Business Case for
Electronic Health Records System

Oregon Department of Corrections (ODOC),
Operations Division, Health Services (HS) Administration Section

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Business Case – Authorizing Signatures

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Executive Summary

The Oregon Department of Corrections (ODOC) provides medical care, behavioral health services, dental care, substance abuse treatment and medications to more than 21,000 patients a year housed in 14 institutions. ODOC also sends patients to hospitals and providers in the community. We track all the data generated by this care in paper charts and by entering rudimentary data into an antiquated offender management system.

Over the last few years and certainly in 2020, ODOC has been challenged in managing critical health care situations such as the seasonal flu, the Salem water crisis, vaccinations, comorbid conditions, complex care coordination, health care access equity and now COVID. We find it virtually impossible to be proactive in these situations as we can't monitor temperature increases system wide, high blood pressure, diabetes or other health indicators to know who our vulnerable population might be because our data is on paper.

We have to teach nurses how to paper chart, and we lose hard to recruit provider applicants when they find out we don't have an Electronic Health Record (EHR) system. 90% of Oregon office-based physicians have adopted EHR's, 80% is the national average[1]. Health IT via an EHR is technology that stores, retrieves, shares, or uses health information, such as diagnoses, medications, allergies, records of doctors' visits, hospital admissions, lab results, and more. Health care providers, health plans, Medicaid coordinated care organizations (CCOs), health systems, hospitals, clinics, public health agencies and other organizations use health IT to manage their businesses and take care of patients. Patients, families, and caregivers use health IT to see their health information, communicate with their providers, and manage health.

The Oregon Health Authority issued a Health IT Report in December 2019 for the legislatively created Oregon Health IT Oversight Council (HITOC) which is an advisory committee for the Oregon Health Advisory Board. This report states that Electronic Health Information Exchange (HIE) in the community is critical. HIE helps providers share clinical data (typically stored in EHR's) for care coordination. It is also a key tool for population health management and addressing the social determinants of health. ODOC is the largest government provider of health care services in the state and has geographically dispersed facilities. By working in partnership with Oregon Health Authority (OHA) to drive HIE onboarding of health providers throughout the state, ODOC's EHR implementation will lead to increased exchange of health information and improved care coordination with community health providers to the benefit of all Oregonians.

Because of the ODOC critical health care situations identified above, the desire to close the "digital divide" with the community and for the benefit of our patients, our community partners and our staff, it's time for ODOC to acquire modern tools and technology to help manage health care for adults in custody.

By conducting a competitive procurement for a Commercial off the shelf system (COTS) or a Software as a Service (SaaS) solution that has been successfully implemented in an environment like ODOC Health Services, ODOC will have the opportunity to choose the best solution from a robust, competitive EHR marketplace. Implementing an EHR will provide many benefits and will support three strategic business objectives:

(1) Provide "Continuity of Care" by ensuring that when changing care setting or providers the information required for medical care is not lost or delayed, including:
- Providing real-time access to medical record to Health Services clinicians regardless of location or care setting.
- Electronically exchanging standard medical data with external partners
- Effectively transitioning care plans to community providers upon release

(2) Enable "Evidence-based Decision Making" to support clinicians in always providing the best-known care for individual AICs and the population overall:
- Real-time reporting for incident response and identification of at-risk AICs and wellness program support.
- Population studies supporting health policy decisions
- Automated best practice and decision support for clinicians to ensure optimal decisions "easy to do the right thing, hard to do the wrong thing"

(3) Operate on a "Modern Technology Platform" that will save time, money, and lives through:
- Sustainable Platform that is easy to maintain and adaptable to changes
- Reducing or eliminating the technology gap between community care and ODOC HS care

[1] Appendix 6 – OHA Report on EHRs and HIEs

- Alignment with enterprise technology strategy and standards

Providing care in a correctional institution is different than community-based care[2]. Differences are discussed in detail in the Opportunity section of this analysis. These differences represent critical considerations for evaluating an EHR solution that might struggle or even hinder uncommon care like some of the more unique aspects of ODOC Health Services. A few of the most critical differences that would certainly impact patient care if unaddressed include:

- Medications are dispensed in "med lines", up to three times per day and in many locations. Hospitals typically dispense medications individually. Clinics do not generally dispense medications, relying on retail pharmacies[3].
- In addition, some medications and other care is mandatory for some AICs and missed meds must be tracked Nearly all care outside of a corrections setting is done with consent and therefore EHRs often don't account for documentation needs of involuntary care[4].
- ODOC does not bill insurance companies and therefore would be severely burdened by charge capture technology included in nearly all EHRs[5].
- Clinical care is complicated by offender management. Custody level, segregation, PREA status, and other restrictions complicate care delivery relative to other outpatient care settings where patient flow starts and ends at the front desk[6].
- Intake of new patients in a corrections environment is a complex, multi-step process that mixes elements of registration, health screening, and assessment[7].

Acquiring a solution while meeting our business outcomes has three alternatives:

1. Assessing and implementing successful EHR solutions already in use at Oregon Youth Authority (OCHIN) and at the Oregon State Hospital (NetSmart) that might be available as a **"shared service"**
2. Assessing **comprehensive EHR solutions** that are widely used at hospitals and clinics in the community and across the country
3. Assessing **corrections specific EHR solutions** modified for Corrections because of the differences in delivering health care noted above, and successfully implemented in Corrections environments across the country.

A preliminary assessment using the three noted alternatives in conjunction with the business objectives, cost and risk are noted in the table below. Each matrix point could result in a high score of 5, the suggested score precedes the 5. The scoring is discussed in detail in the business case.

