Report for

Information Technology Master Planning

October 29, 2018

Client Locations

Coast-to-Coast

Practice Locations
California
Illinois
Texas
North Carolina

800.806.3080
www.clientfirstcg.com

Optimal Technology Guidance

CLIENTFIRST
TECHNOLOGY CONSULTING

TABLE OF CONTENTS

Engagement Purpose and Background

Technology Master Plan Objective

The objective of the Master Plan includes developing and articulating a vision for the effective use of technology to support the work of the County. The Master Plan identifies information technology strategies that have a positive return on investment and improve public safety or resident service.

Over the past few years, the term *IT strategic planning* gave way to a new term called *technology master planning*. The Technology Master Plan deliverables include strategies, as well as tactical and actionable IT initiatives.

The following plan is expected to serve as a guide for the IT Team and County Management over the next five years in planning, procuring, implementing, and managing current and future technology investments. Further, the plan will assist in the managing departmental resources related to information technology services within the County and provided to the public . The plan is the result of a thorough analysis, including:

- Existing hardware and network infrastructure, staffing, funding, applications, business systems, projects, processes, telecommunications, training, and other investments and resources currently in use by the County
- Interviews and workshops involving all levels of the County's staff, including the management team, end-users, and other stakeholders, recognizing limited staff availability
- Identification and prioritization of projects that the IT staff should undertake over the next five years
- Identification of needs to accommodate current and future technology requirements, such as data storage and management, legal requirements, security requirements, etc.

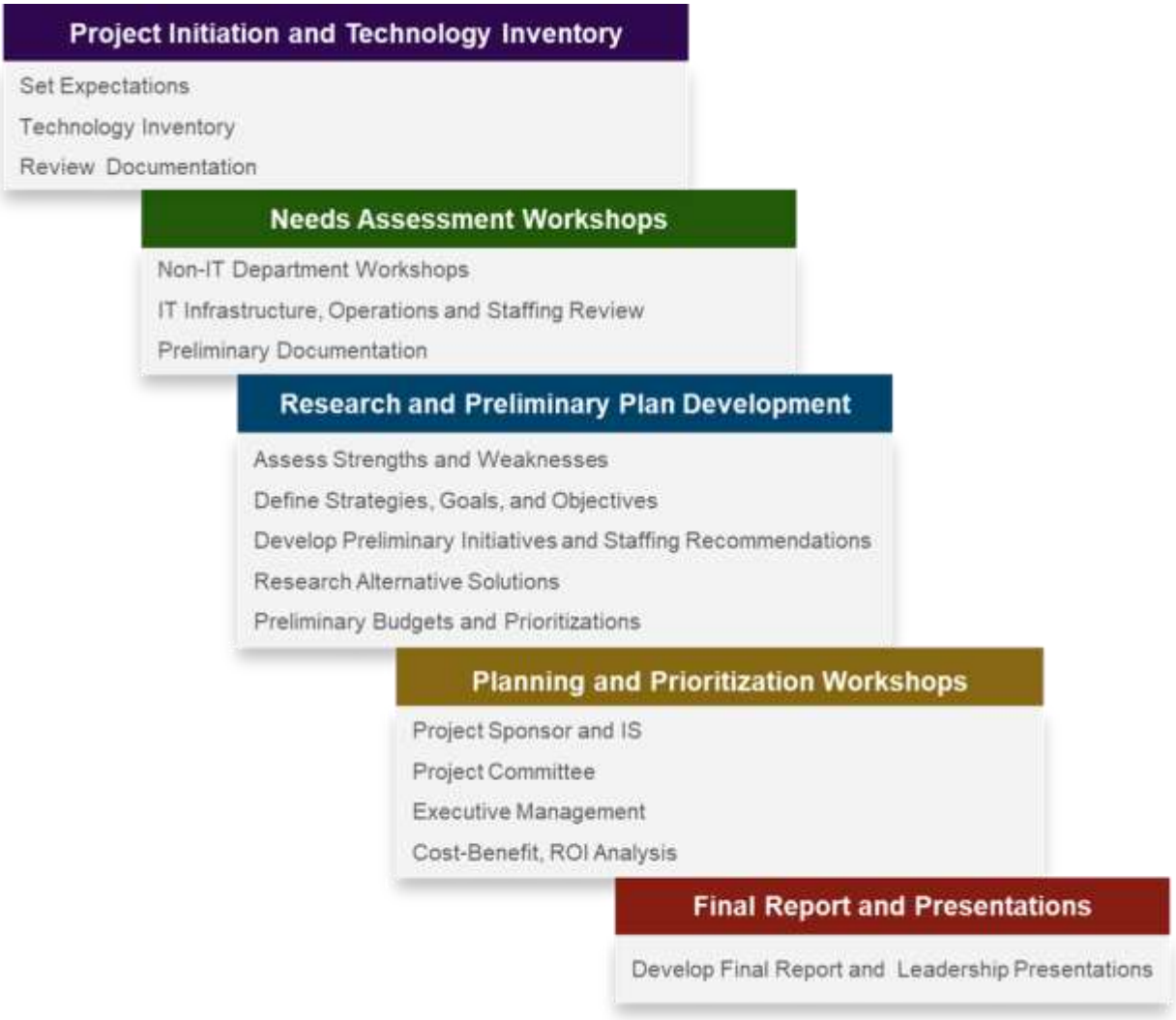
Deliverables

The Master Plan includes:

- Project Purpose and Background
- Methodology for Implementation and Maintenance of the Master Plan
- Current Information Technology Environment Summary
- Key Benchmarking Metrics
- Strategies, Goals, and Objectives
- IT Vision and Principles
- IT Initiatives (Projects) by priority
- Top Priority Initiatives
- Moving Forward
- Timelines
- IT Plan Budgets

Methodology and Approach

We utilized a five-phase methodology for the development of this Technology Master Plan. This process served as the cornerstone of the project, allowing the collaborative process to shape and develop our recommendations and approach, enabling us to tailor each step to fit the County's unique specifications. We worked in partnership with the County to improve the IT environment, so it can better meet the needs of staff and constituents.



Current Information Technology Environment Summary

Summary IT Environment

County of Mendocino **IS Environment Summary**	
IT Staff (Includes County IS and MSCO IS)	30
County Employees (FTE)	1,227
PC's	1,455
Laptops	125
Mobile Devices (e.g., Tablets, Smart Phones, Cell phones, etc.)	630
Telephones	1,300
Servers	146
Network Devices	450
Platforms	Windows, VMware, iSeries
Databases	MS SQL, MS Access
Countywide software applications/modules	Approx. 250+
Avg. Reported Help Desk Tickets per Week	100
Average Open after 7 Days	<10%

County management and staff have done a good job of maintaining information technology systems with the limited financial and staff resources available. The Mendocino County Sheriff's Office (MCSO) and County IS teams deserve credit for continuing to maintain high levels of customer service with an infrastructure that is, in many places, obsolete. We found technology staff to be knowledgeable, hardworking and dedicated to the mission of the County.

We feel that additional rigor in managing internal IS operations will improve customer service and cybersecurity, while essentially maintaining current staffing levels. Significant spending is required to replace obsolete technology infrastructure, including several systems that MCSO and County staff require to perform their duties. These include replacement of an obsolete County-wide microwave wide area network, significant radio, cabling and network equipment upgrades.

The majority of enterprise business applications are prominent and respected local government solutions and a good fit for the County. With the exception of a small number of applications, most of these systems were implemented less than ten years ago. Business processes surrounding these systems have been stagnant since their initial implementation and therefore are not fully utilized. We believe that significant improvement in staff efficiency can be achieved through an ongoing process of assessment, identification of cumbersome processes, configuration improvements and training.

Significantly, the Property system, which accounts for 75% of County revenue each year is reached the end of its effective life. The County has identified replacement of this system as a critical initiative, to be implemented over the next two to three years. Significant staff and third party resources will be required to successfully convert to a replacement system.

Overall, staff training has been limited and, in most departments, has not kept up with new software releases or employee turnover. We believe that staff training is one of the key components to maximizing the effective use of business applications and return on the investment in those applications.

Over the last few years, residents and the public have increasingly demanded more efficient interaction, online transactions, and more transparency through the availability of information. The County will not be able to manage these changes without updating applications and improving the approach to business application utilization and business processes. This increases the need to replace the County's end-of-life enterprise applications, improve methods to better utilize the County's contemporary enterprise business applications, and leverage resource to sustain the IT infrastructure that supports them.

Key Statistics and Metrics

The following analysis provides feedback on two key measurements regarding IT operations:

IT Staffing Resources	Overall IT Staffing vs. Key Equipment Counts
IT Capital Replacement Schedules	IT Equipment Replacement Schedules

These measurements provide an indication of issues that may affect the organization's IT effectiveness as it relates to providing IT support of systems and application solutions.

IT Staffing Resources (Overall IT Staffing vs. Key Equipment Counts (i.e., servers, PCs, and total number of logins) is often a reflection of IT staff productivity. With current up-to-date technology and the proper productivity tools, an individual IT staff member can support more users, reducing overall costs.

Capital Equipment Replacement is an important measure of the ability of hardware to adequately support the ongoing vendor changes to application software. These changes often require additional resources and hardware that are more robust. Slow capital replacement cycles can result in increased downtime and slower system response times, overall.

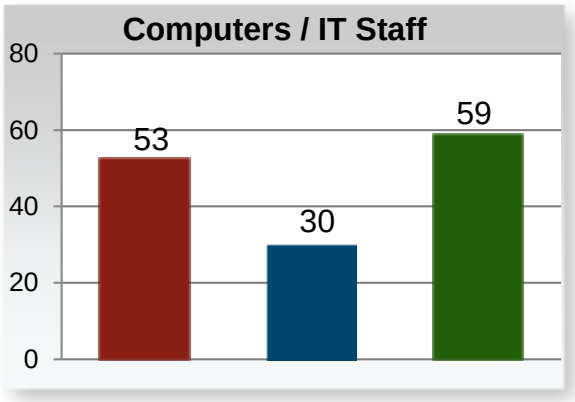
IT Staffing Ratios

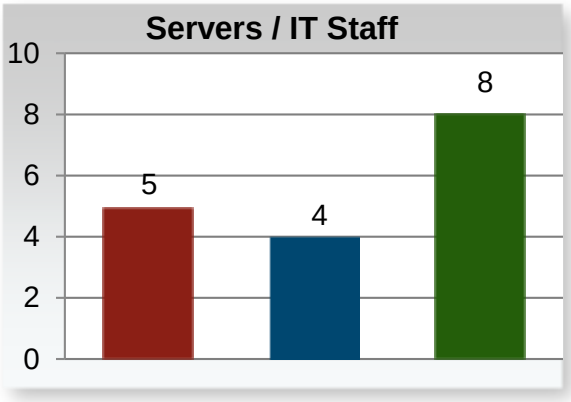
The following table depicts Mendocino's *IT Staffing Ratios* as compared to the number of agency FTEs and equipment per IT staff member. These ratios were derived from two sources; the Peer County Average is a result of data collected by Mendocino from twenty-six counties. We trimmed the data set to ten Peer Counties whose defining characteristics are of a rural nature and low-population density. The Agency Benchmark is based on 47 local government agencies. These are commonly used measures in the industry to validate staffing levels. As the number of individuals served and the amount of equipment increases, staffing levels should also increase.

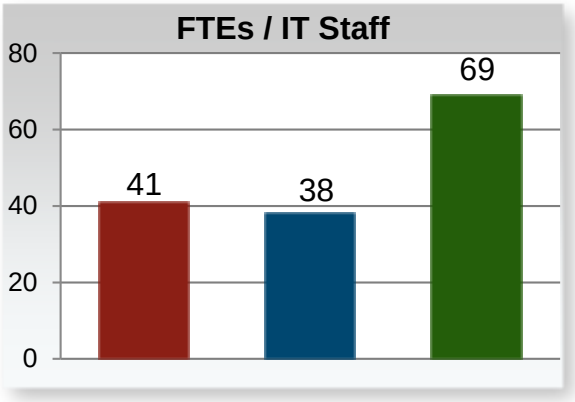
	County of Mendocino	Peer County Average	Agency Benchmark
FTEs / IT Staff	**41**	**38**	**69**
Servers / IT Staff	**5**	**4**	**8**
Computers / IT Staff	**53**	**30**	**59**

In this comparison, the County's IT staff supports slightly more than the average of Peer Counties in FTEs and servers and somewhat less than the Agency Benchmark. County IT support significantly more computers than Peer Counties and slightly less than the Agency Benchmark.

Overall, staffing benchmarks align positively with Peer Counties and our Agency Benchmark. Suggesting that IT staffing levels are appropriate for the County.







Equipment Replacement

The following table represents IT Equipment Replacement Recommended Best Practices and a municipal benchmark of 47 agencies.

	County of Mendocino	Municipal Benchmark	Recommended Best Practices
Laptops	**5 – 8**	**4**	**4**
PCs	**5 – 8**	**4**	**5**
Servers	**5 – 8**	**5**	**5**

The County's current policy is a result of underfunding for the replacement of aging computer equipment. Developing and funding a Capital Equipment Replacement plan utilizing recommended best practices (see the *IT Computer Equipment Replacement Plan* initiative) will reduce reliance on obsolete technology and improve efficiency of staff and the IT function. Efficiency will be improved due to reduced failure and downtime of aging equipment. Replacing obsolete and end-of-life equipment and maintaining a robust, resilient technology infrastructure are major points of emphasis of this Plan.

Strategies with Goals and Objectives

Strategies for improving infrastructure and leveraging and maximizing information system utilization in delivering County services are listed below. Within each strategy, we have listed initial goals and objectives for the County. We have translated those goals and objectives into specific initiatives in the *Information Technology Current State Needs Assessment* of the report. Additionally, outlined later in the report, are the budgetary costs for each initiative, resource requirements, implementation time frame, and, if appropriate, the next steps toward implementation.

Develop a Sustainability Plan

Goals and Objectives

- Develop a sustainability plan to identify the total ongoing cost of technology at the County
  - Expand existing capital replacement planning to include all technology infrastructure items.
  - Document all applications-related costs, including maintenance, upgrades, and training.
  - Understand Total Cost of Ownership (TCO) for new systems.
  - Update Sustainability Plan to include TCO of new initiatives.
  - Utilize the Sustainability Plan to inform budget process related to technology spending needs.

Enhance Utilization of Core Systems and Improve Business Process

Goals and Objectives

- Assess and identify opportunities for improvement in core applications systems.
- Utilize ROI principals to prioritize processes requiring improvement.
- Review current business processes and revise and reconfigure to increase efficiency.
  - Utilize core applications systems to eliminate paper processes and shadow systems.
  - Offer online services to residents and the public
- Develop an ongoing application systems training program.

Improve Analytical and Project Management Capabilities

Goals and Objectives

- Introduce application management best practices.
  - Identify key roles and responsibilities for core business applications.
  - Increase user application training.
  - Provide key departmental personnel with business process and report writer training.
- Conduct process reviews and document application feature/function requirements to identify automation opportunities and streamline processes, reducing duplication, including:
  - Find areas for automating existing manual processes and streamlining existing automated processes.
  - Perform processes within core application systems and eliminate sidebar spreadsheet work and other shadow systems.
  - Implement online services for residents and the public.
  - Find areas where implementing field based mobile applications can improve efficiency.
  - Fully implement reporting capabilities to ensure output that supports better business decisions and measurement of performance goals (key performance measures or KPIs).
- Utilizing return-on-investment (ROI) principles, identify areas for improvement, and use ROI principles to justify additional applications to improve productivity and service.
- Introduce formal Project Management methodologies for complex projects.
  - Create project teams and clearly define team member roles.
  - Utilize project management best practices to oversee project plans and implementation.
  - Train staff in project management best practices.

Improve Emergency Preparedness

Goals and Objectives

- Expand infrastructure resilience and disaster recovery capabilities.
- Identify high-priority systems and recovery time frames.
- When available, implement redundant Internet connections with automatic failover.
- Create secondary Emergency Operations Center capabilities.
- Ensure manual backup processes are developed and in place to maintain business operations until systems can be restored.
- Finalize disaster recovery capabilities and plan.
- Exercise plan annually.

Expand Resident and Public Communication and Online Customer Service

Goals and Objectives

- Increase and implement more online transaction capabilities for online account access, payments, etc.
- Move to Online Planning Application and Electronic Plan submittals, including implementation of:
  - Online Permits
  - Online Permit Inspection Requests and Scheduling
  - Online Code Enforcement Complaints
  - Online Licensing Renewals
  - Online Park and Recreation Program Registration and Payment
  - Citizen Request Management (CRM)

Move Towards a Countywide GIS/Geospatial Application

Goals and Objectives

- Utilize expanded bandwidth capabilities to integrate GIS across departments.
- Leverage GIS integration with the County's systems to better utilize these core applications.
- Create GIS-based emergency operations applications.
- Gather additional more detailed geospatial data for emergency operations and improved parcel analysis.
- Leverage GIS as a repository for geospatial data and application data.
  - Utilize Esri's analytical capabilities to inform reporting and decision-making.

Initiative Summaries

Introduction

Technology Master Planning is a process to assess, research, prioritize, budget, and plan future technology initiatives. Some of the following initiatives are ready for approval and implementation, while others require further assessment and research before the County can make a final determination as to priority, resource requirements, and cost-benefit.

Productivity Improvement – Many of the following initiatives will have a direct impact on overall productivity within the organization. Some of these initiatives will significantly impact specific processes, reducing staff time required to complete a certain process, while others will ease or speed delivery of online services directly to County residents.

Cost Savings – Many of the initiatives outlined herein will have direct or indirect cost savings when implemented. Extensive return-on-investment (ROI) calculations are not within the scope of this report. An ROI Considerations discussion is included in the *Information Technology Current State Assessment* of the report.

Technology Initiative Categories

The master planning process resulted in 99 initiatives. Combined, there are hundreds of findings and recommendations. *CLIENTFIRST* classified the major findings and recommendations into nine categories, including:

Best Practices	**IT Infrastructure**	**GIS**
Departmental Applications and Systems	**IT Operations**	**Telecommunications**
Gov 2.0 / Smart Counties (E-Government)	**IT Security**	**IT Staffing**

Best Practices

A *best practice* is a recognized operational method that consistently provides better results than those achieved with other methods. *CLIENTFIRST* believes the following best practices will enhance the County's ability to select, procure, and maintain more effective technology solutions in the future, as well as improve the overall productivity of staff.

The IT Initiatives addressed within this category, explained in greater depth in the *Appendix*, include:

IT Initiative	Description
Technology Governance	Utilizing an ongoing Steering Committee to drive technology education, policies, practices, and the implementation of the IT Master Plan over the next five years.
Applications Management Best Practices	Establishing roles and responsibilities for IS Division, departments, and users to properly manage and improve overall utilization of software maintained by the County.
Business Process Reviews	Reviewing business processes to improve efficiencies, and provides high-service levels to residents and the public.
Software Selection Best Practices	Following best practices, including needs assessments, evaluation, and procurement when considering new or replacing software solutions.
Enterprise Reporting Best Practices	Documenting unmet reporting needs across the County and devising a plan to develop reports that support daily operations and short/long-term decision-making.
User Training and Support	Improving ongoing user training to improve employee productivity and efficiency and maximize system utilization.
Training Rooms	Continue to maintain training rooms for testing applications and for staff to improve upon existing competencies.
Project Planning and Implementation Best Practices	Implementing a best-practices approach for project planning, implementation, and management.
Return-On-Investment Considerations	Overview showing how to understand ROI opportunities in the County through various technology investments.

IT Initiative	Description
IT Project and Services Portfolio	Developing a portfolio of County Applications and IS Division services and standards, and communications to all management and staff which can be used to delineate roles and responsibilities between departments and IS, as well as set proper expectations.
Sustainability Planning	Providing a more practical or realistic way to determine and plan for the ongoing operational system needs and expenses of major technology infrastructure and application software systems.

Departmental Applications and Systems

The *Departmental Applications and Systems* category includes initiatives primarily related to department business applications identified during the needs assessment process. Many of these initiatives and recommendations can have a significant impact on overall productivity, enhanced communications, and information sharing, improved constituent service, improved transparency, and in many cases, cost efficiencies.

The IT Initiatives addressed within this category, which are explained in greater depth in the *Appendix*, include:

IT Initiative	Description
Munis Gap Analysis and Utilization Improvement	A process to compare the County's functional needs with inventory of existing applications, to determine most cost-effective means to gain increased business process efficiencies through more effective utilization of ERP suites/modules. Includes a Gap Analysis and a plan to close identified gaps.
Budgeting Process Review and Improvements	Conduct a needs assessment to document and improve the budget process by automating existing manual process and incorporating these processes into existing application systems.
Aumentum Assessment and Tax Billing System	Follow best practices to plan and prepare for implementation of the County's new Assessment, Property, and Tax Billing system (Aumentum) and to apply best practices to ensure a successful system implementation.
TRAKiT Gap Analysis and Utilization Improvement	Performing gap analysis to identify functionalities not implemented but available in the existing TRAKiT Land Management system, including online services and field based mobile capabilities.
Election Voting System Replacement (DIMS, GEMS, and Voter Equipment)	Implement required voting equipment certified by the State of California .
Electronic Document Management System (EDMS)	Conducting a needs assessment for the implementation of an advanced County-wide document and content management technology to manage records and record retention, capture documents, store and retrieve data, provide workflow automation, and provide electronic forms and application capabilities with routing and approvals.

IT Initiative	Description
Justware Gap Analysis and Utilization Improvement	Conducting needs assessment to determine gaps in JustWare and develop an improvement plan to close the gaps.
NeoGov Gap Analysis and Utilization Improvements	Considerations for streamlining job applicant tracking process and improving utilization of the NEOGOV application solution.
Enterprise Asset Management (EAM) Including Fleet	Improvement or replacement of work order and fleet management systems.
Fuel Management System Integration	Needs assessment to improve billing and reporting of fuel usage and associated financial accounting.
Centralized Land/Parcel Data Management	Consolidating Land/Parcel information for improved accuracy and data retrieval and consistency of address and parcel information across all software applications.
Cannabis Permits and Licenses Process Review	Process review to improve management, tracking, and reporting of the Cannabis permitting and licensing operations.
Project Tracking and Collaboration	Acquire an application solution the meet the need for collaborative software to manage department or countywide projects.
Bids Management	Procurement of a bids management solution.
Kiosks	Placement and use of kiosks for self-service at County facilities to bridge the digital divide, including any transactional capability offered on the County website.
Board Meeting Automated Text Recording and Minutes (Talk-to-Text)	Exploring Talk-to-Text functionality to streamline creation of Board meeting minutes.
GovInvest License and Implementation	Consideration for the purchase of an employee pension/benefit projection analyses and tracking system.
Intranet	Expand the internal website portal to improve automata tin of employee notifications, County-wide communications, and information sharing between departments.

IT Initiative	Description
Agency Wikis	Improving collaboration within and across departments through exchange of information on an internal website.
OpenGov	Enabling public access and quick internal department access to financial-related data.
Electronic/Digital Signatures	Implement County-wide electronic/digital signature capability.
Homeless Management Information System (HMIS)	Replacement of County's existing Homeless Management Information System.
Migration of Access and Homegrown Applications to COTS	Where possible, migrate standalone MS Access databases or internally developed AS/400 applications to COTS ("commercial, off-the-shelf") applications.
Website Content Management Training	Need departments to receive training on performing website content updates in order to perform frequent changes to their web pages.
Mass Public Outbound Communications	Solution options for notifying County residents and staff regarding information or status updates.
Replacement of Probation Assessment.com System	Replacement of Probation Assessment.com assessment system.
Animal Services Chameleon System Improvements	Conduct a process review and assessment to fully utilize needed functionality available in the existing Chameleon system.
Library Scheduling System	Obtain a new system for automation of personnel/volunteers, rooms/facilities, and event scheduling.
GIS Assessment and Computer-Aided Dispatch Base Layer	Build base layer to meet needs for dispatching, including improvements for automated assignment, automated vehicle location (AVL), and other general GIS integration capabilities.
Aegis Gap Analysis and Utilization Improvement	Following the planned major upgrade, perform a gap analysis to identify functionalities not implemented but available in the existing CAD/RMS system.

IT Initiative	Description
Jail Visitation Management Software	Procurement and implementation of Jail Visitation Management software.
Automated License Plate Readers	Use of automated license plate readers on patrol vehicles and fixed installation at entrances to neighborhoods.
Sheriff's Vehicle – Voice Recognition	Use of voice recognition software in patrol vehicles for hands-free access to mobile data computers (MDCs).
Sheriff's Office Automated Vehicle Locator (AVL)	Need locators to track real-time vehicle geographic positions.

Gov 2.0 / Smart Counties (E-government)

Gov 2.0 is a growing body of shared knowledge regarding the utilization of new technologies in combination with creativity, information sharing, and the collaborative process to better serve and interact with the public. The principles of Gov 2.0 include:

Principle 1 - Serve as the primary source of reliable, accurate, and timely County information, delivered to the customer on his/her platform of choice.

Principle 2 - Maintain a real-time, interactive, and user-centered website that offers easy access to public information and online services.

Principle 3 - Offer opportunities for online civic engagement and social collaboration.

The possible benefits of developing such communication methods go beyond just simple release of information. The advantages include:

- Increased efficiency and cost reduction for public services offered electronically
- Greater government transparency
- Better-informed and more involved public
- More collaborative efforts between the County and the public
- Faster and more convenient access, promoting public satisfaction and approval

Recently, *Smart County technology* has been paired with Gov 2.0 capabilities into a single technology planning category. Smart Counties use data and technology to create efficiencies, improve sustainability, create economic development, and enhance quality of life factors for people living and working within the County. It also means that the County has a resilient and smarter technology infrastructure.

The IT Initiatives addressed within this category, which are explained in greater depth in the *Appendix*, include:

IT Initiative	Description
District Attorney-Specific Email and Web Page URL	Creation of a separate email URL and webpage domain name for the District Attorney.
Volunteer Tracking and Contact System	Considerations for the use of volunteer management and contact software for Office of Emergency Services and other departments that my need the ability to track, contact, and communicate with volunteers.
Central Door Access Control System	Assessment of County's access control requirements and potential for using a County-wide system that uses a single employee ID badge for HR and for facility access.

IT Infrastructure

CLIENTFIRST conducted a detailed IT infrastructure assessment, including the network, servers, equipment, inside/outside cable plant, and other communications infrastructure.

The IT Initiatives addressed for this category, which are explained in greater depth in the *Appendix*, include:

IT Initiative	Description
Network Upgrade	Upgrade the County data network to replace end-of-life equipment and increase resiliency by reducing the number of single points of failure.
Structured Connectivity System	Develop a Structured Cabling System (SCS) Standards document for improved documentation and management of voice, data, and video cabling installations. Hire a third party for cabling required for office moves, wireless, and other projects
Storage Area Network (SAN) Upgrade	Procurement of additional SANs for failover and redundancy (replication), which include instituting Storage Tiering to improve performance of core data and applications. (Initial Phase complete).
Cloud Computing	Utilizing IT services or equipment that are available through the Internet. Dependent on implementation of resilient Internet connectivity from the County.
IT Computer Equipment Replacement Plan	Development of computer equipment replacement procurement plan for all device types.
Internet Bandwidth	Implementation of redundant Internet to increase carrier diversity for disaster recovery, speed, and reliability improvements.
Office Software Upgrades	Upgrade to the most current version of Microsoft Office.
WebEOC	Emergency operations center with real-time information feeds.
Technology Support for the EOC	Upgrade outdated equipment and technology to support use of EOC in a large-scale emergency (Phase 1 complete).

IT Initiative	Description
Network Resiliency Study – Emergency Broadband Availability	Identify alternatives and implement a resilient network path to an Internet point of presence in the County.
Electronic Mail (GroupWise)	Move to Microsoft Exchange and MS Outlook for electronic mail.
E-Fax	Implementing cost-effective, electronic fax solution (current solution is end-of-life and no longer supported by the vendor).
VMware Upgrade and Server Refresh - Complete	Enable additional features in virtual environment (complete).
Remote Access Upgrade	Expand remote access to computer systems for selected staff to use in the field and during off-hours.
Wireless Network	Expand wireless Internet access to the County staff and guests.
Video Surveillance Assessment and Replacement	Assessing current video surveillance technology and needs and implement a single, standard video surveillance platform that can be used throughout the County.
Property System	Transition Property System to a new, more reliable platform (in progress).
Microwave and Multiplexer Replacement	Replace the microwave, multiplexer, and routing system that provides network connectivity to all County facilities and radio service to Public Safety and County field staff.
Radio Systems Upgrades and Replacement	Plan for upgrades to the County-wide radio system. Upgrade and replace aging radio components. Many components and systems are more than 20 years old.
Microwave Ring Expansion	Complete expansion of microwave ring to increase resiliency and eliminate single points of failure that could affect first responders' ability to communicate in fire or other natural disaster scenarios.
Video Conferencing	Replacement of video conferencing systems that are obsolete.

IT Initiative	Description
Infrastructure Roles and Responsibilities	Define IT responsibilities between the Sheriff and County IS Staff
MCSO Structured Connectivity System	Develop a Structured Cabling System (SCS) Standards document for a bid to replace the existing cabling and to improve documentation and management of voice, data, and video cabling installations. Replace and upgrade the cabling within Ukiah Sheriff's Office facilities to current standards. Will improve security and reduce potential downtime.
MCSO Local Area Network (LAN) Upgrade	Upgrades to the MCSO's Local Area Network to replace obsolete equipment and reduce single points of failure.
MCSO Infrastructure Upgrade (Servers, SAN, and Backups)	Upgrades to the MCSO's IT infrastructure to replace obsolete equipment.
Multi-Jurisdictional Radio Operations	Procurement and deployment dual-frequency radios in southern Mendocino County to increase interoperability with neighboring public safety jurisdictions.
Dispatch Radio Console Replacement	Replacement of the dispatch console prior to reaching end-of-life

IT Operations

IT operations are the daily support and maintenance of all IT infrastructure and user support. These include the processes and procedures used by IT staff to maintain the network, applications, and workstations. Initiatives related to IT operations are often focused on productivity improvements and implementing IT best practices.

The IT Initiatives addressed for this category, which are explained in greater depth in the Appendix, include:

IT Initiative	Description
IT Operations – Enterprise Management Platform	Improved IT automation related to the network, device monitoring and management, and IT Help Desk. Reduce manual tasks performed by IT staff.
Mobile Device Management	Expand Mobile Device Management software to track, control, and manage all mobile devices
IT Cost Recovery (IT Budget Allocations)	Developing an IT cost recovery model to allocate IT costs fairly, using holistic review and measurable to ensure use of services are charged proportionately
IT Procurement Practices	Using objective best practice procedures for procuring IT investments to ensure independent specifications and best cost/value is obtained for the County
IT Policies and Procedures	Revising and developing new IT policies for encryption, purchasing and procurement, device configuration, remote access, etc.
MCSO IT Operations - Enterprise Management Platform	Improved IT automation for the MCSO related to the network, device monitoring and management, and IT Help Desk. Reduce manual tasks performed by MCSO IT staff.

IT Security

IT Security refers to all security systems and practices, including Disaster Recovery, used to protect County systems and data.

IT Initiative	Description
Disaster Recovery Planning	Developing capabilities to survive a major failure or catastrophic event involving IS resources and facilities
Disaster Recovery Site Implementation	Implementation of data center, redundancy, and co-location for disaster recovery
Backups	Improving maintenance and security for routine back up procedures (MCSO backup improvements complete).
Firewall Upgrade	Upgrade and replacement of firewalls that protect County networks from the Internet (complete).
IT Security Assessment	Following the implementation of network improvements, assess cybersecurity posture and outline improvements to network security
Logging and Audit Trails	Improved audit trail capabilities and expansion of current logging capabilities
Records and Data Retention	Policies and procedures for disposal/destruction of electronic records and data
PCI Compliance Study	Review standards and laws that govern payment processing for public and County security (mainly enabling secure card transactions)
Staff Security Awareness Training	Periodic online security awareness compliance training.

GIS

The GIS category includes initiatives primarily related to GIS applications and processes identified during the needs assessment process. Many of these initiatives and recommendations can have a significant impact on overall productivity, enhanced communications, and information sharing, improved constituent service, improved transparency, and in some cases, cost efficiencies.

The IT Initiatives addressed within this category, which are explained in greater depth in the *Appendix*, include:

IT Initiative	Description
GIS Assessment and Master Plan	Countywide assessment and master plan for the future GIS data and resource needs
GIS Data Acquisition	Considerations for improved collection of GIS data
GIS Emergency Operations Readiness	Adoption of GIS applications and processes for preparing and responding to emergencies

Telecommunications

This category addresses voice and data communication systems.

The IT Initiatives addressed for this category, which are explained in greater depth in the *Appendix*, include:

IT Initiative	Description
VoIP Phone System Upgrade and Resiliency	Upgrade and improve Countywide Voice-over-Internet Protocol (VoIP) telephone system. Integrate phone systems and improve resiliency.
Phone System Training	Periodically train staff on existing and new telephone features

IT Staffing

This category addresses issues facing overall IT staffing resources.

The IT Initiatives addressed for this category, which are explained in greater depth in the *Appendix*, include:

IT Initiative	Description
Business Analysis and Project Management Skill-Set Needs	Ability for IS Division operations to provide application/business analyst/project management roles and skill sets

Key Initiatives

The following are a list of Key Initiatives that were identified as a part of the planning process. These initiatives could also be considered high priority. The Key Initiatives listed below either provide immediate ROI, are a long-term building block for the success of the plan, or mitigate risk. The County has made note of these as the initiatives from this plan that should be kept in the forefront during the future implementation of this Technology Master Plan.

It should also be noted that these initiatives are not ranked in any particular order. The County is contemplating such a ranking prior to beginning the implementation of the Technology Master Plan.

Applications Management Best Practices	• Best Practice applications management advises that business applications are owned by the Departments, with IT ensuring availability, data integrity and security. • Department ownership implies that staff keep up-to-date on available applications improvements and take a leading role in application upgrades and enhancements to increase efficiency.
Project and Implementation Best Practices	• The major IT Plan-recommended initiatives involve significant financial and staff resources and affect critical multi-department systems. • Successful implementation of these systems will be important to the County's ability to serve residents and visitors. • Best Practices project planning is an important way to improve the odds of successful implementation of these complex systems.
User Training and Support	• Another key success factor of system implementation is User Training. • User training is also probably the most important factor in improving application utilization, which is key to fully realizing the benefits of investment in application systems.

Sustainability Planning	• Historically, the County has invested a limited amount of funding in replacing aging technology infrastructure. • The amount of spending has been less than is required to maintain systems adequately. • All technology, including door access control, staff workstations, mobile devices, network infrastructure, telephone systems, radio, video surveillance systems, wireless and all major applications systems upgrades should be included in Sustainability Planning. • Technology has a limited lifespan and must be upgraded and replaced on a regular basis. • Planning for replacement is a key component of Sustainability Planning and budget management.
Munis (ERP) Gap Analysis and Utilization Improvement	• Munis was installed a number of years ago and surrounding business processes have remained largely unchanged since then. • We believe that significant efficiency gains can be achieved resulting in many staff hours saved through a process of assessing the current system, identifying gaps in functionality that result in cumbersome business processes and implementing improvement plans. • We feel that potential improvements in efficiency will be very significant to the organization and result in improved customer service and business decision making.
Aumentum Assessment and Tax Billing System	• As described in the report, the Property and Tax billing system is responsible for three-quarters of County revenue. • The existing system is currently out-of-date and lacks the features of modern property tax and billing software, and the County has contracted for a replacement system called Aumentum from Thomson Reuters. • Users of the system span multiple departments and implementation will be a very significant undertaking. • By necessity, staff must leverage Best Practices methodologies for Application Ownership and Project Management in order for this project to be successful.

Voting System Replacement	• The State of California and the California Secretary of State have stated that "the biggest threat to the election systems throughout the State is old voting systems and equipment." • The current County DIMS, GEMS software, and associated equipment is end-of-life and must be replaced with software and systems certified by the State of California Enterprise Risk Management Office and the Secretary of State. • Per the above Voters Choice Act requirement, Mendocino County is set to receive approximately $675,000 from the State. • To be eligible and to receive these matching funds from the State, Mendocino County/Elected Registrar of Voters must become a Voters Choice Act County.
Infrastructure Upgrades	• Limited spending on capital equipment replacement has caused a significant infrastructure technology deficit that spans network infrastructure, radio, cabling, desktop operating systems and other basic technology components. • Upgrading these systems to current generation equipment will require significant staff and monetary resources and several years of dedicated work effort.
IT Operations Management	• Like every other department, IT is most efficient if automation tools are utilized to perform repetitive tasks and provide early warning of potential failures or security anomalies. • IT has implemented some automation tools and, to some degree, has been using staff time to make up for limited funding. • A single County-wide IT automation toolset will improve IT efficiency, responsiveness, and system availability.
Emergency Operations Readiness	• Recent fires have underscored how important a resilient technology infrastructure and geo-spatial data are for emergency preparedness and response. • In this report we outline several key initiatives to improve overall technology infrastructure resiliency and geo-spatial data.

Conclusion

Moving Forward

This plan was developed as a collaboration between the consultant and County staff. County staff participated in numerous workshops and conference calls and worked diligently to review and refine the recommendations in this plan.

We feel the County is an excellent position to move forward with this plan, improve County information technology, and better utilize applications systems to provide enhanced services to residents and visitors.

The completed plan should not be viewed as static, but rather as a dynamic tool that is revised and updated as business conditions and requirements change. If the planning function is not an ongoing process, certain objectives and benefits will not be realized, because the objectives themselves may change as the organization and its environment evolves.

Benefits

Major benefits that are (or should be) realized through the implementation of this Technology Master Plan include:

- Increased collaboration and communication between the departments and IT
- Transformation of the organization's overall understanding, knowledge, and stewardship of information technology
- Clear direction for IT operations and IT projects for the next five years, focused on meeting the organization's needs
- County-wide department consensus and understanding of all IT initiatives and their priorities
- Foundational process and methodology for evaluation of project investments and analyzing business case justification

Immediate Next Steps

Moving forward, over the next 6-to-18 months, the focus should be on upgrading and replacing obsolete equipment and improving technology infrastructure resiliency. Overall, we recommend Departments focus on improving business processes and expanding application utilization. Significant resources will be required in the near future to replace the County's voting systems and replace the County Assessor/Tax System software.

