

Reducing Complexity and Accelerating Value of Your PC Infrastructure

Three Strategies to Improve IT Efficiency and Reduce TCO



Windows Vista

Abstract

The enterprise PC landscape is filled with many resource and management challenges, which IT managers must address to ensure cost-effective operations and high levels of service, often on a limited or shrinking budget. Managing PC infrastructure in this challenging environment requires that PC management costs be minimized. To help realize these goals, organizations need to have world-class IT resources dedicated to designing, implementing, and maintaining their IT infrastructures.

This paper highlights the capabilities, expertise, and resources of Tata Consultancy Services, a global IT solutions and services provider that is engaged by enterprises throughout the world. Tata Consultancy Services helps its customers design, implement, and maintain their PC environments and IT infrastructures with the objectives of ensuring infrastructure optimization (IO) and reducing total cost of ownership (TCO).

Engaging Tata Consultancy Services for IO assessment, deployment, and ongoing systems management services is one of three recommended strategies that IT managers can use to improve IT efficiency and reduce TCO. The other strategies—adopting PC-related best practices and deploying Microsoft applications and technologies—reflect the results of five PC management studies conducted by IDC and sponsored by Microsoft in 2005 and 2006.

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Executive Summary

The enterprise PC landscape is filled with many challenges, which IT managers must overcome to ensure cost-effective operations and high service levels, often on a limited or shrinking budget. Managing the PC infrastructure within this dynamic environment requires control of PC management costs through a variety of means, some technical and some knowledge based.

Studies sponsored by Microsoft and conducted by IDC in 2005 and 2006 provide several high-level findings, which show how organizations can achieve significant total cost of ownership (TCO) savings and improve their IT operational efficiency. These findings include:

- **Organizations can achieve significant IT labor cost savings by adopting PC-related best practices.**

The research study results indicate that an organization's infrastructure optimization (IO) status, a measure of IT operational efficiency, is a strong indicator of PC-related cost savings. Research has shown that IO status reflects the number of best practices adopted.

Adopting all seven of the core best practices described in the operational cost reports cited in this paper could enable an organization to save up to \$830 per PC per year more than organizations that implemented none of these best practices. However, most organizations participating in the studies adopted between one and four best practices and saved an average of \$200 to \$500 of IT labor costs per PC annually.

- **Organizations can enhance IT operational efficiency by deploying current Microsoft applications and technologies.**

IT labor cost studies were conducted at a wide variety of Microsoft enterprise customer organizations in 2006. Results of these studies show that organizations can use up-to-date PC operating system (OS) and systems management software to operate IT processes more efficiently and reduce the IT labor costs associated with supporting their PC environments.

Upgrading desktop and notebook PCs to the Microsoft® Windows Vista™ client operating system can be a cost-effective way to provide capabilities that support adoption of PC-related best practices. By deploying Windows Vista and using selected capabilities such as User Account Controls (UAC) or a built-in firewall, organizations can implement best practices that can help to drive down IT labor costs. For example:

- In a study of users who had deployed late beta versions of Windows Vista, IDC found that Windows Vista-based PC environments had IT labor costs that were \$37 per PC per year lower than those based on the Microsoft Windows® XP Professional Service Pack 2 (SP2) client operating system.¹
- Several Windows Vista capabilities are directly relevant to implementing three PC-related best practices, which were linked to an additional IT labor cost savings of \$430 per PC per year.

- **Organizations can improve IT efficiency and accelerate TCO savings by engaging a global IT solutions and services provider such as Tata Consultancy Services (TCS).** Rather than using inhouse IT services, organizations can benefit by engaging an experienced global IT solutions and services provider such as TCS to deploy and manage the latest Microsoft applications and technologies, perform IO assessments, and provide ongoing post-deployment and systems management services.

Tata Consultancy Services, the first global IT services provider and the inventor of the IT global delivery system, has nearly 40 years of experience developing and delivering solutions and services to organizations worldwide. TCS managers, business consultants, and specialists develop these offerings by using knowledge, business, and technical resources, which include:

- A networked global delivery model, which provides customers in 52 countries worldwide with 24 x 7 access to up-to-date, culture-friendly solutions and services.
- A global network of research facilities, IT solution development centers, distinguished IT professionals, and unique worldwide relationships with academic institutions.
- Advanced proprietary deployment, infrastructure optimization assessment, and risk reduction methods and tools based on Microsoft People-Ready technologies.
- Access to pre-launch programs for Windows Vista and other Microsoft applications.
- Ongoing investment in research and development, best practices, product development, and sustaining and disruptive innovations that drive value.

¹ IDC, "Core Infrastructure Optimization Research – Summary of Findings," January 2007, page 9.

Introduction

With globalization, companies of all sizes are under extraordinary pressure to accomplish more with less. Public demand for more efficient operations creates similar pressures at schools and public sector organizations. As a result, the strategic use of IT dollars is a business imperative. IT managers must directly address a wide range of PC infrastructure issues to ensure cost-effective operations and high service levels, often on a limited or shrinking budget. Typical PC management challenges include:

- **Lack of standardized PC processes.** Organizations often lack a standardized hardware and software purchasing, provisioning, and support plan. Without standards to guide purchases, local IT departments acquire what they want, when they want. The result—duplicate purchases and IT effort, poor application integration, and problems integrating applications and data into existing IT systems.
- **Manual IT processes.** The lack of centralized automated deployment, imaging, and provisioning processes makes IT operations more labor-intensive, less efficient, and more expensive.
- **Complex, hard-to-manage PC infrastructure.** PC environments consisting of many client operating systems and legacy applications make securing, backing up, supporting, and resolving security threats to PC environments slower, more labor-intensive, and more expensive.
- **Insufficient level of IT skills and experience.** As organizations add more complex and powerful applications and tools to their existing infrastructures, IT professionals need up-to-date knowledge and skills to operate the systems efficiently. However, improving IT staff expertise requires training and time away from their core duties, which increase IT support costs.
- **Need to balance IT efficiency and organization-specific business requirements.** Many organizations have difficulty improving IT efficiency in a way that provides the best mix of lower costs, better IT services, and improved business agility that supports their business goals. Lack of understanding of their infrastructure optimization status, which can guide IT purchasing, provisioning, and support activities, can result in duplicate budget purchases, increased IT staff effort, and lower return on IT investments.

Faced with cost control, service delivery, and business agility imperatives in this challenging environment, IT managers can use several approaches that contribute to cost-effective IT service delivery. Implementing industry-recognized, PC-related best practices is the first of these strategies.

Best Practices Reduce IT Labor and End-User Costs

Best practices include standardized processes, methods, and tools that can reduce IT costs, improve service levels, or promote business agility. Results of cost studies conducted at a wide variety of Microsoft enterprise customers show that organizations can use up-to-date PC operating systems, systems management software, and tools to capture value and reduce the IT labor costs of their PC environments.

