IT Department Annual Report

Introduction

This report highlights the accomplishments of the Silicon Image IT department over the past year and gives you a preview of current and future initiatives.

Edward Lopez, CLO

Rapidly changing technology makes it hard for businesses and their IT departments to maintain their focus on innovation, creativity, and enhancing employee productivity. Most IT departments remain preoccupied with regular maintenance and upkeep of the organization's servers, network and applications. Day-to-day operations are essential to cost control and operational efficiencies but do very little to demonstrate that an IT department acts as a value-add organization in the company.

We have launched a number of key initiatives that highlight our vision of how we contribute to maintaining and enhancing the success of Silicon Image. This report details some of these initiatives; meanwhile, here are a few highlights:

Compliance:

- IT supported backups for laptops/desktops
- Disaster Recovery Planning for critical apps

Productivity Improvements:

- SharePoint 2007 portal for intranet and basic document management
- Microsoft Exchange and Office 2010 upgrades
- Microsoft Lync for IM and Voice Communications

Applications and Business Processes:

- Project Portfolio Management (Planview)
- Vendor Managed Inventory
- i2 Supply and Demand Planning

During the course of the last year, the Silicon Image IT department has continued to demonstrate that business productivity can be improved

IT Department Annual Report for 2010

with strategic thinking around business continuity, compliance, and enhancements in infrastructure and applications portfolio.
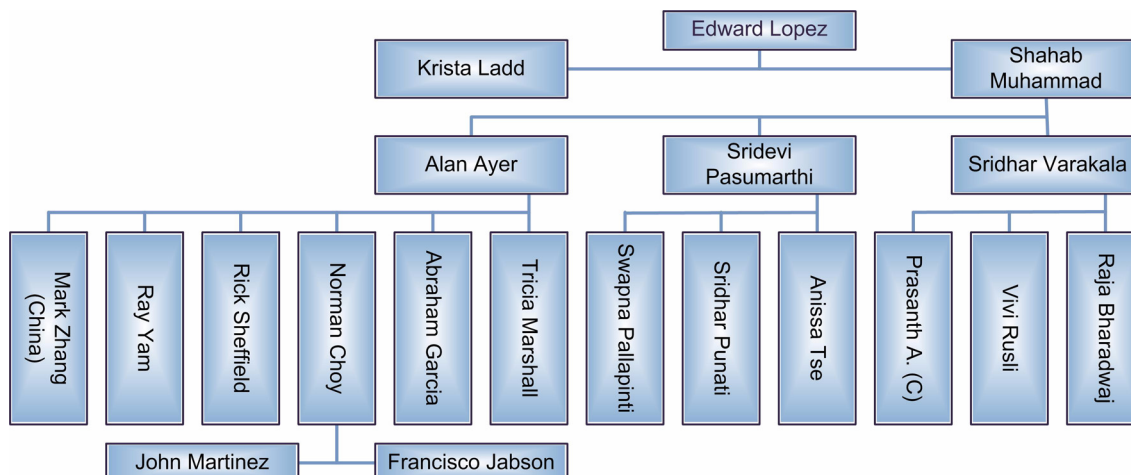
Shahab Muhammad, IT Director

An IT department of a company is in many ways the backbone of that company because it is responsible for that company's entire computing infrastructure from hardware to software and networking. A good IT department can be an active player in helping make the entire company more efficient and profitable.

I took over leading the Silicon Image IT department in May, 2010. As I look back on the past year, I have a lot to be proud of. Your IT department has completed the many projects described in this report and contributed to the company's success by delivering improvements in business processes and efficiency. We have worked to provide and maintain a robust infrastructure that actively supports Silicon Image's ongoing global leadership in HD video. These efforts are paying off in both direct and indirect added value to the entire company from identifying additional revenue sources to lowering the time and cost of doing business.

