and disaster recovery), as well as security risks and compliance. These activities are typically a responsibility of the IT organization with participation from the business.

Forces contributing to the data explosion

Change in the business environment is happening at a record pace. Corporations are influenced by both internal and external dynamics that have massive impacts on all parts of the business, particularly IT. Data growth began when physical records were replaced with electronic records. Now there are several additional business changes that contribute to the data explosion.

Mergers and acquisitions

The trend toward company consolidation is not a new one, but a stronger focus on costs and economies of scale has significantly increased the number of mergers and acquisitions. The number of systems and sheer volume of data increase the complexity of data management. Organizations are faced with identifying which systems will remain, which will be integrated, and which will be retired, impacting the security and storage of data produced and maintained by those systems.

Prevalence of ERP and CRM systems

More and more corporations are implementing systems to manage major areas of the business such as customer service, inventory, sales force, HR, and financials. The combination of technology and new business processes creates a dramatic increase in the amount of data that is produced. Much of it is extremely sensitive data about customers, employees, suppliers, and partners.

More sophisticated business intelligence capabilities

As business intelligence gains traction and matures, there are more requirements for access to data, both current and historical. In some cases, new data is produced that predicts and tracks business trends. In addition, the use of unstructured data (e.g., images, video, and audio) puts a strain on current data management practices.

Corporate regulatory compliance

Requirements placed on organizations to comply with regulations like HIPAA, PCI, SOX, BASEL II, European Commission Directives, and others, mean that many companies have to retain more data, and for longer periods. Being able to produce this information at any given time for an audit is critical.

Advances in technology

As social media moves into the workplace, it creates new pressure on IT departments to manage the data created. Companies are beginning to realize the value of multimedia collaboration, including videos, podcasts, shared presentations, and documented conversations, all of which contribute to the explosion of data at levels never before seen.

Why the piecemeal data management approach no longer works

EDM is no easy task. What is easy to do is to react to issues as they arise. Most corporations have processes to store and back up data, as well as to secure the enterprise. As disks get low on space, more servers are racked. And, as new applications are added to the IT environment, additional storage is added. If a particular business unit needs a special back up, a new backup process is developed.

Although these individual reactive steps are simple, they can lead to a proliferation of unnecessary infrastructure and may put the corporation at risk for a security breach. IT organizations also face significant business pressures such as the need to reduce risk, support business agility, and keep costs under control. Without EDM, this will be very difficult.

The known and unknown risks

Protecting data—and therefore a business—demands a full understanding of where the data security risks lie. More often than not, vast amounts of sensitive data float about the business outside the purview of IT. This data may be found in applications, servers, databases, on mobile devices, and removable media storage units such as thumb drives. Data risks arise from many types of threats both external and internal, and fall into a number of broad categories, including:

- Accidental or intentional security violations by staff or contractors
- Targeted organized crime and competitive espionage
- Data loss, including accidental misplacement or deletion
- Malware, malicious code, and advanced computer viruses
- Unwatched and unpatched security defense mechanisms such as firewalls
- Inability to produce needed information at a given time for an audit or similar event
- Natural disasters and hardware malfunction

A 2009 Data Breach Investigation Report by the Verizon Business RISK team,[5] found that of the 90 confirmed cases across their 2008 caseload, SQL injection, a technique that exploits a database vulnerability, was a factor in over 79% of the records impacted. One case was of particular interest. While balancing transactions, personnel at a European issuer of pre-paid debit cards found major discrepancies exceeding 5 million Euro in their ledger. Many of the cards used over the weekend had a balance increase without a corresponding load increase from an authorized merchant. Verizon IR personnel arrived on-site the next day to gather digital evidence.

Through forensic analysis of web server logs, it was apparent that intruders originating from foreign IP addresses had used SQL injection strings to increase the value of multiple pre-paid credit card accounts. Attackers logged in and altered properties (e.g., card value cap and transaction withdrawal limit) of pre-paid cards they purchased from merchants across Europe.

