Section 5: Information Technology

Overview of IT Organizations and Services

The department's IT staff is geographically distributed, providing services in each of the state hospital facilities. Some IT services are shared and centrally managed at the headquarters office in Sacramento.

The following information provides a "snapshot" of the IT organization, functions, infrastructure, applications, staffing, physical plant, and location.

Headquarters

The department's IT division staff at headquarters consists of the following branches, functions, and positions:

BRANCH/SECTION	FUNCTION	Positions
CIO OFFICE		3.0
• Information Security	Security incident investigation and reporting, policy, and process	1.0
• Enterprise Services Support	IT Administration and IT Health Insurance Portability and Accountability Act (HIPAA) management	3.5
INFRASTRUCTURE SERVICES		
• Network Services	Provide network services to Sacramento office (headquarters) and two psychiatric programs, and provide expert consulting to all hospitals	6.0
• Help Desk	Desktop/help desk support for headquarters and psychiatric programs	5.0
• Web Information Architecture	Manage and update Intranet and Internet web pages	1.5
• Database Services	Database administrator	1.0
APPLICATIONS DEVELOPMENT		
• Wellness and Recovery Model Support Systems (WaRMSS) and HQ	Design, program/deploy, and maintain enterprise-wide software applications (client server applications)	17.0
• Hospital Systems	Design, program/deploy, and maintain enterprise-wide software applications (mainframe applications see full list below)	10.0

IT staff located at headquarters provides IT services and support to 11,700 DMH users statewide for the specific functions listed above.

The following information is data about headquarters:

Facility	IT Capacity
48 IT positions	400 Personal Computers (PCs)
270 headquarters employees	700 e-mail accounts
1 building	62 miles of Network
	66 Network equipment components (routers, switches, and firewalls)
	30 customized and commercial off-the-shelf (COTS) software applications supported locally

Statewide functions supported centrally at headquarters have evolved since 1980 as separate systems and do not have the attributes of modern, integrated systems. They are critical to hospital operations because they store individuals' records necessary for performing the day-to-day functions at the hospitals and psychiatric program facilities. However, these aging systems are labor intensive, requiring multiple points of redundant data entry. Data is also exported to multiple external databases for analysis and reports. Data redundancy, inadequate security, and lack of system documentation discussed later in the report increase the risk associated with operational information requirements. The major legacy applications currently supported and in use at headquarters are:

- Admission Discharge Transfer (ADT) System
    - The ADT system performs state hospital census functions. Statistical information from this system is used for management reporting and research purposes.
    - ADT includes over 500 programs, 800 screens, and 200 standard reports.
    - Systems: Natural, ADABAS
    - 400 users
- Administration Information Management System (AIMS)
    - AIMS allows users to manage and route program documents to a centralized storage location. County staff have the capability to electronically submit project status reports to the department for review. AIMS provides up-to-date funding approval progress to the counties and department management.
    - Systems: Microsoft SharePoint 2010, SQL Server 2008 R2, and SQL Server Reporting Services
    - Six users

- Criminal Background Check (CBC)
  - CBC allows users to track background checks for provider staff. Fulfills Health and Safety Section 1522.08 requirements, which requires specified departments to create a database to store required information.
  - CBC includes 50 programs, 100 screens, 25 letters, and 30 standard reports.
  - Systems: SQL Server 2008 R2, .Net
  - 50-100 users
- Hospital Clinical Operations and Operational Data Store (HCO/ODS)
  - These systems replicate patient data from mainframe systems to servers that are accessed by headquarters and hospital staff as needed. The replicated data is in turn used for populating local databases for additional customized applications at each facility used for mission critical day to day operations.
  - ODS includes 77 tables with 1,882 columns of data replicated from the Mainframe to seven state hospitals, headquarters WaRMSS, and the Sex Offender Commitment Program. Headquarters and the hospitals have developed hundreds of applications using the ODS database.
  - Systems: SQL Server 2005, Software AG Event Replicator Target Adapter, .Net Applications
  - 130 users
- Physicians Orders System (POS)
  - POS automates physician order entries and the transmission of physicians' orders to the service provider. POS uses extremely complex client/server architecture and is currently only used at Napa SH. The other hospitals have requested its use but the project has not occurred due to lack of resources.
  - POS includes 800 modules, 329 screens, and 50 standard reports.
  - Systems: Natural for Windows, ADABAS.
  - 1200 users
- Pharmacy Hospital Operations (PHO) System
  - The Pharmacy Hospital Operations system processes medication orders and recurring non-medication orders.
  - PHO includes 990 programs, 1000 screens, and 190 standard reports.
  - System: ADT
  - 326 users
- Wellness and Recovery Model Support System (WaRMSS)
  - WaRMSS captures client information, fulfills court monitor reporting requirements, and facilitates scheduling of treatment activities to match treatment objectives.
  - WaRMSS includes 20 modules, 5000 code pages, 390 database tables, and 1500 objects (stored procedures, functions, and views).
  - Systems: ASP.NET (VB, C#), and MS SQL Server 2005.
  - 5,000 users (clinical staff using systems 24/7)

