EMC IT REDEFINED:
A CONTEMPORARY IT ORGANIZATION BUILT
FOR AGILITY, INNOVATION, AND COMPETITIVE
ADVANTAGE

ABSTRACT
As EMC’s technology portfolio evolved to deliver cloud computing, the EMC IT organization also had to adapt to deliver IT-as-a-Service (ItaaS) and become a true service provider to the business. In a journey spanning six years, EMC IT transformed the organizational structure, culture, people, and processes to align more closely to the needs and objectives of the business.

In the process, the IT organizational transformation dramatically improved IT efficiency, saving EMC tens of millions of dollars. It also improved end-user satisfaction, as well as EMC’s business agility and competitive position in the global market. While EMC IT strives to be a better, more mature business partner and service provider, the organization believes its experiences and lessons learned can provide invaluable help to other IT organizations navigating similar evolutions.

This white paper documents the results of that transformational journey, “EMC IT Redefined,” and describes EMC IT’s current overall organizational structure and strategic objectives. The transformations inside of many of EMC IT’s individual organizations also are covered in detail. This white paper covers the consolidation of disparate teams, establishment of new roles and skill sets, and the redefinition and strengthening of relationships between EMC IT and the company’s business units.
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EXECUTIVE SUMMARY

The gap between the needs of the business and capabilities of the traditional IT department has continued to widen as pervasive access to technology has empowered business users with direct access to cloud capabilities via alternate sources and providers. In addition, the rate of change in today’s dynamic market has put additional pressure on IT to deliver services with extreme efficiency and agility.

These conditions challenge the traditional operating model of IT controlling access to technology as a strategy for reducing costs. Discouraging demand and rationing the supply of IT services have proven to be an unsuccessful approach for an IT organization striving to become a valued business partner that delivers strategic value. Fundamental transformation is needed in IT, and EMC IT is no exception.

Like many companies today, EMC transformed its IT infrastructure to deliver full-scale cloud computing. This was a crucial step for enabling EMC IT to deliver IT-as-a-Service (ITaaS) to the business. To ensure widespread adoption of ITaaS and evolve into a true service provider, IT also had to transform its organization.

For several years, EMC IT has been on a journey toward ITaaS and has gradually evolved the structure, culture, and role of its organization to better align with the needs and objectives of the business. This organizational transformation has touched every aspect of IT—from architecture, infrastructure and application development, to the way in which IT services are created and funded, to enterprise security and support.

No longer does IT hold a monopoly on technology. Instead, EMC is building new consultative relationships with the business, streamlining business units’ access to IT services, and creating new job functions centered on providing the business with not only the services it needs, but, just as important, an outstanding customer experience.

In addition, EMC IT is helping business units reduce risk by building controls into the services it offers, rather than attempting to bolt security onto services that already are being delivered.

By brokering and integrating services from external providers, EMC IT further augments its existing capabilities while improving delivery of highly differentiated, competitive services at reduced risk. Ultimately, IT organizational transformation is enabling EMC to operate with greater strength and agility, aggressively pursue business opportunities, and drive continued growth in an increasingly competitive global market.

This overview white paper documents EMC IT’s organizational transformation, focusing on today’s structure, and explains how EMC arrived at this decision and why these changes were made. EMC IT has published this overview white paper with accompanying appendices which detail the transformations inside of several of EMC IT’s individual organizations.

The white paper details how EMC IT consolidated disparate teams to improve efficiencies, created new roles and developed new skill sets to better align IT capabilities with the business, and employed standardization and automation to improve IT responsiveness. The paper also outlines how EMC IT refocused its resources and methodologies to simplify the way IT services are packaged, delivered, and consumed.

In addition, the overview white paper provides insights and advice on navigating the major cultural shift required by organizational transformation. It addresses the need for open communication and education so individuals understand why changes are being made and how their new roles will not only add value to the organization, but also create opportunities for career advancement. The white paper also documents best practices that other IT organizations can use to guide their own organizational transformations.

As EMC IT has realized, the journey to ITaaS is long and extremely challenging, but the rewards are substantial. Through a combination of people, process and technology initiatives, EMC IT has greatly improved IT efficiency, accountability and agility, helping to reduce costs and enable key business capabilities. Even with these substantial gains, there remain many areas that IT needs to improve. IT remains inspired and committed to continuing the ITaaS journey with the purpose of increasing the benefits and establishing IT as a true competitive advantage for EMC.
INTRODUCTION: JUSTIFICATION FOR ORGANIZATIONAL CHANGE

Achieving a successful enterprise technology transformation is highly dependent on transforming the IT organization itself, including staff roles, skill sets, processes, business engagement models, governance, and other key elements. As EMC IT pursued its own technology-driven evolution, encompassing Cloud Computing, Big Data, and IT-as-a-Service (ITaaS), they recognized that broad and deep organizational changes also were critical to achieve their larger IT goals. Specifically, this included delivering an outstanding user experience, maximizing efficiency and productivity, reducing costs, and earning the role of a strategic and enabling partner to their business clients.

There were a number of business drivers for EMC IT’s organizational transformation. While important steps in the IT transformation, such as standardization, virtualization, and consolidation of the infrastructure had been completed, the engagement model with the business units was cumbersome. At the core, much of IT was organized around technology silos without an overarching enterprise view of capabilities.

EMC IT acted as a monopoly, doing the best it could to satisfy an insatiable demand for IT services with a fixed budget based on the previous year’s spend. In addition, its fixed supply of services was running on complex, fragile and disparate technology stacks that did not support automated processes.

As a result EMC IT avoided exposing and marketing its services to users, fearing it might create more demand than could be fulfilled. The business units were forced to conform to highly prescriptive and restrictive procedures to obtain IT services. In many instances, business users found the processes simply too slow and difficult, and as a result, began circumventing IT and consuming external public cloud services.

While EMC IT had built a consolidated and optimized cloud infrastructure, important changes in how IT services were delivered and consumed remained necessary. Ultimately, the organization had to identify and communicate the value of doing business with EMC IT versus creating an environment that encouraged the business units to work around the organization.

EMC IT REDEFINED: A TRANSFORMATIONAL JOURNEY

To achieve its objectives of operating IT like a business, earning a position as a strategic, enabling partner-of-choice to the business, and creating competitive advantage for the company, EMC IT embarked on a journey of organizational transformation that spanned people, process and technology (Figure 1).

![Figure 1 – Components of IT Organizational Transformation](Image)
This undertaking required a major cultural shift, requiring all groups in IT to realign their behavior from acting like a monopoly to operating as a commercially competitive service provider. This multi-year journey, which is still ongoing, has led to EMC IT’s current operational and organizational model (Figure 2).

**Figure 2 – EMC IT Redefined: A Contemporary Organizational Model for Innovation, Agility and Competitive Advantage**

The impact of IT organizational transformation culminating in this latest structure has been profound. Consolidation and standardization greatly reduced the unit cost of IT resources, saving EMC tens of millions of dollars. IT gained greater agility to respond faster to changing business needs while delivering a higher quality of service that won back business from public cloud providers. In addition, EMC’s business operations from manufacturing to finance to customer support all benefitted from smoother, more reliable and cost-effective access to vital IT services, contributing to improvements in productivity and profitability in their own divisions.

By aligning IT organizational structure with the capabilities of a converged technology infrastructure, IT is realizing its aim to operate like a service provider. As a result, IT has become a partner with the business to meet EMC’s strategic business goals more efficiently and effectively while improving the company’s competitiveness.

**DEMAND CENTERS: A CONTEMPORARY APPROACH TO MANAGING DEMAND**

In the current organization, requests for services flow through EMC IT Demand Centers, which are aligned to individual functional business units, such as Sales, Marketing, Services, Finance, Global Services, and various product divisions. Serving as trusted advisors, EMC IT’s demand center teams work closely with the business units to promote the use of standardized services and service components while helping them gain increased value from their IT investments.

Demand Centers have the crucial role of shaping demand. They accomplish this by understanding the strategic and tactical needs of the business units and matching those needs to services that exist in the service catalog. The demand center teams also evaluate the business impact of satisfying requirements with standardized services versus creating the business case for investment. In addition, the business units rely on demand centers to serve as the primary connection to the service centers and manage all aspects of service-level management including negotiation, reporting, identification and resolution of recurring SLA issues.
EMC IT’s Demand Centers are led by senior IT executives adept at consulting with business unit executives. In its organizational model, each demand center leader also has operational IT responsibilities outside the Demand Center. This combination of roles resulted from the CIO’s desire that demand center leaders maintain their perspective on the balance between supply-side and demand-side requirements.

SERVICE CENTERS: DELIVERY OF STANDARDIZED SERVICES
On the supply side, EMC’s IT Service Centers are responsible for the supply of all IT services. Each Service Center is accountable for a distinct portfolio of services. Some Service Centers provide IT services primarily to the business units while other Service Centers serve individual users. Another group of Service Centers focuses on IT component services that are principally consumed by other IT Service Centers. The Service Centers develop, deliver and automate value-driven, standardized services that address the majority of IT use cases. They also provide customized services for those use cases that cannot be satisfied by standardized services.

EMC IT’s Service Centers are organized by the following categories of services:

SECURITY SERVICES
Serving the entire EMC enterprise, including EMC IT, the Global Security Services organization provides security services that are integrated into the development of all other IT services, including cloud, data, applications and consumer services. The organization’s primary objectives are to protect corporate and customer information, appropriately manage risk, enable innovation by providing secure solutions, and ensure that EMC can operate effectively even during disruptive events.

In addition, Security Services will measure security compliance and drive remediation of issues when needed. It also will empower IT to provide secure services by embedding security expertise in service teams. EMC Global Security Services is evolving from an organization focused on scanning the infrastructure for security risks and providing reactive, “bolted-on” solutions to one dedicated to building security into all IT services before they are released.

For a historical perspective on the evolution of EMC security, please reference Appendix A.

CLOUD PLATFORM SERVICES
The Cloud Platform Service Center delivers infrastructure services, application development and hosting platforms. Powered by a well-run hybrid cloud that incorporates public and private cloud capacity and best practices, the Cloud Platform Service Center provides a unique set of platform and infrastructure capabilities. Additionally, it operates all existing data center and infrastructure solutions and facilitates the migration of legacy solutions and existing workloads to the new hybrid platforms.

The service centers will develop, deliver and automate value-driven, standardized services that address the majority of IT use cases, and provide customized services for those use cases with requirements that cannot be met by standardized services.

EMC IT’s cloud platform organization has gradually transformed from a collection of independent technology siloes to an integrated organization focused on the utility of the platform.