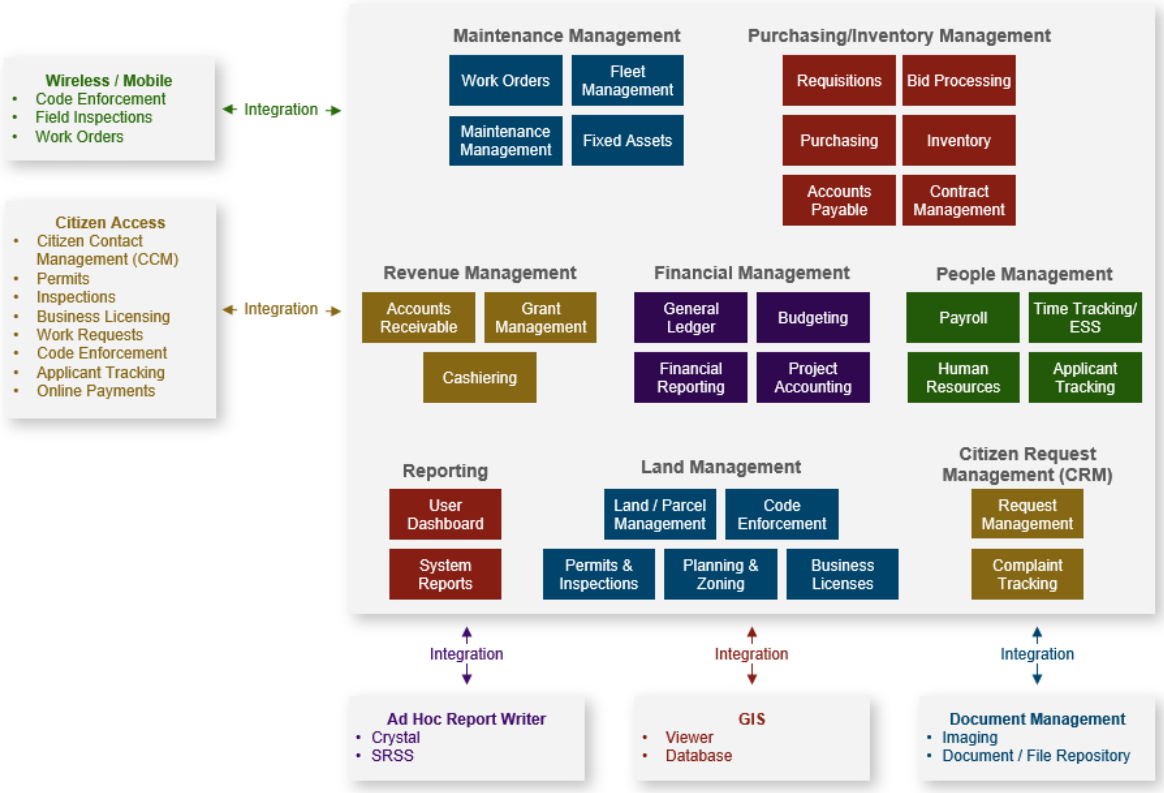
We also recommend the County form an IT Steering Committee as described in the IT Governance initiative. Utilizing, the IT Steering Committee, we recommend the County review and update the plan annually using an abbreviated version of the master planning methodology. In this way, the plan will be a vehicle to continuously guide the information technology activities of the County. The annual Technology Master Plan update should be synchronized with the County's annual budget process, so Technology Master Plan initiative costs can be properly represented in the County's annual budget.

Exhibit

Benefits of Modern ERP Software

An *Enterprise Resource Planning (ERP) System* automates and integrates many core, County-wide functions into a single solution, while automating manual processes and providing a central location of information and reporting. An enterprise system allows collaboration and sharing of information between divisions, departments, and citizens to provide a transparent and efficient government operation. The benefits of an enterprise system are numerous and include:

- Built-in integrations between Land, Work, Financial, and People Management application suites
- Newer technology platform (processing, capacity advantages)
- Real-time notifications/queues
- Task tracking
- Real-time access to information
- Elimination of duplicate data entry
- Improved data integrity
- Centralized location and customer account maintenance
- Reliable information
- Workflow capabilities
- Centralized cash receipt capabilities
- Efficient revenue collection
- Reduced operating costs
- Improved internal communication
- Foundation for future improvement
- Potential reduction in annual maintenance and support fees
- Improved online information for citizens to access



Financial and People Management

The *financial management suite* is a suite of an enterprise system that encompasses the financial tasks and processes performed to ensure all organization-wide activity is properly accounted for and accurately reported to local, state, and federal agencies. Benefits of a financial management suite include:

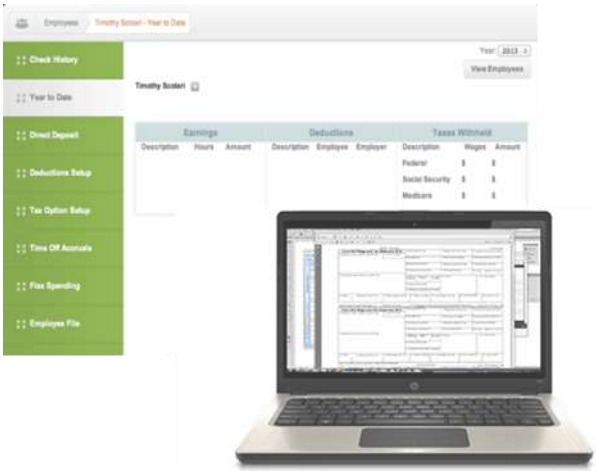
- Quick generation of financial reports
- More efficient budgeting processes
- Real-time access to available budget and funding
- Better spending controls for departments and projects
- Management of grants and funding sources
- Real-time inquiries into capital improvement project progress

The people management suite manages the organization's workforce and provides automation to the human resources, payroll, timekeeping, and applicant tracking functions. Employee self-service is also available to allow employees the flexibility in retrieving their information at their convenience. Benefits of a people management suite include:

- Paperless personnel forms
- One-time data entry
- Tracking or misplacement of employee paper files
- Incorporation of employee self-service (ESS)
- Integration between timekeeping, payroll, HR, and financial management
- Quick and reliable reporting to federal and state agencies
- Improved employee satisfaction
- Automated Time Entry Approvals and Payroll Calculations
- Minimal steps between processing payroll and issuing direct deposits and checks

Employee Self-Service

Employee self-service (ESS) empowers employees to provide, change, and retrieve their personal information through an online employee portal, thereby reducing the manual interaction required with the Human Resources Department. ESS offers an online option for employees to access and manage information for themselves:



- Address changes
- Tax allowances changes
- Open enrollment benefits
- Dependent changes
- Leave/vacation accrual balances
- Electronic paystub copies
- Year-end W-2s
- Populating and retrieving timesheets
- Time requests
- Tax forms
- Many other forms and applications

Reporting

The number one problem that is commonly seen when utilizing disjointed applications is the extensive time users dedicate to the consolidation of information for reporting purposes. Enterprise systems allow information to be quickly retrieved from a single source with numerous readily available reports. Users are also able to create their own reports without requiring them to be technical experts. This allows staff to spend more time studying analytics rather than manually assembling reports. Benefits of improved reporting include:

- Aggregated data across divisions, departments, and organization
- Improved data accuracy and reduced human error
- Intuitive report creation capabilities
- Board-ready reports
- Sharing of created reports
- Elimination of labor-intensive report creation

Individual User Dashboards

Dashboards form part of a user's home page and display reports, key indicators, and other metrics regarding day-to-day operations, activities, and historical trends. Benefits of dashboards include:

- Quick links for immediate access to required tasks and approvals
- Easy modification of dashboards for each user's preference
- Automated generation of dashboard information
- Transformation of data into visual information
- Easy-to-understand graphics
- Real-time analysis
- Drill-down access to activity detail

Mobile Computing

Mobile computing provides the flexibility to operate a more mobile and productive workforce. An enterprise system can allow staff to utilize applications while in the field in order to perform their job functions while away from their office. Common benefits of mobile computing include:

- Completion of work while in the field
- Real-time access to information
- Inspection results in the field
- Receipt of notifications and job assignments
- Reduced travel to and from office locations
- Map routing based on location of activities
- Retrieval of mapping information
- Management of code enforcement cases in field

Online Citizen Access

Online citizen access enables a more transparent government by providing the public with 24/7 access to real-time information for inquiries and payment processing. This empowers residents to retrieve online information that is pertinent to each individual, and for them to take further actions, which improves customer relations by eliminating the need to be physically present at the County. The following are examples of online citizen access transactions:

- Online permit applications
- Submit and access plan review comments
- Online payments
- Submit complaints
- Submit citizen requests
- Submit inspection requests
- Access to inspection results
- GIS maps (zoning, etc.)

Citizen Request Management

A *citizen request management system* is used to track, manage, and resolve citizen concerns and requests in a timely manner by automatically routing citizen requests to the appropriate department. It also provides the citizen with the flexibility to submit and track their complaints through the Web or a mobile phone application. Common benefits of a citizen request management system include:

- Ability for citizens to submit requests 24/7 through a phone application or the website
- Automatic assignment and routing of requests, by type, to appropriate department(s) or staff
- Ability for citizens to view current request status
- Conversion of requests to work orders
- Ability to include photos and geolocation of a request
- More effective and efficient processes
- Improved transparency and citizen relationships

Land Management

The Land Management system is one of the suites that are offered by enterprise application systems and manages the creation, issuance, and tracking of community development activities related to planning and zoning, permitting, building inspections, licensing, and code enforcement. Benefits associated with the utilization of the application include:

- More automated permit processing from application through permit issuance
- Automatic routing for permits requiring reviews and approvals
- Single electronic file for all permit applications and documents
- More automated tracking of reviews, inspections, and fees by permit and development projects
- Tracking of timelines, tasks, and required group reviews
- Viewing all project and permit information at a glance
- Readily accessible planning and zoning records
- Automatic generation of case documentation
- Centralized current and historical parcel information

GIS Integration

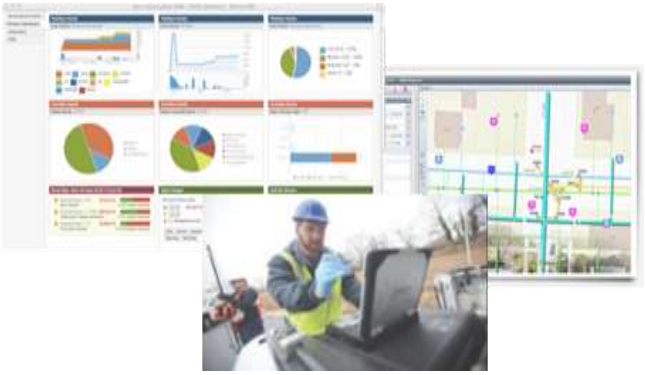
Enterprise systems offer real-time integration to *geographic information systems (GIS)* in order to display land-use, zoning, and infrastructure layers on a map, as well as parcel, permit, inspection, code enforcement, and work order activity that resides within the enterprise system. Benefits of *GIS integration* include:

- Viewing system activity on a map (e.g., active projects, permits, cases, etc.)
- Map routing of work orders, service request, and daily inspections
- Displaying locations of infrastructure assets
- Generating asset condition analysis
- Ability to overlay multiple map layers
- Integration to website for resident inquiries

Maintenance/Work Order Management

Another suite of an enterprise system is the *maintenance/work order management system*, which provides automation in managing the maintenance and day-to-day operations related to infrastructure assets, buildings, facilities, and fleet vehicles, while being able to capture and report on the labor, equipment usage, and materials costs associated with a work order and preventative maintenance. System benefits include:

- Electronic routing of citizen requests
- Centralized task and maintenance management
- Completion of work orders from the field
- Streamlined public works operations
- Retrieval of historical work order information and costs
- Quicker work order completion times
- Improved decision making through access to real-time information
- Viewing of asset and activity trends visually through GIS mapping capabilities
- Better replacement planning and forecasting
- Enhancement of staff productivity
- Improved compliance with regulatory standards
- Improved safety and risk management



Technology Master Plan Capital Budget

The Technology Master Plan budget on the following pages is NOT an entirely new set of spending requirements. The plan encapsulates all information technology issues and needs of all departments in the County. Some projects are normally funded by departments themselves, some already have capital reserves set aside, and others are part of normal annual IT budgeting.

CLIENTFIRST TECHNOLOGY CONSULTING

Technology Master Plan Capital Budget

Mendocino County, CA

H -	**High** - Initiative is mission critical, it mitigates risk, and/or it has significant cost benefit or return on investment. Also provides significant level of service or protection to constituents and the community. Funding for these initiatives typically begins in the beginning of the 5-year planning period.
M -	**Medium** - Is important to the organization, has measurable cost benefit or return on investment. Medium-priority initiatives also provide a service and protection to constituents and the community, but at a lower degree than a high-priority initiative. Funding for these initiatives typically begins in the middle of the 5-year planning period (Year 2 or 3). Can also be a high-priority initiative that is dependent on another high-priority initiative that is a prerequisite.
L -	**Low** - Provides value, but with minimal cost benefit or return on investment. Can also be a medium-priority initiative that is dependent on another medium-priority initiative that is a prerequisite. Funding for these initiatives typically begins towards the end of the 5-year planning period (Years 3-5).

Initiativ	IT Initiative	Comments	Priority	Budget Range		FYE 2018	FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023
				Low	High						
Best Practices											
1	**Technology Governance**	Conduct an IT Governance Workshop that will include a Governance guideline binder for County's future use and reference	M	$10,000	$20,000		$15,000				
2	**Sustainability Planning**	Providing tools and staff training	H								
3	**Project Planning and Implementation Best Practices**	Providing tools and staff training. This is policy and practices the County will follow per the initiative recommendations.	H								
4	**Applications Management Best Practices**	These are policies and practices the County will follow per the initiative recommendations.	H								
5	**Business Process Reviews**	These are policies and practices the County will follow per the initiative recommendations.	H								
6	**Software Selection Best Practices**	These are policies and practices the County will follow per the initiative recommendations.	H								
7	**Enterprise Reporting Best Practices**	These are policies and practices the County will follow per the initiative recommendations. Application Support will be critical to implementation of these practices.	M								
8	**User Training and Support**	Initially Windows 10, Office 2016, and then ongoing Office and Departmental Training budget year-over-year.	H	Ongoing			$50,000	$50,000	$50,000	$50,000	$50,000
9	**Training Rooms**	Facilities, computers and equipment, with refresh in year 3.	H	$25,000	$25,000			$25,000			
10	**IT Project and Services Portfolio**	Documenting IT roles and responsibilities for all services including SLA for business application support	M	$8,000	$12,000				$10,000		
11	**Return-On-Investment Considerations**	This is policy and practices the County will follow per the initiative recommendations. This will be covered in the IT Governance Workshop and included as part of individual initiatives, as applicable.	H								
Departmental Applications and Systems											
12	**Munis Gap Analysis and Utilization Improvement**	Increase utilization and close gap on functionality and capabilities that have not been implemented. This will include some process evaluation and improvement.	H	$300,000	$600,000		$100,000	$250,000	$250,000		
13	**Budgeting Process Review and Improvements**	This is an adjunct to the Munis Gap Analysis and Utilization Improvement, but focuses on a process review and plan to improve the budget creation process within the Munis system.		$30,000	$50,000	$35,000	$35,000				
14	**Bids Management Tool**	Recommend considering Tyler Munis functionality before considering third-party solutions	M	$25,000	$50,000			$50,000			
15	**NEOGOV Gap Analysis and Utilization Improvements**	Increase utilization and close gap on functionality and capabilities that have not been implemented. This will include some process evaluation and improvement.	M	$20,000	$30,000			$25,000			
16	**GovInvest License and Implementation**	Costs to be determined	M								

Technology Master Plan Capital Budget

Mendocino County, CA

Initiativ	IT Initiative	Comments	Priority	Budget Range		FYE 2018	FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023
				Low	High						
17	**Aumentum Assessment & Tax Billing System**	Mendocino on the waiting list for implementation of the Aumentum system by Thomson Reuters behind a number of other CA Counties. This system is represent approximately 75% of the County revenue and is therefore highly critical. The existing system is old and is well beyond its life cycle. County should try to move up the timeline for this implementation. enlist third-party subject matter assistance, and proceed with implementation planning and preparation now. *NOTE: Costs do not include previously budgeted costs to Tompson Reuters...costs noted here are for planning and third-party resources to assist the County with implementation.*	H	$225,000	$300,000	$20,000	$100,000	$100,000	$100,000		
18	**Cannabis Permits and Licenses Process Review**	Improvements of all the processes including permits, licensing, revenues, etc. for Cannabis to make sure all business process are fully operational and that all processes are efficient, reliable and secure. Also includes the review of any connection or potential integration with the Aumentum Cannabis module.	H	$50,000	$100,000		$75,000				
19	**TRAKiT Gap Analysis and Utilization Improvement**	Increase utilization and close gap on functionality and capabilities that have not been implemented. This will include some process evaluation and improvement.	M	$50,000	$100,000			$75,000			
20	**Centralized Land/Parcel Data Management**	Will be included as part of the GIS Assessment and Plan noted above. It will include GIS becoming the master and enterprise repository for all Land and Parcel data/information for the County.	M	Included in GIS Assessment	Included in GIS Assessment			ed in GIS Assessment			
21	**Election Voting System Replacement (DIMS, GEMS & Voter Equipment)**	There is a need to replace the DIMS, GEMS tabulation system and older voting equipment by 2020 election to meet State Standards. The State has matching funds for Mendocino County of up to $675,000 dependent upon the County becoming a Voters Choice Act County. The total cost of the replacement is estimated to be about $1.6M-$1.8M, which nets County cost of $900K - $1.2M if the County receives State the matching funds of $675K.	H	$900,000	$1,200,000		$500,000	$1,300,000			
22	**Electronic Document Management System (EDMS)**	Costs includes Needs Assessment/System Selection, system acquisition, and system implementation. Also includes expansion of EDMS system use to all departments as a County-wide EDMS solution standard.	M	$400,000	$600,000				$65,000	$300,000	$200,000
23	**Enterprise Asset Management (EAM) Including Fleet**	Process review and analysis and system utilization with review of CAMS long-term viability	M	$100,000	$200,000				$50,000	$100,000	
24	**Fuel Management System Integration**	These costs include the streamlining of processes utilizing more direct integration from Gasboy to the Munis ERP and or Fleet Maintenance system. Costs also include the potential options of replacing the in-house Garage System software with off-the-shelf vendor-supported solution (Tyler Munis or other).	H	$20,000	$35,000		$20,000	$30,000			
25	**Project Tracking and Collaboration**	Costs to acquire and implement Project Tracking and Collaboration system	M	$35,000	$75,000			$20,000	$30,000		
26	**Intranet**	Assessment, Vision Internet, design and implementation	M	$50,000	$100,000			$50,000	$50,000		
27	**Agency Wikis**	Agency staff population over time	L	included above	included above			included above	included above		
28	**Electronic/Digital Signatures**	Various options and equipment, if necessary.	H	$25,000	$50,000			$25,000	$25,000		
29	**Homeless Management Information Mgmt System (HMIS)**	Software and implementation	M	$75,000	$125,000				$100,000		
30	**Migration of Access & Homegrown Applications to COTS**	Includes review of internally written applications (including Access systems) to determine which can be replace by COTS solutions and then replacing those systems. This will be a multi-year process.	M	$100,000	$250,000			$50,000	$40,000	$35,000	$25,000
31	**Website Content Management Training**	Training for Departments on maintaining their content on the County's public facing website including training to improve efficiencies in maintaining content.	H	$20,000	$30,000		$25,000				
32	**Animal Services Chameleon System Improvements**	Increase utilization and close gap on functionality and capabilities that have not been implemented. This will include some process evaluation and improvement.	M	$20,000	$30,000			$25,000			
33	**Library Scheduling System**	Online subscription solution or premise-based solution.	M	$5,000	$25,000				$15,000		
34	**JustWare Gap Analysis and Utilization Improvement**	Increase utilization and close gap on functionality and capabilities that have not been implemented, as well as interfaces and eFiling with the Court. This will include some process evaluation and improvement.	M	$75,000	$125,000			$100,000			
35	**Replacement of Probation's Assessment.com System**	To be determined. One of two left on the system.	H								
36	**GIS Assessment and Computer-Aided Dispatch Base Layer**	Should be completed before the upcoming Aegis Upgrade	H	$20,000	$40,000		$25,000				

Technology Master Plan Capital Budget

Mendocino County, CA

Initiativ	IT Initiative	Comments	Priority	Budget Range		FYE 2018	FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023
				Low	High						
37	Aegis Gap Analysis and Utilization Improvement	Complete upcoming Aegis upgrade before proceeding with this initiative. Increase utilization and close gap on functionality and capabilities that have not been implemented. This will include some process evaluation and improvement.	M	$75,000	$125,000				$100,000	?	
	Aegis Upgrade	NWS - Required	H				$135,000				
38	Jail Visitation Management System	Software and implementation	M	$30,000	$60,000			$45,000			
39	Migrate Jalan Warrant Process & Historical Data to Aegis	Includes implementing the Warrants module in Aegis and also data conversion from Jalan. Due to errors with initial data conversion attempt this is now being done manually by County staff.	M	N/A	N/A						
40	Conceal and Carry Weapon (CCW) Permitting Software	Software and implementation	L	$30,000	$50,000					$40,000	
41	3D Incident Mapping	Cost are for training on existing FARO scanner shared by DA and Sheriff Office. Costs in Year 5 to add another scanner or replace existing due to end of life cycle.	M	$20,000	$50,000	$5,000					$40,000
42	Automated License Plate Readers	Estimated for four units	M	$80,000	$100,000			$40,000	$40,000		
43	Sheriff's Vehicle - Voice Recognition	Cost for voice recognition in MCSO fleet of squad vehicles	M	$125,000	$200,000			$60,000	$105,000		
44	Sheriff's Office Automated Vehicle Locator (AVL)	Sierra modems should work for GPS. Need GIS layers to support AVL	L								
Gov 2.0 and Smart Counties											
45	OpenGov	OpenGov is already licensed by the County. These costs are for training, assistance with setup and configuration and potential additional licensing costs.	M	$20,000	$50,000			$20,000			
46	Mass Public Outbound Communications	Typically an ongoing subscription pricing model, based on estimated volume of use. Annually.	H	$20,000	$35,000		$25,000	$25,000	$30,000	$30,000	$35,000
47	Board Meeting Automated Text Recording and Minutes (Talk-To-Text)	Talk-to-Text acquisition and implementation	L	$25,000	$50,000						$50,000
48	Kiosks	Pricing is from County's proposal from Toshiba. Average cost per unit is $25 - $40K with estimate of 3 Kiosk locations to be implemented over 2 years.	H	$75,000	$120,000			$50,000	$50,000		
49	District Attorney-Specific Email & Web Page URL	County IT Staff to complete	H	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
50	Volunteer Tracking and Contact System	Online subscription solution or premise-based solution.	M	$10,000	$25,000				$15,000		
51	Central Employee ID Badge and Facility Security Access	Costs including planning, selection, acquisition and implementation	M	$400,000	$600,000				$175,000	$175,000	$175,000
IT Infrastructure											
52	Network Upgrade	Includes redesign, core network = $200K	H			$225,000	$500,000	$500,000	$500,000	$500,000	
53	Structured Connectivity System	Adds/Moves/Changes and Wireless	H			$15,000	$15,000	$25,000	$25,000	$25,000	$25,000
54	Storage Area Network (SAN) Upgrade	Current SAN is obsolete	H			$125,000		$125,000			$50,000
55	Cloud Computing		L								
56	IT Computer Equipment Replacement Plan		M				$150,000	$150,000	$150,000	$150,000	$150,000
	Public Safety Mobiles		M	$250,000	$300,000		$90,000	$48,000	$36,000	$84,000	
57	Internet Bandwidth	200Mb today - double bandwidth - alternative carrier	M				$20,000	$34,400	$14,400	$14,400	$14,400
58	Office Software Upgrades		M				$250,000	$250,000			
59	WebEOC										
60	Technology Support for the EOC	Include video conferencing gateway	H			$50,000	$50,000				
61	Network Resiliency Study – Emergency Broadband Availability		M					$50,000	$50,000	$50,000	
62	Electronic Mail (GroupWise)	Hosted at County until resiliency in place	H					$400,000			
63	E-Fax	Have 2 FAX servers in HHS (NewPoint), but end-of-life, will require a significant upgrade	H				$25,000				
64	VMware Upgrade & Server Refresh - Complete	ESXi Upgrade budgeted	H			$20,000				$160,000	
65	Remote Access Upgrade	For remote access to applications by select employees when out of the office	M					$25,000			
66	Wireless Network		H				$35,000	$35,000	$35,000		
67	Video Surveillance Assessment and Replacement	Assessment & centralized mgmt, Camera replacements in Cap Replacement Initiative. Start with Juvenile Hall & Child Support. Need maintenance contract for DOT	M					$50,000	$250,000	$250,000	$100,000
68	Property System	Move DMV from AS/400 (Completed)	H	WebEOC		$47,560					
69	Microwave and Multiplexer Replacement	Includes batteries, which are 10 yrs. old	H			$15,000	$20,000	$1,500,000			
	Mux/MPLS Upgrade	Interface with Microwave	H				$1,750,000				
70	Radio Systems Upgrades and Replacement										
	Radio Repeaters - Capital Replacement	EOL in 2020, need to replace 60 repeaters over the long run, batteries in 2022	M						$150,000	$165,000	$165,000
	Radio Repeaters - Spare Parts Inventory	EOL in 2020	H				$25,000	$25,000			
	Radio - Voting comparators upgrade		H				$55,000				
71	Microwave Ring Expansion	Point Arena & Cold Springs, Fort Bragg spur	M					$300,000		$500,000	
	Microwave resiliency Sonoma County Connection	Resiliency in event of AT&T fiber cut	M						$500,000		

Technology Master Plan Capital Budget

Mendocino County, CA

Initiativ	IT Initiative	Comments	Priority	Budget Range		FYE 2018	FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023
				Low	High						
72	Video Conferencing	Polycom Replacement	H					$26,000	$26,000		
73	Infrastructure Roles and Responsibilities	No cost	H								
74	MCSO Structured Connectivity System	Both buildings & fiber between	H	$100,000	$150,000	$20,000	$361,000				
75	MCSO Local Area Network (LAN) Upgrade										
	Router Upgrade	Quantity 10, all EOL	H				$35,000				
	Firewall Upgrade	Quantity 2, both EOL	H				$30,000				
	Switch Upgrades		H			$40,000	$100,000				
	Switch Upgrades Remote Offices		H					$20,000			
76	MCSO Infrastructure Upgrade (Servers, SAN, and Backups)										
	SO Server Upgrades		H			$30,000					
	Aegis Server Replacement		H			$112,000					
	Backup Server & Software upgrade	Completed	M								
	SO Resilient Server - Dispatch		M					$55,000			
	SO Resilient Server - Admin		M						$40,000		
77	Multi-Jurisdictional Radio Operations	Purchase multi-channel for multi-jurisdictional integration	M				$40,000	$40,000	$40,000	$40,000	$40,000
78	Dispatch Radio Console Replacement	Will be obsolete in 2 or 3 years	M						$800,000		
IT Operations											
79	IT Operations – Enterprise Management Platform										
	Help Desk Ticketing System	Track IT publishing an entirely new version in FYE 2019	H								
	IT Asset Management Automation		M					$25,000	$18,000		
	IT Automation Tools (Patch Management)		H						$25,000	$18,000	
	IT Support Metrics	Dependent on implementation of new Track IT version in FYE 2019	M						$18,000		
	Network Management Tools (Configuration Management)		M					$25,000	$18,000		
80	Mobile Device Management	Lots of demand for portable computing	H					$3,000	$3,000	$3,000	$3,000
81	IT Cost Recovery (IT Budget Allocations)		M								
82	IT Procurement Practices		H								
83	IT Policies and Procedures	Standards	H				$7,800				
84	MCSO IT Operations - Enterprise Management Platform										
	AD Audit		H			$2,500					
	Operations Software		H					$20,000	$50,000		
	Cloud based backup	Encrypted data is CJIS compliant	M					$24,000	$24,000	$24,000	$24,000
	Security Audit	When major upgrades are complete	M					$35,000			
IT Security											
85	Disaster Recovery Planning		M					$40,000			
86	Disaster Recovery Site Implementation	Complete replication in FYE2020, resilient servers in FYE2021	M						$153,000		
87	Backups	Disk to Disk to Tape & Some Cloud	M					$40,000	$30,000	$30,000	$30,000
88	Firewall Upgrade	Full suite of firewall anti-lots-of-stuff protection	H			$14,000					
89	IT Security Assessment	When core systems upgrades are done	M					$50,000			
90	Logging and Audit Trails		H				$25,000				
91	Records and Data Retention	Archiving Solution	H				$65,000				
92	PCI Compliance - Study		H			$25,000					
93	Staff Security Awareness Training		H				$3,000	$3,000	$3,000	$3,000	$3,000

CLIENTFIRST TECHNOLOGY CONSULTING

Technology Master Plan Capital Budget

Mendocino County, CA

Initiativ	IT Initiative	Comments	Priority	Budget Range		FYE 2018	FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023
				Low	High						
GIS											
94	**GIS Assessment and Master Plan**		M					$100,000			
95	**GIS Data Acquisition**		M						$150,000		$25,000
96	**GIS Emergency Operations Readiness**		H					$25,000	$150,000		$25,000
Telecommunications											
97	**VoIP Phone System Upgrade and Resiliency**	Integrate Mitel's - single system	M					$150,000			
98	**Phone System Training**		M					$25,000	$25,000		
IT Staffing											
99	**Business Analysis and Project Management Skill-Set Needs**										
						$801,060	**$4,756,800**	**$6,638,400**	**$4,583,400**	**$2,746,400**	**$1,229,400**
											$20,755,460

***Other Funding Sources** (Funded, Planned and/or Estimated)					FYE 2018	FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023
PEG Funds										
Point Arena Grant						$250,000				
Operating Funds	Utilize current year operating funds in lieu of reserve funding				$47,560					
Aegis Upgrade						$135,000				
Voter System Replacement Grant	Potential $675,000 in matching dollars									
Mobile Computers	Public Safety									
					$47,560	**$385,000**	**$0**	**$0**	**$0**	**$0**

	FYE 2018	FYE 2019	FYE 2020	FYE 2021	FYE 2022	FYE 2023
IT Dept. Allocation	**$753,500**	**$4,371,800**	**$6,638,400**	**$4,583,400**	**$2,746,400**	**$1,229,400**

Technology Current State Assessment (Initiatives)

The following section contains the *Technology Master Plan Initiatives Workshop* documentation in its entirety.

Report for

Technology Current State Assessment

October 29, 2018

Client Locations
Coast-to-Coast

Practice Locations
California
Illinois
Texas
North Carolina

800.806.3080
www.clientfirstcg.com

Optimal Technology Guidance

CLIENTFIRST
TECHNOLOGY CONSULTING

Table of Contents

Best Practice

Best practices are methods that are recognized as consistently providing better results than those achieved with other methods. We believe that the following best practices will enhance the County's ability to select, procure, and maintain solutions that are more effective in the future, as well as improve overall productivity of staff.

1. Technology Governance
2. Applications Management Best Practices
3. Business Process Reviews
4. Software Selection Best Practices
5. Enterprise Reporting Best Practices
6. User Training and Support
7. Training Rooms
8. Project Planning and Implementation Best Practices
9. Return-On-Investment Considerations
10. IT Project and Services Portfolio
11. Sustainability Planning

1. Technology Governance

Background

IT Governance

Traditionally, key IT decisions are made by IT professionals and a select few organization managers. This does not always ensure the most effective delivery of technology to stakeholders (all departments and constituents). *Technology governance* can provide a collaborative forum for major decisions, planning, internal communication, and department/staff training regarding such matters. It provides a methodology for stewardship of IT resources on behalf of the stakeholders who demand a benefit and/or return on the investment.

Steering Committee

A *Technology Steering Committee* is a group of employees and managers from a variety of departments and disciplines that provide long-term direction and oversight for an organization's technology resources. This committee can provide a stabilizing influence and focus for development of organizational concepts and planning. Some of the responsibilities the group may carry out include:

- Identifying and developing of technology initiatives
- Prioritizing technology initiatives
- Prioritizing GIS initiatives
- Monitoring and reviewing initiatives
- Project management of IT Master Plan implementation
- Providing a forum for lessons learned during implementation of technology projects
- Providing an initial review process of technology-related projects requested by individual departments
- Reviewing and providing feedback on long-term, unresolved Help Desk issues
- Developing and reviewing standards and policies
- Helping to achieve support across the organization
- Acting as a sounding board for management and staff

Implementation of a technology governance methodology can be an effective forum for departments to become more knowledgeable about technology and how it can be used to enhance customer service and create efficiencies throughout the County's business processes.

Findings and Observations

- The County requires interdepartmental cooperation to meet its technology goals. The upcoming implementation of the IT Master Plan provides a great opportunity for County departments to collaborate on future technology use and applications.
- The County functions in a world of limited resources. Prioritizing the implementation of an IT Master Plan will require departments to cooperate in order to achieve their goals.
- Initial implementation of the critical components of the IT Master Plan have been coordinated between the CEO's office and the Sheriff's office.
- As implementation of the plan progresses, other departments will have a greater interest in understanding and influencing IS priorities.

Recommendations

Assemble and implement a Technology Steering Committee, including a Charter, to discuss technologies, recommend priorities, assist in policy development, communicate with department staff and management, and **oversee the implementation of the IT Master Plan**.

Utilize the Technology Steering Committee as the initial forum for the IS Division and other departments to propose/present new technology-related projects to ensure best practices are followed and applied to the review, selection, approval, procurement, implementation (project management), and ongoing technology maintenance.

Benefits

- More transparency, responsibility, and accountability
- Prioritization of initiatives
- Improved compliance and consistency
- Enhanced communication and collaboration
- Higher degree of business and technology alignment
- Widespread personal and professional growth

Next Steps

- Determine potential Committee members who are:
  - Interested in participating on the committee
  - Able to speak for department heads
- Consider representation of key departments who are large consumers of technology on the Steering Committee.
- Assign a lead and/or subcommittee for all IT Master Plan initiatives.
- Monitor and discuss active/in-process IT Master Plan initiatives at each Committee meeting.
- Form subcommittees, as appropriate.

2. Sustainability Planning

Background

Sustainability planning is the process of mapping the acquisition, maintenance, upgrade, improvements, training, and eventual replacement for major application systems over a long-term period (i.e., five-to-ten years). Benefits include:

1. Reduces significant unplanned, periodic spikes in capital expenditures of large hardware and software solutions
2. Schedules upgrades and replacements of departmental business application systems and critical infrastructure in a convenient and timely manner

The growing practice of sustainability planning provides a more practical or realistic way to determine and plan for the ongoing operational needs of all departments.

Because software applications are expensive, County-wide network infrastructure are the primary technology tools of the business departments and public safety, the County can benefit from the implementation of sustainability planning, versus the more limited practice of *replacement planning*.

Return-on-Investment (ROI) Considerations

A study conducted by Express Metrix for quantifying ROI as it relates to IT and software asset management describes the following ROI benefits of replacement planning within an organization:[1]

- Reducing cost of ownership related to IT assets by determining licenses for which an organization is overspending and reducing Help Desk costs
- Managing technology change, by developing software procurement models that map current and future needs with technology migration and upgrade planning
- Minimize security risks by preventing unauthorized use, enforcing desktop standards, and identifying PCs with unlicensed applications

In a study conducted by the Aberdeen Group, the following were the cost savings that occurred after incorporating a Sustainability Plan:[2]

- System automations reduced paper costs by up to 11%
- Efficiencies reduced facility costs by up to 10%
- Waste and disposal costs were reduced by up 8%
- Transportation and logistics costs were reduced by up to 5%

[1] Express Metrix.

[2] Aberdeen Group, 2009.

Recommendations

- Develop a Sustainability Plan for IT infrastructure and major software application solutions.
  - Microsoft licenses should be replaced N-1 (i.e., every other version).
  - Larger core applications (e.g., Financials, Work Order Management, etc.) benefit most from sustainability planning, because these should only be replaced every 10-to-15 years, if procured and managed properly.
  - Critical infrastructure related to public safety that should be included in sustainability planning are:
    - Microwave system
    - Radio system
    - Data network
    - Internet and network resiliency
- Investigate and track annual maintenance and support, and upgrade costs for all major systems to determine if the cost structure is sustainable. If the cost structure is not sustainable, consider alternatives and priorities over the next five-year period.

Benefits

- Increased long-term investment through scalability
- Reduced maintenance expenses
- Increased trust in systems
- Reduced risk and liability
- Reduction in total cost of ownership
- Avoidance of unforeseen upgrades
- Informed purchase timing

3. Project Planning and Implementation Best Practices

Background

A best-practice approach should be followed for all significant implementation projects for both software and IT infrastructure. The complexity and risk determine the actual level of due diligence that should be performed. The following is an outline of project planning and implementation best practices:

- **Determine Scope of Work** – Work with all stakeholders to determine what needs to be accomplished.
- **Design** – For larger, more complex projects, the design effort may become a separate project. For smaller projects, design is integrated into budgeting.
- **Specifications** – Determine appropriate vendor-agnostic specifications to include with procurement requests to reduce ambiguity and provide better comparisons between vendors.
- **Collaborate** – Include input and requirements of all stakeholder groups to ensure all requirements are included in specifications and all stakeholders buy into the final solution. IT Steering Committee should review as part of the Committee's role and responsibilities.
- **Develop Budget** – Project budgets include hardware, software, and consulting/SME costs. Consulting costs are estimated by outlining the various work steps and estimating the hours required to complete them.
- **Gain Sign-Off** – Once the budget is complete, review the scope of work and costs with the project sponsor and gain their approval before continuing, including consent by the IT Steering Committee.
- **Create Project Plan** – Based on all stakeholder needs, delivery dates, and the tasks to be completed, develop a project plan and estimated implementation date.
- **Create Project Team(s)** – Assemble the project team, including
  - PMO (Project Management Office) which represents the core project team
  - Module/Stakeholder Teams
- **Outline Communication Plan** – Outline the process for communicating implementation dates, improvements, and training to appropriate staff members.
- **Document Other Plans** – Other plans may include training, testing, contingency, and back-out. These plans are developed on an as-needed basis.
- **Configure, Implement, and Train –** Utilizing planning methodologies and technical expertise, configure the necessary system components and implement the solution with the least possible impact to staff and productivity. The IT Steering Committee should receive status reports on the progress of the implementation, including whether the project is on time and within budget, user needs are being met, and vendors are following through with their contractual obligations.
- **Post-Implementation Review** – Complete a post-implementation review with successes, lessons learned, and any unresolved issues requiring vendor assistance. Report the results of the IT Steering Committee's review.
- **Post-Implementation Support** – All implementations that affect multiple users require on-site, post-implementation support to eliminate remote response times.
- **Documentation** – Develop any necessary procedures and update documentation as part of the project.

Findings and Observations

Through interviews with management and the various departments, the County's implementation policies and practices were found to be inconsistent and often only followed a minimum number of the best practices noted above. During interviews, many departments identified core system implementations, including Munis, Aegis, TRAKiT and other systems, as initially only being marginally successful due to these inconsistencies.

Recommendations

- Develop a project portfolio for all IT and software-related projects.
- Follow planning and implementation best practices as listed in the introduction of this initiative.
- Review all major active and upcoming projects during IT Steering Committee meetings.
- Obtain services of third-party project managers and subject-matter experts, as appropriate and cost beneficial.

Benefits

- Prioritization of projects
- Reduced periods between transitions
- Increased information-sharing capabilities
- Enhanced communication and consensus
- Increased anticipation and management of technology upgrades
- Improved analysis and planning
- Increased departmental collaboration
- Measurement and tracking of results and outcomes

4. Applications Management Best Practices

Background

The County utilizes over 250 different software applications or modules throughout all departments. Major systems include:

Application Functionality	Vendor
Financial/Accounting Management	Munis
Personnel Management & Payroll	Munis
Land Management (Planning, Permitting, Inspections, Code Enforcement, etc.)	TRAKiT
Property Records, Assessment, Tax Billing/Collection *(Note: Cannabis Tax Billing now on Thomson Reuters "Aumentum" & Remaining Assessment & Taxes moving to Aumentum starting in 2020)*	In-House AS400 (See Note)
Work Orders/Maintenance Management	CAMS
Electronic Document and Records Management	DocuWare, Questys, Real Vision (RVI), Granicus
Geographic Information System (GIS)	Esri
Library System	Horizon
Computer Aided Dispatch/Records Management System/Jail Management System	Aegis
Attorney Case Management (District Attorney, Public Defender, Probation	JustWare

A more comprehensive example listing of County applications is included below.