- Client Services Information System (CSI)
  - The CSI collects, edits, and reports on client demographic and service encounter information on the entire California public mental health population of approximately 650,000 people receiving services annually. The system works via a web browser to two way communication and utilization with the counties via the Information Technology Web Services (ITWS).
  - CSI includes one primary database (with 500 megabytes), 116 tables, and 1.5 billion records.
  - Systems: ADABAS-C, Natural for PCs, SQL Server 2000.
  - Users include: 58 county mental health program staff, the Mental Health Services Oversight and Accountability Commission (MHSOAC), and various research groups such as the University of California and California State University.
- Information Technology Web Services (ITWS)
  - This system (a Web portal) provides the counties and their vendors with the means to securely pass data files for Short-Doyle/Medi-Cal, Medi-Cal Eligibility Data System, Performance Outcomes and Quality Improvement, Client Services Information System, etc. via the Internet to DMH as well as receive them from DMH.
  - System: ASP.NET
  - 5,700 users
- Conditional Release Program (CONREP)
  - The CONREP information system records patient data, provider contract information, and services received for judicially committed patients receiving community-based services. Through data analysis, it evaluates the effectiveness of the program.
  - CONREP includes 56 user forms, 120 database tables, and 15 standard reports.
  - Systems: ADP applications and SQL Server 2000.
  - 150 users
- Mentally Disordered Offenders (MDO) System
  - The MDO system provides a comprehensive method of prioritizing, evaluating, and tracking MDO patient referrals from CDCR to CONREP discharge. Aggregate data regarding referrals, clinician activity, evaluation results, state hospital population, CONREP population, and CDCR facilities is also provided.
  - MDO includes 45 user forms, 30 database tables, and 15 standard reports.
  - System: SQL Server 2000.
  - 50 users
- On-Line Administrative Services Information System (OASIS)
  - OASIS is an integrated collection of applications with a common infrastructure that support the department's administrative functions such as procurement, contracts, training, telephone directory, asset tracking and project portfolio.
  - OASIS includes 264 user forms, 246 database tables, and 156 reports.
  - System: ADP applications and SQL Server 2000.
  - 180 users

- Sex Offender Commitment Program Support (SOCPS)
  - The SOCPS data system consists of several linked databases containing information on potential Sexually Violent Predator (SVP) inmates referred from CDCR and screened by the department.
  - SOCPS data system includes 2000 source code files, 75 user screens, 160 database tables, and 30 standard reports.
  - Systems: ASP.NET, C# and SQL 2005.
  - 150 users
- Data Collection and Reporting (DCR)
  - This system provides both on-line and Extensible Markup Language methods for collecting performance outcomes from the 58 California county mental health care providers regarding the consumers of MHSA Full Service Partnerships.
  - DCR includes one primary database (with 18 gigabytes), 69 tables, and 15 million records.
  - Systems: ASP.NET, C#.NET, VB.NET, SQL Server 2005.
  - 58 counties and the MHSOAC are users.
- Avamar
  - This system provides online backup services that are clustered and geographically dispersed. The online backup system is available for all sites to backup their mission critical data and systems.
  - System: An appliance provided by EMC Corp.
  - Approximately 200 active servers are currently on the grid.

Hospitals

Each hospital's IT staff function independently as an organization to provide the hospital's IT services; the IT manager at each hospital reports to the hospital administrator. The department also has program (mental health care) responsibility for the psychiatric programs at three correctional facilities. At these facilities, the plant operations are managed by CDCR. The newest of these is the Stockton facility, which represents collaboration between DMH and CDCR for the treatment of the medical as well as mentally disordered prison population.

Each facility has its own separate IT staff, computer equipment and systems, and disaster recovery plans. These IT organizations have evolved over time and operate as if they are independent organizations. Below is a brief description of each of those eight facilities and their associated IT organizations.

Atascadero State Hospital is located in Atascadero on California's central coast. It opened in 1954, expended $238 million in 2010-11, and has:

Facility	IT Capacity
19 IT positions (including vacancies)	1500 PCs
2062 employees	2127 e-mail accounts
license for 1275 beds	146 miles of Network
42 buildings	101 components of Network equipment (routers, switches, and firewalls)
653 acres	135 customized and COTS software applications supported locally

Coalinga State Hospital is located in the city of Coalinga, a small town at the edge of the Coastal Mountain Range. It opened in 2005, has expended $174 million in 2010-11, and has:

Facility	IT Capacity
14 IT positions (including vacancies)	1380 PCs
1548 employees	1648 e-mail accounts
license for 1500 beds	125 miles of network
47 buildings	108 components of Network equipment (routers, switches, and firewalls)
320 acres	68 customized and COTS software applications supported locally

Metropolitan State Hospital is located in Norwalk near Los Angeles. It began providing services in 1915, has expended $167 million in 2010-11, and has:

Facility	IT Capacity
11.9 IT positions	893 PCs
1563 employees	1912 e-mail accounts
license for 1275 beds	62 miles of Network
108 buildings	69 components of Network equipment (routers, switches, and firewalls)
162 acres	60 customized and COTS software applications supported locally