To learn about the historical evolution of Cloud Platform Services, please reference Appendix B.

BIG DATA SERVICES
A newly formed organization in EMC IT, the Big Data Service Center is driving EMC to become a truly predictive enterprise. By unleashing the full value of data, data integration, analytics, the Big Data Service Center is helping EMC dramatically increase agility, revenue and productivity while enabling more innovation.

In the past, development and delivery of data services were handled by business intelligence, database administrator, and integration teams, which previously were embedded in infrastructure and application organizations. With Big Data opportunities driving business transformation and top-line growth for EMC, IT chose to create a Service Center focused exclusively on increasing the value of data across the company.

To understand the evolution of EMC IT’s analytics organization, please reference Appendix C.

BUSINESS APPLICATIONS
For nearly 20 years, EMC IT tended to purchase packaged applications instead of building them from scratch. Since the packaged applications often lacked key functionality required by the business units, EMC IT became consumed with massive customization
Not only did these customization efforts increase costs significantly, but they locked EMC into a rigid and fragile operating framework that made it difficult, if not impossible, to adapt to future requirements.

Two years ago, EMC IT embarked on a new application strategy focused on implementing packaged applications with little or no customization. Now, EMC IT drives process changes to adapt to the standard functionality of the applications. When process changes are not practical, IT addresses specialized business requirements through applications developed in-house instead of customizations.

To facilitate this strategy, EMC IT has created three application Service Centers:

**3rd Platform Application Services:**
This Service Center is focused on developing contemporary 3rd platform applications that improve business agility, market leadership, and growth opportunities for EMC, and which leverage the power of social and mobile delivery capabilities. (Figure 3).

**Enterprise Application Services:**
The Enterprise Application Service Center delivers and maintains EMC’s mission-critical enterprise ERP and CRM platforms, driving growth for EMC, enabling future capabilities, and maintaining platform integrity. To enable this, Enterprise Applications Services focuses on business process optimization, application configuration, application integration, and application administration activities.

**SOFTWARE-AS-A-SERVICE, PURCHASED APPLICATION SERVICES:**
With best-in-breed SaaS and packaged applications and partners, the Purchased Application Service Center helps EMC foster business growth, increase productivity and speed time to market of IT services. The mission of the Service Center is to rapidly configure and deploy SaaS or packaged applications, with no invasive customization, providing business capabilities that create or enhance EMC’s competitive advantage.
Figure 3 – Industry Trend Toward the 3rd Platform

*For a historical perspective on how EMC IT’s application function has evolved, please reference Appendix D.*

**END-USER COMPUTING SERVICES**

The End-User Service Center simplifies, standardizes and streamlines common productivity tools that are designed to adapt to an evolving, increasingly agile workplace. With these tools, End-user Services focuses on enhancing the user experience and helping EMC employees execute daily tasks with increased efficiency, success and satisfaction.

*To further understand the evolution of EMC IT’s End-User Services organization, please reference Appendix E.*
SERVICE PORTFOLIO MANAGEMENT AND SERVICE OPERATIONS: ENHANCING ITaaS DELIVERY AND SUPPORT

EMC IT’s Service Portfolio Management and Service Operations organizations support the supply and demand processes in the ITaaS model. These organizations enable EMC IT operate more like a business and cost effectively source, introduce, support, and improve and retire services as necessary to meet demand.

SERVICE PORTFOLIO MANAGEMENT

Responsible for EMC IT’s service catalog and portal, the Service Portfolio Management (SPM) team manages IT services throughout their lifecycle. The SPM team relies on the Service Centers to populate the service catalog with component services consumed by other Service Centers, as well as services delivered to end-users.

As the service catalog expands, SPM’s Solution Desk actively identifies opportunities to reuse services and service components across EMC’s business units.

Since standardized services and service components don’t always satisfy the full range of business unit needs, SPM’s Solution Desk also evaluates the business case and designs unique solutions to meet specialized requirements.

To see how EMC IT’s organizational approach to Product Management and Service Portfolio Management have evolved, please reference Appendix F.

SERVICE OPERATIONS

Service Operations is the customer service arm of EMC IT with the primary objective of proactively monitoring service delivery and resolving support incidents. To further improve customer service, Service Operations continuously measures service quality and speed of resolution, among other aspects of support. Functioning as an extension of the Service Centers, Service Operations provides all consumers of EMC IT services with a unified, consistent resource for all support-related incidents.

To read about EMC IT’s ongoing industrialization of IT support and operations functions, please reference Appendix G.

ENABLEMENT CENTERS: DEFINING AND GOVERNING CORE IT PROCESSES

Forming the backbone of EMC IT’s operations, EMC IT’s Enablement Centers define and govern core IT processes. They help our Service Centers quickly and efficiently bring valuable offerings to market that are aligned with business requirements. The Enablement Centers also support the Demand Centers by defining and communicating the business value of EMC IT and marketing its services to business units, the overall enterprise and end-users.

We operate seven Enablement Centers: IT Management, Enterprise Architecture, IT Finance, Human Resources, Marketing Communications, Digitization and Automation, and Mergers and Acquisitions.

IT MANAGEMENT

The IT Management team represents the Office of the CIO, driving key administrative agendas and operating the Vendor Management Office. This team not only helps EMC IT manage its vendors and partners more efficiently, but also drives higher value-add from vendor partnerships as well.

ENTERPRISE ARCHITECTURE

EMC IT’s approach to IT and enterprise architecture has changed dramatically over the years. A legacy of decentralized architectural decisions had led to solutions that may have satisfied short-term requirements for specific end-user communities or business units but also have created major obstacles for EMC to achieve overall business agility and efficiency.

Over the past decade, IT’s architecture function has evolved to become a tightly aligned and coordinated team. Today, IT’s Enterprise Architecture Enablement Center connects EMC and IT’s strategies by setting and reinforcing technology standards, as well as establishing and implementing enterprise IT architectures that are aligned with EMC business objectives.

To learn more about the evolution of EMC IT’s architecture function, please reference Appendix H.
**IT FINANCE**
While the organizational structure of EMC IT’s Finance team has not changed significantly, its financial processes and job functions have transformed substantially. Evolving IT from a classic cost center to an organization that provides services based on a consumption model has required the IT executives leading the Service Centers to develop increased expertise in financial disciplines required to run IT as a business.

*To read about how EMC’s IT Finance team brought transparency of value and cost to discussions between IT and the business units, please reference Appendix 1.*

**HUMAN RESOURCES**
Similar to Finance, IT’s Human Resources organizational structure is similar to what it was ten years ago. However, its ongoing transformation has required the Human Resource team to develop new skills, especially related to change management and organizational development.

**MARKETING COMMUNICATIONS**
EMC IT’s small Marketing Communications team made a significant impact on the ITaaS journey by successfully building a strong brand for EMC IT across a wide range of communities, including EMC, customers, prospects, analysts, and media. A key success factor was the steady flow of crisp and consistent messaging.

In addition, Marketing Communications embraced an “outside-in” marketing approach that put the spotlight on customers, such as internal EMC IT organizations and the numerous business units that EMC IT serves. The Marketing Communications team uses a variety of distribution channels, such as social media, blogs, video, and the web, to more closely connect EMC IT with its customers, as well as unify IT employees to support and drive its organizational transformation and other strategic initiatives.

**DIGITIZATION AND AUTOMATION**
Demand for digitized processes and automation of tasks has grown as EMC IT has evolved to deliver value through an ITaaS framework and run operations more like a service provider. EMC IT formed the Digitization and Automation team to meet this requirement and help IT achieve efficiency, productivity, agility, and quality goals.

With each Service Center handling automation of their own services, the Digitization and Automation team is responsible for centrally establishing and maintaining the overall framework, core enabling systems and technology stacks.

The Digitization and Automation function also maintains ownership for all core IT processes. Over the years, EMC IT recognized the value in aligning more closely to the ITIL process framework, which in turn has enabled the organization to more effectively automate core processes with industry-standard platforms.

*To gain insight on the impact of ITIL on EMC IT’s organization and its evolving approach to automation, please reference Appendix J.*

**MERGERS AND ACQUISITIONS**
EMC has a rich history of acquiring and integrating technology companies. Many of its most successful products today are the result of acquisitions and integration strategies that were directly aligned with EMC’s business imperatives.

EMC IT has a dedicated Mergers and Acquisitions team that handles all of the IT due diligence, planning and execution of integration activities associated with physical infrastructure, applications, data and end-user services. Drawing from many years of experience, this team has created a series of "how-to" publications recommending best practices and steps to follow when integrating an acquired company. Each document is customized according to the strategic intent of the acquisition, as well as the size and complexity of the effort. These publications recommend extensive use of standard services consumed across the EMC enterprise. Consequently, EMC IT’s integration strategies provide acquired firms with significant speed and cost advantages over traditional integration approaches.
TRANSFORMATIONAL BEST PRACTICES
Throughout its organizational transformation, EMC IT has developed a number of overarching best practices for ensuring successful transitions for the various teams designing, building, delivering, and supporting ITaaS. Many of these best practices may help other IT organizations undergoing similar transformations.

MANAGING CHANGE WITH PROACTIVE COMMUNICATION
In any restructuring or transformation, staff chosen for new roles must have appropriate skills and understand their responsibilities. To help ease the impact of change and ensure higher job success, we recommend offering training to fill any skills or knowledge gaps. In addition, EMC IT proactively communicates new roles and responsibilities across the organization to help facilitate healthy team dynamics and collaboration. People who have worked for service providers often are more comfortable with these types of transformational changes and provide another valued perspective.

Openness and transparency about all of the changes in the organization and sharing this information at regularly scheduled “town hall” meetings have been critical. The organization has found that showing how teams inter-relate and serve a common purpose helps reduce anxiety about the changes and build camaraderie through better understanding of why the transformation is so important to IT and the broader business operation.

As part of its commitment to making EMC IT “a great place to work,” the organization’s IT leadership actively communicates opportunities for career advancement and growth. The natural tendency to resist change cannot be underestimated so ample time must be factored into schedules for working with individuals, understanding their personal concerns, and providing reassurance.

One-on-one dialogue is essential for calming anxieties and outlining a growth path. These discussions help increase employees’ comfort with the changes and even encourage excitement and enthusiasm.

