

White Paper

Transitioning to a Dynamic Data Center

The Keys for Successfully Migrating Your Business

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Data Center Transformation or Bust

The speed of change in global markets and the challenges of new modes of business demand companies operate in and react to quickly changing landscapes. Nowhere is this more critical than in the means and methods the enterprise uses to power its business, typically via IT services. As a result, businesses will increasingly demand more from their IT departments, which presents new opportunities for IT teams to adopt new approaches and transform the data center itself so that it is more closely aligned to the business.

The data center and IT services have become instrumental in almost every business in the modern age, yet many are still being powered by legacy infrastructure designed in the previous century. Typically, these environments tend to be rigid and siloed compute infrastructures that are inefficient and costly to scale. Most organizations host the majority of their applications on physical servers and non-virtualized storage environments. Worse, due to these legacy design and technology limitations, IT organization struggle to deliver the services the business demands when it needs them; just maintaining legacy infrastructure consumes the majority of most organizations' IT budgets and time.

The ultimate goal of IT is to create a compute infrastructure that is virtual, flexible, in some cases mobile, and, above all, able to deliver services where and when they are needed. If designed and implemented correctly, the IT services delivered can provide a strategic advantage that can positively impact a business. IT organizations have a tremendous opportunity to transform the data center leveraging new technologies, developing new processes, and enhancing existing resources to become an enabler of the business—and not merely a cost center.

New technologies and trends such as virtualization (server and storage), convergence, and the concept of cloud or utility computing break the traditional physical bonds of what a data center is and can be. The data center of the future will be:

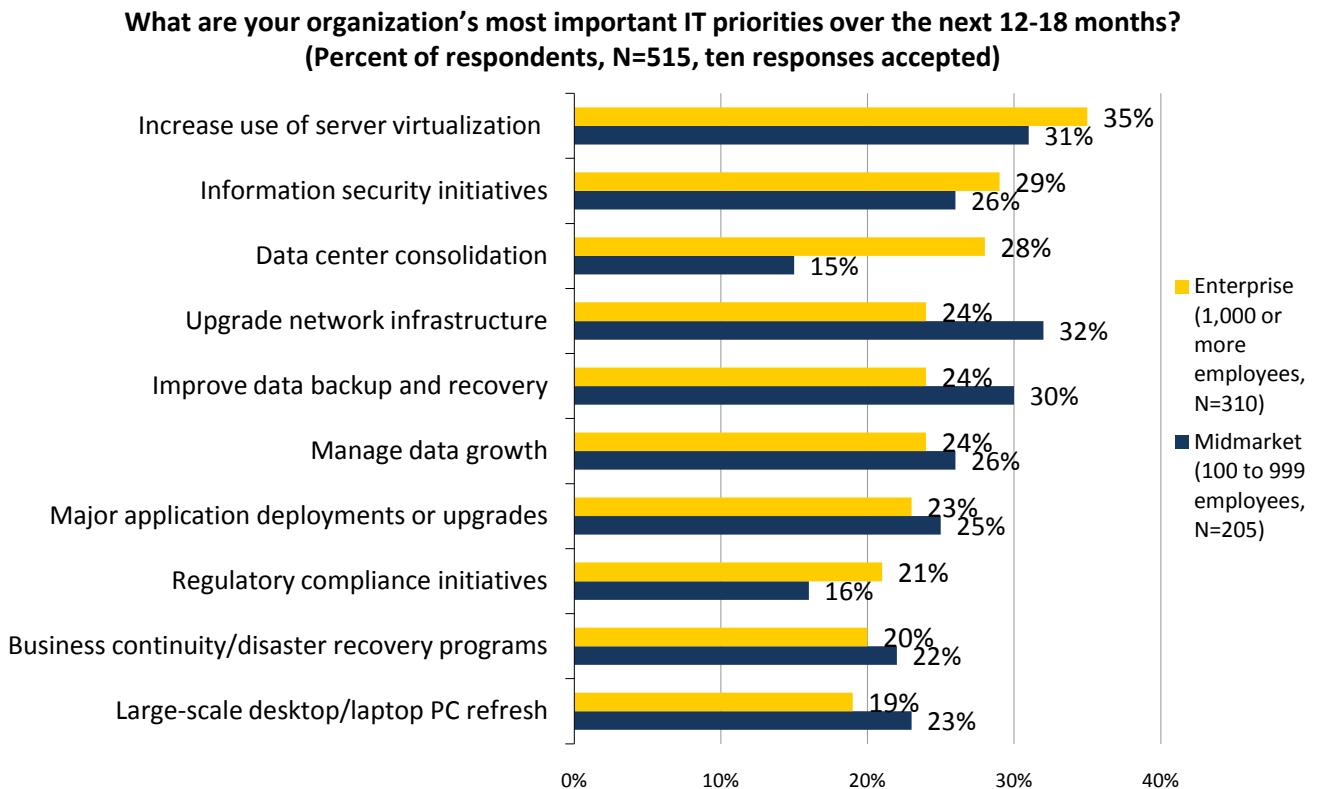
1. Modular
2. Sustainable
3. Ubiquitous
4. Dynamic
5. Service-driven