In each of the Microsoft-sponsored IDC studies cited in this paper, adoption of PC-related best practices is directly related to lower operational costs. Of the approximately 50 best practices identified as relevant to influencing PC-related costs, seven had the strongest relationships with lower IT labor and end-user costs. These seven best practices can be grouped into four basic types of IT activities, which include:

- **Standardizing PC hardware, software, and procedures** to reduce duplicate purchases and integration problems.
- **Centralizing PC management tasks** to reduce IT effort and costs.
- **Creating a comprehensive PC security system** to reduce security threats and problem resolution times.
- **Using automated software distribution and group membership** to reduce the effort of hardware and software inventories and to standardize IT support processes.

In the IT labor cost reports, best practice adoption rates were also associated with improved service levels and greater business agility.²

Results of a Microsoft-sponsored IDC study reported cost reductions for organizations using a single version of the Microsoft PC operating system, Microsoft Systems Management Server 2003, and the Active Directory® service of the Microsoft Windows Server™ 2003 operating system.^{3,4}

² IDC, "Core Infrastructure Optimization Research – Summary of Findings," January 2007, page 9.

³ Current Windows software is defined as any version of the Windows client operating system released before Windows Vista.

⁴ "Infrastructure Optimization: Driving Down Costs of the Business Desktop," Microsoft Corporation, April 2006, p.3.

Organizations can reduce the IT labor costs associated with their PC environments by using Microsoft Windows Vista or an earlier version of the Windows client operating system. The study results indicate that standardizing on Windows XP Professional SP2 offers significant IT labor and end-user cost savings. However, upgrading to the Windows Vista operating system offers additional benefits such as lower IT labor costs, more reliable and secure PC operation, improved network performance, and greater system manageability than was available in earlier versions of Microsoft Windows. Use of Windows Vista also helped to reduce PC user labor costs.

Best Practices Increase IT Efficiency

Infrastructure optimization focuses on the overall development of an organization's IT processes and the specific technologies that the organization adopts. Microsoft developed its Infrastructure Optimization Model (IOM) to help organizations measure the maturity of their current IT processes and technology investments and to prioritize future IT investments. Exhibit 1 illustrates the characteristics of organizations at each IOM level.⁴

IOM Level	IOM Level Description
Basic	<ul style="list-style-type: none"> Most IT resources are used to keep IT functioning with reactive management. Systems are complex, incompatible, expensive, and do not provide services throughout the organization. Organizations use few IT policies and automated processes.
Standardized	<ul style="list-style-type: none"> Organizations run somewhat effective, centralized IT departments. IT systems remain complex, incompatible, and expensive and are run as stand-alone operations. Basic automation provided by centralized IT group; pockets of automated services exist at business units.
Rationalized	<ul style="list-style-type: none"> Long-term IT strategy is developed jointly by business and IT groups. IT policies defined with business criteria and enforced with IT processes and technology. Complexity engineered out of IT processes, and application compatibility issues are minimal. This is the most cost-effective infrastructure optimization state.
Dynamic	<ul style="list-style-type: none"> Cost savings are secondary to maximizing business agility, which is a source of competitive advantage. Some decision making is decentralized to bring decisions closer to business processes. IT systems are highly automated and flexible and respond quickly to changing business conditions. Organizations may choose not to implement some IT best practices because they reduce business agility.

Exhibit 1: Functional description of organizations in the Microsoft IO Model

In all studies cited in this report, participating organizations were grouped into Basic, Standardized, and Rationalized levels of IO development. Organizations participating in the research studies did not achieve the highest (Dynamic) level of IT efficiency.

The Microsoft-sponsored IDC studies compared IT and PC user labor costs, service levels, business agility, and application capabilities across the lowest three IO levels. The following section makes these comparisons and describes the Microsoft applications and technologies that enabled these benefits.

Reducing PC-Related TCO

This section describes how IT managers can use IT efficiency improvements and Microsoft applications and technologies to reduce their organization's TCO.

Adopting Best Practices

In recent IT labor and PC user cost studies, the number of best practices that an organization adopted was an effective predictor of infrastructure optimization status and TCO savings.⁵ Exhibit 2 shows the IT labor cost savings that can be achieved by adopting best practices with PCs running current versions of the Windows client OS and systems management software.⁶

Best Practices	Cost Savings
Standardized desktop strategy	\$110
Single system management tool	\$110
Centrally managed PC configuration and settings	\$190
Comprehensive, centrally managed security program	\$130
Automated packaging tools and software distribution	\$120
Automated user provisioning	\$ 50
Comprehensive directory solution	\$120
TOTAL	\$830

Exhibit 2: IT labor and PC user cost savings linked to IT best practices

Adopting all seven of the best practices described in the IT operational cost reports would enable organizations to save a theoretical \$830 per PC per year more than organizations that had implemented none of these best practices. However, no organization adopted all of the best practices; most adopted between one and four best practices and saved between \$200 to \$500 of IT labor costs per PC annually.

Improving IT Operational Efficiency

Microsoft and IDC study results document a strong relationship between IO status and IT labor savings—the higher the IO status (Basic, Standardized or Rationalized), the lower the IT labor costs.

⁵ "Infrastructure Optimization: Driving Down Costs of the Business Desktop," Microsoft Corporation, April 2006, p. 7 and IDC White Paper sponsored by Microsoft, "Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Managing the Windows Desktop," Doc #203482, October 2006, p. 25.

⁶ Results were compiled from three documents:

- IDC White Paper sponsored by Microsoft, "Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Managing the Windows Desktop," Doc #203482, October 2006, p.9.
- IDC White Paper sponsored by Microsoft, "Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Identity and Access Management with Active Directory," Doc #204221, November 2006, p.9.
- IDC White Paper sponsored by Microsoft, "Optimizing Infrastructure: The Relationship between IT Labor Costs and Best Practices for Systems Management Server," Doc #205110, January 2007, p.3.

Exhibit 3 shows the relationships of costs, service levels and business agility at each IOM level.^{7, 8}

	Basic	Standardized	Rationalized
IT Labor Costs	\$1,320	\$580	\$230
Service Levels (# Service Desk Calls)	8.4	8.5	7.7
Business Agility (# Weeks)	5.4	5.2	4.3

Exhibit 3: IT labor and end-user cost, service level, and agility improvements

In this study, moving from the Basic to the Standardized IO level reduces IT labor costs by an average 56 percent; moving from Standardized to Rationalized reduces IT labor costs by 60 percent. These savings are made possible principally by adopting best practices and organization-wide use of Microsoft deployment and management applications, methods, and tools.