KEEPING A FOCUS ON BUSINESS UNIT REQUIREMENTS
When moving to a services-based model, it is not unusual for teams to take a supply-side view, translating what they do into services that they believe their customers will want. A more successful, but more time consuming approach is to engage customers in the process of defining services, to ensure that service definitions map to use cases and ultimately that the services will be met with favorable adoption once released. To advance the adoption of ITaaS, EMC IT conducts quarterly business reviews to ensure that IT service offerings keep up with competitive offerings and deliver an acceptable P&L. These reviews include an evaluation of end-user sentiment regarding service quality and value to gain feedback for continuous service improvement. Innovation and incubation of ITaaS and 3rd platform technologies have been major focal points of the ongoing transformation. This emphasis has been instrumental in helping IT evolve to serve users’ ever-changing consumption preferences and enhancing technologies.

More broadly, engaging executive leaders in both the business units and IT organization to validate the direction of the IT organizational transformation early in the process and throughout the phases is critical. It’s important that IT executives demonstrate strong, consistent and positive leadership at all levels. IT management also must partner closely and engage the business unit leaders to ensure that changes within IT align to the needs of the business, further helping IT to earn the status of a trusted advisor. All IT initiatives should be based on clearly defined business benefits and return on investment.

DEFINING AND REINFORCING ORGANIZATIONAL VALUES
A successful provider of technology-enabled services is fundamentally different from a monopolistic IT organization. Traditional cost-center focused IT organizations highly value behaviors and strategies that discourage taking risks and creating demand and emphasize managing technology and operations by silos. These values contrast sharply with an entrepreneurial IT service provider dedicated to responsible risk-taking, keeping customers happy and proactively marketing IT’s capabilities across the organization. Such a provider also seeks to identify problems before they occur and assumes end-to-end accountability for resolving issues.

EMC IT discovered that defining the values required in the ITaaS provider model and reinforcing those values throughout the organization created a groundswell of support that ultimately helped all of IT take ownership of the transformation.
CONCLUSION

An integral part of EMC IT’s journey to the cloud and IT-as-a-Service has been an organizational transformation that has affected every corner of IT. While the transformation continues, EMC IT has already made enormous strides in implementing important changes, which are driving new efficiencies and value throughout the organization and EMC’s overall business operations. From the way IT services are architected, funded and delivered to the way they are run, secured and supported, EMC IT has become integral to the business and its goals are now aligned with business objectives. The IT organization maps more directly to the offerings they deliver, streamlining the path for business users to acquire the services they need. In essence, IT has become an enabler of growth, contributing value to the business rather than just cost.

In many cases, IT teams have consolidated and defined more business-focused roles for their staff. This helps make IT resources more readily available to the business, while giving IT staff greater business insights to continually improve their services. Toward that end, IT has developed new levels of expertise in technology areas such as virtualization, cloud, data science, security risk analysis, and core application environments such as SAP, Microsoft, Salesforce.com, and SaaS applications.

A major shift for EMC IT has been developing a more consultative role with the business. This is fundamental to becoming a true service provider able to match its offerings to business needs.

EMC IT continues to drive standardization and automation throughout the organization to make its services as easy and efficient as possible for the business to consume. With the introduction of an IT portal or service catalog, approximately 125 IT services are now available via self-service. EMC IT also created dedicated service centers and service owners who are closely aligned with development and support teams and manage these offerings with a keen focus on total customer satisfaction.

The impact of this organizational transformation has touched many levels of the company. It has reduced IT bureaucracy, created greater accountability, streamlined service delivery, and enabled more responsive support. IT has become more efficient and the business units are more satisfied with IT services, helping to reduce the occurrence of shadow IT. In addition, individuals across IT are enjoying a better work and life balance, as well as new career opportunities.

For EMC as a company, the combined benefits of standardization, virtualization, consolidation, financial transparency, and the resulting IT efficiency has meant tens of millions of dollars in savings. The improved agility in the infrastructure and IT organization enables EMC to respond to new business opportunities and absorb new acquisitions more quickly and easily, resulting in a clear competitive advantage.
APPENDICES: INSIDE EMC IT'S FUNCTIONAL UNITS

More information on the transformations inside several of EMC IT's individual organizations, including their chronology, challenges, accomplishments, and best practices, are included in the appendices. These supporting sections include:

• APPENDIX A: BUSINESS-FOCUSED SECURITY
• APPENDIX B: REORGANIZING FOR CLOUD INFRASTRUCTURE TRANSFORMATION
• APPENDIX C: DATA ANALYTICS KEEPING PACE WITH THE BUSINESS
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• APPENDIX E: END USER COMPUTING SERVICES
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• APPENDIX G: TRANSFORMED SERVICE OPERATIONS
• APPENDIX H: ENTERPRISE ARCHITECTURE REDEFINED
• APPENDIX I: IT FINANCE TRANSFORMATION
• APPENDIX J: DIGITIZATION AND AUTOMATION THROUGH ITSM
APPENDIX A: BUSINESS-FOCUSED SECURITY

To serve an enterprise as large and diverse as EMC, IT had to ensure proper safeguards for protecting the company's vital information assets and mitigating risks that could threaten business operations. Ten years ago, before information security had become a top strategic priority in the corporate world, EMC IT had a small group of technologists focused primarily on managing firewalls to block intrusions to the infrastructure. These individuals were loosely organized within application development and were generally isolated from the business units. As EMC expanded into global markets and amassed vast amounts of data-driven intelligence, IT recognized that the risk environment was changing and required increased levels of control.

In response, IT formed the Global Security Organization (GSO) to focus on high-level risk assessments and more advanced security technologies. When EMC acquired new companies, the GSO was increasingly involved to ensure a smooth merger, which elevated awareness that security also required business context to be truly effective. Further, new regulations at the time, such as Sarbanes-Oxley, accelerated the GSO's move toward business-focused security as a growing number of EMC's customers began pressing to review the company's security policies and controls. The GSO expanded the purview of security beyond just blocking intrusions to include comprehensive security monitoring and response.

CYBER RISK CONSULTANTS PARTNER WITH BUSINESS USERS

A central change to how security was delivered focused on the creation of new roles for individuals to take on a more consultative relationship with the business as cyber risk intelligence analysts. Staffing these roles required hiring new analysts and developing individuals internally with new skill sets. Cyber risk intelligence analysts need to understand both the threat environment and business requirements to determine potential risks, and have in-depth knowledge of the appropriate security controls to mitigate those risks. Strong analytical skills are especially important as uncovering a threat can require piecing together seemingly unrelated events to uncover patterns that point to risk. Communication skills are also essential to be an effective consultant to the business, as well as a liaison to developers implementing security measures.

EMC IT has now embedded cyber risk intelligence analysts with business teams across EMC to foster communication and evaluate risk tradeoffs of business initiatives. For example, if a project could net millions of dollars in additional revenue, but potential risks
might cost the company hundreds of thousands of dollars, then the business could easily justify investing in significant security measures to mitigate those risks.

The GSO also created a controls assurance function, which formalizes how security policies are carried out across the enterprise, and reports on security metrics to prove the effectiveness of those policies. This is part of a comprehensive incident detection and response architecture (Figure 4) that integrates security systems, threat context, and risk intelligence analysis to maximize safeguards to EMC’s valuable information.

TARGETING SECURITY CONTROLS
As part of EMC’s transformation to IT-as-a-Service model, the GSO recognized the importance for service owners to take ownership for secure service delivery. The GSO is decentralizing many security controls, making them an integral part of the IT service offering while retaining governance and accountability through controls assurance.

The strategy is to make the security practices as easy as possible for service owners to consume and ensure protection without impeding productivity. Toward that end, IT is providing service owners with proper training and tools to easily integrate security into service delivery. The GSO also has built in flexibility for users to personalize security tools so they can take ownership of their own security controls. GSO analysts are working with service development teams to not only raise awareness of the threat environment, but also integrate security controls directly into their applications.

In many cases, developers use RSA tools to automate security functionality such as data loss prevention. For example, an application programming interface (API) can perform a quick validation to determine whether or not to deliver data based on user access privileges, user role, device in use, or other factors. This rules-based risk assessment performed at the application level is more efficient and effective than simply transmitting encrypted data with no business context.

Additionally, automating security controls has enabled the GSO to increase the overall level of protection without adding headcount. The organization also is being smarter and more efficient about focusing analysts and resources on the most significant threats rather than trying to deliver full coverage to every potential situation. In addition, rules-based automation results in more predictable application of security policies.

CYBER SECURITY: A COMPETITIVE ADVANTAGE
As the value of business information grows, and cyber threats to its security increase, conversations about risk and control assurance extend all the way to the corporate boardroom. Today, EMC’s executive management team and board are as concerned about cyber security as they are about financial security. In fact, both issues are interrelated.

Cyber security has become a critical element in EMC’s entire supply chain and matters immensely to its customers. With cyber threats so pervasive, customers now want documented, quantified assurance that appropriate measures are in place to protect the supply chain against security risks or breaches.

Engendering a close, engaged relationship between the security organization and corporate leaders helps ensure that the right security measures are in place at all levels. In addition, a strong cyber security strategy not only relieves business concerns, but can also serve as a competitive advantage. At the same time, EMC believes that sharing breaches publicly provides everyone with insight into the enormity of the threat level. Understanding where these threats originate and how they affect the business is a powerful tool for refining security practices and policies to improve protection for everyone inside and outside of EMC.

MANAGING CULTURE CHANGE EFFECTIVELY
Security organizations traditionally have a culture of control, and it can be difficult to change that mindset. EMC IT and the GSO found that integrating security practices and controls into all aspects of the business—from boardroom conversations to application development—is an essential part of broadening the traditional security perspective and addressing the growing threats from cyber attacks.

To streamline the transition, EMC IT chose targeted areas in the organization to decentralize security, measure results, and use demonstrated value to build trust in the new approach. Over time, security controls are further distributed as more and more applications are updated.

EMC IT recognized early on that cultural change takes substantial time and resources. As a result, the GSO has offered extensive, regular staff training and communication programs that highlight the need for security. Transparency regarding security policies and practices also has been essential so people understand why they are necessary.
ADVANCING SECURITY WITH SERVICE CENTER FOCUS
EMC IT recently formed a Global Security Services center to deliver increased focus and advancement for the company’s security programs. The center assesses risk, develops controls and develops componentized security services that are consumed by cloud, application and consumer service offerings. In addition, the center measures security compliance and remediates issues when needed. It also empowers IT to provide secure services by embedding security expertise in service teams.
APPENDIX B: REORGANIZING FOR CLOUD INFRASTRUCTURE TRANSFORMATION

The introduction of virtualization and the potential cost savings associated with using computer hardware more efficiently were the impetus that began the infrastructure transformation. As technology progressed and business demands evolved, the EMC IT Infrastructure Organization evolved to keep up with those changes in technology and business expectations.