In fact, there may come a day when many in the IT organization don't even know where the physical assets that today we refer to as "the data center" are actually located. Beyond the technology, the people element might present the most difficult facet of the transformation: both bandwidth of human resources and human attitudes often inhibit efforts to get to next generation technology.

Taking a look at the top ten IT priorities for 2010, it is clear that IT organizations are planning for quite a bit this year.¹ While data center consolidation and consolidation enabling technologies such as virtualization rank high on the list, these are interspersed with many other priorities and a host of initiatives that focus on refreshing and updating infrastructure that was ignored through the economic downturn.

¹ Source: ESG Research Report, [2010 IT Spending Intentions Survey](#), January 2010. All subsequent ESG Research statistics come from this publication unless otherwise specified.

Figure 1. Top Ten IT Priorities



Source: Enterprise Strategy Group, 2010

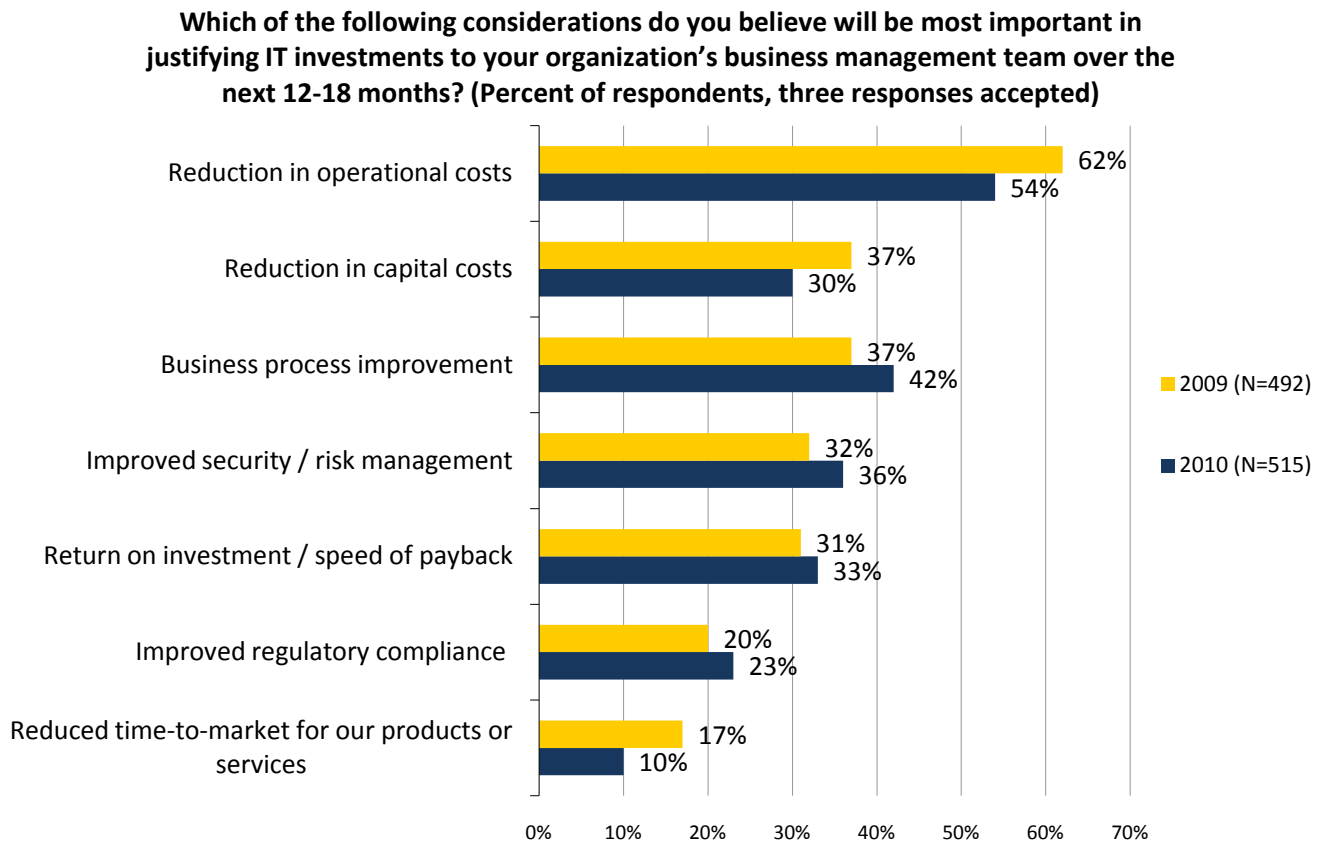
At a high level, organizations understand that these new technologies will help them transform their data centers and they are starting to make the investments; however, many are not able to reproduce the projected ROIs. Transformation is difficult and requires maintenance of current services and the design and implementation of new ones. As a result, many organizations aren't well versed in new technology, new processes, and new skills required and a project can lose momentum and be declared completed long before reaching its full potential. This occurs for a host of reasons; this paper will explore some of the more common pitfalls that hamper successful transformations and the keys to overcome them.

Obstacles Limiting Successful Transformations

Building out a brand new data center is not an easy task, but trying to transform an existing one is even more difficult. A number of obstacles can limit the success of a transformation project, including:

- Balancing cost, risk, and cycle time.** Consider the pressure that IT is under to balance reducing cost, mitigating risk, and improving cycle times and understand how that impacts the IT purchases. ESG research (shown in Figure 2) conducted for the last two years indicates that IT organizations are primarily concerned with how an IT purchase will help reduce operating costs, improve business processes, and mitigate risk. Interesting to note is how, in 2009 when the economy was strained, organizations placed more focus on reducing capital expenses (tied for second place). Clearly constrained capital budgets will have an impact on transformations. They will be costly, but this needs to be weighed against the opportunity costs associated with not transforming a legacy data center. In addition, the sheer people effort in terms of time and skills to manage complex transformation is often just not available internally.