	Continuity of Care	Evidence-based Decision Making	Modern Technology Platform	Total Projected Cost (Implement + 5 yr M&O)	Investment Risk
Existing/ Shared Service EHR Solution	**Strong Alignment (3.8/5)**	**Superior Alignment (4.5/5)**	**Strong Alignment (4/5)**	**$35,972,325 (4/5)**	**Medium (3.3/5)**
Comprehensive EHR Solution	**Strong Alignment (3.5/5)**	**Superior Alignment (5/5)**	**Superior Alignment (4.2/5)**	**$44,220,327 (3.2/5)**	**Medium (3.8/5)**
Corrections Specific EHR Solution	**Superior Alignment (4.7/5)**	**Superior Alignment (4.7/5)**	**Strong Alignment (3.7/5)**	**$28,562,030 (5/5)**	**Low (5/5)**

While any of the proposed alternatives could be successful, the "Corrections Specific" solutions were determined to be the best alternative. These solutions, generally, include the core functionality provided by the other alternatives, and they have been "right-sized" and "optimized" for health services in a corrections environment. "Right-sized" meaning they do not include functionality that is not needed in a corrections environment but is included in a typical clinic or hospital implementation. "Optimized" meaning functionality and workflows have been designed to support the unique challenges of providing health services in corrections.

[2] See Appendix 7 - ODOC EHR As-Is Analysis
[3] See Appendix 9 - As-Is Diagrams (Medical)
[4] See Appendix 9 - As-Is Diagrams (Medical)
[5] See Appendix 13 - As-Is Diagrams (Core)
[6] See Appendix 13 - As-Is Diagrams (Core)
[7] See Appendix 8 - As-Is Diagrams (Intake)

Exclusively pursuing an existing solution through a shared service contract with a partner State of Oregon agency is not viable because: (1) as implemented the existing solutions lack functionality that is needed by ODOC, (2) procuring an existing system is expected to be costly, and (3) current OYA and OSH contracts cannot be easily adapted to a shared service model with ODOC[8].

ODOC proposes to procure an EHR solution through a competitive procurement that will encourage all vendors with viable solutions to think creatively about how they can support ODOC in achieving the project objectives. It is also the best way to acquire a corrections-specific solution yet would also allow shared service providers and commercial vendors to compete on a level playing field while encouraging them to be innovative in their approach and pricing.

ODOC proposes to fund the EHR Implementation in part by leveraging elements of the current Agency budget supplemented by additional General Fund allocations. The ODOC staffing will be comprised of existing ODOC FTEs and $5 million is being requested for 23.5 additional FTEs, most of which are planned as limited durations positions[9]. The IT Infrastructure will be largely funded through the current operational budget and $3.5million is being requested for additional IT infrastructure costs. Software and related professional services are partially funded by the previously approved $1.5million for planning and $18.4 million is being requested for the design, implementation, and transition to operations[10]. A budget request of $18.4 million will be submitted for the 21-23 biennium to fund the EHR Implementation project through completion.

HIGH-LEVEL TIMELINE BY PHASE, BIENNIUM, TASK, COST

Phase (endorsement received)	Biennium	Description	Total Cost
Concept (Stage Gate 1)	2015-2019 (Funded)	• Business Case – High Level • PM / BA through June 30, 2017	Completed
Initiation & Planning (Stage Gate 2)	2019-2021 (Funded / Supplemental Request)	• Professional Services ($411 thousand) • Data Processing Services • Staffing ($63 thousand) • Facilities Work	$1,500,000 (funded) $474,000 (Supplemental)
Execution (Stage Gate 3)	2021-2023 (Requested)	• Professional Services ($4.9 million) • Data Processing Services ($5 million) • Staffing ($5 million) • Facilities Work/equipment ($3.5 million)	$18,400,000
Monitor & Closeout (Stage Gate 4)	2023-2025 (Planned)	• Professional Services ($800 thousand) • Data Processing Services ($3 million) • Staffing ($877 thousand) • Facilities Work ($200 thousand)	$4,877,000

Summary of key project risks:

- Lack of funding
- Resistance to changing existing business processes to effectively utilize the new software may delay or reduce the realization of planned business benefits
- Over customization of the EHR solution may increase the cost and time to implement and increase maintenance & operations (M&O) complexity.
- Lack of available HS's staff to participate in project work groups may cause project delays and/or result in solution configuration choices that negatively impact operations.
- Changes in policy and/or collective bargaining agreements may affect the implementation schedule
- Lack of availability of key-skilled vendor resources with corrections experience may impact the schedule

Based on best practices and analysis of the risks identified with the project the project team has identified five (5) critical success factors for this project summarized below:

- Establish and follow a strong governance model
- Select a proven solution and experienced implementation vendor
- Provide adequate resources including both financial resource and ODOC staff
- Minimize customization and implement a structured change management process to control scope

[8] See Appendix 5 - Market Scan
[9] See Appendix 3 - Staffing Plan
[10] See Appendix 2 - EHR Solution Analysis Financials

- Make organizational change management a critical part of the implementation solution

Consequences for failure to act are discussed in the Conclusions section below

Purpose and Background

The Oregon Department of Corrections (ODOC), Health Services Division (HS) is seeking to modernize the management of Adults-in-Custody (AIC) health records. With the support of the State of Oregon Senate Bill 843 Workgroup and the 2019 Oregon Health Authority Health IT Report to Oregon's Health IT Oversight Council (HITOC) both of which state the importance and value of an Electronic Health Record (EHR), this ODOC project will procure and implement the first EHR system to address business problems faced by the organization as a result of the primarily paper-based system.

This Business Case analyzes options to directly address that goal. The most viable alternatives are compared, in a standardized way, to support a conclusion for the best path forward. Cost, organizational fit, and other factors are discussed at length for each viable option.

Background

The effort to integrate and modernize the ODOC health care technology platform is a well-documented effort dating as far back as the 1990's, when ODOC first actively engaged in automation efforts, but it was not until the early 2000's that the idea for an integrated EHR system began maturing. A detailed timeline is provided below, which summarizes the efforts over the most recent 15 years.