The IT landscape is changing rapidly as new technologies emerge and the trends toward mobile and cloud computing accelerate. Employees, suppliers, manufacturers, distributors, and customers are more tightly integrated than ever before with profound effects on the entire supply chain that include unprecedented opportunities and risks. The Silicon Image IT department is actively engaging ongoing training and adaptation to meet these emerging needs head-on and continue to drive solid value to the entire company. We are not resting on our laurels and remain dedicated to being an active part of moving Silicon Image forward in the months and years to come.
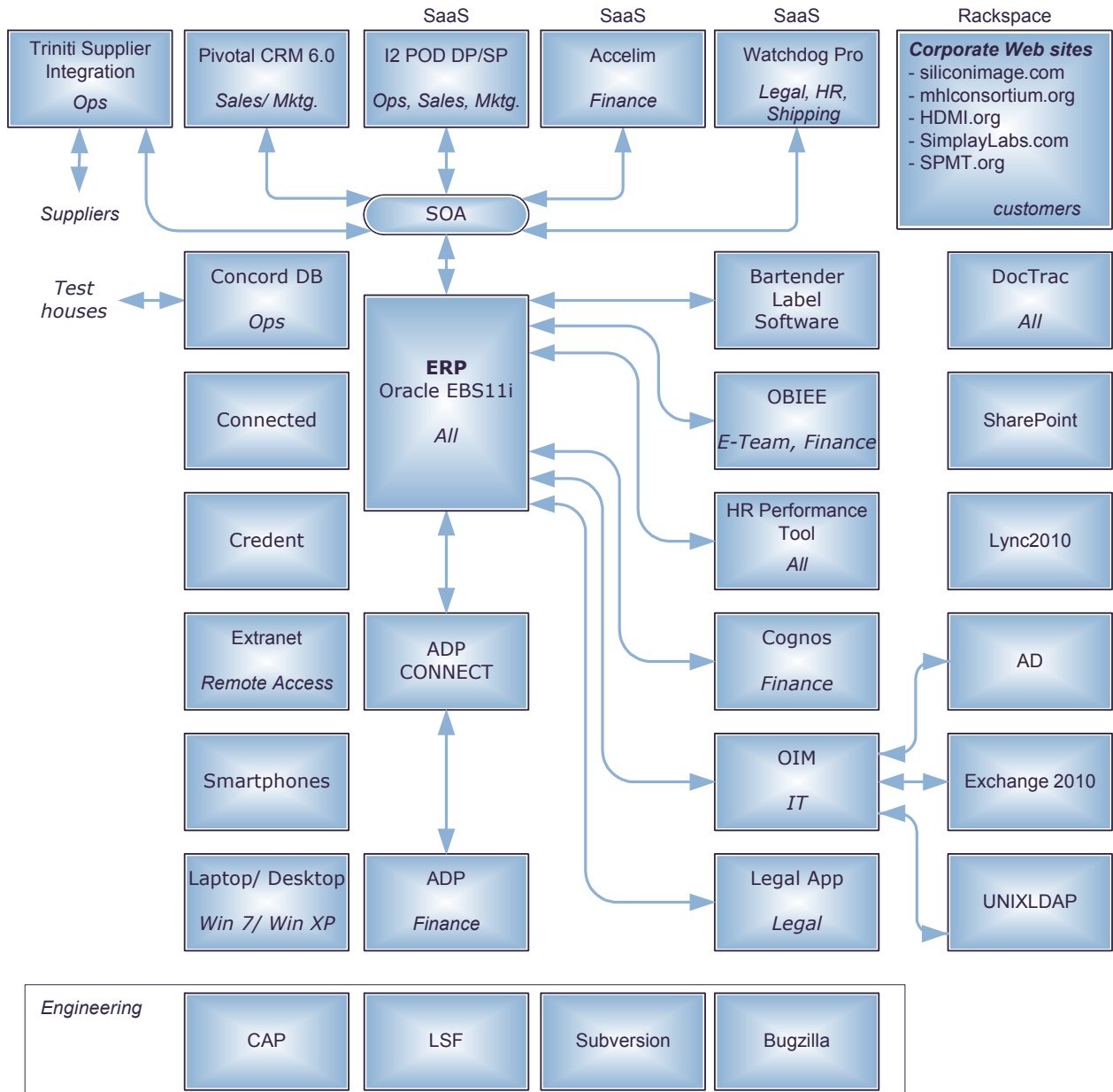
Management can only accomplish so much because it is the dedication and diligence of individual team members that ultimately drives results. Individual IT department members are the public face of the overall IT effort and their actions determine how the company accepts and works with the IT department. I could not be more proud of the Silicon Image IT department and of every member of the team who does whatever it takes to support the rest of the company. Their dedication and enthusiasm are truly inspiring and are allowing us to accomplish great things. Similarly, a great team can only accomplish so much because senior management sets priorities and expectations for the IT department. I would like to thank Ed Lopez and everyone on the Silicon Image E Team for their unwavering support of the IT department and our mission.