Napa State Hospital, located in Napa, opened in 1875 and is the department's oldest hospital. It has expended $254 million in 2010-11 and has:

Facility	IT Capacity
24 IT positions (including vacancies)	1400 PCs
2,286 employees	1600 e-mail accounts
License for 1362 beds	25 miles of Network
220 buildings	112 components of Network equipment (routers, switches, and firewalls)
138 acres	45 customized and COTS software applications supported locally

Patton State Hospital, located in San Bernardino, opened in 1893, has expended $312 million in 2010-11, and has:

Facility	IT Capacity
15 IT positions (including vacancies)	1700 PCs
2806 employees	2508 e-mail accounts
license for 1287 beds	125 miles of Network
94 buildings	84 components of Network equipment (routers, switches, and firewalls)
245 acres	75 customized and COTS software applications supported locally

Salinas Valley Psychiatric Program, located in the Salinas Valley, is a facility within Salinas Valley State Prison (SVSP) and is an expansion of SVSP's Correctional Treatment Center. It opened in 2003, has expended $60 million in 2010-11, and has:

Facility	IT Capacity
5 IT positions (including vacancies)	210 PCs
735 employees	400 e-mail accounts
license for 370 beds	50 miles of Network
9 buildings	15 components of Network equipment (routers, switches, and firewalls)
On property of CDCR	6 customized and COTS software applications supported locally

California Health Care Facility is a new facility being constructed in Stockton. It is a unique facility within the CDCR, with services being provided by staff from CDCR, DMH, and the California Correctional Health Care Services. The anticipated date of full occupancy is 12/31/2013. It is targeted to have:

Facility (still in development)	IT Capacity
1 IT position (as of September, 2011)	536 PCs (documented)
772 employees	772 e-mail accounts (anticipated)
license for 475 DMH beds	No DMH network
DMH will occupy 8 buildings of the 38 total buildings on the Stockton site	No DMH components of Network equipment (routers, switches, and firewalls)
On property of CDCR	Customized and COTS software applications supported locally to be determined.

Vacaville Psychiatric Program, located within the CDCR California Medical Facility, opened in 1988, has expended $55 million in 2010-11, and has:

Facility	IT Capacity
5 IT positions	290 PCs
535 employees	315 e-mail accounts
license for 396 DMH beds (as of 12/5/2011)	1.5 miles of Network
2 buildings	21 components of Network equipment (routers, switches, and firewalls)
5 acres	6 customized and COTS software applications supported locally

Scope and Approach:

A review of the IT organization at the department was requested as part of the overall special project that is broadly examining the complexion of DMH going forward after the realignment. For IT, the specific request included:

- ✓ How well is IT providing support to the department?
- ✓ What should the IT organization and services include for the re-aligned department with the assumption that the department only consists of the hospitals and psychiatric facilities?

To meet the schedule for this special project, a review of the IT organization was conducted during August 2011. One manager from the California Technology Agency (CTA) worked with DMH IT managers and staff to examine the organization and develop this report. The review consisted of interviews with key IT staff, executive IT customers, and a sample review of IT documentation such as internal procedures, manuals, standards, project documentation, strategic plan, and disaster recovery plans. Standards and procedures included application management, network management, information security, project management and budget management. The overall IT organization was reviewed for compliance with state IT statute and policy, as well as customer service.

Observations

In summary, the findings of this review conclude that the department's IT program is inadequate for a hospital system that serves approximately 6350 patients. Every program IT serves requires systems stabilization and/or major development, e.g.: electronic medical records for tracking patient conditions and care; pharmacy management; coordination of 24-hour staffing services; development of costs by patient commitment type and acuity; administrative budget and personnel management as well as the underlying supporting infrastructure (network, servers, cooling systems, data storage, power). The list goes on. Overall, the existing systems are so fragile that system availability and data is in danger of being lost or corrupted.

✓ IT at DMH is unsustainable in its current architecture and organization.

- Existing systems are not documented,
- The organization as a whole is under resourced,
- IT evolved at DMH without a cohesive departmental approach,
- Hospitals grew their own IT organizations while headquarters focused on development of systems to address the county programs and hospital enterprise legacy systems that are now over 20 and 30 plus years old,
- Security program elements are over 10 years old placing data at risk,
- IT costs were cut when financial problems escalated without any evaluation of the specific reduction affects, and
- IT planning and the requisite IT budget do not exist.

The following observations and findings are grouped by the area or function reviewed:

✓ IT Organization

- The IT organization composition is generally described in the introduction to this chapter. However, IT is not a single organization at DMH; it is six distinct organizations with accountability to six different program executives. Each organization has different objectives, standards, priorities, and resources. This organizational structure creates inefficiencies and duplication of effort.
- Staffing standards, levels, services and workload are inconsistent between these six organizations. The psychiatric programs have minimal IT support.
- The department is not in compliance with the state IT statutes (Government Code 11544-11547, codified spring 2009) and policies and does not have a plan in place to address its approach to become compliant.