EHR Procurement History at ODOC and Partner Agencies

October 2004: The Task Force on Managing Mental Illness in Prisons presented its findings and recommendations on electronic medical records (EMR) to ODOC, determining that: "Standardized information technology should be available to all staff, throughout the Department of Corrections. Including automated treatment and behavior plans, computer access for officers on every tier…electronic medical records, access to transfer information, and automated tracking of medication compliance. Standardized access to, and maintenance of, behavior and treatment plans would provide security staff with pertinent information when needed."

May 2005: ODOC initiated the "M-Track Electronic Medical Record Health Services Automation Project," which consisted of a business needs, technical assessment, requirements definition and gap analysis of ODOC with respect to a software platform that tracked and automated electronic medical records.

September 2009: The industry has moved from a medical record focus (EMR) onto broader all-encompassing patient health records EHR. ODOC released a request for information (RFI) for Electronic Health Records Systems to obtain information on how various EHR system solutions might meet the business needs of ODOC requirements.

2009: OSH Replacement Project begins $25M project to implement NetSmart as the EHR across all OHA facilities, including Oregon State Hospital (OSH).

January 2011: A business requirements document for ODOC was created for an EHR system by a selected third-party vendor. The 2011 effort moved to contract execution for implementation; however, the contract was cancelled.

2011: Oregon State Hospital started NetSmart implementation.

June 2013: During the 77th Oregon Legislative Session, Senate Bill 843 was passed and signed into law creating the Work Group on Corrections Health Care Costs. In December 2014, the group concluded its evaluation of the ODOC health care system expenditures and efficiencies. One of the Workgroup's major recommendations was for ODOC to purchase and implement an EHR system to improve clinical operations and increase operational efficiency, and the agency requested and received funding for initial start-up costs. This funding request was carried forward in the Governor's Balanced Budget, which was released December 2014.

January 2015: An agency-wide Readiness Assessment Report was provided by a third-party vendor for the implementation of a Commercial-Off-The-Shelf (COTS) EHR. The readiness assessment was the culmination of a three-phase project plan to prepare ODOC for implementation of a SaaS EHR system.

June 2015: ODOC published its "Business Case for an Electronic Health Records." However, the project did not move out of the business-case stage.

July 2015: ODOC appointed a new Health Services Administrator with experience implementing and administrating EHR systems.

January 2016: ODOC released another request for proposals seeking a team of Business Systems Analysts to completely redevelop the Business Case analysis packet for the HS Steering Committee and ultimate DAS approval.

March 2016: ODOC hired a new Chief Information Officer, with experience of implementing and administrating EHR systems.

2016: Oregon Youth Authority implemented OCHIN's version of Epic (the Epic "Connect Program") through membership of OCHIN. The contract was negotiated through the DAS "Client Services" rules.

January 2017: The Stage Gate 1 Business Case was submitted and approval was received

April 2017: Health Services Administrator left ODOC

September 2017: New Health Services Administrator was hired with BHS EHR experience

2018: OSH implemented the NetSmart EHR pharmacy module, and signed a long-term contract renewal with NetSmart

March 2018: – ODOC Chief Information Officer left ODOC

March 2019: RFP for Project Management Vendor completed

December 2019: Project Management Vendor onboarded

May 2020: Request for information publicly released to ORPIN. 20 vendors submitted responses.

2020: OSH develops a Stage Gate 2 Business Case for the move to the latest version of the NetSmart platform, hosted on the vendor's private cloud. If approved this would require further procurement activity resulting in a new contract

With the current use of an increasingly outdated, paper/electronic patchwork of disparate applications and processes, staff struggle to deliver constitutionally mandated health care services effectively and efficiently to the AIC population throughout the State of Oregon[11]. Furthermore, the technology gap is widening between ODOC and outside health organizations[12].

ODOC, HS provides around-the-clock care to Oregon's adult-in-custody (AIC) population at 14 institutions across the State. This includes medical, dental, behavioral health, substance abuse treatment programs and pharmacy services, with visits to outside hospitals or to see Corrections-specific providers. To ensure this level of care, ODOC employs approximately 600 health care personnel and manages several agreements with health care organizations and contractors in communities throughout Oregon and surrounding states. ODOC HS is headed by an administrative unit in Salem, which sets policy and long-term direction for operational units representing the health care program at each facility.

Toward ODOC's mission, vision, and core values, and in the most efficient and effective ways possible, the department has been dedicated to program and service delivery evaluations and assessments through audits, research, and key performance measures[13]. Over a decade, business and technical issues have been documented on the current paper/electronic health record system that support the need for a new EHR solution to help staff do their work as effectively, efficiently and safely as possible[14]. This includes HS, ITS, and operational support for transports, facilities, and scheduling. As recently as 2014, a report from the Correctional Health Care Costs Task Force (Senate Bill 843-2013) included the "use of electronic health records system" as a primary recommendation to the State's Ways & Means Subcommittee on Public Safety.

Since the 1970s, the Federal courts have interpreted and applied the Eighth Amendment to require states to provide medical care (medical, mental health, dental). In Oregon, the right for health care falls under ORS 423.020 (24) and are outlined in OAR 291-124 outlining "Health Services" rules.

Today, state corrections agencies throughout the country are struggling to manage increasing populations and associated health care issues while maintaining a level of service that meets legal requirements, and Oregon is no exception. The cost of incarceration alone is approximately $100,500 per adult for an average custody of 39 months. Add to increasing population numbers that on a national level, adults entering custody are unhealthy, many on average 10 years beyond their chronological age or in need of geriatric care, and health care services needs becomes more apparent. In Oregon, it was found that between 1995 and 2010 alone, the number of State and