Figure 2. Top IT Justification for New IT Purchases



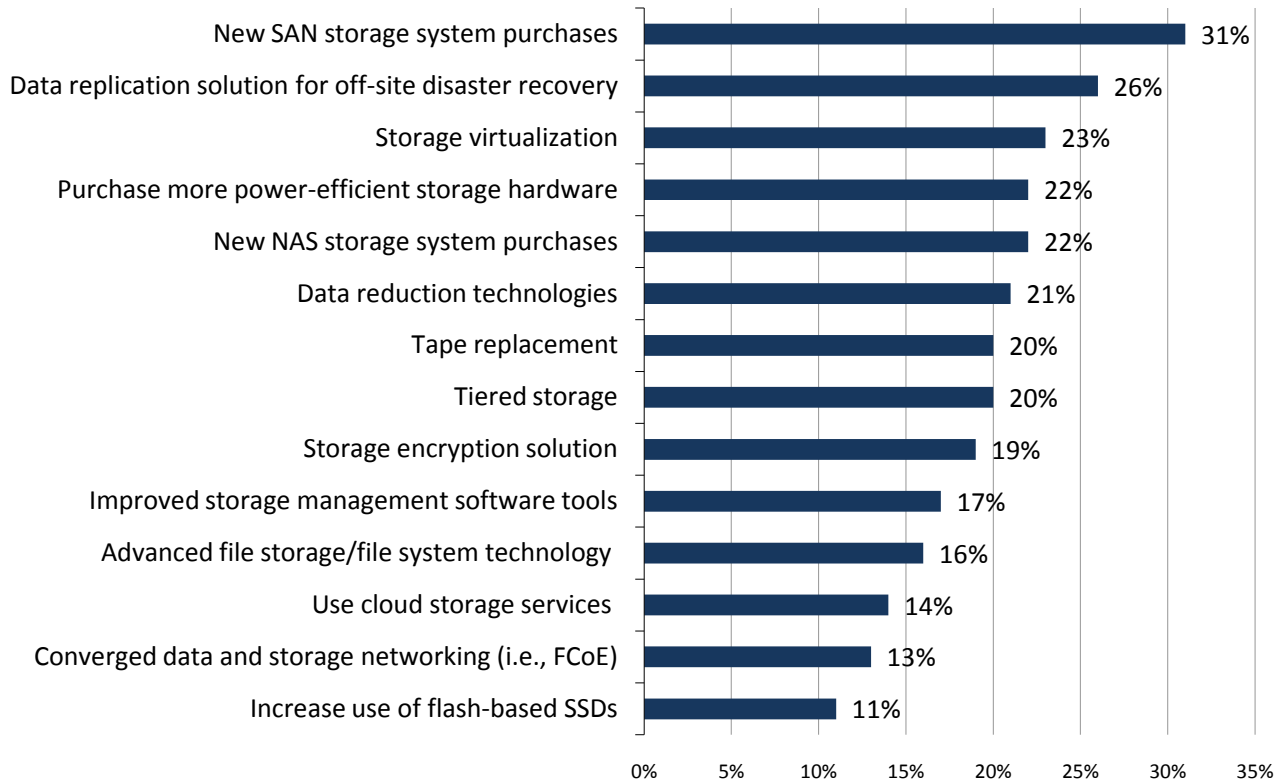
Source: Enterprise Strategy Group, 2010

- Shelf-ware and unused functionality.** In order to achieve the desired return on investment for many IT projects, organizations need to not only purchase technology (hardware and software) based on its functionality, but also install and use it. More importantly, the functionality should be predicated on a real business need. Without fully understanding business needs, IT is setting itself up for failure as the recently acquired but misaligned functionality may never be used. This phenomenon, where functionality is purchased but not actually used, is commonly referred to as “shelf-ware.” “Wholesale shelf-ware” or even “partial shelf-ware” (using limited set of functions) can also occur due to a lack of time and resources, which will result in organizations not meeting projected ROIs as those are typically derived from leveraging all the features.

This is more common than one would think: most of the shops ESG speaks to mention that they bought a piece of equipment or software package because it had extensive capabilities and yet, when asked if they are using all those features, many only point to one or two functions that are used consistently. When probed further, most admit to not having the time or resources to dedicate to learning and implementing it. For example, organizations will continue to make investments in storage (see Figure 3), but are less likely to invest in the technologies and software, like virtualization and storage management, that would actually help to defer or avoid those purchases. Thus, IT is trapped: spending too much time trying to manage inefficiently-deployed storage instead of leveraging transformative technology.