    - An attempt to initiate compliance occurred in July 2011. IT staff were directed to report to the CIO but without any preparation, direction, planning, process changes, service level agreements, duty statement updates, formal Human Resource organizational changes, or budget allocation changes. This approach resulted in significant confusion with both IT staff and IT customers on how to proceed with day to day operations. Critical decisions such as license and subscription renewals were not made timely resulting in operational risks and financial penalties.
    - There is evidence of discussions to address some statewide IT policies and initiatives such as data center consolidation and e-mail migration, but the broadly distributed program management of IT as well as the fiscal crisis prevented development of meaningful plans.

- The IT organization does not include all the required organizational or staffing elements for the sustainability of an IT organization:
  - IT administration, including budget and procurement
  - IT planning
    - IT requires regularly scheduled maintenance to continue with current level of tools and support.
    - A new IT initiative requires advanced planning and approvals and is a standard business practice in both the private and public sectors.
  - The DMH Project Management Office (PMO) exists only on paper. State policy requires all the elements generally provided in a PMO to be in place for any department developing projects, both reportable and non-reportable. The department does not have staff to perform these functions.
  - Information analysts/technical writers are not part of the organization and therefore:
    - There is limited system documentation for continued support of systems and applications. This is especially critical when knowledgeable staff leave the organization.
    - There are minimal documented procedures to ensure policy compliance, consistency, quality, and efficiency with repeatable processes.
  - The organization's staffing is insufficient for the size and demands of the hospital organization, and additional workload analysis is recommended. This is a general observation illustrated by:
    - Backlog of customer and court ordered requests;
    - Backlog of timely maintenance;
    - The number, size, complexity, and age of the existing applications;
    - Lack of IT security;
    - Comparison of DMH to other state agencies IT staffing resources;
    - DMH headquarters historically was primarily staffed by contractors who are no longer supporting the organization;
    - IT staffing evolved without planning and analysis; hospital IT staff evolved as each hospital identified its immediate IT needs because support from headquarters was not available; and
    - Existing conditions create IT "heroes" fighting fires versus planning and executing those plans.

Table 5.1: Functional and geographic distribution of IT staff

	Application Development	Infrastructure	IT Administration	Project Management	Total
Headquarters	27	14.5	6.5	0	48.00
Coalinga	2	12	1	0	15.00
Atascadero	5	11	3	0	19.00
Patton	2	12	1	0	15.00
Napa	5	16	3	0	24.00
Metro	3	7.9	1	0	11.90
Salinas	0	5	0	0	5.00
Vacaville	1	4	0	0	5.00
Stockton	1	0	0	0	1.00
Total	46.00	82.40	15.50	0	142.90

Table 5.2: Comparison of other state agencies' IT organizations to DMH

	State Agency Listed from smallest number of employees to largest number of employees.	Total Department Budget	Total Number of Employees	Total Number of IT Employees	Percent of IT Staff to Total Number of Employees	Ratio of IT Staff to Employees Served
1	Department of Consumer Affairs	92,018,381	1,535.40	139.40	9.1%	1:11
2	Public Employee Retirement System	162,664,850	2,361.40	477.00	20.2%	1:5
3	Veterans Affairs	128,828,158	2,631.60	63.60	2.4%	1:41
4	Department of Health Care Services	206,770,587	3,025.40	316.30	10.5%	1:10
5	Department of Water Resources	251,897,361	3,299.20	132.00	4.0%	1:25
6	Department of Public Health (DPH)	246,778,876	3,563.40	249.90	7.0%	1:14
7	Department of Social Services	266,386,428	4,286.00	550.10	12.8%	1:8
8	Franchise Tax Board	333,890,183	5,678.70	1,197.50	21.1%	1:5
9	Department of Developmental Services	406,473,165	6,618.10	68.50	1.0%	1:97
10	Department of Motor Vehicles	410,487,863	8,640.30	461.80	5.3%	1:19
12	Employment Development Department	68,818,030	11,011.20	673.60	6.1%	1:16
12	**Department of Mental Health**	**892,304,937**	**12,232.70**	**143.00**	**1.2%**	**1:86**
	Total		64,883.4	4,472.7	6.9%	1:14

- ✓ IT Budget
    - The IT budget does not exist.
    - All problems reflected in budget management for DMH also affect IT.
    - IT managers have no visibility or management responsibility for IT funds; therefore there is always uncertainty from year to year for financial planning.
    - Requests are made to the program manager as procurement needs are identified.
    - Elements of the IT budget are buried in multiple program budgets, e.g. the data center costs are in the LTCS division budget.
    - The lack of management of an IT budget creates multiple non-compliance issues with state policy for accountability, capital planning, strategic planning, asset management, and project planning.

- ✓ IT Planning
    - Strategic Planning:
        - There is no current IT strategic plan; the last plan was developed in 2008 when the primary focus of IT at headquarters was the development of the county Short-Doyle claim payment system and the development of WaRMSS.
        - The 2009 Agency Information Management Strategy (AIMS) is a well written document. However, in many cases, an inadequate process or system (e.g. asset management and quality assurance/testing) was presented as adequate. However, some of the problems identified in a strengths and weaknesses section of the AIMS plan are also identified in this review. The necessary plans and tasks to resolve these foundational problems are not part of the AIMS plan's objectives. For example, issues identified in the 2009 AIMS include:
            - A need to adopt technical architecture and application development standards.
            - There is an insufficient level of staff to support existing applications and infrastructure.
            - There is no Project Management Office or project planning and management standards.
            - The department needs to develop procedures and processes.
    - Capital Plan
        - The department does not have a capital plan. IT is a long term planning function. Projects, both software and infrastructure, are required to be part of the organization's capital plan. The capital plan process ensures that the department is aligned with the Health and Human Services Agency and the California Technology Agency (CTA) objectives and policies. Departments are not to expend resources on projects without the project concept being vetted and approved through the capital plan process.