RAPID BUILD-UP OF VIRTUALIZATION EXPERTISE

EMC’s CIO had set a target of 100 percent virtualization, and with just 30 percent of the infrastructure virtualized, IT realized they needed dedicated VMware experts focused on building a virtualized infrastructure independent of the operating environment.

As a result, EMC created a virtual infrastructure team that would be given full-time, overarching responsibility for the virtual infrastructure. While building broad and deep competence in VMware, this team was charged with ensuring that the back-end components for the virtual infrastructure were optimized for consistent, reliable operations regardless of what operating system, application, or workload was deployed on top. The three separate operating environment teams were then consolidated into a single systems team focused on virtual servers.

Placing this organizational focus on building virtualization expertise was critical to meeting IT’s strategic objectives of lowering costs and improving agility. In the seven years since forming the virtual infrastructure team, EMC has advanced from a 30 percent to a 94 percent virtualized environment and has more than doubled the number of virtual machines from less than 5,000 to more than 11,000. A highly virtualized infrastructure also has helped EMC save tens of millions of dollars through improved efficiency while dramatically increasing agility for deploying new services. Without a team focused on continually building competence in virtualization and optimizing the virtualized infrastructure, these results would not have been possible.

PRIVATE CLOUD INFRASTRUCTURE GROUP: CREATION OF NEW SKILL SETS AND ROLES

While the establishment of the virtual infrastructure team marked a major milestone in EMC’s journey to cloud computing, other groups in IT—including storage, networking, and backup/recovery—remained separate from the systems team. Technology convergence in the data center, including the introduction of converged infrastructures such as VCE Vblock™ Systems, highlighted the need to also combine skill sets and job functions to better position the organization for delivering ITaaS.

In response to these forces in the data center, EMC created the Private Cloud Infrastructure Group (PCIG), merging silos of systems, storage, networking, and backup and recovery staff into a single entity. The PCIG was charged with managing the infrastructure more holistically—as a combination of all component technologies—to enable EMC’s private cloud.

As a first step, EMC IT identified a senior-level IT executive with strong client service skills to oversee this transformation and formalize new roles and responsibilities in the PCIG. The senior IT executive collaborated with other IT leaders and select members of the PCIG team to create a functional model and then map an organizational structure to that model by identifying specific individuals to fill each job function. This led to the creation of several new roles (Figure 5).

TRADITIONAL ROLES

- SYSTEMS ADMIN
- STORAGE ADMIN
- BACKUP & RECOVERY ADMIN
- NETWORK ADMIN
- SECURITY

NEW ROLES

- CLOUD ARCHITECT
- CLOUD ADMIN
- CLOUD CAPACITY PLANNER
- SVC MGMT
- CLOUD SECURITY EXPERT

Figure 5 – New IT Skills and Roles
For example, IT created the role of Cloud Architect with responsibilities for optimizing the underlying cloud infrastructure to ensure sufficient capacity and performance for the growing number of IT solutions being delivered as a service. This precipitated a major shift from assigning staff resources to a single component, such as servers or storage, to focusing on the cloud infrastructure as a whole. Aligning skill sets to the holistic cloud architecture also created more flexibility to reuse IT components for multiple IT service offerings.

Another new role created was the Cloud Consultant to provide technical assistance for business and application teams that wanted to migrate their workloads to the private cloud. Cloud Consultants required strong communication skills and broad technical knowledge, with their primary function to make it easier for the business units to work with IT.

Instead of multiple technology experts across different areas consulting with the business unit, a single Cloud Consultant would engage. In addition, the Cloud Consultant would offer business users a choice of common cloud services to rapidly meet their needs, as opposed creating each solution from scratch.

IT also created a platform services team responsible for delivering services from the private cloud, including application hosting, file services, database services, and storage. While there was no chargeback or self-service enabled at this point, the creation of a service delivery team was a critical step toward transforming IT into a service-oriented organization capable of providing services and delivery timeframes closely aligned with the requirements of EMC’s business units.

EASING TRANSITION WITH PROACTIVE COMMUNICATIONS
A transformation of this magnitude did not occur without challenges. Creating new roles for people often provokes anxiety and resistance.

As a result, navigating the changes required extensive communication and transparency from management to keep everyone on the team fully informed and engaged. Managers needed to spend extra time explaining reasons for transformation—particularly in the context of larger trends in the industry—and impress upon each individual the value that their skills would bring to the new role. Sharing the meaning and value of change was critical to ensuring a smooth transition and easing concerns.

QUICKER TIME TO MARKET FOR NEW PROJECTS
Since the formation of the PCIG and alignment of roles with the underlying cloud infrastructure, IT has dramatically improved efficiency and responsiveness in serving the business.

For example, launching an Infrastructure-as-a-Service (IaaS) offering in IT’s service catalog streamlined delivery of a virtual machine from dozens of manual steps over a period of 45 days to an automated process that takes just 30 minutes. More complex virtual infrastructure requests are handled using pre-defined templates, reducing project engagements from several months to a couple of weeks.

For its largest ever project to date, IT orchestrated a remarkable 27-month global rollout of a new SAP enterprise resource planning (ERP) solution in the cloud infrastructure, saving EMC millions of dollars and enabling dramatically faster and more efficient integrations of new applications.

With the infrastructure and organization aligned to deliver services, IT has since expanded its service catalog to include SharePoint-as-a-Service, Virtual Desktop-as-a-Service, and Database-as-a-Service, with additional services continually being added.

THE NEXT PHASE: CLOUD PLATFORM SERVICES CENTER
As part of the latest organizational model, EMC IT has created service centers for delivering cloud platform services, as well as other offerings, including: security services, data services, 3rd platform application development, enterprise application platforms, SaaS, COTS and OTS business unit applications, and consumer end-user services.
APPENDIX C: DATA ANALYTICS KEEPING PACE WITH THE BUSINESS

As an information-driven company, EMC built a massive global data warehouse containing data from across the company—sales, marketing, finance, manufacturing, and other operations. For industrialized reporting on end-of-quarter sales, bookings, revenue, and other metrics, this centralized, fast-growing repository served the business well. But when it came to ad hoc queries, data mining, trend analysis, and other specialized analytics, the process for extracting data and generating custom reports was slow and cumbersome.

Traditionally, when business groups initiated an analytics project, IT worked closely with them to define requirements and then develop a report. Dissatisfied with the time and accuracy of this process, some business users pulled data out of the global data warehouse independently and purchased their own tools to perform analytics and reporting. This trend toward shadow IT exposed sensitive corporate data to potential risk since it was often stored on unprotected systems outside of IT.

To ensure proper safeguards for corporate data and also streamline analytics and ad hoc reporting for business users, IT introduced the Business Analytics-as-a-Service (BAaaS) offering, implemented on the EMC Greenplum Data Computing Appliance. Using the sophisticated predictive modeling and data mining capabilities of Greenplum, IT’s BAaaS offering provides business users with a sandbox where they can load subsets of data from the global data warehouse, add their own data if desired, and perform ad hoc queries using the tools of their choice—all within a secure, protected environment.

PRODUCT MANAGER AND DATA SCIENTIST HIRES

To support BAaaS, IT instituted several key organizational changes (Figure 6). First, a product manager was hired to oversee daily operational requirements of BAaaS and serve as the IT representative of this service for business users.

IT also hired data scientists offering deep expertise in statistical techniques to work with their business counterparts with domain expertise in finance or marketing. If a business unit needs assistance, it can now engage a data scientist to load data and perform advanced analytics to support a project or provide needed reporting unique to that domain. Chargeback systems were put in place for both BAaaS and the data scientist resources. This allowed the organization to invoice for BAaaS or data scientist services each business unit consumed.

In addition, IT created a governance council to oversee data quality and master data management. The council applies business rules to all enterprise data elements. This way, the council can monitor quality, identify lapses in quality, and take any necessary action to cleanse the data. Business users are now assured of having consistently high data quality when they use the BAaaS offering.
STREAMLINED ANALYTICS DRIVING INCREASED REVENUE

Since implementing BAaaS, IT has streamlined the process for business units to run ad hoc queries and generate custom reports. With Greenplum’s capabilities and added value of data scientists, the business also is able to perform more sophisticated analyses, which in some cases have direct bottom-line impact.

For example, insights gained by EMC’s sales and marketing organizations through BAaaS resulted in increased revenue of nearly $100 million. With a better understanding of customer behavior and market dynamics, the business also positioned sales teams with opportunities where they have the highest likelihood of success, improving sales productivity and efficiency.

The data science services have made valuable contributions in field technical services. Through advanced analytics, EMC’s service teams now track the lifecycle of storage disk drives at customer installations and prioritize which drives needed replacement prior to a failure occurring. This ability has dramatically improved the total customer experience and enhanced the efficiency of EMC’s customer service organization.

Despite the huge potential for benefitting the business units, a significantly new approach to analytics and reporting like BAaaS was initially met with some resistance. Certain users, for example, were concerned that BAaaS would restrict their access to desired data. IT had to work diligently to put the right processes in place to avoid regressing to its former role as a gatekeeper to enterprise data. This effort required not only the right technology, such as Greenplum, but also the right organizational structure to ensure the appropriate data was accessible to each business domain without jeopardizing data quality or security.

Through collaboration with the business and by instituting effective governance, IT is further improving BAaaS to increase business agility and value. For example, EMC IT recently created a service center focused on Big Data Services that will continue to enhance and extend an elastic data fabric that will enable data consistency and easy integration. As a result, EMC’s new Big Data Services Center will accelerate EMC’s transformation of Big Data into insight and action and ultimately lead to breakthrough performance for the business units and EMC overall.
APPENDIX D: BUSINESS APPLICATIONS

EMC IT has significantly improved the efficiency and agility of delivering enterprise applications such as ERP. Historically, EMC had heavily customized its legacy ERP application to satisfy specialized and evolving business requirements. With two million lines of custom code and hundreds of application interfaces, the ERP system had become extremely complex and difficult to maintain and upgrade after ten years of customization.

During this period, EMC’s business model had changed dramatically through organic growth and strong merger & acquisition (M&A) activity. As a result, EMC’s revenues and employee count had more than doubled, which stressed the existing systems.

In addition, EMC IT was unable to move the legacy ERP system to a virtual infrastructure due to operating system limitations. Heavy customization also prevented upgrades to the application layer. The ten-year-old ERP environment had become a “burning platform” – consuming valuable resources and limiting business agility. The situation demanded a radical change to the way such enterprise applications would be handled in the future.