Note: This is not an official inventory

- A-Check
- Adobe
  - Acrobat
  - Acrobat DC
  - Acrobat Pro
  - After Effects
  - Illustrator
  - InDesign
  - Photoshop
  - Premier
- AFLAC
- Aegis
  - Bookings and Releases
  - Computer Aided Dispatch
  - Jail Custody/housing
  - Juvenile Hall
  - Records Management
- Amazon Account
- Assessments.com
- AS400 (In-House)
  - Assessment
  - Property Tax System
  - Sales Tax
  - Tax Billing/Collect
  - Invoice Images
- AT&T
- Aumentum (Cannabis Tax)
- AutoCAD
- Avatar
- Baker and Taylor
- Brother P-Touch
- Brown Armstrong Portal
- C3 SAT
- CalOrigin
- CalACES
- CalAgPermits
- California State Tax Portal
- Callan
- CalPEATS
- CalPERS
- CAMS
  - Accounts Payable
  - Accounts Receivable
  - Equipment Cost Tracking
  - Inter-Department Billings
  - Inventory
  - Project Tracking
  - Time Sheets
  - Utility Tracking
  - Work Orders
- Canteen Manager
- CashPro
- CD Burner XP
- Chameleon
- Child Support Services Portal
- C-IV

- ClerkDocs
- CLETS
- CMIPS II
- CobbleStone
- CoolUtils
- Crossmatch
- Crystal Reports
- CWS/CMS
  - Child Welfare Management
  - Juvenile Housing
  - Juvenile Medical Information
- Datatude
- DCSS/CSE/CSU
- Digital Reel
- Dimensions
- DIMS
- DMV
- DocuWare
- Dropbox
- DS Service
- Eagle Recorder
- E-IEVS
- Email Archive
- e-OSCAR
- eRA Commons
- Essential Forms
- Esri
  - ArcGIS
  - ArcMap
- Evernote
- Facebook
- FastStone Capture
- FedEx
- Find Catalog
- Firefox
- FirstView
- Fishman's Supply
- Fleetster
- Fuel Master
- Garmin BaseCamp / Map Installer
- GEMS
- Gov Pay
- Google
  - Calendar
  - Chrome
  - Earth
  - Earth Pro
  - Maps
- GPS
- Granicus
- Granit Cuff
- HMIS
- Hoopla
- Horizon
- HP Scanning Utility
- ID Maker
- Image Tool
- ISIS
- JALAN
- Jalen
- JBI
- JCPSS
- JDA
- JLAN
- JUMP/LEAPS
- JustWare
  - Prosecutor
  - Defender
  - Probation
- KidStar
- KIPHS
- LDS
- Legacy
- LexisNexis
- Library Aware
- LifeStatus360
- Live Scan
- L-SAWs
- MailChimp
- Mail Converter Pro
- Meds
- Meeting Wizard
- Micro Focus Filr
- Microsoft
  - Access
  - Excel
  - Internet Explorer
  - OneNote
  - Outlook
  - PowerPoint
  - Publisher
  - Skype
  - Visio
  - Windows Media Player
  - Word
  - Word Perfect
- Midwest
- MMRO
- Money Tracker
- Movie Maker
- Mozilla Thunderbird
- Munis
  - ACA
  - Accounts Payable
  - Budgeting
  - Contracts
  - Employee Inquiry
  - General Ledger
  - Human Resources
  - Payroll
  - Property Tax Administration
  - Purchase Orders
  - Requisition
  - Time and Attendance
- My State Street
- NCIC
- Nemo-Q
- NeoGov
  - Human Resources
  - Position Requests
  - Recruitment
- Net Smart
- NextRequest
- Nixle
- Novell
  - Calendar
  - e-mail
  - Instant Message
  - Scheduling
- Oasys
- OCLC Connexion Client
- OCLC WorldShare
- One Web
- OpenGov
- OPTUM360
- Oracle
- Oracle Apex
- OTIS
- Overdrive
- Panoramic
- Paradigm

- ParcelQuest
- P-Card
- PCX
- PensionGold
- Permitium
- PMS
- QR Code Generator
- Questys
- Real Vision Software
- Revenue Results
- RevQ
- RTL
- RVI PC Imaging 8.0
- SACRS
- Sage 50C
- SAM
- ScanSoft OmniForm 5.0
- Segal and Cheiron Portal
- SFIS
- SIMS
- SirsiDynix Horizon
- Smartsheet
- Sofos
- SoftCode
- Sonoma County Secure Messaging
- Sophos
- SQL Server 2014 Report Builder
- State Controller Portal
- SurveyMonkey
- Target Solutions
- Telephone
- Thomsen Reuters
- Time Tracker
- TRAKiT
  - eTRAKiT
  - PermitTRAK
  - ProjectTRAK
  - LicenseTRAK
  - CodeTRAK
  - LandTRAK
- TRAKiT Help Desk
- Vet-Pro
- VideoLAN
- Vision Internet
- VLC
- VPN
- Webapps
  - Business License Lookup
  - Car Reservation system
  - Contractor Lists
  - County Forms
  - Employee Information Portal
  - Facilities Work Orders
  - Fleet Star
  - In/Out Board
  - IT Service Work Orders
  - MSDS
  - Timesheets
  - Web Editor
  - Work orders - GS
  - Work orders - IT
- WebEx
- Website Calendar
- Website pages
- WITS
- WORKS P-Card system
- Xpress Tax
- ZipMessage

Findings

- The County has made good decisions on the selection of many of its core systems (e.g., Munis, TRAKiT, and Aegis) but implementation of these systems excluded beneficial capabilities and time-saving and service-level functionality. This has left a number of these system underutilized, resulting in loss of productivity due to manual processes, inefficient workarounds, and inefficient or unnecessary reconciliations.
- Training is needed for many software applications throughout the County (see *User Training and Support* initiative).
- The County is lacking sufficient resources to document business processes, develop needs for applications systems, prioritize needs, evaluate solutions, and identify sufficient implementation and ongoing management and support resources for these software solutions. Additionally, the County has insufficient IT resources to ensure quality applications utilization, increase department process improvements, and gain significant efficiencies in labor throughout the organization.
- Gaining greater utilization of the existing application modules is vital to significant increases in productivity by staff throughout the County. The ability to accomplish this is difficult because of limited resources and the diversity of application providers in use.

Future Applications Management Best Practices

The County can benefit greatly by changing traditional applications management and support practices. Use of the following recommendations can lead to improved functionality, use, and increase overall productivity.

Future Applications Roles and Responsibilities

Applications support and management roles and responsibilities must be identified and assigned to each department's operational application modules. We recommend starting with:

- Finance, Accounting, and Budgeting (Munis)
- Personnel Management and Payroll (Munis)
- Land Management (TRAKiT)
- Assessment and Tax (Aumentum)
- Work Orders/Maintenance Management (CAMS)

Identification and assignment will help the County select capable staff resources to fulfill the roles and responsibilities for applications management best practices in the future.

Process Owner

- "Resident expert" on staff who is responsible for a given departmental process or function
- May also be responsible for oversight and delivery of the daily, weekly, monthly, and annual processes that the application or module is utilized to fulfill
- Primarily makes final decisions on process policies, procedures, and deliverables for their area of expertise
- Stays current with the applicable industry best practices, technology, and applications capabilities
- Stays current with existing County application vendors' capabilities, offerings, and enhancements

Application Champion (Super-User)

- An expert on a specific application or software module
- Possesses greatest knowledge of application or module
- Lead trainer or support person for other staff members that utilize application or module
- Usually has formal training and is responsible for application configuration setup and changes on an ongoing basis
- Often trained to provide ad hoc report writing capabilities
- Stays current with the applicable industry best practices, technology, and application capabilities
- Stays current with existing application vendors' capabilities, offerings, and enhancements

Business Process and Application Analyst Skillset

- Assigned to work with process owners, application champions, report writers, and users
- Reviews business processes, current utilization of application, manual processes, and shadow systems (e.g., spreadsheets and other databases) to increase automation, improve efficiencies, and increase utilization of the core business application
- Assists in the development of user, application, and process requirements
- Assists in developing and documenting standard operating procedures (SOPs)

Ad Hoc Report Writer Aptitude

- Aptitude to develop ad hoc reports using vendors' report writing tools, which may include third-party tools such as Crystal Reports, Cognos, or Microsoft SQL Server Reporting Services (SRSS)
- Assigned as the "go-to" person for ad hoc reports that other users cannot quickly generate on their own

IS Division Roles and Responsibilities

Define IT roles and responsibilities by application module. Consider taking the following actions:

- Identify role of IS Division for a given application or module (primarily server and network support, but in some cases may also provide application analysis and support, or ad hoc/custom report writing).
- Departments need to take as much responsibility as possible for applications management of software modules utilized by their primary business-process functions, as the IS Division does not have all the resources to fulfill all applications management support and maintenance roles for the entire organization.

Multiple Roles

Please note that the organization may not have an identified resource in some instances, and that some applications may not require certain roles. It is also likely that, in some instances, the same person(s) will fulfill more than one role for a given application/module.

Module Lead

- Lead responsibility for needs assessments, selection processes, documentation, gathering information, and coordinating other Key Module Stakeholders (see below)
- Lead participant in reviewing software and business process needs requirements
- Provides feedback or clarifications on software needs
- Lead departmental implementer for new software module/functionality

Key Module Stakeholders (often from other departments)

- Participant in reviewing software needs requirements
- Assists in gathering documentation and identifying department/division needs
- May also provide feedback or clarifications on software needs
- Share responsibility in implementation of new software modules/functionality

Business Department Application Training

As applications software changes and grows in complexity, training staff members to use software properly becomes more critical. We believe that a renewed County-wide emphasis on targeted staff training on applications software will pay significant dividends in increased staff effectiveness and productivity. An inventory of high-priority training is essential to achieve expected productivity. The County can identify and assess future training needs for all applications and users upon completion of an application/user matrix (see *Applications and User Licensing Inventory* initiative).

Recommendations

- Consider adding more specialized application/business analyst personnel (application support specialist) to the IT staff to provide increased and improved applications support to departmental users for departmental business applications.
- Departments should be encouraged to become more responsible for changes to application setup and configurations with assistance from IT personnel. If department personnel are unable to make these changes, training should be provided. If needed, third-party subject-matter experts can be helpful for large or complex projects.
- Training department personnel to perform their own simple report writing (basic listings and extracts in tabular form) is challenging, but beneficial. More complex reporting often requires specific understanding of database structures in the application. This can free up

the capacity of IT staff to focus on other important issues, such as providing assistance on more difficult or complex reporting needs.

- Over time, we believe that applications utilization by departments will improve if *applications sponsors* (i.e., process owners and application champions) take a more active role in monitoring upcoming functionality improvements from new software releases that will benefit the County. In addition, it would be helpful if application sponsors and sponsoring departments monitored and discussed applications usage with other peer organizations and entities to gather information and potential productivity improvements that could be incorporated into the County's systems.
- Specifically assign a above roles and responsibilities to each applicable application or module.
- Key assignments should encompass responsibility for understanding industry best practices and solutions or processes available, as well as taking the lead in continually assessing and inventorying needs.
- Inventory current and future feature/function, reporting, training, and support gaps, and maintain improvement needs lists by specific software modules.

Benefits

- Increased use of applications features resulting in higher return on software investment
- Higher degree of user independence and less reliability and cost for vendor assistance or time required by County IT staff
- Identification of applications user roles and responsibilities
- Improved efficiencies and productivity
- Improved customer service

Next Steps

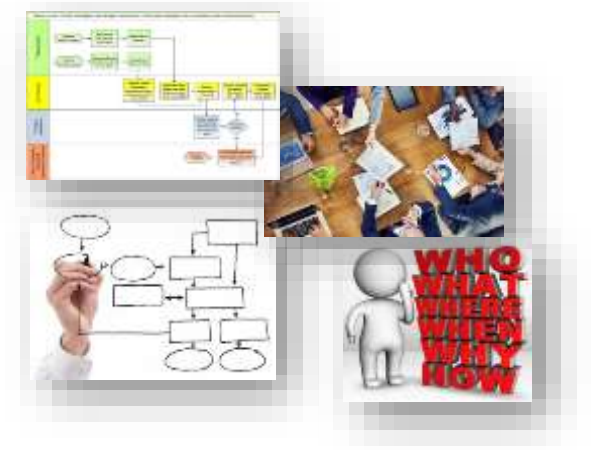
- Each department should complete Application/User Matrices for current and future applications usage and applications management roles, and IT Steering Committee should review completed matrices.
- Identify process owner(s) for each module, or insert "N/A" if not applicable.
- Identify application champion(s) for each module.
- Identify application analyst(s) for each module, or insert "N/A" if not applicable.
- Identify ad hoc report writers, or insert "N/A" if not applicable.
- Differentiate (e.g., by color shading, annotations, etc.) if individuals are expected to assume roles in future with additional training.
- Define IS Division roles and responsibilities for all applications or modules.

5. Business Process Reviews

Background

A *Business Process Review* (often called Business Process Improvement) is a method of analyzing and evaluating current processes for the purpose of:

- Identifying enhancement and streamlining opportunities
- Automating manual processes
- Eliminating or dramatically reducing the use of shadow systems and processes
- Eliminating paper and other equipment and supply costs
- Maximizing human resources involved in the processes
- Embedding or transferring the knowledge of subject-matter experts (SMEs) into the processes and associated workflows
- Applying the functionality of technology and the configuration of the system to support process improvements



It should also be noted that the features, functions, and capabilities of applications systems can also dictate opportunities for process improvements.

Process review and improvement is a continual process. This is not an effort that is applied once and then forgotten, settling on the status quo. Individuals should strive for continuous improvement. An organization stays healthy in the same way, by continuing to review and improve processes and incorporate those improvements into the configuration and setup of the supporting application systems. Processes and system configurations need to be continually improved in response to:

- Emergence and introduction of new technologies
- Release of application software updates containing new features, functions, and capabilities
- Changes in law, regulations, or rules
- Changes in the needs and demands of your constituents and the public user community
- Unforeseen changes in access to resources or funding
- Changes in business operation processes

Although process review and improvement should be continual, it is most common for process improvement projects to occur:

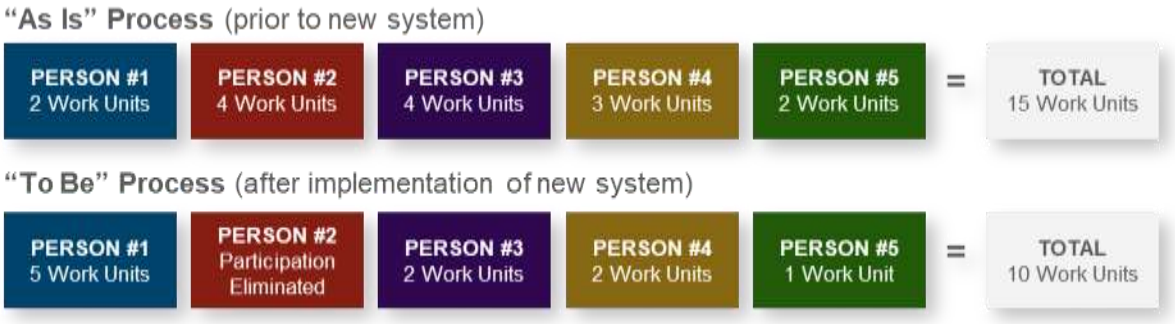
- In preparation for, and during the implementation of, new or replacement application systems
- When new technology becomes available that provides opportunities for additional automation
- On a pre-established process review and improvement cycle (important to ensure a continued regularly scheduled focus on improvement)

Recommendations

- Perform Business Process Reviews throughout the organization, breaking processes down by department, division, and—finally—the process level. This should also take into consideration interdepartmental interaction and dependencies.
  - Begin by analyzing the staff feedback throughout this report to identify high-priority areas.
  - These Business Process Reviews should be scheduled per the following:
    - In preparation for and during the implementation of new or replacement application systems
    - When new technology becomes available that provides opportunities for additional automation
    - On a pre-established process review and improvement cycle (important to ensure a continued, regularly scheduled focus on improvement)
- These Business Process Review (and improvement) efforts should be conducted in coordination with the *Application Management Best Practices* initiative. Departmental process owners and the application support resources (Application Support Specialist/Business Analyst) need to be involved with this review process in parallel with their ongoing application management support roles.
- Some areas that could benefit from a business process review were revealed during the interview process and included Budgeting, Cannabis, Tax & Assessment (as part of future Aumentum implementation), etc.
- County management needs to be aware of the potential need for employee reassignment/redeployment and the moral/emotional effect this may have (see Workload Transference concept described below).
- Consider utilizing a third-party SME or consulting firm, initially, for scheduling, structuring, and conducting the necessary business process review and improvement efforts. It is often helpful to have an outside resource assist, due to their position as an unbiased third party.

Workload Tranference (a business process concept)

As a result of business process improvements, including those that occur during the implementation of new systems, the County's processes will be changed and streamlined. These changes often require the shifting of workload (tasks and amount of effort) from one person to another. Even though a particular individual in the process may realize an increase in their workload, the total work effort for the entire process is reduced. This is called "workload transference" and is the reason reallocation and change in personnel duties is often required to achieve the potential gains from the implementation of a new system. The diagram below represents this principle of workload transference.



Even though Person #1 in the process has an increase of three work units, the work units of the individuals down the process stream have been reduced, with a total reduction of workload for the entire process stream (reduction of five work units).

***Note**: It is important to understand this as an example of a single process. This example represents a reduction of hours/effort and not a reduction in employee count.*

Benefits

- Improved efficiencies through:
  - Process enhancements and streamlining
  - Automation of manual processes
  - Elimination or dramatic reduction of shadow systems and processes
  - Elimination of paper and other equipment and supply costs
  - Maximization of human resources involved in the processes
- Improved utilization of existing system through reconfiguration and setup, gaining productivity, and achieving better results
- Preservation of institutional knowledge by embedding or transferring staff knowledge into processes and associated workflows
- Maximized investment in software applications and technologies by incorporating process improvements in system workflows, configuration, and setup

A Case Study *(Example of a Failure to Implement Process Improvements)*

An agency in southern Florida invited their existing ERP vendor to meet and discuss the status of their system. The purpose of the meeting was a courtesy to inform the vendor of the organization's plans to replace the existing ERP system and to begin a competitive system selection process. Top-end new agency management had come in, and they explained that over the six years of operation, the system had remained unchanged and was not keeping pace with increased functionality demands and the application of new technologies. In short, they felt the system was simply not meeting their needs. The vendor was obviously disappointed, but also surprised. The vendor was a recognized industry leader and was consistently winning over 50% of all competitive opportunities. Their R&D investments were at a rate greater than 20% of their annual revenues and they had introduced significant functionality enhancements and technologies during the six years of their relationship with the agency. The vendor had conducted extensive competitive analysis which documented their solution as having a high level of feature/function capability in the 90+ percentile. Furthermore, the vendor's system was operating on the latest and most accepted technology platform. The vendor was also continuing to grow at a rate faster than nearly all their competitors.

In reaction to this news, the vendor expressed their surprise and provided a summary of their company's accomplishments over the previous six years. The vendor also presented a proposal to the agency asking for the opportunity to perform an assessment and gap analysis as a pro bono service to the agency. Since no costs were involved, the agency accepted the vendor's offer, but also planned to move forward with the solicitation of proposals and review the functionality and costs of other competitors' ERP offerings.

What was Revealed?

In summary, the assessment and gap analysis uncovered the following:

During the initial implementation of the ERP system, six years earlier, the agency chose not to implement process improvements and automation recommendations put forth by the vendor. Agency management at the time wanted to keep their existing processes in place and configure the new system to support their then-current processes.

Over the six-year use period, the vendor had introduced *eight major functionality version releases* and had rolled out *a number of significant add-on modules and technologies*, including:

- Public online access and online payment systems for nearly all modules
- Enhanced and expanded mobile and field-based software and technologies
- An expanded and improved user interface, with new dashboards and key performance measure components on the dashboard
- Enhanced workflow and system configuration capabilities, with significant integration capabilities with email and calendaring/scheduling
- Redesigned reporting capabilities, which took advantage of new database technologies that provided a much easier tool set for end-users to write reports, customize existing reports, and share scheduled delivery of reports

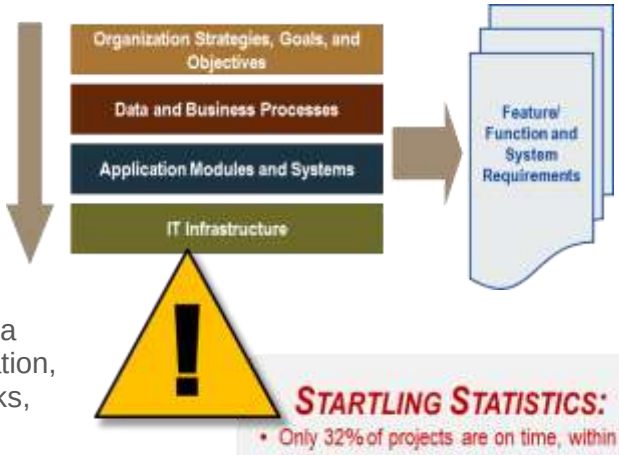
The eight major functionality releases also contained over 300 new features/functions, with nearly 100 of them considered as a high priority by the customer community.

During the six-year use period, the agency had applied all the patches and new software versions, but had never reviewed the release notes to understand the new features/functions and capabilities that were included. The agency simply applied the version upgrades and continued to operate the system the same way they did on the first day of their implementation.

6. Software Selection Best Practices

Background

Selecting the right system and technology is more critical today than ever before, because the efficiency and effectiveness of the organization is directly dependent on its use of technology and information systems. Organizations realize they must take greater advantage of automation to meet growing constituent and public demands.



Return-on-Investment Considerations

While new software solutions can transform certain operations, processes, and constituent services, consider these facts:

- Without proper preparation, planning, and a methodology for selection and implementation, organizations face many problems and risks, including:
  - Spending hundreds of thousands—and, potentially, millions—of dollars more than necessary in total cost of ownership
  - Failed or prolonged implementation
  - Implementation of systems that still do not meet the organization's functional needs
  - Low productivity
  - Poor contract negotiation position
  - Lack of and/or reduced integration between other software systems
- Organizations typically fall short of their implementation goals due to one or more of the following factors:
  - Insufficiently defining system objectives and requirements
  - Failing to adequately involve both management and users
  - Underestimating the costs and effort required
  - Failing to adequately plan for expansion
  - Failing to properly evaluate software
- For key software systems to be implemented properly and for the organization to reap the full benefits, the organization should utilize a structured analysis and selection methodology. A structured approach to selection and implementation results in significant benefits, including:
  - Reduced risk of a failed or prolonged implementation
  - Lower total cost of ownership
  - Independent and objective analysis of potential alternatives
  - Well-defined objectives and requirements
  - An education process for the organization

STARTLING STATISTICS:

- Only 32% of projects are on time, within budget, deliver all required features and functions, and achieve measurable business and stakeholder benefits.
- Approximately 44% of projects are "challenged" (late, over budget, and/or have less than the required features and functions).
- 69% of project failures are due to a lack of and/or improper implementation of project management methodologies.
- Nearly 40% of those surveyed said that a "lack of employee buy-in and executive support" was the biggest challenge facing a successful implementation.
- A recent customer survey shows that enterprise implementation projects:
  - Have only a 7% chance of on-time implementation.
  - Will likely cost more than estimated.
  - Will likely deliver unsatisfying results (only 21% will realize half or more of expected benefits).
- In a past study of local government enterprise implementations published in *Government Finance Review*, it was found that the average project was 176% over budget and 243% beyond the planned implementation timeline.

- Selection of technology that meets the organization's short- and long-term objectives and requirements
- Effective contract negotiation through well-prepared and documented needs
- Overall project time savings
- Improved implementation readiness

Recommendations

- Adapt these best practices for size and complexity of projects. More due diligence is generally required for larger, more complex projects. However, even small projects can benefit with these due-diligence methodologies.
- Utilize best-practice selection methodology when evaluating new software solutions (see example work plan below).
- Consider third-party consults when selecting or improving complex or highly specialized solutions.
- Ensure process reviews are completed and detailed feature/function specifications are documented as part of the RFP (see example below).
- Ensure detailed feature/function specifications are utilized with test scripts before going live on new applications implementations.
- Include all stakeholders in each software evaluation and implementation project.
- Ensure detailed feature/function specifications are utilized in post-implementation reviews and ongoing training (see example work plan pages below).

Benefits

- Reduction in hardware/software requirements
- Reduction in preparation time for deployments
- Better identification of integration requirements
- Reduced license fees
- Increased utilization of applications systems
- More effective due diligence
- Increased staff buy-in, consensus, and morale
- Improved decision making (selecting software that is the best fit for assessed needs)
- Improved implementation results (time, costs, and results)

Example Work Plan

Step	Software System Selection Work Plan
Phase 1 – Needs Assessment and Recommendations	
1	Kick-Off and Project Team Development – Hold a formal Kick-Off Meeting, and then work with the Project Manager to finalize the makeup of the selection Project Team and document required roles and responsibilities. Include representatives from all key stakeholder groups.
	IT Infrastructure and Staffing Readiness Review
2	IT Information Meetings and Interviews – Conduct information-gathering activities focused on the ability of the existing IT staff and infrastructure to support the needs of the organization and to review the readiness to implement and support the platform that will be required for the new software system, including:
	IT Network and Infrastructure
	Storage and Backups
	Servers, Server Applications, and Management
	IT Security
	Disaster Recovery
	Desktop Environment
	Printers
3	Documentation – Document information and summarize the required preparation initiatives, findings, and recommendations.
4	IT Assessment Memo – Prepare a memo assessing gap and readiness of IT infrastructure to support the organization's general needs and to support the introduction of the new software system. The memo is to include the following:
	General readiness of IT to support the organization's needs and support the introduction of a new software
	IT Initiatives with findings and recommendations, including the following scope:
	IT Environment and Infrastructure
	IT Applications Support Staffing Structure
	Business Department Needs Assessment Interviews
5	Business Process Review and Feature/Function Analysis – Meet with the identified personnel by functional area and software modules to review existing manual and automated systems and operations, including any custom-developed work-around systems/processes. Include a cross-section of all user types in each needs assessment workshop.
6	System Requirements Documentation – Document information gathered during process reviews and develop feature/function requirement specifications specific to your organization.
Phase 2 – RFP Development	
7	Preliminary Vendor Research, Communication, and Coordination – Research vendor community to identify qualified vendors meeting the organization's system and service requirements and communicate with potential vendors. Vendors do not respond to all RFPs, so pre-communication is helpful to obtain proposals that are in the organization's best interest to consider.
8	Develop Request for Proposals (RFP) – Prepare a Request for Proposals (RFP) document, and work with the organization to make adjustments and revisions, as well as ensure its compliance with the organization's purchasing guidelines and is distributed per policy (assumes development of a single RFP document). RFP should include, but will not necessarily be limited to, the following:
	Comprehensive list of functions/requirements with prioritization
	Cost, including purchase or other financial payment plan options

Step	Software System Selection Work Plan
	Required technical specifications
	Installation costs
	Migration from existing to new system (cost and time line)
	Training cost and training schedule
	New system hardware/network/system software requirements
Phase 3 – Vendor Evaluation and Demonstration Management	
9	Manage vendor questions and answers during established proposal response time lines.
10	Proposal Evaluation – Analyze and evaluate proposal responses. Provide an initial Summary Vendor Comparison Worksheet that provides side-by-side comparison of key system evaluation requirements, including feature/function compliance statistics.
11	Analysis Results Workshop to Determine Vendor Finalists (Short List) – Conduct a collaborative review workshop with a key stakeholder committee and determine which vendors are to be short-listed.
12	Develop Demonstration Documents – Prepare an agenda and sample demonstration scripts for vendor demonstrations to be sent to vendor finalists for their advance preparation. Also, prepare vendor demonstration evaluation forms for use by selection committee members during demonstration sessions.
13	Reference Check Form Preparation – Prepare form to be used by project team members during finalist reference checks/calls.
14	Schedule and Facilitate Vendor Demonstrations – Schedule demonstration dates and facilitate initial vendor demonstrations to ensure that pertinent requirements are addressed (estimate three vendors at X days each).
15	Develop Site-Visit Documents – Prepare an agenda for each vendor site visit and a site visit evaluation form for organization selection committee members to complete during each visit.
16	Post Demonstration/Visit/Reference Check Due Diligence and Follow-Up – Track follow-up issues and conduct comprehensive due diligence. This may include additional demonstrations, Q&A facilitation, reference checking, and site-visit assistance, etc.
17	Finalist Selection – Conduct a meeting with the organization selection committee to facilitate discussion and finalize the vendor selection.
18	Review Selected Vendor's IT Requirements – Review the IT (server, workstation, network, etc.) requirements provided in the selected vendor's proposal, and prepare a memo outlining observations and recommendations for IT.
Phase 4 – Contract Review and Negotiation Assistance	
19	Implementation Plan Review – Review implementation plans, project management office, resource requirements, and time lines.
20	Implementation Team Organization – Establish Implementation Project Team based upon PMI and COBIT Project Management Office (PMO) principles and applications management best practices.
21	Contract Review and Negotiation Assistance – Conduct contract reviews and negotiations with an SME and legal representation.

Example Feature/Function Specification

Feature Number	Feature / Function / Capability	Standard - Current	Standard - Next	Report Writer	3rd-Party Application	Custom Modification	Not Available No Response	Comments
	Requisitions / Purchasing							
4.000	VENDOR MAINTENANCE GENERAL FEATURES							
4.020	**VENDOR – ADDRESSES** - Provide for multiple addresses per vendor (must support non-USA addresses) with a minimum of four addresses and five lines each.						1	
4.028	**VENDOR APPROVAL** - Ability for departments to setup a temporary vendor with only purchasing to approve new vendors.						1	
4.035	**ON-LINE REQUISITION/PO APPROVAL** - Provide functionality online to route requisitions or purchase orders to appropriate users (or their backup user) with notifications for their approval or disapproval. Allow entry of disapproval notes and ability to restart the approval process if required.	1						
4.036	**ON-LINE TRACKING OF APPROVED REQUISITIONS** - Ability to use online query for all purchase requisitions that are awaiting the user's approval.	1						
4.041	ENCUMBRANCE ACCOUNTING							
4.042	**ENCUMBRANCE ACCOUNTING** - Provide all procedural functions of an encumbrance system including verification of budget availability before accepting invoice, requisition and purchase order transactions.	1						
4.046	PURCHASE REQUISITIONS							
4.047	**FORMAL BID FUNCTIONALLY** - Provide formal bidding functionality and process, which ties with both purchased requisitions and purchase order functions.		1					Future release
4.050	**BUDGET / PURCHASE LIMIT CONTROLS** - Provide security controls to either allow or disallow amounts to be entered that exceed budget amounts.	1						System either start workflow process, or not route items that exceed budget amount
4.052	**RECURRING REQUISITIONS** - Allow recording, reporting, retrieval, and editing of recurring requisitions.						1	
4.054	**ELECTRONIC REQUISITIONING** - Provide the ability to generate electronic requisitions by multiple end-users.	1						
4.099	**DEPRECIABLE ASSET** - Ability to code items as depreciable assets.	1						This is available at the PO level
4.107	PURCHASE ORDER PROCESSING							
4.109	**PURCHASE ORDER GENERATION** - Allow items to be split from requisitions to multiple purchase orders.					1		
4.140	**PURCHASE ORDER – THRESHOLD AMOUNT** - Ability to set a limit (cumulative) for a single vendor in a year for purchases.	1						yearly limit tracked via misc user defined field
4.158	**CONTRACT EXPIRATION ALERT** - The system should provide a warning or block payments if a contracts insurance has expired.	1						Information is available via drill down
4.160	**APPROVALS** - Ability for an approval to be routed to multiple approvers, via workflow rules, where either approver, but not both, is not required.	1						
4.194	**PURCHASE ORDER COMMITMENT REPORTING** - Generate a purchase order commitment report reflecting the dollar amount of anticipated deliveries by vendor.	1						
4.196	INTEGRATION							
4.198	**INTEGRATION - ACCOUNTS PAYABLE** - Provide for automatic transfer of purchasing information to Accounts Payable (e.g., vendor, address, amount, purchase order number, etc.)	1						
4.199	**INTEGRATION - BUDGET** - Provide capability to validate funds availability for Requisition and Purchase Order transactions. Allow override capability.	1						
4.202	**INTEGRATION - GENERAL LEDGER** - Ability to download purchasing card transaction file (.txt) to post transaction detail to General Ledger by general ledger account code. Note: each transaction is associated with a specific general ledger account number in the text file.							standard P-Card integration is available via import into Accounts Payable
4.203	**INTEGRATION - PROJECT ACCOUNTING** - Purchase Order transactions coded to Projects must integrate with Project Accounting and/or Work Order Management systems.							

7. Enterprise Reporting Best Practices

Background

Enterprise software applications that support the critical business functions and processes of the organization (e.g., ERP, Financial, Maintenance and Operations, and Property) also store and retain the organization's critical information and data as a byproduct.

Reporting is based on the premise of entering/capturing data and then extracting and presenting this data as information. Information is the outcome of the reporting process, presented in a useful, consumable, and digestible format, enabling the organization to:

- Equip line, supervisory, and department/division management personnel with information to make necessary daily decisions during the conduct of fulfilling operational responsibilities
- Provide leadership with the ability to better understand and validate operations and output
- Measure how well the organization is meeting its goals, objectives, and service levels, as well as meeting any established key performance indicators
- Make decisions and establish practices/policies to manage risk
- Empower leadership to make strategic decisions necessary for guiding mid- and long-term direction for the organization, and measure the ongoing implementation and results of those decisions

Information provided from reporting results can be presented in many formats, including, but not limited to:

- Traditional rows and columns
- Tabular
- Pivot tables
- Graphic (e.g., line, bar, and pie, including dashboard presentation)
- Overlay

Ideal reporting systems can also provide the results in actionable format, including, but not limited to:

- Using analysis tools to apply filters and factors to view and better understand the information
- Using the data to determine options and apply decision criteria (what if scenarios)
- Share and combine data with information from other departments, other system, or even external data sources
- Allowing collaboration and group analysis

An organization will find it difficult to maximize utilization of their application software and achieve their goals in an environment where data is painstakingly entered into a system but cannot be retrieved in a meaningful way. In short, enterprise applications cannot deliver full value without providing the organization the ability to use the data contained in these systems to manage their operations and guide them in determining their future direction.

Findings and Observations

- Crystal Reports and SQL Server Reporting Services are used for reporting purposes throughout the County.
- Multiple departments would like to receive Crystal reports, SQL Server Reporting Services user training.

Recommendations

- The County should take a complete inventory of all reports, including shadow-system reports (i.e., those compiled in MS Excel).
  - This inventory should be maintained using a spreadsheet, table, or database, using the sample below as a starting point.
    - *Note: This is only an example. Headings and data fields can be added, changed, or deleted to best meet County needs.*
  - The history of changes or modifications to the reports with the reasons and benefits of those changes should be kept in the inventory and/or with the report itself.
- Shadow-system or unmet reporting needs should be addressed in the system to improve business processes.

Report Name	Priority & Reporting Tool Used	User	IT	Vendor	Report Options

- The inventory above provides a means to document responsible party(s) and roles (user, IT, or vendor), in keeping with *Application Management Best Practices*. Those responsible for report creation and development should be identified and maintained. It is not necessary that report development falls solely on the shoulders of IT personnel. Departmental staff members know their business processes and data best and are often best equipped to develop reports independently.
- Department staff can be trained to develop basic and moderately sophisticated reports. For more complex reports that require joins and other more complex functionality, department staff can partner with IT resources in the report development process. The table below is an example of what some organizations have used to assign departmental application and reporting, based on roles/responsibilities. These should be completed for each application software system within the organization.

Enterprise Software Needs Assessment
Roles and Responsibilities

PO = Process Owner(s) | AA = Application Analyst(s) | FL = Application Area Functional Lead (Liaison/Coordinator)
FF = Feature Function Lead Revie | RW = Ad hoc Report Writer(s) | FF = Feature Function Reviewer(s)
AC = Application Champion(s) | IT = IT Responsibilities (e.g. System Admin. or server support) | NP = Needs Assessment/Software Selection Participants
U = List of all users of the module by name

	Financial Management										
	General Ledger (includes Bank Reconciliation)	Budgeting	Project and Grant Accounting	Purchasing and Requisitions	Contract Management	Accounts Payable	Accounts Receivable	Cashiering and Online Payments (Cash Receipts)	Fixed Assets	Financial Reporting	Ad Hoc Reporting
PO =											
FF =											
AC =											
AA =											
RW =											
IT =											
FL =											
FF =											
NP =											
U =											

- The County should make use of all reporting and information presentation options available. Options for meeting reporting needs are as follows and are also **placed in order of preference/priority**. It should be noted that these options are often dependent on the technology, database, database structure, and development tools the application vendor(s) applied in the building of their systems.
  - **Dashboard(s)** - Dashboards are provided by many enterprise application software vendors. Dashboards are often used as the launch platform for the application, but also display information that is of interest to the specific user's role. For instance, status of expenditures against budget, number, and types of work orders issued versus completed for a particular time period, and much more. These results are often displayed graphically as context-sensitive content so that clicking on the graphic enables drilling-down to the detailed information contained in the application upon which it is based. Frequently-used reports can also be pinned on the Dashboard for quick access and execution.
  - **Vendor Application Standard Reports** - Most vendors provide a set of prewritten reports that are included with the software application. These are reports that the software vendors have determined are most commonly needed/requested by the application user community and included in a quick-access link that can be executed from a drop-down list or menu. These standard reports usually have additional criteria to select (e.g., applying a date range, specifying a particular value type, etc.) Some vendors have written these reports using their own report-writing services (i.e., SSRS) which allows the use of standard reports as a base, from which user modifications are applied with the vendor's ad hoc reporting tools.
  - **Ad Hoc Reports** - Ad hoc reporting tools allow for the custom development of reports without the benefit of programming knowledge. Most report-writing tools are intuitive enough for non-IT-oriented department staff to independently create customized reports. It should be noted that familiarity with application and the data contained in the system is a prerequisite to be able to use any ad hoc reporting tool. However, any user that is a mid- to high-volume user of the application who is also computer proficient usually has the system knowledge to make use of an ad hoc reporting tool. As noted earlier, more sophisticated reports may require the assistance of IT staff. Ad hoc reports are a powerful tool for the user community, allowing them to independently meet their basic reporting needs. The types of ad hoc reporting tools that are available include:

- Application vendor proprietary tools
- Vendor-incorporated SQL Server Reporting Services (SSRS)
- Third-party reporting/BI tools (i.e., Crystal, Cognos, Business Objects, etc.)
- Other non-SQL, server database-specific reporting tools (e.g., Oracle reporting tools, etc.)