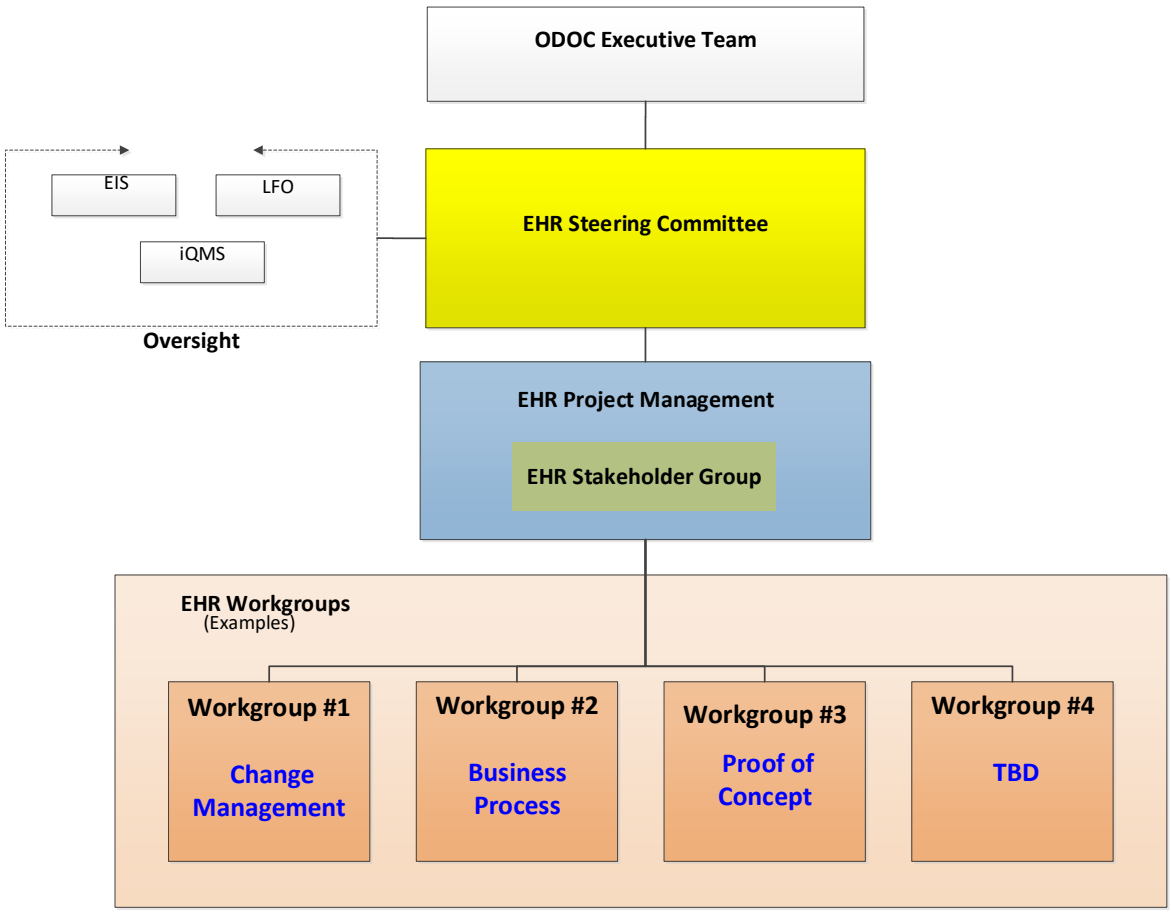
[11] See Appendix 7 - ODOC EHR As-Is Analysis
[12] See Appendix 6 - OHA report on EHRs and HIEs
[13] See https://www.oregon.gov/doc/about/Pages/home.aspx
[14] See Appendix 14 – ODOC EHR Stage Gate 1 Business Case

Federal adults in custody age 55 or older increased by 330 percent, outpacing the national average of 282 percent. Between 2006 and 2012, the diagnosis of chronic medical illnesses and mental illness (hepatitis C, HIV/AIDS, diabetes, respiratory, and cardiovascular) saw an increase in every category, with cardiovascular disease increasing by 24 percent. This represents thousands of patients in the AIC population. With such increases comes the need for increased efficiency in delivering health services.

During the 2020 Market Scan, project team members interviewed representatives from State correctional departments in Ohio, California, Utah and Iowa, all having previously implemented at least one if not multiple EHR systems. Many States noted their EHRs as key enablers to proactive COVID response[15]. Ohio DOC, considered by its peers to have top-performing health services, cited their EHR as a critical success factor in "centralized monitoring for hotspots". One representative went so far as to say Ohio State Corrections "could not survive" the pandemic without the EHR.

Project Governance

The project will be governed consistent with PMBOK best practices. The project's Executive Sponsor serves as Chair for the Steering Committee and is a member of the ODOC Executive Team. A diagram of governance is shown below and discussed in more detail in Appendix 1- Governance Structure:



[15] See Appendix 5 - Market Scan

Problem

The Oregon Department of Corrections (DOC) Health Services provides legally mandated medical, dental, behavioral, mental health, treatment programs and pharmacy services to 21,000+ AIC's that are clients in a 12-month period. These services are provided 24x7 by more than 600 ODOC healthcare service professionals at the 14 housing facilities across the state. Additional hospital and Corrections-specific care are provided by health care organizations in communities throughout Oregon and surrounding states.

Over more than a decade, business and technical challenges/issues have been identified and documented. The identified inadequacies find the current paper/electronic health record in woeful need of replacement with a new fully automated EHR solution to aid staff in doing their work as effectively, efficiently, and safely as possible[16]. This includes HS, ITS, and operational support for transports, facilities, and scheduling.