ENTERPRISE APPLICATION STRATEGY TRANSFORMED

Choosing SAP as its new ERP platform, EMC launched a new project called PROPEL. Rather than customize SAP to meet EMC’s unique business requirements, PROPEL would instead use out-of-the-box SAP tools and functionality with minimum core modifications. This required changing and adapting EMC business processes to a “vanilla” SAP solution. To enable this transformation, EMC assembled a large team from all aspects of the business, IT, as well as SAP and other systems integration partners to ensure delivery of the PROPEL project on time and within budget. Achieving a global SAP launch with a simultaneous go-live across EMC’s global operations was another critical objective.

Organizationally, the global rollout required people with a different set of skills and mindset. In the past, the enterprise application team focused on understanding each business unit’s nuanced requirements. Now, the team needed “change agents” with deep SAP skills who could guide business users toward adapting their operations to a standardized platform.

With a steadfast commitment to standardization and a close partnership with the business units, EMC completed the SAP rollout in just 27 months and executed a successful go-live to 8,000 global users simultaneously.

Avoiding Customization

To minimize any customization to the application, EMC IT created a governance organization called the PROPEL Program Management Office (PMO) with oversight to a Change Control Board (CCB) comprised of business and IT leads. The CCB members meet frequently to review and analyze any business requests to enhance SAP, and ensure that they do not impede the SAP upgrade path or impact any other users outside the group requesting changes. The PMO then carefully manages monthly rollouts of SAP enhancements and works with the business units to institute process changes when needed.

In one situation, a business unit requested an SAP application enhancement that would affect EMC's quality process on the manufacturing floor. Before making the changes, the PROPEL PMO required the business unit to build a business case that specified the savings, revenue impact, competitive differentiation, and other benefits. By following this strict procedure, any IT investment in enhancing an enterprise application would be tied back to the value it brings to the business as a whole.

Dramatic Cost Savings, Improved Agility

Since adopting this fundamentally new approach of deploying a standard SAP solution and allowing only minor enhancements, the run support costs for SAP have been dramatically reduced. Offshore resources with standard SAP skills can be used since the internal requirement for familiarity with a highly customized application environment has disappeared.

EMC also can adapt to business changes more quickly and easily. For example, EMC can integrate new business acquisitions into the new SAP environment in as little as two months compared to up to two years with the legacy solution. IT also was able to move SAP fully into its virtualized infrastructure, saving an estimated $11 million initially, with additional infrastructure savings expected over the coming years. Perhaps most important, IT has developed a stronger relationship with the business, evolving from order-takers to true partners focusing on business needs while ensuring cost-effective operations and streamlined scalability for SAP.

Enterprise Applications Platform Services

With the success of PROPEL, EMC IT will be following the same policy—running out-of-the-box enterprise applications with minimal or no customization—for all its enterprise applications. The principles applied to PROPEL also will be replicated for rollouts of Microsoft
Exchange and other enterprise applications. EMC IT is applying best practices from the PROPEL experience to these enterprise application projects.

Since both massive cultural and process changes were required by the SAP PROPEL rollout, EMC IT learned that significant time and resources to manage change must be allocated throughout an enterprise project. Also vital are full support from the executive leadership and all management levels combined with proactive, intensive communications to explain changes to staff and ease their concerns.

In the latest evolution of enterprise application delivery, EMC IT has created an Enterprise Application Platforms service center that ensures core enterprise business-critical processes are operating with top-tier availability and effectiveness.

**Third Platform Technology Innovation**

Another recent transformation for EMC IT’s application delivery was the creation of a service center called Third Platform Application Services, a new service center for next-generation application development such as mobile, Web, and social media. This organization focuses on third-platform application architectures and development methodologies. In addition, the team supports and refactors existing applications for the third platform.

**SaaS and Packaged Application Services**

EMC IT also created a service center that configures, deploys and supports business unit-sponsored Software-as-a-Service (SaaS) and packaged applications, such as off-the-shelf (OTS) and commercial off-the-shelf (COTS) solutions.

Building on lessons from EMC’s enterprise application development teams, the SaaS, OTS, COTS Application Center integrates these applications without invasive customization. In addition, this team will support the retirement and replacement of existing applications.
APPENDIX E: END USER COMPUTING SERVICES

In the past, EMC IT took a "one size fits all" approach to enabling end-user connectivity to applications and services. As user demand grew for devices, such as iPhones and Macs, which were not supported by EMC IT, the organization eventually realized that the productivity of a person is highly dependent on their preference and comfort with their end-user device, as well as how they connect to others. EMC IT concluded a significant technology and cultural shift was necessary to satisfy users, but one that would provide cyber security as well.

To facilitate this change, IT merged three separate teams (Client Technologies, Global Networks, and Telecom) into one group called Client Technologies and Connectivity (CTC). The CTC organization was charged with promoting a quality end-user experience, spanning how users gain access to the network and data center services, as well as the devices they use for various forms of communications such as voice, email, instant messaging, and video conferencing. Meeting these objectives would affect how applications were developed and the security methods applied.

CTC was driven by a more adaptive philosophy to ensure that almost every type of end-user device and platform could be accommodated. This was especially important with the emergence of unified communications as the ways users choose to communicate, share content, and collaborate have become tightly integrated. As a result, CTC was committed to delivering standardized IT services that would enable unified communications regardless of end-user device.

Meeting this objective was not easy as devices and platform technologies were constantly changing. By aggressively tracking the device industry and diligently working with EMC application developers to elevate their awareness of the need for choice, CTC was able to achieve significant results and demonstrate that supporting unified communications is a business enabler.

For example, a customer conversation with an inside sales representative often quickly expands across EMC product lines. Now, instead of placing the customer in a queue or requiring a call back, the inside sales representative can see which of the other agents are available and initiate a conference regardless of the location of their device. Ultimately, this level of unified communications not only improves communication among business users, but it also enriches EMC’s engagement with customers, positively impacting Total Customer Experience (TCE).

Further, sales productivity and the interaction sales has with customers has vastly improved with the support of mobile devices.

Today, EMC salespeople can access the EMC Sales Playbooks via desktop or mobile device, including iPads and mobile phones. This allows salespeople to access critical technical, sales, and marketing information on the device of their choice and from any location, providing a useful tool in the sales process.

In addition to improving the technology experience, work satisfaction and productivity for users, CTC’s efforts also translated to a competitive hiring advantage for EMC by offering potential employees more choice.

A SHARPENED FOCUS ON CONSUMER AND END-USER REQUIREMENTS

With EMC’s publicly stated goal of becoming one of the world’s 25 best companies to work for, EMC IT recognizes that offering personalized, easy-to-use and effective technology tools to its employees will go a long way in achieving this recognition.

Toward that end, EMC IT has created a Consumer/End-User Services Center focused on making the employee working experience simple, seamless, and productive with superior end-user technologies. Ultimately, these technologies will improve job satisfaction across EMC and drive agility, efficiency and productivity.
APPENDIX F: FULL LIFECYCLE SERVICE PORTFOLIO MANAGEMENT
To fully realize its delivery of IT-as-a-Service, EMC IT had to take a fresh look at its services portfolio. Traditionally, IT followed a project-centric approach to serving the business whereby a business unit presented a need, IT defined all requirements and implemented the requested solution or vendor application, and the project was completed. This model would not support the automated, self-service aspects of ITaaS. It also didn’t fully satisfy the needs of business users who increasingly turned to external cloud service providers for faster and less costly alternatives.

In response, IT began to “productize” its offerings. Instead of customizing different tools and applications for every request, the organization created standardized packages of product and service offerings, marketed to the business through a service catalog with a chargeback model. In addition, IT focused on the full service lifecycle of each packaged offering as opposed to operating primarily from a project delivery view. This required ongoing attention to service quality, functional enhancements and business value delivered. IT also would need to determine when or if a service needed to be discontinued and replaced with something better.

EMPOWERED PRODUCT MANAGEMENT
To facilitate the transformation to IT-as-a-Service, IT created a new Product Management organization responsible for overseeing the lifecycle of each service offering. Product managers became responsible for interfacing directly with business users to understand their needs and expectations—not just regarding features and functions, but also service-level requirements and cost.

Product managers captured the business point of view and evaluated it against the service portfolio, identifying any gaps and rationalizing the offerings to determine if some products could be eliminated. They also examined offerings from external cloud providers, including Amazon and Google, to ensure EMC’s internal portfolio offered compelling, competitive value.

To staff the product management team, EMC IT looked internally within the IT organization to recruit individuals with product management experience, but also hired seasoned product managers from other parts of EMC. The new group built competency by using existing knowledge and best practices from EMC’s product engineering groups, including a profit & loss mindset, competitive analysis, lifecycle management, funding, marketing and sales, scaling, and product retirement.

Graduated Rollout of Service Portfolio
Early in its development, the product management team realized that rolling out all services at once would be difficult to coordinate and challenging for users to absorb. The team created an incubation program with a small team to build the service catalog and IT portal starting with a single offering—Infrastructure-as-a-Service (IaaS). The IaaS offering provides business users the ability to create a virtual machine (VM) environment for their testing and POC purposes. The team standardized the IaaS offering by defining specific VM configurations from which business users could choose, loaded it into the service catalog on the IT portal, and built a workflow to automate the ordering and provisioning process.

Following the successful launch of IaaS, the product management team has been able to replicate the processes and workflows and apply them to other services in the service catalog. Today, the catalog includes approximately 70 services that business users can order. The service catalog offerings span IaaS, Platform-as-a-Service (PaaS), and Database-as-a-Service (DBaaS), as well as a range of standardized tools and applications, including Microsoft SharePoint, client computing devices (PCs, laptops), virtual desktops, and communications tools such as Microsoft Exchange, WebEx, Jabber, etc.

Enhancing Competitiveness
To make service catalog offerings compelling to the business users and allow it to better compete against external cloud providers, EMC IT focused on quality, cost, and speed. The EMC team priced its offerings to be more attractive than the competition, included a warranty, and provided well-defined SLAs. As a result, IT is now able to respond to the business with the same or faster response than outside providers, delivering higher value, and ensuring absolute customer satisfaction.

The ITaaS team learned that a key success factor in keeping business users loyal to internal IT service offerings was to communicate the value they provided and to collaborate with their customers to ensure end-user needs are well understood and addressed. Because communication is vitally important for effectively selling and positioning IT’s services to the business, the team is developing new educational and marketing programs to highlight the advantages and value of acquiring services internally instead of externally.
END-TO-END SERVICE MANAGEMENT TEAMS

While ITaaS product managers assess business needs and define service offerings, IT also recognized the need for a broader function responsible for the engineering, testing, financial management, and support of the services. To address this need, IT created service management teams comprised of technology engineers, product managers, and IT finance personnel. In the past, these disparate functional groups worked independently whenever their skills were needed to create and deliver an IT project. This structure lacked coordination toward a common goal and accountability for meeting customer expectations.