Figure 3. Storage Spending Plans

With regards to specific spending plans for data storage, in which of the following areas will your organization make the most significant investments over the next 12-18 months? (Percent of respondents, N=286, five responses accepted)



Source: Enterprise Strategy Group, 2010

- Managing resistance to change.** In many organizations, this may be the biggest obstacle. Transformation requires things to be done differently and may involve interacting with other domains and technology groups. Resistance could come from being unfamiliar with the technology, moving outside of one’s comfort zone. This is prevalent in the storage domain and can be witnessed by how long it took for thin provisioning and storage virtualization to take gain traction. Just because something has always been done a certain way, doesn’t mean it will always remain that way. Facilitating change often requires the assistance of outside agents to broker plans and solutions.
- Underestimating the level of complexity in cross-domain solutions.** After years of building out teams around independent technology silos (server, network, and storage), IT is now asking those organizations to work together more closely. In fact, creating a dynamic, highly virtualized environment mandates it. As virtualized server environments are deployed and organizations want to take advantage of advanced mobility functions, networked storage environments are required and these technology domains begin to overlap. Because of this interdependency, a problem in one area can have a profound impact on another. Yet, because organizations have allowed technology segments to build out as independent and closely protected silos, providing cross-domain, contextual management is difficult. In many cases, when a problem arises, even simple communication between the different domains is limited and finger pointing across domains creates significant delays in fixing the problem.

- **Adapting to new tools and developing new processes.** Data center transformation requires new technologies to be deployed and integrated. Virtualization is a great example of one of these technologies as it requires not only new management solutions, but also numerous process changes. In addition to the obvious changes to provisioning new machines—now virtual machines—this new technology will also impact processes related to backup, disaster recovery, business continuity, and, possibly most important, decommissioning vms (to avoid vm sprawl). To be truly effective for the business, these processes should be based on best practices and not just “good enough.”

Many existing monitoring and management tools cannot be used for virtualized environments. As a result, organizations have to purchase and learn new tools and, in a mixed environment, that means more things to manage. Without experience in virtualized environments, it will be difficult to develop best practices and optimize quickly.

- **Lack of proper planning.** The rush to achieve consolidation and cost savings often results in actions taking place without full understanding of the end results. In order to realize the full benefit of new virtualization technology, organizations need to properly plan the new environment, realizing that technology deployed in one domain could have a significant impact on another. This has been seen numerous times when server virtualization initiatives slowed due to problems in the network or storage because the environment was not considered as a whole. This also includes incorporating any new process changes and properly educating resources on new equipment or software.

This also impacts the ability to fully realize an ROI, because without first identifying the business requirements, determining where the alignment with IT needs to occur, and understanding how all of that will happen, it will be difficult to track and measure the attained ROI as the project progresses and eventually draws to completion.

