

Information Technology in Maine State Government

2016 Annual Report



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Office Of Information Technology

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2016 Annual Report

Overview

This 2016 OIT Annual Report fulfills the statutory reporting requirements of the Chief Information Officer (CIO) set forth in the [Maine Revised Statutes, Chapter 163 §1973](#) subsection 3B and [§1974](#) subsection 6.

In January 2005, the Office of Information Technology (OIT) was created by Executive Order, consolidating functions, staff, and equipment from the Bureau of Information Services (BIS) and all Executive Branch Agencies. The consolidation was done to promote State-wide information technology solutions and use of information efficiently across government. Since the consolidation, OIT has been delivering the full range of technology services to the Executive Branch, and selected services (such as e-mail and network support) to non-Executive Branch agencies.

OIT provides technology support and strategic leadership for 12,000 Executive Branch employees, 14 Cabinet-level departments, and all the smaller agencies in the Executive Branch. It also provides network support for the Judicial Branch, Secretary of State, and Attorney General. It supports Maine Citizens through the Maine.gov web portal, public safety radio project, ConnectME broadband expansion, etc. The Chief Information Officer (CIO) directs, coordinates, and oversees information technology (IT) policymaking, planning, architecture, and standardization throughout state government. The CIO, as head of OIT, provides central leadership and vision in the use of information and telecommunications technology on a statewide basis; sets policies and standards for the implementation and use of information and telecommunications technologies; develops and supports IT-related legislation; identifies and implements IT business and project management best practices; and facilitates research and development activities to identify and establish effective IT service delivery.

Over the last two years and continuing into the future, OIT has been / will be following industry best practices in several areas:

- In-practice:
 - Revamped the Project Management Office, to provide professional level expertise for project management
 - Introduced 'Agile' project management approach, to improve project delivery and functionality
 - Put significant effort into IT workforce recruiting and retention, since 25% of OIT resources are eligible to retire in the next two years
 - Have adopted and implemented a cloud first strategy (like the federal government) to take advantage of industry offered infrastructure
 - Have worked with all agencies to review and revamp cyber security practices
- In-planning:
 - Work with the Procurement Division in DAFS to revamp IT procurement (risk, delivery)
 - Review / create plan for upgrading our legacy systems (some are over 25 years old)

OIT Divisions:

- Application Systems
- Core Technology Services (infrastructure)
- Project Management Office
- Business Process Management
- Cyber Security
- Business Continuity and Disaster Recovery
- IT Architecture and Policy
- Finance
- Radio Services
- Technology Business Consultants
- Vendor Management / Contracts
- Workforce Innovation

OIT's two largest organizations are Application Systems and Core Technology Services. The Applications Systems organization oversees systems development and maintenance for approximately 600 application systems, for all Executive Branch Agencies. Core Technology Services include network and voice services, radio operations, data centers, servers, desktop/ laptop computers, and IT customer support for all 12,000 State employees in the Executive Branch.

OIT's 450+ staff support:

- 65,000 Help Desk contacts per year, with a 98% rating of satisfied or highly satisfied
- 12,000+ desktop / laptop computers and e-mail accounts
- 3,000+ users with smart phones and access from other mobile devices
- 13,000 phone lines
- Over 50 projects in support of all Executive Branch agencies and enterprise systems
- 800+ servers supporting 600+ agency application systems and databases
- 562 million megabytes (562 terabytes) of data storage
- Network support state-wide, with wireless access in 288 locations (658 access points)
- State-wide radio network with 43 towers and 2,625 radios

Significant improvements in the past year include:

- Strengthening cyber security
- Improving project management
- Launching business process improvements
- Core Data Center Network Upgrade

The overall State-wide IT budget for fiscal year 2017 (July 2016 – June 2017) was \$137.2 million. Of this, approximately 48% was from the General Fund, 19% from Federal funds, 11% from the Highway Fund, and 22% from various other funds.

Strategy / Direction – OIT in 2020: The Plan

OIT strategy for the Five-Year Plan will encompass project delivery, building a resilient, redundant, and flexible infrastructure, and risk management (including cyber security and disaster recovery).