The Silicon Image IT Team

Applications

The Silicon Image applications landscape is as follows:

		SaaS	SaaS	SaaS	Rackspace
Triniti Supplier Integration — *Ops*	Pivotal CRM 6.0 — *Sales/ Mktg.*	I2 POD DP/SP — *Ops, Sales, Mktg.*	Accelim — *Finance*	Watchdog Pro — *Legal, HR, Shipping*	**Corporate Web sites** - siliconimage.com - mhlconsortium.org - HDMI.org - SimplayLabs.com - SPMT.org *customers*

Suppliers

SOA

Test houses

Concord DB — *Ops*		Bartender Label Software	DocTrac — *All*
Connected	**ERP** Oracle EBS11i — *All*	OBIEE — *E-Team, Finance*	SharePoint
Credent		HR Performance Tool — *All*	Lync2010
Extranet — *Remote Access*	ADP CONNECT	Cognos — *Finance*	AD
Smartphones		OIM — *IT*	Exchange 2010
Laptop/ Desktop — *Win 7/ Win XP*	ADP — *Finance*	Legal App — *Legal*	UNIXLDAP

Engineering

CAP	LSF	Subversion	Bugzilla

Silicon Image uses the following applications:

- **Oracle Applications 11i:** The Oracle Applications consist of financial, order management, procurement, supply chain, and human resource management areas modules. These modules form the primary Silicon Image back office enterprise application that automates various business processes such as Procure to Pay, Order to Cash, Hire to Term etc. It also provides various self-service capabilities such as iExpense, iProcurement, and Employee HR related activities.

- **Pivotal CRM:** This is the primary sales force automation system that helps Silicon Image refine, automate, and streamline sales process to accelerate the sales cycle, reduce administrative burden, and secure better sales results. Pivotal assists with opportunity tracking, quote authorization, reconciling point of sales data, and customer support/failure analysis.

- **I2 POD DP/SP:** The i2 Planning on Demand (Demand and Supply Planning) modules help Silicon image generate more accurate demand forecasts and optimize both production and inventory. Demand Planning helps us optimize inventory levels and increase inventory turns by leveraging planning capabilities such as bottom-up sales forecasting, marketing and new product forecasts, statistical forecasts, and exception-based alerts. Supply Planning provides planning capabilities that represent the end-to-end supply chain network including complex alternate routes and components, customer attributes, time-phased yields, cycle-times, and bills-of-material.

- **Performance Appraisal Tool:** This tool facilitates automated streamlining of the annual performance appraisal process to ensure that the Silicon Image workforce remains engaged, focused, and highly productive.

- **Accelim Invoice Processing:** Accelim reduces manual invoice processing and allows easier data import into Oracle applications. This shortens total processing time and decrease costs while simultaneously increasing productivity. It also provides early error notifications and improves company control of cash flow.

- **DocTrac:** Document management system that eases the process of controlling, sharing, and managing documents.

- **Legal Application:** Used for searching, creating, approving, and maintaining NDAs between Silicon Image and third parties. Automatic notifications are generated at various stages of an NDA lifecycle.

- **Triniti WIP Supplier Collaboration:** This product integrates subcontractors and manufacturers to help Silicon Image planning and operations. It delivers robust interfaces between the Oracle Applications and the numerous shop floor systems within the supply chain. Triniti provides a wide range of data validation to ensure that only clean data is loaded into Oracle Applications. It also delivers a comprehensive set of error management screens and reports that let users fix data problems on their own instead of via the IT department.

- **Oracle Business Intelligence (OBIEE):** OBIEE delivers a robust set of reporting, ad hoc query and analysis, OLAP, dashboard, and scorecard functionality via a rich end user experience that includes visualization, collaboration, alerts, and notifications. This tool provides reports for the Silicon Image E-Team and Finance departments including Revenue, Daily Bookings, and Standard Margin Visibility

- **Cognos:** Cognos is a business intelligence and enterprise planning tool used for budgeting and forecasts.

- **Oracle Identity Manager (OIM):** This provisioning tool automates the personnel on-boarding and off-boarding process by creating, enabling, and disabling accounts in Oracle Applications, Windows Active Directory, Exchange, and Sun One LDAP Server.