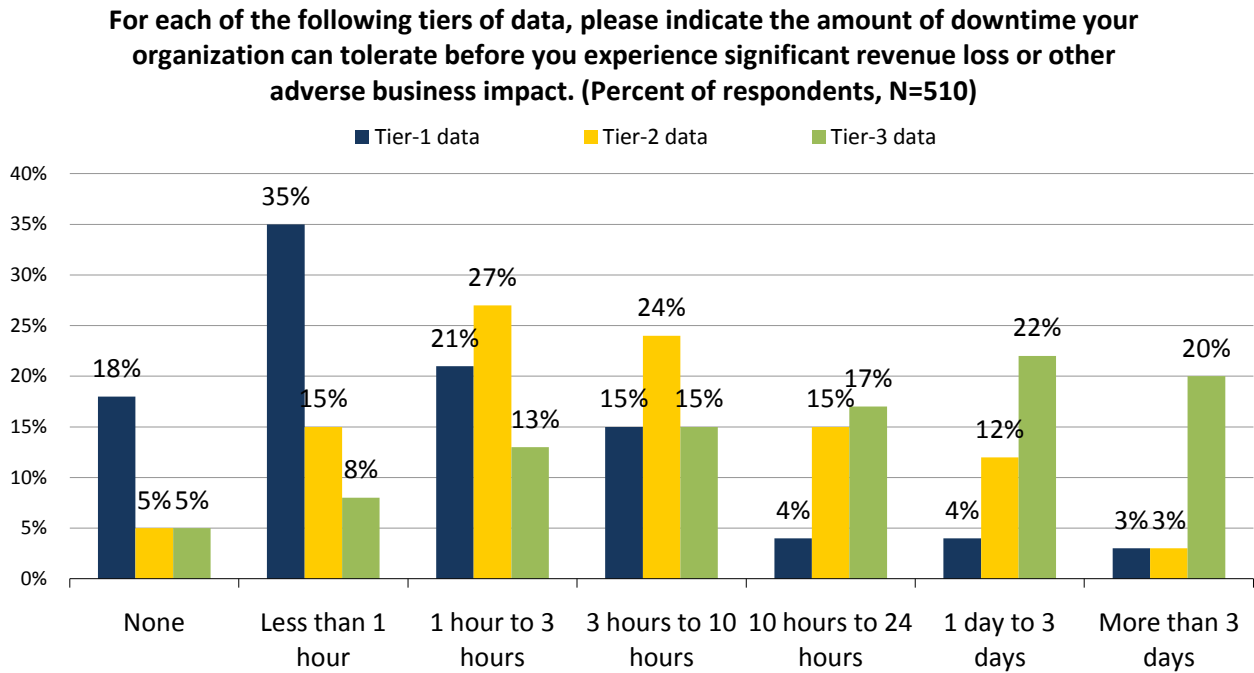
The reasons outlined above can cause an organization to reach the end of its journey only to find that it has not achieved the desired results. Transformations are difficult, especially when trying to do so while keeping the lights on and all applications available, so let’s look at what it takes to make this transformation a reality.

What is Needed to Make the Transformation a Reality

Now that we have laid out some of the challenges of transforming a data center, it’s time to look at what is needed to make it happen. Organizations need to:

- **Transform the data center without interrupting the business.** As evidenced in the ESG research shown in Figure 3, organizations have very little tolerance for downtime. This is especially true for tier-1 data, with almost 20% indicating that they can’t tolerate any downtime and another 56% indicating they can tolerate three hours or less. Even tier-2 and tier-3 data are becoming increasingly important. This means that transformation needs to be conducted in a manner that does not disrupt or negatively impact the business. One of the best ways to mitigate this risk is to engage trusted organizations that have deep experience and know where the pitfalls are and how to avoid them.

Figure 4. Tolerance for Downtime



Source: Enterprise Strategy Group, 2010

- Plan on getting help.** Assessing the current environment; designing and architecting a new solution; and procuring, implementing, and integrating new technologies require a lot of time and expertise. Given that the majority of IT staffs are 110% utilized, taking on such an enormous project is not realistic. Fighting fires and ensuring availability requirements are met leave little time for transforming the data center.

Also, because of challenges associated with multiple domains involved in the transformation, it will be easier to have an outside organization navigate political and technical boundaries. Leveraging a trusted partner that understands the environment and is able to interact with both technology teams and business units is crucial.

- Adopt a comprehensive approach.** Data center transformation is not just about the technology, it also includes people and process. This means that organizations need to understand the impact of new technology on established processes and how they will need to be modified. Roles and responsibilities, both during and after transition, must be clearly documented, communicated, and agreed upon. More importantly, many of these new and transformative technologies will drive greater interdependence among currently siloed groups. Virtualized servers require networked storage for advanced mobility functions; converged networking ties the storage and networking team together with shared infrastructure. In order for the transformation to be a success, all groups need to be working together, not against each other.

This comprehensive approach starts with a “business first” focus and keeps the IT organization aligned with the needs of the business and not on inter-domain rivalries. “Cross-functionally” means that all parties, regardless of the technology they support, are focused on working together to ensure service levels to the business are always met or exceeded. Server installs rely on IP addresses, power ups rely on patch updates, and functioning applications require pre-provisioned storage.