Deployment Costs

Higher IO status can also be linked to lower deployment costs of in-place PC operating system upgrades. Exhibit 4 shows the differences in IT labor costs for study participants operating at different levels of IT efficiency.^{9, 10}



Exhibit 4: Average deployment costs for TCO study participants

In this study, participants operating at the Rationalized IO level reported average deployment costs for in-place upgrades 20 percent lower than organizations at the Standardized level and 54 percent lower than organizations operating at the Basic level. Deployment cost savings resulted from the streamlining of IT operations through the use of best practices and more shared software stacks across PC systems.

⁷ IDC, "Core Infrastructure Optimization Research – Summary of Findings," January 2007, p.8.

⁸ Service levels are measured by number of service desk calls per user per year. Agility is measured by the time needed to deploy a new application.

⁹ IDC White Paper sponsored by Microsoft, "Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Managing the Windows Desktop," Doc #203482, October 2006, p. 16.

¹⁰ These results reflect only IT labor costs; hardware, software, and PC user labor costs are not included.

Infrastructure Optimization Improvement Strategy

To maximize IT labor cost savings, organizations should consider creating a suitable IO strategy that defines specific steps needed to improve their IO status. This multi-step process involves describing the current IO status of the enterprise IT infrastructure and identifying methods and resources needed to achieve stated improvement goals in a systematic way. For example, here is a high-level, four-step process that can be used by organizations of any structure or size:

1. Specify high-level, IO-related goals and resources.
2. Determine current organization-wide IO status.
3. Determine IT, business, and human resources needed to achieve required optimization goals.
4. Use knowledge gained in previous steps of the process to implement IO improvement methods.

Organizations can implement this process internally or engage a third-party IT services provider to make the initial IO assessment and manage the IO improvement process.

Deploying Current Microsoft Applications and Technologies

Deploying Microsoft applications, tools, and technologies is the second strategy available to IT managers wanting to improve IT efficiency and reduce TCO. This strategy provided organizations participating in IT labor research studies with substantial cost savings.

One study sorted participating organizations by how efficiently they engaged in four groups of IT activities: PC configuration and standardization, identity and access management, PC security, and systems management. Exhibit 5 illustrates the best practices—and average annual savings—enabled by various Microsoft applications and technologies at organizations with different infrastructure optimization status.¹¹

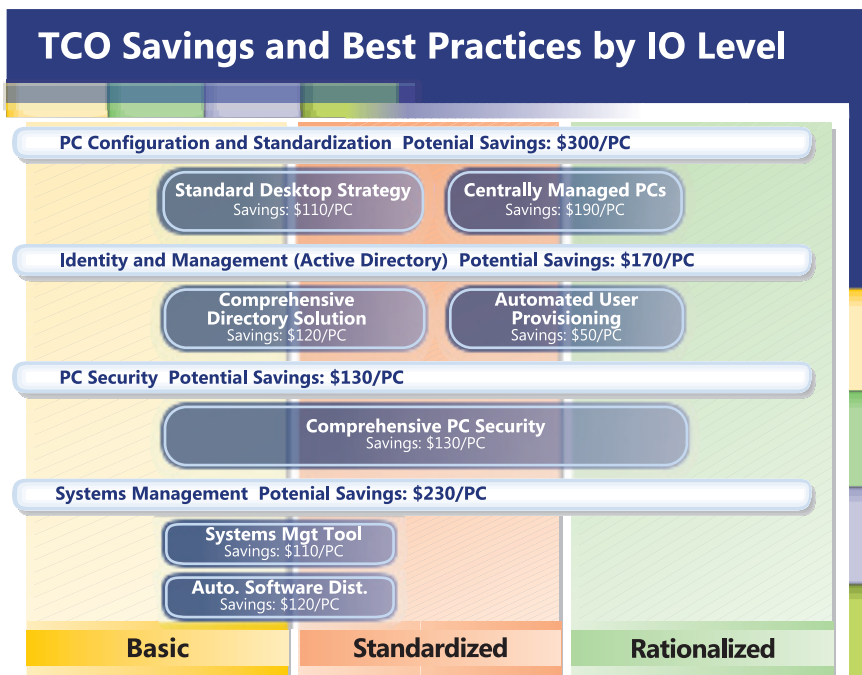


Exhibit 5: Organizations at any IO level can benefit by using Microsoft applications and technology.

¹¹ IDC, "Core Infrastructure Optimization Research – Summary of Findings," January 2007, p 16.

As Exhibit 5 shows, best practices are most likely to reduce IT labor costs as organizations improve their IO status. However, organizations at any IO level can achieve benefits by using Microsoft applications that support best practices. Exhibit 6 shows which Microsoft applications and technologies support the adoption of best practices that help organizations to reduce their TCO.¹²

Enabling Best Practices with Microsoft Technologies

		Windows Vista	Active Directory	Group Policy Objects	Identity Integration Server	Systems Management Server	Desktop Optimization Pack
PC Configuration & Standardization	Standard Desktop Strategy	●	●	●	●		●
	Centrally Managed PCs	●	●	●	●		●
Identity & Access Management	Comp. Directory Solution		●		●		
	Auto User Provision		●		●		
PC Security	Comp. PC Security	●	●	●		●	●
Systems Management	Systems Management Tool		●	●		●	●
	Auto Software Distribution		●	●		●	●

Exhibit 6: Microsoft applications and technologies support the adoption of IT labor-saving best practices.

Windows Vista Promotes TCO Savings

In 2006, 141 organizations participating in the Windows Vista early adopter program also participated in IT labor and PC user cost studies. Results of these studies show that deploying Windows Vista provides 6 to 10 percent lower IT labor and PC user labor costs than earlier versions of the Windows client operating system. Exhibit 7 shows this trend of ongoing cost savings.¹³

Average Annual Costs of Different Microsoft PC Client OS

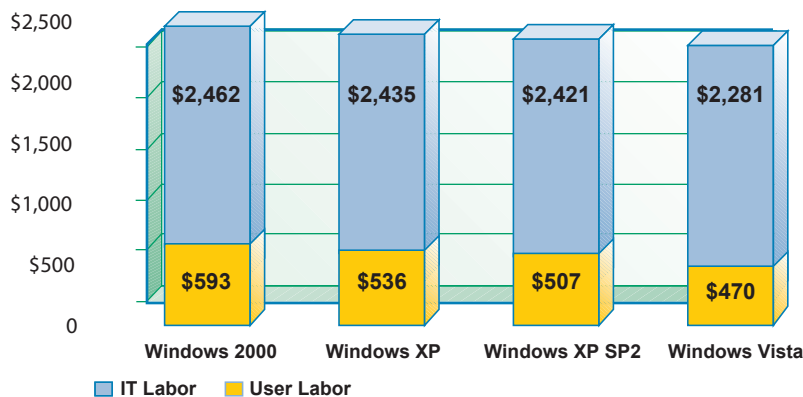


Exhibit 7: Windows Vista delivers greater IT labor and PC user labor savings than previous Microsoft PC client OS.