By creating formal service management teams, each member now has complete lifecycle responsibility for a service offering—such as feature and function, cost, conformance to the roadmap, service quality, and other areas, with full accountability to ensure customer satisfaction.

Launching with Infrastructure-as-a-Service (IaaS)

The first service management team was formed around IT’s initial service offering, IaaS. The team collaborated on every facet of the service, from deciding how to bundle and price the offering to defining SLAs. While ensuring the portal was fully functional prior to launch, service management also found that significant time and effort was needed to accurately assess cost elements, and price and package the offering appropriately. The objective was to ensure that the IaaS offering was engineered to deliver a high-quality end-user experience. In addition, the team created data sheets and knowledge articles to promote the service, as well as educate business users on how to acquire and use IaaS—all in an effort to enable as much self-sufficiency as possible.

Following the successful launch of IaaS, IT has continued adding service teams to manage other offerings in the catalog. For example, a Cloud Hosting service team now oversees a suite of offerings that includes IaaS, PaaS, DBaaS, and BAaaS. Similarly, the SharePoint-as-a-Service team provides business users with easy access to the Microsoft SharePoint platform by offering a per-user charge that accounts for license fee, service costs, and warranty. With a cross-functional team, IT can ensure that an offering such as Platform-As-A-Service (PaaS) is enabled with all the necessary components to provide a complete platform, including application, web servers and database servers.

Enhancing the Total Customer Experience through ITaaS

By focusing on user satisfaction and standardizing on operational metrics, the service management teams are meeting IT’s goals of optimizing service delivery, increasing efficiency, and improving the total customer experience. As a result, IT now runs service delivery more like a business, with the ability to deliver competitive solutions and account for their successful adoption and profitability.

While the IT organization continues this transformation by adding more service teams, it also faces a challenge to guide the business units toward a different way of working with IT. This requires an ongoing cultural shift that IT is helping to facilitate through stronger communications and marketing of the service portfolio.

In transforming service management, EMC IT learned the best way to gain traction was to get some early wins by identifying a select number of services that are most in demand by the user community. Rather than wait for the entire initial set of services to be completely finalized, the service management team found it was better to make the services available as soon as they were ready to help generate interest, demand, and adoption.

A NEW TEAM: SERVICE PORTFOLIO MANAGEMENT

To further accelerate the roll out of ITaaS, EMC IT has created a Service Portfolio Management team. This team will define service strategy, service portfolios and service features in support of the IT architecture, and will manage services through their lifecycle. The team will oversee standardized services identified for EMC’s self-service catalog, as well as purpose-built, non-standard services diverted to EMC IT’s Solution Desk.
APPENDIX G: TRANSFORMED SERVICE OPERATIONS

Recognizing that a fully realized IT-as-a-Service model also must encompass comprehensive IT service and support, EMC reexamined its global IT service operations. Traditionally, the organization was comprised of disparate teams focused on individual technology areas such as systems, storage, and network. In many instances, technology engineers were handling support calls for the infrastructure components or services they developed, which took valuable time away from their primary function of building products and services. If they were working on tight deadlines, the build projects would take priority over the support calls, which could affect response time. Further, as EMC IT rolled out its private cloud infrastructure, the multi-tenancy and consolidation associated with the cloud intensified the need for operational excellence and continuous availability of business applications.

With IT support fragmented by technology silos, it was difficult for service operations to gain a big picture view of inter-related issues across the infrastructure stack. For example, service operations could determine if a service was down, but could not pinpoint whether the problem originated at the application or platform level. As a result, resolving problems was often time-consuming and resource-intensive, causing frustration among business users waiting for services to be restored.

With approximately 60,000 EMC users to support, EMC IT consolidated the silos of service teams into a single, integrated organization with a dedicated focus on delivering higher-quality customer service. This process also involved removing support responsibilities from engineers so they could focus solely on development, while expanding service to cover all aspects of IT, including platforms, applications, and middleware. The result was creation of the IT Service Operations (ITSO) Command Center.

ITSO COMMAND CENTER: REDISTRIBUTION OF SUPPORT AND ENGINEERING ASSETS

Prior to the ITSO Command Center, EMC IT’s network operations center (NOC) had built a successful track record of providing responsive, around-the-clock end-user support. The NOC team had developed extensive technology competency while maintaining a strong relationship with engineering. This allowed the NOC to handle the vast majority of support calls, freeing the network engineers to concentrate on development.

Service operations wanted to build on success of the NOC and replicate the model in the ITSO Command Center to encompass support for the entire IT infrastructure stack beyond the network. The primary goals of this change were to:

- Increase quality of customer service
- Accelerate time to problem resolution
- Eliminate nighttime emergency calls to engineers
- Enable engineering to focus on design and build of new IT capabilities
- Improve work/life balance for employees
- Enhance career development opportunities

The ITSO Command Center resides across two locations—one in the U.S. and the other in India—to enable “follow-the-sun” coverage for EMC’s global enterprise. To deliver high quality support, the timing of shifts in the ITSO Command Center matches the primary hours of operation in each geographical location. All run support, such as resolving IT service problems for the company’s business users, which is now consolidated within this one umbrella organization.

Many in the U.S. facility were already service operations staff in separate technology groups who were brought together into the consolidated organization. Others were engineers who already spent the majority of their time handling support calls so they were moved into the command center full time. They received training to develop support-focused skills and learn proactive strategies aimed at averting issues. The remaining engineers who only occasionally handled support calls were then free to focus more on their primary role of designing and implementing IT services. While the ITSO Command Center took on prime responsibility for run support, the organization still engages the technology engineers to assist only with the more challenging technical issues.
CONSOLIDATION IMPROVES EFFICIENCY AND EFFECTIVENESS

Today, all support calls stream into the IT help desk. If escalated, the incidents are sent to the ITSO Command Center for deeper technical analysis and resolution. From there, service operations experts have the option of collaborating with the technology engineers when deep technical knowledge and expertise are needed to restore services. Having one support team instead of multiple disparate teams has forced greater standardization in how support is handled, helping to improve efficiency.

ITSO also designed and built a state-of-art command center to facilitate greater efficiency and teamwork. Support teams are grouped in pods based on their natural synergy with one another. For example, storage and systems experts work in the same pod while network and security experts reside in a different pod. Shift supervisors are positioned in the center of the pods to easily stay connected with all activity. In addition, large video monitoring screens are located throughout the command center to graphically display vital information from the infrastructure and aid in around-the-clock observation and troubleshooting.

All this effort is paying off. Since creating the ITSO Command Center, the average time to resolve service issues has improved substantially. For example, outages of the “order to cash” process for receiving and processing customer sales orders—just one of the 22 mission-critical applications monitored by the command center—was reduced significantly. In addition, everyone on the team has gained a more satisfying work/life balance.

ENTERPRISE MANAGEMENT AND AUTOMATION SYSTEMS: TOOL SET STANDARDIZATION

Consolidating service operations exposed gaps in how alerts were handled between engineering and the run support team. Previously, each technology group in engineering had separate sets of tools for monitoring different infrastructure components, such as storage, network, or telecommunications. Alerts from these systems went directly to the engineer on call in that group, bypassing the command center entirely. The disparity of tools also made it impossible to gain a holistic view of the infrastructure and services, which impeded the resolution of problems.

To address the silos of tools and staff, EMC IT grouped all of the people who managed the monitoring tools into a centralized Enterprise Management and Automation Systems (EMAS) team within the ITSO Command Center. Members of the EMAS team are now aligned with each engineering technology group. EMAS team members consult with the engineers to understand the exact monitoring requirements of their products and services, and then implement the appropriate tools so the right kinds of alerts are sent to the command center. As with creation of the command center itself, centralizing management of the monitoring tools further freed the engineers to focus on their primary responsibilities.

CONTINUED EVOLUTION OF ITSO

To enable full-service, around-the-clock support for the business, ITSO needed to go even further with its transformation. A major change is expanding ITSO’s capabilities to cover everything involved in running IT services, including applications, databases, integration technologies, security, and middleware.

To ensure the command center staff had the necessary skills to deliver enterprise-wide support, ITSO needed to engage in further organizational restructuring. ITSO is employing two primary strategies for broad organizational change:

- **Shift and Lift**—This approach encompasses individuals, as well as entire teams. For example, security run operations, which had been handled by a team within engineering, was simply shifted directly into the command center. In other instances, command center leaders worked with engineering to identify individuals who spent the majority of their time on support and had high demand expertise in areas such as client technologies. Such individuals were then shifted into service operations.

- **Shift to the Left**—In situations where an engineer had needed expertise, but spent little time providing support, the command center applied a shift to the left, or service optimization, strategy. The engineer would provide knowledge transfer with all associated technical documentation to the command center. The ITSO would rationalize or evaluate skill sets and knowledge bases, across the command center to ensure that the most appropriate people would receive the knowledge transfer.

With better integration of service operations staff with the engineers who create the IT services, ITSO has improved speed and efficiency of identifying and resolving infrastructure outages. In addition, ITSO is helping EMC IT deliver on and strengthen its role as a service provider to the business.
Increased Efficiency with Tiered Service Levels

Consolidating service operations—both people and tools—has created a highly efficient organization capable of handling 95 percent of trouble calls. Enabling this level of service is a three-tiered structure with Level 0 self-service, Level 1 service desk services, and Level 2 ITSO Command Center or field operations support.

Within this construct, EMC IT is following a “community first” strategy by creating e-services, automated support channels, and online forums that business users can use to resolve many issues without involving IT (Figure 7). The goal is to drive as much support traffic to Level 0 as possible because it is not only less costly for EMC IT, but also provides a faster, more satisfying support experience for users. As part of this strategy, EMC IT is authoring 200 knowledge articles and posting them online for access by users.

ITSO also is automating support with its advanced monitoring tools. If the tools detect a fault or negative trend in operations, they create an incident alerting the EMAS team, which can often resolve problems before they impact the business. More challenging incidents that require deeper analysis and troubleshooting are then escalated to the ITSO Command Center.

Refocusing on Customer Service

With its organizational transformation, ITSO has intensified its focus on customer service. This included expanding the organization with strategic hires in communications and outreach. One of the primary goals of the communications staff is crisper, more concise information delivery. They are also targeting notifications and updates to those groups affected by a particular incident rather than broadcasting them to all 60,000 employees as had been the practice historically. Over time, the organization plans to offer service operations communications on a subscription basis, as is common with public providers, and allow business users to opt in or out based on their personal preferences.