- Ensure everyone is vested in doing “the right thing.”** This is particularly important when working with third party service providers. When performing a data center transformation, make sure that compensation is structured based on results achieved and not just for executing against a particular scope of work. Goals needs to be established based on the return on investment, not installation milestones. In some cases, this may even involve a shared risk model. Critical to this success is having executive sponsorship that can overcome internal disputes and has a vested interest in the final outcome.

- **Focus on more than server virtualization.** Transformation needs to encompass all data center technologies. From this perspective, many organizations are well on their way with server virtualization initiatives. As mentioned previously, ESG research indicates that the number one IT initiative for 2010 was to increase the use of server virtualization technologies. However, in order to fully realize the benefits of a data center transformation, equal emphasis must be placed on enabling networking, security, and storage technologies as well. In many cases, this means deploying virtualized storage resources so they can provide the same levels of service and flexibility as the server domain. More importantly, there needs to be a high level of coordination. Monitoring and management will be extremely crucial for providing adequate service levels.

Hitachi Data Systems' Keys to a Successful Transformation

[Hitachi Data Systems](#) Services teams have been working with enterprises for a number of years and understand that, in order to fully transform a data center, there are four keys to ensure success and make sure organizations are able to fully realize their desired ROIs. Hitachi's four keys are outlined in Figure 5 and include:

Figure 5. Four Keys of Data Center Transformation



Source: Hitachi Data Systems, 2010

1. Assessing the environment and potential gains

Since 2001, HDS has been working on developing the concept of storage economics and has now extended that to include the people and process elements (migration costs, best practices, and processes) in order to make the transformation successful. The first step in transforming the data center involves a detailed assessment of the current environment and evaluation of the potential gains that could be achieved. Typically done in the form of a workshop, ROIs are calculated for multiple facets including consolidation, utilization, migration, operations, and managed services. This is essential to benchmarking the current environment and it also clearly determines the final objective, which can be leveraged to negotiate outcomes and shared risk. Conducting this type of upfront assessment and analysis will provide realistic projections of improved efficiency and returns on investment.

2. Maintaining overall governance

In order to demonstrate significant advances as a result of the transformation, HDS works with its clients to establish overall program metrics and key performance indicators (KPIs) that will be tracked throughout these multifaceted engagements. This is relevant because transforming a data center will include working on numerous concurrent, complementary workstreams that involve people, process, and technology. HDS will monitor and manage all workstreams, measuring progress against end goals and making adjustments where necessary to ensure that the desired objectives and metrics are met in a timely and efficient manner.

HDS has found that the most effective way to ensure all objectives are met is to partner with the client to achieve common goals. HDS recognizes that transforming a data center is not easy and that, with so many moving parts, having ownership in the project improves the success rate. To achieve that, HDS offers options for sharing the risk. They include:

- i. **HDS Program Management** – HDS will provide a “Program Manager” who will have overall responsibility for driving the transition. This would include all of the HDS services as well as the customer’s teams. This person will be tasked with documenting and reporting on progress and success as defined by the initial assessment and goaled with reaching agreed upon transitional milestones and desired end states (i.e., improved service levels).
- ii. **HDS Risk-Sharing** – HDS will commit to defined price reductions per managed terabyte or per defined service event (i.e., for a migration) in environments in which HDS has full operational management. Organizations can be assured that HDS has a vested interest in not only creating an optimized environment, but also maintaining that environment in an optimal state, resulting in the highest possible services levels to the business.

3. Transitioning the business

Now that ROIs have been calculated and the end state has been decided upon, the hard part begins: actually making the transition. Based on proven methodologies, HDS will manage the transformation process from beginning to end, keeping in mind that this is as much about the people and process as it is the technology. To that end, HDS offers services to further develop and educate an organization’s resources during the transition that include:

- i. **Educational Services** – HDS will hold knowledge transfer sessions to impart experience and knowledge on subjects ranging from infrastructure to best practices. This will be especially critical for those environments deploying new technologies and requiring new processes that will ultimately be managed in-house.
- ii. **Coaching Services** – HDS experts will work with an organization’s staff, providing tips and reminders to help learn new concepts, develop new processes, and maintain optimal service levels that are closely aligned to the business.