The foundation for the next five years will be:

1. **Business Process Management (BPM)** for process efficiency
2. **Agile Methodology** for predictable project delivery
3. **Enterprise Strategy** for reusable systems
4. **Risk Management** (cyber security and business continuity/ disaster recovery planning)
5. **Workforce Development** for finding and training the needed technology professionals

The Evolved Approach: Enterprise Modernization

OIT proposes over the next five years to develop a focused strategy of enterprise modernization. Investment in these five strategic areas will result in reduced development costs, reusability of assets, predictable delivery, and flexibility.

Business Process Management/ LEAN

- Help Agencies to respond to changes quickly
- Empower Agencies to make changes themselves
- Reuse tools that work across government
- New tools and products quicker to market

Agile Delivery

- Agencies drive the priorities
- Agencies control costs
- Implementations are 3 times more successful
- Making changes is low risk and straight forward
- Predictible project delivery

Legacy Modernization

- Methodically retire expensive legacy systems
- Replace aging inflexible hardware
- Develop a modern flexible workforce
- Currently legacy maintenance costs \$50M in FTE support annually

Risk Management

- Redesign aging, vulnerable networks
- Design infrastructure with disaster recovery included
- Bolster our cyber security workforce and tools

Workforce Innovations

- Hire new skills and talent
- Harmonize skills around small number of platforms and technologies
- Knowledge transfer to new workforce
- Address shrinking talent pool through interns and outreach

Enterprise Strategy

Application Services

With 350 staff members and contractors, OIT Application Services develops and maintains 600 agency and enterprise application systems, which support a myriad of agency and Enterprise programs for all agencies of the Executive Branch of Maine State Government.

Challenges

There are a number of significant challenges faced in the support of state applications:

- Workforce Recruiting and Retention
- Legacy Application Issues

Recruiting and Retention

Staff recruitment and retention remain a significant challenge. The Applications divisions continually operate with 15% vacancies. As the economy has improved this situation has worsened. The net result is an impact on the quality of service, the amount of work we can do, and an increase in cost when we hire contractors to fill vacant roles.

Legacy Applications Issues

As mentioned above Applications Support has responsibility for some 600 different application systems. About 85% of our efforts are dedicated to operating and maintaining the State's legacy applications, that is to say "keeping the lights on." The balance of our activity is applied to new initiatives which include modernization of old applications and to a lesser degree new functionality. The state has applications as old as 40 years of age with the average being around 15 years of age. The older an application the higher the maintenance cost and more expensive it is to adapt to changing agency needs.

Going Forward

OIT needs to consolidate teams to provide a better focus on technology and shared services. Not only does this create better economies of scale, it creates opportunities to standardize the application of technology, and it reinforces the creation of an enterprise which can provide a rich and reliable set of services across the state government.

Risk Management

Cyber Security

The Office of Information Technology has made significant progress in the last few years in combating cyber threats. But Cyber Security threats continue to proliferate, and given a network of our size and complexity, the current Cyber Security approach must continue to evolve to align with industry best practices.

The Challenge

From a Cyber Security standpoint, the State Executive Branch network presents the following challenges:

- 600+ sites, stretching from Kittery to Madawaska
- 12,000+ users with desktops/laptops
- 800+ servers
- 30,000 "other" devices (phones, printers, routers, HVAC controllers, cameras, etc.)
- 600+ applications
- Numerous non-state devices (approved and not approved)
- 1,000s of remote devices
- Commingled network with the Secretary of State, Attorney General, Audit, and the Judiciary, with no security walls in-between
- 20 separate lines of business with different priorities
- External attacks have increased roughly five-fold in the last two years

Threat Metrics

On an average working day:

- 1.4 million intrusion attempts are stopped
- 30,000 spam emails are blocked
- 15 workstations get infected with malware, leading to loss-of-productivity of about six hours per workstation

Business Continuity/ Disaster Recovery (BC/DR)

Business Continuity and Disaster Recovery are processes and plans that help organizations prepare for disruptive events – whether an event might be a hurricane, a data breach, or simply a power outage caused by a backhoe in the parking lot. BC/DR encompasses how employees will communicate, where they will go, and how they will keep doing their jobs. The details can vary greatly, depending on the size and scope of an organization and the way it does business.