¹² IDC, "Core Infrastructure Optimization Research – Summary of Findings," January 2007, p.15.

¹³ IDC white paper sponsored by Microsoft, "Analysis of the Business Value of Windows Vista," Doc #205426, December 2006, p. 2.

Deploying Windows Vista is an effective way for IT managers to maximize annual TCO savings of desktop and notebook PCs. Research based on the experience of Microsoft Technical Assistance Program (TAP) participants shows that the combination of core Windows Vista technology and best practices saves participating organizations an average 24 percent in IT labor and 19 percent in PC user labor costs per PC per year.¹⁴ Exhibit 8 illustrates the impact that Windows Vista deployment can have on IT labor costs.¹⁵

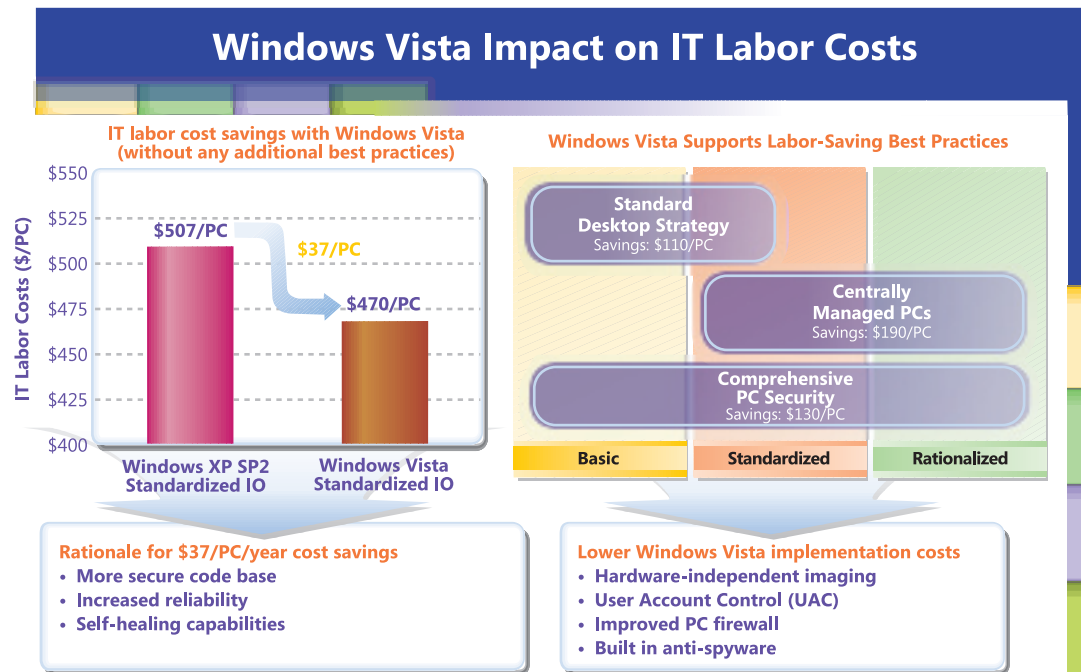


Exhibit 8: Windows Vista enables TCO savings and supports PC-related best practices.

Exhibit 8 shows that PC environments based on Windows Vista operate at \$37 per PC per year lower IT labor costs than those based on Windows XP Professional SP2. Organizations that deploy Windows Vista and adopt three best practices supported by several Windows Vista capabilities—using a standard desktop strategy, comprehensive PC security, and centralized management—have the potential to reduce their TCO by up to \$430 per PC per year. Windows Vista helps to make these savings easier to realize by providing capabilities that:

- Support the creation of a single, organization-wide desktop strategy.
- Centralize control of user application installation and PC configuration privileges.
- Support creation of a comprehensive security plan that includes a centrally controlled firewall and standard quarantine procedures.

Whenever deploying new software or assessing IO status with internal resources is not appropriate, organizations can use another strategy to reduce IT labor costs—engaging an experienced global IT solutions and services provider. The following section describes the benefits that can be achieved by taking this option.

¹⁴ IDC White Paper sponsored by Microsoft, "Analysis of the Business Value of Windows Vista," Doc #205426, December 2006, p. 4.

¹⁵ IDC, "Core Infrastructure Optimization Research – Summary of Findings," January 2007, p. 16.

Realizing Value by Engaging Tata Consultancy Services

The previous section describes how organizations can significantly reduce PC management costs by implementing Windows Vista and using associated best practices to optimize their PC infrastructure. Another way to achieve this value is by engaging an IT services and solutions provider with the global presence, deep experience, and broad range of skills that can make these business goals a reality.

Tata Consultancy Services (TCS), one of the world's most respected global IT services and solutions providers and a key Microsoft Partner worldwide, provides its customers with:

- Expertise working with global enterprise accounts.
- Experience addressing customer business needs.
- An excellent track record of developing robust Microsoft-based solutions.
- Successful and predictable deployment results.
- The capacity to deliver large and complex deployment solutions to global customers.
- Local presence, the ability to talk with customers in person locally, not from an overseas office.
- Credibility in the business community and the trust of its customers.

This section introduces the capabilities, expertise, and resources of Tata Consultancy Services.

A New Era in Business and Global IT Services

Established in 1968, Tata Consultancy Services (TCS) is one of the world's leading and most trusted IT consulting, services, and business process outsourcing organizations. A division of the 120-year-old, US\$ 22 billion TATA SONS group headquartered in Mumbai, India, Tata Consultancy Services is Asia's largest and one of the world's fastest-growing, global IT consulting solutions and services organizations.

With a business presence in 52 countries, TCS is firmly established in developed markets such as the United Kingdom, where it has had a local presence for over 38 years and in the United States and Canada, where it has had a local presence for more than 25 years. TCS also maintains business operations in high-growth markets such as Latin America, Africa, the Middle East, and the Asia Pacific region.

TCS offers a full range of IT solutions and services, such as infrastructure services, software deployment, IT administration, business process optimization, engineering and industrial services, and product-based solutions. Based on the Microsoft platform, TCS solutions and services are characterized by several unique qualities:

- **Predictability** in solution execution, budgets, and management outcomes of IT initiatives.
- **Innovation** in creating and building the very best IT-based solutions to meet critical business goals.
- **Business value**, which includes lower TCO, increased revenue, and higher margins.

These qualities are based on four fundamental capabilities:

- **Smart use of technology.** Robust deployment frameworks (built in alignment with Microsoft), management and upgrade tools, and best practices shorten project development cycles and make engagements more cost-effective and predictable.
- **Next-generation business efficiency.** The TCS networked global delivery model provides cost and IT efficiencies. TCS also has experience in building tools that expedite solution delivery and help to reduce costs.
- **Beta testing.** By working closely with Microsoft product groups, TCS develops, beta tests, adapts, and deploys released and pre-release Microsoft products and technologies.
- **A 360-degree understanding of business issues.** This understanding is the result of experience in driving relevant business solutions, embedded teams who help drive more effective customer engagements, and deep vertical knowledge acquired by supporting the IT and business needs of TATA SONS, the TCS parent company.