HDS understands that a data center transformation is only successful if it results in higher IT service levels and tighter alignment to the business

4. Migrating the organization

HDS will take responsibility for migrating to a new environment with minimal business interference. Understanding that this is more than just a technology play and that people and processes also need to change is the key to HDS’s success. Working closely with business units, HDS will coordinate resources and accelerate the time to migrate while simultaneously mitigating associated risks. This is accomplished by leveraging unique processes that have been developed and honed during thousands of migrations in some of the world’s largest financial, communications, government, and technology firms. HDS also utilizes innovative technologies like storage virtualization platforms, High Availability Manager, and a number of other host-, appliance-, and array-based tools as required based on the best fit for that environment. The final result is a fully optimized environment with updated processes and business aligned service levels.

Once transformation and migration are complete, HDS offers management services to ensure that the desired end state is maintained or continually improved. Customers can manage the improved operations or leverage HDS for both onsite and remote services.

Adhering to these four keys to ensure success, Hitachi Data Systems has delivered solutions in numerous customer environments and one example is highlighted below.

Managing the Operation – Protecting Critical Call Record Data

O², a division of Telefónica, provides mobile and broadband services to Northern Europe as well as several other European countries. The combination of O² and its parent company has created the second largest wireless services provider outside of China. O² is heavily focused on the smartphone marketplace, providing innovative text, music, and streaming video services to a population of nearly 54 million mobile users.

When O² sought to protect and manage 800 TB of critical call record data, it turned to one of its long-standing partners, HDS. O² set the bar high when it evaluated potential partners to manage its backup and recovery operations. Comprehensive reporting capability, 24/7 support, and immediate access to support expertise were required. The motivation for outsourcing management of backup and recovery processes was based on difficulties in meeting current SLA requirements as well as extended backup and restore times.

After HDS deployed remote managed services capabilities augmented by onsite, expert HDS personnel to manage the backup and restore process, O² can now confidently say that its data is protected. “With the new HDS solution, we are able to meet our SLAs,” said Roman Pritzkow, Manager of Design and Delivery Infrastructure for O². Mr. Pritzkow further said “We have not had to add to operational staff” thanks to HDS’s operation of the infrastructure.

In addition to meeting O²’s backup and recovery SLAs, HDS has also supported a recent large-scale migration project, freeing O² to focus on strategic initiatives like the introduction of deduplication into the environment.

The Bigger Truth

Transformation is inevitable: the data centers of the future must be highly virtualized and dynamic computing environments must be closely aligned to the needs of the business. The only questions that remain are when to embark on this journey and how confident you are that internal staff can complete the transition successfully while still maintaining daily operations.

Because of the massive scale of these transformations, the larger the environment and the more people and processes involved, the more difficult achieving the desired ROI will be. Even just the introduction of good old-fashioned Project and Program Management can make the difference between success and failure. It is not uncommon for an organization to begin a project and then realize halfway through that they have underestimated the complexity and time required, at which point the project stalls or, worse, it is stopped without getting to the end state. To avoid these doomed from the start projects, organizations need to ensure they have the right plan and the ability to execute it—again, considering that transformation requires more than just technology. In most cases, the technology is the easy part; creating new processes, incorporating cultural changes, and simply changing the way things are done are often the real challenges.

It is the position of ESG that organizations should strongly consider leveraging the expertise and experience of a vendor that has demonstrated its capabilities in transforming data centers. Again, the ability to act as an agent of change extends beyond simply designing and installing new equipment to incorporate the transformations that need to take place at the process and people levels. The best technology in the world cannot save a poorly planned and executed transformation project.



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