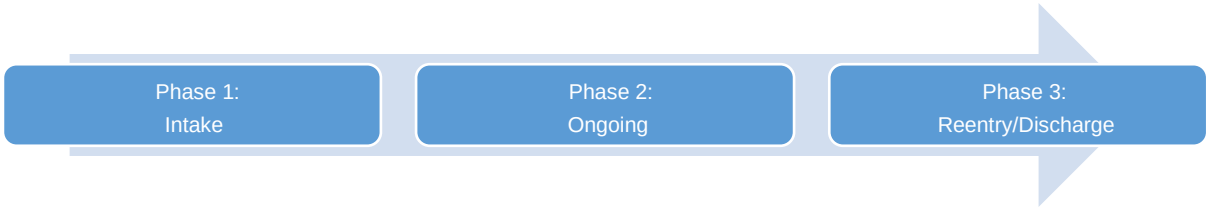
ODOC loses efficiencies and data quality by reporting from information inconsistently tracked and stored outside of a centrally managed system of record. The longer ODOC operates with a paper/electronic based system surrounded by manual processes and supplemental systems ("workarounds"), the more custom development will accrue, making further changes harder in the future (technical debt). Other long-term problems include: ongoing alignment with Oregon Information Resources Enterprise Information Resource Management Strategy; DAS Enterprise Technology Services Strategic Plan; and the Executive Order 7 Unifying Cyber Security in Oregon, in which State agencies must carry out new actions to unify IT security functions.

ODOC's HS current paper/electronic system consists of outdated technology solutions supported by non-integrated applications, paper-based patient health records, and paper-driven workflows. This paper/electronic patchwork of applications and processes does not ensure the quick and efficient sharing of health record data/information, ease of information management and data security, ability to easily audit for fiscal oversight and regulatory compliance, or support advances in technology for informing clinical decisions. An EHR solution could address many major business problems currently faced by all those engaged in the current system, some of which include very broadly:

- Continuity of Care – Intake, Ongoing, Reentry
- Measurement – Evidence-Based Decision Making, Performance Indicators, Compliance and Public Health Partnerships
- IT Modernization – Non-Centralized Data Management Compounded by Technical Debt

With more than 21,000 annual clients and 14,500 of those housed in 14 institutions of the Oregon State Correctional System, and as the largest mental health provider in the State, ODOC HS has the opportunity to interconnect its AIC population with all other State health care centers as well as interconnected health care clinics and infirmaries in its 14 institutions internally.

THREE PHASES OF THE CORRECTIONS-SPECIFIC CONTINUUM OF CARE



Continuity of Care: Intake, Ongoing, Reentry

Effective clinical decision-making relies on unencumbered access to current, authoritative, accurate, clinical patient information that utilizes industry best practices and complies with regulations. An EHR supports better coordinated care by helping providers across different disciplines share clinical data. To coordinate care, a patient's physical, behavioral, and oral health providers must be able to share information. An EHR can provide real-time access to patient information at the point of care, promoting safer and better-informed clinical decisions, especially when it is easily accessible within the clinician's workflow. An EHR also supports referrals, notifications about critical health events, and access. When an AIC is released to the community, Health Exchange Technology can enable the sharing of health information to subsequent providers.

[16] See Appendix 7 - ODOC EHR As-Is Analysis

Measurement: Evidence-Based Decision Making, Performance Indicators, Compliance and Public Health Partnerships

To achieve HS organizational quality objectives requires effectively managing competent and engaged staff in a framework that allows continuous improvements. When health-related information is not readily accessible or available within the current systems, however, this has constraining effects on decision-making, performance, and compliance—not to mention that is harder for ODOC to tie in to external partners (e.g., hospitals, specialists, and other organizations like the Oregon Health Authority).

When compared to modern EHR capabilities[17], the current lack of robust measurement capabilities limits the full effectiveness of HS staff to make informed, up-to-date decisions about patients from the AIC. It is also much more difficult to measure and assess legislative key performance measures (KPMs) and Correctional Outcomes through Research and Engagement (CORE), the latter of which was introduced in 2013 as an effort to improve accountability, performance, and decision-making.

With the current system, the ability to measure and evaluate organizational management targets is time intensive. Offsite medical health care, BHS coordination, AIC blood pressure, diabetes complications monitoring, and so on—all of this requires the ability to efficiently access authoritative AIC health record information. The current system does not easily provide the data granularity required to better correlate health care quality management and reentry processes for recidivism rate improvements.[7] Alignment with analytics in Oregon is also an ongoing effort.

IT Modernization – Non-Centralized Data Management Compounded by Technical Debt

Extra development work can accumulate when easy-to-implement solutions are chosen in the short term instead of applying the best overall solution. This extends to failure to consolidate aging and/or redundant systems. The longer that ODOC operates with a paper/electronic system surrounded by manual processes and supplemental application "workarounds," the larger the gap from modernization and sustainability. Additionally, HS loses workflow efficiencies and data quality by tracking and reporting from information inconsistently tracked and stored outside of a centrally managed system of record. Furthermore, data and system security will continue to be challenging.

- Reducing the technology gap between community care and HS care is a vital component to achieving improved quality of care, fiscal management within the OHA health care transformation objectives and compliance with the standard of care.
- Components used by health services within the Correctional Information System (CIS) do not meet the current business needs and are costly and difficult to expand.
- Supplemental applications outside the scope of ITS make tracking and identifying each file used by HS challenging.
- Effective internal communication among work units and institutions is essential. "Inmate information derived from history and assessment, when used effectively, can decrease incidents of violence, self-harm, disciplinary incidents and staff injuries."

Key Differences of Corrections Care versus Community-based Care

- Medications are dispensed in "med lines", up to three times per day and in many locations. Hospitals typically dispense medications individually. Clinics don't generally dispense medications, relying on retail pharmacies[18].
- In addition, some medications and other care is mandatory for some AICs. Nearly all care outside of a corrections setting is done with consent and therefore EHRs often don't account for documentation needs of involuntary care[19].
- ODOC does not bill insurance companies and therefore would be severely burdened by charge capture technology included in nearly all EHRs[20].
- Clinical care is complicated by offender management. Custody level, segregation, PREA status, housing orders and other restrictions complicate care delivery relative to other outpatient care settings where patient flow starts and ends at the front desk[21].
- Intake of new patients in a corrections environment is a complex, multi-step process that mixes elements of registration, health screening, and assessment[22].

