STATE OF ALASKA

DEPARTMENT OF HEALTH AND SOCIAL SERVICES (DHSS)

DHSS ENTERPRISE TECHNOLOGY ROADMAP DELIVERABLE

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Version 1.0

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TABLE OF CONTENTS

1 EXECUTIVE SUMMARY 1
1.1 Introduction 1
1.2 Scope 1
1.3 Current Technology Environment 1
1.3.1 Strategic Health-Related Initiatives and Systems 3
1.4 Enterprise Technology Roadmap Recommendations 3
1.4.1 Alaska Enterprise Framework Recommendation 4
1.4.2 Business Initiatives 5
1.4.3 Support and Engagement in Selected Statewide Initiatives 6
1.4.4 Modification of Selected Current DHSS Initiatives 6
1.4.5 Recommendation for Scaled-Back Initiative 8
1.4.6 Recommendations for New Initiatives 8
1.5 Expected Outcomes 10

2 INTRODUCTION 11
2.1 Document Overview 11
2.2 Methodology 11
2.3 Goal 11
2.4 Changing Landscape of Health Care and Human Services 13
2.5 Technology Trends Affecting Alaska 14
2.5.1 Technology Challenges in Alaska 15

3 CURRENT ALASKA HEALTH INFORMATION TECHNOLOGY ENVIRONMENT 17
3.1 Overview 17
3.2 Network 17
3.3 Health-Related Application and Project Inventory 17
3.4 As-Is Environment Summary 19
3.4.1 Strategic Health-Related Initiatives and Systems 20
3.4.1.1 MMIS Replacement Project (MMIS) 20
3.4.1.2 Eligibility Information System (EIS) Replacement Project 20
3.4.1.3 Integrated Resource Information System (IRIS) 21
3.4.1.4 Master Client Index (MCI) Project 21
3.4.1.5 Provider Enrollment Portal 21
3.4.1.6 State-Level Registry (SLR) for the EHR Incentives Program 21
3.4.1.7 Health Information Exchange (HIE) Project 21
3.4.1.8 Enterprise Notifications Service (ENS) 21

4 ENTERPRISE TECHNOLOGY ROADMAP 23
4.1 Strategy 23
4.2 Future Architecture 23
4.2.1 Business and Information Architecture Recommendations 28
4.2.1.1 Governance and Portfolio Management 29
4.2.1.2 Supporting Tools for Comprehensive Care Management 31
4.2.1.3 Business Process and Organizational Reengineering 34
4.2.1.4 Information Technology Support Structure 34

4.2.1.5 Security and Privacy 37
4.2.1.6 Shared Services 37
4.2.1.7 Data Management 38
4.2.1.8 Business Intelligence (BI) vs. a Data Warehouse 39
4.2.2 Services and Technology Architecture Recommendations 40
4.2.2.1 Migration to the "Cloud" 41
4.2.2.2 Enterprise Bus, BizTalk and Cloud Computing 42
4.2.2.3 Telehealth and Telemedicine 42
4.2.2.4 Broadband Communications 42
4.2.2.5 Recommendations Regarding Existing Systems and Initiatives 43
4.2.2.5.1 Master Client Index (MCI) 43
4.2.2.5.2 Provider Portal 44
4.2.2.5.3 Eligibility Information System 45
4.2.2.5.4 Business Rules Engine and Workflow 45
4.2.2.5.5 Laboratory Information Management System (LIMS) and Lab Reporting 45
4.2.2.5.6 Pharmacy Software and eMAR 46
4.2.2.5.7 Electronic Medical Records (EMR) 46
4.2.2.5.8 Case Management Systems 47
4.2.2.5.9 Electronic Document Management 48
4.2.2.5.10 Grants Management 49
4.2.2.5.11 State Level Registry (SLR) 50
4.2.2.5.12 Geographic Information Systems (GIS) 50
4.2.2.5.13 Enterprise Notifications Service (ENS) 50
4.2.2.5.14 Direct Secure Messaging (DSM) 51
4.2.2.5.15 Quality Assurance (QA) Systems 51
4.2.2.5.16 Licensing, Certification and Registration 52
4.2.2.6 Recommendations for New Initiatives 52
4.2.2.6.1 Health Insurance Exchange (HIX) 52
4.2.2.6.2 Health Plan Identifier (HPID) and Other Entity Identifier (OEID) 54
4.2.2.6.3 Client Portal Project 54
4.2.2.6.4 WIC/SNAP/TANF Master Provider Index (MPI) Project 56
4.2.2.6.5 Business Intelligence/Data Warehousing 56
4.2.3 Expected Outcomes 56
4.2.3.1 Recommended Prioritization, Schedule, and Cost 57

5 CHALLENGES 62
5.1 Future State Challenges 62

6 ASSUMPTIONS 64
6.1 Enterprise Technology Roadmap Assumptions 64

APPENDIX A – REFERENCE MATERIAL 65

APPENDIX B – DETAIL OF CURRENT DHSS SYSTEMS ENVIRONMENT 66

APPENDIX C – ACRONYMS 78

APPENDIX D – GLOSSARY OF TERMS 81

LIST OF FIGURES AND TABLES

Figure 1: Alaska Enterprise Framework 5
Figure 2: Alaska Future State Goals 12
Figure 3: Intersection of Health Care and Technology Trends 15
Figure 4: As-Is Systems Diagram 19
Figure 5: Build a Foundation for the Enterprise Architecture 24
Figure 6: To-Be Shared Services Model 26
Figure 7: To-Be Alaska DHSS Enterprise Architecture 27
Figure 8: Enterprise Technology Key Dates 28
Figure 9: Shared Services Governance Structure 30
Figure 10: Recommended Governance Process 31
Figure 11: Migration of ITS Service Delivery 36
Figure 12: Exchange Options for States 53
Figure 13: Roadmap Schedule 59

Table 1: Health System Application and Project Inventory by Division 2
Table 2: Health System Applications by Function 2
Table 3: Recommendations for Modification of Current Initiatives 6
Table 4: Application and Project Inventory Analysis 18
Table 5: Application and Project Inventory Database Record Count Analysis 18
Table 6: DHSS EMR Applications and Projects 46
Table 7: Major Alaska Case Management Systems 47
Table 8: Sample of Systems with Licensing & Certification Functionality 52
Table 9: Initiative Cost and Prioritization Table 60
Table 10: Implementation Challenges and Recommendations 62

1 EXECUTIVE SUMMARY

1.1 Introduction

DHSS has a critical role in Alaska's information infrastructure. The systems must promote integrated health and wellness, access to health care, improved public health outcomes and health care delivery for the citizens of Alaska. They must support Alaska Health Care Communities' efforts to make accurate clinical decisions and citizens' ability to find and request information and services.

Like most states, Alaska is actively pursuing technology improvements as part of a multi-year plan designed to meet these current and future business needs, with a focus on lower cost, increased efficiency, and improved service.

The recommendations in this Roadmap capitalize on DHSS's multi-year plan and suggest additional steps and initiatives for continuing the transformation over the next five to six years.

The goal of the Roadmap is to provide a framework and strategy to evolve the use of technology toward integrated services and systems to improve overall performance and provide the ability to deliver services efficiently within available resources.

1.2 Scope

The Cognosante Enterprise Roadmap Engagement included two activities, completion of an application and project inventory and development of an Enterprise Technology Roadmap.

The scope of the application and project inventory portion of the assignment included surveying for systems for health care and tracking of health information and the infrastructure to support them, including registries, disease and health databases, care management and payment systems, and health care Information Technology (IT) infrastructure systems such as BizTalk. Systems for general infrastructure support, such as financial systems, facility management, internal inventory systems, internal service desk support and procurement systems were not within scope of the inventory.

Based on information obtained from the inventory, Cognosante developed the DHSS Enterprise Technology Roadmap. The scope of the Roadmap includes current and future state diagrams, timelines, proposed initiatives, prioritization, costs, business impacts, and assumptions related to health care technology.

1.3 Current Technology Environment

DHSS has over 100 health-related applications and registries and over 40 health projects in its portfolio. Most of the applications are stand-alone; in fact, about 70 percent of the applications and registries have no integration or interfaces with other systems. Of the 30 percent of systems that include an interface, less than half have more than one interface.

Following is a summary of DHSS health-related projects and application.

Table 1: Health System Application and Project Inventory by Division

Division	Division Acronym	Applications	Projects	Registries/ Other
Department of Health and Social Services (Department wide)	DHSS	2	4	0
Alaska Pioneer Homes	APH	10	3	0
Office of the Commissioner	COM	1	0	0
Division of Behavioral Health	DBH	7	3	0
Division of Juvenile Justice	DJJ	2	2	0
Division of Public Assistance	DPA	10	5	1
Division of Public Health	DPH	41	16	9
Finance and Management Services	FMS	2	2	1
Division of Health Care Services	HCS	6	5	1
Office of Children's Services	OCS	7	1	0
Senior and Disabilities Services	SDS	4	1	2
TOTAL		92	42	14

In addition to a low number of interfaces between systems, there is a significant amount of duplication of functionality, providing an opportunity to eliminate redundancy and increase the systems' efficiency by sharing functional capabilities and data. For example, more than 30 of the DHSS health-related applications contain some type of case management functionality.

Table 2: Health System Applications by Function

System Function	Number of AK Systems performing the Function
Case Management Functions	32
Client Portal	9
Communication	12
Health Information Tracking	18
Eligibility Determination or Eligibility Support Functions	14
Enrollment in Programs	13
Financial Management Functions	15
Grant Management	9
Licensing & Certification	7
Plan Management	12
Provider Portal	14
Registries & Surveillance	20
Training	2

Note: *The information presented in this table is derived from the IT Matrix Database, therefore depends on the accuracy of the database. Due to differing knowledge levels of survey respondents, the data may not be comprehensive or completely accurate. Cognosante recommends using it as a guideline rather than exact representations.*

Note 2: *Many of the systems in place have multiple functions; therefore, the total of this table does not equal the total number of applications.*

DHSS implemented some of the major systems in the 1980s; these systems are either in the process of being replaced or targeted for replacement. Additionally, there are a number of systems that are over 10 years old that are candidates for modernization or replacement.

Alaska utilizes a mix of in-house developed/supported systems and outsourced system hosting and support.

The current environment provides great opportunity for increased efficiency by consolidating and integrating systems, sharing data, and modifying the system acquisition, hosting, and support structure.

1.3.1 Strategic Health-Related Initiatives and Systems

Alaska has numerous strategic projects underway that set the stage for modernization of systems, improved services and compliance with the Medicaid Information Technology Architecture (MITA) and the CMS Seven Conditions and Standards.

- **MMIS Replacement Project (MMIS)**, scheduled to be implemented in April 2013
- **Eligibility Information System (EIS)** Replacement Project, beginning in 2012. Phase I to replace Medicaid eligibility determinations must be up and running by 2014; Phases II through V go through the end of 2017.
- **Integrated Resource Information System (IRIS),** planned to be implemented in five functional phases between August 2012 and March 2015.
- **Master Client Index (MCI)** Project, which began with four core systems, JOMIS, ORCA, Permanent Fund Dividend (PFD), and the legacy EIS, was expanded to include DS3 and AKAIMS.
- **Provider Enrollment Portal**; currently a stand-alone database that is uploaded to the legacy MMIS as an interim solution until the new MMIS system is implemented.
- **State-Level Registry (SLR)** for the EHR Incentives Program
- **Health Information Exchange (HIE) Project**, required to meet the federal regulations for meaningful use, as spelled out in the American Recovery and Reinvestment Act (ARRA).
- **Enterprise Notifications Service (ENS)**, to provide the ability to send broadcast and targeted notification documents, such as emails, faxes, or text messages to email servers and external printers, with logging and tracking. Funded by the Office of Children's Services (OCS), it is scheduled to implement in the fall of 2012.

1.4 Enterprise Technology Roadmap Recommendations

To improve service, increase efficiency, and lower cost, Cognosante recommends that the Alaska Information Technology environment moves toward a business-process focused organization in alignment with the Centers for Medicare & Medicaid Services' (CMS) Seven Conditions and Standards. This approach increases the use of shared services and integration opportunities, employs the principles of a strong IT governance model, focuses on security, works to decrease redundant systems and data, and provides appropriate technology support.

In addition, Cognosante recommends that Alaska monitors the evolution of federal standards and continues to refine the Information Technology environment as the standards are revised and matured. Alaska should especially stay in touch with the National Human Services Interoperability Architecture (NHSIA), which is currently in the early stages of development. This initiative, funded by a federal grant under the Administration for Children and Families (ACF) and led by John Hopkins University, is leveraging past developments of various federal and state programs, including Medicaid Information Technology Architecture (MITA), National Information Exchange Model (NIEM), Global Reference Architecture (GRA), Service Oriented Architecture (SOA), and cloud computing projects, to develop a comprehensive framework architecture for Human Services. Cognosante believes this effort will provide the foundation for the next iteration of MITA, and will support common eligibility and information sharing across programs, agencies, and departments.

1.4.1 Alaska Enterprise Framework Recommendation

To create the foundation for a business-process focused organization, Cognosante recommends moving toward an enterprise framework structure of systems, as illustrated in the following diagram:

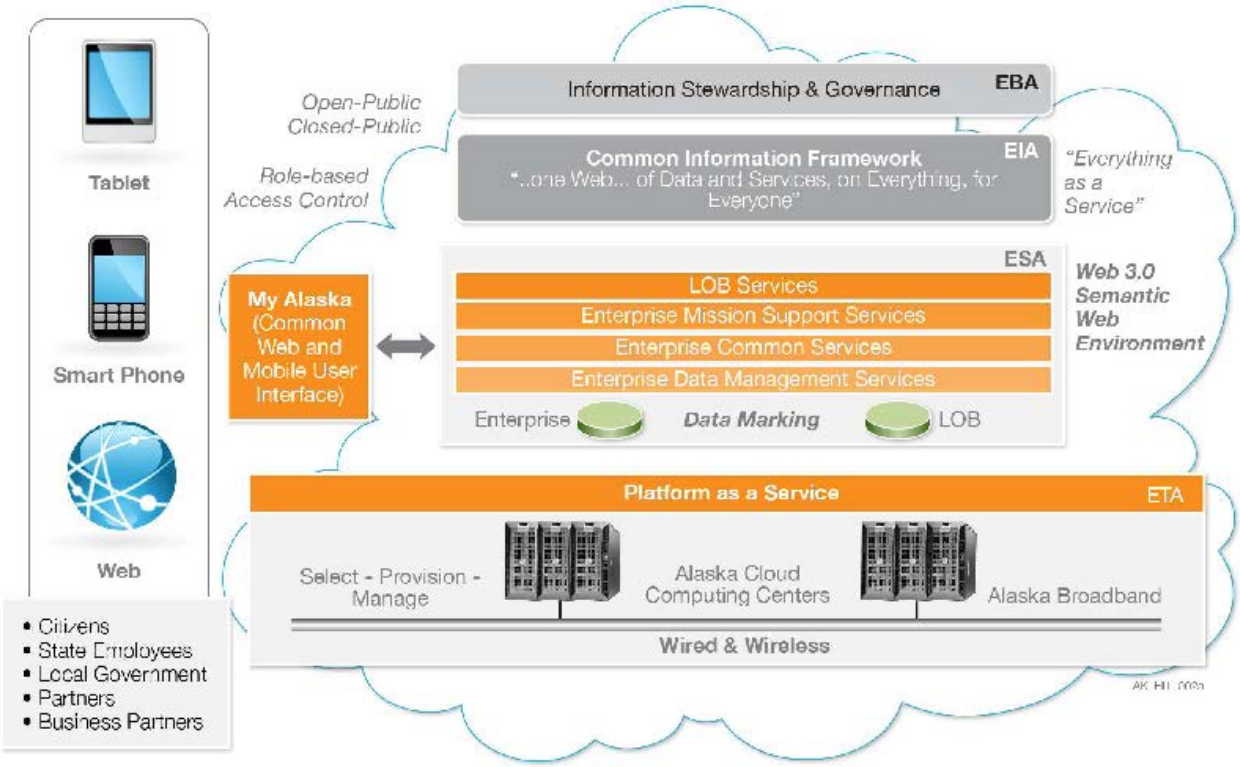

Figure 1: Alaska Enterprise Framework

Briefly, starting at the top, the layers of the Enterprise Architecture are:

- EBA = Enterprise Business Architecture, where a common understanding of the organization is developed and aligned with strategic objectives and tactical demands
- EIA = Enterprise Information Architecture, the layer of the framework that focuses on fully integrating information by streamlining business processes, providing secure and reliable access to information, and optimizing and sharing data
- ESA = Enterprise Service Architecture focuses on a comprehensive set of services-oriented solutions to meet State's business needs
- ETA = Enterprise Technology Architecture represents the technology infrastructure environment that must support the ESA

1.4.2 Business Initiatives

To achieve a business-process focused organization with shared data and services, there must first be alignment, collaboration, and cooperation across agencies and programs, a demonstrated service development strategy including service design, a transition plan from existing services to newly defined services, and an ongoing service maintenance and release strategy. Development of this environment requires putting an appropriate Shared Services Business Architecture in place.

Cognosante recommends that Alaska examine and develop certain existing structures to support evolution toward a Shared Services Business Architecture. Existing structures include current efforts for Governance and Portfolio Management, Information Technology Service Delivery, Business Process Reengineering (BPR), and Security Oversight.

Governance

The existing HIT Governance Committee may perform the governance process; if so, ensure active participation of key representatives from all divisions of DHSS and clearly define expectations that this committee has the responsibility to direct the department appropriately in IT strategy, governance, and acquisition.

Instruct the Governance Committee to adopt a Shared Services policy across the organization, which reduces functional redundancy and lowers the total cost of ownership of systems for departments. Also, charge the Governance Committee to break down existing data silos and eliminate data duplication between lines of business by requiring that data stores are organized around entities, which will drive the shared services model. Develop a set of project/funding evaluation criteria against which the governance group can operate to avoid duplication and leverage shared services.

Information Technology Service Delivery

Delivery of IT services are impacted by the migration to a new Health Services Enterprise Architecture, and requires a shift to a new IT Service Model that focuses more on strategy, management, oversight, and support rather than actual development of systems. Consider

migrating IT service delivery away from system development toward providing expert technical guidance and support services.

Business Process Reengineering

To move toward a service-oriented environment, there is a potential need for business process and organizational reengineering to consolidate the areas of redundancy within the state organizations to align with the use of shared services. Cognosante recommends adoption and facilitation of a business process and organizational reengineering methodology and approach for DHSS.

Security and Privacy

Security and privacy issues are critical and require sponsorship, visibility, and support by the Department. Expand the role of the Information Security Office (ISO) to ensure security oversight, coordination of policy and process, and security expertise are consolidated and organized at the highest level of the organization with oversight by the Governance Committee or the Commissioner.

1.4.3 Support and Engagement in Selected Statewide Initiatives

The statewide initiatives for Broadband Communications and Telehealth and Telemedicine contribute to building an Enterprise Framework for DHSS. The Department should engage in and support these statewide endeavors.

1.4.4 Modification of Selected Current DHSS Initiatives

Cognosante recognizes that building an enterprise framework is a transformation that takes place incrementally. Many of the DHSS initiatives and projects currently in progress can contribute to the transformation with small to moderate vision and scope adjustments, mainly to decrease duplication of functionality, share services and data, promote electronic exchange of information, and protect security and privacy. Following is a brief overview of selected active initiatives to leverage to assist with building the enterprise framework.

Table 3: Recommendations for Modification of Current Initiatives

Current Project or Initiatives	Recommendation Heading	Recommendation (See below for more detail)
DHSS Information Technology Services (ITS) Server Consolidation Initiative	Cloud Computing	Continue server consolidation in development of the DHSS private cloud; consider migrating selected services to the public cloud
BizTalk Implementation	Framework Structure Activity	Migrate BizTalk to AppFabric and move the state's Enterprise Service Bus (ESB) to the public cloud
MCI, MMIS, EIS, SDS ASP	Shared Data and Portals	Initiate separate projects with business sponsors for each of the following initiatives: MCI, Master Provider Index, Client Portal, and Provider Portal initiatives, and engage an

		experienced architect to review the technical designs
LIMS, Electronic Lab Reporting, Pharmacy Software, HIE Orion Health CDR, eMAR, Grants Management, QA, Licensing	Reduce Duplication of Functionality	Review initiatives; require that they take a more enterprise view; expand and/or consolidate systems where appropriate
MMIS, EIS, ENS, GIS, Direct, Case Management	Shared Services	Identify functionality implemented by these projects that can be shared and implement them as shared services, such as a Provider Portal, Client Portal, Business Rules Engine, Workflow Management, Direct Secure Messaging, and Geographic Information Systems
SLR, HIE	Federal Requirements	Begin planning now for integrating the SLR with the HIE to collect and manage meaningful use clinical data by the required deadline

Cloud Computing

Cloud platforms are well suited to meeting the needs of Alaska's technology requirements. They will allow Alaska to get applications up and running faster, are less expensive for many applications, have improved manageability and less maintenance, provide flexibility by allowing for rapid and transitory growth, and require less upfront investment when building out something new. Continue to leverage cloud technologies; migrate services to cloud-based platforms for common access; consider utilizing Infrastructure as a Service (IaaS).