Service operations outreach staff is implementing a customer sentiment strategy, conducting surveys and building a feedback loop to product managers and service owners to guide enhancements. The organization uses the ITSM platform to track information, such as number and type of incidents, and generate reports to service owners to help them continually improve quality.
As part of its transition to becoming a service provider, ITSO also has instituted a standard review process with service owners, and developed key performance indicators (KPIs) to measure service quality. To drive this effort, the organization hired a data scientist who examines historical trends, reviews conditions that impact services, and performs analytics to predict potential problems. The goal is to identify 90 percent of impending incidents far enough in advance so they can be addressed before the business is affected. ITSO has already successfully tested these predictive analytics with Microsoft Exchange. The next step is expanding the practice across all of the solutions supported by ITSO, and eventually moving completely away from purely reactive threshold-based alerts to predictive alerts.

By developing and automating run books, which are formal sets of procedures that define the appropriate response to each type of alert, the organization expects to ultimately create a self-healing environment that maximizes service availability and performance for the business. Finally, the organization is also refocusing its desk-side support organization to perform more proactive service-like coaching of users on how to use productivity tools, which has been very well received.

**ENTERPRISE-WIDE SERVICE RELIABILITY AND EFFICIENCY IMPROVEMENTS**

As a single organization focused on customer service, ITSO has realized tremendous benefits and efficiencies. Not only do users benefit from more reliable, efficient access to critical IT services, but EMC IT has accelerated its virtualization and cloud initiatives now that less time and resources are devoted to troubleshooting and firefighting.

In addition to decreasing mean time to resolve issues, ITSO has reduced expenditures associated with trouble tickets by four percent annually through its shift-to-the-left initiative and by driving support requests more toward Level 0. ITSO projects these annualized hard cost savings will be reduced by 10 percent by the end of 2014. By targeting communications for specific audiences and making each notice more crisp and pertinent, ITSO has reduced the number of messages going out to business users by approximately one million—a 70 percent reduction. Today, messages go out only to affected users—generally a small subset of EMC’s overall user population. More efficient and targeted communications is helping to improve IT’s brand, building greater trust and value across the company, and improving overall client experience.

As the ITSO Command Center evolves, the IT help desk will continue to be the first line of support, strengthened now by expanded levels of cross-functional staff knowledge, as well as intelligence generated by the command center’s monitoring tools. Tighter integration among these various levels of support resources assures greater accountability and efficiency, resulting in a higher percentage of problems being resolved on the first call.

In addition, having all support responsibilities centralized enables end-to-end visibility to better correlate multiple issues for quicker resolution. It also improves alignment between service operations and overarching IT objectives—namely, ensuring higher levels of service to maintain business productivity and user satisfaction.

**A Phased Approach to Absorbing Change**

The transition from disparate technology support groups to a centralized organization focused on enterprise customer service can be disruptive and requires extensive time and resources.

When considering staff outside of ITSO for transfers to the command center, ITSO leaders needed to carefully identify people with a true passion for troubleshooting and broad cross-functional knowledge to correlate information and solve complex problems.

Equally important was demonstrating to engineers that moving into an operations support role was a desirable career path with valuable growth opportunities. One of the key steps to support this notion has been recruiting engineering managers into the command center. Since a key focus of the new command center was developing deep technology competency, engineers found they were highly valued as among the most knowledgeable and effective problem solvers in the command center.

The engineering and service operations teams also had to work closely to agree on dividing the responsibilities—new and old—between the engineers versus the support staff. Flexibility was critical, and taking a phased approach proved effective—gradually moving select engineers into support roles and engaging in knowledge transfer where personnel moves were not feasible.

To gradually facilitate change, ITSO holds regular team meetings, lunch and learn opportunities, strategy sessions, and monthly all-hands meetings to keep everyone updated on organizational changes and strategies.

Since more sophisticated capabilities for identifying and analyzing incidents was actually driving an increase in trouble tickets, ITSO needed to ensure existing staff would be able to handle the increased volume while continuing to move forward key initiatives. While automation continues to improve staff efficiency, ITSO also has needed to re-prioritize projects to ensure a high level of customer service.
Most important, EMC ITSO has learned that having one centralized organization dedicated to customer service has been the key to improving IT efficiency while providing high-quality support for the full range of services needed to run the business.

A BROADER CHARTER
As part of EMC’s most recent IT reorganization, IT has renamed EMC ITSO to Service Operations, which will continue to be responsible for maximizing service uptime and quality. The Consumer and End-User Services team will become part of Service Operations to enable a powerful and unified focus on user experience from both a support and end-user services perspective. In addition, Service Operations will drive user experience thought leadership in support of innovation incubation and IT Proven activities.
APPENDIX H: ENTERPRISE ARCHITECTURE REDEFINED

Establishing a holistic approach to architecture was fundamental to EMC IT’s organizational transformation. Prior to the transformation, IT was organized into four separate architecture groups—Application Development (Service Delivery), Global Infrastructure Services (Servers, Storage, Networking, Backup), the Business Technology Group (BTG), and Security. Each of these groups had a narrow view focused on their own respective areas of responsibility without a larger sense of common purpose and technology direction.

Cloud Computing and IT-as-a-Service require a broader approach and a focus on managing interdependencies across disciplines. Application development agility needs pervasive platform services while platform services require delivery via an elastic cloud infrastructure. Finally, a comprehensive ITaaS model needs end-to-end automation and visibility to improve the user experience.

CONSOLIDATION OF ARCHITECTURE TEAMS

To drive a more holistic approach to enterprise architecture, EMC established the role of Chief IT Architect and organized the four groups as an enterprise architecture team with dotted-line responsibility to the Chief IT Architect. Team members were expected to evaluate business processes, applications, and infrastructure and embrace common goals. Instead of a fully centralized architecture team, the structure of individual technology domains remaining independent with dotted-line reporting allows team members to more easily develop forward-thinking methodologies to enhance project engagement, and yet work with a holistic view of business objectives.

The team focused on not just IT capabilities, but also roadmaps for how each member of the team would contribute to a common set of goals and objectives projected over several years. The team met weekly to review its plans and track progress. This brought to the forefront dependencies among the various architectures and roadmaps, facilitating collaboration and reinforcing the enterprise value of their individual contributions.

CONNECTING IT ARCHITECTURE TO THE BUSINESS STRATEGY

EMC built an overarching business architecture plan to bring together all capabilities and individual roadmaps into a larger strategy. The result was a shift from a technology-centric orientation to a business-centric and information-centric orientation so that server, storage, networking, security, applications, and other technology initiatives would align with the needs of the business as a whole.

As part of this effort, EMC established an IT advisory board of chief technology officers and product managers from each product-focused business unit, which meets quarterly with the enterprise architecture team to review its roadmaps. This has strengthened the relationship between IT and the business units, allowing the architecture team to better prioritize IT initiatives based on business needs.

Today, the enterprise architecture team also acts as a governance review board to ensure that all new IT initiatives link to the business architecture roadmap and support EMC’s strategy and business priorities.

Holistic Architecture Roadmap Enhances Total Customer Experience

By taking a more holistic approach, the enterprise architecture team has led several major projects that advance EMC IT’s journey to the cloud and ITaaS through greater standardization, virtualization, and consolidation.

For example, EMC’s SAP PROPEL project fundamentally changed the way EMC IT manages its ERP environment. Instead of implementing highly customized ERP solutions across the enterprise, IT deployed PROPEL on a standard SAP solution hosted in a private cloud. With the transformation brought about by the enterprise architecture team, EMC also consolidated 13 innovation labs into one, creating a new model for innovation that would foster and accelerate IT development opportunities and help the business grow.

The broader impact on EMC has been higher levels of business productivity and effectiveness, which has improved the total customer experience for end-users interacting with IT. The IT organization also is able to allocate resources more efficiently. In addition, the architects are better attuned to how their investments today impact the future of the enterprise, creating tighter alignment between individual projects and common business goals.
ADVENT OF THE SOLUTION DESK

To streamline interaction between the business units and enterprise architecture team, EMC created a "Solution Desk," comprising a mix of architects and business analysts. The primary objective of the Solution Desk was to simplify the estimation process early in the lifecycle of a proposed initiative.

Traditionally, business users came to IT with solution requests and the architecture team immediately engaged in a deep-dive requirements analysis, applying a high degree of due diligence and providing a detailed estimate of scope and cost. The old process typically took six to nine months to produce an estimate, and led to a proliferation of multiple stand-alone architectures across EMC. When projects would not move forward, months of IT time and resources would be wasted.

Alternatively, the Solution Desk examines solution requirements at a high level and provides business users a range of options, each with a rough estimate allowing a 30 percent variance. When the Solution Desk receives project requests, the appropriate business analysts and architects conduct an initial proposal review, followed by an input meeting with the business user to prioritize the high-level requirements.

EMC IT recommends following an Agile project management model of providing estimates to the business. It’s also been important to ensure that any SLAs associated with the estimate are preserved even though the estimate may have a 30 percent variance.

Because the Solution Desk has a holistic view of the overall architecture, team members look for capabilities in existing architectures that can satisfy the solution requirements. Since it is much less expensive to reuse existing architectures than to develop new ones from scratch, this approach encourages greater adoption of standardized enterprise solutions while discouraging unnecessary uniqueness and divergence from the standards.

Accelerated ROI Analysis

The Solution Desk has reduced the timeframe to just two weeks for evaluating potential options and two weeks to complete a high-level estimate. Instead of waiting up to nine months, business users know within one month whether a proposed solution offers an acceptable return on investment.

Approximately 50 percent of projects brought to the Solution Desk are discontinued, or filtered out, after the first month of due diligence, allowing more viable projects that offer greater business value to move forward more quickly.

By accelerating the process of estimating solution initiatives, the Solution Desk has helped EMC dramatically improve its business agility. Projects that come through the Solution Desk proceed faster to the design and architecture process, enabling EMC to respond more quickly to new opportunities and with increased confidence in the value of its IT investments.

LOOKING FORWARD: ENTERPRISE ARCHITECTURE TEAM

In addition to rolling out demand centers and service centers, EMC IT has created the Enterprise Architecture enablement center that will help more closely link IT’s strategies with EMC’s business objectives by conducting the following activities:

- Set and reinforce technology standards
- Establish and implement IT architecture
- Integrate EMC Federation solutions with IT’s architecture and service portfolio

The new Enterprise Architecture team will ensure that offerings supported by the service centers are closely aligned with EMC’s technology standards and business strategy.
Understanding the cost, price, and value of all IT services is a key aspect of transforming IT to be able to operate as a business and deliver ITaaS. Because of this, financial transparency became a critical driver in EMC’s overall IT transformation (Figure 8).