TCS brings a wide variety of knowledge, technical, business, and cultural expertise to each deployment, consulting, and systems management engagement.

Rethinking Business As Usual

Tata Consultancy Services technical and business expertise is based on the abilities of its more than 80,000 worldwide associates drawn from 65 nationalities. These individuals include more than 21,000 women and more than 8,300 non-Indian employees. More than 9,000 associates contribute to the company's engagements in the United States.

The Tata Consultancy Services Global Delivery Model

The TCS global delivery model is the foundation of the company's capabilities. In 1968, TCS was the first global IT solutions and services provider to develop and use this model to provide its worldwide customers with 24 x 7 access to up-to-date, efficient, and culture-friendly solutions and services. The TCS delivery model is based on a global network of delivery centers, from which project size, complexity, and process maturity requirements are managed and matched to available TCS professionals working from offshore, near-shore, and onsite locations. The structure of the TCS global delivery approach is summarized in Exhibit 9.

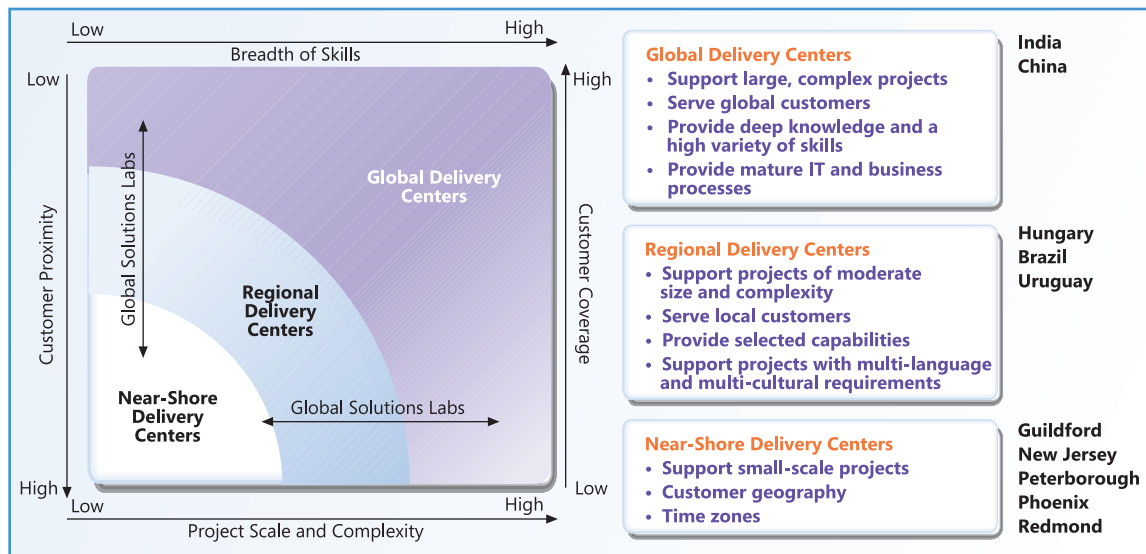


Exhibit 9: TCS delivery centers are matched to different project requirements.

For example, large-scale, complex projects that support large customer organizations and require mature development and management processes would be served from a TCS global delivery center. Smaller, less complex projects would be sourced from near-shore centers. These capabilities are based on integrated TCS project and quality management frameworks, which enable the company to reduce the project risk of technology solutions. Ultimately, this approach provides customers with higher levels of TCS staff productivity and more predictable project outcomes.

A Global Network of Research and Solution Development Centers

The ability to provide high-quality IT services on a worldwide scale is based on the Tata Consultancy Services network of deployment, research, and solution development facilities, which is illustrated in Exhibit 10.



Exhibit 10: Worldwide network of research and solution development facilities

Delivery Centers. In the global network of TCS centers, customers receive services locally from associates located at 179 offices in 52 countries. This network of delivery centers enables TCS to provide talent and logistical support to projects conducted from often distant and highly dispersed locations. For customers with operations spread across the globe, TCS provides solutions with economies of scale and scope. TCS brings customers with local or regional operations best-in-class technology consulting and services that help them stay ahead of the competition and achieve greater returns on their IT investment.

Innovation Laboratories. TCS operates a global network of 18 basic and applied IT research laboratories. At the basic research facilities, the focus is on software development productivity and the challenges posed by next-generation architectures and applications. These facilities are staffed with senior researchers drawn from the world's leading universities such as the Massachusetts Institute of Technology (MIT), Carnegie Mellon University, the University of Texas at Austin, and the Indian Institutes of Technology (IIT).

Industry-specific IT research is conducted at TCS innovation labs. These facilities give TCS customers on-demand access to innovative, cost-effective solutions developed by teams of process analysts, technology specialists, and R&D specialists. For example, the Innovation Lab for Travel and Hospitality develops a wide range of reusable assets and components that helps airlines retain their differentiators, increase worker productivity, and achieve significant cost savings from their technology investments. These facilities are staffed with industry experts, who have long experience in applying technology to business solutions.

Infrastructure Solutions Centers. TCS develops advanced infrastructure solutions for global customers at a solution center in Chennai, India. At this center, TCS collaborates with Microsoft to develop innovative solutions and proofs of concept (POCs) that can be deployed for TCS and Microsoft customers globally.

Solution Centers and Centers of Excellence. TCS operates a global network of Microsoft Solutions Centers and Centers of Excellence (COEs) for various technologies and service domains. Microsoft COEs are communities of technology experts, who work at various TCS locations worldwide and support Microsoft solutions on TCS projects.

These COEs, which focus on emerging technologies:

- Provide customers with advanced Microsoft solutions.
- Benchmark product performance.
- Perform POCs of Microsoft solutions.
- Evaluate newly released Microsoft products such as Windows Vista.
- Build competencies in newly released Microsoft products and technologies.
- Develop standards and guidelines for the use of Microsoft applications and technologies.

The long-term global alliance of Microsoft and TCS provides several important benefits. For example, TCS is a member of a select group of global system integrators that have a close relationship with Microsoft. This relationship is managed at a global level from Redmond, Washington in the United States. This relationship provides TCS with access to Microsoft product groups, decision makers, senior executives, and the latest Microsoft technologies, which are often unavailable to the public.

Tata Consultancy Services Knowledge Resources

TCS has made an ongoing commitment to use and support Microsoft technologies in its deployment, systems management, and process engineering engagements. This commitment is reflected in its status as a Microsoft Gold Certified and Global System Integration Partner. TCS deployment-related programs and practices demonstrate the company's focus on Microsoft technologies.