- The level of crisis intervention in IT is so high that, in addition to the departmental financial crisis, it has prevented the IT staff from developing shorter term annual plans.

- Information Technology Acquisition Plan (ITAP)
    - The CTA implemented the ITAP as one element of IT procurement management. All IT acquisitions relating to hardware, software or consulting services must be approved in advance by the CTA Generally, procurement items are identified at least once a quarter, prior to the actual procurement and approved by the CIO, the HHS Agency and the CTA.
        - The ITAP process adopted by the department was too lengthy and included unnecessary, multiple steps that can be streamlined. The CTA recently modified their policy and process to minimize the items requiring approval at the CTA level.
        - However, there were also two other barriers to this process:
            1. DMH IT requires program purchase approval of any new software applications. There was no process or headquarters' standard to identify who had program approval, the deputy director of LTCS or the hospital executive director. To resolve this conflict, IT required approvals from both executives for every purchase. This additional approval created unnecessary delays that had a negative impact on the program operations.
            2. Due to the recent DMH fiscal constraints, IT division management placed a hold on all ITAP approvals, effective November 2010. However, the lack of communication and the ambiguous relationship among the CIO, the deputy director of the LTCS division and the hospitals did not allow for a clear understanding of the process. This has created serious IT deficiencies in all organizations.

- ✓ Project Management
    - There is a Project Management Office (PMO) at the department. However:
        - There are no DMH policies, processes, procedures, forms, or templates for project initiation, planning, execution, or closure.
        - There is no staffing for the PMO.
    - A PMO Project Charter was developed in the spring of 2011 but the effort never launched.
    - Project management phases align with state policy:

Project Management Institute	State Information Management Manual
Initiation Phase	Concept Approval – Capital Plan
Planning Phase	Feasibility Study and Report
Executing	CTA Project Management Methodology (CA-PMM)
Monitoring and control	Post Implementation Evaluation Report (PIER)

✓ Communication – there is an information vacuum and a cultural divide between headquarters and the institutions, as evidenced by:
- No communication plan
- No communication delivery system
- Insufficient information and understanding about the organizations: hospitals, headquarters, HHS Agency, CTA
- Insufficient understanding of statewide policies
- No information visible and available for most IT staff
- No IT governance; objectives of business must align with objectives of IT

IT depends on structure, documentation, and repeatable processes to ensure quality in its products and services. At DMH, patient care is dependent on accurate and timely information. The following critical IT processes are considered required for a healthy and low risk IT organization, and therefore were examined.

✓ IT Procurement
- Existing procedures are illogical, extensively long, and bottleneck at multiple approval points. Generally the effort becomes unorganized because it cannot be tracked. It encourages poor budget management by requiring complete procurement processes prior to encumbering, or pre-encumbering funds.
- Lower value procurements are decentralized and the headquarters' complicated process discourages coordination of efforts for leveraged procurements. A procedure revision is already in process to address this issue.
- Backlog of procurement requests due to cumbersome process.
- Opportunities for leveraging IT procurement for increased cost savings exist and have been recognized. Two enterprise procurement opportunities have been executed.

- ✓ Application Systems Support and Stabilization
  - The IT division supports 14 statewide systems consisting of thousands of programs and over 500 local applications supporting hospital operations.
    - There is no documentation for systems in production now.
    - The existing clinical application systems are fragile, slow in performance and cumbersome to use.
    - DMH IT has very few skilled staff that maintains the 14 statewide systems.
    - There are no current and executable disaster recovery plans for the existing clinical applications.
    - There are no standard processes for the software development life cycle.
    - There is no quality assurance/testing unit or standard testing procedures.
    - There are no adequate facilities for end user training.
    - Demand is greater than development supply, resulting in software development backlogs.

- ✓ Infrastructure
  - The IT infrastructure of an organization has a specific life cycle; systems age out and must be replaced; in some cases the organization expands beyond the use of the system. Due to the fiscal crisis, the department has not adequately managed or refreshed its assets as needed. Also:
    - The majority of hardware is aging out.
    - Networks and bandwidth at the older hospitals are inadequate and cannot support any change or growth.
  - Enterprise Architecture is not documented; compliance with statewide architecture requirements is unknown.
  - Server Rooms are not to standards; there are cases of inadequate power and cooling.
  - The IT organization has not adopted standard operating procedures including service management for implementation statewide, such as the IT Infrastructure Library.
  - The department has multiple help desk applications at each location which should be standardized; however, the infrastructure issue must be resolved before the help desk/work order system may be standardized.