Framework Structure Activity

To put the structure in place for shared services and experience potential cost savings, examine migration of BizTalk to AppFabric, which is Microsoft's cloud-based middleware version of BizTalk, to move the state's ESB to the public cloud. (Middleware is computer software that provides services to software applications beyond those available from the operating system.[1])

Shared Data and Portals

Development of master data stores and external portals are key initiatives to drive a service-oriented architecture. These include the MCI, Master Provider Index, Client Portal, and Provider Portal initiatives, which need to gain traction and focus, be technically compatible with each other, and have designs that are able to grow with the demands. Initiate separate projects with business sponsors for each, and engage an experienced architect to review the technical designs.

[1] (Wikipedia Various Authors, 2012)

Reduced Duplication of Functionality

There are currently a number of systems or initiatives in place or beginning where duplication of functionality will or has occurred. Reducing duplication will generate cost savings for the Department and provide more accurate and timely information. The group of systems and initiatives that duplicate functionality in other existing systems includes the Laboratory Information Management Systems (LIMS), Electronic Lab Reporting, HIE Orion Health CDR, Pharmacy Software and eMAR systems, Grants Management, Quality Assurance Systems, and Licensing, Certification, and Registration systems. These systems and initiatives require additional consolidation work or a shift in scope that assumes a more enterprise vision.

System initiatives are the catalyst for reduction of duplication of functionality. Ensure that the governance committee is responsible for identifying and addressing these as well as other functionality duplications and addressing them at the inception of the projects. Review existing initiatives to ensure that they take an enterprise view; expand and/or consolidate systems where appropriate.

Shared Services

The potential exists to leverage shared services in multiple projects that are underway. The MMIS project has a Provider Portal, Client Portal, and a Business Rules Engine; there are projects for an ENS, Direct Secure Messaging, and Geographic Information System (GIS) that are all candidates for shared services. Direct the EIS and the state's case management systems to utilize these shared services and shared data where appropriate.

Federal Requirements

Alaska has implemented a State Level Registry (SLR) application developed by Xerox/ACS to support the incentive payment program. This application is an important component in providers' submission of meaningful use data. In the future, the state will be required to collect, consolidate, and report meaningful use data to CMS. Begin planning now for integrating the SLR with the HIE to collect and manage meaningful use clinical data by the required deadline.

1.4.5 Recommendation for Scaled-Back Initiative

A project to pilot an Electronic Document Management System (EDMS) is planned for September 2012. This technology is past its prime; rather than implement a system to digitize paper documents we recommend that Alaska pursue a goal away from producing any paper at all. We recognize that some places require paper, such as contracts that require a physical signature, but most other types of paper can be created digitally and remain that way. As new systems are implemented, ensure that they have a goal to create documents digitally and go paperless.

1.4.6 Recommendations for New Initiatives

Cognosante recommends initiating a limited number of new initiatives to meet federal regulations and provide consolidated reporting of information.

These include implementing Comprehensive Care Management tools, initiating multiple projects including a Health Insurance Exchange (HIX) project, a Health Plan Identifier (HPID) and Other Entity Identifier (OEID) project, and a project to implement HL7 Clinical Document Architecture (CDA), and implementing Business Intelligence Tools.

Comprehensive Care Management Model and Supporting Tools

Cognosante recommends that the Department implement tools to assist in developing and administering a comprehensive care management model for DHSS clients that coordinates care across multiple practitioners and settings. The goal is to lower the cost of care by changing the way care is delivered from one of reactive to proactive through use of shared actionable information that permits caregivers and patients alike to understand a patient's specific needs and conditions, provides clear communication between providers, and empowers the consumer to actively engage in improving their health status.

The recommended tools include supporting systems that aggregate data and incorporate analytics, such as Business Intelligence (see below), leveraging and expanding the HIE Orion Clinical Data Repository (CDR), Statewide HIE, HL7 Clinical Document Architecture (CDA) solution (see below), and a unified health record. The result is actionable patient knowledge, generated in real-time, shared equally with members of the care team and the patient, allowing care to become proactive, coordinated, and based on wellness.

Health Insurance Exchange (HIX)

Because Alaska will be required to participate in an exchange by 2014 according to federal law and the governor has determined that Alaska will not be building a State-Based Exchange (SBE), planning will need to occur on how the state will participate in the federally sponsored exchange. States that do not develop an SBE will need to participate in either a State Partnership Exchange (SPE) or the Federally Facilitated Exchange (FFE).

Under an SBE the state operates all exchange activities but may use some federal government services; under the SPE, a state may administer plan management functions, in-person consumer assistance functions, or both. In FFE states, FFEs will perform these functions.

Alaska will need to choose between the SPE and the FFE and plan for implementation. In addition, the current direction of CMS is that the FFE will be a temporary measure, requiring the state to have their own exchange in the future. Alaska will need to develop a strategy for future deployment of a state-run exchange.

HPID and OEID

The Affordable Care Act (ACA) mandates utilizing a standard HPID and OEID. HSS expects to issue the final rule on these codes within the next 45 days. Monitor the status of the ruling. Begin planning to initiate a project to remediate the MMIS and other state systems to comply with the ruling.

HL7 Clinical Document Architecture

The HL7 Clinical Document Architecture (CDA) provides the capability to access data from disparate aggregation of clinical, laboratory, administrative, and personal data in real-time and

create a consolidated summary patient record. Cognosante suggests that Alaska would benefit by adopting HL7 CDA as the standard for all Protected Health Information (PHI) data storage to support providing the information necessary to do Comprehensive Care Management.

Business Intelligence Tools

Cognosante recommends that DHSS connect key data stores, such as the Clinical Repository, Vital Records and Public Health registries, to the MCI and MPI for consolidated reporting capability, and acquire Business Intelligence Tools, which can provide consolidated reporting of information on the connected data stores. This solution provides robust reporting capability without the expenditure and effort required to build a comprehensive data warehouse.

1.5 Expected Outcomes

Implementation of the recommendations above will provide the following benefits for the State of Alaska:

- Strong oversight and governance of IT acquisition projects
- Improved IT service model
- Strengthened security oversight and measures
- Standardized business services, available and accessible through cloud services
- Consolidation of systems
- Elimination of duplicate storage and unnecessary collection of data
- Creation of a state-wide master shared services and data management strategy
- Standardized technology platform, available and accessible through multiple access channels
- Greater access by citizens and providers to health care information and services
- Higher level of shared knowledge
- Lower overall system acquisition and support costs

2 INTRODUCTION

2.1 Document Overview

The purpose of this document is to provide the Department of Health and Social Services (DHSS) with an Enterprise Technology Roadmap that is business-process focused, in alignment with the Centers for Medicare & Medicaid Services' (CMS) Seven Conditions and Standards, and provides recommendations for shared services and integration opportunities. The Roadmap provides DHSS with an enterprise systems plan that increases the use of Service-Oriented Architecture (SOA) and modularization of business processes for a component-driven approach to DHSS enterprise systems business functionality.

Cognosante has organized this document into six major sections:

1. **Executive Summary** – Briefly presents the main topics discussed in the document, provides an overview of the analysis, and a gives summary of key findings.
2. **Introduction** – Outlines the goal of the Roadmap, provides an overview of the current Alaska Health Information Landscape, and discusses technology trends affecting Alaska.
3. **Current Alaska (AK) Health Information Technology (IT) Environment** – Recaps the existing IT landscape and provides the information regarding the update of Alaska's Health IT application and project inventory.
4. **Roadmap** – Provides recommendations, including future state diagrams, timelines, proposed initiatives, prioritization, costs, and business impacts. Includes identification of where DHSS business units can leverage shared services to achieve an Enterprise Application Framework.
5. **Challenges** – Discusses the challenges faced by DHSS that impact moving toward an Enterprise Application Framework.
6. **Assumptions** – Provides the assumptions used in developing the Roadmap.

2.2 Methodology

To develop this DHSS Enterprise Technology Roadmap document, we used information gathered and developed during the course of our State Medicaid Health Plan (SMHP) and HIE contracts as a starting point and expand on that work to develop a complete document. Interviews with multiple DHSS managers and staff who possessed application, technology, and program expertise added to the depth of the compiled material. We gathered and reviewed other State initiatives and plans and compiled material from industry experts. Finally, executive staff members within Cognosante with deep expertise in health care and health care technology provided guidance, feedback, and review of the material presented.

2.3 Goal

DHSS contracted with Cognosante to develop the Enterprise Technology Roadmap to outline strategic initiatives to transform Alaska health care information technology into an enterprise-

focused organization that is viable in Alaska's environment, cost-effective, and sustainable over time. The goal is to provide a guide for DHSS to leverage new technologies and maximize existing ones to support a health care system for Alaska that places individual Alaskans, their families and communities at the center of their health care experience and ultimately shift the focus from treatment to prevention.

Like most states, Alaska is actively pursuing technology improvements designed to meet these current and future business needs. Cognosante recognizes that the DHSS vision for the future of Health Information Technology (HIT) spans multiple years and consists of existing and planned projects and initiatives that will significantly contribute to Alaska's health care transformation. The recommendations in this Roadmap capitalize on existing projects and suggest additional steps and initiatives for continuing the transformation over the next five to six years, including prioritization, timing, and high-level cost projections.

The recommendations in this Enterprise Technology Roadmap support these priorities by outlining actions that improve service, increase efficiency, and lower cost.

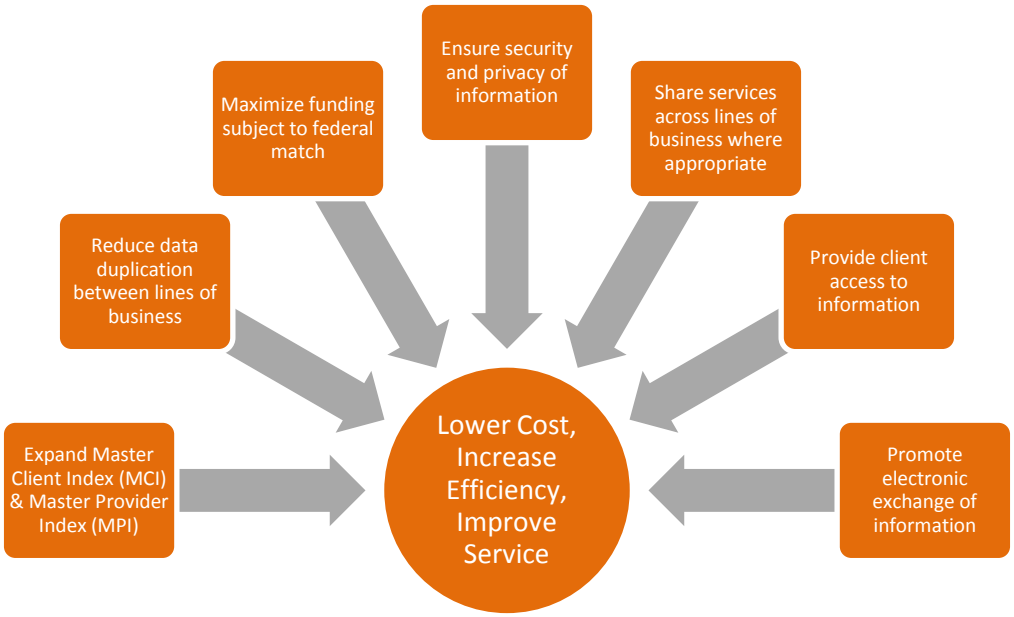

Figure 2: Alaska Future State Goals

This Roadmap emphasizes utilizing MITA as a framework to look at "as is" and "to be" functionality to move toward a business process-focused organization, in alignment with the CMS' Seven Conditions and Standards. The threads woven throughout employ the principles of a strong IT governance model, an increased use of shared services, a focus on security, a decrease in redundant systems and data, and provisions for appropriate technology support.

2.4 Changing Landscape of Health Care and Human Services

Health care in our country is undergoing major and rapid change. The unprecedented speed and magnitude of change presents many challenges but also provides opportunities to Alaska government and its citizens.

Alaska's IT environment needs to evolve to address the following changes in health care and human services:[2]

- **Consumer Empowerment:** Consumers will continue to have access to more information, empowering them to take more control of their health and health care decisions.
- **Medical Practice Changes:** Doctors are becoming more aware of the cost of health care, are finding alternative ways to incentivize their practice, and will be adjusting accordingly.
- **Health Care Delivery Solutions:** The solutions to providing health care will change, to include accountable care organizations (ACOs), medical homes, and integrated delivery networks (IDNs).
- **Health Insurers and Insurance:** Insurance companies will be required to price and sell policies to everyone, regardless of health status.
- **Data Accessibility and Privacy:** Data will be more readily accessible, providing challenges for privacy and security, but also improving coordination of health care and increasing efficiency.
- **Government Involvement:** Government is and will continue to be closely involved in our future health care.
- **Pharmaceuticals:** The pharmaceutical industry will evolve. Facing tough competition with generic and over-the-counter drugs and with more scrutiny on the benefits and cost of new releases to their branded medications, which has been a mainstay of the industry in recent years, pharmaceuticals will be forced into reviewing and revising their business models.
- **Technology:** Technology will be an integral part of providing overall health care, and plays a role in every one of the changes mentioned above. Data will be shared to improve efficiencies, and mobile, digital, and cloud-based technologies will be employed to provide a more efficient and effective experience between consumers, health care providers, insurers, and retailers.

Given these challenges (or in spite of them), Alaska continues to pursue leading-edge initiatives in support of the changes to health care and human services. DHSS, Alaska eHealth Network (AeHN), the Alaska Regional Health Information Organization (RHIO), and Alaska Electronic Health Record Alliance (AEHRA) have worked in close partnership with state and local partners to provide incremental and continuous advances in health care support.

[2] Note: Source material for the bullet points in this section was significantly derived from an article written in 2011 by Bart Foster. (Foster, 2011)

2.5 Technology Trends Affecting Alaska

There are emerging trends in every aspect of technology today. This Roadmap document identifies the following trends with the potential to address many of the barriers with IT in Alaska, resulting in a positive and cost-effective outcome:

- **CMS Seven Conditions and Standards and MITA:** CMS has developed MITA and the supporting Seven Conditions and Standards as a national framework to support improved systems development and health care management for the Medicaid enterprise; adherence to these principles provides access to enhanced funding.
- **Accessibility of Information:** Via client portals, citizens gain access to information and services available to them at all times of the day, accessible from everywhere on multiple types of devices.
- **Digital Government and Enterprise Mobility Management (EMM):** By utilizing Web technology, employing digital devices, and providing electronic rather than paper records, the workforce has better access to information, allowing for workload efficiencies and leveling.
- **Broadband:** Continuing to increase the broadband coverage in Alaska allows the employment of more modern technology across the state.
- **Business Analytics:** Implementing a Business Analytics tool that can be used enterprise-wide will allow for better program management, new insights and an understanding of business performance based on data and statistical methods.
- **Computerization of Medical Providers:** Continued encouragement and incentives to medical providers will have a positive impact on EHR adoption and the providers' ability to provide targeted and cost-effective services to the state.
- **Cloud Computing:** Cloud computing, which is delivery of computing and storage capacity as a service, is the direction for the future of computing, and is a model that is well suited to meeting the needs of Alaska's technology requirements.
- **Telehealth and Telemedicine:** The use of electronic information and telecommunications technologies to support long-distance clinical health care, professional health-related education, public health, and health administration has been widely employed in Alaska and pioneered by the Department of Defense (DOD) for military personnel.
- **Security and Privacy:** Implementing a digital environment poses major challenges to security and privacy. Health Information Portability and Accountability Act (HIPAA) regulations, in many cases strengthened by provisions in the Health Information Technology for Clinical and Economic Health (HITECH) Act, will need to be adhered to closely, and networks will require strong security measures.

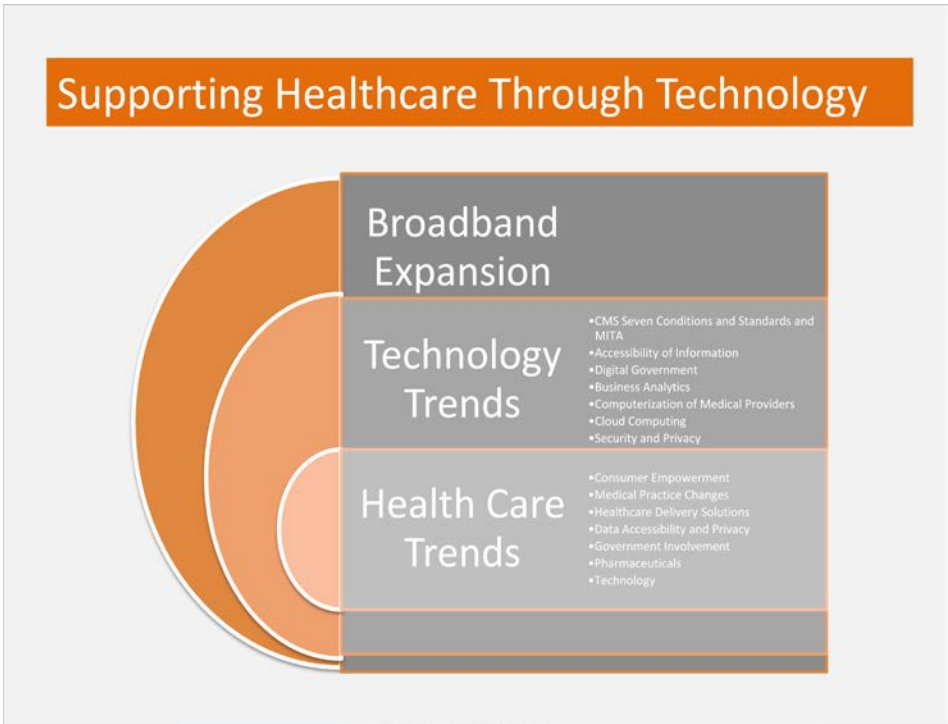

Figure 3: Intersection of Health Care and Technology Trends

2.5.1 Technology Challenges in Alaska

In addition to the worldwide changes taking place in the technology arena, which pose challenges of their own, Alaska faces specific but not necessarily unique challenges.

- **Siloed Operations:** As a decentralized department, projects and systems in DHSS have been traditionally implemented with a divisional, rather than enterprise, perspective, which has resulted in functional and data redundancy, more than 100 implemented systems, limited system integration, and employment of different identity and access methods
- **IT Governance:** Although an HIT Governance committee has been implemented, its purview and span of control has been limited
- **IT Support:** IT support poses challenges to the organization, due to a combination of a lack of funding, the broad scope of systems in place, decentralization of IT resulting in the implementation of systems without IT involvement, and a limited pool of skilled applicants available in Alaska
- **System Obsolescence:** Rapid technology changes quickly renders systems obsolete; some legacy systems have been in place for 30+ years and lack scalability or are difficult to maintain, other systems were developed “organically” resulting in inconsistency, frequent system errors, and lack of integration
- **Funding:** Disparate funding streams and related restrictions have magnified many of the issues listed above

- **Geography:** Alaska's healthcare system has a large remote population; although broadband access is increasing, latency issues exist. The population has low remote technology capabilities.

This Enterprise Technology Roadmap will provide Alaska decision-makers suggestions for initiatives to employ over the next five to six years to meet the changing technical landscape head-on with solutions that significantly contribute to Alaska's health care transformation, can be implemented incrementally, promote centralization or consolidation where it makes sense for the enterprise and the business owners, and are cost-effective.

3 CURRENT ALASKA HEALTH INFORMATION TECHNOLOGY ENVIRONMENT

3.1 Overview

The purpose of the As-Is Health Care IT landscape section is to provide an overview of the current state of projects and initiatives that support health information activities in Alaska.

3.2 Network

Although the broadband network connectivity in Alaska does not currently span the entire state, the State of Alaska's Broadband Task Force has a goal of making high-speed Internet available to all Alaskans by 2020.

Network Expansion Status

In January of 2010, Alaska received federal broadband stimulus funding from the U.S Department of Agriculture's Rural Utilities Services (RUS). The loan/grant extends terrestrial broadband service to Bristol Bay and the Yukon-Kuskokwim Delta, an area roughly the size of the state of North Dakota. Completion of the project consists of two distinct efforts, TERRA-SW and TERRA-NW.

Terra-Southwest (TERRA-SW) Project (Built in 2011)

The TERRA-SW Project, which included 400 miles of new fiber-optic cable and 13 new microwave towers connecting 65 communities, was completed in 2011. The TERRA-SW network serves 9,089 households and 748 businesses in 65 covered communities, including public/nonprofit/ private community anchor institutions and entities such as regional health care providers.