- **Oracle SOA Suite (SOA):** The Oracle BPEL Process Manager integrates various applications to simply data transfer between those applications. The preceding diagram displays the SOA-integrated applications used by Silicon Image.

- **ADP PC/Payroll:** Payroll software used by the Finance department.

- **ADP Connect:** The ADP Integration Connection allows information corresponding to PAN (implemented 11/2008) to transfer directly from Oracle E-Business Suite to ADP PCPW Payroll without

paper processing. This includes such information such as new salary rate, termination dates, and new hire/personal employee information transfers from Oracle HR to Payroll through an efficient process that minimizes errors and saves time.

- **WatchDog Pro:** Assists with compliance by providing information about people and companies with trade restrictions imposed by the US government.
- **BarTender Enterprise Print Server:** Prints shipping labels.
- **Footprints:** Help desk
- **Workshare:** Legal tool for comparing documents
- **CPI:** Patent management

Infrastructure

The Silicon Image network infrastructure is as follows:
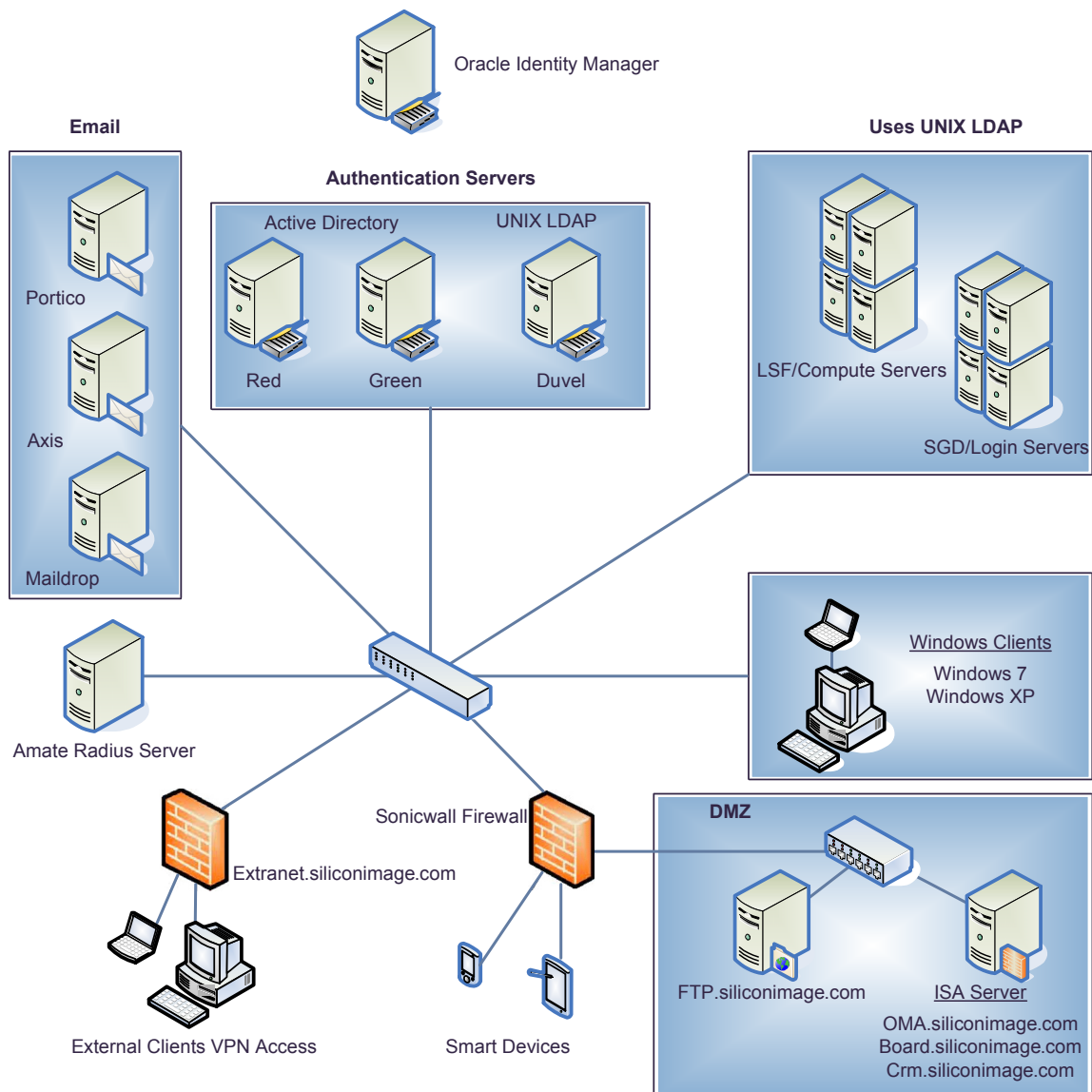
Statistics