- ✓ Documentation Standards
  - Documentation of products constructed by IT is required for the continued maintenance of the systems; there are over 500 software products used locally at individual hospitals (custom developed and off-the-shelf configuration) and 14 statewide systems consisting of thousands of programs.
  - At a minimum, all systems should have documented:
    - Business requirements
    - System design
    - User Guides

- Training Manuals

- ✓ Service requests (also part of the infrastructure findings)
  - Headquarters and each hospital have a help desk/work order system for customers to request services; different software is utilized and installation is local.
  - Infrastructure reliability issue is required before this issue may be resolved. The hospitals are 24 x 7 operations with a dependency on the automated systems. Communication lines must be from two sources to ensure data access before any systems or applications are moved off the hospital campus or standardized and hosted at the data center.
  - Many employees do not know when they should contact the help desk or how to access the help desk.

- ✓ Disaster Recovery
  - The last disaster recovery plan was finalized in February 2009.
  - This plan was updated and submitted to the Technology Agency in 2011 but it was rejected as inadequate.
  - There is no disaster recovery environment.
  - There are no updated procedures and there are no regular disaster recovery testing procedures.

- ✓ Security
  - The risks to the systems and data are high.
  - Controls on data integrity and testing are limited; errors can be introduced into reports. Quality assurance practices are not in place.
  - The security at DMH has, for the most part, not been updated in over 10 years.
  - An external evaluation was conducted of the IT environment and the security issue findings included:
    - Inadequate access control
    - Inadequate business continuity and disaster recovery planning
    - Inadequate information security governance
    - No vulnerability scanning, intrusion management or penetration testing
    - Inadequate security operations (e.g. patch management, event log management)
    - No physical security for servers or other IT assets
    - Inadequate physical environment for IT equipment
    - Inadequate telecommunications and network security

- The inadequate security places the IT systems and data at risk. The following is a sample of DMH systems and the impact at the hospitals if these systems were compromised:
    - Admission, Discharge, and Treatment System not available:
        - There are no work arounds or alternative manual procedures if ADT is not available, other than completely paper based internal and external processes. There are over 6000 patient admissions and discharges each month.
        - There would be no electronic patient information; ADT contains the patient file which is the foundation for all patient care-related programs with over 800 screens and 200 standard reports.
        - If ADT is down, all other systems are impacted. Without ADT, there would be no hospital census information used for multiple other systems critical to daily patient care including pharmacy/medications, WaRMSS, Physician Ordering System, and most locally built systems.
        - No insurance billing (revenue generation) while the system is down.
        - Without automation there would be a significant need for increased labor and an increasing risk of error impacting the health and safely of both the patients and the employees.
    - Pharmacy Hospital Operations System not available:
        - No automation for processing medication and recurring non-medication orders, resulting in:
            - No prescription renewal reminders
            - No electronic file for the automated unit-dose dispensing machines.
            - No validation of drug-to-drug interactions or allergies
        - A manual paper-based process could be used with an exponential use of resources. There are 27,000 medication orders per month.
    - WaRMSS not available:
        - Inability to provide timely, adequate and appropriate treatment and care to individuals in the hospitals. Without WaRMSS, hospital staff would have to manually research information that is currently readily available in WaRMSS in order to plan and monitor treatment, schedule appointments, and monitor, oversee, and respond to high risk physical/behavioral indicators.

- Treatment planning would be more time-consuming. Hospital staff would need to revert to manual documentation and would no longer have real-time access to information and incident notifications for issues requiring their attention or due dates. Manual documentation and tracking of assessments and treatment plans would be labor intensive and would likely result in an inability to meet deadlines established by the Court's Enhancement Plan and provide required, updated, and relevant treatment planning.
- Disruption of daily operations to over 5,000 system users. In a recent one week period, there were over 8,600 records updated in the WaRMSS system; actual WaRMSS use volume is likely much higher because only records that were updated are counted. These statistics do not count the frequent and numerous times staff login to the WaRMSS to run reports, review, look up and/or verify information, and receive incident, timeline and trigger notifications etc.
  - The WaRMSS system is not designed well and is labor intensive for the end user; options to improve WaRMSS will be explored.

- ✓ Asset Management
  - There is no centralized IT asset management; IT asset management is a decentralized and manual process.
  - There is no staff dedicated to software and hardware management.
  - At the time goods are received, assets are tagged and recorded manually. However:
    - Records are not updated when assets are relocated or retired;
    - Inventory counts are completed as required.
  - IT assets are depreciable and should be part of the financial records.
  - IT assets have a limited useful life; the equipment either wears out over time or changes to the organization or industry occur, which renders the asset obsolete.
  - Advanced planning is required for procurement; the ITAP, capital plan, FSR, or BCPs may be needed.
  - State policy requires:
    - Asset tracking
    - Inventory
    - Software inventory and licensing

✓ Staffing Workload
  - All data gathered in this short time indicates that the existing staffing levels are insufficient to provide the level of care for a complex, statewide medical organization.
  - Without IT governance, IT workload is not prioritized; continuous urgent requests due to lack of communication and lack of planning create inefficiencies and additional workload.
  - Workload for IT must be determined based on the type of work and the rate of change.
  - This study did not provide sufficient time to perform a workload study, but the data collected does support a workload study is warranted for existing IT services.
  - All new products and services should be properly resourced going forward.