Opportunity

[17] See Appendix 5 – Market Scan
[18] See Appendix 9 - As-Is Diagrams (Medical)
[19] See Appendix 9 - As-Is Diagrams (Medical)
[20] See Appendix 13 - As-Is Diagrams (Core)
[21] See Appendix 13 - As-Is Diagrams (Core)
[22] See Appendix 8 - As-Is Diagrams (Intake)

With more than 21,000 AIC's requiring services in a 12 month period across 14 institutions of the Oregon State Correctional System, and as the largest mental health provider in the State, ODOC HS has the opportunity to interconnect its AIC population with all other State health care centers as well as interconnected health care clinics and infirmaries in its 14 institutions internally.

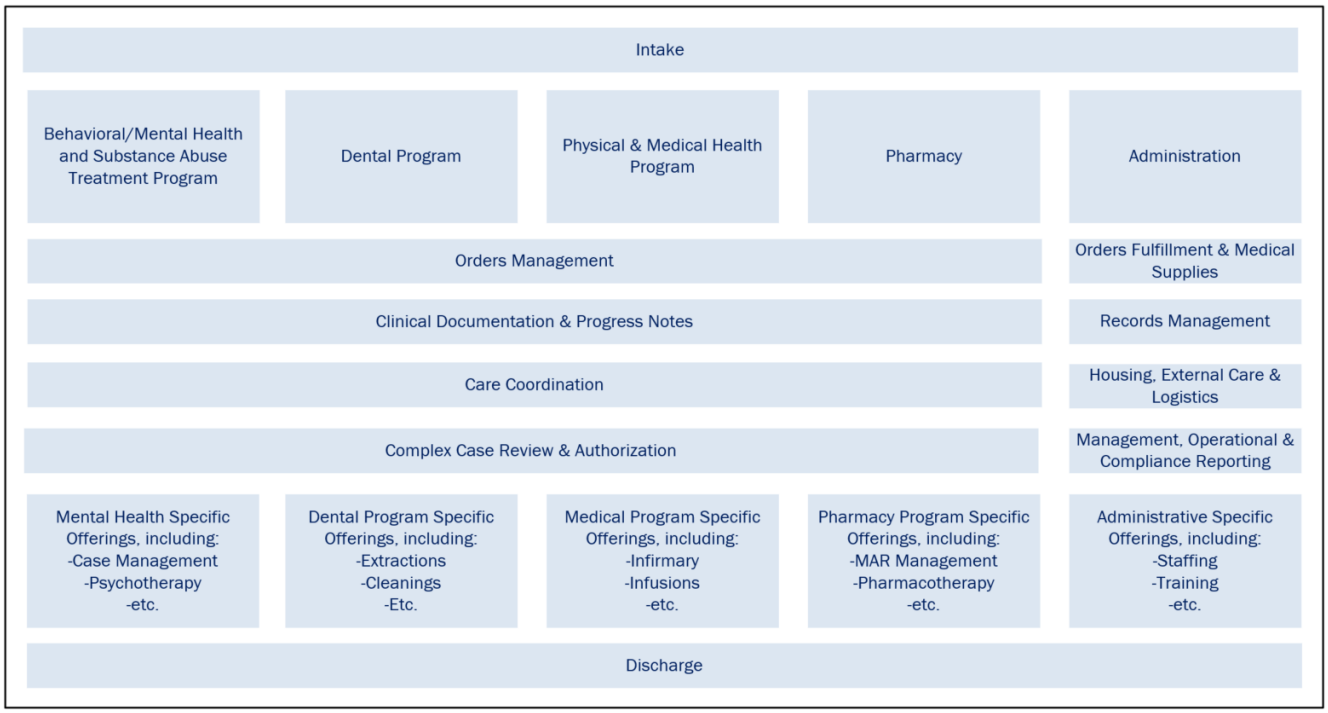
Due to the implementation of an EHR system and availability of data, Citizens of Oregon could benefit from the ODOC HS becoming an integral component of the Oregon health care continuum. The State of Oregon through the ODOC mission of promoting public safety by holding offenders accountable for their actions and reducing the risk of future criminal behavior has an opportunity to improve many areas of the Health Services business with an EHR solution.

Continuity of Care: Intake, Ongoing, Reentry

HS business processes are limited technologically in the ability to improve seamless care during intake, custody, and release. An EHR solution would:

- Improve clinical decision-making through concurrent access to authoritative and accurate clinical patient information.
- Digitally enable AIC health intake and assessment business processes.
- Enable ability to use secure health data via the Oregon Health Information Exchange as AIC patients are released from custody, enter communities, and sign up for health care.
- Unify patient information in manageable digital formats to be available for all ongoing care.
- Digitally enable the release and reentry business processes.
- Eliminate hours spent locating and delivering patient health charts to clinicians and then back to chart rooms
- Provide patient health record access to medical providers simultaneously, including medication usage.
- Provide effective method(s) for clinical teams to collaborate.
- Improved appointment/scheduling capability.
- Improved HS staff wellness. Increased staff retention – conversion to electronic documentation positively effects engagement by 1) eliminating conflict over the sole copy of the paper chart by multiple clinicians and 2) removal of documentation as a barrier to care, which is a primary dissatisfier amongst the clinicians
- Integration across Clinical programs – medical, behavioral health, dental, pharmacy, and substance abuse programs can all document in the same system even if using different modules.
- Highly reliable care – increase standardization of care by providing the same set of tools to all clinicians, including progress note templates and standard visit workflows
- Safety of care – electronic documentation of orders allows for back-end reconnaissance and error checking like with drug-to-drug interactions and contraindications.
- Timeliness of care – electronic encounter tracking can surface gaps of care in preventive and routine treatment like late colon cancer screens.
- Care Coordination – improve clinical teamwork through concurrent access to authoritative and accurate clinical patient information
- Enhancements to scheduling – electronic visit schedules enable a variety of tools that help manage high volumes like with same-day capacity blocks, recurring visits, reschedule prompts, etc.
- Care Transitions – electronic documentation is easier to receive and share across care settings which supports greater continuity at intake, while in custody (with transfers between institutions & care in the community), and upon release to the community.