- **Financial Analysis and Financial Statement Report-Writing Tools** - These reporting tools are a form of ad hoc reporting, but include additional capabilities related to financial analysis and financial reporting needs of finance and accounting staff. A few common reporting tools for this need are listed below:
  - Reporting tool developed by the software application vendor, to be used with their particular application
  - Tools to produce financial reports, like CAFR builders and other tools to produce other GASB-related/required reports
  - Third-party financial reporting tools offered to work with the more common financial/accounting systems in the local government market space.
- **Application Vendor Business Analytics and Key Performance Indicators (KPIs)** - These are typically tools that allow for performance-based analytics and other performance measure-related reporting. These are often accompanied by a dashboard with the same characteristics described in the *Dashboard* option above. Many of these tools also provide more sophisticated capabilities for exporting to Excel for the use of Excel-based pivot tables and other advanced Excel capabilities. Some software vendors are beginning to offer these capabilities as an optional "bolt-on" to their application solutions.
- **User-Programmed/Coded Reporting** - These are reports built using internal IT staff or could also include hard-coded reports that a vendor may build for the customer. Standard and ad hoc reporting options should be explored before turning to this alternative. This option is usually deployed when the reporting need is so sophisticated or complex that a coding method is the only way to accomplish the desired outcome. Examples of this type of report include:
  - SQL queries
  - Other coded/programmed reports
- **Application Vendor-Written Custom Applications** - Because of the vendors' detailed knowledge of their own systems, they are often a good resource for hire to write custom reports. It is often best to have several reports grouped together, which will help keep costs more manageable, as vendors will provide discounts for larger blocks of hours for these reporting services. It is also a good idea to request that the vendor build these reports using their report-writing tool, if possible, so responsibility in maintaining them can be assumed in the future, as needed, or used as a base to build variant (modified) reports.

- After completing the existing report inventories and identifying County reporting responsibilities/roles as recommended above, an assessment and gap analysis should be conducted, to include:
  - A review of existing reports to determine how well they meet needs and if any modifications are required to better meet needs or to provide more value
  - A detailed list of necessary reports that are needed for all departments and divisions, including any formatting or Excel export needs and reporting tool options to be applied (per definitions above), and organization-wide cross-application reporting needs, which require additional processes to combine data from multiple sources using multiple reporting tools and options

- Conduct a workshop, after the undeveloped necessary reports have been identified, to prioritize these reports, with participation of all staffing levels within the County from line/field staff to supervisors and management, including executive leadership, as necessary, to cover all reporting needs in the assessment and gap analysis process
  - Prioritization should apply a High, Medium, and Low scale. High-priority reports should be done in the first third of the implementation period. Medium-priority reports should be completed in the middle third of the implementation period. Lastly, the low-priority reports should be completed in the final third of the implementation period. Cost-benefit and impact to operations and customers should be utilized in these prioritizations.

8. User Training and Support

Background

Software systems are tools utilized to conduct business operations. Like other tools (e.g., phones, audiovisual equipment, backhoes, plotters, etc.), gaining greater utilization of these tools through sufficient training and installation of other available software modules is key to significant increases in productivity and greater efficiency, as well as achieving cost savings in many areas.

Findings and Observations

- Software applications that are underutilized will gain significant increases in staff productivity if more training were provided.
- An updated inventory list can clarify and confirm licensing compliance, over/under seat license requirements, and identify training needs and user-responsibility roles, as discussed in the *Application Management Best Practices* initiative.

Return-on-Investment (ROI) Consideration

In a study conducted by Nucleus Research, an organization drove productivity gains of up to 50% through ongoing, successful user trainings.[3]

Recommendations

- Complete an Applications/User Matrix, by department and user.
  - Conduct a survey, by user, to assess training required to address actual needs and determine anticipated enrollment. This should be driven by department managers to elicit participation when training is made available.
  - Process improvement reviews will uncover many needs for additional training across departments and application systems.
- Use existing training rooms/facilities for training and for use as a lab to implement application improvements, as well as configure and setup systems to accommodate process improvement/workflows.
  - Optimum configuration for a training facility is a minimum of 500 square feet, with twelve PCs and one-two printers for hands-on training.
- Determine strategies for accomplishing training needs and engage software vendors:
  - Self-learning aids
  - Internal classes (internal or external trainers)
  - On-site vendor training
  - Lunch-and-learns
  - Go-To Application Champions
  - Training opportunities at software vendor annual user conferences
- Participate in software vendor user conference and local user meetings if they are available.

[3] Nucleus Research, 2010.

- Create a repository of basic “how to” training aids and other training information (e.g., videos, past class information, etc.)
- Consider procuring a screen-capture video solution to assist with developing internal video training aids.
- Current and future needs can be evaluated and prioritized through a combination of mechanisms, including the IT Steering Committee.
- Consider class attendance as a factor in performance evaluations. This can be accomplished by having department management involved and agreeing to which classes each employee would benefit from.
- Consider efforts to reduce and/or limit the total number of software vendors and databases whenever possible. This will reduce and limit overall cost-of-ownership, support requirements, training and reporting needs, and improve overall integration capabilities.

Benefits

- Improved operations management
- Improved utilization and efficiency of software applications
- Activation and use of existing functionality that is currently unknown but important to the County
- Review and activation of new functionality provided in future applications software releases
- Increased information sharing
- Better identification of training needs
- Increased training alternatives
- Improved software administration (fewer staff required to service user community)

9. Training Rooms

Background

Training Rooms serve as a great opportunity for staff to become familiar with applications or expand on their current skills. It serves as a best practice to promote professional growth and continued improvement through increased utilization of existing or future organization applications to be released to staff. A dedicated Training Room is also a requirement for all major software implementation projects.

Findings and Observations

- The County has existing conference and meeting rooms that are multi-use that are often used for training.
- County IS has a full-time Training Room with dedicated PCs to help successfully complete the projects outlined in this plan.
- HHS has two full-time training rooms with dedicated PCs that can be used for training when not in use by HHS trainees.

Recommendations

The organization should continue to maintain these Training Rooms for:

- Testing new applications that are being implemented
- Implementing and testing application updates to existing applications
- Lab activities, including testing implementation of new application features or reconfiguration of existing application setup
- Use by staff (users) to improve upon existing application skill sets and competencies
- Maintaining an existing and new applications inventory and training room PC images can be a challenge.
  - Consider using applications push or the IS imaging solution to easily push applications to training PCs.
  - Time spent automating maintenance of training room PCs will pay large benefits in reduced maintenance in the long run.
- Due to the expected volume of upcoming applications training, two or three training rooms may be need at various times.
  - Consider refreshing training rooms as a part of the Capital Replacement Planning cycle.

10. IT Project and Services Portfolio

Background

An *IT Support Services Portfolio* is a complete list of IT projects and services provided to County staff and the public. The support services portfolio outlines IT responsibilities for each service and any service-level agreements for those services (e.g., 24/7 support required, disaster recovery priorities, user-access permissions, report writing for certain software modules, server uptime requirements, etc.) Applications support is only one aspect of the complete portfolio. Other IT services include projects, Help Desk, data network, telephone systems, IT security, etc.

Recommendations

- Create an IT Projects and Services Portfolio to effectively communicate and set expectations for all users regarding what support services IT provides and communicate service-level standards.
- Portfolio should outline what set of deliverables IT staff will provide to complete IT projects or deliver the defined services.
- Utilize results of IT Master Plan as the basis for a five-year project portfolio and budget.
- IT Steering Committee (see *Governance* initiative) should track and review the portfolio and receive regular updates from IT staff and departments on the status of projects.

11. Return-On-Investment Considerations

Background

We believe broader understanding of return-on-investment concepts and analysis for potential new projects will benefit the County in justifying wise technology investments and reduce self-regulation when considering technology and process improvements.

IT Infrastructure, Operations, and Support

Limiting the number of software and technology vendors supporting County functions will decrease the growth of IT infrastructure operational costs and support costs in the medium-to-long term. The following is a list of technology areas impacted when determining the number of applications necessary to support and maintain an organization's core business solutions:

- **Hardware** – Servers required to house the applications
- **Software** – Additional software, such as key operational software applications and the number of different database tools required to support core applications
- **Licensing** – Increased licensing due to an increased number of vendor applications and various associated database tools
- **Business Continuity** – Increased Disaster Recovery Planning effort, testing, and recovery complexity to support multiple-vendor applications
- **Support Costs** – IT support costs for hardware and software as vendor application volumes increase
- **Operation Costs** – Increased training for employees to meet expertise requirements as more vendor applications and different database tools are introduced

Departmental Labor Costs

Many organizations do not adequately understand the impact of improved automation and the resulting reduction in manual processes and shadow systems when considering implementation of new systems or conducting process improvement analysis to improve utilization of existing systems. Most productivity analyses show that, over time, labor cost savings far exceed the cost of reasonable automation efforts. The savings associated with the avoidance of one new hire or the elimination of a position due to attrition may be $50,000 to $100,000 or more per year (including total payroll, taxes, benefits, and other costs). The life of some new systems should be over ten years, making the savings from the avoidance of just one new hire and/or elimination of vacated positions the equivalent of $500,000 to $1,000,000 over ten years. Ten years should be the minimum expected life cycle for major applications systems.

Return-on-Investment (ROI) for Applications Systems

Improved utilization of applications systems can result in immediate and sustained savings in time spent performing specific tasks or processes. These individual improvements do not always equate to immediate, "hard" savings. They may result in intangible benefits to the County, the population that the County serves, or cumulative savings from reduced long-term personnel needs.

User Training and Support

Applications software is continually evolving. Improvements and enhancements are made yearly. Maintaining staff efficiency and improving productivity over time requires ongoing training of all staff. Users are typically not trained on all aspects or capabilities of particular software applications or other technology-based tools during initial implementation. Therefore, it is important for the organization to develop methodologies to carry out functionality use, reporting, and training requirements in order to utilize the County's important technological assets to their fullest potential over time.

Calculation Examples

Whenever possible, we recommend that staff calculate tangible and intangible benefits when requesting approval for a project. The following calculations can be utilized in those efforts. We believe in being conservative and practical. Exhaustive ROI studies should not be necessary. Focusing on a limited number of reasonable examples, as outlined here, should normally be sufficient to provide adequate justification for strategic projects.

Labor Efficiency Savings	**=**	**Labor Hours Saved X Gross Hourly Rate**
Tangible Labor Cost Savings	**=**	**New hire avoidance, elimination of position through attrition, consolidation of work load and positions, etc.**

Hard Cost Savings

- Hardware
- Software
- Maintenance
- Inventory reductions

Intangible Benefits

- Alignment with business needs
- Improved decision-making
- Compliance with regulatory requirements
- Increasing levels of service
- Improved service to public users
- Increased safety
- More transparency
- Improved public communication
- Improved employee communication and satisfaction
- Systematic IT planning and improvements

Return-on-Investment (ROI) Cost Considerations

Related Studies

A study conducted by Macquarie University[4] discovered the following:

- Overall ROI in IT projects is around 30%.
- The projects that deliver at least some benefits should be about 52.5%.
- Successful IT projects can have an ROI of around 400%.

Shadow System Elimination

The propagation of numerous shadow systems has occurred due to the underutilization of the existing system and the limitations and the inability of the existing system to provide information in real-time, analyze information, and perform management reporting. These shadow systems involve the management of offline spreadsheets, databases, paper, and other tools to meet the departmental and County-wide needs that the existing processes and systems cannot fulfill. Some examples of these shadow systems include, but are not limited to:

- Journal entries entered in Excel (Finance)
- Tracking of Financial, HR, and Payroll information in Microsoft Access or Excel
- Limited use of automated system allocations, causing extensive manual tracking and reporting
- Departmental duplicate tracking of budgets in Excel

The County should inventory all shadow systems to identify, inventory, and determine which ones can be eliminated with the new system. Additionally, if resources are available, the County may want to consider estimating the time spent on specific shadow systems throughout the organization. If beneficial, the County may also wish to consider such an effort to determine the true savings resulting from the elimination of these shadow systems through the implementation of the proposed new system. In the meantime, a very conservative example is being provided below. It is expected that the true cost savings will exceed this example.

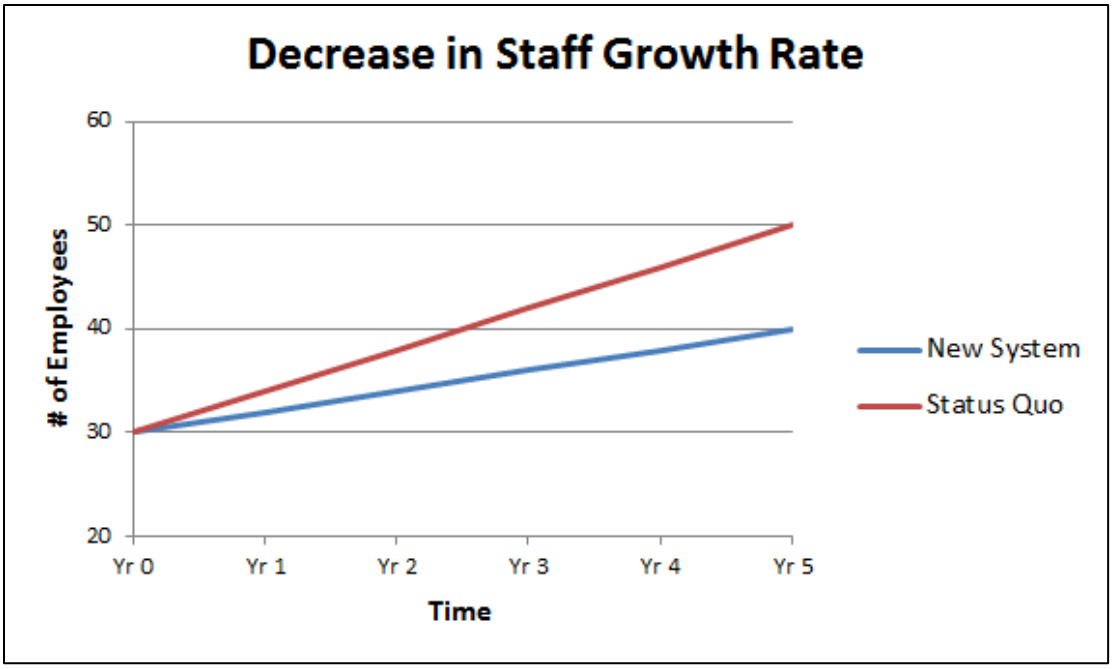
Shadow System Cost Saving – Example

4 departments each @ 20 hours spent per week on Shadow Systems	=	2 Full Employees	=	Estimate of $75,000 annual Employee Cost (fully burdened)	=	$1,500,000 in Savings over 10 Years

Decrease in Staff Growth Rate

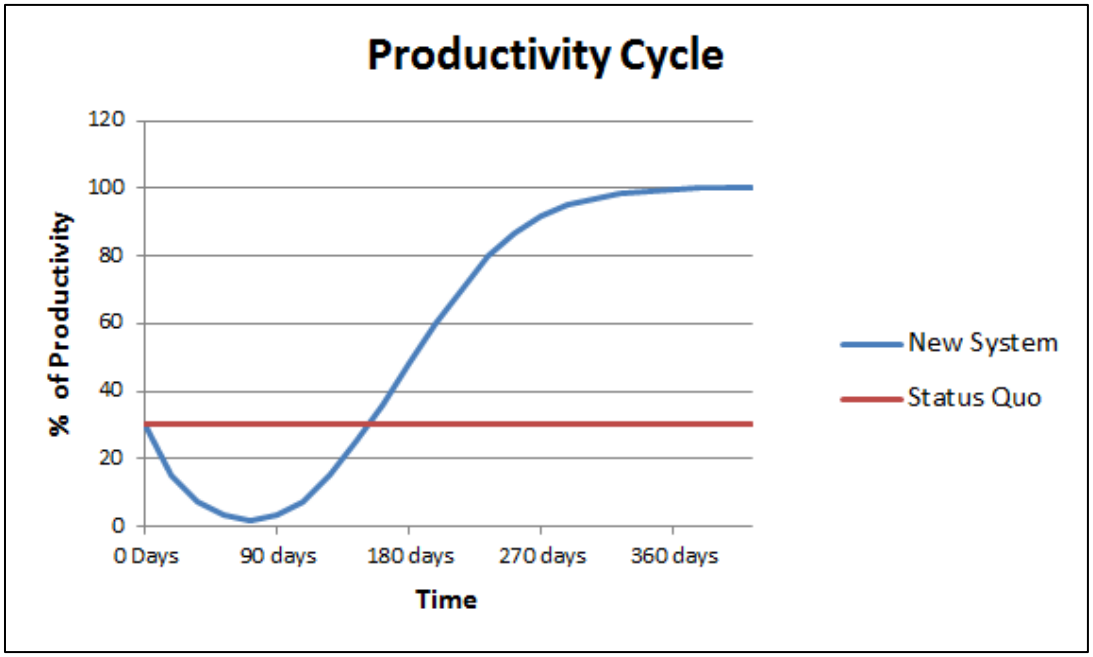
Personnel efficiencies and productivity gains will be realized from the new systems, including automation of existing manual processes, gains from the elimination of shadow systems, and process improvements. Seldom, if ever, have elimination in actual staff been observed due to hidden backlog or other needs that have been set aside due to existing workloads. But, reduction of staff through attrition (retirement, resignations, etc.), reallocation of staff, and the slowing of the organization growth in staff commonly occur. The diagram below is a visual representation (not quantifiable actual results) of the principal of what is often experienced regarding staff growth projections related to the implementation of a new system.

[4] Macquarie University, 2006.



Productivity Cycle

Through the proper successful implementation of improved processes and new systems, the County should expect to achieve close to 100% of the expected gains in productivity. However, it should be understood that there is a lead time associated with when these productivity gains will be realized. The productivity cycle is represented in the diagram below. Initially, due to learning curves, the time required for implementing new processes, and the assimilation of the organization's staff, there is often a 90- to180-day loss in productivity before actual gains begin to be realized.



Departmental Applications and Systems

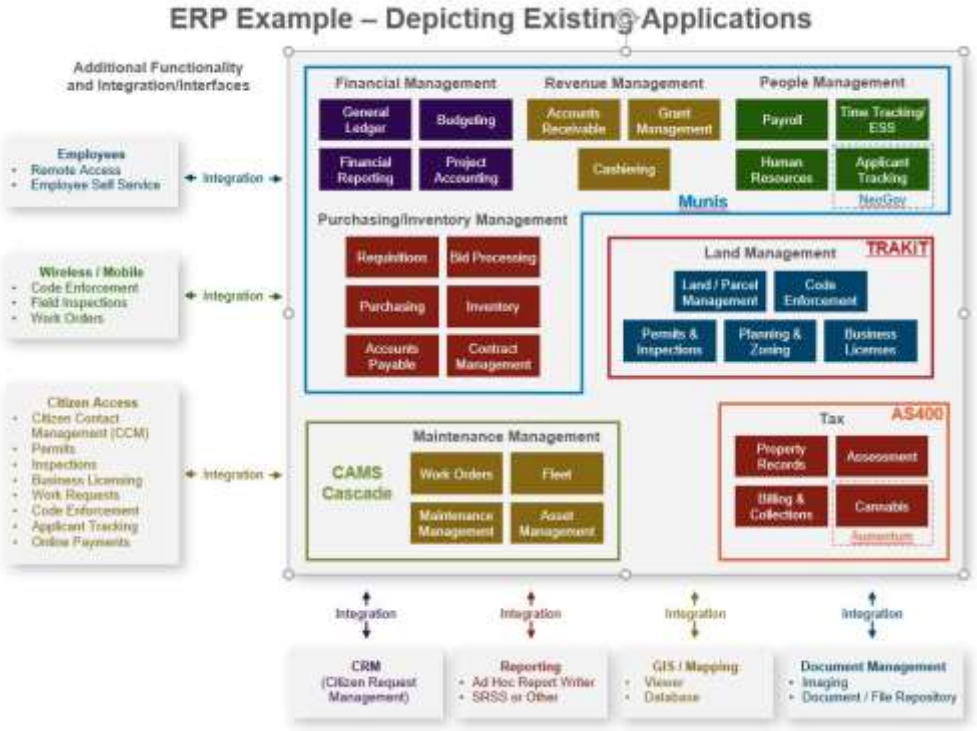
The *Departmental Applications and Systems* category includes IT Initiatives that are primarily department business applications-related and were identified during the assessment process. Many of these initiatives and recommendations can have a significant impact on overall productivity, enhanced communications and information sharing, improved constituent service, improved transparency, and, in some cases, cost savings.

12. Munis Gap Analysis and Utilization Improvement
13. Budgeting Process Review and Improvements
14. Aumentum Assessment and Tax Billing System
15. TRAKiT Gap Analysis and Utilization Improvement
16. Election Voting System Replacement (DIMS, GEMS, and Voter Equipment)
17. Electronic Document Management System (EDMS)
18. Justware Gap Analysis and Utilization Improvement
19. NeoGov Gap Analysis and Utilization Improvements
20. Enterprise Asset Management (EAM) Including Fleet
21. Fuel Management System Integration
22. Centralized Land/Parcel Data Management
23. Cannabis Permits and Licenses Process Review
24. Project Tracking and Collaboration
25. Bids Management
26. Kiosks
27. Board Meeting Automated Text Recording and Minutes (Talk-to-Text)
28. GovInvest License and Implementation
29. Intranet
30. Agency Wikis
31. OpenGov
32. Electronic/Digital Signatures
33. Homeless Management Information System (HMIS)
34. Migration of Access and Homegrown Applications to COTS
35. Website Content Management Training
36. Mass Public Outbound Communications
37. Replacement of Probation Assessment.com System
38. Animal Services Chameleon System Improvements
39. Library Scheduling System
40. GIS Assessment and Computer-Aided Dispatch Base Layer
41. Aegis Gap Analysis and Utilization Improvement
42. Jail Visitation Management Software
43. Migrate Jalan Warrant Process and Historical Data to Aegis
44. Conceal and Carry Weapon (CCW) Permitting Software
45. 3D Incident Mapping
46. Automated License Plate Readers
47. Sheriff's Vehicle – Voice Recognition
48. Sheriff's Office Automated Vehicle Locator (AVL)

12. Munis Gap Analysis and Utilization Improvement

Background

One of the County's primary systems is Munis' ERP solution from Tyler Technologies. *Enterprise Resource Planning (ERP)* is a software solution that allows integration among various departments and their respective functions. The result is an enterprise-wide integrated system of communication, storage, and operations. Improvements to ERP solutions bring about processes that multiple departments can benefit from. Common local-government-related ERP application modules include Accounting, Financial Reporting, Payroll, Human Resources, Billing, Planning and Permitting, Work Orders/Maintenance, and Tax. The graphic below shows a typical ERP environment related to the County's operating environment. The Munis component is represented in the blue-boxed area.



Findings and Observations

Munis is a respected local government ERP solution and has a significant customer base in California and throughout the country for counties of similar size and complexity to Mendocino. Although there were mixed satisfaction levels expressed by some accounting and non-accounting departmental users, most departments expressed their desire to improve use of the system, including:

- Additional training
- Additional reports and report improvements
- Activation of more features and capabilities (not currently implemented)
- Activation and implementation of software modules not currently used
- Elimination of Excel-based shadow systems for numerous processes (see examples in the *Staff Feedback* subsection of this initiative)
- Higher use of Tyler Content Management (TCM) for use with Munis
- Greater use of end-user dashboards and workflows

The County can clearly benefit from conducting comprehensive process reviews and needs assessments with all departments related to the use of Munis system to prioritize feature/function requirements and training needs and evaluate the need for other Munis software modules that would benefit the County. It would be beneficial for the County to enlist a third-party subject-matter expert to perform on-site process and needs review activities that will document the gaps in the existing implementation and recommend improvement suggestions that will close this gap. This should include scope to assess and determine what will be necessary to eliminate most manual shadow systems (Excel and others), avoiding duplication of effort and unnecessary reconciliations. This will improve staff productivity across the County.

The following table shows the existing modules that the County has licensed from Munis. It also represents the potential improvements that could be realized.

Industry-Typical Enterprise Module Name	Current Available Vendor-Equivalent Module	Licensed	Implemented	Potential Process Improvements
Financial Management				
Tyler Munis				
General Ledger	Financial Core	Yes	Yes	Yes
Bank Reconciliation	Financial Core	Yes	No	Yes
Budgeting	Financial Core	Yes	Yes	Yes
Accounts Payable	Accounts Payable	Yes	Yes	Yes
Requisitions	Purchasing	Yes	Yes	Yes
Purchase Orders	Purchasing	Yes	Yes	Yes
Cash Receipts	Centralized Cashiering	Yes	Yes	Yes
Financial Reporting	CAFR/GASB Reporting			Yes
Fixed Assets	Fixed Assets	Yes		Yes
Project Accounting	Project Accounting	Yes		Yes
Grant Accounting	Project Accounting	Yes		Yes
Ad Hoc Reporting	Ad Hoc Reporting	Yes	Yes	Yes
Accounts Receivable	Misc. Accounts	Yes		Yes
Online Capabilities				
Online Payments	Online Payments		No	Yes
Online Misc. Receivables	Online Payments		No	Yes
People Management				
Tyler Munis				
Payroll	Personnel Management	Yes	Yes	Yes
Human Resources	Personnel Management	Yes	Yes	Yes
Position Control	Personnel Management	Yes		Yes

Industry-Typical Enterprise Module Name	Current Available Vendor-Equivalent Module	Licensed	Implemented	Potential Process Improvements
Time Tracking	Time Entry			Yes
Leave Requests	Personnel Management			Yes
Benefits Administration	Personnel Management			Yes
Performance Evaluations	Personnel Management			Yes
Personnel Budgeting	Personnel Management			Yes
Claims Management	Personnel Management			Yes
Workers Compensation	Personnel Management			Yes
Training Management	Personnel Management			Yes
Employee Self-Service	ESS			Yes

Recommendations

- To avoid spending thousands of dollars on unfocused application implementation and training that may leave some processes not fully automated or optimized, we recommend conducting process reviews and/or needs assessments to determine gaps and develop an improvement plan to close this gap. The needs assessment process inventories current and future functionality requirements by application module for each department. The software vendor is then asked to respond to these requirements with their capabilities to determine their level of compliance with the County's specific needs and requirements.
- Review applicable manual processes and shadow systems, such as spreadsheets and databases, to determine automation improvements that will result in labor efficiencies.
- Training and training/user guide needs should also be considered. Numerous departments stated that existing Munis training/user guides are not up to date and often do not depict the current screenshots that users now see on their screens.
- Identify unique department needs for financial reporting or processes. An example of a specific department need was for Munis to create invoices from specific project codes on a monthly basis.
- From the above needs assessment documentation, determine any unmet needs ("gap") and any additional training required and new modules to implement.
- Any requirements that the vendor is not capable of providing can then be dealt with by other means, such as more efficient work-arounds, third-party applications, modifications, and changes in organizational processes and procedures.
- This process can also be used to inventory all required reports, as well as integration/interface requirements between other applications such as CRM, EDMS/ECMS, GIS, and the County's website.
- From the completed assessment and gap analysis, develop a plan to improve utilization, including process improvements, activation and setup of unused functionality and capabilities, implementation of workflows, and closing gaps in required training and reporting needs.
- Implement the plan.
- Enlist a third-party subject-matter expert to manage the above steps and work with Munis resources.

13. Budgeting Process Review and Improvements

Background

The Munis ERP financial planning and budgeting functionality cannot just check transactions against budgets but can also manage the multi-month budget creation process online, run statistical data, link dollars to results and more in real time, and manage both existing and projected general, payroll, and capital improvement budgets. Potential functionality includes:

- Build reports and templates from prior year or average of years
- Create unlimited number of budget projections for up to ten years in advance
- Work in summary or detail views
- Define approval processes
- Use position and budget control to forecast salary and benefit costs and simulate changes to positions with what-if scenarios
- View dollars available after taking salary and benefit commitments into consideration through payroll encumbrances
- Use performance-based budgeting to create a budget that corresponds to the County's goals and mission and help justify budgetary requests

Findings and Observations

The County's current budget creation and reporting processes are largely managed and tracked outside the Munis ERP system. Munis has online budget creation processes for operating capital and payroll/position budgeting, including some functionality to track future projections. This functionality was not originally implemented when Munis was acquired.

The County devotes thousands of labor hours to the budgeting process, tracking, and reporting, and therefore desires to streamline these processes by taking better advantage of new and existing technology.

Recommendations

- Conduct a needs assessment to document processes (process review descriptions, procedural mapping, and workflows, as necessary), objectives, and application configuration requirements, which will include any potential systems integration/interface requirements.
- Provide an analysis of the functional requirements as it pertains to existing or potential future application software solutions.
- Assist with the development and issuance of requested information for applicable software vendors.
- Facilitate capabilities and compliance evaluations of applicable software vendors, including demonstration management, to ensure process improvements can truly be accommodated in the required application software systems.
- Perform Vendor Due Diligence, Contract and SOW Review, and Contract Negotiation Assistance with Tyler Munis.

Note: At the time this report was being prepared, this initiative was in-process.

14. Bids Management

Background

Bids management software solutions provide e-procurement tools designed to give government agencies the ability to setup electronic bid packages, publish them to a wide vendor community, and manage the bidding and contract award process. These solutions can provide bid details, workflows, transparency, and audit trails. Many solutions for this functionality are offered as subscription-based cloud solutions, referred to as *software-as-a-service (SaaS)*. Tyler Munis has a Bids Management solution the County should evaluate.

Findings and Observations

Some of the more prominent third-party vendors that offer these services include:

- BidSync
- BidNet
- Planet Bids
- eBid Systems
- Onvia DemandStar

Recommendations

- Select software vendor according to software selection best practices.
- Consider the bids management module(s) available from Tyler Munis which is already fully integrated to the County's financial solution.
- If a third-party solution is chosen, ensure that the selected vendor will be able to interface/integrate with the County's existing Tyler Munis system.

Benefits

- Centrally managed information
- Quicker procurement process
- Better outreach and publication to a wider vendor community
- Increased automation and vendor communication
- Increased and improved bids and quantity of proposal responses
- Easy access to procurement documents
- Interface/integration capabilities to flow into bid tracking and purchasing within the District's ERP system

15. NeoGov Gap Analysis and Utilization Improvements

Background

NeoGov is a software solution that provides Human Resource (HR) management functionality. The County is currently using the Insight (Applicant Tracking) suite. HR and the County departments feel the implementation may not have activated all the functionality and capabilities available.

Findings and Observations

The users would like to make improvements, including, but not limited to:

- More training
- There may be additional advantages from the other suites NeoGov offers, including:
  - **Onboarding** – This is not currently licensed but has functionality to streamline the onboarding process of new hires, including integration with existing HR and Payroll systems.
  - **Perform** – This automates employee performance and evaluation processes.
  - **Train** – This is not currently licensed but automates the process of managing the required training and certifications.
- Greater automation of the system to reduce paper
- Streamline processes
- Improve required and general management reporting

Recommendations

- Conduct process reviews and needs assessment(s) to determine current and future functionality requirements. Fully evaluate the software modules to determine viability and compliance with the County's specific needs and requirements.
- Review applicable manual processes and shadow systems (e.g., paper forms, spreadsheets, and databases) to determine automation improvements that will result in labor efficiencies.
- *Note: The County may want to consider the same functionality from Tyler Munis due to the advantages and efficiencies that can be realized from the integration between Munis Financial, Human Resources, and Payroll capabilities.*
- Implement the plan.

16. GovInvest License and Implementation

Background

GovInvest is a solution to help agencies solve their unfunded pension, OPEB (other post-employment benefits), and debt issues using software that provides actuarial reports. The GovInvest output is structured in a way to facilitate analyzing liabilities, including running various scenarios (what-ifs). Output can then be used to find solutions and develop plans. In the spirit of open government, this information can then be presented to internal stakeholders (executive management and elected officials). There are also options to provide visuals and outcomes through a public-facing internet portal.

Findings and Observations

- GovInvest was identified as a potential solution for the County during the County Leadership Group discussion and several departmental interviews.
- County participants were interested in the approach the County could take and the amount of effort required to implement GovInvest.

Recommendations

- Assemble a research committee to determine the County's needs and whether GovInvest is a good fit to meet them.
- Even if GovInvest is the County's only consideration, the County should follow the recommendations in the *Software Selection Best Practices* initiative.

17. Aumentum Assessment and Tax Billing System

Background

The County's existing Assessment, Property, and Tax Billing system is a County application that was initially developed by an outside firm for the Sutter County Tax Collector and Assessor. The system is now supported by County IT, including support of query capabilities, reporting, and general system administration. The system runs on an IBM AS400 platform.

The County's goal is to migrate away from the AS400 environment. To ensure a stable platform and mitigate risk during this migration period, the County recently replaced the AS400 system and ensured the IT Department has AS400-knowledgeable staff members to support the system through this transition period.

Findings and Observations

Along with several California counties, the County recently acquired a new Assessment, Property, and Tax Billing system called Aumentum from Thomson Reuters.

- The Cannabis Sales Tax component of Aumentum was recently implemented by the County.
- The County is on Thomson Reuters' schedule behind several other CA counties. Depending on the implementation timeline for these other counties, Mendocino County will begin implementing the remaining Aumentum modules/functionality in approximately one-to-two years.

Recommendations

- The County should closely monitor the Thomson Reuters implementation timeline for the counties in line ahead of Mendocino County. This will ensure the County has the necessary resources in place to begin their implementation when Thomson Reuters is ready.
- To ensure a successful implementation, the County should follow the recommendations and processes described in the *Project Planning and Implementation Best Practice* initiative.
- Enterprise projects like this are complex, multi-year implementations. Therefore, consider utilizing a third-party SME for implementation planning and project oversight.
- Due to the structure of existing data in the legacy AS400 system, there may be challenges with data conversion. The County should plan for the potential financial and human resource needs for the data conversion aspect of this project.

18. Cannabis Permits and Licenses Process Review

Background

The County is currently managing, tracking, and reporting on the Cannabis permitting and initial licensing process in numerous software solutions and manual procedures. A great deal of effort resulted in a plethora of cannabis-related policies and procedures through many County departments, including:

Agriculture

- Cultivation Permit
- Nursery Permit

Treasurer Tax – Collector

- Cannabis Taxes and Facilities Business License

Planning and Building Services

- Zoning Requirements
- Administrative Permit
- Use Permit
- Building Permit
- Site Plan Questions
- Agricultural Exempt Building Application (Hoop House)
- Cargo Container Policy

Environmental Health

- Well Permit
- Septic Permit
- Hazardous Materials

Code Enforcement

- Cannabis Complaints

Executive Office

- Track and Trace

Findings and Observations

The County is now making progress on processing initial permits, but the backlog at the time of this report is nearly a thousand cases and permit renewal processes are just beginning. In order to continue processes and handle the additional growth, the County is in need of the following:

- Streamline processes and ensure they adhere to policies and procedures
- Decrease cost and time of transaction processing
- Improve decision making by providing easy access for end users (staff, management, and elected officials) to data
- Improve process tracking and reporting to all levels of the organization, including reporting to State regulatory requirements
- Reduce risk of errors by eliminating unnecessary duplicative data entry, spreadsheets, and side systems
- Decrease dependency on individual power users through improved documentation, training, and a more intuitive system
- Adopt use of best business practices
- Strengthen operational effectiveness and efficiencies

Recommendations

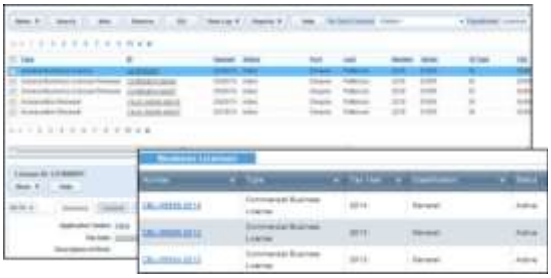
- Conduct a needs assessment to document processes (process review descriptions, procedural mapping, and workflows, as necessary), objectives, and application configuration requirements, which will include any potential systems integration/interface requirements.
- Provide an analysis of the functional requirements as it pertains to existing or potential future application software solutions.

- Assist with the development and issuance of requested information for applicable existing or new additional software vendors.
- Facilitate capabilities and compliance evaluations of applicable software vendors, including demonstration management to ensure process improvements can truly be accommodated in the required application software systems.
- Perform Vendor Due Diligence, Contract and SOW Review, and Contract Negotiation Assistance with existing or potential new vendors.

19. TRAKiT Gap Analysis and Utilization Improvement

Background

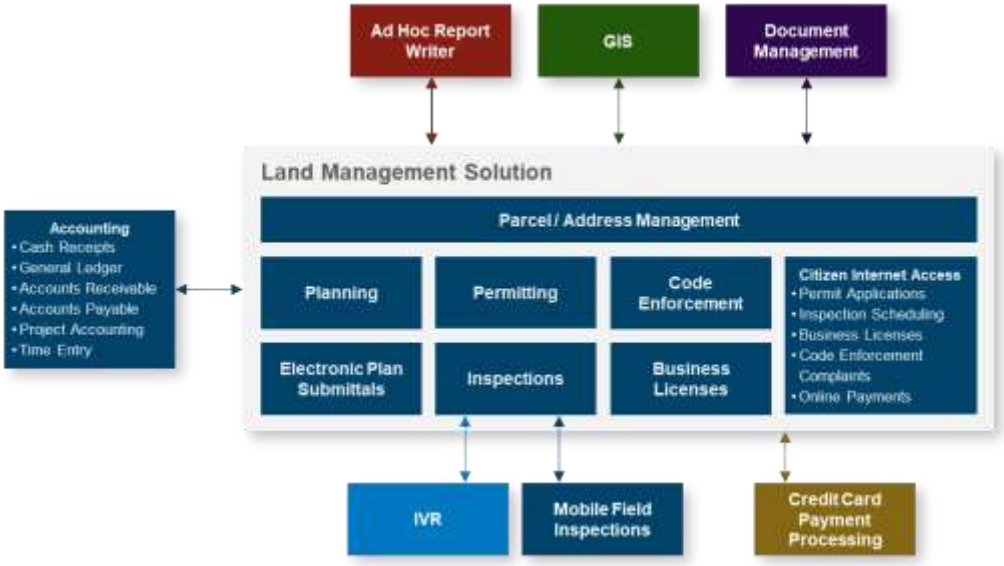
Land Management, commonly called *Community Development*, is a suite of application modules, including:



- Planning, Project Development, and Land Use
- Permitting
- Inspections
- Code Enforcement
- Recurring Revenue and Business Tax
- Parcel/Address Management
- Mobile/Field-Based Functionality

Findings and Observations

The County currently uses the Land Management suite of modules from Superion called TRAKiT.



The above diagram is a visual representation of a typical land management system suite that exists in most prominent ERP offerings. It is very similar to the County's TRAKiT.