Terra-Northwest (TERRA-NW) Project (Began in 2012)

The TERRA-NW Project will deliver end-to-end middle mile terrestrial broadband service, from the Internet backbone in Anchorage to almost 4000 households and 300 business in 20 rural Tribal communities across more than 8000 square miles in the Norton Sound and Kotzebue regions (the PFSAs), some of the most remote regions of the United States. This project is scheduled to be completed in 2013.

Additional Network Expansion

The Alaska Broadband Task Force is seeking additional funding to continue the expansion beyond TERRA-SW and TERRA-NW.

Many of the recommendations in this Roadmap depend upon continued expansion of the broadband network across Alaska and therefore require close monitoring and alignment with the broadband expansion project schedule.

3.3 Health-Related Application and Project Inventory

One of the goals of the Enterprise Technology Roadmap project was to develop a comprehensive database of the DHSS health-related projects and applications. At the beginning of the effort, the State and Cognosante worked together to determine which data points would be gathered for each project and application. Upon discussion, it was also determined that the SharePoint database, called the IT Matrix, presently in use to capture system information would be the repository for the Roadmap survey information. The State expanded the database to contain additional elements and Cognosante updated the data as surveys were completed. The updated IT Matrix Database is the deliverable for the repository of survey information.

To perform the inventory, Cognosante staff assumed the task of calling a contact, and often multiple contacts, for each system within scope to obtain technical and business-related information. Results from the surveys were loaded in the IT Matrix Database as the surveys were completed.

The following tables illustrate the depth and completion status of the IT Matrix Database.

Table 4: Application and Project Inventory Analysis

Analysis Area	Counts
Applications (In Scope)	
Applications Updated (not including deletions)	71
Applications Added	14
Applications where Contact was not made	7
Total Applications in Scope of Roadmap	**92**
Registries and Other (In Scope)	
Registries and Other Updated	8
Registries and Other Added	4
Registries where Contact was not made*	2
Total Registries and Other in Scope of Roadmap	**14**
Projects (In Scope)	
Projects Updated	34
Projects Added	3
Projects where Contact was not made	5
Total Projects in Scope of Roadmap	**42**
Total Applications, Projects, and Other	**148**

*These registries did not have either an IT or Business Contact assigned

Table 5: Application and Project Inventory Database Record Count Analysis

Records in SharePoint Database	6/20/2012 Total	8/13/2012 Total	8/13/2012 Out of Scope	8/13/2012 In Scope
Applications	134	155	63	92
Projects	101	108	66	42

Registries	23	17	7	10
Other	29	31	27	4
Unclassified	29	0	0	0
Total in DB	**316**	**311**	**163**	**148**

3.4 As-Is Environment Summary

DHSS has over 100 applications and registries in use and over 40 projects that are active or requested in its current portfolio. Most of the applications are stand-alone; in fact, about 70% of the live applications and registries have no integration or interfaces with other systems. Of the 30% of systems that include an interface, less than half have more than one interface, and two of the listed interfaces are actually manual transfers of data. Figure 4, below illustrates the current application and interface status of DHSS systems.

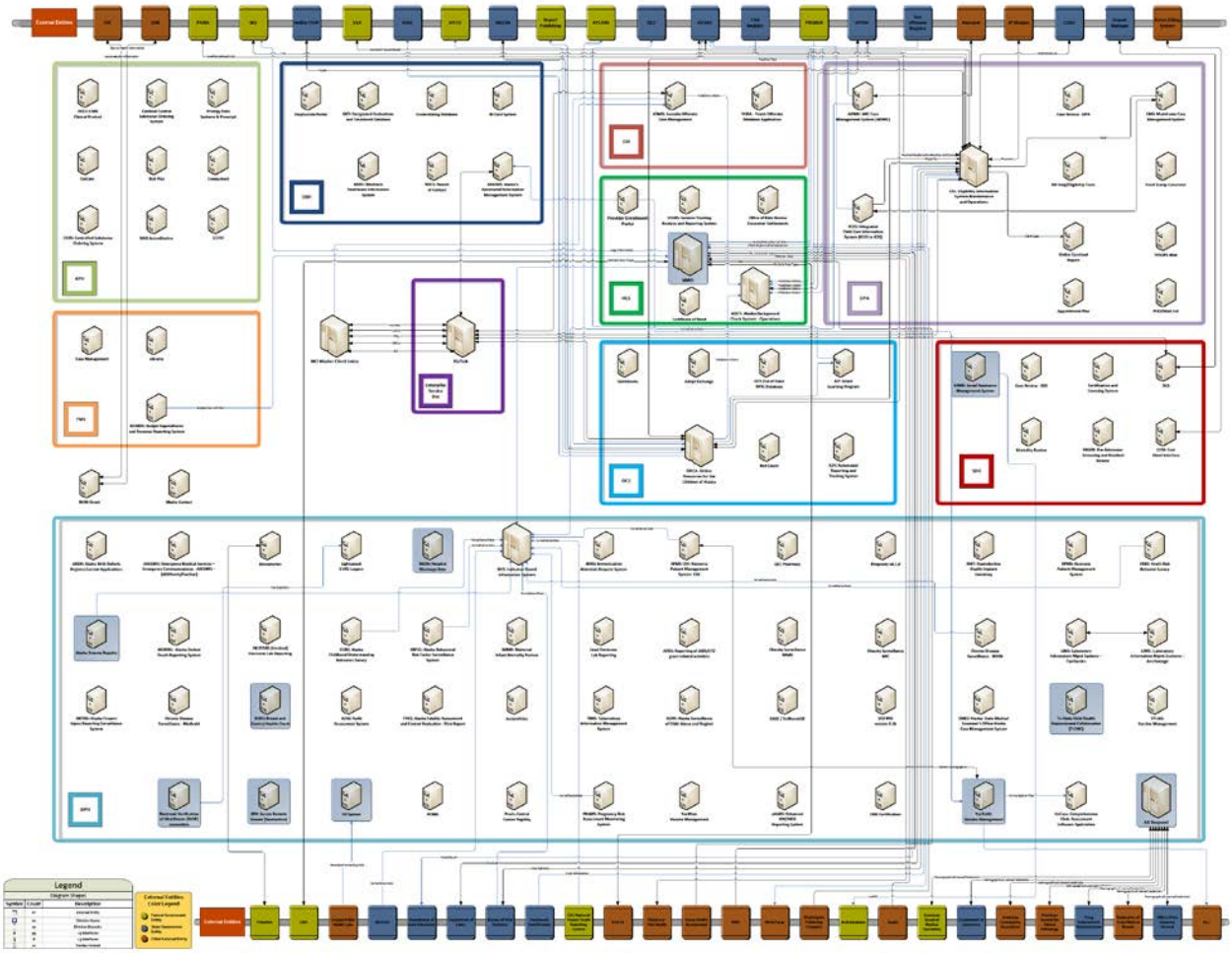

Figure 4: As-Is Systems Diagram

(Note: This figure is shown for high-level illustration only. A detailed diagram has been provided as a separate document with drill-down capability. To read the detail, please reference the separate document.)

Some of the major systems, including Vital Records, the WIC system, and the legacy MMIS and Eligibility systems, were implemented in the 1980s; these systems are either in the process of being replaced or targeted for replacement. In addition, there are a number of systems that are over 10 years old, including RPMS, STARS, and ACCU-CARE, that are candidates for upgrades or replacement.

Alaska utilizes a mix of in-house developed and supported systems and outsourced hosting and support.

There was concern expressed by DHSS program staff who participated in the application and project surveys that the IT support that they receive does not meet their needs, possibly due to the need for IT staff to handle the responsibility of supporting a large and diverse portfolio of systems and projects.

The current environment provides great opportunity for increased efficiency by consolidating and integrating systems, sharing data, and modifying the system acquisition and support structure.

3.4.1 Strategic Health-Related Initiatives and Systems

Alaska has numerous strategic projects underway that set the stage for modernization of systems, improved services and compliance with MITA and the CMS Seven Conditions and Standards. It will be important to take an enterprise view in each of these projects and leverage shared services where it makes sense.

Section 4 will discuss the impact of the Enterprise Technology Roadmap on these projects in more detail.

3.4.1.1 MMIS Replacement Project (MMIS)

In September 2007 DHSS awarded a contract to Xerox (formerly Affiliated Computer Services (ACS)) for a new MMIS to replace the legacy system. The contract includes design, development and implementation of a new claims payment system; a claims data warehouse information system; and operations of the new system for five years. The new system will have self-service features so users can access it through a user-friendly Web portal, and it will incorporate features and advancements that provide the foundation for future growth and evolution of HIT and Alaska's Medicaid program. The new system is scheduled to be implemented in April 2013.

3.4.1.2 Eligibility Information System (EIS) Replacement Project

A project began this year (2012) for Phase I of the Eligibility System Replacement Project. Phase I replaces the portion of the legacy EIS that performs Medicaid eligibility determinations, which needs to be up and running by 2014. When Phase I is complete, DHSS will have two

separate EIS systems, one for Medicaid eligibility and one for all other types, until Phases II through V to replace the remaining types of eligibility have been implemented.

3.4.1.3 Integrated Resource Information System (IRIS)

IRIS is a comprehensive enterprise-level project to replace the DHSS legacy financial system, Alaska State Accounting System (AKSAS), and the legacy payroll system AKPAY. This project is an implementation of AMS Advantage Enterprise Resource Planning (ERP) system that will be implemented in five functional phases between August 2012 and March 2015.

3.4.1.4 Master Client Index (MCI) Project

The MCI is a central repository for information relating to state citizens who receive services from the Department. The repository utilizes a tool called MultiVue to do merging and matching of client records. The repository began with four core systems, JOMIS, ORCA, Permanent Fund Dividend (PFD), and the legacy EIS, and it has been expanded to include DS3 and AKAIMS. Recently, a Provider Client Index (PCI) was created that has records from the MMIS and Professional Licensing. The MCI stores the PCI data, tagged as a different entity type. Future expansion of the MCI is expected.

3.4.1.5 Provider Enrollment Portal

The Provider Enrollment Portal provides the ability for MMIS providers to log on to a web portal and enter information regarding enrollment and reenrollment. This information is stored in a stand-alone database that is uploaded to the legacy MMIS. This portal is an interim solution until the new MMIS system is implemented.

3.4.1.6 State-Level Registry (SLR) for the EHR Incentives Program

The SLR program provides incentive payment to hospitals and providers who implement electronic health records. The SLR system allows hospitals and providers to attest to their compliance with measures, standards, and criteria necessary to receive Medicaid and EHR incentive payments.

3.4.1.7 Health Information Exchange (HIE) Project

The HIE project was chartered to implement the Alaska Health Information Exchange and includes the HIT pilot to send structured lab results electronically. This project is required to meet the federal regulations for meaningful use, as spelled out in the American Recovery and Reinvestment Act (ARRA).

The Alaska HIE provides the potential to connect health systems across the state to allow for the coordination of care, reducing healthcare costs and improving population health. The Department plays a critical role in the success of this project. State systems such as the MCI, MPI, immunization registry, the State Lab LIMS and MMIS are targets for interoperability with the HIE.

3.4.1.8 Enterprise Notifications Service (ENS)

This system is being funded by OCS, interfaces with the ORCA system, and is scheduled to implement in the fall of 2012. It will create an ENS, potentially using the BizTalk server. The purpose of the system is to provide the ability to send broadcast and targeted notification documents to email servers and external printers, with logging and tracking. Notification documents may be emails, faxes, or text messages that are used to send emergency notifications, public health alerts, meeting requests, information such as a policy or program changes, routine scheduled messages, etc.

4 ENTERPRISE TECHNOLOGY ROADMAP

4.1 Strategy

This section provides an Enterprise Technology Roadmap that outlines the activities and initiatives recommended for inclusion in a strategic plan for Alaska DHSS health information technology.

The foundation of a solid strategic plan is having an understanding of the mission, objectives, needs, and capabilities of each of the departments that will utilize and access the business services. The goal is alignment of department strategic needs and vision with the “To Be.” Much like a MITA project, an Enterprise Technology Roadmap and the resulting strategic plan are about far more than technology; they address multiple components that reflect the changes/challenges to the business, information, services and technology.

The Roadmap describes what needs to be done, but in many instances, not how to do it. State planners and officials are responsible for determining how best to implement the Roadmap. The state can follow the recommendations in this document by planning within the department; the outcome of the planning is the DHSS Strategic Plan that defines the Business and Information Architectures for the state, and includes a Master Data Management Strategy. Subsequent definition of the Services and Technology Architectures takes place during development of the Information Technology Strategic Plan.

4.2 Future Architecture

Achieving the goals of the Enterprise Technology Roadmap depends upon the development of an enterprise architecture strategy, which focuses on integration, standardization of systems across the organization, and sharing key data stores. The results of an effective enterprise architecture include improvements in business agility, access to shared client and provider data, lowered risk of mission-critical system failures, and lower costs.

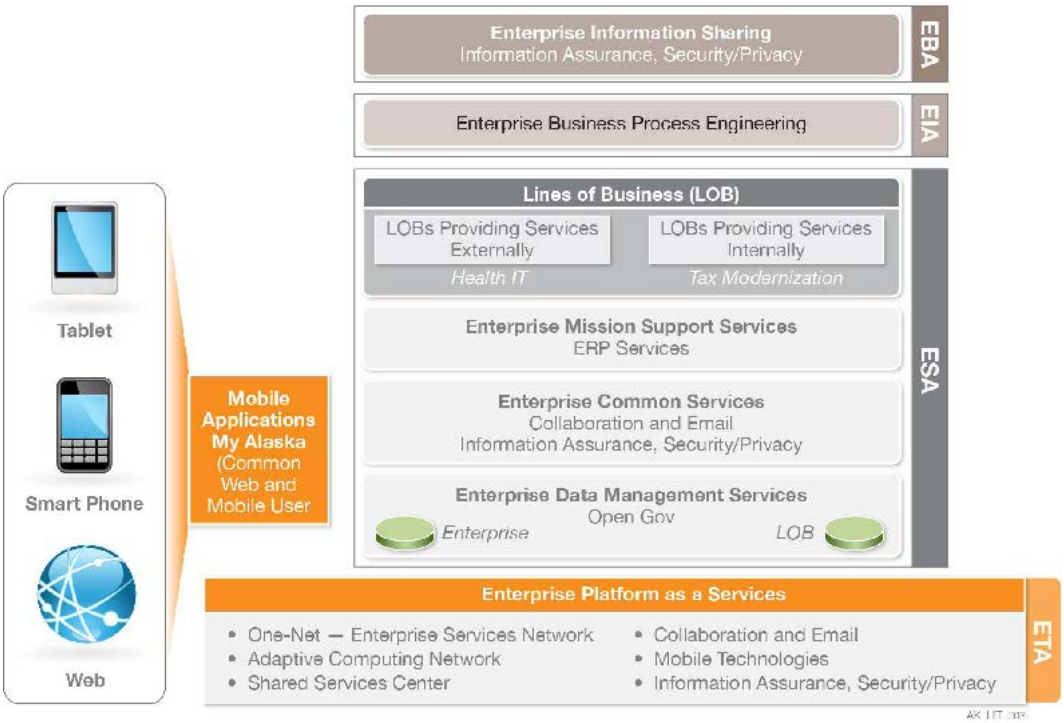

Figure 5: Build a Foundation for the Enterprise Architecture

Briefly, starting at the top, the layers of the Enterprise Architecture are:

- EBA = Enterprise Business Architecture, where a common understanding of the organization is developed and aligned with strategic objectives and tactical demands
- EIA = Enterprise Information Architecture, the layer of the framework that focuses on fully integrating information by streamlining business processes, providing secure and reliable access to information, and optimizing and sharing data
- ESA = Enterprise Service Architecture focuses on a comprehensive set of services-oriented solutions to meet State's business needs
- ETA = Enterprise Technology Architecture represents the technology infrastructure environment that must support the ESA

Six Steps to Build a Foundation for Execution[3]

Jeanee W. Ross, Peter Weill, and David C. Robertson identify six steps for creating an effective enterprise architecture in their book *Enterprise Architecture as a Strategy*:

1. Analyze your existing foundation for execution

[3] (Ross-Weill-Robertson, 2006)

2. Define your operating model
3. Design your enterprise architecture
4. Set priorities
5. Design and implement an IT engagement model
6. Exploit your foundation for execution for growth

The recommendations in this section align with the six steps above.

Begin the Planning Process

During the planning phase, keep in mind that the strategy is data driven and focuses on efficient capture and storage of data, therefore the first step in the plan is to understand and effectively manage data stores. The culmination of this step is the development of the Master Data Management Strategy.

Next, once the stores are understood, build the strategies for developing and sharing of common business services to a common access layer, making them available through enterprise services. See Figure 6 below, illustrating the Shared Services Model, and Figure 7, which shows the Alaska DHSS To-Be Architecture.