Focus on Microsoft Technologies. TCS has a deep understanding of Microsoft technologies and Microsoft's short-term and long-term plans to develop those technologies. This knowledge guides the content and management of TCS solutions. TCS has identified engagements based on Microsoft technology as a primary area of company growth. The TCS Infrastructure Services Practice focuses on developing solutions that provide cutting-edge Microsoft solutions to its global customers. For example, members of the practice play an important role in the success of TCS Windows Vista deployments. The knowledge and experience that these individuals contribute to these engagements include:

- **Executing deployment projects that require multilingual skills.** TCS deployment specialists are selected from a pool of skilled employees and deployed locally at TCS global, regional, and near-shore delivery centers.
- **Broad experience in IT projects that provide end-to-end solutions,** which include design, integration, and implementation functions.
- **Deployment knowledge** gained by taking an active part in proactive technology adoption initiatives such as the Windows Vista beta release.
- **Extensive experience** in using Six Sigma-based initiatives to improve the deployment process.

TCS also participates in Microsoft programs that prepared organization teams for the Windows Vista product launch. These programs include:

- **Microsoft Advanced Desktop Deployment for Partners program.** This program consists of Microsoft technical training sessions that enable TCS deployment team members to become Windows Vista deployment specialists. TCS adopts the train-the-trainer approach, in which new TCS deployment specialists instruct others within the organization to ensure that TCS has a pool of specialists, who can carry out Windows Vista deployments for global customers.
- **Application Compatibility Factory program.** In this program, TCS deployment application specialists develop the skills needed to help customers prepare Windows Vista application compatibility testing capabilities across their organizations.

At TCS, development of proprietary methods and methods that support Microsoft technologies is another important part of delivering world-class IT solutions and services.

Tata Consultancy Services Processes and Methods

TCS understands the business processes, standards, and workflow necessary for smooth and successful migration engagements. For example, TCS has developed and tested methods for migrating operating systems and applications to a Windows Vista PC-based environment. This expertise is reflected in the project management, deployment, and IO assessment processes needed to migrate PC environments to Windows Vista.

Tata Consultancy Services ROLIT Deployment Framework

TCS knows that a well-managed deployment is a key to a successful migration to Windows Vista. The TCS ROLIT (Readiness, Outline, Laboratory, Illustrate, and Transform) project management framework is the TCS approach to PC deployment. The automated deployment capabilities that ROLIT provides offer significant cost savings to application installation projects.

Developed by TCS specifically for platform transformation initiatives, ROLIT is a proprietary end-to-end process that combines automated deployment, project management methods, and real-time performance monitoring methods and tools. The ROLIT framework is tightly aligned to the Microsoft Solutions Framework (MSF).¹⁶

The TCS deployment team adopts the ROLIT framework to ensure that effective planning and management occur from the start of a project to the final deployment of user desktops in a production environment.

Benefits and Business Value. By using proven deployment methods, the ROLIT framework helps organizations:

- **Standardize their PC environment**, which increases IT efficiency and supports industry-recognized best practices.
- **Reduce IT costs and time to value** by providing a rollback procedure for failed migrations and using proven standardized deployment methods at one or many locations.
- **Avoid IT costs created by rework** resulting from non-standard, ad hoc deployment methods.
- **Respond quickly to changes** in the customer's IT or business environment.
- **Replace manual deployment tasks with automated methods**, which decreases rework and related IT labor costs.
- **Maximize the percentage of successful migrations** by identifying risks and creating risk mitigation plans.

Performance Monitoring. TCS deployment and customer managers work together to monitor day-to-day project performance. TCS team members use standardized tools and methods to monitor project progress, identify potential problems, and take corrective action if needed.

In the ROLIT process, these methods emphasize finding and resolving potential issues or risks early in the engagement. The TCS deployment team uses standardized methods to ensure consistency between deployment engagements. The TCS deployment manager can also monitor project performance in real time by using digital dashboards based on Microsoft technologies. These dashboards display business and mission-critical information so that executives can make faster, more accurate business decisions.

Automated Deployment. The ROLIT framework uses its Application Compatibility Toolkit, Zero Touch Migration Tool, and other deployment methods and tools developed internally at TCS. These technologies, which automate formerly manual deployment tasks, enable TCS to reduce IT staff effort during deployment. For more information about the ROLIT framework, see Appendix A, "Tata Consultancy Services ROLIT Deployment Process."

Tata Consultancy Services Zero Touch Migration Tool

The TCS Zero Touch Migration Tool is a complete, automated deployment solution designed to reduce the effort and cost of migrations from legacy Windows client operating systems to Windows Vista. TCS developed this tool to eliminate time-consuming, error-prone manual deployment tasks. The tool is based on Microsoft Zero Touch Deployment technology and is developed within the Microsoft Solution Accelerator for Business Desktop Deployment (BDD) framework.¹⁷

¹⁶ Information about the Microsoft Solutions Framework is available at <http://www.microsoft.com/technet/solutionaccelerators/msf/default.aspx>.

¹⁷ For more information about Microsoft Zero Touch Deployment technology, go to <http://www.microsoft.com/technet/technetmag/issues/2006/09/ZeroTouch/?related=/technet/technetmag/issues/2006/09/ZeroTouch>.

Members of the TCS deployment team use the tool during the Transform phase of the ROLIT deployment process. The tool enables them to perform hands-free migrations—including transfer of user data and profiles—quickly and easily with just one click of the mouse. The TCS Zero Touch Migration Tool adds value by:

- **Reducing IT effort and total deployment costs** by automating formerly manual deployment tasks.
- **Reducing the effort and costs of rework** by minimizing human intervention and providing an error-free migration process.
- **Reducing time to value** by eliminating time-consuming manual deployment tasks.
- **Reducing the number and severity of post-deployment support calls** by eliminating human intervention.
- **Capturing the applications and PC settings** used before migrations and deploying the same applications when deployment is complete.

Rollback Process

Past experience in TCS enterprise engagements proves that with strict adherence to ROLIT methods and quality assurance processes, the number of failed migrations and rollbacks—and related IT labor costs—can be avoided almost completely. However, the need for rollback procedures exists because PC hard disks crash, networks can fail during migration, and network adapter or other hardware conflicts create problems in individual PCs. These unforeseen problems make it necessary to restore backed-up PC images or adopt other rollback procedures. The TCS rollback process:

- **Recreates the PC image** with the old operating system base build for select Platinum or Gold classified users.
- **Restores PC user profile and data** to eliminate the need for a manual rollback.
- **Installs all supplemental applications automatically** to reduce the need for manual installations.
- **Confirms that PC functionality is restored** to reduce the need for unscheduled manual installations.
- **Analyzes the cause of migration failure** to reduce problem resolution time and increase the likelihood of future deployment success.