This section provides various internet bandwidth metrics and other statistics.
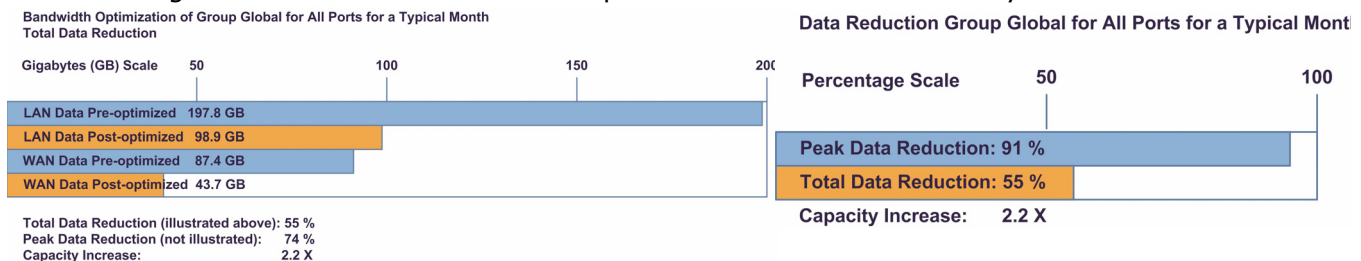
Bandwidth by Application

The following table lists the "Top 10" Silicon Image applications by the amount of data used per application during a typical month:

App Category	App Name	Gigabytes
web-browsing	web browsers	384.94
web-browsing (encrypted)	web browsers	102.83
online backup	Iron Mountain Connected Backup	334.51
media	Youtube iTunes Rtmp Flash	67.46 45.73 62.11 40.23
file transfer	ftp	54.43 G
engineering data	subversion	50.75 G
other	not categorized	37.77 G

Bandwidth and Data Optimization

The IT Department uses Riverbed WAN optimization to achieve significant reductions in overall bandwidth usage and related costs. Riverbed accelerates application performance and ensures fast, reliable data access for Silicon Image employees around the globe, including LAN-like performance for mobile employees. Overall bandwidth utilization has been cut by 60%-95% using data deduplication across all TCP-based applications. Riverbed analyzes each byte of data and eliminates the maximum amount of redundant data before that byte crosses the network.

The following charts reflect bandwidth and optimization between the Sunnyvale office and China.

Bandwidth Optimization of Group Global for All Ports for a Typical Month
Total Data Reduction

Gigabytes (GB) Scale   50   100   150   200

LAN Data Pre-optimized   197.8 GB
LAN Data Post-optimized   98.9 GB
WAN Data Pre-optimized   87.4 GB
WAN Data Post-optimized   43.7 GB

Total Data Reduction (illustrated above): 55 %
Peak Data Reduction (not illustrated):   74 %
Capacity Increase: 2.2 X

Data Reduction Group Global for All Ports for a Typical Month

Percentage Scale   50   100

Peak Data Reduction: 91 %
Total Data Reduction: 55 %

Capacity Increase: 2.2 X

The IT department has full visibility into application performance and optimization levels, which helps drive business decisions about infrastructure investments and opportunities for further optimization. Reducing bandwidth reduces or eliminates the need to purchase additional servers, routers, switches, etc. and also reduces the cost of data transfers. Ensuring data integrity such as security and backups is also much easier.

Email

This chart displays incoming email statistics and spam/threat blocking statistics for a typical month.