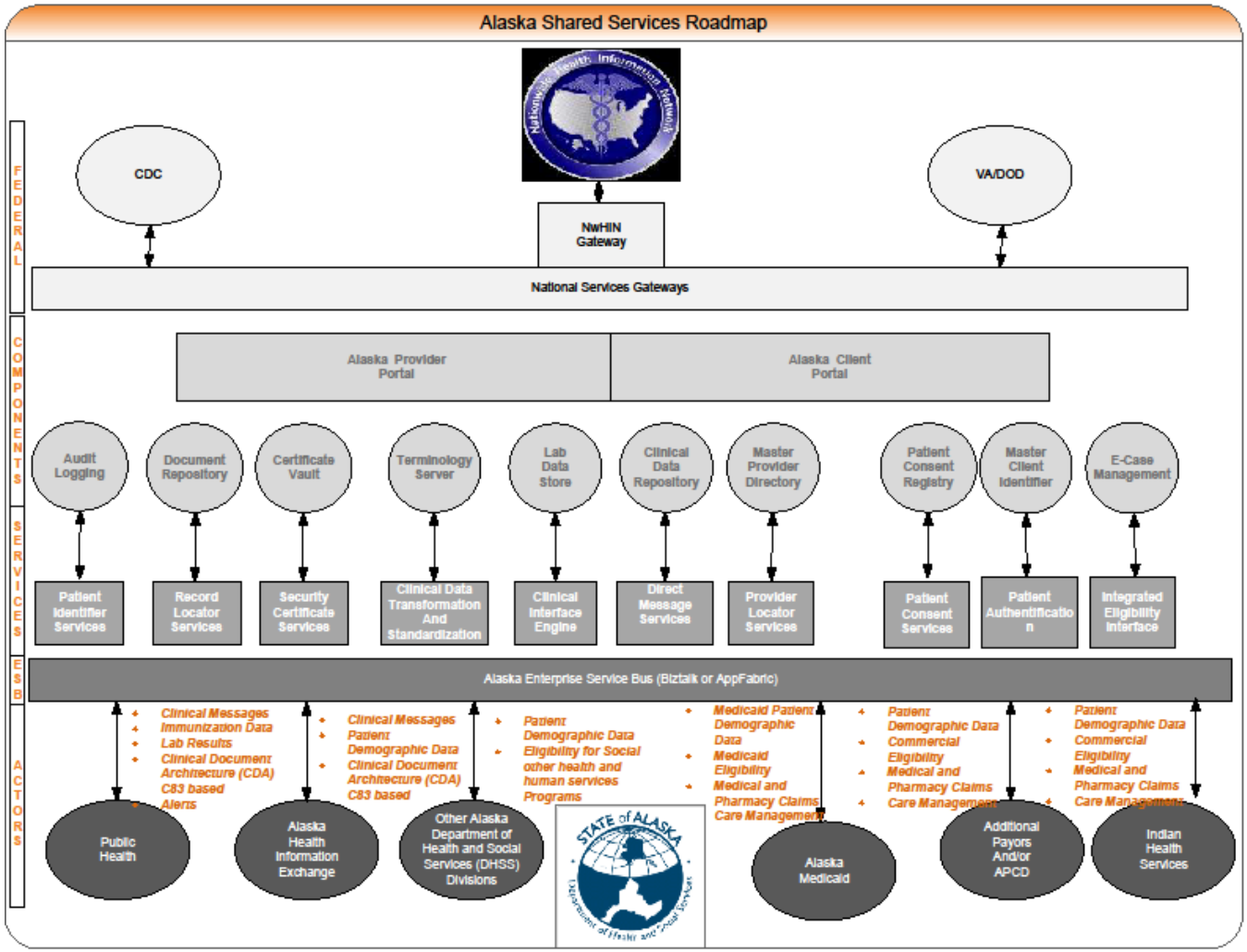

Figure 6: To-Be Shared Services Model

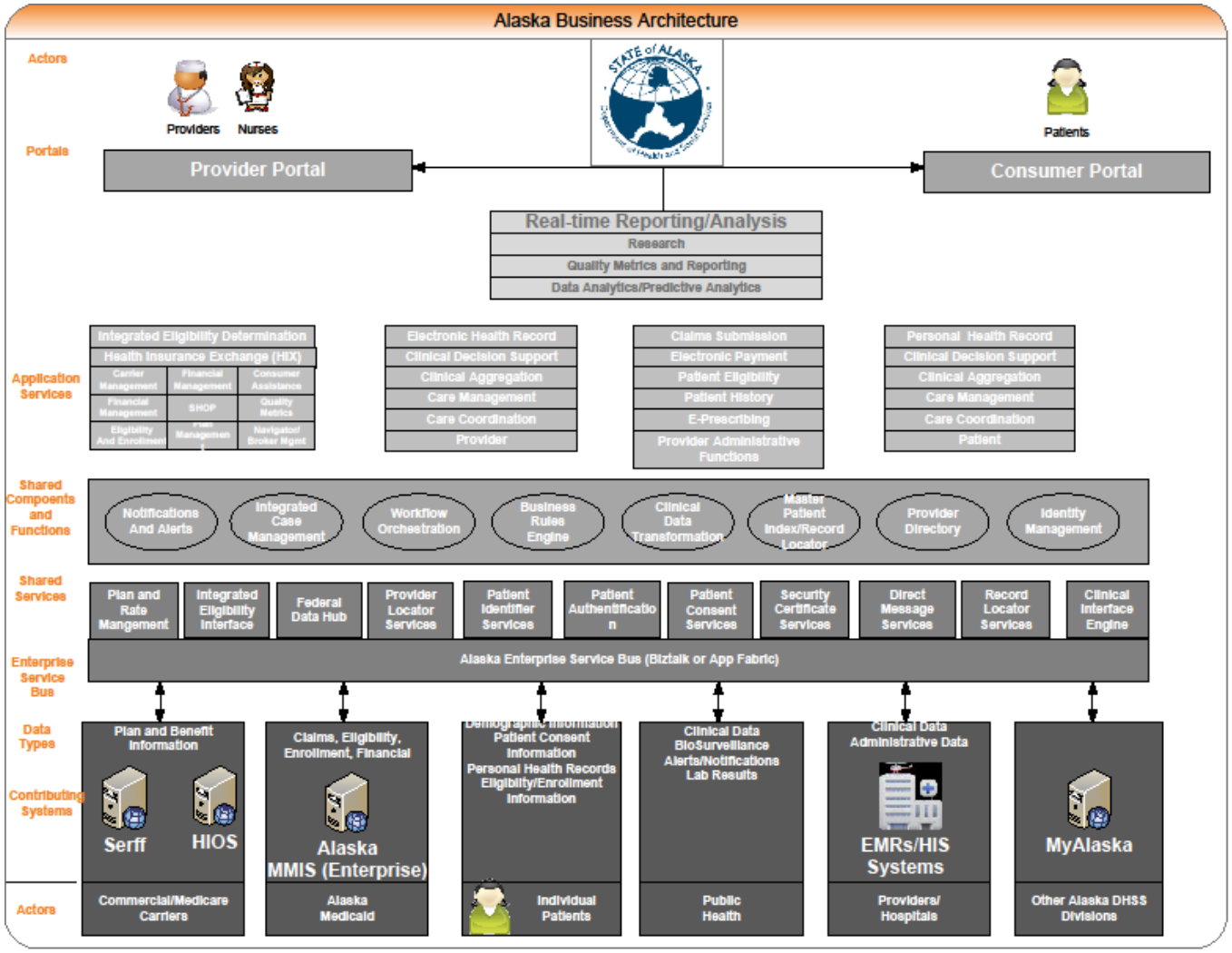

Figure 7: To-Be Alaska DHSS Enterprise Architecture

Following is a high-level schedule with major milestones for achieving the Alaska Enterprise Architecture.

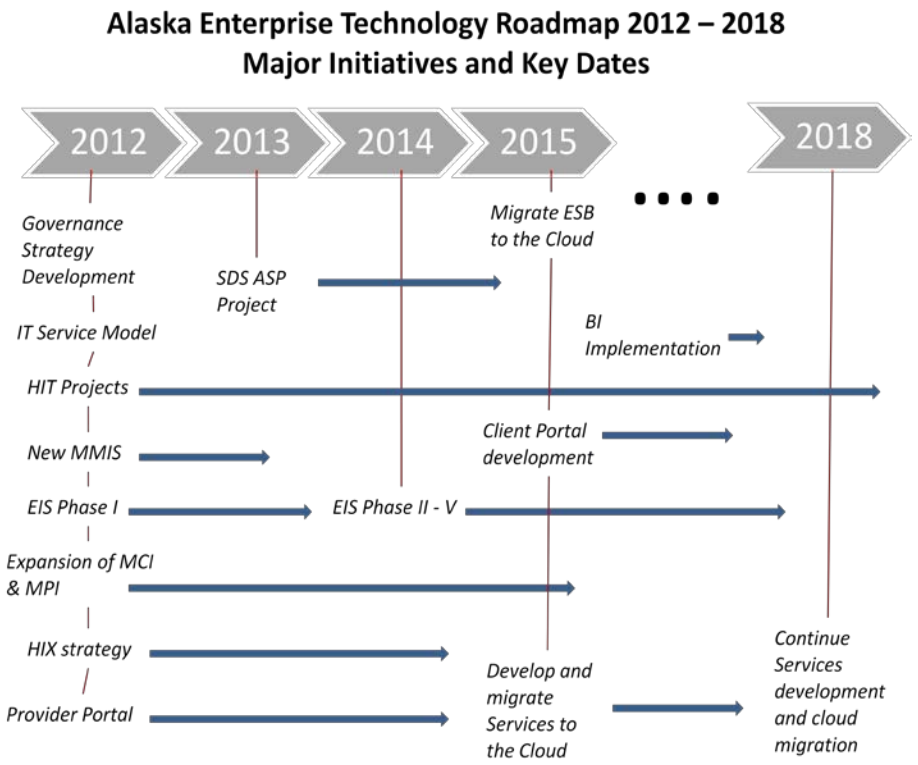

Figure 8: Enterprise Technology Key Dates

The recommendations in this section are organized by architecture layer, beginning with the Business and Information Architecture, and followed by the Services and Technology layers.

4.2.1 Business and Information Architecture Recommendations

A company's business architecture is "A blueprint of the enterprise that provides a common understanding of the organization and is used to align strategic objectives and tactical demands." [4] The Information Architecture focuses on fully integrating information by streamlining business processes, providing secure and reliable access to information, and optimizing and sharing data.

Building the Business and Information Architectures are critical first steps to ensure a solid foundation for the technology plan. These disciplines form the foundation for knowledge management, which is the process of identifying, capturing, and organizing data, then turning data into the knowledge required to improve overall performance and efficiency.

[4] (Business Architecture Working Group, 2012)

To achieve knowledge management there must first be alignment, collaboration, and cooperation across agencies and programs, a demonstrated service development strategy including service design, a transition plan from existing services to newly defined services, and an ongoing service maintenance and release strategy.

4.2.1.1 Governance and Portfolio Management

Successful and timely implementation of this Enterprise Technology Roadmap will require the active participation of key representatives from all divisions of DHSS.

Recommendations:

Develop Shared Services Organization Governance: Begin by convening a Shared Services Committee to develop enterprise goals. This Committee may be the existing HIT Governance Committee; however, it is critical to ensure that representatives are included from each division of DHSS who are empowered to make decisions on behalf of their divisions. Avoid creating a "rubber-stamp" committee; clearly define expectations that this committee has the responsibility to direct the department appropriately in IT strategy, governance, and acquisition.

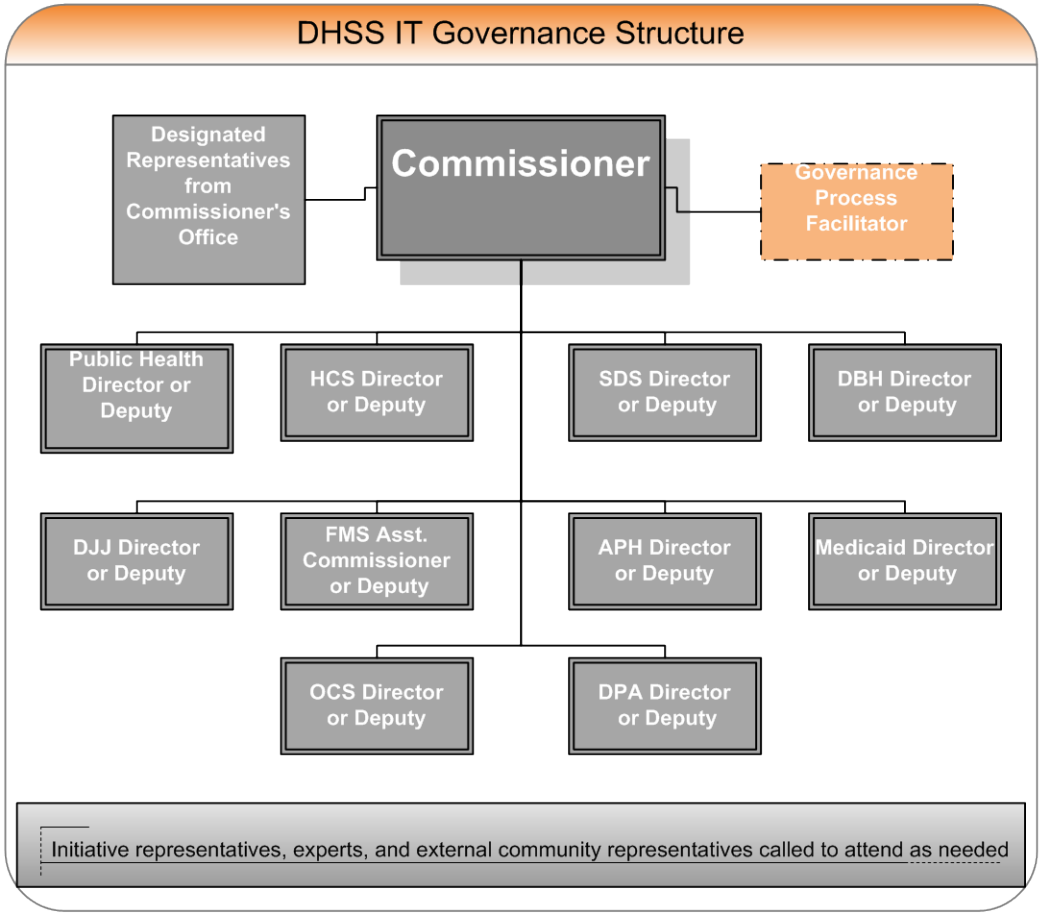

Figure 9: Shared Services Governance Structure

Steps for Renewal of the Governance Committee:

1. Review the membership on the HIT Governance Committee; ensure representation of all DHSS divisions
2. Provide guidance to the group; including setting expectations and defining roles and responsibilities. It may be beneficial to hire an outside party to facilitate the first stages of the formation of the committee and the strategic planning sessions to assist the committee with developing direction and building cohesion.
3. Institute strategic planning, lifecycle governance and portfolio management of IT
4. Develop a shared vision in the approach to managing and acquiring systems
5. Assign the Governance Committee the responsibility to make decisions on prioritization of projects; make certain that all acquisitions and developments go through the committee process
6. Agree on the IT Governance Review Process for Proposed Initiatives (see Figure 10 below); ensure alignment of the process with the Department's results-based budgeting
7. Develop strategies for common capture and storage of data that maximizes reuse of data from single, standardized repositories
    a. Integrate citizen- and business-entity information statewide so that providing information more than once is not required because technical solutions efficiently capture information and share it based on authorized actions
    b. Focus on eliminating data duplication between lines of business by ensuring data is captured once and is available for use by authorized users as required
8. Agree on and publish uniform practices and policies

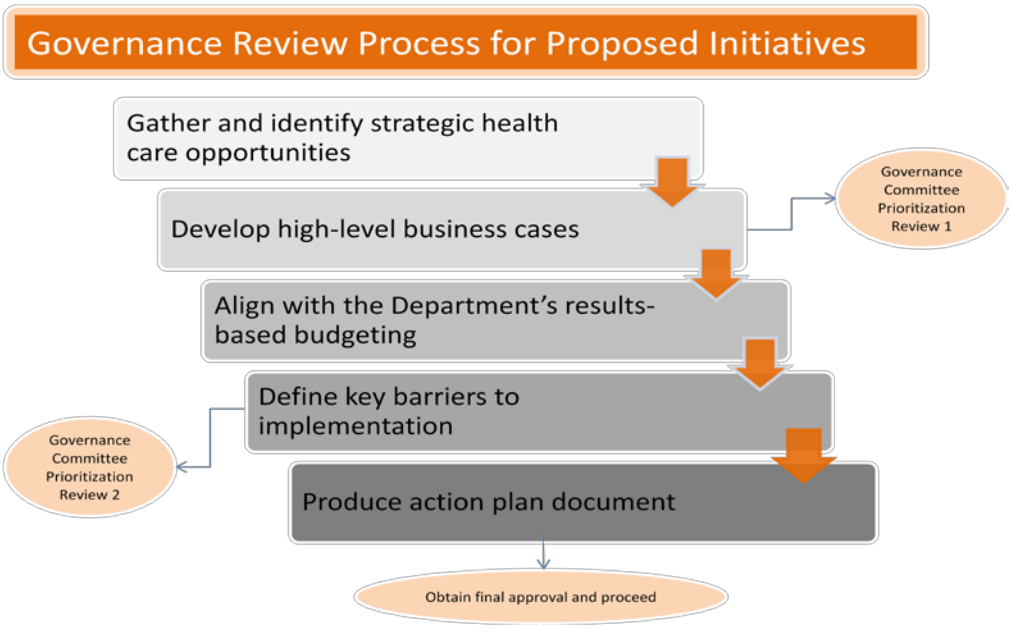

Figure 10: Recommended Governance Process

Take a broader look beyond health systems, and include all major DHSS systems in the Governance Review Process and the strategic plan. There are multiple opportunities to integrate with systems outside the Health System arena that would be strategic:

- Integration with Alaska Public Safety Information Network (ASPIN), which is being requested by DJJ and SDS, could also be used by DPA and should be interfaced with the ABCS2 and Livescan projects in HCS
- Integration with the IRIS project, for financial and contract information; this system can integrate with MMIS, EIS, ASP, Grants systems, CMS, and others

During the Governance Review Process, watch for:

- Duplication of functionality with other initiatives
- Potential to leverage shared services, both established shared services and new services
- Organizational changes to consolidate functions and share business information for efficiency gains

4.2.1.2 Supporting Tools for Comprehensive Care Management

Because the state's population is small and mainly rural, Alaska is more likely to employ a fee for service Medicaid model, rather than a capitated care model for service delivery. For states who employ the fee for service model, the next frontier to improve the quality and lower the cost

of care is providing coordinated care management for costly and at-risk populations within the DHSS client population.

Alaska, like many other states, suffers from a growing population of chronically ill. According to recent Behavioral Risk Factor Surveillance System (BRFSS) statics[5], also verified in the Kaiser Family Foundation (KFF) statistics, 65% of all Alaskans are either over-weight or obese[6]. Additionally, Over 25% Alaska citizens between the ages of 18 and 65 have been diagnosed with at least one chronic condition. Although this group represents only 20-25% of the overall population, they consume 75% of the states' healthcare dollars. Chronic illness is the leading cause of death and disability for the citizens of Alaska. The challenge facing Alaska is to stem rapidly rising healthcare costs while simultaneously improving the quality of life and outcomes for these chronically ill citizens.

The key to improving health outcomes and lower costs for Alaska is influencing the choices individuals make and changing behaviors that result in healthier lifestyles. An additional challenge rests in administering health care for these individuals. Many of these patients exhibit multiple chronic conditions as well as the co-morbidity of both physical and mental health issues. The complex nature of their healthcare needs often results in fragmented care across multiple practitioners and specialists. Such fragmentation leads to obtaining services in settings inappropriate to their illness and condition, and often, are the least cost effective means of receiving care. Treatment received under these conditions, although it is well intended and necessary, is often disjointed and frequently addresses only the symptoms of the problem and not the root cause.

Alaska has started down the path of addressing these issues through the HIE, the HIE Orion Health Clinical Data repository, and the Patient-Centered Medical Home initiatives.

Recommendation:

Cognosante recommends that the Department implement tools to assist in further developing and administering a comprehensive care management model for DHSS clients to coordinate care across multiple practitioners and settings. The goal is to change the way care is delivered from one of reactive to proactive through use of shared actionable information that permits caregivers and patients alike to understand a patient's specific needs and conditions, provides clear communication between providers, and empowers the consumer to actively engage in improving their health status.

Utilize external services like the HIE CDR and BioSense where possible, rather than replicating those services internally.

Following are suggested tools to support the care model:

- Supporting systems that incorporate analytics to identify at-risk populations and members (such as Business Intelligence, HIE Project's Orion Health Clinical Data Repository (CDR), and Statewide HIE)
- HL7 Clinical Document Architecture (CDA) solution capable of communicating with various legacy systems to accumulate patients' scattered clinical and administrative

[5] http://hss.state.ak.us/dph/chronic/hsl/brfss/
[6] http://www.statehealthfacts.org/index.jsp

data, and then aggregate the individual data points into a comprehensive patient summary (see CDA below). Adopt HL7 CDA as the standard for all PHI data storage to support providing the information necessary to do Comprehensive Care Management.

- Unified health record containing patient specific, actionable information. Once a comprehensive, aggregated patient summary is created, evaluate the consolidated patient history to identify potential care gaps as compared to national care standards. Identify care opportunities and patient safety issues, and produce care alerts based on evidence-based guidelines. (Supported by Statewide HIE and associated analytical tools.)

The result is actionable patient knowledge, generated in real-time, shared equally with members of the care team and the patient, allowing care to become proactive, coordinated, and based on wellness, not "rescue" plans.

This type of functionality is defined in the future DS3/ASP system for elderly and disabled; this concept should be expanded to include any recipient with chronic conditions such as diabetes, heart disease, COPD, etc.

Clinical Document Architecture (CDA)

Continued advancement in interoperability, data access methods, web-services, and orchestration processes are lessening the dependency on large-scale data stores. The HL7 Clinical Document Architecture (CDA) provides the capability to access data from disparate clinical, laboratory, administrative, and personal data in real-time and create a consolidated summary patient record. Utilize CDA to allow different formats of clinical and administrative information to be shared in real-time with providers and patients alike. The CDA supports the creation of the Continuity of Care Document (CCD), a document that is quickly becoming a standard. The CCD c32 Patient Summary version allows for the collection of patient medical procedures, hospitalizations or acute incidents, medications list, allergies, family and social history, and lab results.

The data can be standardized, de-duplicated, and presented, in real-time, directly to provider and patient portals. Additionally, this patient history can be evaluated using rules-engine technology and Clinical Decision Support tools (CDS). Using rules engine technology, the Patient History can be examined for:

- Gaps in care as compared to Evidence Based Medicine Guidelines
- Medication Therapy Management Issues (medication therapy)
- Patient wellness and preventative care alerts.

This approach allows disparate pieces of patient data from multiple sources to be consolidated, de-duplicated, and standardized in real-time. The multiple sources selected for consolidation can be both internal and external, if desired. DHSS can make this information available in real-time to DHSS providers that may never have encountered the presenting patient, giving them a comprehensive understanding of a patient's history, care needs, allergies, family and social history. It is technically possible to provide this information to external providers as well, if the need exists and DHSS chooses to do so, although security and privacy concerns need addressing in the process.

The alerts produced from the rules engine also provide actionable information that forms the basis of understanding of the patient health status, care needs, and current risks.

This information can be generated in real-time and shared equally with members of the care team and the patient, allowing care to become proactive, coordinated, and based on wellness, not “rescue” plans. The result is a solution that addresses not only the need to connect and exchange healthcare information, but a solution that turns disparate data into the knowledge providers and patients need to improve health outcomes.

4.2.1.3 Business Process and Organizational Reengineering

CMS’ Seven Conditions and Standards include making business processes service oriented. To move toward a service-oriented environment, there is a potential need for business process and organizational reengineering to consolidate the areas of redundancy within the state organizations to align with the use of shared services. It is not necessary to have multiple organizations performing the same functions using a single, shared business or technical service.

Recommendation:

Organize a Reengineering Unit to adopt and facilitate a business process and organizational reengineering methodology and approach for DHSS. Many external consulting firms specialize in this discipline, employing methodologies such as “lean” and “Six Sigma”, and can assist the state to adopt an approach that fits Alaska’s needs. Combine identification of shared services with organizational and process review, utilizing the Reengineering Unit for facilitation. Employ the Governance Committee to oversee and approve any recommended organizational and process changes.

4.2.1.4 Information Technology Support Structure

Migrating to a new Health Services Enterprise Architecture has an impact on how IT services are structured and delivered, and requires a shift to a new IT Service Model that focuses more on strategy, management, oversight, and support rather than actual development of systems. A new model will have advantages for Alaska that address many of the current issues cited regarding IT support, including the need to support 300+ systems with current staffing levels and a limited range of available expertise.