The following chart highlights the types of activities that happen in the various Health Services functions:



Measurement: Evidence-Based Decision Making, Performance Indicators, and Compliance

Health Services has an opportunity to further standardize health data and management to improve patient health through digital systems and business intelligence and analytics. The opportunity is to not only interconnect the 14 health care centers at the institutions but also connect state and nation-wide in order to share in the National Quality Strategy public health data. ODOC would be better equipped to:

- Assess and manage regulation compliance against HIPAA - HiTech and other regulatory mandates.
- Reduce the 14,000+ hours required to manually prepare for National Commission on Correctional Health Care (NCCHC) accreditation.
- Improve outside (community) consult care and cost management.
- Improve compliance and reporting with State, Federal, and Departmental regulations.
- Maintain patient chart data with high precision and accuracy, as it is difficult to manage with the current paper health record format.
- Improve health data quality and usability.
- Improve ability to correlate health care improvements and reentry processes to recidivism rate improvements.
- Improve evidence-based decision-making capabilities, population health management, and chronic health issues in particular.
- Improve the ability to correlate grievances with executed policy and procedures.
- Better assist the elderly population of AIC, whose health care costs continue to rise.
- Access to care equity – the ability to assess if all ethnic groups are receiving access to health care
- Access to care equity – enhanced clinical documentation allows for more reliable reporting of barriers to care such as ensuring staff are always alerted to a rare language interpretation need in advance of a visit.
- Systemwide data – structured, reportable data that is standardized across institutions and is traceable across levels and down to the individual User
- Program planning support – use systemwide data to identify care trends and shift in needs like when to establish specialized treatment on premises rather than offsite

IT Modernization: Non-Centralized Data Management Compounded by Technical Debt

By modernizing its technology platform for health record data, Health Services has an opportunity to increase continuity and standardization across programs, facilities and importantly with external care providers out in the community. Modernization of critical business systems will:

- Improve ODOC's ability to meet its mission and promote public safety by supporting functions necessary for clinical excellence and risk management.
- Provide the technical capabilities to institute and comply with the most current computer hardware and software security requirements set by Federal and State laws.

- Provide the technical capabilities to institute and improve data management and security protocols that secure personal health information (PHI).
- Improve data management to unify and track outside consults, labs, and services reporting, as well as provide the capability to integrate information systems with organizations outside of ODOC.
- More easily align with Oregon Information Resources Enterprise Information Resource Management Strategy, DAS Enterprise Technology Services Strategic Plan, and Executive Order, Unifying Cyber Security in Oregon.
- Acquire an EHR that fulfills our business requirements at the best price
- Minimal IT maintenance burden – adapting to standard build where possible to reduce upfront and ongoing expense of customization
- Ease training burden – Nursing and medical schools no longer teach paper-based clinical documentation and so clinicians new to Health Services need additional training

Continuity of Care: Intake, Ongoing, Reentry:	
Description	*Proposed Measure*
Digitally enable AIC health intake and assessment business processes	**100%** of AIC's are assessed within x days of intake
Improved appointment/scheduling capability	X % of AIC's are scheduled for follow up care within x days of diagnosis
Supports medication assisted treatment for substance abuse	% AIC's with identified substance abuse receiving MAT where appropriate
Unify patient information in manageable digital formats to be available for all ongoing care	X % of AIC's have an electronic record that includes medical, mental health, dental and medication information.
Provide effective method(s) for clinical teams to collaborate	X % of AIC''s whose chart is reviewed by multiple providers for collaboration
Improve clinical decision making through concurrent access to authoritative and accurate clinical patient information	Attain x% reduction in legal fees as a result of consistent record keeping and electronic auditing of clinical care.
Enable ability to use secure health data via the Oregon Health Information Exchange as AIC patients are released from Custody, enter communities, and sign up for health care	X % of released AIC's are signed up for health care, if eligible.
Measurement: Evidence-Based Decision Making, Performance Indicators, and Compliance	
Description	*Proposed Measure*
Provide the ability to scan/assess medical records in times of public health emergencies (Salem water, influenza, COVID) to identify vulnerable population	% of AIC's who are vulnerable to x condition at each institution.
Improved monitoring of vaccine initiatives	% of AIC's who rec'd flu vaccine for 2018 flu season
Better assist the elderly population of AIC, whose health care costs continue to rise.	% of AIC's who are identified as having the medical indicators characterized as "elderly". AIC's age faster than general pop.
Supports wellness programs to reduce health care costs	% of inmates who have wellness assessments % of inmates with high blood pressure. % of inmates with high cholesterol. % of inmates with unhealthy BMI
Identify care trends to assess when to establish specialized treatment on premises rather than offsite	% of offsite visits for x condition compared to total offsite visits

Market Research

History of EHRs

Paper-based health records were used almost exclusively until the late 1960s, when technological innovations led to the beginning of new approaches and the standardization and sharing of medical records. By the late 1980s, personal computers and Windows-based software became prevalent in physician offices although they were used more for billing and scheduling rather than electronic medical records. At the hospital level, computerized registration made check-in processes more efficient, but hospital computer systems were still segmented by department with no ability to communicate[23].

The Master Patient Index (MPI) was introduced in the 1980s to keep track of patients and their medical data. This paved the way for the development of modern EHRs. This effort was catapulted forward in the 1990s with the advent of the World Wide Web. By 2010 EHRs had become commonplace in community health care settings. As of 2015, electronic health records were used in 96 percent of hospitals and 87 percent of physician practices were using electronic health records[24].

In 2015 the Centers for Medicare and Medicaid along with the Office of the National Coordinator for Health Information Technology (ONC) established standards and other criteria for structured data that EHRs must meet in order to qualify for use in the Promoting Interoperability Programs. Some of the highlights are:

- Supports patient electronic access to health information through new functionalities and a range of potential technologies that allow patients greater flexibility and choice in how they access and share their health information.
- Able to record sexual orientation and gender identity, as well as social, psychological, and behavioral data (e.g., education level, stress, depression, and alcohol use).
- Includes data segmentation privacy requirements to support the exchange of sensitive health information.
- Improves patient safety by applying enhanced user-centered design principles to health IT.