The following are some of the desires for Land Management operational improvement areas identified by the County Departments interviewed:

- Electronic (online) permit applications and plan submittals as well as online permit payments
- Electronic (online) planning applications and plan submittals as well as online planning deposits and payments
- Public and contractor access to planning and permit application status
- Electronic (online) inspection requests
- Mobile field-based tools for inspections, etc.
- Ability to route plans electronically for review and perform electronic markup process (workflow)

- Interested in exchanging electronic documents with outside clients
- Real-time GIS integration
- Increased or improved use of mobile computing capabilities in the field

Recommendations

- To avoid spending thousands of dollars on unfocused application implementation and training that may leave some processes not fully automated and/or not fully optimized, we recommend conducting process reviews and needs assessment(s) to determine gaps and develop an improvement plan to close this gap. The needs assessment process inventories current and future functionality requirements by application function for each department. The software vendor is then asked to respond to these requirements with their capabilities to determine their level of compliance with the County's specific needs and requirements.
- From the above needs assessment documentation, determine any unmet needs ("gap") and any additional modules that may need to be considered as well as the required training.
- Review applicable manual processes and shadow systems such as paper forms, spreadsheets, and databases to determine automation improvements that will result in labor efficiencies.
- Any requirements that the vendor is not capable of meeting can then be dealt with by other means, such as more efficient work-arounds, third-party applications, modifications, changes in organizational processes and procedures, etc.
- This process can also be used to inventory all required reports, as well as integration/interface requirements between other applications such as Munis, GIS, the County's website, etc.
- Develop a plan from the completed assessment and gap analysis to improve utilization, including process improvements, activation and setup of unused functionality and capabilities, implementation of workflows, and closing of gaps in required reporting needs. This should also include a training plan for the above improvements.
- Implement the plan.
- Consider enlisting a third-party subject-matter expert to assist with the above steps and work with Superion TRAKiT resources.

20. Centralized Land/Parcel Data Management

Background

Centralized land and parcel data management is important for consistent organization-wide parcel and address data for all departments to utilize. The updating and sharing of a central database are essential for departments to operate efficiently in retrieving historical records.

Findings and Observations

- The County's GIS staff members are responsible for creating and maintaining map layers for streets and other various infrastructure categories.
- The address/parcel information is contained in various systems throughout the County and therefore is not consistent and does not support aggregate organization-wide reporting. No formal policies or processes are in place to update parcel and address information from the County nor do they have synchronized addressing and property information across all application software systems.
- The County could realize significant productivity gains and improved accuracy by using a common, centralized parcel/address database to populate any new or changed information.
- Not all County staff members have access to GIS software (Esri) nor basic GIS layers.

Recommendations

- Utilize the GIS database for master address/parcel records.
- When selecting future software systems that offers both a master address/location and parcels, these systems should allow for regular updates and synchronization with GIS.
- All information updates from external and internal sources should first be done through GIS. Then, updates to other systems would be done using GIS master information.
- Strong, structured control of who is authorized to update this information should be enforced and typically limited to only GIS data editors.
- Geo-based applications should be configured so that users select valid addresses, rather than entering free-form addresses for each transaction.

Benefits

- Improved data integrity (i.e., consistent organization-wide parcel and address data)
- Connectivity with County parcel systems
- Improved review and planning
- Better GIS layer reporting
- Increased staff efficiency by reducing data entry into multiple land-based systems
- Ability to allow access to this information via the Web to the public

21. Election Voting System Replacement (DIMS, GEMS, and Voter Equipment)

Background

The State of California and the California Secretary of State have stated that "the biggest threat to the election systems throughout the state is old voting systems and equipment." Most voting systems and associated equipment are 10 years or older and do not have the necessary security capabilities required by the state. As a result, the State of California has budgeted to help the 58 counties through a weighted formula, setting an amount available for each county. A local match is required by each county as a minimum. It should be noted that to be eligible and to receive these matching funds from the state, Mendocino County/Elected Registrar of Voters must become a Voters Choice Act County. These system upgrades need to be completed in time for the 2020 election.

Findings and Observations

Per the above Voters Choice Act requirement, Mendocino County is set to receive approximately $675,000 from the State. Estimates put the total costs for election system replacement (software and equipment) at approximately $1.6M - $1.8M.

The current DIMS, GEMS software, and associated equipment will be replaced with software and systems certified by the State of California Enterprise Risk Management Office and the Secretary of State.

Recommendations

- Work with the state to select, acquire, and implement the required equipment certified by the State of California as described in the *Findings* above.
- The implementation should follow the *Project Planning and Implementation Best Practices* initiative.
- It is recommended that the County consider using a third-party subject-matter expert with a high-level of experience and reputation in implementing election systems.

22. Electronic Document Management System (EDMS)

Background

Electronic Document Management Systems (EDMS), also referred to as *Electronic Content Management Systems (ECMS)*, can be utilized for much more than document scanning, storage, and records retention management.

Additional uses include:

- Enterprise records management, including retention management
- Integrated document/process workflow management, including internal request management, routing and distribution (Accounts Payable, Accounts Receivable, HR, Project Tracking, etc.)
- Forms management (Web and internal-based)
- Project/process collaboration
- Minutes management
- Agenda management (often through third-party partner).
- Media management, including synchronized meeting video streaming
- Web publication/posting for all above items, if desired

Findings and Observations

The County does not have a consensus on a singlular preferred solution for a future organization-wide document management system. The County currently has a mix of document storage systems, including:

- **DocuWare** – This solution is thought to be the County's chosen EDMS system for the future and is in live operation for:
  - Planning/Building
  - Sheriff
  - Executive Office
- **Real Vision (RVI)** – This system was put in place to lookup invoices, contracts, and other financial information from the system(s) prior to the implementation of Munis. The goal has been to migrate RVI to DocuWare.
- **Questys** – This is used in the County on a limited basis.
- **Digital Reel** – Contains old Assessor Clerk-Recorder records for lookup and viewing that were converted from microfilm or microfiche.

In interviews with Departments, there was not a strong opinion that DocuWare is the right long-term EDMS system for the organization. It was interpreted that some at the County would like to consider other EDMS alternatives that are more prominently implemented in the local governments throughout California. The County continues the desire to focus on a single organization-wide solution for integrated and interactive document sharing, as well as commonality and consistency of file and document storage and retention. The goal of the County continues to be the successful implementation of an enterprise EDMS solution that can provide the following benefits:

- **Compliance** – Improved and more efficient ability to comply with increasing volume and complexity of regulations and retention requirements
- **Security** – Improved physical abilities and accessibility to security
- **Workflow Capabilities** – Electronic capture, routing, and approvals of manual paper processes
- **Improved Efficiency** – Increased productivity through automation of manual processes and time reduction in retrieving and sharing information
- **Reduced Costs** – Reduced costs of printing, paper, storage space, and labor
- **Reduced Carbon Footprint** – Minimized paper waste (see *Green IT* initiative under *Best Practices*)
- **Improved Transparency** – Increased accessibility to information via the Web, including full automation of some types of documents immediately upon creation without additional processing or labor
- **Disaster Recovery** – Protection of vital records through storage redundancy

Return-on-Investment (ROI) Considerations

- A study conducted by Coopers and Lybrand found the following:
  - The average document gets copied 19 times in its life.
  - 90% of documents that are handled in an office are merely passed along or shuffled through.
  - The costs to manage a single document are below:
    - $20 to file a document
    - $120 to find a misplaced document
    - $220 to replace a lost document
  - 7.5% of all documents get lost.
    - An office that generates 200 documents a week will lose 15 of them, costing a total $3,300.
  - 3% of all documents are misfiled.
    - An office generating 200 documents a week will misfile six of them, costing the company $720.
- A feasibility study by the North Dakota Information Technology Department regarding ECMS technology found the following:
  - An organization that scans 600 documents per day can have the following benefits upon implementing an ECMS:
    - An ROI payback period of 15 months
    - Gained productivity of almost $114,375
    - Subsequent annual savings of $110,295
    - An overall three-year benefit impact of $531,990
    - Saved $36,556 in annual costs when compared to manually storing and managing documents
- A study conducted by Prescient Digital Media found that an ECMS saves employees between 50-60% of time searching for documents.

Recommendations

- Consider all EDMS alternatives, including DocuWare, by first conducting a needs assessment and process review with all departments to gain an understanding of how the

EDMS system should work across the entire organization. Also consider what functionality, configurations, and training would improve the staff members' ability to effectively utilize an EDMS system, provide more transparency, and integrate other departmental applications and business processes.

- Follow a Software Selection Best Practices approach to develop an RFP, applying needs assessment results to determine a primary vendor to meet County-wide needs.
- EDMS implementations on an organization-wide basis are commonly underscoped and underfunded, leaving organizations with limited benefits. The selection process should include a full assessment of potential costs and resources required in order to properly prioritize implementation efforts that will occur over multiple years.
- Integration with other core application systems across the county should be considered, including Granicus (Agenda/Legislative Management).
- Conversion of documents from Real Vision (RVI), Questys, and Digital Reel is an important component of implementation to the new EDMS system. Particular attention should be made to ensure all departments have access to their previous content when the move is made to the new system.
- EDMS can be a complex and multi-year endeavor to streamline and automate various business processes across departments. Therefore, consider utilizing a third-party subject-matter expert for the process reviews, ROI analysis, and procurement project.

Benefits

- Automated workflow and routing
- Reduction in paperwork and related costs
- Online document retention and archiving
- Improved version and authorization control
- Improved public records access
- Increased information-sharing capabilities
- Ability to provide Web posting and public access to residents
- Integration with Agenda Management/Media Management

23. Enterprise Asset Management (EAM) Including Fleet

Background

Enterprise Maintenance Management (EAM) includes tools for work orders as well as maintenance and asset management of County infrastructure, facilities, streets, sidewalks, parks, trails, bridges, drainage, culverts, etc. EAM is new terminology, and many people still use the older "Work Order and Maintenance Management" or CMMS terminology.

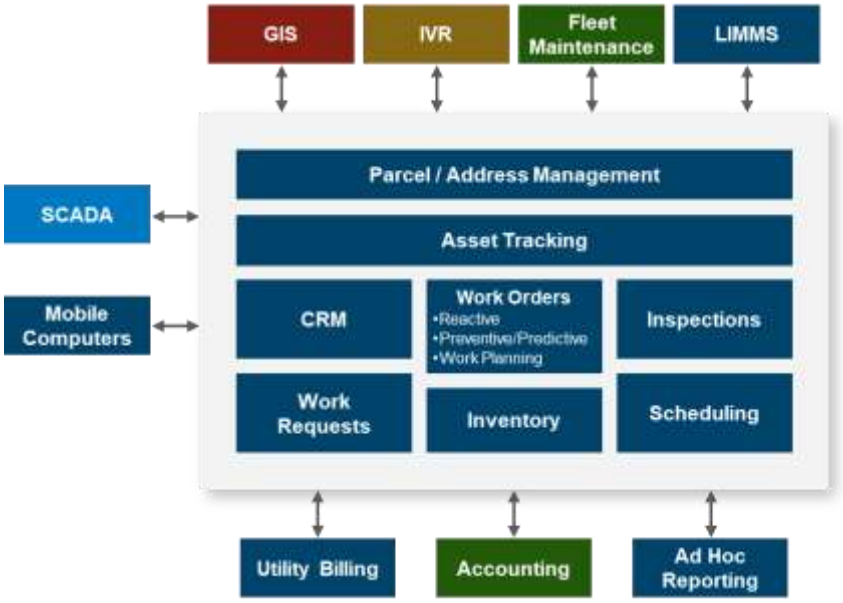
The following is a list of typical EAM software system functionalities. It is not intended to be all-inclusive or organized by specific software modules.

Enterprise Asset Management Functionalities

- Work Requests
- Inspections and Condition Assessment

Work Orders

- Preventative and Predictive Maintenance
- Facilities Maintenance
- Asset Tracking
- Warehouse Inventory
- Parcel/GIS Location Management
- GIS Integration
- Report Writing
- Costing and Budget Forecasts



Findings and Observations

The County is currently using the CAMS system from Cascade Software Systems Inc. in the Transportation Department and Facilities and Fleet Division. CAMS is an asset management system that includes typical asset management capabilities. CAMS is also written to operate as a standalone system, so it includes some accounting, budgeting, and human resources capabilities. The County is using these accounting capabilities, including AP, AR, Invoices, Equipment Cost Tracking, Receipts, Reports, Contracts, and Project Management/Accounting. This includes an interface to the Munis financial system to Accounts Payable.

CAMS has had a visible presence and is used in approximately 40 counties in California. Cascade Software Systems Inc. (CAMS) has been in business for 30 years and has been operating at Mendocino County for more than 15 years. However, the separate CAMS systems installation and implementation in Facilities and Fleet is more recent and not yet fully implemented.

The County implemented Fleet Maintenance Pro from Innovative Maintenance Systems for Fleet Maintenance approximately five years ago. It can potentially be integrated with CAMS, but the integration has not been implemented.

Staff Feedback

The following are comments from management and the daily users of the CAMS system:

- CAMS is not as user-friendly as it looks, operates like an old Windows PC system, and is 20 years old.
- It is considered more of an accounting system than an EAM system.
- The learning curve on CAMS is slow due to the older user interface.
- Users have to page between windows to enter or inquire information.
- Users must double-enter for inventory in remote yards as well as entering time (entered on spreadsheets and then entered into CAMS).
- Accounting, Invoices, POs, etc., are done at the CAMS level with an interface to Munis, but it still seems like manual entries are required for some things in Munis.
- Staff members still use handwritten forms and then enter into the CAMS system.
- Even though most of what staff members need gets into CAMS, there still seems to be a lot of paper flying around in both locations and out in the field.
- Facilities and Fleet have implemented contracts, projects, and human resource details but still need to implement work orders and the mobile application for facilities work orders.
- Facilities and Fleet enter some invoices into CAMS and others into Munis.

Recommendations

- Determine if Transportation's CAMS system is upgraded to the latest version.
- In order to fully implement CAMS functionality, consider conducting business process reviews to automate functionality that is still manual or conducted through shadow systems around the CAMS system (e.g., work order processing).
- Consider contract, project accounting, budgeting, and invoice processing capabilities of the Munis ERP solution to minimize overlapping functionality, duplication of effort, and reduction of reconciliations between systems.
- If it is determined in the future that the County would replace the CAMS system, follow a software selection best practices approach to build an RFP, including full operational business process reviews and new system needs assessment requirements.
- Include a work order/maintenance and asset management suite from the County's existing ERP vendor (Tyler Technologies) due to the advantages offered from a fully integrated solution as a possible consideration.
- EAM implementations on an organization-wide basis are commonly under-scoped and underfunded, leaving organizations with limited utilization and intended benefits.
- EAM projects can be a complex, multi-year endeavor to streamline and automate various business processes. Therefore, consider utilizing a third-party subject-matter expert for the process review and analysis, system selection, and implementation project management.

24. Fuel Management System Integration

Findings and Observations

- The County wrote an in-house system called Garage System to interface with Gasboy and provide the ability to bill departments for vehicle use, miles, and fuel.
- The Gasboy system is not interfaced with the Fleet Maintenance Pro Fleet Management system.
- Additional shadow systems (primarily Excel) are used for Fleet costing, budgeting, and billing to departments.

Recommendations

- Consider conducting a comprehensive needs assessment and costing and budgeting process review for Fleet and Fuel expenses. Although there is integration and some in-house application functionality, there is a great deal of shadow system and manual processes to allocate and budget Fleet and Fuel expenses to the departments.
  - The County may be able to streamline these processes, utilizing more direct integration from Gasboy to the Munis ERP and/or Fleet Maintenance system.
- If viable options exist, consider replacing the in-house Garage System software with off-the-shelf vendor-supported software such as Tyler Munis and the existing or a replacement Fleet Management solution.

25. Project Tracking and Collaboration

Background

Collaboration software can provide effective, flexible, and secure ways of sharing information, including storing, routing, and managing documents, maintaining task lists, managing forms, and creating and managing workflows. The following are benefits of project tracking and collaboration software:

- Internal and external project teams will have a central repository of information related to each project.
- Project documentation is stored centrally to the project (e.g., contracts, purchase orders, reports, interviews, findings, procedures, data, etc.)
- Documents, final and interim reports, procedural documents, and collected project data are adequately tracked to projects.
- Data is not duplicated multiple times due to distribution methods and management.
- Teams are provided with an electronic distribution point for information regarding a project.
- Project collaboration tools provide the ability to share information through multiple types of communication and media, such as:
  - Task creation, tracking, and assignment
  - Calendaring
  - Gantt charts
  - Contacts
  - Alerts
  - Document sharing libraries (versioning, check-in/out)
  - Workflow
  - Search
  - MS Office integration
  - Mobile access for smart phones
  - Project sites
  - Website content management
  - Discussion forums
  - Photo galleries
  - Metadata management

Several vendor-hosted project tracking and collaboration solutions are available that will support collaboration with both internal and external groups of users. Some sample project tracking and project collaboration solutions include:

- Basecamp
- Teambox (Redbooth)

- Zoho
- Wrike
- Smartsheet

Findings and Observations

- The County had several requests for project management/collaboration software.
- The County does not have a designated standard, and personnel are using various tools at their disposal.

Recommendations

- Form a multi-department committee to review project tracking/collaboration solutions and their overall capabilities.
- Conduct a needs assessment that documents feature/function requirements and needed capabilities.
- Follow software selection best practices.
- The recommendations from the *Project Planning and Implementation Management Best Practices* initiative should be followed to implement the system, including the necessary system administration and end-user training.

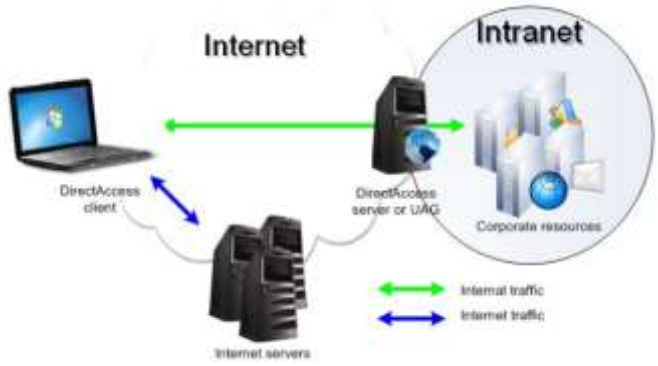
26. Intranet

Background

An *intranet* has a similar function to an organization's public-facing website except that it uses the organization's internal computer network to house a website-structured presence to share information in a private and secure manner. Generally, it is dedicated to internal use by the organization, staff, and management.

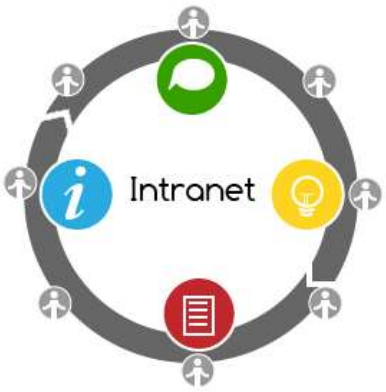
Intranets or intranet sites provide useful information such as the ability to communicate within the organization and reduce miscommunication by providing consistent informational and instructional content. It also reduces the time spent requesting and distributing documents between and throughout departments and the need for maintaining physical documents. Intranets can be used to:

- Quickly communicate news, changes in policies or benefits, and emergency information
- Promote a common culture
- Offer a dynamic calendar of events, activities, due dates, etc.
- Important news and newsletters
- Allow easy access to policies and procedures, training manuals, or forms
- Provide contact information for departments, supervisors, and other staff
- Collaborate on County projects with contractors and vendors
- Contain links to application-supported services (i.e., there may also be a link to Employee Self-Services that are tied to the Human Resource and Payroll applications, enabling employee capabilities to access electronic check stubs, electronic W-4 forms for filing changes, or other HR services)



Other potential County-wide intranet uses could include, but would not be limited to:

- Increased County-employee communications
- Tricks and tools that would benefit users
- Contact information (internally and externally shared)
- Major project-related information
- Personnel forms
- Benefits information
- Policies and procedures
- Administrative forms
- Training libraries



Agencies that are most successful with intranets set up staff personal computers to have the organization's intranet site as the homepage that launches whenever a browser is opened.

Findings and Observations

- Numerous Departments expressed a strong need and interest for the County to add an Intranet site.
- During the needs assessment interview workshops, several departments expressed that it would be nice to have the intranet manage content similarly to the way the County's Vision Internet public website operates, which would eliminate the need to learn content management on two different systems.

Recommendations

- Conduct a County-wide needs assessment for internal department communications that could be posted or stored on the intranet, such as frequently asked questions and frequently requested information, so that employees can utilize the intranet's self-service capabilities.
- Consider integration of the intranet with future EDMS capabilities (see the *EDMS Electronic Document Management System* initiative).
- Make the intranet the default Internet browser homepage for all County staff.
- Use the intranet site as a method to reduce other mass employee communications, such as email, flyers, and bulletin-board posters (as applicable).
- Design the intranet with tools to automatically convert the intranet content and presentation components to a mobile-compatible display format so employees can use their smart phones and tablets to access the District's intranet.
- Provide training for employees to access self-service capabilities as users. In addition, provide training for staff that needs to post content and provide self-service information to ensure they can post and maintain content regularly.
- There are many parallels between implementing an organization's public-facing website and implementing an internal organization-wide intranet. It is recommended that the County consider designing and building the intranet with the same tools and resources that are used for the County's public website.
    - The County's existing website vendor, Vision Internet, offers templates and structure for organizational intranets. Using Vision Internet may result in website/intranet tool cost savings and keep the knowledge and skills required consistent for County staff that will be tasked with supporting content on both the County's website and the future intranet site.
- Implement practices and make the intranet a component of the IT Steering Committee responsibilities to ensure that the site is maintained regularly and remains relevant and up-to-date for the County's employee community (see *IT Governance* initiative).

Benefits

- Reduction in miscommunication due to the use of a single-source communication location
- Electronic Documents (decreasing labor and space requirements for physical documents, such as procedure manuals or paycheck inserts)
- Electronic Forms (decreasing the need for physical employee forms)
- Increased employee productivity and collaboration
- Remote access to information when outside the office

27. Agency Wikis

Background

A wiki is essentially a website with the ability for defined users to collaboratively edit and contribute information. Wikis are also sometimes used as a substitute for an internal intranet environment.

Findings and Observations

- Several departments expressed an interest to set up wikis for their department or a division to post and exchange information, as well as enhance communication.
- The effort for the group to work together collaboratively can be beneficial.
- Other counties and cities have offered the ability for departments or groups to set up wikis under published policies and guidelines.
- Most were not sure where to start and others have already started investigating how to get a wiki started in their operational area.

Recommendations

- As with any solution, IT and County management will need to determine if wikis should be allowed.
- Since a wiki is a technology, the County IT department should establish specific policies and procedures. This should include user roles and access for each wiki.
- A standard wiki toolkit should be selected so wikis are built using uniform tools by all departments. This will help with standardizing training, stability, and reliability, while making it easier for staff members to work across departments.
- There are several wiki tools for building online communities at a department or operational group level. Some tools have a cost and others are free. Commonly known tools include:
  - MindTouch
  - Wikispaces
  - Atlassian Confluence
  - MediaWiki

28. Electronic/Digital Signatures

Background

Electronic/digital signatures allow for a person to sign a document electronically from anywhere they have access to a computer. There is a difference between an electronic signature and a digital signature, as outlined below:

- An *electronic signature* is a captured signature using a signature pad, a touchpad (tablet or phone), or a computer, using a mouse.
- A *digital signature* goes further by embedding a PKI (Public-Key Infrastructure) which requires signers to have a registered digital certificate that links the signer to their signature. In this instance, both the requesting party and the signing party have a specific key identifying their role in the transaction.

The process of identifying signers and originators is the primary difference between an electronic signature and a digital signature. Because both electronic and digital signatures are now equally secure and legal forms of signatures (based on recent UETA and ESIGN acts), many government entities opt for the convenience and versatility of Electronic Signatures.

Findings and Observations

- HHS, MCERA (Retirement), and other County departments have expressed interest in electronic signatures for approvals.
- The Retirement Department is interested in receiving online forms with electronic signatures.
- Some agencies are now using digital signatures for external contracts. However, the County is implementing a Contract Development and Management system from Cobblestone software and the County would like to have digital signature capability incorporated as part of this solution from Cobblestone.

Recommendations

- Identify all documents the County would benefit from using digital signatures (e.g., contracts, agreements, forms, etc.)
- Explore potential integration with documents that are processed and stored through the County's Electronic Content Management System
- Investigate vendor systems to evaluate and compare. Example software vendors include:
  - DocuSign
  - HelloSign
  - SignNow
- Follow best practices according to the *Software Selection Best Practices* initiative, to select the appropriate system.
- Implement according to the *Project Planning and Implementation Best Practices* initiative.
- As part of the Cobblestone Contract Management implementation, the County should investigate whether the Cobblestone solution includes digital signature capabilities.

Benefits

- Improved tracking
- Increased efficiencies
- Reduced risk of lost documents
- Secured signatures
- Reduction of printing, faxing, mailing, copying, scanning, and filing costs

29. Homeless Management Information System (HMIS)

Background

Homeless Management Information Systems (HMIS) facilitate efforts to assist the homeless in their communities to achieve success and self-sufficiency.

HMIS systems need to:

- Have ability to configure programs and services to be HUD-compliant
- Meet Federal Partner Program-Specific Data Element regulations
- Have compliant forms and templates
- Provide HUD-compliant intake forms

Findings and Observations

- HHSA's existing system was implemented over ten years ago and is now in need of replacement.
- Options include enhancing or updating the existing system or finding a replacement in the marketplace.
- If replacement is the best alternative, HHSA's preference is to find a solution from a reputable software company that already has a presence in California.

Recommendations

- Research vendors and costs. Clarity HMIS seems to the most prominent in California, with few other options.
- Consider reaching out via email or use an association-sponsored email list to communicate with your HHSA peers and determine what they may be using.
- Follow the *Software Selection Best Practices* initiative to select the appropriate system.
- Follow the recommendations included in the *Project Planning and Implementation Best Practice* initiative.

30. Migration of Access and Homegrown Applications to COTS

Findings and Observations

Internally Developed Applications and Databases

Although the County primarily utilizes commercial, off-the-shelf (COTS) software applications, the County also has several internally developed application databases. The County relies on these applications, but they consume IT resource time to code, maintain, and manage interfaces and movement of data between systems. In-house systems can sometimes be inefficient and costlier over time. A number of these systems may have potential to be replaced with COTS applications that have more functionality and can free up IT resources.

These internally developed solutions are primarily comprised of the following:

- **Microsoft Access Databases** – There are several MS Access databases for numerous functions, mostly to track information, documents, public requests, and more.
- **Custom Developed Applications** – Developed with various tools and databases on the backend.

Migrating Internal Applications to COTS Solutions

One of the strongest technology trends across both public and private sectors is to migrate from internally developed application development to licensing-specific COTS applications. This can be more cost-effective and efficient than maintaining a custom-developed application environment, which is discussed later in the *Benefits* subsection of this initiative.

MS Access solutions continue to have their place, but the decision to use this approach should be the exception and only considered after all other options have been deemed unfeasible.

The County should use and complete the following table to list additional internally developed database applications, identifying which can potentially be migrated to a COTS solution and which applications may require an alternative approach.

Current Database	Description	Potential COTS Software Option(s)
Business License	Print business licenses, tracking, etc.	• Aumentum
Construction Bid	Track vendors for road or other construction RFPs	• Munis Bids Management • Bids Management Software
Direct Purchase Authority	Track vendors	• Munis Bids Management • Bids Management Software
Employee Info Portal (SRDB)	Employee information from multiple sources	• Munis Self-Service
Extended Leave Tracker	FMLA tracking	• QCERA (replacement in progress)
Facilities work order request	Work orders for facilities, repairs, etc..	• Munis EAM

Current Database	Description	Potential COTS Software Option(s)
Fleetster	Fleet tracking (gas billing, pool car reservations, authorized driver list, etc.)	• Munis EAM • Fleet Management Software
In-Out-Board	Simple in-out board for presence status	
ISCAF	Request system for NSA to add or delete perms and users	• Help Desk Software
Management Training Benefits	Track expenditures/balances for training funds	• Munis Human Resources • Training Tracking Software
Munis Interface	Reports and aux logic built to assist with Munis-related tasks	
Munis Reports	Munis report distribution	• Munis User Dashboards • Intranet
Probable Cause	Resource for officers to send probable cause requests to judges	
Retirement	Tools for retirement planning, mostly depreciated with LRS implementation	
Time Sheets	Allow employees to enter hours worked, time-off requests	• Munis Time Sheets • Tyler/Munis - ExecuTime
Badger	Badge printing software	• ID Badge Software
DOJ Tracker	Adult services (HHSA) provider tracking through application process	
SSI Tracker	Database for SSI recipients	
Environmental Health App	Database tool for tracking various EH tasks	
Misc. Access app in Social services	Various	

Recommendations

- All applications that have industry-available COTS solution offerings could be reviewed to determine if a COTS solution is feasible and cost-effective. These migration processes, when appropriate, should be approached as a project. Applications should be categorized, prioritized, and then scheduled for migration over time. *Note: Some databases may not be feasible to move to a COTS solution.*
- Consideration should especially be given to custom databases or programs whose correlated software modules are already offered by existing enterprise solution providers, such as Munis, TRAKiT, Aegis, etc.
- All COTS selection and acquisitions should follow industry software selection best practices.

Benefits

- There are many benefits for implementing COTS applications as core departmental systems. Custom-development would only remain feasible for unique or niche processes that are not common and do not support a market of customers large enough for vendors to develop a COTS solution.
- Some of the most obvious benefits of COTS applications over custom-developed solutions are outlined below.
- **Low Development Risk** – A COTS application is already developed and tested in the field with an established user community. A custom-developed application is initially fluid and not stable until the development is completed. The risk is whether the system can be developed successfully in-house. This can even be risky if using a large, established, and reputable programming firm. A COTS application exists and does not have an upfront development risk.
- **Lower Cost of Entry** – COTS solutions sometimes have lower cost of entry (comparing apples-to-apples functionality) because users are part of a community, with each customer paying a license for access to the software. In a custom-development scenario, development costs are not shared with a large user base. It is an economy-of-scale formula with cost control based on the size of the participating user community.
- **Higher Odds of Implementation Success** – A COTS solution has been implemented many times over. COTS vendors also provide implementation teams, including project managers, conversion specialists, subject-matter process specialists, training specialists, and more, that have vast experience in implementing their systems.
- **Ongoing Enhancement and Regulatory Updates** – COTS vendors require their customers to pay annual maintenance fees. These fees are a form of shared year-over-year funding for enhancement development (R&D) and for updates to meet state and federal requirements.
- **Support Team Access** – The COTS annual maintenance fees also fund a centralized hot-line and customer support center for all customers having specific experience with the COTS application environment. They are not supporting a one-off, single application, in addition to numerous other unrelated custom applications.
- **Industry Specialization/Functionality** – These COTS vendors are specialized in providing these application systems to the public sector. They understand the business of government entities and their application needs. They do not serve other or multiple industries and sectors.
- **Safety in Numbers** – A user of a COTS application becomes a member of a community of users. These are peers that can be consulted and conferred with. Most COTS vendors hold annual user conferences to provide information on the direction of the product, version releases, and often offer free training. A custom-development situation means operating as a one-off solution, being stranded on an “application island”.
- **Beneficiary of a Competitive Marketplace** – COTS solutions emerge because there is a market large enough to fit the model for a successful COTS software company. When there is such a market with a large number (sometimes thousands) of potential customers, there are nearly always competitors. This competitive environment benefits COTS customers because their chosen vendor is consistently striving to improve and maintain, or gain, a competitive edge, providing customers the benefit of increased functionality and improved service. Custom-development scenarios foster little, if any, competition and competitive benefit.

31. Website Content Management Training

Findings and Observations

During the assessment interview process, nearly every department expressed interest in training on the County's Vision Internet website system, with the highest desire being requested for training on updating and changing content.

Recommendations

- Survey each department to determine who needs training and specifically what type.
- Using the departmental survey results, work with Vision Internet to establish training to meet the needs identified. Vision Internet could provide this training remotely over the Web to keep costs manageable.
- If the demand for this type of training remains high, the County could consider a train-the-trainer approach for a County business analyst, and that analyst would be equipped to provide future training to staff members.
- This training should be incorporated into the overall training plan recommended in the *User Training and Support Best Practices* initiative.

32. Animal Services Chameleon System Improvements

Background

County Animal Services is using Chameleon software from HLP, Inc. Chameleon is an integrated Shelter Case Management System that automates all the processes performed within the County's Animal Services department and at the Animal Shelter. Chameleon assists the County with managing and tracking the following:

- **People** – Staff and Volunteers
- **Animals** – Records, History, Profiles/Photos, Connections to national pet websites
- **Licensing** – Initial and Renewals
- **Kennel/Shelter** – Intake/Outcome, Lost and Found, Management
- **Medical** – Medical history, Treatments, Medications
- **Field Activities** – Calls for Service, Citations, Bites, Dispatching
- **Finance/Receipting** – Fee Calcs, Cashiering, Transaction History

Findings and Observations

Animal Services is using the system, and some staff members have history using Chameleon at other facilities. However, some staff members feel there is room for improvement. These opportunities may include:

- Additional or advanced training
- Greater use of system automation to reduce paper
- Streamline processes
- Implement Auto Email capabilities
- Improved general reporting (case load and more), which would include training and Crystal Reports license access, which are now limited only to IT Department personnel.

Recommendations

- Conduct a process review and needs assessment of additional functionality that would be helpful, including unmet reporting and training needs.
- Review applicable manual processes and shadow systems (e.g., paper forms, spreadsheets, and databases) to determine automation improvements that will result in labor efficiencies.
- This process can also be used to inventory integration and interface requirements such as Munis.
- Develop a plan from the needs assessment to improve utilization, including process improvements, activation and setup of unused functionality and capabilities, and closing gaps in required reporting needs.

33. Library Scheduling System

Findings and Observations

The Library's current scheduling process is primarily manual and does not meet the Library's needs for connected shared use across all branches. Functionality needs include:

- Staff Scheduling
- Room Scheduling
- Events (including staff-scheduled)

Recommendations

- Conduct a process review and develop feature/function requirements for all scheduling needs.
- Follow needs assessment best practices according to the *Software Selection Best Practices* initiative.
- Select a new software vendor according to the *Software Selection Best Practices* initiative.
- Implement using recommendations from the *Project Planning and Implementation Best Practices* initiatives.

34. Justware Gap Analysis and Utilization Improvement

Background

Attorney Case Management Systems (CMS) automate the process, documents, filings, disclosures, and other actions associated with managing and prosecuting/defending legal cases, as well as managing probation cases. Many agencies have integration with:

- Police and Sheriff offices for receiving incident data, referral for charges, and other information relating to the case
- Courts for filing and other court required interaction

Findings and Observations

JustWare, from Journal Technologies, is a set of Case Management System products utilized by the Mendocino County offices of the District Attorney, Public Defender, and Probation Office. A breakdown is included below:

- District Attorney – JustWare Prosecutor
- Public Defender – JustWare Defender
- Probation Office – JustWare Probation
- County Council – JustWare Defender

Four County offices are currently using the system but believe more system functions and capabilities that were not originally implemented would be beneficial. Desired improvements include:

- More training
- More automation within the system to reduce paper
- Streamline processes
- Improved access and JustWare in the Court for the DA and Public Defender
- Two-way interface to receive referrals from law enforcement (PDs and Sheriff) and the ability to report charges back to law enforcement
- Interface to pass on discovery to private attorneys and between District Attorney and Public Defender
- An interface for the District Attorney, Public Defender, and Probation Office to eFile to the Courts, as well as receive disposition information from the Courts reflected in their respective case management systems (the day sentencing and disposition is completed in the Court)
- Ability to email directly from the JustWare system (currently information is saved from JustWare and attached to a GroupWise email for sending). JustWare has this capability, but it is only supported for Outlook/Exchange or Office 365 (see *Electronic Email [GroupWise]* initiative)
- Improved reporting capabilities, including electronic reporting for required State (DOJ) reports (e.g., 8715 and 8716 forms, JCPSS, Novell Assessments, etc.)
- Determine the ability and feasibility to provide the following JustWare Case Management functionality/capabilities:
  - Case Management for victim and witness advocacy staff (JustWare V/W Advocacy)
  - Expand Case Management for County Counsel
  - Improved ability for Probation to view the Case Management module

Recommendations

- To avoid spending thousands of dollars on unfocused application implementation and training improvements that may leave some processes not fully automated and/or not fully optimized, we recommend conducting process reviews and/or needs assessments to determine gaps and develop an improvement plan to close these gaps. The needs assessment process inventories current and future functionality requirements by application function for each department. The software vendor is then asked to respond to these requirements with their capabilities to determine their level of compliance with the County's specific requirements.
- Review applicable manual processes and shadow systems (e.g., paper forms, spreadsheets, and databases) to determine automation improvements that will result in labor efficiencies.
- Any requirements that the vendor is not capable of providing can then be dealt with by other means, such as more efficient work-arounds, third-party applications, modifications, and changes in organizational processes and procedures, etc.
- This process can also be used to inventory all required reports, integrations and interfaces, and training requirements.
- The improvements should also include the implementation of an e-Discovery process that the District Attorney, Public Defender, Alternate Defender, and Probation can all use to share information to eliminate the need for hard copy documents and increase efficiency and reduce costs.
- Develop an implementation plan, using the recommendations in the *Project Planning and Implementation Best Practices* initiative.
- Consider enlisting a third-party subject-matter expert to assist with the above needs analysis and plan development and work with Journal Technologies (JustWare) to implement the improvements.

35. Replacement of Probation Assessment.com System

Background

Assessment.com is a software application solution for static risk assessment. The system was originally developed for a consortium of 16 probation offices with only two-to-three members still using Assessment.com.

Findings and Observations

- Due to the age of the software and the fall-off of consortium users, a replacement tool needs to be identified and implemented.
- Most of the original consortium have already made the move to the Noble Software Group's Assessment solution, and the County Probation Office is planning to move to the Noble system.

Recommendations

- Research vendors and costs. There is not a large market for computer off-the-shelf software providers.
- Reach out to the previous consortium members to determine what solutions they have selected as a replacement.
- Investigate the replacement alternatives identified to compare and evaluate them.
- Follow best practices according to the *Software Selection Best Practices*.
- Follow the recommendations included in the *Project Planning and Implementation Best Practice* initiative.
- At the time this report was prepared, this initiative was in process.

36. GIS Assessment and Computer-Aided Dispatch Base Layer

Background

GIS systems are integral components in the business of managing the County's addresses, parcels, streets, roads, and other activities. In addition to tracking all parcels within the County, many agencies inventory infrastructure assets, such as street signs, street lights, bridges, roads, hydrants, and other fixed items through the GIS system. Current generation CAD/RMS systems often utilize GIS layers for dispatching officers, automated vehicle location, vehicle routing, state and federal reporting, and crime analysis.

Findings and Observations

- GIS staff members attempt to update parcels based on land use changes every year or two.
- Parcel definitions are not always clear.
- GIS staff members utilize Google Earth and US Government low-resolution photographs to assist in defining parcel boundaries.
  - Low-resolution photographs limit GIS staff member's ability to clearly define parcel boundaries.
- Roads within the County often have multiple names.
  - Naming roads and assigning official addresses can be difficult.
- Current versions of New World Systems Aegis require GIS base layers and accurate GIS street centerline data for dispatching and reporting.
  - Inaccurate GIS data can lead to dispatching or reporting errors.
- New World Systems will provide some assistance in evaluating existing GIS capabilities before migrating to current versions.
  - We have worked with agencies who have uncovered GIS issues after Aegis upgrades that hampered dispatch or reporting capabilities.