**Figure 8 – 8-Step Process For Simple, Fair, Accurate Charge/Showback**

Financial transparency is essential for successfully implementing IT chargeback, which is the practice of invoicing each business unit for the IT services it consumes. Chargeback provides business units with a clearer picture of what they spend on IT services. This helps business units gauge the value of those services, make informed decisions about IT investments, and sharpen their focus on efficiency. EMC IT has set a goal of 100 percent chargeback.

Through the early stages of its ITaaS journey, EMC IT was charging business units 54 percent of its budget for IT services. Charged back IT services primarily consisted of business application services, including software development and packaged applications such as ERP and customer relationship management (CRM), as well as end-user services, including printing, mobile devices, and PCs. IT needed full financial transparency to allow the organization to become more accountable, responsive and competitive, and to reach its 100 percent chargeback goal.

**DATA ACCURACY: A FOUNDATION FOR CHARGEBACK**

To expand chargeback and further ingrain financial transparency into EMC IT’s standard operating model, a small team of finance, business operations, and infrastructure managers within IT painstakingly identified costs related to every aspect of delivering a service to the business units. Armed with this information, the IT Finance team implemented a simple cost model to calculate raw costs identified during the initial cost gathering exercise. The team then rolled these figures into cost pools which could be directly associated with EMC IT’s portfolio of products and services.

EMC IT realized that to justify chargeback, data used in its cost model had to be extremely accurate. Because manual efforts to scrub the data only achieved 60-70 percent accuracy, the team developed an in-house tool to automate the process. The result is a Data Quality-as-a-Service system that creates a consolidated set of cost data for reporting and consumption in the chargeback model.

Since implementing Data Quality-as-a-Service, time spent gathering, analyzing, and correcting data decreased from more than 280 hours per week to less than 10 hours per week. EMC IT estimates savings of more than $60,000 per month in labor costs alone. Even more important, data accuracy has increased to 95 percent—an improvement of over 50 percent.

To ensure ongoing data quality and stabilize the cost model, EMC IT created the role of data stewards. These individuals in IT are responsible for understanding every aspect of cost data within a specific group or data domain, such as project management, data center management, or IT service management. By owning the data, the data stewards ensure that any problems are properly corrected in the master data set.
EXPANDING IT CHARGEBACK

With a solid cost model and assurance of cost data quality, EMC IT expanded chargeback to include hosting services for business applications such as ERP, CRM, and HR. Chargeback also applied to other services used broadly across EMC, including end-user services encompassing communication and collaboration (email, messaging, video conferencing); computing (office software, desktop tools, help desk, mobile support); and connectivity (Internet, VPN, network services); and optional ITaaS offerings (virtual desktop, SharePoint, Syncplicity, virtual server, and other premium services).

As a result of this expanded chargeback, EMC IT transitioned from 54 to 89 percent chargeback across the corporation in just 12 months (Figure 9).

![Figure 9 - Financial Transparency Transition](image)

EMC IT also created new consumption-based contracts with managed service providers to provide needed granularity to support the chargeback system. Instead of charging EMC per person for labor associated with IT services, such as production support, the new formula was based on units of work, such as number of service tickets closed.

At this point, EMC IT was ready to introduce a formal invoice process to the business units by generating service charges from cost data and presenting them to the business units. The initial invoicing process took three months to complete due to the simultaneous rollout of EMC’s new ERP solution, requiring adjustments to financial processes. EMC IT then worked with each business unit on completing proper journal entries in the accounting system.

EMC IT is now automating delivery of service invoices through a new online tool to enable business unit controllers to view their invoices online. In addition, the automated system will generate invoices on a monthly basis compared to every three months previously.

FINANCIAL TRANSPARENCY RESULTS

The impact of financial transparency has been significant, and additional benefits are expected as EMC IT continues to extend chargeback and refine its cost model. Business units not only have a clearer picture of what they spend on IT services, but they can better gauge the value of those expenditures to guide their future IT investment decisions. By building greater transparency, trust and demonstrating higher value, EMC IT also has reduced the prevalence of shadow IT and its associated risks and run-time costs.

Better alignment of IT services and support to business value also has produced measurable financial benefits, These include both a reduction in IT operating expense and a decrease in IT staff required to support the cloud infrastructure. By moving managed service contracts to a unit-based cost structure rather than paying per FTE, EMC IT has realized millions of dollars in savings. IT efficiency also has improved thanks to standardized application offerings, and with a more agile service delivery model, IT can respond to business requests in days or hours instead of weeks or months. Ultimately, a more efficient and agile IT organization is enabling EMC business units to respond more quickly to market shifts and new opportunities, while better managing IT costs.
LESSONS LEARNED IN IT FINANCE

As EMC IT engaged in its financial transparency journey, the organization embraced several principles that were essential to ensuring its success.

IT has made it a priority to foster agreement among business leaders regarding where money should be spent, aligning IT initiatives to not only business unit objectives but also corporate goals. In addition, EMC IT maintains a strict process for how funds are allocated in the general ledger, minimizing variations to avoid complexity and potential errors.

EMC IT started with a relatively simple cost model and pricing strategy, and then evolved the model over time to become more granular. Pricing of services also reflect tax structure, accounting rules, security, and regulatory compliance, and is set slightly higher than cost to account for unexpected overruns. To ensure its offerings are competitive, EMC IT regularly compares its service offerings and pricing to those offered by outside providers.

Although EMC IT encountered some initial resistance, the organization’s ability to understand cost, price, and value of all IT services, commitment to high data quality, and success in delivering strong cost data were crucial in providing financial transparency to the business and allowing EMC IT to operate as a business and deliver ITaaS.
APPENDIX J: DIGITIZATION AND AUTOMATION THROUGH ITSM

With regard to support of internal business customers, EMC IT operated in silos focused on individual technology components rather than end-to-end service. In addition, IT often embraced a reactive approach that treated support as an afterthought. Consequently, when a problem arose, the support staff typically would work overtime to resolve issues.

As the organization transformed to an ITaaS model, EMC IT needed to become more proactive and build support into service design and delivery. Legacy tools that IT was using to build and manage its services had become obsolete and did not offer the key functionality required for ITaaS. To address this issue, EMC IT launched a program called UniTy to adopt and implement an ITSM-based framework for service management and delivery—specifically, the ITIL framework. The UniTy program follows a set of guiding principles based on ITIL best practices (Figure 10) and uses an IT service management toolset that supports ITIL.

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<th>Standardize</th>
<th>Design for agility, manageability, scalability and reliability leveraging industry best practices. No customizations</th>
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<tr>
<td>Quality</td>
<td>Commit to meet customer quality and service delivery expectations</td>
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<td>Value</td>
<td>Drive business value</td>
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<td>Accountability</td>
<td>Governance in place to assure accountability and manage risk</td>
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Figure 10 – ITSM Program Guiding Principles

The objectives of UniTy were to operationalize all IT processes, from handling service requests to better aligning IT service offerings to business requirements. To support these objectives, the program initiated new processes and optimized existing processes, refocusing IT on end-to-end service to improve the total customer experience.

EMC IT is currently implementing six ITIL processes: Incident Management, Knowledge, Request Fulfillment, Problem, Change, and Asset/Configuration. In the next phase, IT will implement Availability Management. Each process has standard tasks and workflows to reach the desired outcome as efficiently as possible. For example, the steps for Incident Management ensure that service is promptly restored. The Request Fulfillment process enables IT to efficiently deliver on service requests, and measure its performance to drive continuous improvement.

The UniTy program also includes a technology enablement team to embed appropriate workflows and functionality into processes consistent with ITIL best practices. In addition, a transformation enablement team is responsible for educating the service delivery managers how to follow these ITIL processes.
SUPPORT INCIDENTS REDUCED

Following the initial rollout of UnITy, IT quickly realized several incremental improvements (Figure 11. For example, prior to adopting ITSM standards, the volume of support incidents was increasing by 10 percent annually. Since ITIL processes have been in place, the number of incidents has been reduced by 10 percent. ITSM also has enabled EMC to realize $5.1 million in annual savings from improved in-house production support, reduced dependence on managed service providers, and decreased need for service desk resources due to self-service capabilities.

As additional ITIL processes have been implemented, IT is working more efficiently, delivering services faster, and lowering support costs. Embracing ITSM has proven to be a critical factor in enabling ITaaS and improving the total customer experience.

SUCCESS FACTORS

EMC IT credits several success factors that have helped accelerate the adoption of an ITSM framework. In addition to securing executive sponsorship, EMC IT learned it was valuable to maintain frequent, ongoing communication about ITSM with the user community during all of the project phases. Toward that end, the UnITy team included people with a deep understanding of ITSM practices who have been able to evangelize ITSM and educate the rest of the organization. The IT organization also has closely followed best practices for its ITSM framework and avoided customizing the tools to ensure consistent adoption.
EXPANDING THE REACH OF ITSM

The ongoing organizational transformation in IT has created demand for applying ITSM standards in more areas than originally anticipated to help the enterprise as a whole perform more efficiently.

For example, asset management, which tracks the lifecycle of PCs, software, and other end-user tools, was handled differently by each business unit across EMC. There was no central repository for managing these assets. Now, the UnITy program staff will implement ITIL processes and tools to enable IT to consistently monitor and track assets throughout their lifecycle on a global basis.

There also is interest in applying ITSM principles outside of IT. For example, EMC Human Resources (HR) traditionally has used a wide range of systems and tools to manage its many interactions with employees, such as responding to questions about benefits and payroll. Implementing ITIL will standardize HR processes to improve responsiveness and efficiency, and ultimately enhance the employee experience.

AN ORGANIZATIONAL FOCUS ON DIGITIZATION AND AUTOMATION

In further support of the ITSM organizational transformation, IT has created an Digitization and Automation team to achieve IT’s agility, quality, and operational excellence objectives. Specifically, the new team will focus on further defining and improving core processes, governance, and delivery lifecycles and methods.

In addition, the team will drive automation and digitization of all IT functions and services to minimize manual tasks, improve efficiency, reduce cycle times, and improve the Total Customer Experience.

REFERENCES

For more information, please visit:
www.emc.com/EMCITProven
EMC IT Transformation blog at http://itblog.emc.com/

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