OIT continued development of its BC/DR program after successfully completing several major program milestones in 2015 such as the Business Impact Analysis (BIA) and developing strategies to mitigate the most critical BC/DR capability gaps. The list below highlights some major program improvements and accomplishments achieved throughout 2016:

- Developed additional program structure, working towards compliance with several major BC/DR related standards: ISO 22301:2012, NFPA 1600, and NIST SP 800-34.
- Training on special BC/DR tools and procedures for key personnel
- Completed a massive upgrade of the State's 25 year old network infrastructure resulting in greatly improved ability to ensure continued network services despite suffering a potential catastrophic disaster.
- Regularly published a quarterly Risk Management Newsletter that has a readership including all State Departments, Local and County Emergency Management Agencies, and Thomas College
- An OIT Employee, who is also a Guardsman, was selected by the Maine Army National Guard to travel to the country of Montenegro and conduct a Government-level Disaster Recovery Strategy Seminar and Exercise

Network / Infrastructure Improvements

With State agencies increasingly reliant on network availability, OIT Network Services has undertaken a series of initiatives to improve capacity and reliability for all State agencies.

1. **Core Network Improvements:** 2016 saw major improvements in the reliability, availability, scalability and manageability of the State data network, and successful upgrade of the most critical elements in the State's data network. All key network components at the heart of the network were duplicated to provide a back-up should a primary device fail, and to allow technicians to take one device off-line for repairs without affecting network availability. This major overhaul displaced three highly vulnerable devices with 14 devices to provide both redundancy and distributed functionality. There is still much to be done to increase reliability across the entire network down to the desktop. In 2017, the Network team will be focused on upgrading data center campus switches to improve reliability and capacity.
2. **Internet capacity:** Total demand for Internet access continues to grow dramatically. Two separate links now provide full redundancy for State agency access to the Internet. This dual-link design will ensure that if one link fails or needs to be serviced, the other link will have sufficient capacity to provide acceptable response times. Current average utilization of 600 megabits per second (Mbps) can be expanded to 2,000 Mbps (or 2 gigabits per second) as needed.
3. **Network Diagnostic Tools:** Over the past year, the Network Team implemented important new tools to help monitor the health of the network. In doing so, the team can now move from a reactive to a proactive posture, identifying and resolving problems before they become service affecting.
4. **Augusta Fiber Ring:** The three Augusta campuses, (East Campus, State House Campus, and Commerce Drive Campus) each comprise roughly 2-3,000 State employees. Connections between these campuses formerly ran on fiber optic cables that linked Commerce Drive to the Cross Office Building (COB), and COB to the East (Riverview) campus. While this design had been adequate in the past, a single car accident could take out a pole, leaving an entire campus or data center without network access. In 2016, a new fiber network was installed following a ring topology. Now, each campus is fed from two directions, largely eliminating the possibility of some disaster isolating that campus. Notice on the attached map that the CMMC complex has fiber feeds into both 45 and 51 Commerce Drive, that the Capitol complex has fiber feeds into both the State Office Building and the Sewall street Data center and that the East campus has entrances from Arsenal street and Hospital Street.

Workforce Innovations

Research both nationally and statewide indicates that there are not enough technology and computer science resources graduating from college to replace the retiring workforce, or to keep up with the growing need of IT resources. OIT is attempting to overcome this “Silver Tsunami” effect by proactive efforts to hire interns and veterans. OIT mentors are assigned to help ensure success of the intern program.

The next generation of IT professionals is well established in cyberspace including LinkedIn and Facebook OIT is meeting them where they are to attract some of the best and brightest to establish their IT careers here in Maine and at the Office of Information Technology.

Strategies for Workforce Innovations

IT Workforce Challenges and Solutions

Per the U.S Department of Labor, information technology occupations are projected to grow 12 percent from 2014 to 2024, faster than the average for all occupations. These occupations are expected to add about 488,500 new jobs, from about 3.9 million jobs to about 4.4 million jobs from 2014 to 2024. At the same time the need for IT resources is growing, large numbers of IT workers are leaving the workforce for retirement.