Recommendations

- Use a qualified third party to review and assess County GIS data for compliance with Aegis specifications prior to upgrade.
- Allow sufficient time to remediate GIS data before an upgrade.
- Increase the frequency of published parcel and address updates from the GIS team to County GIS consumers.
- Review road and street names comparing United States Postal Service names with nicknames and legacy names to develop a standard for the County.

Benefits

- Centrally-managed information
- Improved accuracy of GIS information
- Easier creation and storage of digital maps
- Better analysis of infrastructure
- Improved land-parcel management
- Improved customer service through the ability to publish for public access

37. Aegis Gap Analysis and Utilization Improvement

Background

Aegis CAD/RMS/JMS (Computer Aided Dispatch/Records Management/Jail Management) from Tyler Technologies is a respected and well-regarded public safety solution with a significant base of users across the country, including California.

Findings and Observations

Aegis is the primary software solution in the Mendocino County Sheriff's Office (Sheriff). There are various satisfaction levels expressed by some of the sheriff office users.

Although, most expressed their desire to improve use of the system, including:

- Additional training
- Streamline processes
- Improved integration with GIS (see GIS Assessment – CAD/RMS Specific initiative)
- Improved integration/interfaces with the Court, DA's Office, Probation, etc.
- Improved reporting capabilities
- General higher-level automation by fully using the features, functions, and capabilities of Aegis

There is also a major Aegis upgrade/release that is coming from Tyler that will be implemented in fiscal year 2020. The timing of this initiative should be coordinated with the implementation of this release.

Recommendations

- To avoid spending thousands of dollars on unfocused application implementation and training improvements that may leave some processes not fully automated and/or not fully optimized, we recommend conducting process reviews and/or needs assessments to determine gaps and develop an improvement plan to close these gaps. The needs assessment process inventories current and future functionality requirements by application function for each division. The software vendor (Tyler) is then asked to respond to these requirements with their capabilities to determine their level of compliance with the Sheriff's specific requirements.
- Review applicable manual processes and shadow systems (e.g., paper forms, spreadsheets, and databases) to determine automation improvements that will result in labor efficiencies.
- Any requirements that the vendor is not capable of providing can then be dealt with by other means, such as more efficient work-arounds, third-party applications, modifications, and changes in organizational processes and procedures, etc.
- This process can also be used to inventory all required reports, integrations and interfaces, and training requirements.
- Develop an implementation plan and complete the implementation following the recommendations in the *Project Planning and Implementation Best Practices* initiative.
- The Sheriff should enlist a third-party subject-matter expert to assist with the above needs analysis, plan development, and work with Tyler Aegis to implement the improvements.
- Due to the implementation of the upgrade/release implementation in fiscal year 2020 and the large amount of feature/function additions, we recommend this gap analysis and utilization improvement be conducted after the upgrade/release is fully deployed at the Mendocino Sheriffs' Office.

38. Jail Visitation Management Software

Findings and Observations

- The Sheriff is currently using spreadsheets and paper for this process.
- The desire is to automate the process as much as possible.
- Tyler Aegis does not have a visitation management system but have indicated the willingness to assist with an interface to Aegis.

Recommendations

- Conduct a business process review and needs assessment that documents feature/function requirements and capabilities. Also, be sure to include all integration needs to Aegis, and others required systems.
- Research Jail Visitation Management software, preferably in use by peer sheriff offices in California.
- Follow Software Selection best practices.

39. Migrate Jalan Warrant Process and Historical Data to Aegis

Background

- The historical Jalan Warrant Data, consisting of warrant process information and other historical data, is critical to the Sheriff's Office operations and is accessed daily.
- During the Aegis implementation, the data from the old Jalan system was converted into the Aegis system, but it caused numerous errors and the decision was made to back out the Jalan data.
- Due to these errors, the Sheriff's Office decided to manually copy the warrant information into Aegis to ensure the data is transferred accurately. Originally, there were more than 4,000 active warrants in Jalan that needed to be converted. At the time of this report, there were approximately 900 warrants that still needed to be migrated from Jalan to Aegis.

Findings and Observations

- The Jalan software, including the warrant data residing on the AS400, is aging and is not being supported. As a result, it is approaching a fragile state. Loss of this information would create a serious problem for the Sheriff's Office.
- The AS400 public safety data (CAD, Crines, and Jalan) is backed up weekly.
- Warrants are available in hard copy, but that requires a manual search, which significantly increases labor time.
- Probation also accesses both active and historical data from the Jalan system. At times, Probation has experienced problems accessing this information in Jalan.

Recommendations

- Complete the conversion of the remaining 900 records from the Jalan system.
- Determine if any other public safety and Court information should be converted. This should include the Jalan data access needs of Probation and other Justice-based departments throughout the County.
- Determine what staff resources and expertise is required to extract any additional public safety or Court data from Jalan and convert it into the Aegis system and complete the conversion as necessary.

40. Conceal and Carry Weapon (CCW) Permitting Software

Background

The Sheriff has been using Permitium for registration and permitting for CCWs (conceal and carry weapons).

Findings and Observations

- The Sheriff would like to automate the system further to have the ability of renewing on the website, which would also provide additional information to the public.
- The Sheriff would like to consider expanding these capabilities with Permitium or with the Aegis CCW module.

Recommendations

- Research both Permitium and the Aegis CCW permit systems to determine the best solution.
- Implement the preferred solution following the recommendations in the *Project Planning and Implementation Management Best Practices* initiative.

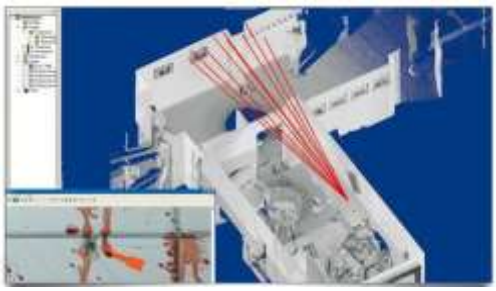
41. 3D Incident Mapping

Background

Recent surges in technology have put practical cost-effective 3D crime scene tools in the hands of investigators. Traditionally, officers would manually layout, measure, and draw a crime scene or incident site that would be two dimensional and static.

With today's scanning technology, these same drawings can be created in 3D and digitized, allowing the viewer to rotate the image, depicting various angles, locations, and perspectives.

Findings and Observations



The Sheriff and District Attorney offices share a FARO 3D Laser Scanning system that is stored in the District Attorney's Office. The system was originally acquired through grant dollars.

- Investigators can capture crime scenes and accident sites in 3D with scanning times taking as little as 15 minutes. The current FARO Laser Scanner provides an exact record of the entire scene at the touch of a button and permits the site to be returned to normal use shortly afterward.
- 3D documentation can now replace crime scene sketches. The crime scene reconstruction can be visited repeatedly to verify witness testimony or evaluate hypotheses.
- Accurate analysis of line of sight, blood spatter, bullet trajectories, or crash elements complement other techniques such as offender's height estimation from video surveillance or skid mark distances in the case of vehicle accidents.

Recommendations

- The Sheriff's Office has requested additional training on the existing shared use FARO system
- Based on current and projected needs, the County believes there will be a need for a second scanner and that plans should be made.
- The shared use environment between the Sheriff and District Attorney offices is a cost-effective policy which should be continued.

Benefits

- Reduced time for the following:
  - Site closure (intersection or road segment)
  - Getting measurements
  - Completing initial sketches
- Electronic dissemination of drawings
- Additional analysis capabilities
- Testing of hypotheses
- More site images than currently performed
- Investigator time savings
- Additional saving potential in dealing with liability cases

42. Automated License Plate Readers

Background

Automated license plate reader technology allows authorities to identify vehicles associated with Amber Alerts, stolen vehicles, potential suspended-license drivers, or other infractions upon a scan of a license plate. License plate readers can be used at street intersections, inside police squad cars, or disguised in other mobile devices such as portable speed readers.

Findings and Observations

- License plate readers (LPRs) are becoming a force-extension tool, providing the ability to record and alert officers to vehicle movements.
- In Mendocino County, fixed-point LPRs would provide limited value, while equipping some patrol vehicles with LPRs could improve officer recognition of suspicious vehicles.
- Other jurisdictions have used disguised LPRs to assist in neighborhoods or subdivisions that may be experiencing a rash of crime.

Recommendations

- Consider LPRs for up to three patrol vehicles, based on geographic areas.
- Consider LPRs that can be placed at entrances to neighborhoods or subdivisions that may be having issues with externally generated crime.

43. Sheriff's Vehicle – Voice Recognition

Background

- Voice recognition software can be used to translate voice commands to mobile data computer commands, allowing officers to dictate reports or run license plates without typing.
- Voice recognition software has improved a great deal in recent years and can now recognize 95% to 99% of spoken words.
- Other jurisdictions have successfully deployed voice recognition software to reduce the temptation of an officer to type while driving and to increase officer productivity.

Findings and Observations

- Many sheriff deputies are not proficient typists.
- Typing in a vehicle can cause an officer to lose situational awareness. Voice recognition software can reduce typing, increase situational awareness, and improve officer safety.

Recommendations

- Research voice recognition software that integrates with mobile data computers.
- Follow Software Selection best practices.
- Consider pilot testing one or more solutions.

Benefits

- Improved officer safety
- More efficient and thorough report writing

44. Sheriff's Office Automated Vehicle Locator (AVL)

Background

Existing vehicles with Sierra modems can provide GPS locator information to automatic vehicle locator (AVL) systems.

Mobile data computers with internal cellular modems may provide limited GPS locator information. Connectivity challenges with internal cellular modems increase in areas with limited cellular coverage, such as Mendocino County.

Findings and Observations

By equipping the sheriff's office vehicles with location technology, each unit can be tracked to its geographic position in real time, allowing the County to:

- See one unit, several units, or the entire fleet on designated maps
- Monitor engine and fuel data
- Keep a usage history for each vehicle

Recommendations

- Incorporate Sierra external cellular modems in all MCSO vehicles for improved cellular connectivity.
  - Sierra external cellular modems will also improve AVL functionality.
- Investigate potential benefits of specific uses for AVL.
- Gather requirements for AVL and investigate potential vendors.
- Follow the guidelines of the *Software Selection Best Practices* initiative.

Benefits

The benefits of maintaining up-to-date data on vehicles gives managers the ability to:

- Reduce response times by locating the nearest vehicle for dispatch. This is especially valuable due to a large geographical size of Mendocino County.
- Improve driver safety
- Improve public safety
- Increase efficiency savings
- Improve public relations

Gov 2.0 / Smart Counties

Gov 2.0 / Smart Counties (E-government) is the concept of using new technologies in combination with creativity, information sharing, and the collaborative process to better serve and interact with the public.

49. District Attorney-Specific Email and Web Page URL
50. Volunteer Tracking and Contact System
51. Central Door Access Control System

45. OpenGov

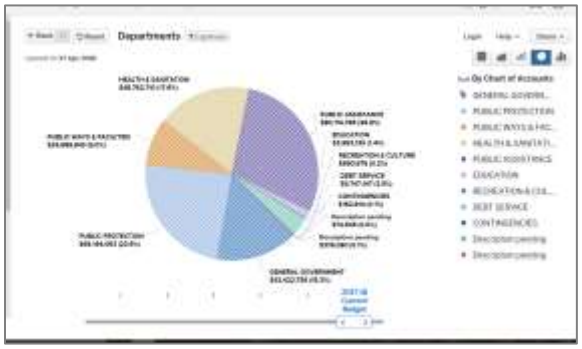
Background

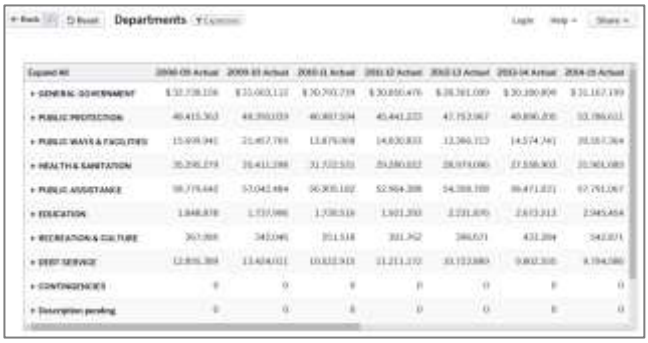
The principals of transparency, participation, and collaboration have been a visible, leading trend since these concepts were put forth by the Open Government Directive back in 2009. OpenGov and similar solutions have emerged and grown in capabilities over time.

These Open Government solutions integrate with County enterprise systems, and if the applications environment is made up of solutions from multiple vendors, these systems can potentially be integrated as well. Data can be viewed in dashboard form for internal use and applied against key priorities and performance metrics. A key element of these systems is that the data can be presented to the public through an Internet portal.

Findings and Observations

- During the County Leadership Group discussion, several participants provided feedback on the need for public access to financial-related data. OpenGov was mentioned as one of the solutions being considered, which the County already licenses for some functionality that is provided on the County website.
- The financial data provided on the County website includes historical actual revenues and expenses, as well as approved budget. However, this information is not up-to-date due to internal staff turnover.





- The County has recently re-engaged OpenGov to learn more about the overall system and portal capabilities to update the information and maintain it on an ongoing basis.

Recommendations

- Assemble a research committee to determine the County's needs and determine the interest and needs of the public.
- Obtain training from OpenGov focused on the outcome of the County's needs determined in the step above.
- Consider OpenGov's internal portal and key performance metrics capabilities for department reporting and research.
- Depending on County needs and licensing costs, the County may also want to explore other solutions, including Tyler Citizen Transparency service (since the County has Tyler Munis and Aegis solutions).
- It should be noted that vendors in this open-government space often describe the integration and data access as easy to integrate. However, it takes talent, resources, and time to make these systems work with the County's existing systems environment.

46. Mass Public Outbound Communications

Background

Outbound communication systems, such as Reverse 911, have gone through a significant transformation in recent years. There are many more system providers which caused price reductions in the marketplace. Enhanced mass notification systems can also integrate with severe weather warning systems and use delivery mechanisms like emails, texts, RSS feeds, social media, etc. These systems can be used for non-emergency mass notifications as well, such as street closures, interruptions in water service, major organization events, etc.

Findings and Observations

- The Sheriff's Office and Office of Emergency services is currently using the mass communication products from Everbridge Inc.
- Some other departments may already be utilizing alternative types of outbound communications.
- Other departments have expressed the need and are interested in potentially using mass email or text message notifications for the following:
  - Street Closures
  - News Releases
  - County Events
  - Disasters
- There is also potential interest from the public to receive notifications, and department staff members would like to allow the public flexibility to register for whichever notifications they would like to receive.

Recommendations

- Consider utilizing the County's existing Everbridge solution as the County-wide mass communication solution before procuring additional new software.
- Several website providers, including the Vision Internet, may offer a resident notification capability and the ability for the public to register for specific notifications.
- Consider collecting citizens' communication preferences (e.g., mail, email, text, website, opt-in or -out for specific types of communications, such as public safety, emergencies, community events, general info, etc.)
- Determine costs of greater usage. Costs are usually measured per contact, but some vendors have gone to an annual-subscription model based on agency population.
- Consider integration with certain automated emergency notification systems.

Benefits

- Increased community outreach
- Improved public relations
- A single standardized tool for use across the entire County

47. Board Meeting Automated Text Recording and Minutes (Talk-to-Text)

Background

Talk-to-text (voice-to-text) is a growing field. However, it is not a common feature used with Agenda/Legislative Management systems used by local government agencies.

Findings and Observations

It is not clear if talk-to-text technology has been integrated with the County's existing Legistar (Granicus) system nor if Granicus supports such capability.

Recommendations

- Investigate options and communicate with Granicus to determine if talk-to-text is feasible for the County's system environment.
- If it is determined to be feasible, ensure that the solution can be thoroughly tested or run in a beta environment to prove it is a viable solution.
- If there is a positive outcome from the above due diligence, proceed with implementation.
- There are other third-party solutions that provide talk-to-text recording for meeting environments. However, it is uncertain if they are viable in a from such as the Board Chambers.

48. Kiosks

Background

Kiosks are public-access computing devices placed in convenient places for citizens to use to access information and conduct transactions without having to call County staff members or wait in line at the office counter. This also provides a method for citizens without home computers to take advantage of electronic business services available from the County. Potential uses include:

- Accessing various types of program information (perhaps from the County websites)
- Accessing other community-oriented information or services
- Completing online forms or filings
- Completing various types of registrations or applications
- Making online payments

Findings and Observations

The County Executive Office and several Board Supervisors have expressed the need to provide services for the public to bridge the digital divide. Anything that the public can do at their business or their home, online, or on a personal computer, can also be performed on a Kiosk. Kiosks emerged as one of the key options to meet this need and are considered an important technology for Health and Human Services.

Recommendations

- Consider using repurposed desktop computers before spending additional funds on kiosks.
- Consider placement and use of kiosks for self-service at County vestibules and lobbies, annex facilities, libraries, etc., where appropriate to provide ease of access. Locations that the County would initially like to be considered are:
  - Ukiah
  - Fort Bragg
  - Willits

Deployment should include, at minimum, any transactional capability offered on the County website.

49. District Attorney-Specific Email and Web Page URL

Findings and Observations

For identity, communication, and branding, the District Attorney has requested:

- A separate email URL depicting the DA's own domain name (name@mendocinoDA.org)
- A separate webpage domain name (www.mendocinoDA.org)

Recommendations

- Due to possible changes related to migrating from GroupWise MS Exchange server or Office 365, it is recommended that the DA's make no changes until that decision is made and the project is funded. It would be better for the DA to settle into the new environment before making such a change.
- Once the transition is complete, the DA's office can work with the IT Department and discuss the details and options related to the domain change.
- The domain name change should be planned as a project and implemented based on the recommendations outlined in the *Project Planning and Implementation Best Practices* initiative.

50. Volunteer Tracking and Contact System

Background

A volunteer or disaster services worker (DSW) management system provides efficiencies in tracking, managing, and communicating with volunteers. Typical volunteer management systems provide online volunteer applications, alerts and announcements, tracking of volunteer/disaster services, worker skill sets, licenses, certifications, services hours, and scheduling. Some of these systems also allow volunteers to access and update their information and schedules through an online volunteer portal and mobile devices.

Findings and Observations

Office of Emergency Services is manually tracking hundreds of Disaster Service Workers (DWS) and is interested in a centralized digital location to store and retrieve legal copies of DSW documents to allow access to volunteers and their specific information and skills.

Recommendations

- Research volunteer management systems comparing functionality and costs. Example vendors include:
  - Sumac
  - CERVIS
  - YourVolunteers
- Ensure that the system chosen must be able to track skill sets, licenses, and certifications.
- Identify any other departments that may also have a need for volunteer tracking capabilities.
- Follow best practices according to the *Software Selection Best Practices* initiative to select the appropriate system.
- Follow the recommendations included in the *Project Planning and Implementation Best Practices* initiative.

Benefits

- Streamlined volunteer applications
- Centralized volunteer information
- Better management of volunteers and their assignments
- Improved scheduling

51. Central Door Access Control System

Background

Door access control and security, or *keyless entry*, is an effective way for the County to manage security and access to various buildings, facilities, or other controlled locations. Such systems often use a single, multi-functional photo ID badge for facility access. Secured access control systems allow the County to track and control access to facilities and secure spaces (such as computer rooms) within facilities.

This limits security risks and allows for the management of access by employees and the public. Many agencies are moving to a single, organization-wide system to manage security and access to facilities.

Door access control systems:

- Ease management of facility access by reducing the need to manage individual keys and locks
- Create audit trails of access to secured spaces
- Can be integrated with video surveillance systems

Findings and Observations

- The County has separate keyed and wireless security systems.
- Systems are a mix of physical keys, key pad locks, and cards.
- Many departments have suggested a centrally managed County-wide system for security and access if it can accommodate everyone and provide access to constituents enrolled in services or programs.
- The Sheriff Department has a door access control system.
- Several other departments have older, standalone door-access control systems.
    - Some of these older systems are end-of-life and no longer supported.

Recommendations

- Complete an inventory of County's facility access and control requirements.
- Consider a single, County-wide system that includes all departments and divisions within the County.
    - Access can be administered by specific departments within a single system.
    - MCSO and HHS may require separate administrative capabilities due to regulatory requirements.
- Follow best practices according to the *Software Selection Best Practices* initiative to select the appropriate system.
- Ensure integration between the new system and other systems (e.g., Sheriff systems, Active Directory and, potentially, others).
- Consider moving to proximity cards for employee identification cards.
    - Sheriff and HHS will have unique requirements.
    - HR is typically assigned primary responsibility for card management.

Benefits

- Improved maintenance requiring less time
- Mechanical locks and keys replaced with electronic locks, badges, or cards and readers
- Eliminated expense of rekeying or changing locks for employee separations

- Reduce costs through economies of scale due to a centralized system instead of numerous duplicated individual departmental systems
- Reduction of false alarms by employees and others
- More efficient temporary access by outside personnel, like visitors or vendors
- If integrated with the Police Department systems, aids more timely response to alarms
- Decreases liability and risk by increased access control

IT Infrastructure

IT Infrastructure refers to networks, servers, equipment, inside and outside cable plant, and other communications infrastructure.

52. Network Upgrade
53. Structured Connectivity System
54. Storage Area Network (SAN) Upgrade
55. Cloud Computing
56. IT Computer Equipment Replacement Plan
57. Internet Bandwidth
58. Office Software Upgrades
59. WebEOC
60. Technology Support for the EOC
61. Network Resiliency Study – Emergency Broadband Availability
62. Electronic Mail (GroupWise)
63. E-Fax
64. VMware Upgrade and Server Refresh - Complete
65. Remote Access Upgrade
66. Wireless Network
67. Video Surveillance Assessment and Replacement
68. Property System
69. Microwave and Multiplexer Replacement
70. Radio Systems Upgrades and Replacement
71. Microwave Ring Expansion
72. Video Conferencing
73. Infrastructure Roles and Responsibilities
74. MCSO Structured Connectivity System
75. MCSO Local Area Network (LAN) Upgrade
76. MCSO Infrastructure Upgrade (Servers, SAN, and Backups)
77. Multi-Jurisdictional Radio Operations
78. Dispatch Radio Console Replacement

52. Network Upgrade

Background

A *Local Area Network* (LAN) is a group of interconnected computers that span a building using copper, fiber cabling, or wireless technology as a means of communication. Typically, access to a LAN is controlled by authentication software integrated with Active Directory. Authorized users access the network and can then use resources and applications assigned to them. LANs are very common due to their small size, low maintenance, fast speeds, and ease of use.

Findings and Observations

- The County LAN's consist primarily of various makes and models of Cisco switches.
- County IT supports all the network switches including those at the Sheriff's office.
  - Many switches are end-of-life and end-of-service.
  - The core switch at County IS a single Cisco 6513, which is end-of-life and no longer supported.
  - The core 6513 does most of the routing for the County.
  - The core switch at MCSO is also end-of-life and no longer supported.
  - There are many unmanaged switches of various makes and models, mostly in MCSO. Unmanaged switches create the following security risks on the network:
    - Cannot route traffic properly, so they create extra traffic on the network
    - Do not support VLANs for proper network traffic segmentation
    - Cannot be monitored
    - Have a higher rate of failure

- A limited number of Virtual LANs (VLANs) are in place in some parts of the organization.
- Port-level security is not in use.
- The County does not have centralized management software to configure switching and routing equipment.
  - The County does not have a patching schedule or deployment templates for new or existing switches.
  - The County would like to establish a bimonthly deployment schedule for all switches, firewalls, and routers.
- The County maintains a limited inventory of spare network equipment.

Recommendations

- Replace the core switches at County IS and MCSO with redundant layer three switching to improve network resiliency.
- Eliminate all unmanaged switches on the network.
- Improve network documentation and diagrams.
- Develop a comprehensive network design to correspond with the network upgrade.
  - Expand the use of VLANs to increase prioritization and security.
  - Consider routing at regional aggregation points to facilitate local communications and services.

    - Determine the best method of implementation of port-level security.
- Implement a configuration management tool to distribute and backup network configurations.
- Create a network equipment inventory and capital replacement plan.

Benefits

- Improved network performance and reliability
- Increased security on network and resources
- Reduction in costs associated with replacements and failures
- Ability to establish an internal SLA (99.9% would be standard for local government)
- Improved budget and project planning
- Increased network resiliency and performance
- Reduced IT staff support effort

53. Structured Connectivity System

Background

A *structured connectivity system* is a complete set of cabling and connectivity products that integrate voice, data, video, and other technology systems into a comprehensive infrastructure.

Findings and Observations

- Fiber-optic communications system patch panels are not labeled in a reliable manner or in some cases, are not labeled at all.
- The copper, horizontal cabling system is primarily comprised of Category 5e (1 GB) cable.
  - Category 5e cable is inadequate for the newest generation of wireless access points.
- The fiber-optic backbone system varies throughout the buildings and, in some cases, has bandwidth limitations of 1 GB.
  - Current generation backbone systems are 10 GB.
- MSCO cabling is limited; to add computers and printers within the existing cabling plant, staff members use small, unmanaged switches.
  - Small, unmanaged switches are a major security concern. If they begin to fail, they can create broadcast traffic that may take the entire network down.
- Some small, unmanaged switches are used in other County facilities.
- IS staff members perform small cabling jobs to assist department facility moves.
- Equipment racks and cabinets are not grounded.
- As-built record documentation related to the horizontal and backbone communications system does not exist.

Recommendations

- Create a bid document, including Structured Cabling Systems (SCS) standards to re-cable MCSO offices.
  - This document will be used to support the ongoing needs of the County as it relates to maintaining the existing SCS and can also be provided to architects and/or contractors as part of the construction specification for future projects. The SCS Standards Document should have the following as its goals:
    - Implement a non-proprietary cable infrastructure system supporting multi-vendor equipment and services.
    - Provide reduced cost for future cable installation, support, and management.
    - Maintain consistency providing reduced training requirements for employees.
    - Improved troubleshooting and support for ongoing management/maintenance.
    - System based on recognized industry standards (ANSI, TIA/EIA, IEEE, and BICSI).
- Develop and implement a unified labeling system that incorporates the fiber-optic cable.
- Provide suitable patch-cord management system at equipment racks and/or cabinets.
- Utilize the MCSO bid to hire a contractor to perform small cabling jobs as required.
  - Charge departments back for cabling as a part of department moves (See *IT Cost Allocation* initiative).
- Plan to upgrade wireless access-point cabling.
  - Industry best practice specifies two (2) Category 6A cables to each access point.

54. Storage Area Network (SAN) Upgrade

Background

Servers and storage area networks together provide the computing power that drives modern enterprise applications.

A *storage area network* (SAN), shared storage that uses data communications infrastructure, provides several unique benefits over direct-attached storage, including easier scalability, centralized management, and increased disk utilization.

Hyperconverged systems, a newer technology, combine servers and storage into a single platform. This results in greater ease of use, easier expandability, and, in some cases, faster recovery times. Hyperconverged systems can be expensive for larger organizations.

Findings and Observations

- The County operates virtual environment of servers that are aligned with specific types of applications.
- The County is in the process of replacing the current production SAN.
  - The current production SAN is obsolete.
  - The current SAN has a storage capacity of 85 TB of usable space with 60 TB committed.
  - The current SAN is a Dell EqualLogic; the new replacement SAN will be an upgrade moving to the Dell Compellent series.
  - The County is planning on repurposing the current production SAN by moving it to the old downtown MDF and setting it up for off-site replication.
- The Sheriff's office is in the process of configuring a new virtual environment to replace the Aegis system and provide enough capacity to upgrade to the Enterprise version.
- There are some ancillary physical servers in production.
  - The current configuration of physical servers at the Sheriff's office limits consolidation and resiliency options and increases support costs.
- Solid-State Disk (SSD) technology provides significant performance increases over spinning drives.
- The County utilizes its VMware virtual server environment on its SAN. This has many benefits for VMware, including centralized management, failover, and load balancing.

Recommendations

- When moving to a virtual server environment at MCSO, store all data on the new SAN.
- Utilization of VMware for the virtual environment at MCSO will match County IS, leverage the current knowledge of County IS staff, and provide economies of scale.
- The new SAN should include enough SSD capacity for all critical, high-speed applications, such as SQL databases.
  - Institute *storage tiering*—a storage networking method where data is stored on various types of media based on performance, availability, and recovery requirements—to improve the performance of core data and applications.
  - Use slower spinning drives for traditional file type databases.

- Procure an additional iSCSI-based SAN for failover and redundancy (replication and synchronization).
- Include necessary backup and disaster recovery capacity as a part of the design process.

Benefits

- Improved recovery times in the event of a major issue at the primary computer room
- Increased performance and enhanced reliability
- Reduction in reoccurring costs for maintenance and expansion
- Improved server performance
- Improved user experience
- Increased flexibility and system growth

55. Cloud Computing

Background

Cloud computing can be described as IT services or equipment that are not internal, but available through the Internet. This can range from having a server hosted in an organization or facility other than the local organization, accessing information from a portable device, processing requests from the field, subscribing to an Internet-based software solution per a subscription model (often referred to as "software-as-a-service," or SaaS), and more. The benefits of cloud computing allow individuals to collaborate and remain centralized, regardless of location.

Cloud computing is one the most prominent discussions among current trends in IT. Significant benefits can be achieved, including security, disaster recovery, and cost savings. However, cloud computing options for many systems are still not cost-effective nor the most secure approach.

Findings and Observations

- The County has very few cloud-based systems.
- Infrastructure and Internet access improvements will be required for the organization to fully utilize cloud-based systems.

Recommendations

- Before moving any significant applications to the cloud, the County should:
  - Procure a second Internet connection from a separate Internet provider
  - Conduct a cost-benefit analysis

  Note: Insufficient Internet bandwidth and lack of redundancy can cause severe negative business impacts if/when the Internet is not available or performing as required.
- As a part of this plan, we recommend cloud-based backups and disaster recovery services.
- The County should continue to consider cloud-computing options for future projects.
  - Cost-benefit can be a significant factor for some cloud decisions.
  - Some cloud solutions do not reduce cost.
  - Some cloud solutions have limited functionality versus some on-premise, server-based solutions.
  - Moving some existing on-premise, server-based solutions may provide little benefit to the County in cost savings or functionality.

56. IT Computer Equipment Replacement Plan

Background

- County PC replacement policy varies by department. Some departments utilize a five-year replacement schedule, others do not maintain a formal replacement schedule.
  - Mobile devices are covered by the PC replacement schedule.
  - Servers, network devices, and other equipment are not covered.

Findings and Observations

- The County has some old workstations and other computer equipment that is past its expected end-of-life.
- IT does not maintain a complete inventory of computer equipment, including when purchased and expected end-of-life.
- The County has been catching up on the replacement of older PCs.
- Many other technology components are at or past end-of-life including:
  - Microwave backbone
  - Radio systems
  - Dispatch radio console
  - Network switching equipment
  - Servers (primarily MCSO)
  - EOC computers

IT Equipment	Recommended Replacement Cycle (Years)
Network Switches	7
Phone System Upgrade	5
Phone System Replacement	10
Audiovisual Equipment	5
Servers	5
Disk Storage	5
PCs	5
Laptops	4
Mobile Devices	2
Wireless Devices:	
Point-to-Point	5
Wireless LAN	4
Windows Software	+/- 5
MS Office	+/- 5
Printers, Scanners	5
Plotters	5

Recommendations

- Develop a five-year, rolling computer equipment replacement plan and budget across the entire County.
- Allow customized length of time for replacement of any technology that may have a unique end-of-life.
- Purchase discounted extended warranties at the time of purchase that will cover the equipment throughout its useful life (e.g., five years for computers and servers, etc.)
- As a result of the project preliminary recommendations, the County has initiated a network upgrade project to eliminate end-of-life equipment.
- The County should provide capital replacement information for use at the start of each budget cycle.

Return-on-Investment (ROI) Considerations

- A study conducted by Express Metrix for quantifying ROI, as it relates to IT and software asset management, describes the following ROI benefits of Replacement Planning within an organization[5]:

[5] Express Matrix.

- Reduced cost of ownership related to IT assets by determining licenses for which an organization is overspending and reducing Help Desk costs
- Managed technology change by developing software procurement models that map current and future needs with technology migration and upgrade planning
- Minimized security risks by preventing unauthorized use, enforcing desktop standards, and identifying PCs with unlicensed applications

As previously referenced in the *User Training and Support* initiative, in a study conducted by the Aberdeen Group, the following were the cost savings that occurred after incorporating a Sustainability Plan:

- System automations reduced paper costs by up to 11%.
- Efficiencies reduced facility costs by up to 10%.
- Waste and disposal costs were reduced by up 8%.
- Transportation and logistics costs were reduced by up to 5%.

Benefits

- Better forecasting of purchases
- Managed process that flattens capital expenditures over time
- Improved computer performance
- Improved available features
- Reduction in trouble tickets to support failing or faulty hardware
- Ability to keep spare equipment around to be reissued, eliminating employee downtime
- Increased employee performance by eliminating the use of old, slow, and post-lifecycle technology
- Reduction in total cost of ownership

57. Internet Bandwidth

Background

Increased *Internet bandwidth* and high availability are becoming increasingly important to organizations for daily functionality. This allows for additional resources to become available during peak Internet usage and provides for resiliency when disasters occur that may affect primary Internet connections that are no longer accessible.

Findings and Observations

- The County Internet bandwidth is made up of Sonic two Internet xDSL lines.
  - E-mail, video conferencing, and VPN use a Sonic-provided connection that offers 30 Mbps via 5 bonded SDSL lines.
  - The second Sonic connection uses 8 bonded VDSL for a potential of 500 Mbps down. Under testing, actual is around 200 Mbps.
  - There are a limited number of vendors available in the area due to the geography and population density of the County.
  - The County has not evaluated Internet options in approximately three years.
- The County utilizes a single Internet provider which uses a single fiber-optic connection.
  - Most agencies of similar size are using two separate Internet service providers to increase resiliency for the Internet connection and improved uptime.
- As the County continues to move to cloud-based applications, the importance of Internet bandwidth and reliability increases.

Recommendations

- Plan to expand the primary Internet connection to nearly double in the next three-to-five years.
- A second Internet connection should be implemented as a part of the County's Disaster Recovery and resiliency planning initiatives.
  - Best Practice would be to implement an Internet connection from a separate provider at a separate County location utilizing diver's fiber-optic cabling.
    - Implementation of a second Internet connection would be most effective if the second connection was terminated at a secondary computer room.
- Additional Internet bandwidth will be required as the County increases the use of cloud-based systems.
- Increased Internet costs have been included in the recommended Five-Year Budget.

Benefits

- Improved performance
- Increased Internet up-time
- Increased resiliency, providing increased cloud-based applications and services uptime
- Reduced risk and liability
- Disaster recovery safeguard

58. Office Software Upgrades

Findings and Observations

- The County currently has desktop and laptop computers primarily utilizing Windows 7 with Microsoft Office versions ranging from 2010 through 2013.
  - County IS currently upgrading Health and Human Services to Windows 10 and Office 2016.
- The new computers being deployed will have Windows 10 with Office 2013. Some users will get Office 2016.
  - Some staff members save files locally.
- Office 2016 is in general release, and the first service pack has been published.
- The IS Team believes they have site licensing for Office 2013 and have downgraded the license to use 2010 versions previously.
- Training on Office software for County staff appears to be inconsistent across the organization.
- Consistent versions of Windows 10 and Microsoft Office will reduce issues related to feature compatibility.
  - Training will also be simplified.
  - Staff productivity will improve.
- Newer application software products will integrate with Office 2013 and above.
  - Application integration will further improve staff productivity.

Recommendations

- Consider a strategy of consistent versions of Windows, Office, and other productivity applications across the organization.
  - Include training as a part of each major upgrade.
- Require staff members to save files in approved locations (not the C: drive) through Group Policy.

59. WebEOC

Background

WebEOC is an emergency operations center (EOC) application that processes various global and regional real-time information feeds to allow for quick planning and preparation, as opposed to local emergency response only. WebEOC can also integrate with CAD systems.

Return on Investment (ROI) Considerations

- A study conducted by OpsCenter shows that an automated EOC system can reduce part-time staffing needs by 25% or more[6].

Recommendations

- Select new EOC software vendor according to the *Software Selection Best Practices* initiative.
- Manage implementation using best practice methodology.

Benefits

- Centrally managed information
- Alignment with disaster recovery plan
- Incident Command System
- Event Information Tracking
- Coordinate support for emergency responders
- Basis for communication to the public during local incidents and for recovery activity

[6] OpsCenter, 2013

60. Technology Support for the EOC

Findings and Observations

- The County activated the EOC for an extended period during the fires of October 2017.
- The County currently has a working EOC committee.
  - EOC workstations were not properly patched, delaying deployment.
- The EOC activation was hampered by old technology, under powered workstations, limited network connectivity, and security boundaries between County IS and MCSO.
- The County's Emergency Operations Center (EOC) technology is insufficient to function optimally in large-scale emergencies. Existing technology includes:
  - EOC Computer is still running on Windows XP
  - Under-powered GIS workstations
  - Fixed location workstations attached to small monitors that limit productivity
  - The IT Team brings in laptops for use and sets up a temporary wireless network for access to the County network
  - Lack of telephone connectivity or licenses
    - *NOTE: Stored telephones were not properly patched, delaying deployment.*
  - Lack of storage for EOC equipment
  - Lack of power, cables, and other miscellaneous supplies
  - Limited wireless network

Recommendations

- We recommend that the EOC committee, County IS, and MCSO IS work together to develop the specific requirements for the County's Emergency Operations Center.
- Add additional wireless capabilities to provide high-speed support for up to 20 individuals or 60 total devices.
- Conduct a study of EOC needs and provide budget for recommended improvements accordingly.
- Incorporate spare radios and batteries.
- AV improvements:
  - Expand workstation display systems
    - Expand GIS mapping capabilities housed within the room
- Consider creating a separate server that connects to County IS and MCSO IS.
  - Replicate critical data, including GIS, to the EOC server.
- Expand EOC storage to include room for two monitors for 20 workstations.
  - Incorporate docking stations for existing EOC Microsoft Surface tablets.
  - Replace out-of-date workstations with new workstations.

Benefits

- Alignment with Disaster Recovery Plan
- Support for Incident Command System
- Event Information Tracking
- Coordinated support for emergency responders
- Basis for communication to the public during local incidents and for recovery activity

61. Network Resiliency Study – Emergency Broadband Availability

Background

With prior failures in the AT&T fiber network (see *Network Resiliency* Initiative), we recommend that the County create a County-owned resilient network path to an AT&T point of presence in Sonoma County. This resilient path will primarily be used for Public Safety-related applications and, to be sure, Public Safety should be given priority.

Internet access is now crucial for many residents and is even more crucial in emergencies and natural disasters. Recent experience with residents crowding around the Willits Library during an AT&T outage point out the increasing importance of Internet access for everyone. In emergency and natural disaster situations, residents need to keep in touch with loved ones, caregivers, and aid agencies.

The concept of this study would be to determine—at a more granular level than as a part of a Strategic Plan—whether there is a cost-effective way to provide residents and other County government agencies with emergency Internet connectivity.

The questions this study could answer include:

- Could the County provide residents and other government agencies reasonable Internet connectivity speed while maintaining Public Safety needs as a top priority?
- How could the County cost-effectively connect to other government agencies, especially municipalities and school districts, to provide emergency Internet access?
- How would the County secure emergency Internet access?
- How would the County provide emergency Internet access to residents?
  - Would hotspots at County facilities be effective or would they create other issues?