Staffed by a small but experienced group of IT professionals, Alaska IT is well positioned to migrate to a new model of support that will provide a higher level of customer approval and IT staff career satisfaction.

Recommendation:

Consider migrating IT service delivery away from system development toward providing expert technical guidance and support services. Establish Service Level Agreements (SLAs) that institute a process of measurement and communication and then inaugurate organizational change and outsourcing if necessary to meet the SLAs. See Figure 11, “Operations” for specific process recommendations. Plan for organization and training around technologies that support the Roadmap Enterprise Technology Plan, including:

- Planning for migration of infrastructure and applications to the “Cloud”
- Outsourcing where it makes sense
- Shifting involvement from system development to:
    - Strategic technical planning, guidance, and review, including SLA management and measurement
    - Process and Knowledge management
    - Change and Release management
    - Asset management
    - Operations and Support services (this may include support and development of SharePoint or similar applications, but these solutions should not be applied to core systems)

Another alternative is to consider transferring infrastructure responsibility to a centralized state wide organization (Enterprise Technology Services or ETS) to reduce redundancy and duplication.

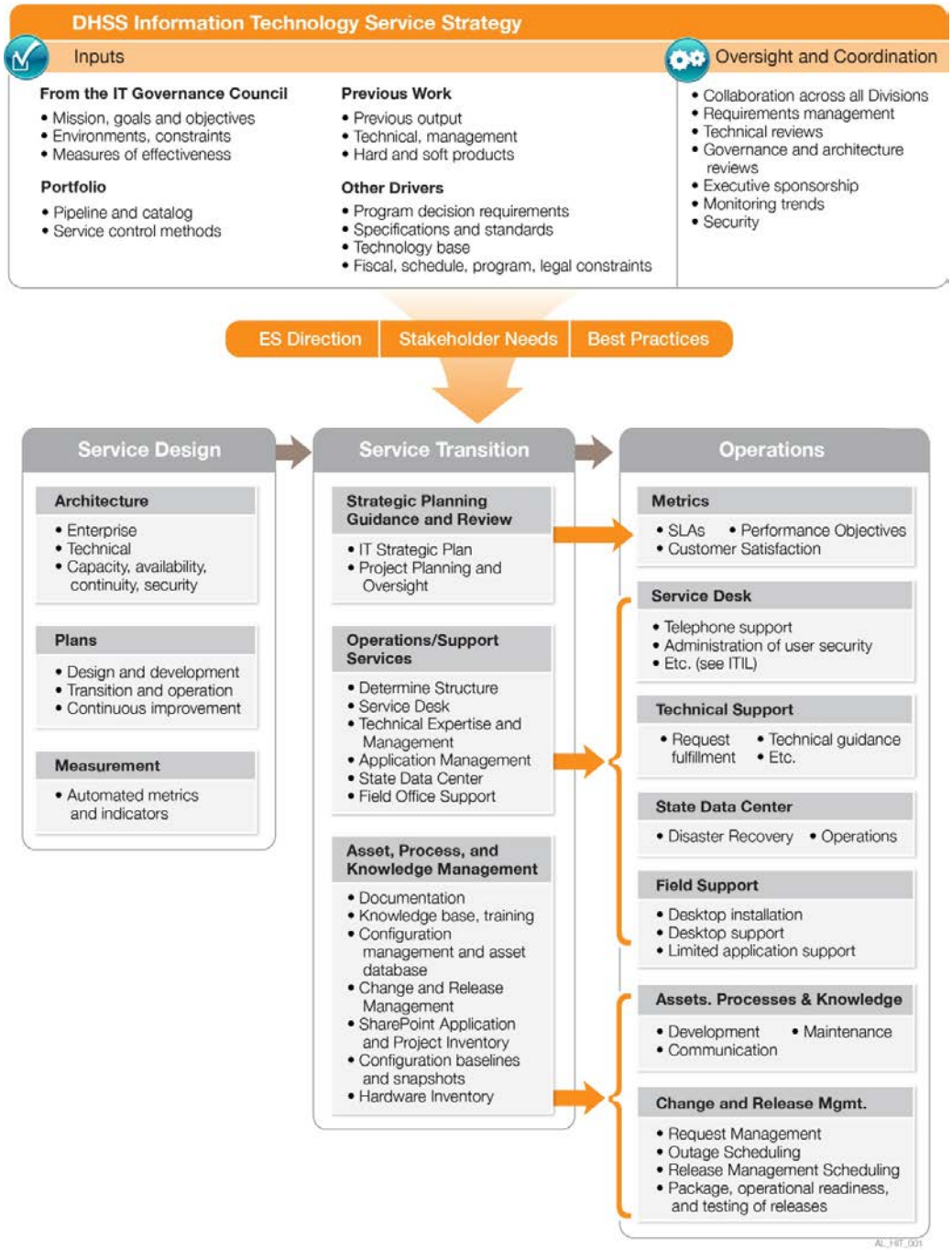

Figure 11: Migration of ITS Service Delivery

- Ensuring that every application and project has an IT owner who is involved with that initiative, even if it is outsourced
    - Require that the IT owner keep the information (technical and business-related) current for his/her assigned applications and projects in the IT Matrix system

  - Ensure that the IT owner participates in the evaluation and technical consultations for new projects
- Delivering administrative operational functions using the same processes/tools/technologies statewide
- Making information or service delivery functions for operations available in a form and format that promotes use internally and externally
- Enhancing the careers of the State's IT professionals by providing training in technologies that support the new organization (Cloud technologies, Security, Strategic Planning)

4.2.1.5 Security and Privacy

Security and privacy issues are critical and require sponsorship, full focus, and support by the Department. Concerns in this discipline span a broad spectrum, including HIPAA protections, internal and external data sharing, policy development and maintenance, technical management, and general threat and vulnerability concerns, to name just a few. Government entities are especially targeted and vulnerable, calling for guidance and administration by a skilled professional team.

Identity management is another pressing issue; multiple methods for identity management make accessing multiple systems cumbersome and inefficient.

Recommendation:

Expand the role of the Information Security Office (ISO) to guide the organization and coordinate the privacy and security policies and procedures into a cohesive and functional whole. Organize it at the highest level of the business (perhaps with oversight by the Governance Committee or the Commissioner) rather than having it as part of a DHSS division. Staff the ISO with security experts who report to the business, have a business focus, but are technically skilled in security and privacy issues. Increase staffing; ensure they are paying attention to security issues and that they are certified (CCISP or equivalent), their qualifications are up to date, and they receive future training in security developments and technology.

4.2.1.6 Shared Services

The concept of shared services is that systems can be broken into component parts, or modules, and the modules that represent functionality that is common in more than one part of the organization can be shared by other parts of the organization. Changes to the baseline functionality of all modules can be made without affecting how the extension works. Utilizing a shared service model – called a Service-Oriented Architecture (SOA) - decreases duplication of functionality and associated costs and makes future customizations or upgrades easier to deploy without breaking custom functionality. Common Services can also be leveraged across Lines of Business (LOB), reducing redundancy and lowering the total cost of ownership of systems for departments. Standardizing services also enforces uniform data definitions across LOBs and departments, allowing for consolidation of data storage and access routines. Master Data Management is improved as data values are standardized within common data stores,

meaning that data is stored on common repositories, breaking down traditional LOB or department level data silos.

Recommendation:

Adopt a Service Oriented Architecture (SOA) across the enterprise. Put a structure in place for shared services, and organize and manage all services and delivery processes to maximize responsiveness, efficiency, and effectiveness internally and externally. Create a vision about the individual services to employ, identify components, determine how they can be shared, and connect existing systems to the shared services through an ESB. During review of requests for new initiatives, look for opportunities to identify and/or leverage shared services.

In lieu of developing direct system-to-system interfaces while the organization matures to a robust SOA, use a tool like BizTalk (which is considered an Interface Engine (IE) rather than a true ESB) as the ESB. The ESB enables integration of systems by allowing each system, given appropriate authorization, to be viewed as a shared resource accessible via services deployed on the ESB.

MCI is a good place to begin this process; providing an index of client records through BizTalk exposes the functionality to multiple systems via a shared service rather than individual interfaces. Follow MCI with other shared services, such as a Master Provider Index (MPI), Provider Portal, Client Portal, enterprise notification services, a document registry, rules engines, workflow engines, data warehouse, auditing functions, licensing and certification functions, and grant and contract management.

4.2.1.7 Data Management

Sharing and efficiently capturing and storing data focuses and drives execution of a service-oriented strategy. Understanding and effectively managing data stores, therefore, is an initial step in the execution of the Roadmap.

This process is well underway with the MCI. The proven technology, lessons learned and expertise drawn from the MCI effort will be invaluable in establishing a Master Provider Index (MPI) and implementing data exchange between the HIE and state management information systems.

Recommendation:

Eliminate data duplication across lines of business by ensuring data is captured once and is available for use by authorized users as required. Build data stores and organize data around entities and roles. Protecting data confidentiality across business entities can become a barrier to this effort; strive to break down existing data silos and fiefdoms by addressing security and privacy concerns with policy modifications as well as technology solutions.

Expand data initiatives further, including expansion of the MCI and the establishment of new initiatives, through a process of solid planning, management, and oversight. Integrate existing data sources where appropriate and provide the accessibility to the data in a meaningful way. Consider additional data management initiatives such as business directories, licensing and

certification information, document repositories, and Public Health Information stores. (See Figure 6 for examples of data types for consolidation.)

Build and follow a data management plan with a schedule that has been approved and is monitored by the IT Governance Committee. The long-term direction is to avoid standing up data silos.

4.2.1.8 Business Intelligence (BI) vs. a Data Warehouse

Having accurate information, consolidated across divisions and provided in a timely manner, is mandatory in the fast-changing health care environment. DHSS needs quick, flexible retrieval of information and the ability to analyze it across divisions online without the need for requests to create reports that require programming.

Building an enterprise-wide data warehouse is often the solution presented to address this need. Although nice to have, building a comprehensive data warehouse is costly and time-consuming. Alaska is developing an MMIS-specific data warehouse as part of the MMIS replacement project, but the state may not have the volume of people and transactions to justify expending the cost and effort to expand the MMIS data warehouse enterprise-wide or to develop a separate enterprise-wide data warehouse.

Recommendation:

The concept of building a large repository of all information is not cost effective for Alaska, and is not a recommended goal. The goal is to have real-time data reporting when, where, and how it is needed.

Instead of developing an enterprise data warehouse, Cognosante recommends a two-part solution:

- Implement a BI solution that utilizes on-line analytical processing (OLAP)
- Connect key data stores, such as the Clinical Repository in the statewide HIE, and Vital Records and Public Health registries, to the MCI and MPI for consolidated reporting capability
- Create abilities to standardize, cleanse, and de-duplicate data in real-time, eliminating the cost and need to build operational data repositories

Implementing a BI tool that can be used enterprise-wide will allow for better program management, new insights and an understanding of business performance based on data and statistical methods. A BI solution will provide reporting and analysis capability for Alaska that can grow with the State and support multiple programs. Robust BI solutions can be procured from major firms such as Oracle, Microsoft, SAP, IBM, and others at a fraction of the cost of building an enterprise data warehouse.

A BI solution will allow development of queries that will be useful when conducting:

- Surveillance and utilization review
- Fraud, waste, and abuse (FW&A) detection

- Provider and beneficiary profiling, including peer group comparisons
- Disease and care management analysis
- Geographic area comparisons
- Benefit plan design and review
- Appropriateness of care, such as reviewing for age and gender appropriateness
- Rate setting for individual rates, Managed Care Organizations (MCO), and institutional providers
- Cost trends and comparisons between state Medicaid plans, MCO plans, and commercial insurance plans
- Performance monitoring for both Medicaid providers and contractors
- Quality measurements, such as maternal health, emergency visits, and preventive care services

4.2.2 Services and Technology Architecture Recommendations

Once the Business Architecture and Information Architectures have been determined and developments are underway, design and implement the Service and Technology Architectures. During design of the Service Architecture, focus on developing a comprehensive set of service-oriented solutions and applications to meet the State's business needs, followed by design of the Technology Architecture, which is the technology infrastructure environment that supports the Service Architecture.

During the design, it is important to consider the following:

- Follow the recommendations in the CMS Seven Conditions and Standards and the structure of MITA where possible
- Identify a common enterprise platform with reusable tools across the enterprise, as well as common access channels
- Keep privacy and security in the forefront of system design and acquisition
- Build interfaces with key systems rather than duplicating information
- When reviewing proposed initiatives, identify components and determine how they can be shared
- Implement systems in smaller increments or iteratively to leverage the benefits sooner
- Take advantage of expert services available from vendors who specialize in the subject matter area and technology
- Outsource development and hosting of applications
- Consider Commercial Off-the-Shelf Technology Solutions (COTS) where they make sense for faster implementations, ease of maintenance, and cost benefits
- Limit customization where possible

4.2.2.1 Migration to the "Cloud"

Cloud platforms are well suited to meeting the needs of Alaska's technology requirements. They will allow Alaska to get applications up and running faster, are less expensive for many applications, have improved manageability and less maintenance, provide flexibility by allowing for rapid and transitory growth, and require less upfront investment when building out something new.

Types of cloud computing include:

- Software as a Service (SaaS) provides server applications that are delivered as web services that are cheaper and easier to adopt than traditional purchased applications. Given the rapid pace of technology development, using SaaS will often provide better value to the state overall.
- Infrastructure as a Service (IaaS) is the most basic cloud service model where providers offer physical and virtual computers and other resources. This model leads to the ability to scale to support a large numbers of virtual machines. Other resources in IaaS clouds include images in a virtual machine image library, raw (block) and file-based storage, firewalls, load balancers, IP addresses, virtual local area networks (VLANs), and software bundles.
- Platform as a Service (PaaS) is a category of cloud computing services where the provider provides the networks, servers and storage, and the consumer creates the software using tools and libraries from the provider. The consumer also controls software deployment and configuration settings.

Alaska is developing a private cloud that has resulted in decreasing the number of servers from 450 to less than 200 at present. The two data centers in Juneau and Anchorage were developed as virtual server environments. Some major systems have been virtualized; for example, ORCA went from a rack of physical servers to a virtual environment. This is an excellent approach, and a good start to the migration process.

Recommendation:

Continue to leverage cloud technologies. Compare the cost of the private cloud infrastructure to procuring a public IaaS, and consider migrating to a secure public cloud if it proves to be cost-effective, since utilizing IaaS will allow the state to "pay as you grow". Explore and understand BizTalk migration to AppFabric (cloud based middleware services).

Take advantage of SaaS, software services, where possible, for faster, easier, and less expensive application deployment.

- Other Benefits of utilizing public cloud technology include:
    - Lowers cost of software licenses
    - Increases options for storage
    - Removes burden and costs of infrastructure management from Alaska IT staff
    - Provides flexible and accessible platform for common services

4.2.2.2 Enterprise Bus, BizTalk and Cloud Computing

BizTalk is currently Alaska's solution for an enterprise bus, as recommended in the "Logical Architecture for the Integration of Alaska State Systems into the HIE" document dated August 25, 2011.

Recommendation:

Microsoft has introduced a roadmap for leveraging existing BizTalk capabilities and integrating them with the AppFabric public cloud environment. Microsoft's AppFabric application is the cloud-based middleware version of BizTalk, therefore migration to AppFabric is a natural progression toward using a public cloud for the state's enterprise bus. BizTalk 2010 includes capabilities to leverage BizTalk services and orchestrations into the cloud-based Windows Azure (public cloud solution) AppFabric Service Bus. This permits Alaska to develop a flexible migration strategy to a public cloud and continue to leverage current on-premises BizTalk services. The AppFabric capabilities also include AppFabric Connect, which provides pre-made maps and accelerators for connecting to different Lines of Business (LOB).

Evaluate the services that Alaska would like to retain private vs. migrate to a secure public cloud. For the long term, move toward a migration of BizTalk into the Azure AppFabric environment.

Key benefits of adopting AppFabric:

- Improves application speed, particularly for frequently run jobs and requests
- Provides the ability to integrate with BizTalk, without replacing current capabilities.
- Supports and allows for on-premises and cloud-based "hybrid" solutions
- Reduces cost of ownership, including software license and maintenance costs
- Includes data integration accelerators for Lines of Business

4.2.2.3 Telehealth and Telemedicine

Alaska is one of the most advanced states in utilizing telehealth and telemedicine technologies, employing the use of electronic information and telecommunications technologies to support long-distance clinical health care, professional health-related education, public health, and health administration. Alongside Alaska's initiatives, the Department of Defense (DOD) has pioneered telehealth efforts for military personnel.

Recommendation:

Continue to build telehealth and telemedicine infrastructures. Since Alaska has a significant military and veteran population, consider leveraging DOD telehealth and telemedicine technology, focusing future early efforts on military personnel. People in nursing homes are another early target population who would benefit from added telehealth and telemedicine technologies.

4.2.2.4 Broadband Communications

Many of the initiatives recommended in this Roadmap depend upon continued expansion of the broadband network across Alaska. Parts of the network are satellite-based, causing latency in some areas.

Recommendation:

Closely monitor the schedule for Alaska broadband expansion and align the schedule for implementing the Roadmap initiatives with it as it makes business sense. Continue to investigate and address latency issues.

4.2.2.5 Recommendations Regarding Existing Systems and Initiatives

4.2.2.5.1 Master Client Index (MCI)

The DHSS MCI is a match and merge system that contains a variety of case management demographics from programs within DHSS. DHSS purchased MultiVue, the software used for the matching and merging, from Visionware. It performs de-duplication from a variety of systems and helps to determine individuals and families even if their name or address are not represented identically by ranking matches based on a variety of business rules. A staff person manually resolves individuals that might be a match but that cannot be determined without human intervention.

The development of a MCI has been an excellent start to Alaska's migration to shared services. Nine major Alaska systems plug in to the MCI including JOMIS, ORCA, PFD, EIS, DS3, AKAIMS, MMIS, and Professional Licensing. Because the MCI is a repository of client information, it is closely tied to myAlaska, which is an authentication and electronic signature system allowing citizens to interact with multiple State of Alaska services through a single username and password.

Although many major systems are utilizing the MCI, it appears that this initiative is sponsored by the ITS group rather than at a department level by the business, and a multi-year plan for its expansion has not been developed. As it is expanded, there are significant issues regarding ownership, governance, privacy, and security that require close business involvement to address and resolve.

Recommendation:

Before adding additional systems to the MCI, engage a data architect to review the technical approach to the design and implementation to ensure that it is designed to grow and be maintainable as more systems plug into it.

MultiVue does not produce a unique identifier as a record locator, which provides the ability to have a holistic view of a client. Select or create a unique identifier for individuals.

Identify a system that is a rich source of demographic data for the next expansion of the MCI, as it is critical to have a system such as this to be a major driver for the system. Some states use the DMV client database, which provides the benefit of both rich data and a unique identifier. Other excellent candidates for rich demographic data include Alaska's TANF and Vital Statistics systems, which should be considered for early expansion. Consider early integration with

MyAlaska (MyAlaska should share the MCI database, rather than have its own) if it is also a source of rich demographic data.

Ensure that the matching and merging algorithms meet the business rules for each system coming in to the MCI. Undertake an effort to determine and document the match rules for each division and system.

Because there will not be a 100% match by the system all the time, manual intervention is required to ensure accuracy. Designate an administrator to process de-duplications that cannot be resolved automatically by the tools in place. Depending upon the number of systems in the MCI and the volume of activity, this function may require a full-time position.

Alaska is well positioned to move to a cloud solution with the MCI shared service. Numerous vendors have expertise in this area; consider this opportunity as the first to be deployed to the cloud.

Designate a business sponsor at the department level and develop a five-year plan for the expansion of the MCI.

4.2.2.5.2 Provider Portal

Alaska recently implemented a web-based provider portal that provides the ability for MMIS providers to enroll in the state Medicaid program. A Phase 2 of the implementation, supporting re-enrollment of providers, is scheduled for August 2012. This portal provides functionality to validate existing legacy data and capture new provider data for the MMIS system. The current implementation approach did not create integration between the portal and the MMIS; the portal operates as a stand-alone database, whereby a batch process ports the data collected into the MMIS after the fact.

The MMIS project team will issue a provider portal in Phase 2 to replace the stand-alone portal currently in place.

There is great demand for a fully functional Provider Portal across the organization; for example, the recent requirements developed for implementation of the SDS ASP and Provider Portal System clearly defines the ASP system needs for this functionality.

Recommendation:

From a technical standpoint, the MMIS Provider Portal delivered in the Phase 2 implementation will be well suited for sharing with other applications. Develop a plan for leveraging and expansion of the Phase 2 Provider Portal, providing it as a shared service utilized by multiple systems and programs.