With these loaded cards in hand, one group of criminals spent the weekend visiting ATMs all around the world while another group used SQL injection to reload cards as their values were depleted. Through these efforts, criminals successfully withdrew roughly 3 million Euro.

Many organizations have been holding off comprehensive security initiatives in an effort to cut costs. These savings are often elusive. One breach can easily exceed the cost of a solid security program multiple times. Cuts in security initiatives leave critical enterprise data susceptible to costly intentional or unintentional breaches. Additionally, valuable resources are wasted as IT staff tries to meet the organization's data security compliance requirements manually, or try to patch together point solutions.

According to a 2009 study conducted by the Ponemon Institute,[6] businesses that suffered a data breach in 2009 paid a higher price for the incident than any previous year. The study states the average cost for a data breach reached $6.65 million. The most expensive data breach in the study cost a company nearly $31 million and the least expensive data breach for a company included in the study was $750,000.

Reduced agility and productivity

In addition to managing risks, unmanaged data growth creates an agility challenge. As a business grows, so does the supporting data infrastructure. Over time that growth can result in a mix of server types and configurations. The complex mix of disparate infrastructure components and "data everywhere" is not scalable over the long run. Plus, the lack of an extensible architecture impacts a corporation's ability to leverage information in order to achieve business goals.

Without a comprehensive EDM plan, corporations will continue to spend more time and money just to maintain the status quo instead of innovating and investing in the future.

The majority of breaches still occur because basic controls were not in place or because those that were present were not consistently implemented across the organization.

When performance for critical application processes degrade as data volumes increase, productivity is also affected. Backup and recovery timeframes are stretched to the point where system availability is seriously threatened. This often results in missed service level objectives that ultimately can impact teams across the whole organization. For example, missed objectives in service level agreements (SLAs) can affect:

- Timely inventory updates
- Call center access to customer information
- Financial close process
- Business intelligence and analytic capabilities

The Board of Directors at a food processing company decided to implement an ERP system that covered all of their subsidiaries. However, their current architecture consisted of two networks that were sorely out of date, complex to maintain, and could no longer meet the needs of the business—let alone support a distributed ERP system.

They upgraded their IT infrastructure to a private IP service that met their requirements for operating flexibility by connecting and integrating their subsidiaries, even adding additional sites not already linked to the network. The company met their nine month deadline and now has a flexible infrastructure that will let them meet future business demands with greater ease. This new environment sets a firm foundation to support ERP and a host of other business systems, and has improved user response time and system performance.

Inefficient cost management
Capacity requirements have grown along with the costs to support that capacity. While physical storage costs have come down slightly, increased capacity means increased resources needed for support. Those resources show up both in capital costs and operational expenses. Data centers need to be reconfigured or new centers built to accommodate increased demands. More staff time is required for routine maintenance and managing administrative issues such as repartitioning and out-of-space conditions.

Increased database sizes mean increases in the CPU cost of running batch operations and routine maintenance tasks. Capacity upgrades may be needed even though they often haven't been budgeted for and many data centers are already at capacity. Increased maintenance costs leave less budget for innovating, and continue to add expense without real benefits.

Increases in operational costs aren't the only consideration. Customer service may also be impacted when call center staff are unable to access the information they need to quickly meet customer demand. The cost of losing customers can be tremendous.

Improvements in enterprise data management can be a catalyst for change
Fortunately, a comprehensive EDM strategy can address these challenges. Many CIOs have applied pieces of data management methods to particular business applications or server clusters, but an integrated, comprehensive solution has always proven difficult. Advances in technology and new processes now allow corporations to discover and classify data, categorize and manage risk, and meet the real-time data access and scalability needs of the business.

Improved data visibility with data classification
Most IT organizations have implemented some kind of security on the data they have. It's the data, devices, and systems they don't know they have that present a problem. Today's extended and distributed enterprise data management program has valuable data flowing into and out of the company. More and more, that data is available to suppliers, partners, and customers, and persists on a number of different platforms including servers, laptops, and mobile devices. This leaves data unprotected and corporations exposed to risks and compliance failures.