Findings and Observations

- In the past five years, the AT&T fiber network has experienced two significant failures. These failures prevent voice and Internet communications outside of the County.
- During the 2015 fiber failure, Willits Library was the sole communications hub for the City, because County Internet connectivity was still functioning.
- The fiber-optic cable path essentially follows Highway 101 through the County.
- The County microwave network that transports radio, voice, and data communications can be expanded to Sonoma County, providing a County-owned communications path separate from AT&T.
  - The potential to secure secondary (Public Safety would have priority) Internet access for residents and other government agencies exists.

Recommendations

- Continue discussions with Sonoma County to determine an appropriate southern terminus of the microwave network.
  - Develop a Joint Powers Agreement (JPA) to provide for network connectivity and transport for a resiliency network connection from Mendocino to the Internet.
- Fund a follow-up study to determine the feasibility of providing residents and other government agencies emergency Internet access on a lower priority than County Public Safety.

Benefits

- Support for the community
- Continued services through other government agencies
  - School districts
  - Municipalities
- Support for future “Next-Gen” E911 applications such as messaging and social media communications
- Support resident safety
- Coordinated support for emergency responders with municipalities
- Backup Internet and voice communications for the County and, potentially, residents, in case of emergency

62. Electronic Mail (GroupWise)

Background

- The County uses GroupWise for the electronic mail platform.
- GroupWise is currently running on five servers in the County IS data center.

Findings and Observations

- The County Management would like to make the transition to a new Microsoft Exchange server or Office 365.
  - Most newer staff members are familiar with MS Outlook and Exchange.
  - Outlook and Exchange integrate extremely well with MS Office and other applications.
  - The Mitel telephone systems owned by the County do not integrate with GroupWise.
  - Many other applications do not integrate well with GroupWise.
- The County should not move to cloud-based email (Office 365) until a second, resilient Internet connection can be installed.
- Many applications (e.g., JustWare) can email from within their respective application. However, most only support this functionality for Outlook/Exchange or Office 365, not GroupWise (see the *JustWare Gap Analysis and Utilization Improvement* initiative).
- The County's email archiving has limited capabilities and is not user-friendly.
  - County is currently seeking quotes for replacement email archiving solutions.
- An email records retention policy is currently not enforced.

Recommendations

- Move to Microsoft Exchange and MS Outlook for electronic mail.
- Investigate and select an improved email archiving solution.
- Develop an Email Records Retention Policy, and implement automatic retention guidelines in support of the policy.

Benefits

- Improved integration with County applications
- Improved integration with business partners and other third parties
- Expanded calendaring, task management, notes, and other functions
- Consistency with other employers
- Reduced time managing email for public records requests
- Reduced time on public records requests
- Improved stability of environment and higher availability of email-based services

63. E-Fax

Findings and Observations

- HHS owns two Mitel Viewpoint fax servers.
  - This product is obsolete and has been replacement by MiCollab product suite.
- Most County fax machines are connected through the Mitel phone systems.
- Each separate fax line costs the County $30 per month or $360 per year.
- While faxes are commonly used in the health field, they can be insecure.
- The estimated cost to upgrade the Viewpoint fax servers to MiCollab integrated fax solution is $10,000 to $20,000.
  - Centralizing fax services and integrating faxing into electronic mail can eliminate the bulk of the fax lines County-wide.
  - Paper, toner, and fax device maintenance costs would be reduced.
- Each individual could have their own fax number correlated to their email address.
  - Departmental fax numbers can be shared between several Outlook profiles.

Recommendations

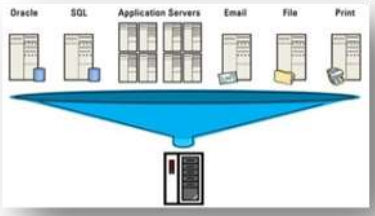
- Inventory all fax machines and fax numbers.
- Investigate fax solution alternatives.
- Develop ROI.
- Implement the most cost-effective solution.
  - A fax server will be most effective after all County phone systems are integrated.

64. VMware Upgrade and Server Refresh - Complete

Background

Hardware virtualization refers to the creation of virtual machine(s) that act like a real computer with an operating system. Software executed on a virtual machine is separated from the underlying hardware resources. Virtualization enables servers to be easier to implement and less costly to own and manage.

Findings and Observations



- County IS has implemented VMware v6.0 for virtualization of most servers.
  - VMware V6.5 has been in general release for more than one year.
- There appear to be limited benefits to moving the rest of the servers to VMware.

Recommendations

- Upgrade to VMware V6.5 - Complete
- Enable additional features on virtual environment:
  - Fault Tolerance
  - Network Interface Bonding
  - DR and Failover Services

Benefits

- Reduced data center space needs
- Reduced power requirements
- Improved failover and reliability

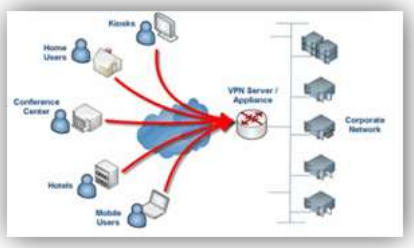
65. Remote Access Upgrade

Background

- Demand for remote access will continue to grow for on premise applications, especially for staff members with significant computing needs in the field.
  - Increased access to mobile applications for smart phones and tablets will also be part of increased remote-access demand.

Findings and Observations

- The County provides remote access through the firewall.
- Current remote-access solution is cumbersome to manage.
- Not all staff members have access to remote access.



Recommendations

- Expanding the Internet bandwidth will improve the remote access experience.
- Select and implement a more robust remote-access solution that simplifies staff member access.

Benefits

- Increased mobility for the current workforce
- Increased security

66. Wireless Network

Background

- Cloud-based control of wireless is becoming the new standard.
  - A cloud-based wireless controller would eliminate the need for a controller and reduce support costs.
- Demand for public Wi-Fi in open spaces will continue to increase.

Findings and Observations

- The County has limited wireless capabilities for staff and guest computing.
  - Existing wireless-access points are a mixture of Standard and Professional versions.
  - Multiple SSIDs exist with different levels of access, using a mixture of security processes consisting of LDAP, MAC address filtering, and password.
- The County does not currently have permanent wireless access in the EOC.
  - The IS team temporarily configures wireless access points in the event of the EOC being activated.
- The County does not currently utilize a wireless "splash page" outlining terms of use.
- Existing wireless access-point cabling is Category 5e and cannot reach the bandwidth rates of current generation wireless devices.
- The County staff members wish to add personal devices to the wireless network.

Recommendations

- When refreshing the wireless infrastructure, develop an open RFP and evaluate cloud strategies from multiple vendors.
  - Procure an enterprise-class wireless solution that will satisfy all security regulations.
- Add a "splash page" to the guest wireless sign-on process.
- Re-cable all wireless access points per the recommendations in the *Structured Cabling System* initiative.
- Conduct a wireless survey to deploy complete wireless coverage for all County buildings.
- Standardize on the Wireless SSIDs across the WAN.
  - Each SSID in use reduces wireless performance by approximately 10%.
- Develop a policy and a compliance methodology for personal devices owned by staff members to access the wireless network.
  - A typical policy would provide staff members with a separate network for personal device use.

Benefits

- Improved wireless speeds
- Reduced complexity
- Increased security
- Expanded coverage

67. Video Surveillance Assessment and Replacement

Background

If actively monitored, security camera surveillance systems can be an effective security tool and criminal deterrent. One study by the Urban Institute determined that the savings and benefits of fewer incidents and crimes outweighed the cost of video surveillance systems. The study also found that law enforcement, facilities, code enforcement, policymakers, and others involved in facility or property oversight viewed security, surveillance, or monitoring cameras as a useful tool for managing behavior, preventing crimes, aiding in response, assisting in arrests, and supporting investigations and prosecutions.

Findings and Observations

- Video surveillance systems are installed at various locations in the County.
- Some video surveillance systems are stand-alone, and others are integrated.
  - Some systems have maintenance agreements, others do not.
- Video surveillance can be used by many departments as a deterrent or to record and track various incidence.
  - Juvenile Hall and Child Support require immediate camera upgrades.
- Video surveillance systems can be integrated with door access control to provide additional visibility into entrances and exits.
- Video surveillance is also an area of emphasis for Smart County applications.

Recommendations

- Create an inventory of video surveillance systems in use County-wide.
  - Identify additional requirements for video surveillance.
- Utilize IP-based cameras and the existing data network for transport of video between locations.
- The Sheriff Department has some unique legal and security requirements related to video management that must be incorporated into the planning process.
- Review wide-area network bandwidth needs as a part of the assessment.
- Consider integration with door access control at critical locations.
- Monitor Artificial Intelligence and Smart County applications for video surveillance.
  - When commercially available, utilize artificial intelligence to provide alerts and alarms instead of active monitoring.

68. Property System

Background

Property systems are used by counties to generate property tax bills. The Mendocino County Property System generates approximately $150MM in County revenue each year. The current system was written more than twenty (20) years ago and resides on an IBM iSeries platform. While iSeries systems are very reliable, it is difficult to implement and maintain modern resiliency using this platform.

Findings and Observations

- The Property System iSeries will be end-of-life and no longer supported in 2019.
- A contract has been signed for a client/server-based property system, but an installation date has not been established.
- Mainframe communications of six (6) state DMV locations are supported through the Property AS/400 – move has been completed
- It is difficult to install and maintain resilient AS/400 systems.

Recommendations

- Purchase and install a replacement IBM Power8 for the Property System.
  - Retain the existing system as a backup if feasible.
- Move DMV communications away from the AS/400. (Completed)
  - Utilize IBM mainframe/IP routing to create resilient routes through the County network.

69. Microwave and Multiplexer Replacement

Background

The County maintains a County-wide radio system that supports the Sheriff's Office, Department of Transportation, Public Works, and other departments with field workers. Many other state and federal agencies also use part of the radio network to fill in gaps in coverage. In South County, radio frequencies can be shared between Mendocino and Sonoma County.

Radio transport service is provided by the County microwave system. Each radio call and radio repeater are multiplexed onto the County microwave and then demultiplexed at Dispatch or the call's destination. Also multiplexed onto the microwave system are County data network connections to approximately twenty facilities that are remote to Ukiah. These include:

- Covelo
- Fort Bragg
- Point Arena
- Willits

Microwave is a highly reliable, secure communications mechanism primarily used by law enforcement and utilities to provide backbone wireless network connectivity over long distances. Microwave frequencies are managed by the FCC. Reliability of microwave systems is typically "five nines" or 99.999%, with an expected mean of less than six (6) minutes of downtime per year. Microwave systems and transmission are also quite rugged and able to penetrate rain, fog, smoke, and other elements that may limit the performance of more traditional point-to-point wireless connectivity. Also, Microwave bandwidth and speed do not degrade over long distances, such as between mountain tops.

For some time during the fires of the summer of 2017, the only Internet access for residents of Willits was through the County Library. This was made possible by the extensive microwave network maintained by the County.

The microwave system consists of three primary components:

- Thirteen microwave towers that create a County-wide wireless network
  - There is a northern microwave loop, such that should one tower fail, the microwave and associated services will continue to operate.
  - Service in the southern sections of the County does not currently have the resilience features of the northern County.
- Network routing components that manage traffic and automatically reroute network traffic in the event of a failure
- Multiplexer (mux) components that assemble analog and digital network signals and package them for transport across the routed microwave network

Taken together, the microwave, routing, and mux systems are the backbone of County-wide radio, voice, and data network communications.

Findings and Observations

- The microwave system, including mux and routing capabilities, was purchased approximately fifteen years ago.
- The entire system is obsolete and end-of-life.
  - The microwave system itself has been highly reliable over the years.
  - Staff members have maintained key radio components by creating an inventory of spare parts and replacing components when they fail.
  - Some mux and routing components have failed over time.
    - Staff members maintain an inventory of mux and routing components, but these components have become much more difficult to procure as the equipment has aged.

Recommendations

- Replace the microwave, multiplexer, and routing system in two phases:

1. Initially, replace the mux and routing components, as they have higher failure rates.
2. In the following budget year, replace the microwave systems themselves.

- Follow best-practice IT procurement methodologies.

Benefits

- Alignment with Disaster Recovery Plan
- Support for Incident Command System
- Support for E911 radio dispatch
- Support for officer communication and safety
  - Radio traffic carried over the microwave system provides the ability for officers to call for backup.
- Support for other public safety agencies assisting the residents and visitors to Mendocino County, including:
  - Cal Fire
  - CHP
  - California Emergency Management staff
  - Local police departments
  - Sonoma County Public Safety
  - Federal Emergency Management staff
  - Others
- Coordinated support for emergency responders
- Basis for communication for field staff members during local incidents and recovery activity
- Support for communications to all County staff members outside of Ukiah.

70. Radio Systems Upgrades and Replacement

Background

The County maintains a County-wide radio system that supports the Sheriff's Office, Department of Transportation, Public Works, and other departments with field workers. Many other state and federal agencies also use part of the radio network to fill in gaps in coverage. In South County, radio frequencies can be shared between Mendocino and Sonoma County.

Radio service is critical for County public safety. Because many areas of the County are remote, and the terrain is quite rugged, radio coverage can be difficult and expensive to provide. The system has over twenty repeaters that boost the signal throughout the County. Voter comparators help ensure that the strongest signal possible is delivered to an officer in their vehicle. The radio dispatch console that controls radio distribution and connectivity within the E911 dispatch center is reaching the end of its useful life.

Radio transport service is provided by the County Microwave system. Each radio call and radio repeater are multiplexed onto the County microwave and then de-multiplexed at Dispatch or the calls end destination.

Findings and Observations

- Staff members have maintained key radio components by creating an inventory of spare parts and replacing components when they fail.
  - As these key radio components reach end-of-life, spare parts become more difficult to find and are increasingly expensive.
- Many key components of the County radio system are reaching end-of-life and will no longer be supported.
  - Radio repeaters will be end-of-life beginning in 2020 and continuing through 2023.
    - Radio repeaters are scattered across the County.
  - The radio voter comparators are end-of-life in 2020.
- The County dispatch console will also be end-of-life within the next three years.

Recommendations

- Replace radio voting comparators in the coming budget year.
- Because County radio repeaters are expected to be replaced over time, we recommend creating an inventory of spare parts while they are still relatively plentiful and inexpensive.
- Replace radio repeaters as a part of a multi-year process.
  - Utilize spare parts to ensure continued service until replacements are complete.
- Replace the dispatch console prior to end-of-life.
- Add all radio components to the Capital Equipment Replacement Plan.
  - Incorporate spare radios and batteries.

Benefits

- Alignment with Disaster Recovery Plan
- Support for Incident Command System
- Support for E911 radio dispatch

- Support for office communication and officer safety
  - Radios provide the ability for officers to call for backup
- Support for other public safety agencies assisting the residents and visitors to Mendocino County, including:
  - Cal Fire
  - CHP
  - California Emergency Management staff
  - Local police departments
  - Sonoma County Public Safety
  - Federal Emergency Management staff
  - Others
- Coordinated support for emergency responders
- Basis for communication for field staff during local incidents and recovery activity

71. Microwave Ring Expansion

Background

The County maintains a County-wide radio system that supports the Sheriff's Office, Department of Transportation, Public Works, and other departments with field workers. Many other state and federal agencies also use part of the radio network to fill in gaps in coverage. In South County, radio frequencies can be shared between Mendocino and Sonoma County.

Radio transport service is provided the County Microwave system. Each radio call and radio repeater are multiplexed onto the County microwave and then demultiplexed at Dispatch or the calls end destination. Also multiplexed onto the microwave system are County data network connections to approximately twenty facilities that are remote to Ukiah. These include:

- Covelo
- Fort Bragg
- Point Arena
- Willits

Microwave is a highly reliable, high-speed, secure communications protocol primarily used by law enforcement and utilities to provide backbone wireless network connectivity over long distances. The FCC manages microwave frequencies. Reliability of microwave systems is typically "five nines" or 99.999%, with an expected mean of less than six minutes of downtime per year. Microwave systems and transmission are also quite rugged and able to penetrate rain, fog, smoke, and other elements that may limit the performance of more traditional point-to-point wireless connectivity. Also, microwave bandwidth and speed do not degrade over long distances, such as between mountaintops.

For some time during the fires of the summer of 2017, the only Internet access for residents of Willits was through the County Library. This was made possible by the extensive microwave network maintained by the County.

The microwave system consists of three primary components:

- 13 microwave towers that provide point-to-point have maintained key radio components by creating an inventory of spare parts and replacing components when they fail.
  - There is a northern microwave loop, such that should one tower fail, the microwave and associated services will continue to operate.
  - Fort Bragg is on a "spur" microwave connection that is a single point of failure.
  - Service in the southern sections of the County do not currently have the resilience features of the northern County.
    - Two microwave towers are required to complete the southern ring:
      - Point Arena Mountain
      - Cold Springs Mountain
- The County recently received a federal grant to expand the southern microwave at Point Arena Mountain. Work on this location is beginning in the summer of 2018.
- Taken together, the microwave, routing, and multiplexing system is the backbone of County-wide radio, voice, and data network communications.

Findings and Observations

- Due to the Federal grant for the Point Arena Mountain, Cold Springs mountain is the only site remaining to complete the southern ring.
- Staff members also wish to leverage the southern ring to extend the microwave system into Sonoma County and provide resilient voice, data, and internet service.

Recommendations

- Recommend closing the Fort Bragg “spur” into a loop to eliminate the “spur” as a single point of failure.
- Recommend completing the southern microwave ring to create resilient radio, voice, data, Internet transport to southern county sections.
  - Complete the implementation of Point Arena Mountain microwave tower (now grant-funded).
  - Apply for grant funding if available for Cold Spring Mountain.
  - Complete Cold Spring Mountain microwave tower and southern network resiliency.
  - Test network resiliency.
- Follow best-practice IT procurement methodologies.

Benefits

- Alignment with Disaster Recovery Plan
- Support for Incident Command System
- Support for E911 radio dispatch
- Support for office communication and officer safety
  - Radio traffic carried over the microwave system provides the ability for officers to call for backup
- Support for other public safety agencies assisting the residents and visitors to Mendocino County, including:
  - Cal Fire
  - CHP
  - California Emergency Management staff
  - Local police departments
  - Sonoma County Public Safety
  - Federal Emergency Management staff
  - Others
- Coordinated support for emergency responders
- Basis for communication for field staff members during local incidents and recovery activity

72. Video Conferencing

Background

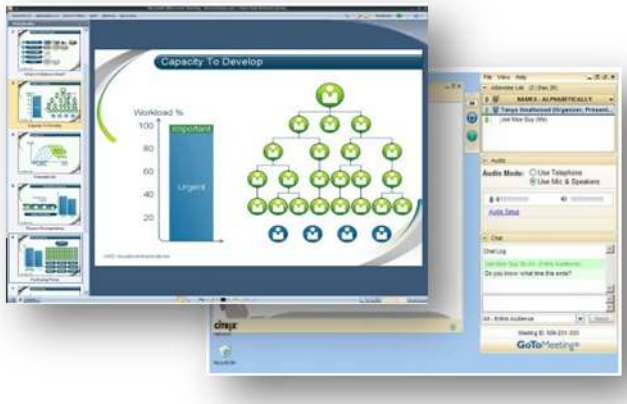
The County has maintained approximately fourteen video conferencing systems to assist in improving communications between offices. During the interview process, users discussed further needs for user-friendly teleconferencing. Video conferencing is being used more and more instead of face-to-face meetings and group training. Common video conferencing capabilities also include:

- One-to-many
- Conference room meetings with video conferencing
- From an office or home site
- Classroom
- Conference room presentations
- Group meetings
- Simultaneously training multiple users in multiple locations with video and audio sharing of all locations

Two vendor examples are:

GoToMeeting

- Screen sharing
- Application sharing
- Remote control
- Annotations
- Teleconferencing
- Web chat
- Recording



WebEx

- Presentation upload
- Screen sharing
- Application sharing
- Remote control
- Annotations
- Teleconferencing
- Web chat
- Recording

Findings and Observations

- The current Polycom video conferencing systems are end-of-life and obsolete.
  - Staff members utilize these systems, but also require one-on-one and small group Web conferencing tools.
- The Polycom video conferencing systems are connected to the data network and are capable of video conferencing to other County facilities.
- During emergency operations, there is a need for video conferencing with other agencies.

Recommendations

- Replace the existing Polycom video conferencing systems as a part of the Capital Replacement Plan.
- Select a standard product (Skype or GoToMeeting) and train users on Web conferencing tools for one-to-one video conferencing.
  - Once a standard product is selected, market the selection to staff members, discussing the benefits of the application and the technology.
  - Verify appropriate users have cameras configured for Web conferencing.
- Investigate and implement the capability to video conference with other agencies as a part of Emergency Operations Planning.

Benefits

- Reduced transportation costs
- Meeting recording and storage capabilities
- Effective remote-control features
- Enhanced group training capabilities

73. Infrastructure Roles and Responsibilities

Findings and Observations

- Sheriff and County IS staff are not always certain of their IT responsibilities in relation to each other and shared County Information Technology Resources.
- Sheriff's Office is a 24/7 operation and the remainder of the County is generally 8/5.
- County IS does not maintain an afterhours call rotation.
- During recent EOC activations, staff worked well together and understood the critical nature of their responsibilities.

Recommendations

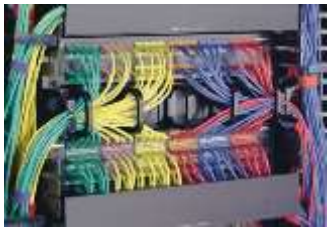
- Sheriff and County IS staff could utilize the following matrix to determine roles and responsibilities:

	Recommended Responsibility	
Responsibilities – MCSO IT	**Sheriff IS**	**County IS**
Workstation support	√	
Antivirus	√	
Policy and Procedures	√	
Staff Cell Phone Mobile Device Management	√	
Server Configuration – OS and Middleware	√	Provide Technical Assistance
Server Configuration – Applications	√	Provide Technical Assistance
Server Configuration – AD and Network Services	√	Provide Technical Assistance
Server Administration – Account Add/Chg/Delete	√	
Network Configuration – Switching, Routing, Firewall		√
Wireless Network Configuration		√
Internet Connectivity		√
Content Filter Administration	√	√
Electronic Mail	Account Administration	√
Telecommunications	Account Administration	√
IT Inventory	√	
Video surveillance	√	
Help Desk – System Responsibility	√	
Help Desk – Tier 1 Support	√	
VoIP (Voice over IP Phone System)		√
Audio Video Systems	√	

	Recommended Responsibility	
Responsibilities – MCSO IT	**Sheriff IS**	**County IS**
Access Control Systems - Installation		√
Access Control Systems - Administration	√	
Radio – County-Wide		√
Radio – handsets and in vehicle	Moving to Sheriff	
Dispatch workstations	√	
Microwave		√

74. MCSO Structured Connectivity System

Background



A *structured connectivity system* is a complete set of cabling and connectivity products that integrate voice, data, video, and other technology systems into a comprehensive infrastructure.

Findings and Observations

- Fiber-optic communications system patch panels are not labeled in a reliable manner, or in some cases, are not labeled at all.
- The copper, horizontal cabling system is primarily comprised of Category 5 (100 MB) and Category 5e (1 GB) cable.
- Category 5e cable is inadequate for current local area network speeds.
- Category 5e cable is inadequate for the newest generation of wireless access points.
- Data network electronics are co-located in a janitor closet with a sink, mop, and pail.
- Due to frequent remodeling and lack of a structured cabling system, small, unmanaged switches have been used to provide workstation connectivity.
- Small, unmanaged switches can cause major network disruptions when they begin to fail.
- The fiber-optic backbone system varies throughout the buildings and, in some cases, has bandwidth limitations of 1 GB.
- Current-generation backbone systems are 10 GB.
- Some equipment racks and cabinets are not grounded.
- As-built record documentation related to the horizontal and backbone communications system does not exist.

Recommendations

- The County should develop and implement a Structured Cabling System (SCS) specification for inclusion in a bid to replace the existing cabling. A structured cabling system replacement project should have the following as its goals:
  - Implement a non-proprietary cable infrastructure system supporting multi-vendor equipment and services.
  - Provide reduced cost for future cable installation, support, and management.
  - Improve troubleshooting and support for ongoing management/maintenance.
  - System should be based on recognized industry standards (ANSI, TIA/EIA, IEEE, and BICSI).
  - Develop and implement a unified labeling system that incorporates the fiber-optic cable.
  - Provide a suitable patch cord management system at equipment racks and/or cabinets.
  - Plan to upgrade wireless access-point cabling.
  - Industry best practice specifies two Category 6A cables to each access point.

75. MCSO Local Area Network (LAN) Upgrade

Background

A *local area network (LAN)* is a group of interconnected computers that span a building using Ethernet cables or Wi-Fi as a means of communication. A LAN allows only authorized users access to the network and uses resources and applications assigned to them. LANs are very common due to their small size, low maintenance, fast speeds, and basic complexity.

Findings and Observations

- The County LAN consists of Cisco switches, routers, and firewalls installed prior to 2010.
- Most switches are end-of-life and end-of-service.
- Limited network segmentation and Virtual LANs (VLANs) are in use.
- Additional VLANs are necessary due to enhanced security requirements and traffic segmentation needs.
- The Sheriff's office has a single core switch.
- Best practice network design calls for resilient core switching.
- The County does not have centralized management software to configure switching and routing equipment.
- There is not a patching schedule or deployment template for new or existing switches, routers, or firewalls. The County would like to establish a bimonthly deployment schedule for all switches, firewalls, and routers.
- No network monitoring system is in place to monitor traffic and health of network hardware.

Recommendations

- Replace switches, routers, and firewalls that are end-of-life.
- Review and enhance the existing VLAN design based on current best practices.
- Plan future switch upgrades as a part of the capital replacement cycle.
- Implement a network management platform to support device configuration and network alerts and alarms.

Benefits

- Improved network performance and reliability
- Increased security on network and resources
- Reduction in costs associated with replacements and failures
- Ability to establish an internal SLA (99.9% would be standard for local government)

76. MCSO Infrastructure Upgrade (Servers, SAN, and Backups)

Findings and Observations

- Sheriff currently maintains a completely separate IT infrastructure.
- Tyler Aegis CAD/RMS servers are obsolete and end-of-life.
- Most other servers are obsolete and end-of-life.
- MCSO disk storage, in conjunction with the servers, are obsolete and end-of-life
- Backup systems are obsolete and end-of-life.
- The backup tape unit is supported.
- Additional backup tape capacity is required in order to complete backups overnight.
- Best practice for CAD/RMS systems include resiliency for both server systems and dispatch workstations.
- The highest probability of potential operational loss are:
  - Individual Dispatch workstations
  - CAD servers
  - The Dispatch facility

Recommendations

- Replace all obsolete and end-of-life server, storage, and backup equipment.
- Move to a virtual environment, utilizing VMware to maintain consistency with County IS.
- Create a virtual server cluster for CAD/RMS and a separate cluster for all other Sheriff servers and disk storage.
- Create two virtual clusters will increase flexibility over the long term.
- Later, implement resilient CAD/RMS servers for backup in the event of a disaster.
- Implement resilient dispatch stations at a secondary location over time.

77. Multi-Jurisdictional Radio Operations

Findings and Observations

- In south Mendocino County, radio interoperability with Sonoma Public Safety radio frequencies is helpful for coordination and improved responsiveness.
- Many current Mendocino County radios do not support Sonoma County frequencies.
- Dual frequency radios that would increase interoperability are available.

Recommendations

- Procure and deploy dual-frequency radios in southern Mendocino County to increase inter-operability with neighboring public safety jurisdictions.
- Inventory a small number of dual-frequency radios for Ukiah staff in the event of an emergency.
- Continue to procure dual-frequency radios over time to expand capabilities.
- Improve integration with neighboring agencies.

Benefits

- Improved public safety
- Better integration with neighboring community public safety organizations

78. Dispatch Radio Console Replacement

Background

The County maintains a County-wide radio system that supports the Sheriff's Office, Department of Transportation, Public Works, and other departments with field workers. Many other state and federal agencies also use part of the radio network to fill gaps in coverage. In South County, radio frequencies can be shared between Mendocino and Sonoma County.

Radio service is critical for County public safety. Because many areas of the county are remote, and the terrain is quite rugged, radio coverage can be difficult and expensive to provide. The system has over twenty repeaters that boost the signal throughout the County. Voter comparators help ensure that the strongest signal possible is delivered to Officers in their vehicles.

Findings and Observations

- Staff members have maintained key radio components by creating an inventory of spare parts and replacing components when they fail.
- As these key radio components reach end-of-life, spare parts become more difficult to find and more expensive to replace.
- Many key components of the County radio system are reaching end-of-life and will no longer be supported.
- The County dispatch console will also be end-of-life within the next three years.

Recommendations

- Replace the dispatch console prior to end-of-life.
- Add all radio components to the Capital Equipment Replacement Plan.
- Include spare radios and batteries.

Benefits

- Alignment with Disaster Recovery Plan
- Support for Incident Command System
- Support for E911 radio dispatch
- Support for office communication and officer safety
- Radios provide the ability for officers to call for backup
- Support for other public safety agencies assisting the residents and visitors to Mendocino County, including:
  - Cal Fire
  - CHP
  - California Emergency Management staff
  - Local police departments
  - Sonoma County Public Safety
  - Federal Emergency Management staff
  - Others
- Coordinated support for emergency responders
- Basis for communication for field staff during local incidents and recovery activity

IT Operations

The *IT Operations* section addresses daily support and maintenance of all IT infrastructure and user support.

79. IT Operations - Enterprise Management Platform
80. Mobile Device Management
81. IT Cost Recovery (IT Budget Allocations)
82. IT Procurement Practices
83. IT Policies and Procedures
84. MCSO IT Operations – Enterprise Management Platform

79. IT Operations – Enterprise Management Platform

Background

An *enterprise management platform* is a complete set of IT operations tools that are fully integrated. They will add a level of automation between network and device monitoring and management and IT Help Desk. This enterprise-level automated approach will streamline the process of support and daily maintenance. The enterprise management platform can include the following modules: IT Help Desk, Network Monitoring/Management, Server Monitoring/Management, Active Directory Monitoring and Audit Logs, Syslog Management, Application Response Time Monitoring, Patch Management, and Software and Hardware Inventory.

Utilizing an enterprise platform for IT Operations will reduce overall management by reducing the number of software vendors that must be managed. Module integration can reduce training time. Integration of inventory with management modules can reduce network discovery time and provide additional device tracking capabilities.

IT Help Desk

Background

Help Desk systems provide an easy way for users to submit requests. IT staff members can assign tickets. The automated electronic, mail-based communications included in Help Desk systems can allow users to track the progress of their tickets as IT staff members update the status. Help Desk systems prevent items from "falling through the cracks" by logging all requests. Another key benefit of Help Desk ticketing system is the collection and analysis of metric data related to the number of requests submitted, resolved, and remaining open.

Findings and Observations

- Departments are currently utilizing the Help Desk system TRAKiT.
- Staff members typically call or email IT to ask questions and resolve issues. IT staff members then enter tickets into TRAKiT for further work to be completed if required. Staff members are assigned to tickets by specific individuals for resolution.
    - Each PC Technician is assigned a specific department or group of departments.
    - Phone calls are the most expensive vehicle to communicate Help Desk requests to the IS Division.
        - PC Technicians work the Help Desk telephone one day each week.
    - The Information Services Web Portal is also used frequently to submit issues or requests to IS staff
    - There is limited cross-training between departments.
    - Not all issues are properly logged in the TRAKiT system. Issues that are resolved by the first touch are often not logged into the system. This could skew the metrics.
    - There is no way to send an email to auto-generate a ticket currently to streamline the ticket creation process.
- MCSO uses Spiceworks as Help Desk product.
- TRAKiT is undergoing a complete rewrite and a new, improved version should be available in general release later in calendar year 2018.

Recommendations

- IS-related tasks and service requests should be emailed directly to or entered into the Help Desk ticketing system to improve the accuracy of the metrics and to help prioritize tasks.
- All IS Help Desk teams should use a shared Help Desk for all departments to standardize IS support practices.
  - TRAKiT can automatically assign Help Desk tickets to specific technicians or groups of technicians.
- The Help Desk ticketing system should be utilized to track staff member productivity and service.
  - Users should be strongly encouraged to utilize the Help Desk ticketing system and email to report issues.
- Metrics related to meeting Help Desk service levels should be developed and tracked on a weekly and monthly basis.
- Each month, summaries of Help Desk tickets opened and closed should be presented to the IT Steering Committee.
  - IT Steering Committee members should be prepared to discuss any Help Desk issues or festering problems during the monthly meeting.
- Develop and communicate a formal service-level agreement for standards to be expected from the IS team.
- Focus on cross-training technicians as a separate initiative. This will lead to better support for the entire County and increase the resiliency in the support coverage.
- Evaluate the need for a new, more complete Help Desk solution that is fully integrated and one that provides audit trails.

Network Management

- Network Device Monitoring
- Performance Monitoring
- Bandwidth Monitoring
- Firewall Management
- Router/Switch Management
- Proactive Monitoring
- Threshold Customizations
- Altering
- Network Interface Stats

Benefits

- Central ticketing system
- Availability to many users
- Increased resolution rates
- Support for all devices
- Improved user communication, experiences, and satisfaction
- Better diagnostics and problem identification
- Increase staff productivity
- Improved security

Network Monitoring and Management

Background

Network Monitoring and Management is software or collection of software used to monitor the status and health of all Network-related hardware and software. IT staff members can be notified immediately for any system outages and receive warnings when something on the network is not functioning as intended. This software will also include the ability to make changes at a larger scale without having to manually touch each device on the network.

Findings and Observations

- The County does utilize a Network Monitoring and Management Suite for most network equipment.

- Network Monitoring and Management has not been extended to servers.
  - Some monitoring and management functions are performed through vSphere, the Vmware management platform.
  - Additional vSphere functionality will be available as a part of the Vmware upgrade.
- It is estimated about three to five hours per week are spent checking the status of each of the primary network devices.
  - Proper software will automate this task and free-up the engineer to focus on more important tasks, like improving the network.
  - Proper software will also improve response time by instantly notifying IS staff members of upcoming and ongoing issues.
- IT staff members are typically functioning in a more reactive role trying to resolve issues once they are reported by other staff members.
  - Waiting for staff members to report the problem creates the longest amount of downtime before the issue is addressed. There is frequently a layer of troubleshooting that is completed before the depth of the problem is identified.

Recommendations

- If current issues can be resolved with the existing County IS Network Monitoring and Management solution, it should be expanded to cover:
  - County IS and MCSO server monitoring, alerts, and alarms
  - MCSO network monitoring, alerts, and alarms
  - All County IS network devices
- Implementing this new tool will require an up-front investment of resources by the County. This investment will be recouped by increasing the County IS reliability and reducing the staff effort required for ongoing general maintenance.
- Metrics generated by the new software will help communicate the overall health of the network and demonstrate when additional investment is required.
- Each month, summaries of Network Health should be presented to the IT Steering Committee.
  - IT Steering Committee members should be prepared to discuss any network-related issues reported or experienced by their staff during the monthly meeting.

Benefits

- Central management of network devices
- Reduced staff workload from automating manual tasks
- Increased network response rates
- Support for all network devices
- Improved user communication, experiences, and satisfaction through regular network health status reports
- Better diagnostics and problem identification
- Improved response time when issues occur
- Increased staff productivity

Server and Application Monitoring

Background

Server and application monitoring is software or collection of software used to monitor the status and health of all server-related hardware and software. IT staff members can be notified immediately for any server or application outages and receive warnings when something on the server is not functioning as intended.

Findings and Observations

- County IS currently uses a basic version of vSphere to monitor servers and applications.
  - Using a server monitoring, alerts, and alarms software product would assist in moving County IS from reactive to proactive.
  - Integrating the monitoring software into the IT Help Desk system will improve metrics and help prioritize tasks appropriately.

Recommendations

- If issues with the current network monitoring and management platform can be resolved, expand use of the product to servers monitoring and management.
  - Implement alarm thresholds for disk, CPU, memory utilization, and other key measures.
- A server and application monitor should be fully integrated into the IT Help Desk and utilized to track staff productivity and service.
  - IT Staff members should be entering time required to address server and application-related issues into the Help Desk ticketing system to improve the accuracy of staff productivity metrics.
- IT Help Desk integration should be a top priority when selecting a server and application monitoring solution.
- Metrics generated by the new software will help communicate the overall health of the servers and applications the County relies on and demonstrate when additional investment is required.
- The County should follow software selection best practices.
- Each month, summaries of the server and application health should be presented to the IT Steering Committee.
  - IT Steering Committee members should be prepared to discuss any server or application-related issue reported or experienced by their staff during the monthly meeting.

Benefits

- Central management of servers and applications
- Reduced staff workload from automating manual tasks
- Increased server and application response rates
- Support for all servers
- Improved user communication, experiences, and satisfaction through regular server and application health status reports
- Better diagnostics and problem identification
- Improved response time when issues occur
- Increased staff productivity

Active Directory Monitoring and Audit Logs

Background

The *Active Directory Monitor and Audit Logs* are software used to monitor the status and health of the Active Directory environment. This software also allows the ability to audit changes made to the Active Directory by date, time, and user. IS staff members can be notified immediately of any issues or potential threats from the Active Directory domain. The software helps Active Directory administrators and help desk technicians with their day-to-day activities. This software provides a powerful tool that can be used to automate bulk tasks like user management.

Findings and Observations

- The County does not currently have an Active Directory monitoring or audit log system.
- IS staff members typically must manually perform multiple steps in Active Directory to complete a single task.
  - The Active Directory software will provide advanced automation for many of these tasks and reduce the work effort required by staff.
- IS staff members must typically review all logs from each server manually and try to interrupt any issues that may be occurring.
  - A new software solution will automate this process and provide a central location for all logs. It will then provide an intelligent analysis of the logs and present IS staff with a potential resolution, saving hours of staff effort.

Recommendations

- An Active Directory Monitoring and Audit Log system should be evaluated and selected following the software selection best practices.
- Metrics related to the health of the Active Directory environment should be developed and tracked on a weekly and monthly basis.
- It is important to track all changes to Active Directory, including those made by IS staff.

Benefits

- Centralized Active Directory management system
- Improved automation of routine tasks
- Increased investigation visibility using Audit trails
- Improved security
- Improved reporting and metrics
- Better diagnostics and problem identification
- Availability of forensics log
- Alerts to bad logon attempts
- Increased staff productivity

Patch Management

Background

Patch management is the term used to describe the task of keeping all endpoint devices, like computers, laptops, and servers, current with the latest software patches. Patch management software automates and manages the deployment of software patches to devices on the network.

Findings and Observations

- The County uses Microsoft Windows Server Update Services (WSUS) to implement Microsoft operating system patches.
- The County has no software to assist in patching any non-Microsoft products. As a result, IS staff members must perform these patches and updates manually, slowing down the deployment of patches and security updates.
- IS staff members typically install patches when working on other issues on the device as a side-note, if time allows.
    - This system, although cost-effective, does not provide a standard solution and results in many devices operating at different patching levels.
- If a major security patch is released, there is no mechanism in place to automatically deploy the patch to all devices and provide a summary compliance report to ensure all devices have the patch applied.