We will be losing expertise to retirement. Twenty-five percent of OIT employees will be eligible to retire in the next two to three years; that equals almost 1,700 years of State of Maine IT experience.

Workforce Innovations has started several initiatives to find and build that next generation IT workforce which includes:

- High school technology night – teaching future students
- Career fairs
- Use of social media for recruiting
- Intern program
- Mentorships
- Veterans apprenticeship program

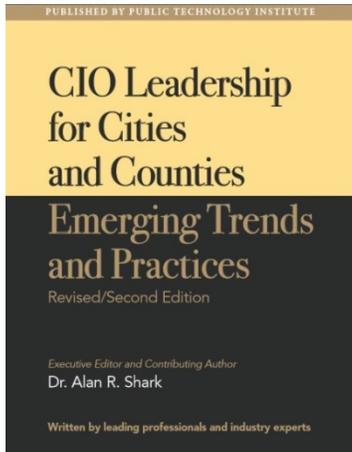
National Recognition

StateScoop Interview on IT Strategy

Maine Chief Information Officer (CIO) Jim Smith and Director of Project Management and Business Process Management (PM/ BPM) Joshua Karstens were interviewed by StateScoop at the National Association of State CIOs (NASCIO) conference. See 8 minute video at: <http://statescoop.com/maine-looks-to-feds-private-sector-for-help-on-it-strategy>



Public Technology Institute



CIO Leadership for Cities and Counties, published by Public Technology Institute. Workforce Innovations Director Kelly Samson-Rickert and CIO Jim Smith published a chapter in this book, called “Workforce Strategies – Find, Hire and Keep Talent”. See chapter 27:

<http://www.pti.org/news/displaynews.asp?NewsID=274&TargetID=1>

OIT Briefs Industry Experts on Agile and Incremental Software Development

As part of the National Association of State Chief Information Officers



(NASCIO) 2016 Midyear Conference, Maine OIT was invited to present on the work they are doing to implement agile project management and improve project delivery. Joshua Karstens, Director of Project Management and Business Process Management presented on behalf of the State of Maine in front of a packed house of conference attendees.

NASCIO is the professional association representing state chief information officers and information technology executives and managers from all states.

Government Technology Public CIO Magazine

Article: Overcoming Barriers

Director Joshua Karstens discusses overcoming barriers in IT projects through the implementation of Agile. https://drjdbij2merew.cloudfront.net/PCIO/PCIO_Mag_Summer16.pdf

StateTech Magazine

Article: Collaboration Technology Fuels Innovation for States and Localities

Director Joshua Karstens discusses how agility breeds innovation.

<http://www.statetechmagazine.com/article/2016/04/collaboration-tech-state-local-governments>

StateTech Magazine

Video: Recruit and Retain a World Class IT Team

CIO Jim Smith and Director Joshua Karstens were interviewed about recruiting IT talent to the State of Maine.

<http://www.statetechmagazine.com/media/video/nascio-2016-recruit-and-retain-world-class-it-team>

OIT Metrics/ Facts

	562 million	megabytes (562 terabytes) of data storage
	25 million	emails per year (inbound)
	14 million	spam emails blocked per year
	1.4 million	intrusion attempts foiled (daily)
	65,000	customer support calls, 98% satisfied or highly satisfied rating
	48,000	“tickets” for service
	35,984	network connections
	13,037	phone lines
	12,370	email accounts
	7,000	SecurID (remote access) accounts
	3,091	users with Blackberries, iPhones, and other mobile devices
	2,625	mobile & portable radios
	945	Oracle and SQL databases
	808	servers (physical and virtual)
	600+	applications systems (all Executive Branch agencies)
	600	facilities supported statewide with network access
	500	invoices processed (monthly)
	388	contracts managed
	288	wireless access locations (658 access points)
	50+	projects in support of all agencies and enterprise systems
	43	mountain-top radio tower sites
	24/7/365	network monitoring
	24/7/365	business continuity / disaster recovery (BC/DR) management

For more information please contact CIO Jim Smith at Jim.Smith@maine.gov.