✓ Succession Planning
  - Training
    - IT training has been substantially eliminated for a number of years.
    - IT staff must stay current in their profession; IT as an industry changes rapidly. IT staff have shared that they receive other training applicable to the hospital environment such as correctional security procedures, or HIPAA, but that training to stay current as an IT professional has not been available.
  - The organizational structure does not promote succession planning.
  - There is no policy or process that would facilitate incorporating succession planning into daily operations.

Recommendations

These problems are significant and numerous but they can be resolved; none are unique or exceptionally challenging. One primary cause of the problems is that the organization has operated with minimal IT resources over a long period of time. Resolution can be expedited in many areas by using the many existing successful models publicly available to the department and working with other state agencies. These problems were not caused by the current IT staffing; they have been heroes to the organization, going above and beyond expectations to sustain the IT operation with limited resources.

The next step is to identify and prioritize corrective actions and develop a strategic plan that will phase in the improvements over a planned time horizon.

- ✓ The department should organize solutions in the following categories:
  - Quick wins – no funding required
  - Longer term improvements – no funding required
  - Allocation of existing resources to highest priority efforts, including cost saving proposals. Recognize that redirecting existing resources will require the elimination of corresponding existing workload or providing additional temporary help until the savings is realized.
  - Identification of high priority efforts, including cost saving proposals that require additional funding

- ✓ Organization
  - Comply with GC 11545; all IT resources are the responsibility of the CIO including telecom.
  - Manage the IT organization as a single division but recognize the benefits of statewide location with IT staff co-located with the primary customer, the hospital staff.
  - Leverage existing resources by standardizing existing software and selecting "best of breed" for each function. Share solution successes between the organizations.
  - Regionalize IT to provide local leadership, support, synergy, and provide day-to-day IT operational services to the psychiatric programs.
  - Reevaluate IT classifications statewide to ensure position duties are aligned with the position classification.
  - Reevaluate workload and staffing in response to the demands of the hospitals; recognize 24/7 hospital operations in the evaluation.

- ✓ IT Budget
  - The IT budget should be developed 18 to 24 months in advance of the budget year.
  - IT project budgets must follow the project approval cycle and the Legislative funding cycle.
  - IT Administration should include an IT budget and IT project budget expert.
  - IT must track and manage its operating and project budgets centrally.

- ✓ IT Planning
  - IT Administration should include staff to support the IT Governance Steering Committee and the Hospital Automation Committee; these two groups are responsible for IT planning activities.
  - Planning must be a first priority for IT; the following must be developed as a plan of action to remediate the organization:
    - Corrective Action Plan (short term)
    - Capital Plan (longer term)
    - Strategic Plan (long term)
    - IT Governance Charter
      - Leadership and direction
      - Service levels
      - Service model
      - Establish workload and project priorities
      - Resolve and leverage relationship with CDCR

- ✓ Project Management
  - Develop a PMO to provide the following project support functions:
    - Initiation and planning
    - Budget development and tracking
    - Schedule creation and maintenance
    - Project status reporting
    - Project portfolio management

- ✓ Communication
  - Establish IT governance
  - Create IT library of documents on the intranet for IT division and other interested department staff; library should include:
    - IT policies and procedures
    - IT project information (project documents, schedule, status reports, etc.)
    - IT calendar of planning events
    - IT organization chart
    - Roles and responsibilities with a directory of staff
  - Conduct weekly IT managers meetings
  - Require IT managers to have weekly staff meetings to keep all staff informed

- ✓ IT Procurement
  - Streamline the procurement process
  - Establish a central IT procurement unit with appropriate training and procedures;
  - Leverage procurement when savings can be achieved

- ✓ Policy, Process, and Procedures
  - • Establish IT Governance; IT is a shared resource:
    - ▪ Establish an IT governance steering committee composed of the chief information officer, the deputy directors, and the hospital executive directors. The IT governance steering committee is responsible for:
      - • Providing vision and leadership.
      - • Prioritizing IT efforts using available resources.
      - • IT business needs will exceed IT resources; the governance steering committee will either recommend delaying new efforts or support additional funding either through a BCP, through savings created by automation or with redirection if an existing function can be discontinued.
    - ▪ Establish a committee of the IT managers (Hospital Automation Committee) to:
      - • Identify and standardize effective IT policies and processes to ensure:
        - o Compliance with statewide requirements
        - o Efficient and transparent operations
        - o Avoid bottlenecks and no-value-added functions.
      - • Leverage IT resources to avoid duplication of effort.
      - • Provide customer service and service agreements.
      - • Provide concept analysis on proposed projects for presentation to the Governance Steering Committee.

- ✓ Application Systems Support and Stabilization
  - • Develop documentation for systems in production now.
  - • Develop a plan that stabilizes the existing clinical application systems, improves performance and work with customers to identify areas of functionality that could be streamlined.
  - • Ensure that the existing staff are trained or fill with qualified staff that maintain the 14 statewide systems.
  - • Develop a current and executable disaster recovery plan for the existing clinical applications.
  - • Identify an application architect to develop software development standards including coding, documentation, and development processes.