Email

Total Attempted Messages:	3,347,758	
Total Threat Messages:	3,161,778	
■ Stopped by Reputation Filtering:	3,128,604	93.5%
■ Stopped as Invalid Recipients:	707	0%
■ Spam Detected:	32,425	1.0%
■ Virus Detected:	42	0%
■ Stopped by Content Filter:	0	0%
■ Clean Messages:	185,980	5.5%
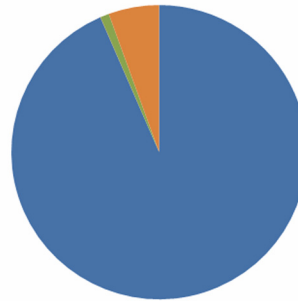
Major Accomplishments

The Silicon Image IT Department has worked on the following projects during the past year:

VMI

Silicon Image formerly operated in a traditional business model where products shipped directly to customers and distributors and inventory ownership transferred to the respective parties as soon as they receive it. In a VMI business model, the vendor (Silicon Image) manages and owns the inventory while it is at the customer location unless they use it. Many large customers prefer the VMI model, particularly those in the mobile space. A team with representatives from the Operations, Sales and IT departments to evaluate implementation of this model.

The VMI project was crucial for conducting business with mobile customers by streamlining and effectively managing Silicon Image supply chain operations and exchanging information with partners and suppliers. For example, Silicon Image can ship product and recognize revenue immediately while also managing inventory at customer locations. This end-to-end solution also helps manage orders from suppliers and related invoices.

Implementing the VMI model supports Silicon Image growth, especially in the mobile device market. Improved demand visibility allows more precise supply management and also reduces freight and warehousing costs because inventory now ships directly to customer sites instead of via distributors.

i2 Planning On Demand

i2 Planning on Demand (Demand/Supply) is an integrated sales and operation planning process that offers the following benefits to Silicon Image:

- Single plan of records
- Ensures data integration
- Allows supply planning based on the Customer Request Date (CRD)
- Enables build strategies
- Simplifies capacity planning
- Spreadsheet-style like reporting
- SaaS solution reduces IT overhead

These benefits integrate sales and planning by allowing the Sales department to input forecasts that Operations can then build to. Actual results vs. forecasts can be compared and adjustments made going forward. Most importantly, i2 replaces the manual work of using Excel spreadsheets that were hand-processed and rolled into other spreadsheets, which saves time, associated employee and other costs, and improves accuracy.

Direct Ship Project

This project gave Silicon Image the capacity to manage shipments from factories directly to the USA without passing through a distribution center. This reduced warehousing and freight costs as well as simultaneously lowering per-part prices and improving lead times.

Print Custom Labels for Shipments

Implementing labeling software worldwide including subcontractors and factories streamlined the shipment process, reduced manual data entry, and also enabled auditing.

China Applications Enhancements

This project enabled online procurement and expense reporting and aligned the China PTO process to Silicon Image practices, which reduced off-line and manual work and also enhanced SOX compliance.

China Infrastructure Enhancements

Upgrading the China hardware and network improved the work experience for engineers as part of the overall goal of allowing them to work more efficiently and improve performance. The upgrades include:

- MPLS connection that guarantees bandwidth between Sunnyvale and Shanghai at reduced cost
- Adding servers to provide more capacity and efficiency.

Internal IM/Microsoft Lync

Microsoft Lync offers instant messaging with improved features tailored for enterprise applications, such as:

- Check colleague availability in real time with detailed tracking information. Lync ties directly to Outlook calendars and automatically updates. The global directory makes finding silicon Image employees easy.
- Switch instantly between instant messaging, voice, video conferences, and application sharing during any conversation. You can even IM from Outlook.
- Share an application or your desktop, upload a PowerPoint, open a whiteboard, or transfer a file in real time with a single click.
- Communicate your personal status using the status note in the main Lync UI and keep track of colleague updates. Use pictures and video conferences to make long distance communications more personal and cost effective.
- Make direct computer-to-computer connections.
- Use presence and privacy settings to control how others contact you or designate others to take calls on your behalf by enabling call forwarding settings.
- Solicit feedback on Office documents from other users without switching applications.
- Stay in touch and be productive anywhere you have an Internet connection.
- Conversations are encrypted to meet compliance and regulatory requirements.

Upgrade Exchange 2003 to Exchange 2010

Upgrading to Exchange 2010 improved the web mail client, which now functions more like Outlook. It also increased mailbox sizes and improved DR options including Database Availability Groups (DAG).