IT Infrastructure Optimization Processes

The need for an IO assessment typically arises when organizations undergo mergers and acquisitions or have business units with different types of IT infrastructure or levels of IT operational efficiency. This need often becomes apparent when IT budgets shrink, and the lack of standardized IT practices causes TCO to rise.

The TCS Infrastructure Service Practice offers Infrastructure Readiness Assessments (iRAs), which are used by TCS deployment architects during the Readiness phase of the ROLIT deployment process. During the iRA process, practice specialists define the scope of the assessment, provide an IO roadmap, and recommend the necessary tools that will be used during the IO improvement process. Specialists also identify specific hardware and software investments that would be required in IO improvement initiatives, timelines for the IO process, and the expected results. The iRA process, which adds value by reducing TCO and enhancing IT operational efficiency, provides these business benefits:

- **A simpler, more manageable PC environment**, the result of standardized IT infrastructure, higher system availability, and less IT effort directed at security issues.
- **Improved IT services and operational efficiency**, which are made possible by simpler, automated IT services, increased desktop reliability, reduced downtime, and the ability of the IT staff to focus on higher-value tasks.
- **Significant cost savings**, which are enabled by lower IT labor and licensing costs, improved use of infrastructure components, and lower IT administrative costs.

Tata Consultancy Services Best Practices

The transformation of customer PC environments is based on TCS best practices, which ensure that user data and applications are maintained throughout the deployment process, deployment costs are kept under control, and the PC environment is protected without hindering PC functionality. Primary TCS deployment-related best practices include:

- **Hardware and software compatibility.** The deployment team uses compatibility information gathered in the inventory analysis performed during the ROLIT process. This compatibility check ensures that the PC hardware is compatible, compatible hardware drivers are available, and that installed applications are certified compatible with proposed solution components.
- **Profile management.** After solution components are installed on user PCs, the TCS deployment team ensures that users get all the applications and peripherals that were installed on their desktops before the migration began. Applications that are not included in the official list of applications are not installed, ensuring that customers do not include suspect applications in the updated PC environment.
- **PC user satisfaction.** After deployment is complete, the TCS deployment team conducts a satisfaction survey to ensure that PC users are satisfied with the outcome of the deployment.
- **Reduced rollout time.** The number of PC updates per day is gradually increased to reduce deployment costs and time to value.

TCS best practices provide customers with value by ensuring that they can:

- **Maintain the function of all authorized applications and peripherals** that were used before the migration began.
- **Avoid the IT costs** of responding to security attacks, changes to PC settings, or unauthorized installations of suspect and malicious applications.
- **Maintain or improve PC and network performance** by ensuring that all IT components are optimized for their specific functions.
- **Maintain or improve IT manager satisfaction** with desktop IT costs and performance.
- **Reduce deployment costs** by ensuring that the implementation is properly planned and uses all available tools and resources to optimize performance.

Tata Consultancy Services also uses standardized methods to reduce risk.

Deployment Risk Mitigation Methods

All TCS deployment engagements include standardized ways to identify and reduce technology, project, and business risk. These risk mitigation methods address potential issues such as:

- User data lost when preventive PC data backup methods are not available.
- Application compatibility issues.
- Deployment team travel time at widely dispersed customer facilities.
- Network bandwidth, which might not be sufficient for file server backup and restore operations.
- Users, who cannot release their workstations for the migration.

Exhibit 11 provides an example of standard Tata Consultancy Services risk reduction methods used in the company's engagements.

Risk Statement				Risk Mitigation Approach
Condition	Consequence	Probability	Impact	
Lack of hardware and software availability	Delay in project schedule	Moderate	High	<ul style="list-style-type: none"> ■ Add a penalty clause in hardware and software supplier contracts. ■ Arrange to obtain resources from alternate vendors.
Lack of business support (Business users are not responsive during rollout)	Delay in project schedule	Moderate	High	<ul style="list-style-type: none"> ■ Communicate plan and emphasize benefits to business users. ■ Involve all stakeholders in the update process.
External USB HDD failure	Data loss	Low	High	Back up data on tape as well as on USB HDD.
Dependency on other projects	Delay in project schedule	High	Moderate	Ensure that all related projects are completed before the rollout.
Difficulty training PC users about how to find resources after deployment.	Increased help desk calls	Low	Low	Prepare detailed training material that PC users can understand.

Exhibit 11: Sample TCS deployment risk mitigation table

Conclusions and Recommendations

Studies conducted by IDC and sponsored by Microsoft in 2005 and 2006 provide several high-level findings, which show how organizations can achieve significant IT labor savings and improve their IT operational efficiency. These findings include:

- **Organizations can achieve significant IT labor cost savings by adopting PC-related best practices.** Research study results show that an organization's infrastructure optimization status, a measure of IT operational efficiency, is a strong indicator of PC-related, IT labor cost savings. This status reflects the number of best practices that an organization adopts.

Adopting all of the seven core best practices described in the IDC reports cited in this paper would enable organizations participating in the studies to save up to \$830 per PC per year. However, most participating organizations adopted between one and four best practices. These organizations saved an average of \$200 to \$500 per PC annually, compared to organizations that implemented none of these best practices.

- **Organizations can enhance IT operational efficiency by deploying current Microsoft applications and technologies.** In 2006, IDC and Microsoft conducted IT labor cost studies at a wide variety of Microsoft enterprise customer organizations. These studies show that organizations can use up-to-date PC operating systems and systems management software to operate IT processes more efficiently and reduce the IT labor costs associated with their PC environments.

Upgrading PCs to the Microsoft Windows Vista operating system can be a cost-effective way to standardize the PC environment and support core best practice activities. For example:

- In Windows Vista-based PC environments, IT labor costs averaged \$37 per PC per year lower than those based on Windows XP Professional SP2.
- Several Windows Vista capabilities support three PC best practices, which were linked to an additional TCO cost savings of \$430 per PC per year compared to organizations that did not implement these practices.
- **Organizations can improve IT efficiency and accelerate IT operational cost savings by engaging a global IT systems integrator such as Tata Consultancy Services.** Rather than providing IT services inhouse, organizations can benefit by engaging Tata Consultancy Services or another experienced global IT solutions and services provider to deploy the latest Microsoft applications and technologies, perform IO assessments, and provide ongoing deployment and systems management services.

Recommendations

Organizations wanting to improve IT efficiency and reduce IT labor costs should consider:

- **Designing and implementing an IO strategy** that is appropriate for their organization. This is the first step to identifying the best practices and IT processes most likely to produce maximum operational savings.
- **Deploying current Microsoft PC applications, technologies, and tools** at the earliest opportunity.
- **Engaging a global IT solutions and services provider** such as Tata Consultancy Services if inhouse IO assessment, deployment, or systems management with internal resources is not appropriate.