A Provider Portal can be more than a way for providers to give and receive information to and from DHSS. Think about things that providers can offer on a portal that are easier to access if electronically available and would be beneficial to DHSS clients, such as:

- Provider information
- Notifications when new patients are being accepted

- A scheduling calendar showing provider appointment availability

Determine and prioritize the systems that need to utilize a Provider Portal. Some examples of systems that would benefit by the use of a provider portal include:

- MMIS
- SDS ASP/DS3
- AK COMMS
- ORCA
- AK AIMS
- BCHC: Breast and Cervical Health Check

4.2.2.5.3 Eligibility Information System

Phase I of the newly initiated EIS Replacement Project replaces the MMIS eligibility functionality; Phases II through V replace the eligibility components required by the remainder of Alaska's programs. Alaska chose this direction based on funding availability and the requirement by the ACA to replace MMIS eligibility by January 1, 2014. Once Phase I goes live until the end of Phase V, Alaska will have two separate eligibility systems, a new one and a legacy system implemented in 1983.

Recommendation:

Look for ways to move forward quickly with replacement of all eligibility functionality.

4.2.2.5.4 Business Rules Engine and Workflow

A Business Rules Engine and Workflow Management are common shared services that many states leverage, and are clearly called out in CMS recommendations and the CMS Seven Conditions and Standards. The MMIS project is implementing the Fair Isaac Blaze rules engine. EIS and SDS ASP system requirements include a business rules engine and workflow.

Recommendation:

Leverage the MMIS Fair Isaac Blaze rules engine for the EIS and SDS ASP systems, and workflow if the MMIS implementation includes a workflow module that can be shared. Consider using these as a primary Business Rules Engine and Workflow Management system for future systems that require this functionality.

4.2.2.5.5 Laboratory Information Management System (LIMS) and Lab Reporting

There are currently two implementations of LIMS (Chemware) systems in Alaska, in Fairbanks and Anchorage. These systems, although implemented with identical software, are deployed on two servers, do not share a common database, and each separately feed data into AK STARS. The two labs perform different tests, which has been a justification for the separate implementations.

Alaska has electronic lab reporting capability through an Orion, Rhapsody v4.1.0 solution. This system is available exclusively to send Public Health Lab results to the CDC. (Note: this solution should not be confused with Orion Health Clinical Data Repository (CDR), the HIE SaaS that also leverages Orion Rhapsody as a component).

In addition, Public Health has a Lead Electronic Lab Reporting system to produce lab reports for lead poisoning testing.

Recommendation:

Consolidate the LIMS systems in Anchorage and Fairbanks, using technology such as mirroring to support the two locations in a more efficient way, so they share data and leverage staff. Determine whether there are differences in clinical terminology prior to consolidation.

Consider leveraging the HIE Orion Health CDR to create a statewide Public Health CDR to store lab results in a standardized format that allows tracking of lab results and monitoring of immunizations in one location.

Review the use of the Lead Electronic Lab Reporting system to see if it can be consolidated into the HIE Orion Rhapsody SaaS.

4.2.2.5.6 Pharmacy Software and eMAR

DHSS currently has three different pharmacy systems in use; Behavioral Health's Alaska Psychiatric Institute (API) is using Meditech's pharmacy solution, Pioneer Homes has a Prodigy pharmacy system and Public Health is using QS1 Pharmacy for Epidemiology prescriptions. In addition, there is a request by Pioneer Homes in the pipeline for an Electronic Medication Administration Record (eMAR) Implementation project, due to the need to address a corrective action by 1/1/2013 from the Veteran's Administration requiring APH to use electronic prescriptions. And finally, DPA has a medication bar coding system that needs an eMAR to be functional.

Recommendation:

Standardize on one pharmacy system within DHSS, ensuring that it is a modern system that will meet the requirements of the Veteran's Administration correction action. Leverage the eMAR for the medication bar coding system that is installed in DPA.

4.2.2.5.7 Electronic Medical Records (EMR)

There are multiple EMR solutions implemented or requested within DHSS. In fact, an analysis of the IT Matrix Database identified instances or requests for an EMR, or had functionality that could be replaced by an EMR, in at least 11 different places:

Table 6: DHSS EMR Applications and Projects

Division	System Implemented or Requested?	Acronym	Description
APH	Requested	APH EMR	EMR project to replace ACCU-CARE; includes an

Division	System Implemented or Requested?	Acronym	Description
			eMAR
APH	Implemented	Epi Care	Providence Health Care's EMR for the pharmacy to access lab results
APH	Implemented	ACCU-CARE	Legacy medical records system
DBH	Implemented	MHIS	Meditech Health Care Information System (MHIS) API system for Patient Medical Records
DBH	Implemented	AKAIMS	Substance abuse and mental health system that contains some EMR information
DBH	Implemented	DET	Designated Evaluations and Treatment Database to track statutorily required hospitalization and transport for involuntary commitments; contains EMR information
DPH	Implemented	RPMS	Resource and Patient Management System (RPMS) administered by the U.S. Indian Health Service (IHS)
DPH	Requested	WCFH	Women, Children's and Family Health Specialty Clinics EHR (WCFH) – project to replace aging Access systems
HSS	Requested	HIE	For the Alaska HIE; project in progress
HCS	Requested	MMIS	Replacement of legacy MMIS; will contain EMR information
SDS	Requested	ASP	Automated Service Plan system that will contain EMR information

Recommendation:

Clearly, there is demand within DHSS for an EMR, and the Department is best served by avoiding purchase and implementation of multiple solutions. Look at the needs for an EMR enterprise-wide and consider organizing a consolidated effort. Ensure that there is consolidation of patient history and connection of the EMR with the HIE.

4.2.2.5.8 Case Management Systems

Alaska has multiple case management systems and systems that store case management information. In fact, the application inventory identifies more than 30 different systems as having some component of case management. Following is a table containing a list of the major Alaska systems that have case management functions.

Table 7: Major Alaska Case Management Systems

Acronym	System Name	Owning Division
Social Service Systems		
AKAIMS	Behavioral Health for Substance Abuse and Mental Health	DBH
AKWIC /	WIC Case Management System DPA (and SPIRIT, the project to replace	DPA

Acronym	System Name	Owning Division
Social Service Systems		
SPIRIT	AKWIC)	
CMS	Mainframe case management system to monitor work requirements for TANF	DPA
ILP	Infant Learning Program Case management system and tools to track for children with development delays	OCS
JOMIS	Juvenile Offender Management Information System	DJJ
ORCA	Online Resources for the Children of Alaska, the state's case management system for children's services	OCS
Social Service / Medicaid Systems		
DS3 / ASP	System to support care management for seniors and people with disabilities; currently planned to be enhanced through the SDS ASP and Provider Portal project	SDS
EIS	Eligibility information system for Medicaid, TANF, Food Stamps, Adult Public Assistance, Sr. Care, General Assistance (all programs)	DPA
Medicaid Systems		
MMIS	Automates the processing of Medicaid claims from providers	HCS
Public Health Systems		
BCHC	Breast and Cervical Health Check, contains client eligibility & claim status for breast and cervical health screening services	DPH
RPMS	Resource and Patient Management System; Nursing RPMS is a decentralized automated information system for patient clinical records	DPH
STD MIS / PRISM	Data management program for HIV/STD program.	DPH
SMEO Alaska	State Medical Examiner's Office Case management system for tracking death investigations	DPH
TIMS	Tuberculosis Information Management System, case management for TB cases	DPH

Recommendation:

There is valid justification for having multiple case management systems, since each of these systems has distinct target clients, program requirements, and funding streams. However, the Department should look holistically at clients and consider maintaining some case information as a shared service. Functions that fall in this category include client demographics, provider enrollment, client and provider portals, and financial management. For example, case management applications are excellent candidates for leveraging shared services, such as the MCI, an MPI, a rules engine, workflow, secure direct messaging, a document repository, and enterprise messaging. As each of the shared services is implemented, look closely at the case management systems for opportunities to plug them in. Using shared services should be a requirement for any new project for a case management system, such as the SDS ASP and Provider Portal project.

4.2.2.5.9 Electronic Document Management

DPA is planning to conduct a pilot of an Electronic Document Management System (EDMS) in southeast Alaska beginning in September. The division has a need to turn their paper documents into electronic files for real-time access to case information from anywhere in the state, so cases can be shared among offices for workload balancing and improved case management.

In addition, Vital Records has the ability to scan and save documents.

Recommendation:

Numerous applications within DHSS could leverage an EDMS system, including the MMIS, EIS, and future ASP systems. However, this technology is past its prime; rather than implement a system to digitize paper documents, we recommend that Alaska pursue a goal away from producing any paper at all. We recognize that some places require paper, such as contracts that require a physical signature, but most other types of paper can be created digitally and remain that way. In fact, some states have penalized providers who insist on submitting paper claims (examples include Utah, Minnesota, and Wisconsin). As new systems are implemented, ensure that they have a goal to create documents digitally and go paperless.

While moving toward a digital environment, consider leveraging the XDS document repository that is being provided by Orion as part of the HIE project. The HIE solution has robust tools to support authentication, access control, routing, indexing and data storage. As such, the state should consider options to leverage the statewide HIE to support document management. The HIE repository, currently planned for clinical documentation, can be used on a broader basis; it can store any kind of document.

In addition, consider migrating the HIE repository to cloud-based storage and contract with it to provide cloud based repository services.

Note: DBH has a scanning and archiving system that could also leverage the XDS document repository, which could be accessed through the Meditech system.

If an EDMS is still a desired approach, take a short-term view by keeping the choice of system to something low-cost, with a plan to replace it as paperless systems and digitizing of documents become more available.

4.2.2.5.10 Grants Management

FMS released an RFP for a system to replace eGrants in July 2012. eGrants is the department's grant management system. There are other systems in the organization for various aspects of grants management, including APDS for reporting of AIDS/STD grant-related activities and SAMS for managing performance of grant awards.

Recommendation:

Look at grant needs across the organization before implementing the new solution. This may be an opportunity to consolidate systems, which could result in modernization of grants administration along with a cost savings.

4.2.2.5.11 State Level Registry (SLR)

Alaska has implemented a SLR application developed by Xerox/ACS to support the incentive payment program. This application is in its third iteration, and is an important component in providers' submission of meaningful use data. In the future, the state will be required to collect, consolidate, and report meaningful use data to CMS.

Recommendation:

Begin planning now for integrating the SLR with the HIE to collect and manage meaningful use clinical data by the required deadline (2014 or 2015?).

4.2.2.5.12 Geographic Information Systems (GIS)

DPH is in the process of implementing a GIS system called InstantAtlas for mapping of health data. GIS systems have broad application across multiple programs, and given the vast expanse of Alaska, may be a technology that has high benefit for the state.

Recommendation:

Implementation of InstantAtlas provides an opportunity to leverage GIS functionality across DHSS. Some potential applications for a GIS system include:

- Managing effectiveness of regional branch offices by comparing health statistics over time that have been mapped to locations and office
- Effective distribution of budgeted funds and staff resources
- Identifying gaps in provider support
- Utilization by Children's Services for location assistance for home visits
- Integration with AK COMMS, the EMS communications system
- Mapping for the Alaska Surveillance of Child Abuse and Neglect Program
- Inclusion in the project to upgrade IBIS, called the Indicator-Based Information System for Public Health - Phase I – Startup

4.2.2.5.13 Enterprise Notifications Service (ENS)

DHSS is implementing a central enterprise service that manages document workflows for multiple systems, providing the ability to send broadcast, group, and individual notification documents such as emergency alerts, public health notifications, meeting notices, routinely scheduled messages, etc. to email servers and external printers, with robust logging and tracking. The vision is that individual applications could share this service rather than hosting their own interfaces for notifications to external clients, reducing development and maintenance costs to the department. Those working on this implementation anticipate that multiple internal systems will have this need. OCS is funding it, because ORCA currently is designing a tightly time boxed, court ordered notifications framework that has a printer interface requirement. The plan utilizes BizTalk as the bus for the service.

Recommendation:

An ENS is an excellent example of a shared service. This functionality is scalable, allowing secure control of messages as granular as emails all the way up to broadcast level actions as long as the interfaces are set up and the lists are specified. Audit tracking is also a benefit of ENS.

Consider expanding this service to Public Health as the next step after ORCA. Public Health notifications, as well as notifications from VacTraK and AK STARS would be desirable applications of this technology. Also consider and prioritize the potential use of this service by the Department's case management systems, as there are wide applications and benefits to case management for an ENS.

4.2.2.5.14 Direct Secure Messaging (DSM)

"YouSendIt":

DSM addresses the ability to send electronic data in a secure encrypted manner. DHSS utilizes a tool called "YouSendIt" for internal and external DSM. Users have cited this tool as cumbersome to use, which appears to discourage widespread utilization. In addition, "YouSendIt" does not encrypt message attachments, either limiting the use of the tool to simple messaging or exposing attachments to security vulnerabilities.

HIE Direct:

As part of the HIE Project, DSM has been implemented to provide a more secure method for physicians and consumers to exchange health information. Broader use of DSM is targeted to support the need to meet meaningful use requirements for electronic health records. Participants are leveraging DSM to exchange transition of care referrals and summary of care records between medical providers.

This initiative includes a pilot of "LAB Exchange over Direct" to send structured lab results electronically from two designated labs to participating providers. Providers will use Direct to send test results from the lab to the provider. It will also supply the foundation services and standards to support patient engagement and public health.

Recommendation:

Phase out the use of "YouSendIt" in favor of the more secure Direct option. Encourage DHSS users to choose Direct for all messages containing PHI and Personally Identifiable Information (PII). Ensure that adequate provisioning and system support are available to support the large number of potential state users, and that State data (and email) requirements are addressed with the Direct solution.

Require applications that include a requirement for accepting PHI or communicating PHI with providers or patients to adopt the Direct project specifications, which will allow providers with MU2 certified EHRs to send PHI directly from within their EMRs.

4.2.2.5.15 Quality Assurance (QA) Systems

The DHSS portfolio includes multiple applications with Quality Assurance functionality. Some of these applications have been developed using SharePoint; others have functionality built into a broader application; while others, such as Risk Plus, are specifically focused on QA. There is currently a request by DPA to replace their Case Review systems with a Fraud Case Management System, and there are multiple requirements in the SDS ASP system request for QA and auditing functions.

Recommendation:

Look for opportunities to leverage QA functionality across the organization, as in the request for a Fraud Case Management system. This is a lower-priority recommendation, but provides a good example of an instance where duplication of functionality with other initiatives can be identified during the Governance Review Process, as recommended in Section 4.2.1.1.

4.2.2.5.16 Licensing, Certification and Registration

As with Quality Assurance Systems, there are multiple applications with licensing, certification, and registration functionality within DHSS. Following is a list of those applications:

Table 8: Sample of Systems with Licensing & Certification Functionality

Acronym or System Name	Description	Owning Division
ICCIS	Includes functionality to conduct and manage child care provider licensing actions	DPA
Credentialing Database	Tracks licensure and training for continuing education and board certification requirements	DBH
ASP	Includes requirements for a licensing and credentialing component (this is a project, not an application at this point)	SDS
Excel Spreadsheets	Track licenses and certifications for SDS	HCS
AK Respond	AK Respond, a system to register licensed health care professionals	DPH
EMS Certification	Individual EMS Certification Management	DPH
Provider Directory	Will likely allow entry of licensing and certification information; recommend that information collected is stored in a central repository	HSS

Recommendation:

Look for opportunities to leverage Licensing and Certification functionality across the organization. In addition, consider integration with the Division of Licensing professional licensing databases and the Master Provider Index (MPI).

4.2.2.6 Recommendations for New Initiatives

4.2.2.6.1 Health Insurance Exchange (HIX)

After reviewing a study on health insurance exchange planning, Alaska's Governor Sean Parnell determined that it is not cost effective for Alaska to create a state-run health insurance exchange to meet the requirements of the ACA. States that do not develop a state-run

exchange will need to participate in either a State Partnership Exchange (SPE) or the Federally Facilitated Exchange (FFE).

Under a State-Based Exchange (SBE), the state operates all exchange activities but may use some federal government services; under the SPE, a state may administer plan management functions, in-person consumer assistance functions, or both. In FFE states, FFEs will perform these functions. See Figure 12 below, provided by CMS, for specific operations models.

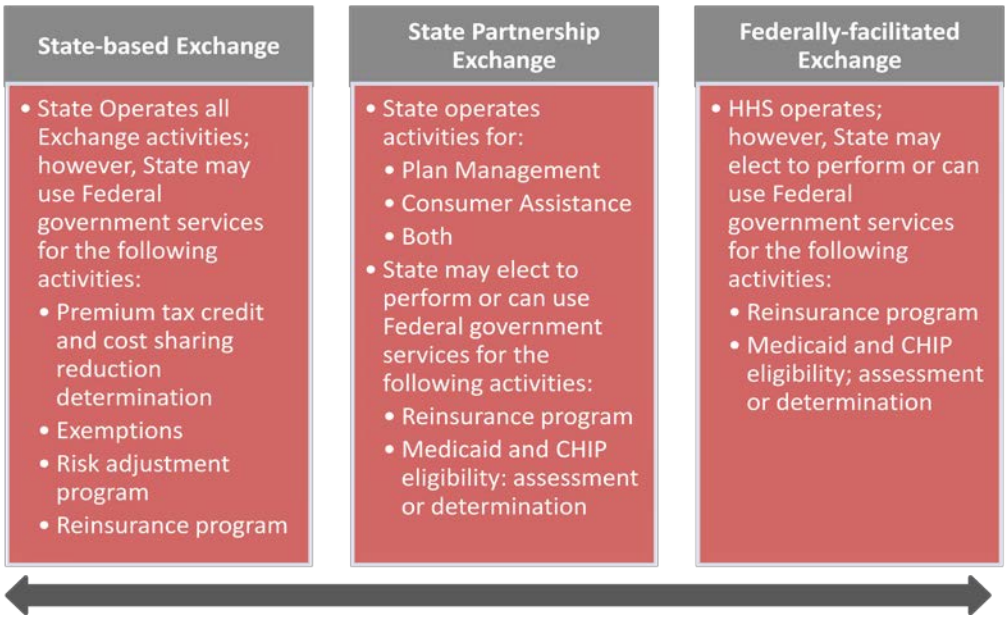

Figure 12: Exchange Options for States

Recommendation:

Rather than develop an SBE, Alaska has decided to participate in either an SPE or the FFE to comply with the federal law by 2014. Alaska will need to choose between the SPE and the FFE and plan for implementation. In addition, the current direction of CMS is that the FFE will be a temporary measure, requiring the state to have their own exchange in the future. Alaska will need to develop a strategy for future deployment of a state-run exchange.

Cognosante recommends the following new initiatives to support the transformation:

- Alaska needs to understand the differences in the functionality and capabilities between the FFE and SPE.
- If the SPE is selected, Alaska will still have the option to migrate over time to a full State Based Exchange (SBE). Alaska needs to examine this option if economically feasible.
- Alaska needs to understand the data interface requirements for connecting with the FFE or SPE. This includes integrating the Federal Exchange option with Alaska Medicaid/CHIP program to support a “seamless eligibility” determination, the Federal Data Hub, and interfacing with commercial issuers.

- It will be important to leverage standards-based interoperability where possible. Plan and encourage real-time transaction exchange as opposed to current batch processes.

Participating in the FFE will require some part of Alaska's Medicaid data be available to the FFE for Medicaid coverage, and the state may need to work with private insurance carriers to develop a connection for Alaska citizen coverage. Alaska may need to make other decisions and participate in additional development initiatives. This planning should begin immediately to ensure Alaska is prepared for the implementation of this portion of the ACA in a timely manner.

Because the current direction of CMS is that the FFE will be a temporary measure, states will need to have their own exchange in the future. If federal grant money to assist is desired, Alaska will need to apply for funding before October 14, 2014 as the final grant funds will be awarded December 31, 2014. Funds can be used for 3 years or until after the first year of operations, whichever comes first.

4.2.2.6.2 Health Plan Identifier (HPID) and Other Entity Identifier (OEID)

A proposed rule published by the federal Department of Health and Human Services (HHS) establishes a unique health plan identifier (HPID) under the Health Insurance Portability and Accountability Act of 1996 (HIPAA) standards for electronic health care transactions. The rule also proposes a data element that will serve as an "other entity" identifier (OEID) for entities that are not health plans, health care providers, or individuals, but that need to be identified in standard transactions.

Currently, health plans and other entities that perform health plan functions, such as third party administrators and clearinghouses, are identified in HIPAA standard transactions using multiple proprietary identifiers that differ in length and format. As a result, health care providers run into a number of time-consuming problems, such as

- Misrouting of transactions;
- Rejection of transactions due to insurance identification errors; and
- Difficulty determining patient eligibility.

The HPID and OEID will enable a higher level of automation for provider offices, particularly for processing of billing and insurance-related tasks, eligibility responses from health plans, and remittance advice that describes health care claim payments.

Recommendation:

The ACA mandates utilizing a standard HPID and OEID. HSS expects to issue the final rule on these codes within the next 45 days. Monitor the status of the ruling. Begin planning to initiate a project to remediate the MMIS and other state systems to comply with the ruling.