Disaster Recovery Readiness

The IT Department visited Disaster Recovery (DR) locations and met with the business groups to come up with a DR plan. We determined that Oracle, email, and Pivotal will be the three primary applications for the DR site. A DR site in Sacramento was chosen and equipment has been purchased.

Upgrade Office 2003 to Office 2007/2010

This upgrade allows better integration with SharePoint and Lync 2010.

Improve Remote Infrastructure

The IT Department added WiFi capability, upgraded the server, and reviewed the overall network infrastructure in Japan. This work is ongoing and will increase standardization while reducing latency and other inefficiencies.

User Provisioning

Upgrading to the latest version of OIM added key enhancements and im-proved overall perfor-mance, including:

- Support for Active Directory 2008 & Exchange 2010.
- Provisioning information related to managers, direct reports, and title in each user's Active Directory.
- AD Password Synchronization is fault-tolerant; if OIM is down and a user changes her or his Win-dows password, the new password will be sent to OIM repeatedly until OIM is back online, which will then sync the pass-word with Oracle ERP and Sun One LDAP Server.
- Provisioning user accounts is now automatic; simply enter user information and both an account and IT ticket will be created.
- Available reports include the number of people hired and monthly break-downs of both onboard-ing and offboarding.

Pivotal CRM 6.0 Upgrade with Mobile Access

The previous Pivotal CRM system suffered from poor performance for people and a cumbersome UI that lacked sufficient offline/Outlook integration. The original plan was to implement a new CRM sys-tem at a cost of approximately $400,000; however, we learned that we could obtain the functionality we need at a fraction of that cost by upgrading to Pivotal CRM 6.0.

The Pivotal upgrade project team consisted of members from the Sales, Support, and IT depart-ments who contributed to its highly successful completion using minimal outside contractor assis-tance. This upgrade supports the company's growth and challenges around sales while also improving both business processes and user adoption. Some key features include:

- Redesigned UI reduces key strokes and screen navigation by 60%.
- Added a server in Shanghai to improve performance for APAC users.
- Enabled Outlook integration and implemented Opportunity Account Management.
- Added smart phone access.
- Upgraded technology to use Smart Client.

HDMI Royalty and Governance Improvements

A custom application was built to track reported HDMI royalties reported by adopters and to track additional information about pending royalties, additional adopters, etc. This project is an improve-ment to previous manual processes and serial number tracking.

Trade Compliance

The growing global presence of Silicon Image makes tracking customers against international watch lists more important than ever. This project allows Silicon Image to check both international watch lists and the US Treasury Department Office of Foreign Assets Controls (OFAC).

SharePoint 2010

Sharepoint 2010 provides an internal CMS system that allows every department within Silicon Image to update content and store information for use by the entire organization. This system replaces local storage and manual knowledge sharing with centralized, automated information resources on a corporate intranet.

Other Accomplishments

(SIMG to reorganize and provide updated info)

The Silicon Image IT Department is working on the following projects during 2011:

SIMPLAY Operating Unit

Simply is a wholly owned subsidiary of Silicon Image. Creating a separate business unit allows the company to better manage this business unit by treating it as a quasi-independent entity with its own separate environment that allows better visibility into operations with separate bookkeeping and other essential functions.

Bartender

The ongoing global Bartender implementation continues to eliminate manual work, data entry errors, avoids bottlenecks, and ensures revenue attainment while also allowing customer-specific labels.

Backup Software

Implementing the Connected Backup service eliminates worries about lost data on laptop and desktop computers. Users can retrieve data anytime from anywhere. Key features include:

- Automated data protection eliminates the risk of human error, equipment/media failure, or catastrophic loss.
- Data is available whenever and wherever needed.
- Fully automated backups remove the burden from backups off of end-users and IT, while still giving IT control over schedule and bandwidth limits.
- Data is stored in highly secure offsite facilities and remains encrypted at all times.
- IT can manage data protection from a secure Web portal with no end user action required.

Web CMS

The Web CMS being implemented by Silicon Image Marketing will make updates to the corporate web site easier and more scalable. The current method requires creating IT tickets to push content live, which limits the ability to rapidly update online content.

Performance

This section lists several important metrics of IT Department performance.