In July 2007, a 1,000-store retail chain fell victim to a sophisticated security breach. The severity of the breach was compounded by the fact that the retailer had no idea that anything had occurred. It was only when law enforcement personnel suddenly arrived at one of the retail's store fronts to investigate that the chain learned that there was a breach.[7]

Enterprise data management is a big undertaking. It's important to have a solid strategy and roadmap, and to continue to make incremental steps toward the ultimate goal.

It's critical that all of the data within the corporation—at rest or in transit—is discovered and identified. Identifying sensitive data, its storage places, and its transit patterns provides the organization with the information required to support security compliance requirements, helps reduce risks of future data loss, and improves processes and applications that handle this data. The steps to classifying data include:

> **Data Discovery** – *Where is the data?*
> Discover data at rest (storage, file shares, desktops, etc.) and in-transit (e-mail, file transfer, IM, etc.) as it leaves for the Internet or a partner's network.

> **Data Identification** – *What is the discovered data and to whom does it belong?*
> Determine the nature of the data (customer lists, R&D, SSNs, credit cards, patient health information, resumes, financial reports, etc.) and the data owner.

> **Data Classification** – *How is the identified data used and why is it important?*
> Associate data with the business processes it supports, how it is used (highly active or low latency, retention requirements) and how sensitive it is (security policies).

Like other assets, data needs to be properly catalogued and tracked so that it can be managed effectively. Data residing on servers "under the desk" or on employee laptops is a good example of data sources that are often unknown. No security program can be complete without knowing where the risks are and where the potential for threats may lie.

Increased flexibility with cloud-based services
As IT departments are asked to cut costs, they are now beginning to look at managed services like cloud-based services. The benefits of both reduced capital and operational expenses are harder to ignore. Plus, the "cloud" has come a long way from its early days of blindly trusting the management of data and applications to a third-party entity. Today's cloud-based services must maintain a high level of availability to meet rigorous SLAs. Some vendors even offer dedicated servers.

Recently, a higher-level educational institution was preparing a business case for the addition of a new data center. Because the cost to build and support a new data center was so high and the new center would not be used to full capacity, they explored cloud-based services, including cloud-computing and the virtual data center. They were able to take the business case out of the capital project requests and create an incremental expense to pay for just the capacity they needed. Not only did they remove their request for capital, but they also decreased their planned costs to support the new center, including headcount and energy costs.

Cloud computing helps reduce capital expenditure on hardware, software, and services by paying the provider for only what is used. Usually, there are little or no up-front costs and corporations can terminate the contract at any time, avoiding potential return-on-investment risk. The services are backed by SLAs with financial penalties for noncompliance. Other benefits include:
- Shared infrastructure costs
- Real-time scalability on a pay-for-use model
- Offsite and managed disaster recovery
- High levels of availability
- Reduced maintenance and energy costs

Leading-edge cloud providers take it one step further and create transparency by providing physical access to the corporation's own data in the cloud provider's data center. This can give CIOs peace of mind because they know just where the data is and how it is being cared for. But probably the biggest advantage is that cloud computing offers security that is often stronger than the security in today's enterprise. Cloud providers have specially-trained security teams, a robust environment, and security protocols that stay current with the latest threats—something most IT organizations struggle to keep up with.

More efficient data lifecycle management with multi-tiered storage
Multi-tiered storage is the reorganization of data across tiered media. In the same way it doesn't make sense to store all data on expensive front-line storage systems, not all data should be put into the "cloud." Highly active data requiring real-time access should be kept close to the application, whereas low latency, historical and archived data can be stored offsite (in the cloud) on less expensive storage media. The concept of multi-tiered storage is beginning to penetrate the enterprise space and the results are improved efficiencies in storage management as well as cost control.

Data managed in a cloud-based environment, with its state-of-the-art security management is often more secure than in the company's own data center.