Appendix A: Tata Consultancy Services ROLIT Process

This appendix describes the functions and deployment methods of the Tata Consultancy Services ROLIT deployment process. This process includes the following phases:

- **Readiness phase**, in which the deployment architect gains an understanding of customer business goals and IT environment.
- **Outline phase**, in which deployment architects and build engineers plan, size, and design the PC environment. Activities in this phase include defining the project plan, identifying deployment-related risks, and developing a risk mitigation plan.
- **Laboratory phase**, in which build engineers set up a laboratory that represents a realistic subset of the customer production environment. TCS testing specialists build the new PC image and test solution performance in this environment.
- **Illustrate phase**, in which TCS build engineers and the customer project manager agree on a pilot environment. A TCS deployment technician also migrates user PCs to the solution in this environment.
- **Transform phase**, in which a TCS deployment technician deploys the solution and migrates user desktops to the new PC environment.



Exhibit 12: The ROLIT platform transformation framework

In each deployment engagement, TCS starts with a clean build rather than an in-place upgrade approach. This standard practice provides these advantages:

- A baseline PC environment is standardized across home, office, and mobile users.
- Files and applications that are unwanted or left over from the pre-deployment PC environment are removed.
- PC performance is improved.
- The number of calls to the help desk is reduced.
- Troubleshooting tasks become easier for help desk personnel to manage.
- The IT staff requires less effort to update and enforce corporate desktop policies.

Appendix B: Tata Consultancy Services Zero Touch Migration Tool

This appendix describes the capabilities, structure, and function of the Tata Consultancy Services Zero Touch Migration Tool. During engagements, company deployment specialists use the tool in the process illustrated in Exhibit 13.

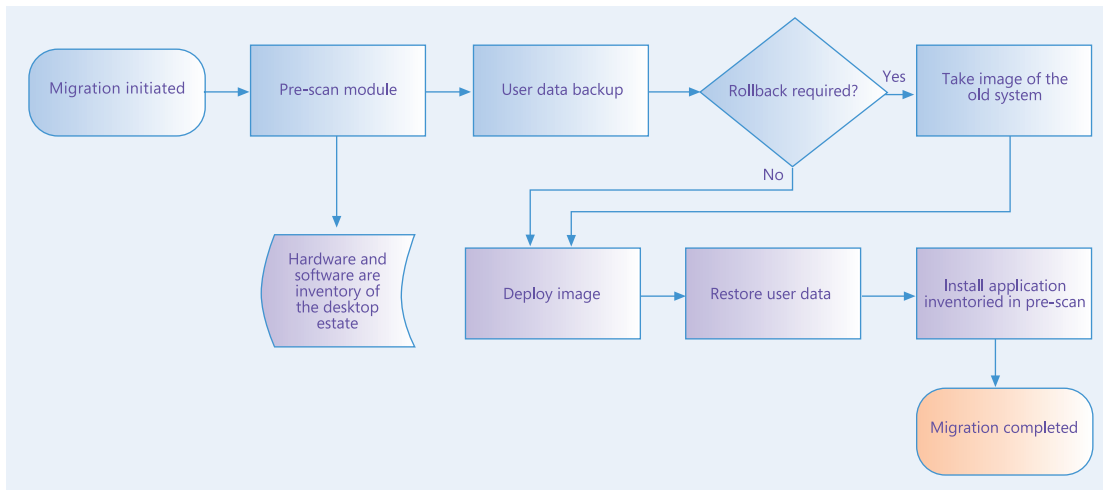


Exhibit 13: Tata Consultancy Services Zero Touch Migration Tool process

Tata Consultancy Services Zero Touch Migration Tool capabilities include:

- User data backup that is based on predefined file extensions.
- Multiple-user profile backup, which can be employed when several users share a desktop.
- Keyboard and mouse lockdown during the migration process, which ensures that users cannot use PCs or change PC settings during the migration.
- Status reporting provided by TCS-developed dashboards, which makes data easy to access and use throughout large organizations.
- Use of the existing PC image to provide complete rollback, which reduces the effort and cost of rollback-related rework (optional).

The TCS Zero Touch Migration Tool consists of pre-scan, migration, and deployment phase modules.

Pre-Scan Phase Module

This module collects the hardware and software inventory data of all PC desktops in an organization by:

- Performing three types of hardware and software inventory:
 - Auto – for PCs installed on a specific network segment
 - File-based – for the inventory of specific PCs
 - IP range – for the inventory of PCs within a specific IP range
- Saving inventory information in the XML file format.
- Consolidating inventory information in a Microsoft Access database.
- Using a flag setting option to define hardware and application compatibility for PCs running the solution.
- Setting a flag to indicate whether the particular hardware model or software version is compatible with solution components.
- Integrating data with the migration phase module of the Zero Touch Migration Tool.

Migration Phase Module

The migration phase module deploys a new PC operating system on selected hardware. During the migration phase, this module:

- Migrates the PC desktop to the new PC operating system.
- Provisions user data and PC settings automatically.
- Rolls back the installation process for select users such as executives, who might have critical data stored in their PCs.
- Locks keyboards and mice automatically to prevent PC use during the migration process.

Application Deployment Phase Module

This module provisions applications discovered during pre-scan phase inventory operations. During application deployments, this module:

- Retrieves data from the pre-scan phase module to generate a list of applications to be installed on PCs migrated to the solution.
- Displays only PCs that were migrated successfully by the migration phase module.
- Provisions applications inventoried by the pre-scan phase module.

Zero Touch Migration Tool Prerequisites

Zero Touch Migration Tool prerequisites include:

- Active Directory
- DNS
- DHCP
- WDS
- WinPE
- PXE-compliant desktops with the network boot enabled in BIOS

Appendix C: About the Authors

Viraf Avari

With a career spanning more than 24 years, Mr. Avari is a Senior Solution Architect with the Infrastructure Services business of Tata Consultancy Services Ltd. In this role, he is responsible for technology planning and execution of complex projects with TCS' largest customers worldwide.

Before assuming his current role, Mr. Avari led the TCS Microsoft Center of Excellence at Mumbai, India for more than 5 years. There, he was instrumental in developing the company's Zero Touch Migration Tool for Windows XP and Windows Vista deployments. Mr. Avari has extensive experience managing Microsoft Windows-based desktop deployment, infrastructure migration, and infrastructure consolidation projects for Fortune 500 companies.

Omer Qureshi

With more than 12 years experience in the IT industry including IT infrastructure, networking, and systems security management, Mr. Qureshi is a Technology Development Manager with the Enterprise and Partner Group of Microsoft Corporation. In this role, Mr. Qureshi is responsible for technical strategy and solutions development for global system integrators and outsourcers, especially solutions that relate to platform infrastructure optimization.

Prior to his current role at Microsoft, Mr. Qureshi worked at Bank of America for almost seven years, where he became the bank's youngest vice president. He has also worked at American Express, Snow Ball/IGN (a Silicon Valley dotcom organization), and Voyager Net, an Internet service provider in the United States Midwest.





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