- ✓ Infrastructure
  - • Identify an enterprise architect to develop DMH enterprise architecture.
  - • Follow statewide enterprise architecture standards.
  - • Adopt a standard methodology for operations and service requests such as ITIL (IT Infrastructure Library).
  - • Develop a schedule to replace aging infrastructure.

- Recognize the need for 99.9% reliability and system availability and develop a strategy that will meet that need at a reduced risk.
- Standardize systems and applications and centrally host them at a Tier 3 data center once the communication reliability is resolved. (Tier 3 data center provides the conditions for 99.982% availability and reliability by providing plant and system infrastructure features such as dual-power sources, cooling, ventilation, redundant independent distribution paths, physical security, and more.)

✓ Security
- Develop a multi-year plan to resource and implement a security program and security infrastructure.

✓ Disaster Recovery
- The ITD must review the disaster recovery report critique provided by the Technology Agency and develop a corrective action plan.
- Develop a disaster recovery infrastructure.
- Schedule periodic disaster recovering testing (drills) to ensure recovery procedures are in place and staff is trained.

✓ Asset Management
- Examine asset management tools used by other agencies; determine which tool may be used or shared by the department.
- Dedicate staff to asset management maintenance.

✓ Staffing Workload
- Complete a workload study for existing services; workload for IT must be determined based on the type of work and the rate of changes required (i.e. changes to software or to equipment).
- All new products and services must be properly resourced going forward.

✓ Succession Planning
- Require managers to provide individual development plans for staff;
- Provide for a reasonable training complement for staff that reflects their duties;
- Provide all IT staff relevant training in state policies and administrative processes;
- Rotate staff to provide cross training

✓ The following projects were proposed for safety and efficiency by both program and IT managers interviewed:
- Electronic medical records (federal mandate to be implemented by FY 2014-15)
- Standard reports (and reporting) department wide
- Ability to measure program outcomes
- Scheduling tool for staffing hospital shifts
- IT tools for patient treatment (schools and cognitive disorders)
- Computer training rooms for employee training of internal applications

- Develop billing system to recover funds from public and private medical insurance.
- Repair infrastructure and security for system reliability and integrity.
- Implement Voice over Internet Protocol (VoIP) for communication between hospitals; the pilot at Napa SH was successful. Telecommunication costs will only be reduced if communication between hospitals is via VoIP.
- Develop personal duress alarm system for employee safety at all campuses; prioritize campuses with the highest risk.
- Replace metal keys with electronic keys to reduce lock-downs, overtime, and locksmith costs.

Progress in process

Many of the problems with IT in the department can begin to have resolution immediately, but many of the problems identified and the deferred maintenance will take some time to correct and will need to be phased in over time and as appropriately resourced.

Short term, IT has initiated the following corrections:

✓ Compliance with Government Code Sections (GC) 11545 and 11546 which includes departmental authority realignment for the following:
  - All IT systems, assets, resources, projects, purchases, and contracts are the responsibility of the CIO. This includes operational oversight of IT functions, human resource management, and operations, including, but not limited to:
    - Web application development;
    - Application and database development and management;
    - Security administration;
    - Telecommunications, including Public Safety Communications;
    - Project planning, consulting and management; and
    - Help desk and customer service management.

✓ Implementation of IT governance to facilitate the compliance with GC 11545 and ensure that the program needs are identified and prioritized to align with the program strategic plan. This includes:
  - The Hospital Automation Committee consisting of IT management; and
  - Departmental Executive IT Steering Committee consisting of the deputy directors and hospital directors.

✓ Reorganization of IT staff to report to the CIO.

✓ Establishing IT regions (Northern, Central, and Southern California) as a team approach to facilitate projects and to explore operational support for the psychiatric programs.

- ✓ Established statewide committee of application developers to recommend standardized applications with the goal to minimize the number of applications that require maintenance and support so those remaining applications may be supported to standards.

- ✓ Identification of an IT budget.

- ✓ Establish work groups for enterprise architecture and application architecture.

- ✓ Priority established to address the safety and security of employees and data.

- ✓ Identification of projects required for the health and safety of employees, security of data, and to generate operational improvements for cost savings. Recommendations provided during interviews have been expanded as discussions continue. Currently IT is developing concept papers to prioritize and approve project efforts before the expenditure of resources:
  - Electronic medical records
  - Performance and utilization improvements to WaRMSS
  - Clinic staffing work shift scheduling tool
  - Personal alarm duress system
  - VoIP
  - Electronic key locks and badges
  - Security infrastructure
  - Identify, develop and deploy DMH automated tools for the new Stockton facility
  - Address the two psychiatric programs growth; identify and deploy DMH automated tools necessary for operations.
  - IT consolidation initiatives:
    - C-Gen (network)
    - CES Mail (email)
    - Server consolidation
  - Services billing system (to recover funds from Medicare and other sources)
  - Tele-medicine
  - Tele-psychiatry
  - Develop Project Management Office