4.2.2.6.3 Client Portal Project

It is Cognosante's understanding that a Client Portal Project is part of the MMIS Replacement Project. A second Client Portal is being developed by the Indian Health Service (IHS) as part of their telemedicine initiative. This functionality has also been requested in the requirements for the ASP system. Although there are multiple efforts and requests for a Client Portal, this initiative does not seem to have any focus. Having a Client Portal for access by all DHSS clients

goes hand in hand with Electronic Medical Records, and can allow clients the same access to information as providers are given. Some of the functions that can be offered through a client portal include:

- Client demographics
- Family and social history
- Application for services
- Patient history
- Patient consent
- Appointment scheduling
- Viewing current medication list
- Access to lists of allergies, immunizations
- Fast access to relevant lab results
- Insurance coverage and prior claims history
- Analysis tools, such as use of a rules engine to analyze health conditions and give recommendations and goals in plain language for patients to read, calculations of the cost of health care, and suggestions and availability of supportive programs

Because villages in Alaska are so remote, it is difficult to manage people's health. A client portal would give them access to their information on-line and support the IHS initiatives in telemedicine.

Recommendation:

Initiate a project to focus specifically on building and expanding a Client Portal. Consider initiating it as a sub-project of the MMIS Replacement Project or the HIE Project, but call it out, manage it, and monitor it separately to give it focus and priority. If managed as a sub-project of the MMIS, determine how non-Medicaid clients receiving Department services (such as SDS senior grants that are General Fund (GF) supported), will receive portal services. Cognosante recommends that this be provided as a DHSS-wide system, which will require cost allocation across programs.

During the planning, determine the systems that will utilize the Client Portal and prioritize the connection to each system. Also, consider linking the Client Portal to local village nurses or providing on-line chat to provider or MCO organizations for additional levels of functionality and support. All so provide access to clients' Medicaid Personal Health Record through the Client Portal. Some of the Alaska applications that would benefit from utilization of a Client Portal include:

- MMIS (being planned)
- SDS ASP/DS3 (Included in the ASP system requirements request)
- AK COMMS

- AK WIC
- CMS Mainframe Case Mgmt System for TANF
- JOMIS
- ORCA
- RPMS (DPH Patient Clinical Records System)
- EIS system

4.2.2.6.4 WIC/SNAP/TANF Master Provider Index (MPI) Project

Currently, an MPI (referred to as the Provider Client Index, or PCI), is being built as a subset of building the MCI. This index will be used as the Direct project Provider Directory.

Although this initiative is occurring, there does not appear to be focus or planning specifically around the creation and use of an MPI leveraged as a central data store of providers that will meet industry standards and incorporate federal requirements, such as a National Provider Identifier (NPI).

The MultiVue tool supports both the MCI and MPI/PCI indices. This approach requires a longer-term view, because an MCI and MPI have different schemas, connect to different parts of applications, and are objects unto themselves. Different business entities work with providers vs. clients, and have needs that divert from the others.

Note that AK COMMS, a DPH application, indicates that it replaces PCMIS and is also a provider index.

Recommendation:

Initiate a separate project for development of the MPI. Focus on developing it for the Direct project, and then implement for WIC/SNAP/TANF. The MPI should be the provider directory and must use national standards such as the NPI. When message routing is implemented, BizTalk can use this directory to route messages.

Investigate the relationship between AK COMMS and an MPI; reduce duplication if warranted.

4.2.2.6.5 Business Intelligence/Data Warehousing

Initiate a project to implement BI in DHSS, as recommended in Section 4.2.1.8.

4.2.3 Expected Outcomes

Implementation of the recommendations above will provide the following benefits for the State of Alaska:

- Strong oversight and governance of IT acquisition projects
- Greater access by citizens and providers to health care information and services
- Standardized business services, available and accessible through cloud services
- Consolidation of systems

- Elimination of duplicate storage and unnecessary collection of data
- Creation of a state-wide master shared services and data management strategy
- Standardized technology platform, available and accessible through multiple access channels
- Higher level of shared knowledge
- Improved IT service model
- Lower overall system acquisition and support costs

4.2.3.1 Recommended Prioritization, Schedule, and Cost

The schedule below lists DHSS major initiatives, critical federal mandates, and Roadmap proposed new projects. Red arrows indicate suggested timelines for Roadmap proposed projects, or recommended extensions to current DHSS projects.

Calendar Year			2012	2013	2014	2015	2016	2017	2018
Projects		End Date							
HIT Projects	HIE Project	12/31/14							
	Lab Pilot	5/8/13							
	EHR Incentive Program, SLR Phase 1 & 2, & Meaningful Use Stage 1 & 2	12/31/21							
	EIS Medicaid Phase I	1/1/14							
	EIS - Phases 2 - 5	12/31/17							
	Direct (DSM)	12/31/13							
DHSS Enterprise Projects	MMIS Replacement Project	10/1/13							
	Provider Enrollment Portal	12/31/12							
	MCI	5/2/13							
	SDS ASP Project	3/1/15							
	T-CHIC	2/20/15							
	Enterprise Notification Service	8/31/12							
	SPIRIT	12/31/12							
State-wide Projects	Terra Broadband	12/31/13							
	IRIS	3/1/15							
Roadmap	Governance Process	12/31/12							
	IT Service Model	12/31/12							
	Client Portal Project	12/31/16							
	Master Provider Index Project	12/31/15							
	HPID and OEID Compliance	TBD							
	Business Intelligence Project	12/31/17							
Federal Mandates	Application Deadline for SBE grant funding	10/14/12							
	Health Insurance Exchange	12/31/13							
	ACA Operating Rules Compliance Certification	12/31/13							
	MMIS 5010	12/31/12							
	MMIS ICD-10	10/1/13							
	MITA 3.0	5/30/14							
	HPID and OEID Rule Announced	10/1/12							
	Compliance with Electronic Transaction Standards	4/1/14							

Key: Planned Recommended or Recommended Extension

Figure 13: Roadmap Schedule

The following table provides estimated costs where available for Roadmap initiatives. Cognosante derived cost estimates by researching similar activities in other states. They are provided for ballpark consideration only; exact costs vary widely depending upon the defined scope of the specific initiative.

Table 9: Initiative Cost and Prioritization Table

Topic	Prioritization	Estimated Cost
Governance and Portfolio Management	High	Incremental cost $0; Within division/department budget
Comprehensive Care Management Model	High	Incremental cost $0; Within division/department budget
Business Process and Organizational Reengineering	High	Depends on approach; may be within division/department budget. Added costs would occur if a consultant is engaged or new staff is hired.
Information Technology Support Structure	High	Incremental cost $0; Within division/department budget
Information Security Office	High	May be within department budget unless new staff is hired
Shared Services/SOA	High	See specific initiatives
Data Management	High	See specific initiatives
Leverage Cloud Technologies	High	Benefit-cost ratios range from 5.7 to nearly 25, depending on the cloud deployment model selected, payback in 3-4 years
Enterprise Service Bus (ESB)	Medium	Initial investment ranges from $400k to $1 million; Vendor studies indicate a 55-65% cost savings when the bus is migrated to the Cloud
Telehealth and Telemedicine	High	Continuation of current initiatives
Broadband Communications	High	See http://www.alaska.edu/oit/-bbtaskforce/homepage.html for cost estimates
Master Client Index	High	Continuation of current initiative; cost of expansion will depend on expansion target and plan
Provider Portal	High	Continuation of current initiative; cost of expansion will depend on expansion target and plan
Eligibility Information System (EIS)	High	Alaska has a planned budget for this initiative
Business Rules Engine and Workflow	Medium	Leverages investment in MMIS, EIS or ASP system; incremental cost for expansion beyond initial system depends on initiatives chosen
LIMS and Electronic Lab Reporting	High	No data was available to estimate consolidation of the two systems in Anchorage and Juneau
Pharmacy Software and eMAR	High	Estimate for an eMAR $200k - $1 million (eMARs are often components of Pharmacy Systems; consider purchasing a pharmacy system with an eMAR rather than a separate eMAR); Purchase

Topic	Prioritization	Estimated Cost
		costs for a pharmacy system vary widely
Electronic Medical Records	High	Depends on the approach; other states with a similar population to Alaska have spent up to $10 million
Case Management Systems	Medium	Varies, depending on system and approach
Electronic Document Management (EDMS)	Low	Up to $5 million, depending on approach selected
State Level Registry	High	Within budgeted project cost
GIS Systems	Low	Leverages existing investment; cost of expansion will depend on expansion target and plan
Enterprise Notification Service	Medium	Leverages existing investment; cost of expansion will depend on expansion target and plan
Direct Secure Messaging	High	Leverages existing investment; cost of expansion will depend on expansion target and plan
Grants Management	Medium	$500k
Quality Assurance Systems	Low	Leverages existing investment; cost of expansion will depend on expansion target and plan
Licensing and Certification Functionality	Low	Leverage functionality in the SDS ASP system; there would be little or no incremental cost for adding divisions
Health Insurance Exchange (HIX)	High	To develop a state exchange, states of similar size have spent up to $70 million. Data for costs for participating in the FFE are not available.
Client Portal	High	The state will have a client portal as part of the MMIS; cost for expansion will depend on number and type of expansions
Master Provider Index	High	Continuation of current initiative; other similar sized states have spent between $1 – 2 million on this effort
Business Intelligence vs. Data Warehouse	Medium	$500k - $1.5 million for BI; enterprise data warehouses can cost upward of $30 million

5 CHALLENGES

This section will include a discussion of the challenges faced, and recommendations to address the challenges.

5.1 Future State Challenges

Table 10: Implementation Challenges and Recommendations

Type	Challenge	Current Strategies	Suggested Additional Strategies
Deadlines	The ACA has established deadlines for specific actions, with little or no flexibility in these dates. ICD-10 compliance is looming, although states are awaiting publication of the final rule to extend the date one year to October 1, 2014 after industry concerns over system readiness.	Alaska is on track to meet ICD-10 and 5010 compliance.	Utilize the knowledge and expertise of the Governance Committee to monitor federally mandated requirements and due dates. Implement robust planning to allow Alaska to meet them. Continually monitor for potential deadline extensions. Establish frequent and collaborative communication channels with federal partners.
Differing Practices and Policies	The practice of decentralized systems, data stores, and practices is part of the culture of the organization and may be difficult to change.	Most current initiatives are focused on a specific program without collaboration or centralization with additional programs.	Centralize decision making with the Governance Committee; instruct them to make decisions based on the needs of the whole department, weighing in the decentralized business needs.
Logistics	Distance of Alaska from the mainland US raises costs for outsourcing and execution of projects	Alaska is aware that the distance has an impact on cost and considers this in cost estimates; they also give preference to local sources when possible.	Continue to ensure budgeting considers this in cost estimates and utilize local businesses where possible. Utilize Cloud services to decrease overall cost.
Logistics	Vast expanses in Alaska make availability of a fast broadband network and access to services difficult	Alaska has made significant investments in broadband technology and is a leader in the nation in telehealth and telemedicine.	Investigate and address broadband latency issues; continue to leverage telehealth and telemedicine technology. Investigate DOD telemedicine efforts to see if there is an opportunity to collaborate.
Meeting MITA and CMS Standards and Conditions	In order to receive Enhanced Federal Funding for future Medicaid systems, CMS requires a MITA 3.0 SSA and that all funded systems meet CMS	Alaska plans activities based upon past evaluations to ensure continued MITA maturity.	1) Each future IT project to address MITA functionality using the MITA 3.0 framework. APDs to identify functionality and technology using the MITA 3.0 TO BE targets and the roadmap in order to maximize federal funding.

Type	Challenge	Current Strategies	Suggested Additional Strategies
	Seven Conditions and Standards.		[CMS required for funding] 2) Consider expanding the MITA 3.0 framework to cover other Alaska non Medicaid business functions to support an enterprise wide architecture at three levels: Business Function, Information, Technology.
Multiple Competing Priorities	Multiple active projects may limit the availability of state leadership, technical and business staff for additional initiatives	The HIT project has a governance committee that oversees the HIT portfolio of projects.	Governance Committee review of initiatives must consider staffing, availability of executives for oversight, and cost during evaluation of initiatives.
State Resources	Staffing constraints and limited budgets make it difficult for DHSS to take on new projects with large scopes of work.	Alaska is currently operating with limited staffing positions, very limited resource availability of existing staff, and limited funding.	1) Utilize the recommendations in this Roadmap to improve efficiency by doing more with less. Examples include sharing services and reviewing processes for efficiency gains, outsourcing system development, and utilizing Cloud technologies. 2) Check into additional federal funding initiatives, such as the State Innovation Models initiative, which is a $275 million competitive funding opportunity for States to design and test multi-payer payment and delivery models that deliver high-quality health care and improve health system performance.
Security and Privacy	The challenges presented by information security and protecting citizen's privacy limit the ability to implement changes	Security and privacy issues are currently managed by a small number of IT staff.	Manage security risks and privacy issues proactively and in a focused manner by creating an organization within DHSS whose singular responsibility is managing all aspects of security and privacy.
Vendor Resources	The health care industry is going through a period of significant change. Alaska is one of many states working on procuring and implementing new systems. This could stretch the resources of the current vendor pool.	Current RFP releases have not considered the vendor resource pool.	Maintain strong communication with a network of vendors who supply the services that will be needed by Alaska. Communicate frequently with federal partners, who are plugged in to the vendor community and can recommend the best time to solicit for services for availability of a pool of qualified resources.

6 ASSUMPTIONS

6.1 Enterprise Technology Roadmap Assumptions

Cognosante developed this document with the following assumptions:

- This work is not designed to be a complete Information Technology Strategic Plan, but may be used to inform the development of such a plan.
- The scope of work in this document may inform a future MITA 3.0 Technical State Self Assessment (SS-A) but does not take the place of the SS-A.
- The recommendations in this Roadmap are designed to be suggestions that build on the existing Alaska infrastructure. Choosing which recommendations to accept and act upon remains the responsibility of the State.
- Staffs from divisions that are not directly involved with health care data were interviewed for information regarding supporting systems, but systems not directly in support of collecting and disseminating client data were out of scope of this body of work.

APPENDIX A – REFERENCE MATERIAL

The following information was leveraged to perform the analysis.

- 2006 FEA Practice Guidance of US OMB . (2012, July 26). *Enterprise Architecture*. Retrieved July 27, 2012, from Wikipedia: http://en.wikipedia.org/wiki/Enterprise_architecture
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APPENDIX B – DETAIL OF CURRENT DHSS SYSTEMS ENVIRONMENT

DHSS DEPARTMENT-LEVEL SYSTEMS AND INITIATIVES

Division	Division Acronym	Applications	Projects	Registries / Other
Department of Health and Social Services (Department wide)	DHSS	2	4	0

DHSS Application Information:

- ***BizTalk***, an application that provides an integration and connectivity server solution. BizTalk is the main service component for MCI Server; it provides the interface for MCI and allows ORCA, JOMIS, etc to share data; 10 Source systems connect through BizTalk.
- ***National Health Information Network (NHIN) Direct*** is a direct secure messaging system that provides a simple way for physicians and consumers to exchange health information in lieu of implementation of the full-blown Nationwide Health Information Network.

DHSS Project Information:

The projects include three initiatives critical to the State of Alaska:

- ***Master Client Index (MCI)*** a central repository for information relating to state citizens who receive services from the Department. The MCI started with four core systems being initially bulk loaded, matched and merged to produce a composite view of a person across all the participating source systems.
- ***Master Provider Index (MPI),*** a central repository for information relating to providers who provide services for DHSS participants.
- ***Health Information Exchange (HIE),*** a project to implement the Alaska Heath Information Exchange, which includes the HIT Pilot to send structured lab results electronically
- ***State Level Registry (SLR) Electronic Health Record (EHR) Incentives Program,*** the attestation system for EHR Incentive Program

ALASKA PIONEER HOMES (APH)

Division	Division Acronym	Applications	Projects	Registries / Other
Alaska Pioneer Homes	APH	10	3	0

APH Application Information:

- ***ACCU-CARE Clinical Product***, the APH medical records program
- ***Prodigy Data Systems & Proscript*** is a pharmacy system that catalogs medications and provides medication management.

In addition to the major applications, APH has the following smaller apps:

- Access to Providence Health Care's medical records system for lab test information
- Two medication ordering and inventory systems (one is being decommissioned at the end of July 2012)
- A system for the pharmacies to download medication price information
- A medication bar-code application that won't be operational until an Electronic Medication Administration Record system (eMAR) has been implemented
- A system used by the Fairbanks home to account for resident trust accounts
- A system that manages Medicaid Part B accreditation
- An incident reporting system

APH Project Information:

- ***Electronic Medical Records (EMR) Replacement Project*** to implement electronic health records, which includes an electronic Medication Administration Record (eMAR) implementation.

The survey also lists a separate eMAR project, which actually may be a subset of the EMR project; business contacts were not certain whether there was duplication between the two.

OFFICE OF THE COMMISSIONER (COM)

Division	Division Acronym	Applications	Projects	Registries / Other
Office of the Commissioner	COM	1	0	0

COM Application Information:

There is only one small application, Media Contact, assigned to the COM division.

DIVISION OF BEHAVIORAL HEALTH (DBH)

Division	Division Acronym	Applications	Projects	Registries / Other
Division of Behavioral Health	DBH	7	3	0

DBH Application Information:

The DBH applications include two major systems, listed below:

- ***Alaska Automated Information Management System (AKAIMS)*** is a free state-government administered web-based management information system and clinical documentation tool for the state's behavioral health grantee providers.
- ***Meditech Healthcare Information System (MHIS)*** is a system for patient health care records.

DBH also has five minor systems for credentialing, reports of contact, a database for designated evaluations and treatment, an ID card system, and a portal for promotion of suicide prevention.

DBH Project Information:

DBH active projects include a replacement project for AKAIMS and two projects for enhancements to MHIS for disaster recovery and scanning/archiving.

DIVISION OF JUVENILE JUSTICE (DJJ)

Division	Division Acronym	Applications	Projects	Registries / Other
Division of Juvenile Justice	DJJ	2	2	0

DJJ Application Information:

The two DJJ applications are both considered major for the division:

- ***Juvenile Offender Management Information System (JOMIS)*** is a statewide repository used to record referrals for juvenile criminal behavior and the Department's actions and services in response to referrals.
- ***Youth Offender Database Application (YODA)*** which tracks individuals' progress through state youth courts.

DJJ Project Information:

The DJJ projects include an enhancement to JOMIS for incident report tracking, and the following major project:

- ***APSIN <> JOMIS identifier exchange*** which is a project to review JOMIS and APSIN person records for possible matches, confirm whether matches exist, and provide an on-going process to bring into JOMIS the APSIN number for matches it finds. This project has potential to leverage the MCI database.

DIVISION OF PUBLIC ASSISTANCE (DPA)

Division	Division Acronym	Applications	Projects	Registries / Other
Division of Public Assistance	DPA	10	5	1

DPA Application Information:

The major DPA applications include:

- ***Eligibility Information System (EIS)*** replacement project; a project to replace the legacy EIS. This is a brand-new project that is just getting started in 2012.
- ***Case Management System (CMS)*** is the Case Management System for the Division of Public Assistance (DPA) used to monitor the work requirement for TANF and provide Federal TANF reports.
- ***Women, Infants and Children's (WIC) Program Case Management System (AKWIC)*** is the case management and payment system for the Alaska WIC program.
- ***Integrated Child Care Information System (ICCIS)*** is the data system used by the Child Care Assistance Program to conduct family and childcare provider eligibility actions, conduct and manage childcare provider licensing actions, and verify childcare assistance payments to providers.

In addition to the major applications, DPA has the following smaller applications:

- A case review system used by DPA for quality assurance
- Three small systems used in support of the EIS system, including one used by the Helpdesk to review EIS production data, one for caseload reporting, and another for scheduling work requests
- A food stamp calculator used by staff and the public to determine if someone is eligible for food stamps
- A Work Request tracking system and an appointment scheduler used to schedule client interviews and share workload across DPA offices.

DPA Project Information:

DPA has multiple major projects in the works, including

- EIS Replacement Project to replace the aging legacy eligibility system.
- Appointment Scheduler Replacement, to replace the Division's appointment scheduling system called Appointment Plus. This project is urgent because the contract for Appointment Plus expires at the end of 2012.
- Fraud Case Management System Replacement to replace the existing legacy Fraud Case Management system that was implemented in 1999.
- ***SPIRIT: WIC Replacement Project,*** to replace AKWIC, which is an aging legacy system.

In addition to these major projects, DPA has a project in progress to evaluate EIS replacement alternatives.

DIVISION OF PUBLIC HEALTH (DPH)

Division	Division Acronym	Applications	Projects	Registries / Other
Division of Public Health	DPH	41	16	9

DPH has more than twice as many applications as any other DHSS division, including several public health monitoring and population health protection systems that encompass disease tracking, bio-surveillance and epidemiological investigations, and immunization monitoring.