Recommendations

- Metrics related to patch management and compliance reporting should be developed and tracked on a weekly and monthly basis.
- A complete software patch management solution should be purchased. Full integration to the Help Desk should be considered a top priority.
- The County should follow software selection best practices to select new software.

Benefits

- Centralized patch management system
- Improved security compliance on software patches
- Improved report metrics
- Support for most software packages
- Better diagnostics and problem identification
- Improved standardization of the IT environment, simplifying the support effort required
- Drastically reduced support time required to deploy security patches
- Increased staff productivity

Hardware/Software Inventory Management

Background

The *Hardware/Software Inventory Management* software is an automated tool used to monitor the status of all hardware (firewall, switches, servers, computers, laptops, tablet, etc.) and software (Microsoft Office, Adobe, Visio, project management software, etc.) This software also allows the ability to run audit reports for budgeting and licensing compliance as needed.

Findings and Observations

- The County does not currently have a robust hardware or software inventory system.
- Staff members typically manually create spreadsheets to present hardware and software inventory lists for licensing for budget or reconciliation.
    - The inventory being created by spreadsheets is often old or out of date and inaccurate or incomplete information.

Recommendations

- A hardware and software inventory management system should be reviewed and selected following software selection best practices.
    - IS staff members should be fully trained and understand how the new system works.
- Metrics related to hardware and software inventory should be developed and tracked monthly.
- The inventory should be used to confirm licensing compliance and budgeting.

Benefits

- Accurate tracking of growth of technology in the County
- Improved budgeting
- Reduced software licensing audit time
- Accountability for all devices

80. Mobile Device Management

Background

Mobile Device Management (MDM) software is a collection of applications that allows management, distribution, usage, and maintenance of portable devices, like laptops, tablets, and smart phones. Additional features allow configurations to be setup on devices to discourage wrongful use and reduce individual device maintenance.

Findings and Observations

- The County uses Microsoft Surface tablets that are not included in the current MDM solution.
- The County uses the Zen for Mobile Devices Management solution for County phones.
- MDM provides the ability to see and control all mobile devices entering the enterprise, whether provided by the County or as part of a bring-your-own-device (BYOD) program.
- There is a high demand among staff for portable computing.

Recommendations

- Expand the current Zen MDM to include laptops and tablets.
- Examine integration with Zen MDM and the Help Desk or inventory system.

Benefits

- Improved staff efficiency and mobility
- Support for all devices
- Less time manually managing and monitoring
- Increased use of remote access
- Easier distribution of software
- Improved Security
- Ability to remote lock, locate, and wipe mobile devices if lost

81. IT Cost Recovery (IT Budget Allocations)

Background

The IS Division's role and execution of operational best practices is that of an internal support function to all departments and County system users and, in some instances, the County's constituents and the public. The departments, users, constituents, and the public are customers of the IS Division.

IT Cost Recovery is the concept of funding the IS Division budget from all other departments based upon various metrics utilization and services provided. At Mendocino County, IT cost recovery could be an excellent way to allocate telecommunications expenses across the organization.

In this way, some IS Division costs can be spread equitably among departments, and the organization can gain a true understanding of the costs required to support the technology infrastructure and support services in order to make better management decisions.

Findings and Observations

- Some IT software costs, including maintenance and support costs, are in Departmental budgets, not the IS budget.
- Some telecommunications systems are owned by specific County departments.
  - Consolidating and updating County telecommunications can, overall, increase resiliency and reduce costs.
- A simple method to allocate telecommunications costs would allow IS increased flexibility in managing telecommunications to the benefit of all users.

Recommendations

- Consider moving all IT-related telecommunications costs to the IT budget to allow reporting and comparisons to peers related to IT spending.
- Consider using a methodology such as number of phones per department to allocate telecommunications costs.

82. IT Procurement Practices

Findings and Observations

The County has a small number of technology-oriented procurement practices in place. These procurement practices should be expanded to include more detail and address different procurement types, including:

- Commodity systems
- Complex systems
- Highly complex or expensive systems

Oversight of the procurement process by the IS Division and the IT Steering Committee should also be included as a practice.

Recommendations

- For commodity systems where several vendors provide very similar products, if three quotes are required by County policy, the County should consider creating an open RFP that does not specify a product manufacturer but provides vendors with specifications that must be met.
  - Increases vendor participation, which often results in lower pricing and better products
- For complex systems, the County should consider procuring installation services from the vendor supplying hardware and software, or other third-party implementers.
  - "Complex systems" are defined as those costing more than $100,000 or requiring more than 160 hours of third-party implementation assistance.
  - Reduces chance of finger-pointing for poor design, damaged product, or poor installation.
- For highly complex or expensive systems, the County should consider including all components in the RFP: final design, installation, construction, testing, conversion, post-implementation support, and knowledge transfer.
  - Includes procurement of complex systems that may span budget years because of cost considerations.
  - All components should be practically considered and integrated.
- Before approval of purchase of a complex system or a system requiring three bids, we would expect that management would require the following of the IS Division:
  - A diagram of the system
  - High-level implementation plan (can be one page of bullet points)
  - A bill of material that includes all components, list price, quantity, discounted price, and ongoing maintenance
  - Costs associated with final design, installation, construction, testing, conversion, post-implementation support, and knowledge transfer
  - A vendor cost matrix and assurances that all responses are truly comparable
  - A written recommendation
- In general, the County should follow best practices for IT hardware and software replacement and procurements and software selection.

83. IT Policies and Procedures

Findings and Observations

The County IS Division has a limited number of IT policies drafted for Administrative systems. The County expressed desire to expand and tighten policies to improve compliance. They also wish to enact policies to ensure that the organization is protected.

Recommendations

- Revise and create a limited number of IT policies and procedures that include the following topics:
  - Encryption
  - Security Awareness Training
  - Purchasing and Procurement Policy
  - Device Configuration (e.g., servers, desktops, network devices, etc.)
  - Computer Security Incident Response
  - Personal Identifying Information (PII) Protection
    - Include HIPAA and PCI compliance requirements.
  - Remote Access
- Utilize the IT Steering Committee to review policies and procedures and facilitate communication throughout the organization.
- Review policies and modify as appropriate at least every other year.

84. MCSO IT Operations - Enterprise Management Platform

Background

An *enterprise management platform* is a complete set of IT operations tools that are fully integrated. They will add a level of automation between network, device monitoring/management, and IT Help Desk. This enterprise-level automated approach will streamline the process of support and daily maintenance. The Enterprise management platform can include the following modules: IT Help Desk, Network Monitoring/Management, Server Monitoring/Management, Active Directory Monitoring and Audit Logs, Syslog Management, Application Response-Time Monitoring, Patch Management, Software Inventory, and Hardware Inventory.

Utilizing an enterprise platform for IT Operations will reduce overall management by reducing number of software vendors that must be managed. Module integration can reduce training time. Integration of inventory with management modules can reduce network discovery time and provide additional device tracking capabilities.

IT Help Desk

Background

Help Desk systems provide an easy way for users to submit requests. IS Staff members can assign tickets. The automated electronic, mail-based communications included in Help Desk systems can allow users to track the progress of their tickets as IS Staff members update the status. Help Desk systems prevent items from "falling through the cracks" by logging all requests. Another key benefit of Help Desk ticketing systems is the collection and analysis of metric data related to the number of requests submitted, resolved, and remaining open.

Findings and Observations

- The Sheriff's Office is currently utilizing the Help Desk system Spiceworks.
- Staff members typically email IT related problems to a GroupWise support account, which automatically creates a Spiceworks support ticket and notifies all IT support personnel via an email. Staff members can also create support tickets via the Spiceworks Helpdesk portal.
- IT support personnel are assigned to tickets by the Computer Operations Manager or accept support tickets based upon assigned support roles for resolution.
- Each member of the Sheriff's Technical Services section focuses on their own preassigned support roles.
- All current Information Technology support technicians have been employed by the County for less than a year, except for the Computer Operations Manager.
- There is some cross-training between support staff.
- Phone calls are the most expensive vehicle to communicate Help Desk requests to the IS Department.

Recommendations

- Create Spiceworks reports for tickets open more than three and more than seven days, and review them weekly with Support Staff.
- Leverage third-party vendors for assistance with specific areas of expertise, such as vehicle/CAD integration.
- Expand cooperation with County IS for network, wireless, and radio systems support.
- Utilize County IS expertise in network design, virtualization, and server OS configuration.

Benefits

- Central ticketing system
- Availability to many users
- Increased resolution rates
- Support for all devices
- Improved user communication, experiences, and satisfaction
- Better diagnostics and problem identification
- Increase staff productivity
- Improved security

Network Monitoring and Management

Background

Network monitoring and management is software, or collection of software, used to monitor the status and health of all Network related hardware and software. IS staff members can be notified immediately of any system outages and receive warnings when something on the network is not functioning as intended. This software will also include the ability to make changes at a larger scale, without having to manually touch each device on the network.

Findings and Observations

- The County is in the process of implementing Solar Winds Network Monitoring and Management Suite.
- IS staff is typically functioning in a more reactive role, trying to resolve issues once they are reported.
- Waiting for staff to report problems creates the longest downtimes before issues are addressed. Frequently, a layer of troubleshooting is needed before the problem is identified.
- No metrics related to network availability are currently reported.

Network Management

- Network Device Monitoring
- Performance Monitoring
- Bandwidth Monitoring
- Firewall Management
- Router/Switch Management
- Proactive Monitoring
- Threshold Customizations
- Altering
- Network Interface Stats

Recommendations

- Develop network availability metrics and service-level goals.
- Metrics generated by the new software will help communicate the overall health of the network and demonstrate when additional investment is required.
- Each month, summaries of Network Health should be presented to the IT Steering Committee.
- IT Steering Committee members should be prepared to discuss any network-related issues reported or experienced by their staff during the monthly meeting.

Network Monitoring and Management - Benefits

- Central management of network devices
- Reduced staff workload by automating manual tasks
- Increased network response rates
- Support for all network devices
- Improved user communication, experiences, and satisfaction through regular network health status reports
- Better diagnostics and problem identification
- Improved response time when issues do occur
- Increased staff productivity

Server and Application Monitoring

Background

Server and Application Monitoring utilizes software, or collection of software, to monitor the status and health of all server-related hardware and software. IS staff members can be notified immediately of any server or application outages and receive warnings when something on the server is malfunctioning.

Findings and Observations

- The Sheriff's Office is currently using Zabbix software to monitor servers and applications.
- Solar Winds can be expanded to include network management and alerts or alarms for servers and critical applications.
- Integrating the software into the IT Help Desk system will improve metrics and help prioritize tasks appropriately.

Recommendations

- Metrics generated by the new software will help communicate the overall health of the servers and applications the County relies on and demonstrate when additional investment is required.

Benefits

- Central management of servers and applications
- Reduced staff workload by automating manual tasks
- Increased server and application response rates
- Support for all servers
- Improved user communication, experiences, and satisfaction through regular server and application health status reports
- Better diagnostics and problem identification
- Improved response time when issues do occur
- Increased staff productivity

Active Directory Monitoring and Log Management

Background

Active Directory Monitor and Audit Logs are software tools used to monitor the status and health of the Active Directory environment. This software also allows the ability to audit changes made to the Active Directory by date, time, and user. IS staff members can be notified immediately of any issues or potential threats from the Active Directory domain. The software helps Active Directory administrators and Help Desk technicians with their day-to-day activities. This software provides a powerful tool that can be used to automate bulk tasks like user management.

Findings and Observations

- The County does not currently have an Active Directory monitoring or audit log system.
- The County has purchased AD Audit for this purpose.
- IS staff members must typically manually perform multiple steps in Active Directory to complete a single task.
- Active Directory management software will provide advanced automation for many of these tasks and reduce the work effort required by staff.

- IS staff members must typically manually review all logs from each server and try to interrupt any issues that may be occurring.
- A new software solution will automate this process and provide a central location for all logs. It will then provide an intelligent analyzation of the logs and present IS staff with a potential resolution.

Recommendations

- The Active Directory monitoring and log management system (AD Audit) should be implemented as soon as feasible (AD Audit has been purchased, installed, and is now in use).
- Metrics related to the health of the Active Directory environment should be developed and tracked on a weekly and monthly basis.
- It is important to track all changes to Active Directory, including those made by IS staff.

Benefits

- Centralized Active Directory management system
- Improved automation of routine tasks
- Increased investigation visibility using Audit trails
- Improved security
- Improved reporting and metrics
- Better diagnostics and problem identification
- Improved logging of forensics information
- Alerts for bad logon attempts
- Increased staff productivity

Patch Management

Background

Patch management is the term used to describe the task of keeping all endpoint devices (e.g., computers, laptops, and servers) updated with the latest software patches. Patch management software is a tool used to automate and manage the deployment of software patches to devices on the network.

Findings and Observations

- The County uses Microsoft Windows Server Update Services (WSUS) to implement Microsoft operating system patches.
- The County has no software to assist in patching any non-Microsoft products. As a result, IS staff members must perform these patches and updates manually, requiring more time for the deployment of patches and security updates than is practical.
- IS staff members typically install patches when working on other issues on devices as a secondary task, if time allows.
- This method, although cost-effective, does not provide a standard solution and results in many devices operating at different patching levels.
- If a major security patch is released, there is no mechanism in place to automatically deploy the patch to all devices and provide a summary compliance report to ensure all devices have the patch applied.

Recommendations

- Metrics related to patch management and compliance reporting should be developed and tracked on a weekly and monthly basis.
- A complete software patch management solution should be purchased and full integration to the Help Desk should be considered a top priority.
- The County should consider expanding the Solar Winds platform to include Patch Management.
- The County should follow software selection best practices to select the new software.

Benefits

- Centralized patch management system
- Improve security compliance on software patches
- Improved report metrics
- Support for most software packages
- Better diagnostics and problem identification
- Improved standardization of the IT environment, reducing required support effort
- Drastically reduced support time required to deploy security patches
- Increased staff productivity

Hardware/Software Inventory Management

Background

Hardware/software inventory management is a method of using software as a tool to monitor the status of all hardware (firewall, switches, servers, computers, laptops, tablets, etc.) and software (Microsoft Office, Adobe, Visio, project management software, etc.) This software also allows the ability to run audit reports for budgeting and licensing compliance, as needed.

Findings and Observations

- The County does not currently fully utilize the purchased inventory tool, PDQ Inventory.
- Staff members typically create spreadsheets manually to present hardware and software inventory lists for licensing for budget or reconciliation.
- The inventory being created by spreadsheets is often old or out of date and contains inaccurate or incomplete information.

Recommendations

- A hardware/software inventory management system should be reviewed and selected following software selection best practices.
- IS staff should be fully trained and understand how the new system works.
- Metrics related to hardware and software inventory should be developed and tracked monthly.
- The inventory should be used to confirm licensing compliance and budgeting.

Benefits

- Improved tracking of technology growth in the County
- Improved budgeting
- Reduced software licensing audit time
- Accountability for all devices

Domain Trust

Background

The Sheriff's Office requested that County IS configure a trust relationship from the Sheriff's Office domain into the County domain (much like what was created for the Health and Human Services Department) to allow automatic authentication to county resources.

Findings and Observations

- There currently is no trust relationship between the Sheriff's Office domain and the County's domain.

Recommendations

- The County should establish a one-way trust relationship with the Sheriff's Office domain.
- The County trusts the Sheriff's Office domain.

Benefits

- Sheriff's Office access to County resources without additional authentication.

IT Security

IT Security addresses all security systems and practices, including disaster recovery, to protect systems and data.

85. Disaster Recovery Planning
86. Disaster Recovery Site Implementation
87. Backups
88. Firewall Upgrade
89. IT Security Assessment
90. Logging and Audit Trails
91. Records and Data Retention
92. PCI Compliance Study
93. Staff Security Awareness Training

85. Disaster Recovery Planning

Background

Utilizing cloud-based backup and disaster recovery is becoming a best practice.

Findings and Observations

- The IT Disaster Recovery Plan is under review and will be refreshed in the current Fiscal Year.
- Service-level agreements (SLAs) are not in place for application recovery in the event of a disaster.
- The County uses Catalogic for backups.
  - MCSO plans to use Catalogic backup as well. This will leverage current IS staff knowledge.

Recommendations

- Utilize a County-owned secondary site for resilient Internet connectivity and off-site backups as a best-practice methodology.
- Work with the departments to understand expected service restoration time frames before refreshing the Disaster Recovery Plan.
- Modify the Disaster Recovery Plan based on expected restoration time frames.
- Consider two disaster recovery scenarios when developing strategies:
  - Loss of main computer room
  - Major disaster eliminating all area communications, the Administrative Offices, and IT infrastructure
- Consider expansion of the DR plan to provide cloud-based disaster recovery for application systems.
  - Utilizing cloud-based DR recovery should be considered after the implementation of resilient Internet connection.
- Evaluate applications portfolio and determine the SLA for each application for restoration.
- Develop strategies for restoration of high-priority applications.
  - Begin to implement, based on strategy and application priority.
  - Test portions of plan every six (6) months.
- Develop a Disaster Recovery Plan with restoration times that have been validated by the Departments.
  - Prioritize services to be restored based on SLA and executive management input.
  - Determine anticipated (RPO) Recovery Point Objective “acceptable data loss.”
  - Determine anticipated (RTO) Recovery Time Objective “time before service is restored.”
  - Develop business continuity plan.
  - Test portions of plan each year.
- True disaster recovery of applications requires either vendor-by-vendor or outsourced arrangements.
- Evaluate application portfolio and determine SLA for restoration.
- Budget for off-site disaster recovery, based on the results of service-level requirements.

Benefits

- Emergency preparedness compliance
- Improved communication
- Awareness of procedures
- Better diagnostics and problem identification
- Reduced risk and liability
- Faster, well-informed decision-making
- Identification of business-critical functions
- Decreased recovery times and exposure to system failures
- Awareness of immediate actions

86. Disaster Recovery Site Implementation

Findings and Observations

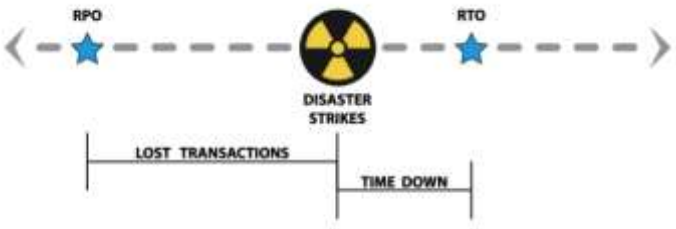
- The County plans to locate Disaster Recovery capabilities in the computer room at the old downtown office.
- The plan is to repurpose the old SAN as a replication target from the new SAN.
- Size of computer room is adequate with plenty of room for expansion.
- The two sites are currently connected with a 1 GB fiber link.
- The County is in the process of developing a complete Disaster Recovery Plan.
- The County does not have Service Level Agreements (SLAs) for application recovery in the event of a disaster.

Recommendations

- In the near term, utilize the old County computer room in downtown Ukiah for replication and disaster recovery.
  - After development of resilient network connectivity to Sonoma County, consider a cloud or remote location more than 50 miles away for off-site backup location of encrypted files.
- Install and configure multiple VMware hosts at the DR location.
- Install and configure SAN at the DR location.
- Configure SAN-to-SAN replication from production to DR location.
- Upgrade the fiber link from 1 GB to 10 GB and create a redundant link.
- Add a secondary Internet connection at the DR location.
- Install Disaster Recovery Equipment.

Benefits

- Improved business continuity
- Reduced risk of data loss
- Reduced downtime in the event of a disaster
- Reduced confusion and clear prioritization during a disaster



87. Backups

Findings and Observations

- Current IT backup solution:
  - Utilizes Catalogic for backups
  - Are sent to tape as encrypted backups
  - Are taken off-site weekly in tape format
  - Currently maintains file-level backups
    - Full server backups, called “bare-metal” backups, are not in use.
    - Based on the limited license purchased from Catalogic.
  - The County does not have enough equipment to test a full system restoration.
- County Sheriff’s office backup solution has been designed, but not yet implemented.
  - MCSO currently does not utilize encrypted backups.
  - Monthly backups are stored on-site in a safe.
  - Sheriff’s office is moving to Catalogic now for a shared backup solution.
    - Sharing the same backup solution between County IS and the Sheriff’s office will allow for resource sharing, benefitting the Sheriff’s office from the County IS staff’s experience with the product.
  - The Sheriff’s office currently estimates recovery time for a network share at about five days.
  - The revised MCSO backup solution will first move backups to disk and then to tape.
    - This methodology will reduce recovery time.

Recommendations

- Expand Catalogic Licensing to include all servers on County IS and Sheriff’s networks.
- Evaluate the cost to expand the backup software Catalogic Licensing to include bare-metal restores.
- Revise MCSO backup procedure to include weekly off-site backups.
  - Off-site backups should continue to be used after the introduction of cloud-based backups. They can be an important backup of last resort.
  - The Sheriff’s office is in the process of purchasing a NAS to use as an off-site backup repository of encrypted backups.
- Encrypt all backups within the Catalogic software.
- When possible, test full system restoration.
  - Test full restoration of a major database or system every six months, at a minimum.

88. Firewall Upgrade

Findings and Observations

- The County currently utilizes a combination of firewall vendors, including Sophos, SonicWALL, and Cisco ASA firewalls.
  - One Sophos firewall is for the primary Internet connection.
  - The primary Internet firewall is currently not using any "sandbox" or advanced threat-detection technology.
    - Sandbox technology helps protect users by downloading and checking all attachments and files before sending them to end-users.
- Several of the firewalls in use at the County have reached end-of-life (EOL).
  - The core County firewall has been recently upgraded and is current generation.
  - The end-of-life firewalls are being used to secure various sections of the County network and should be replaced.
  - Once firewalls are EOL, vendors stop releasing security patches and updates, which leaves network vulnerable to known security risks.

Recommendations

- Procure and install the Sophos Sandstorm subscription for the main firewall.
  - The Sandstorm subscription can be applied to scan all files being downloaded from the Internet and all file attachments sent via email.
- Collect inventory information on all firewalls throughout the County.
  - Replace all EOL devices.
  - Standardize replacement firewalls on a single vendor.
    - Since the current primary firewall is Sophos, consider using Sophos for all firewall needs.
  - Update all patches and firmware on all existing devices not being replaced.

Benefits

- Improved network security
- Reduced risk of viruses being downloaded inadvertently by staff members
- Improved communication between devices and advanced proprietary feature sets through standardization in firewalls throughout the County
- Reduced support costs
- Improved functionality

89. IT Security Assessment

Background

It is a best practice to conduct an *IT Security Assessment* every three years. Penetration testing should be performed annually or when major firewall changes are made.

Findings and Observations

- An IT Security Assessment has not been performed at the County.
  - We believe the County should implement the recommendations in Year 1 of the IT Master Plan before contracting for a Security Assessment.
- The County does not have a central system or activity log storage and management solution.
  - Some network equipment logs are captured.
  - Server and other device logs are not currently captured and stored.
- The County does not maintain an Active Directory change-management audit trail.
- The County has not recently conducted an internal or external penetration test.
- Expanded security policies would be an essential starting point for a Security Assessment.

Recommendations

- Procure a solution to provide centralized system logging and activity login.
- Procure a solution to provide Active Directory-related audit trails.
- Develop security policies and procedures.
- Complete the network upgrade project before conducting a Security Assessment.
- Upon completion of the above recommendations, conduct a more comprehensive third-party IT Security Assessment.
  - Including internal and external penetration testing.

Benefits

- Improved performance and efficiency
- Meets compliance requirements and industry best practices
- Increased data security
- Identify vulnerabilities to resolved

90. Logging and Audit Trails

Background

Audit trails and logging transactions have become an important part of computer forensics. In many cases, client audit trail or system log information has been utilized to determine individuals responsible for specific activities. The ability to determine responsibility for actions is an important part of maintaining the environment.

Findings and Observations

- Firewall logs are stored on the firewall.
- Network equipment logs are collected and sent to SolarWinds Syslog Server.
- Server logs are stored locally.
- An audit trail of Active Directory changes does not exist.

Recommendations

- Purchase active directory audit trail software (e.g., AD Audit Plus from Manage Engine).
- Implement a SYSLOG server, and collect all logs from all servers, firewalls, and other network devices.
  - Create a log retention policy.
  - Logs should be reviewed for anomalies weekly, at a minimum.

Benefits

- Improved functionality and security
- Compliance with industry standards

91. Records and Data Retention

Background

- Electronic records retention durations should mirror paper electronic records and data retention durations.
  - As with paper records, timely destruction is important.

Findings and Observations

- The County has an email archive solution called Unlimited Mailbox.
  - As configured, emails can be deleted from staff inboxes before they are archived.
  - Email archiving can drastically reduce time spent gathering emails for Public Records Requests.
- A policy for email retention is not in place.
- Records retention is not applied to backups.

Recommendations

- Inventory all forms of electronic records storage at the County.
- Implement an email archiving solution and migrate existing personal archive folders to the archive appliance.
- Develop procedures for electronic records retention for the various record types.
  - Implement procedure for records retention and subsequent destruction of electronic records.

92. PCI Compliance Study

Background

Payment Card Industry (PCI) compliance can reduce credit card transaction fees by complying with the Payment Card Industry Data Security Standard (PCI-DSS) for credit and debit card transactions. The major card brands (Visa, MasterCard, American Express, Discover, and JCB) issued the PCI-DSS to enhance the protections in place against the theft of cardholder data and require all merchants and service providers who store, process, or transmit payment card information to comply with its provisions.

Findings and Observations

- Credit cards are accepted as a form of payment at the County.
- Credit card transactions are cloud-based.
  - Credit card transactions are limited to credit card terminals separate from the point-of-sale workstations.
- The current configuration prolongs the customer payment experience and reduces customer-service operational efficiency.
- Some PCI technical requirements have been met by the County.

Recommendations

- Review the PCI standard technical requirements versus current network requirements.
- Review the current credit card payment methodology.
  - Review each Department's credit card processing business process for PCI compliance.
  - Determine if customer service and efficiency could be improved through a revised process.
- It is most effective to separate all payment card data from the County's data network.

93. Staff Security Awareness Training

Background

Security Awareness Training is a formal process for educating employees about computer security. A good security awareness program should educate employees about corporate policies and procedures for working with information technology. Employees should receive information about who to contact if they discover a security threat and be taught that data is a valuable corporate asset.

Regular training is necessary to provide staff with knowledge to help protect the organization's network from viruses and malware. Users are the frontline defense for the prevention of virus and malware attacks.

Confirming how well the awareness program is working can be difficult. The simplest metric is measuring the number of incidents over time, which should be decreasing. The best-practice method of measurement involves a multi-phased approach of baseline testing, then training, then testing using an automated phishing approach. Follow up with additional training as needed.

Online training provides multiple benefits, including:

- Staff members can work at their own pace, on their own schedule.
- Staff members can be enrolled online in multiple training courses.
- Admin control panel can be used to monitor users progress and setup phishing campaigns for testing the users.
- Reports can then be generated to see how users did compared to previous phishing campaign scores to measure improvement.
- Organizations should encourage users to complete training on a regular basis as part of compliance requirements.

Findings and Observations

- Staff members have received little security awareness training.
  - Sheriff's office personnel are required to have security awareness training every two years.
- The County is currently relying on user discretion, desktop antivirus protection, and system backups to combat viruses and malware on the network.
- Opportunities for uninterrupted training provide for the highest retention and most productive use of training time.

Recommendations

- Increase the IT budget to include regular online security awareness compliance training.
  - This training should be mandatory for all users.
  - Incorporate training plans into the annual review process.
  - Select a proactive training solution that allows periodic deployment of simulated phishing attacks to test user awareness.

Geographic Information Systems (GIS) are computer systems that enable users to capture, store, analyze, manage, and display spatially referenced data.

94. GIS Assessment and Master Plan
95. GIS Data Acquisition
96. GIS Emergency Operations Readiness

94. GIS Assessment and Master Plan

Background

GIS systems are integral components in the business of managing a municipality's assets and activities. In addition to tracking all parcels within the County, many agencies inventory infrastructure assets, such as signs, street lights, storm sewers, bridges, fire hydrants, trees, and other fixed items through the GIS system. GIS systems are often integrated with work order systems to improve the accuracy of work order location information and reduce the amount of time spent locating these assets. Additional benefits of a GIS system include reduced field observations, more informed decision-making, improved parcel management, centrally-managed information, and better analysis of infrastructure.

Findings and Observations

County staff members have expressed a need for additional basic GIS functionality, such as the ability to select a parcel and determine its land use or zoning, or produce a simple map displaying basic GIS layers.

- GIS staff members attempt to update parcels based on land-use changes every year or two.
- Parcel definitions are not always clear.
- GIS staff members utilize Google Earth and US Government low-resolution photographs to assist in defining parcel boundaries.
  - Low-resolution photographs limit GIS staff's ability to clearly define parcel boundaries.
- Roads within the County often have multiple names.
  - Naming roads and assigning official addresses can be difficult.
- Planning and Engineering are strong proponents of GIS.
- Transportation is interested in the following:
  - Improved availability and access to maps in the field
  - Updating and storing information related to roadway conditions in a central database
  - Mobile devices with excellent GPS coordinates to accurately document roadway conditions
  - Publishing County or third-party roadwork maps on the website
  - Enhanced GIS reporting and capability to attach data to existing layers
  - Access to all GIS layers through the County intranet
- The Assessor's office is also a key consumer of GIS data.
- Integration of GIS data with key applications, such as Land Management, Sheriff, and Property, are not integrated to GIS.

Recommendations

- Develop a GIS Master Plan. Since the County has limited GIS staffing resources, it will benefit from a plan and structure that approaches the use and benefits of GIS on a County-wide basis. A GIS Strategic Plan should include:
  - Prioritized layers and maps needed

- Processes for updates from the County to GIS data layers
- Identification of County data maintenance update processes
- GIS applications and hardware needs
- Other operational application integration needs
- GIS staffing or outsourcing needs
- Alternative approaches to GIS staffing or resource needs
- GIS data acquisition needs including:
  - Aerial photography
  - LIDAR (Light Detection and Ranging) data
  - Road center lines
  - County assets
- Five-year budget with prioritized initiatives

- Make GIS integration a requirement for all-new, geo-based software application procurements.
  - Most ECMS systems include a GIS integration module for captured metadata (such as Assessor Parcel number or address), with site plans, landscaping plans, and engineering drawings that may enable integration with a parcel or address data layer.
  - Other desired application integrations include planning, permits, inspections, code enforcement, business licenses, work order/maintenance management, CAD/RMS, CRM, etc.

Benefits

- Centrally-managed information
- Improved accuracy of GIS information
- Easier creation and storage of digital maps
- Better analysis of infrastructure
- Improved land-parcel management
- Improved customer service through the ability to publish for public access

95. GIS Data Acquisition

Background

GIS data acquisition refers to accumulating the necessary data to improve the accuracy of GIS data across the County. Key GIS data uses can include parcel boundaries and property information, information on dwellings, land management and permitting, information on roads, official addresses, signs, and E-911. The lack of accurate data limits staff's ability to clearly define parcel boundaries, roads, and dwelling footprints.

Findings and Observations

- Parcel definitions are not always clear.
- GIS staff members utilize Google Earth and US Government low-resolution photographs to assist in defining parcel boundaries.
  - Low-resolution photographs limit GIS staff's ability to clearly define parcel boundaries.
- Detailed aerial photography can be used to find missing building additions and dwellings partially hidden by trees.
- Roads within the County often have multiple names.
  - Naming roads and assigning official addresses can be difficult.

Recommendations

- Perform more detailed aerial photography to improve GIS data accuracy.
- Consider LIDAR (Light Detection and Ranging) data for accurate mapping of elevation and some ability to see through trees.
- Purchase GIS data acquisition devices to better define the location of County assets.
  - Signs
  - Bridges
  - Road center lines
  - Other County assets

96. GIS Emergency Operations Readiness

Background

The 2017 fires caused GIS professionals in the affected counties to create new field-based applications that leverage mobile devices and GIS to increase the availability of real-time information and improve public safety. While we generally recommend delaying major improvements in GIS until the completion of a GIS Master Plan, we believe these Emergency Operations-based GIS applications should be adopted as soon as possible.

Findings and Observations

- Counties affected by the 2017 fires have begun to create GIS mobile applications to aid in emergency response, increase the availability of real-time data from field reporting, and improve public safety.
- While Mendocino County GIS efforts are somewhat hampered over the near term by limited aerial and LIDAR data, some of these applications can have an immediate effect in an emergency.
- Mendocino County does not currently utilize GIS Collector, a tool that allows the collection of field data when not directly connected to the GIS database through cellular or wireless.
  - GIS Collector allows GIS updates to be saved for transmission when connectivity is re-established.
- Potential GIS Emergency Operations applications include:
  - Documenting and reporting damaged roads, bridges, and dwellings through GIS and mobile device photography
  - Documenting and reporting building-by-building evacuation status
  - Documenting and providing field staff with access to locations of dwellings housing individuals with disabilities or special needs

Recommendations

- Continue to work with other counties affected by 2017 fires, including Sonoma and Mariposa, to discuss potential applications.
- License GIS Collector for mobile devices and pilot various applications.
- Continue to improve GIS data accuracy, including dwellings and fixed assets.
- Integrate Health and Human Services data related to special needs dwellings with GIS.
- Expand GIS abilities as a part of the Emergency Operations Center (EOC).
  - Replicate key GIS data to the EOC daily.
- Procure two new GIS workstations for the EOC.

Telecommunications

The *telecommunications system* is a critical tool for local government entities. It enables effective communication with constituants and deliver high standards of service. Telecommunications is also a key element in teamwork, allowing employees to collaborate easily from wherever they are located.

97. VoIP Phone System Upgrade and Resiliency
98. Phone System Training

97. VoIP Phone System Upgrade and Resiliency

Findings and Observations

- The County has standardized on Mitel Voice-over-IP (VoIP) telephone systems.
- Many of the Mitel phone systems located in each facility are stand-alone systems.
  - These stand-alone systems are not integrated with each other to provide fail-over, resiliency, integrated voicemail, or directory services.
- The County's digital access to the Public Switched Telephone Network (PSTN) for its phone system is through Primary Rate Interface (PRI) connections.
  - Many facilities have individual PRIs providing PSTN access.
  - These PRIs do not fail-over to each other.
  - If consolidated, current PRI capacity and ongoing monthly costs may be reduced.
- Voice-over-IP (VoIP) and session initiation protocol (SIP) technology can utilize an Internet connection to accommodate calls. It is highly reliable and fast when compared to conventional telephone systems and is an accepted communication standard. Benefits include reduced costs, ability to easily change numbers as needed, or increase features and support. VoIP hardware upgrades can occur automatically and seamlessly.
- The County has not deployed Mitel desktop integration or presence software to provide integration between desk phones, cell phones, and MS Office applications.

Recommendations

- When network upgrades have been completed, design a consolidated Mitel VoIP telephony system.
  - Move from individual PRI connections at many facilities to two, resilient SIP connections to the PSTN.
  - Integrate Mitel applications databases and consolidate voice mail systems.
  - Test network resiliency, simulating the failure of key phone servers.
- Evaluate the effectiveness of Mitel MS Office integration tools and deploy, if appropriate.
- Evaluate the effectiveness of Mitel cell phone integration and deploy, if appropriate.
- As part of the redesign of the MAN and LANs, and implementation of the new converged network, implement additional PRIs connected at another County building on the MAN.
- Reduce the number of Mitel phone servers required to support the network, based on resiliency.

98. Phone System Training

Findings and Observations

- The County implemented Mitel phone systems over time.
- Some users are desirous of additional training on advanced features.
- Some difficulties have been reported with video conferencing.
- Some difficulties have been reported with interface of MS Outlook.

Recommendations

- Conduct a more thorough training needs assessment with users either through departmental meetings or questionnaires.
- Determine if training is needed overall or for specific users.
- Schedule training as appropriate.
- Conduct training sessions for users on existing telephone system features.
  - Most vendors have a tri-fold “helpful hints” or “common features” handout.
  - Determine available supplemental training materials.

IT staffing can be one of the most important areas of business management, especially in view of the impact IT decisions can have on the organization's productivity, budget, morale, and overall success.

99. Business Analysis and Project Management Skill-Set Needs

99. Business Analysis and Project Management Skill-Set Needs

Background

Government agencies increasingly understand the direct correlation between effective applications utilization, organizational efficiency, and productivity gains. As described throughout this document, increasing application utilization is key for the organization to accomplish more with the same labor resources. Additionally, institutional knowledge too often leaves the organization through retirements and other employment separations. This further affects productivity, because many processes and procedures are inadequately documented and/or automated. Typically, County goals of improved transparency and constituent services are also accomplished through various software programs that collect information, automate, and streamline processes.

We have highlighted the limited availability of application and business analyst skill sets within the business departments and IT function. We believe this is an issue of strategic importance for the County as a whole.

To assist in meeting the need for analytical skills within the organization, IT departments are beginning to transform their overall department structures over time to take on more responsibility in hiring, training, retaining, and managing applications support services. This trend is being made possible, in some measure, by the streamlining of typical IT department operations through productivity and monitoring tools (see the *IT Staff Productivity* initiative).

Typical applications support staff proactively by handling Help Desk needs related to business department applications, business process analysis, applications training, applications setup and configurations, ad hoc report writing, and database administration.

It is not unusual to designate applications support staff for the following major applications systems:

- ERP (Accounting, Finance, and People Management)
- Work Orders/Maintenance Management
- Land Management
- CAD/RMS for Police and Fire
- State of California Human Services applications
- ECMS (Electronic Content Management System)

Findings and Observations

- The County utilizes IS staff to support some major applications.
  - Health and Human Services are not currently provided with IT Analyst assistance.
- IS staff members work with users to extract data from the County's major systems, mostly in the form of reports.
- This plan outlines major upgrades and improvements to many of the County's major applications systems.
- Additional assistance with County business processes will be required to increase application effectiveness.

Recommendations

We believe the County should undertake a focused effort to expand the availability of application support, business analysis, and project management skills. These skills should include:

- Additional business process analysis and design skills
- Additional project coordination and management skills
- Enhanced skills related to determining ROI for recommended improvements and working with the departments to prioritize those improvements

The County's goal should be to develop a business analysis and project management capability that will:

- Work closely with department heads, division leads, and application users to document and/or design/redesign effective business processes and associated business applications, including projects that require effective implementation or reimplementation.
- Make recommendations on improvements to business processes and applications, with the goal of delivering enhanced service and outcomes (e.g., faster permit processing times, automating manual or inefficient processes, etc.)
- Manage software improvements for various departments. These activities include procurement recommendations, ensuring that applications systems are being utilized to their full potential.
- Provide project coordination and oversight of IT-related projects.
- Assist with research of applications software products and services and coordinate feasibility studies for applications, software, and system products under consideration for purchase.
- Collaborate in the testing of applications to ensure quality assurance and fulfillment of contractual obligations.
- Coordinate training, including oversight of training materials, user procedures, and training curriculum and facilitate training sessions as necessary.
- Participate in integration, initialization, and interfacing between multiple systems, either through in-house or outsourced development, when required.

Benefits

- Reduced work order completion times
- Improved decision-making through access to real-time information
- Viewing of asset and activity trends visually through GIS mapping capabilities
- Better replacement planning and forecasting
- Enhancement of staff productivity
- Improved compliance with regulatory standards
- Improved safety and risk management