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Data classification is a prerequisite to performing multi-tiered storage as it identifies data properties and access requirements. It's important to understand what the data represents, how it is used and what the security, retention and access requirements are. For example, access requirements might specify whether the data is highly active (meaning whether the data is frequently accessed or needs to be accessed quickly).

For example, an online retailer was struggling with data overload, having all their corporate data residing on expensive in-house servers. An assessment was performed that recommended a multi-tiered storage plan that would stratify data based on the frequency of use. Now, customer and recent order data remains on the speedy in-house servers, order data between one and three years old has been offloaded to their new, in-house SAN, and order data older than three years has been moved offsite, using a hosted storage solution.

Corporations that use the storage media most appropriate for the requirements of the data can improve performance and control costs. And, by classifying and stratifying data, and putting a multi-tiered storage plan in place, corporations can manage the full lifecycle of data by having data in the right place, at the right time, for the right amount of time.

Tipping point for EDM

As CIOs work to move their organizations forward and meet business demands, they should reconsider their plan for managing data. According to Gartner,[8] "Contemporary business pressures are driving organizations to address data management and integration as a larger, cohesive strategy requiring the close coordination of multiple efforts—to improve speed, agility, competitive differentiation and compliance, among other things."

CIOs who do not change their approach and continue to manage and perform all IT functions in-house will soon face a dilemma: how to handle the explosion in data while controlling costs and maintaining an agile organization.

Many CIOs are looking at the benefits of EDM as a way to solve this dilemma but may struggle with knowing where to start. Consequently, EDM tends to take a backseat to other high-priority business projects. The final push to EDM may then come via a tipping point like running out of data center space or exhausting cost-cutting measures. Or, it may come from a triggering event such as an acquisition, divestiture, reorganization, or security breach.

Embarking on EDM is a big undertaking but the benefits are significant. Identifying, securing, and making data available to decision makers and downstream systems can provide the intelligence and agility the business needs to be competitive. Advancements such as data classification, cloud-based services, and multi-tiered storage, help IT organizations realize these benefits faster and more completely. No longer will CIOs have security nightmares because they don't fully know where they are at risk, or where they are going to store the data for a new business application. EDM can help them identify, secure, and efficiently host their company's data so they can get back to helping the business move forward.

Get your arms around your data. Verizon Business can show you how

If your organization has experienced an explosion in data or is looking to reduce risk and complexity or control costs, contact the experts at Verizon Business. Our full suite of data solutions and team of experts are ready to help you meet any data challenge. Let Verizon Business show you how the advancements in EDM can help your organization's data grow safely and efficiently.

For more information, visit us at www.verizonbusiness.com/thinkforward.

At some point, CIOs will face a trigger event that will bring Enterprise Data Management to the top of the IT priority list.

1   IDC White Paper sponsored by EMC, As the Economy Contracts, the Digital Universe Expands, May 2009
2   IDC White Paper sponsored by EMC, The Diverse and Exploding Digital Universe, March 2008
3   Top 10 Business and Technology Priorities in 2010, Gartner, Inc. January 2010. Data/document management ranked #7 in the 2010 CIO Agenda. (www.gartner.com/it/page.jsp?id=1283413)
4   IDC White Paper sponsored by EMC, As the Economy Contracts, the Digital Universe Expands, May 2009
5   2009 Data Breach Investigations Report, Verizon Business, April 2009
6   Fourth Annual US Cost of Data Breach Study, Ponemon Institute, 2008 (www.ponemon.org/local/upload/fckjail/generalcontent/18/file/2008-2009%20US%20Cost%20of%20Data%20Breach%20Report%20Final.pdf)
7   Case Study: International Retailer Contains Security Breach with Verizon Business Computer Forensic Services, Verizon Business, 2008 (www.verizonbusiness.com/resources/casestudies/cs_intl-retailer-contains-security-breach_en_xg.pdf)
8   Predicts 2010: Data Management Disciplines Drive Business Agility and Technology Adaptation, Gartner, Inc., December 11, 2009

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