DPH is a candidate for careful evaluation and potential consolidation of systems. In addition, DPH frequently utilizes the cloud computing technology referred to as SaaS, which provides them with cost-effective, speedy implementations of applications specific to program needs.

DPH Application Information:

Following is a sampling of the major applications utilized by DPH:

- ***AK COMMS*** is a web-based tool that has been developed by the Emergency Medical Services Unit for emergency communications that will also serve as a provider index for Public Health. In the future, it is envisioned that this tool could be used to provide access to the public to find services and contact information and provide a linkage between primary care agencies and facilities across the state to work in a more coordinated manner.
- ***AK Respond*** is a system to register licensed health care providers.
- ***AK-STARS*** is a tuberculosis case management tool and a tool for epidemiology disease reporting for conditions notifiable to Public Health. Tuberculosis is a program area module. Another module of AK STARS contains electronic lab results from national and local testing laboratories.
- **Indicator-Based Information System (IBIS)** is a web-based system containing health information and indicators to provide public access to public health information.
- ***Laboratory Information Management System (LIMS)*** is Public Health's system to track and report on disease testing and results for the DHSS Labs
- ***Lightspeed***, the legacy registration system for all vital records for the State of Alaska; used to issue certified copies of vital records
- ***Primary Care Management Information System (PCMIS)*** has been the provider index for Public Health; it is a database that contains critical information managed by the Alaska Primary Care Office and other programs within DHSS. The PCMIS also supports the Directory of Health Care Sites in Alaska as well as data describing services and staffing that is used to identify various primary care organizations and roles. This application is being phased out with the implementation of AK COMMS.

- ***QS1 Pharmacy*** is an application used for prescriptions for Epidemiology.
- ***Resource and Patient Management System (RPMS)*** is a decentralized automated information system for patient clinical records administered by the U.S. Indian Health Service (IHS) that includes clinical, business practice, and administrative information management applications and is in use in most health care facilities within the IHS delivery system.
- ***SAGE / SelfImmAGE*** is an application used to track immunization compliance for children in public schools and day care.
- ***SMEO Alaska: State Medical Examiner's Office Alaska Case Management System*** is the system for tracking death investigations.
- ***VacTrAK Vaccine Management*** system is a consolidated immunization information system that has been developed in states over several years. It now includes about 3.9 million immunizations and is in the last stages of testing to be able to include immunizations from Public Health Nurses using RPMS.

In addition to the above major applications and the registries listed below, DPH has several surveillance and data capture systems, including:

- Two systems for AIDS/STD reporting, one specifically for grant-related AIDS/STD activities
- Behavioral Risk Factor surveillance
- Child Abuse and Neglect Surveillance
- Firearm injury reporting
- Health and early childhood behavioral experience survey
- Hospital discharge data
- Lead poisoning testing lab reports
- Maternal Infant Mortality Review
- Newborn hearing screening data
- Pregnancy Risk Assessment Monitoring
- Reproductive Health Implant Inventory
- Tuberculosis Surveillance System

DPH also has several miscellaneous systems, including:

- Immunization program field operations site visit management tool for VFC/AFIX, Prenatal Hepatitis B, School and Childcare compliance
- Breast and Cervical Health Check screening services system
- Bionumerics system for statistical evaluation
- Application for assessing immunization practices within a clinic or anywhere immunizations are given

- Individual EMS certification system
- Connection to a nationwide Vital Statistics verification system
- Immunization materials request system
- Web-based GIS system to map health data
- Laboratory results system to send Public Health results to the CDC
- Utility application to download and report on results from RPMS
- Connection to Oregon Public Health Lab's newborn screening lab result system
- HIV/STD management system
- Two vaccine ordering systems (one is being phased out)

DPH Registries:

The collection of DPH registries includes the Alaska Violent Death Registry, Alaska Birth Defects Registry, Alaska Trauma Registry, Chronic Disease Surveillance registries for Hospital Discharge Data (HDDB) and Medicaid, Obesity Surveillance registries from RPMS and WIC, Fatality Assessment and Control, and the Cancer Registry.

DPH Project Information:

DPH has several major projects taking place, including:

- ***BioSense 2.0 Syndromic Surveillance*** is a project for HIT-MU to build state, local, tribal and territorial surveillance capacity to enhance regional and national all-hazards public health situation awareness.
- ***Emergency Medical Services Web-Based Certification (EMS)*** is a project to implement a system to track, test, and verify emergency medical personnel certifications
- ***Electronic Vital Records Registration System (EVRS)*** is a large project to implement a system for all vital records (birth, death, adoption, marriage, medical marijuana registry), replacing the legacy vital records system, Lightspeed
- ***Indicator-Based Information System (IBIS) Upgrade*** - Phase I – a project to add content and move toward public access for IBIS, which is a web-based health information and indicators system
- ***Tri-State Child Health Improvement Collaborative (T-CHIC)*** is a CMS CHIPRA funded project to improve quality of children's care (5 year demo project with WV and OR)

The smaller DPH projects include:

- ***Alaska Birth Defects Replacement Project (ABDR)*** is a project to replace the Alaska Birth Defects Registry
- ***Laboratory Information Management System (LIMS) Upgrade*** from Horizon 10.2 to Horizon 11 for HIT-MU

- ***NMS Integration with SMEO Case Management*** is a project to add a software component for integration with NMS for the automatic exchange of toxicology results to the State Medical Examiner's Office Case Management system
- ***Women, Children's, and Family Health (WCFH) Medical Home Care Coordination Measurement Tool*** is a project to develop an electronic measurement tool. This effort was planned as a first year activity for a three year federally funded project to support the pilot of care coordination for children and youth with special health care needs within a medical home setting.

Following are unfunded projects that DPH would like to undertake:

- ***Audit Assessment System (AUAS) Upgrade*** is a project to rewrite the existing AUAS application to current standards. This project involves creation of an updated application and a migration utility to carry data forward.
- ***WCFH Specialty Clinics EHR*** is a project to implement a Specialty Clinics Case management and scheduling application for newborn metabolic and congenital disorders, autism screening, newborn hearing screening to replace the current MS Access Specialty Clinics database.
- ***Emergency Medical Services (EMS) Ambulance Certifications*** is a project to create an ambulance certification database that will allow EMS organizations to submit information on their ambulances; system includes certification services, recertifying, input requests for expanded scope of practice, specific information for BLS or ACLS, tracking medical directors for organizations.
- ***STD MIS Replacement Patient Reporting Investigation and Surveillance Manager (PRISM)*** is a project for implementation of a replacement application for STDMIS and replacement of the STD function of AK STARS, probably PRISM. This system will be used to report STD reportable conditions to the CDC, and has fields for case management/ investigation. Florida is giving PRISM to AK. Florida will help do the implementation, but data needs to be extracted from AK STARS, which is a large and expensive undertaking that Florida cannot do, therefore requires funding. This project is #2 in priority for PH.

There are also two DPH projects in the SharePoint application database that have been cancelled.

FINANCE AND MANAGEMENT SERVICES (FMS)

Division	Division Acronym	Applications	Projects	Registries / Other
Finance and Management Services	FMS	2	2	1

FMS Application Information:

- ***Budget Expenditures and Revenue Reporting System*** (BEARRS) is an application that was developed to streamline the production of monthly budget projections for the Department of Health and Social Services, Finance and Management Services, Budget section

- ***eGrants*** is an internal grant management system

FMS Project Information:

- ***Electronic Document Management System (EDMS)*** is a pilot project to implement a system to electronically store and access documents. This pilot project is not currently part of any other existing project.
- ***Integrated Resource Information System (IRIS)*** is a project to replace AKSAS, which is the state's accounting system

In addition, FMS has a registry of active and inactive grants.

HEALTH CARE SERVICES (HCS)

Division	Division Acronym	Applications	Projects	Registries / Other
Health Care Services	HCS	6	5	1

HCS Application Information:

- ***Alaska Background Check System (ABCS)*** is used to verify background checks of people working in state funded health care facilities
- ***Certification and Licensing System*** Used to track Provider License and Certification Status. This is actually an Excel spreadsheet, rather than an actual application. Automation of certification and licensing is planned as part of the SDS ASP and Provider Portal project.
- ***Medicaid Management Information Legacy System (MMIS),*** implemented in 1988 to automate the processing of Medicaid claims from providers. This system will be decommissioned when the new MMIS is implemented.
- ***Services Tracking Analysis and Reporting System (STARS),*** the decision support system (DSS) for the legacy MMIS. This system will sunset when the new MMIS is implemented.

HCS also has two small systems, one to collect and display information about Certificate of Need applications and another to create encounters for the behavioral health and dental pay for service claims and calculate the encounter settlements.

HCS Project Information:

- ***Alaska Background Check System Replacement (ABCS2)*** is a project to make updates to the system that is used to verify background checks of people working in state-funded health care facilities.
    - ***LiveScan Electronic Finger Printing*** is a project to implement LiveScan equipment for the capture and processing of fingerprints for checking criminal backgrounds. This is a sub-project of the ABCS2 project.

- ***Medicaid Management Information System (MMIS) Portfolio of Projects:***
  - ***Replacement Project*** Alaska's MMIS was implemented more than 20 years ago in 1987, and now new technology and federal requirements dictate the construction of a new automated claims processing system. In September 2007 the department awarded a contract to Affiliated Computer Services (ACS) for a new MMIS. The contract includes: design, development and implementation of a new claims payment system; a claims data warehouse information system; and operations of the new system for five years. The new MMIS, known as Alaska Medicaid Health Enterprise, is scheduled to be implemented in spring 2013.
  - ***MMIS 5010***; the purpose of this project is to comply with federal standards for electronic health interactions with the provider community (HIPPA 2), which establishes standardized formats for exchange of data between computer systems.
  - ***MMIS ICD-10*** project is to modify the Alaska MMIS and its supporting data systems and enabling processes (translator operations, system operations, administrative support, and other functions) to meet the Version 5010, National Council for Prescription Drug Programs (NCPDP) D.0, and ICD-10 standards.
  - ***Provider Enrollment Portal*** is a project for enrollment and reenrollment of MMIS Providers via a web portal to validate existing legacy data and capture new provider data for MMIS DDI replacement project (Enterprise). The provider portal is live; version 2 scheduled for Aug 2012. It is currently implemented as a stand-alone database that gets pulled into MMIS.

OFFICE OF CHILDREN'S SERVICES (OCS)

Division	Division Acronym	Applications	Projects	Registries / Other
Office of Children's Services	OCS	7	1	0

OCS Application Information:

- ***Adopt Exchange*** is a public web site that allows people to view information about children awaiting adoption and request more information about said children
- ***Bed Count*** collects number of beds available at residential care for children & youth facilities and displays the information on a public website.
- ***Interstate Compact on the Placement of Children (ICPC) Automated Reporting and Tracking System Database*** is used to track ICPC out of home placements, non-custody adoptions, and approvals
- ***Infant Learning Program (ILP)*** Case management system and tools to track for children with development delays
- ***OCS Out of State Residential Psychiatric Treatment Centers (RPTC) Database*** is a MS/Access database used to track OCS & DJJ youth placed in out of state treatment facilities and their associated costs.

- ***Online Resource for the Children of Alaska (ORCA)*** is a children's services case management system.
- ***Quickbooks*** is used for resident accounts receivable to track benefits received, cost of care and other financial information

OCS Project Information:

OCS currently has just one active project, but a critical one that should be leveraged across the department:

- ***ENS***, a project to create a notifications enterprise service, potentially using the BizTalk server, to provide interfaces between divisional applications and notification clients and servers. Department systems like ORCA need to be able to send notification documents to email servers and external printers, with robust logging and tracking. It is anticipated that multiple internal systems will have this need, and ORCA, in particular, currently is designing a tightly time-boxed, court-ordered notifications framework that has a printer interface requirement. A central enterprise service that manages document workflows for multiple systems potentially precludes each in-house application from having to host its own interfaces for notifications to external clients, reducing development and maintenance costs to the department.

SENIOR AND DISABILITIES SERVICES (SDS)

Division	Division Acronym	Applications	Projects	Registries / Other
Senior and Disabilities Services	SDS	4	1	2

SDS Application Information:

- ***Case Review – SDS*** is a case review system for Corrective Action Plan (CAP) reporting to feds.
- ***Cost Sheet Interface (COSI)***: is a system used to manage information about nursing home residents and communicate it to MMIS. SDS will decommission this system upon implementation of the SDS ASP and Provider Portal system.
- ***Division of Senior and Disabilities Services Data System (DSDS) Data System (DS3)*** is used to manage the multiple programs that DSDS oversees, including Medicaid programs, Adult Protective Services investigations, state-funded general relief programs, and other grant-funded programs that fall outside the scope of Medicaid.
- ***Social Assistance Management System (SAMS)*** manages performance of grants awards and is used to produce an annual Federal report which documents Title III and other matching services (Transportation, Family Caregiver, Case Management, Legal, etc.)

SDS Project Information:

- ***Automated Service Plan and Provider Portal (ASP)*** is a project to implement a web-based Automated Service Plan (ASP) management system for DSDS functions and provide access to a Provider Portal.

SDS Other Applications:

SDS has two other small applications, a spreadsheet used for mortality review reporting, and a screening tool called PASRR that is used for pre-admission screening and resident review.

SYSTEMS FOR USE BY HEALTH CARE PROVIDERS

The assortment of digital applications available in use by health care providers and organizations includes EHRs, Personal Health Records (PHRs), Electronic Medical Records (EMRs), Computerized Physician Order Entry (CPOE) systems, HIE systems, and Telehealth systems such as teleradiology, telebehavioral health, and telepharmacy. Distance learning systems utilizing videoconferencing equipment are also emerging as cost-effective ways to improve health care quality outcomes. Interoperable HIT systems built with these fundamental components can be utilized to enhance patient safety and continuity of care by streamlining access to critical health care information by both clinicians and consumers alike.

APPENDIX C – ACRONYMS

The following acronyms are used throughout this document:

Acronym	Definition
ABCS2	Alaska Background Check System Upgrade Project
ACA	Affordable Care Act
ACCU-CARE	Alaska Pioneer Homes medical records program
ACS	Accountable Care Organizations
ACS	Affiliated Computer Services, now Xerox/ACS
AeHN	Alaska eHealth Network
AEHRA	Alaska Electronic Health Record Alliance
AK	Alaska
AK COMMS	Alaska Emergency Communications System
AKAIMS	Alaska Automated Information Management System
AKPAY	Alaska Payroll System
AKSAS	Alaska State Accounting System
AKWIC	Alaska WIC system
APH	Alaska Pioneer Homes
APSIN	Alaska Public Safety Information Network
ARRA	American Recovery and Reinvestment Act
ASP	Automated Service Plan
BCHC	Breast and Cervical Health Check
BI	Business Intelligence
BPR	Business Process Reengineering
CCD	Continuity of Care Document
CCSP	Cisco Certified Security Professional
CDA	Clinical Document Architecture
CDS	Clinical Decision Support
CMS	Centers for Medicare and Medicaid Services
CMS	Case Management System
COM	Office of the Commissioner
COPD	Chronic Obstructive Pulmonary Disease
COTS	Commercial Off-the-Shelf Technology Solutions
CPOE	Computerized Physician Order Entry
DBH	Division of Behavioral Health
DHSS	Department of Health and Social Services
DJJ	Division of Juvenile Justice
DOD	Department of Defense
DPA	Division of Public Assistance
DPH	Division of Public Health
DS3	Division of Senior and Disabilities Services Database System (DSDSDS or DS3)
DSM	Direct Secure Messaging
EBA	Enterprise Business Architecture
EDMS	Electronic Document Management System
EHR	Electronic Health Record
EIA	Enterprise Information Architecture
EIS	Eligibility Information System
eMAR	Electronic Medication Administration Record

Acronym	Definition
EMM	Enterprise Mobility Management
EMR	Electronic Medical Records
EMS	Emergency Medical Services
ENS	Enterprise Notifications Service
ERP	Enterprise Resource Planning
ESA	Enterprise Solutions Architecture
ESB	Enterprise Service Bus
ETA	Enterprise Technical Architecture
ETS	Enterprise Technology Services
FFE	Federally Facilitated Exchange
FMS	Finance and Management Services
FW&A	Fraud Waste and Abuse
GIS	Geographic Information System
HCS	Division of Health Care Services
HDDB	Hospital Discharge Database
HIE	Health Information Exchange
HIPAA	Health Information Portability and Accountability Act
HISP	Health Information Service Provider
HISPC	Health Information Security and Privacy Collaboration
HIT	Health Information Technology
HITECH	Health Information Technology for Economic and Clinical Health
HIX	Health Insurance Exchange
HPID	Health Plan Identifier
HSS	federal agency: Department of Health and Human Services
IaaS	Infrastructure as a Service
IBIS	Indicator-Based Information System
ICCIS	Integrated Child Care Information System
IHS	Indian Health Service
ILP	Infant Learning Program
IRIS	Integrated Resource Information System
ISO	Information Security Office
IT	Information Technology
ITS	Information Technology Services
JOMIS	Juvenile Offender Management Information System
LIMS	Laboratory Information Management System
LOB	Line of Business
MCI	Master Client Index
MCO	Managed Care Organization
MHIS	Meditech Healthcare Information System
MITA	Medicaid Information Technology Architecture
MMIS	Medicaid Management Information System
MPI	Master Provider Index
MS	Microsoft
NHIN	National Health Information Network
NHSIA	National Human Services Interoperability Architecture
NPI	National Provider Identifier
OCR	Office of Civil Rights
OCS	Office of Children's Services

Acronym	Definition
OEID	Other Entity Identifier
OLAP	Online Analytical Processing
ONC	Office of the National Coordinator
ORCA	Online Resource for the Children of Alaska
PaaS	Platform as a Service
PCI	Provider Client Index
PCMIS	Primary Care Management Information System
PFD	Permanent Fund Dividend
PHI	Protected Health Information
PHR	Personal Health Record
PII	Personally Identifiable Information
QA	Quality Assurance
RFP	Request for Proposal
RHIO	Alaska Regional Health Information Organization
RPMS	Resource and Patient Management System
RUS	Rural Utilities Services
SaaS	Software as a Service
SAMS	Social Assistance Management System
SDS	Senior and Disabilities Services
SLR	State Level Registry
SMEO	State Medical Examiner's Office
SMHP	State Medicaid Health Information Technology Plan
SNAP	Supplementation Nutrition Assistance Program
SOA	Service Oriented Architecture
STARS	Services Tracking Analysis and Reporting System
TANF	Temporary Assistance for Needy Families
TBHS	Tele-Behavioral Health Care Services
TERRA	Terrestrial Broadband Internet Service in Alaska (definition of letters in acronym not available)
TIMS	Tuberculosis Information Management System
WIC	Women, Infants, and Children
YODA	Youth Offender Database Application

APPENDIX D – GLOSSARY OF TERMS

Term	Definition
Business Architecture	The Object Management Group's *Business Architecture Working Group* defines Business Architecture as, "A blueprint of the enterprise that provides a common understanding of the organization and is used to align strategic objectives and tactical demands." [7]
Clinical Document Architecture (CDA)	The HL7 Clinical Document Architecture (CDA) is an XML-based markup standard intended to specify the encoding, structure and semantics of clinical documents for exchange.[8]
Information Architecture	Wikipedia defines Information Architecture as "The structural design of shared information environments".[9] It involves performing master data management, developing standards, and defining and sharing business services. This is the layer of the framework that focuses on fully integrating information by streamlining business processes, providing secure and reliable access to information, and optimizing and sharing data.
Infrastructure as a Service (IaaS)	Infrastructure as a Service (IaaS) is the most basic cloud service model where providers offer physical and virtual computers and other resources. This model leads to the ability to scale to support a large numbers of virtual machines. Other resources in IaaS clouds include images in a virtual machine image library, raw (block) and file-based storage, firewalls, load balancers, IP addresses, virtual local area networks (VLANs), and software bundles.
Middleware	Computer software that provides services to software applications beyond those available from the operating system… Middleware makes it easier for software developers to perform communication and input/output, so they can focus on the specific purpose of their application. [10]
Platform as a Service (PaaS)	Platform as a Service (PaaS) is a category of cloud computing services where the provider provides the networks, servers and storage, and the consumer creates the software using tools and libraries from the provider. The consumer also controls software deployment and configuration settings.
Service Architecture	This level of the architecture framework focuses on developing a comprehensive set of service-oriented solutions and applications to meet State's business needs
Software as a Service (SaaS)	Software as a Service (SaaS) is a Cloud service that provides server applications that are delivered as web services that are cheaper and easier to adopt than traditional purchased applications. Given the rapid

[7] (Business Architecture Working Group, 2012)
[8] (Wikipedia Various Authors, 2012)
[9] (Wikipedia Various Authors, 2012)
[10] (Wikipedia Various Authors, 2012)

Term	Definition
	pace of technology development, using SaaS will often provide better value to the state overall.
Technology Architecture	The Technology Architecture represents the technology infrastructure environment that must support the Service Architecture.