Tickets

Total number of 2010 tickets by department:

Department	Tickets
Engineering	1426
Finance	663
Operations	585
Sales	469
HDMI	327
Corporate Marketing	321
Product Marketing	173
Human Resources	163
Simplay	161
Licensing	117
General	54
Legal	50
Facilities	25
Grand Total	**4534**

4534 Tickets Processed in 2010, by Department:

Engineering:	1426
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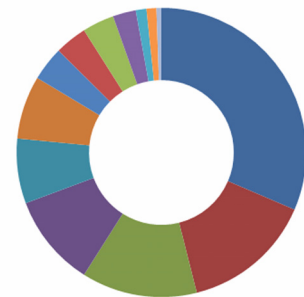
Total number of 2010 tickets by category:

Category	Tickets
Applications	1340
Desktop	1085
Infrastructure	1605
Web-related	504
Grand Total	**4534**

4534 Tickets Processed in 2010, by Category:

|	
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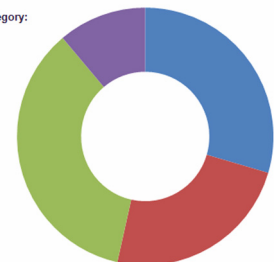
SLA Performance

The IT Department achieved the following percentages of SLA compliance in 2010:
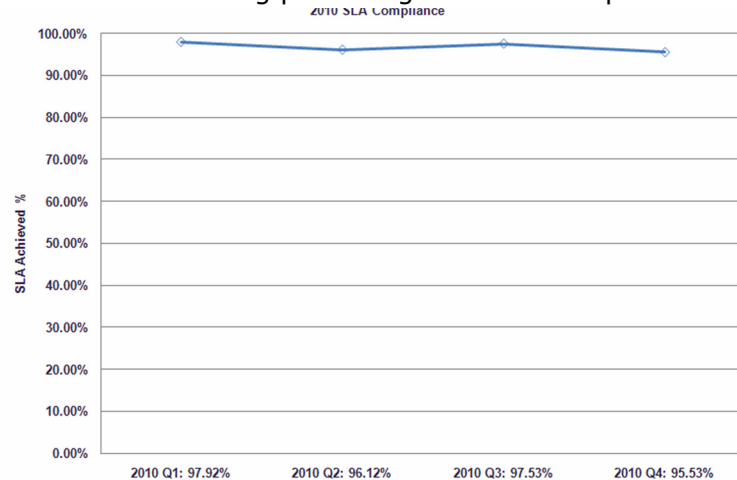
- **2010 Q1:** 97.92%
- **2010 Q2:** 96.12%
- **2010 Q3:** 97.53%
- **2010 Q4:** 95.53%

Survey Results

The IT Department achieved the following percentages of customer satisfaction in 2010 as measured by "satisfied" responses to post-ticket surveys:
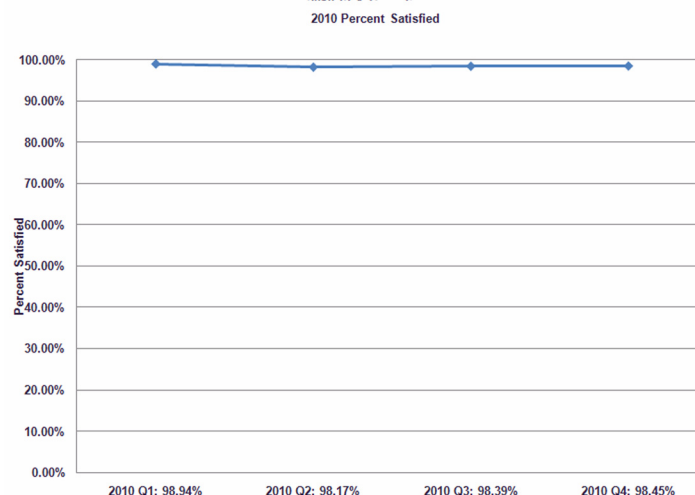
- **2010 Q1:** 98.94%
- **2010 Q2:** 98.17%
- **2010 Q3:** 98.39%
- **2010 Q4:** 98.45%

Training

The IT Department is committed to providing ongoing training for team members as needed. Examples of training include:

- Sending a developer to a Pivotal upgrade training class.
- Web CMS training
- Attending the Interop trade show to stay abreast of trends in IT.
- Attending the Oracle Openworld trade show to stay abreast of application trends.
- Manager training

Cloud Computing Statement

TBD - need from Shahab