Healthcare systems are still struggling with the challenge of widely sharing healthcare data outside their organization. Barriers to aggregating and harmonizing information among healthcare systems include: the cost of creating infrastructures to exchange healthcare data, adoption of interoperability standards, concerns about patient privacy and data security[25].

Products used to support electronic health records vary widely in maturity and scope. Some EHRs have evolved beyond just clinical documentation in hopes of delivering care at lower costs and with better outcomes.

Approach to Market Research

Understanding that the marketplace for EHR Systems is relatively mature, EHR Systems are widely used in Oregon, and many other state corrections agencies have implemented EHR Systems, ODOC conducted a broad-based analysis of the EHR System marketplace to understand the alternatives, including:

- Background research on the vendors in the marketplace and status of EHR systems in corrections
- Interviews with other state correction's health services to understand their EHR journey
- Soliciting direct feedback from EHR vendors through a formal Request for Information (RFI)
- Interviews with Oregon Youth Authority (OYA) and Oregon State Hospital (OSH) to understand their EHR journey

The summary analysis of the market research is included below. For additional details see Appendix 5 - Market Scan.

EHR Product Summary

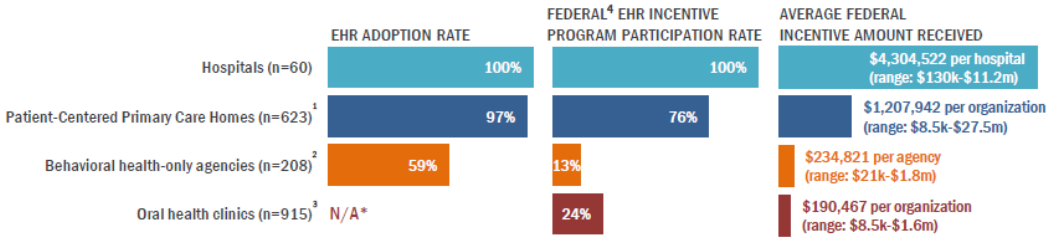
To develop an understanding of the EHR Systems marketplace ODOC: analyzed a recent assessment from OHA on Oregon EHRs/HIEs, looked at solutions in place at other corrections environments, , analyzed vendors that responded to the RFI issued by Oregon Department of Corrections in May of 2020, and an extensive review of solutions that are in operations at OYA and OSH.

The OHA report is discussed in detail in Appendix 6 - OHA report on EHRs and HIEs. Overall, the findings are summarized in the two following tables:

[23] https://www.vertitechit.com/history-healthcare-technology/
[24] https://www.vertitechit.com/history-healthcare-technology/
[25] https://www.vertitechit.com/history-healthcare-technology/

OREGON EHR ADOPTION IS VERY HIGH OVERALL, BUT DIGITAL DIVIDES EXIST.

Oregon has high rates of EHR adoption when compared to other states. However, when we compare EHR adoption rates of **PHYSICAL**, **BEHAVIORAL**, and **ORAL** health providers, a clear digital divide remains.

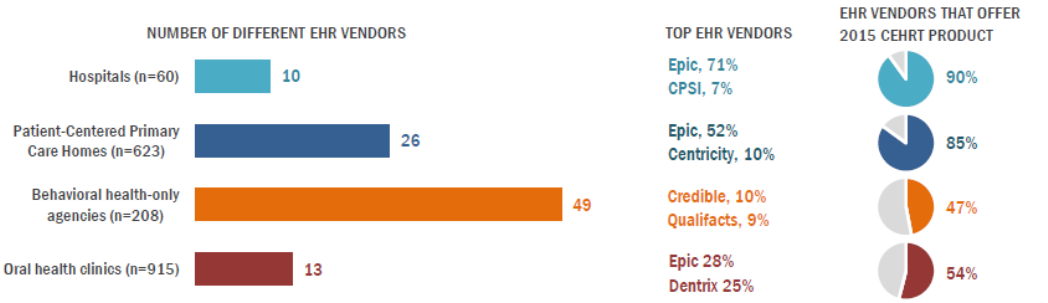


*Not enough data to meaningfully report EHR adoption rate

Physical health providers (represented by Patient-Centered Primary Care Homes, or PCPCHs) use a variety of EHR products, though the vast majority use only a handful of dominant vendors. Most vendors offer products which meet the most recent federal certification standards (2015 CEHRT[5]). PCPCHs have also benefited, along with hospitals, from high rates of participation in the federal Medicare and Medicaid EHR Incentive Programs.

Behavioral health providers use a wider array of products and no one vendor dominates; about half offer 2015 CEHRT. Most providers face challenges with configuring their EHRs for mandated reporting and struggle with managing specially protected information related to substance use treatment. Many are ineligible for the federal Medicare and Medicaid EHR Incentive Programs. For more information, including EHR adoption for all behavioral health providers (including those that are part of a larger physical health organization), see pages 9-10.

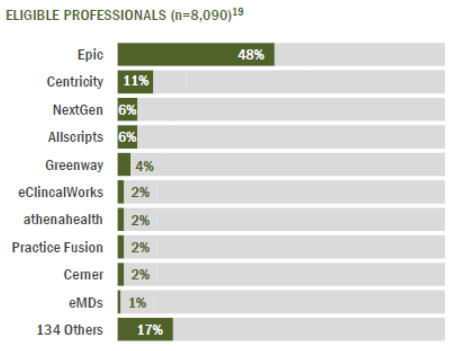
Oral health providers have the smallest pool of EHRs designed to meet their needs, and just over half offer 2015 CEHRT, though this is likely an underrepresentation as very limited oral health information is currently available. About one fourth of providers participated in the Medicaid EHR Incentive Program, most for only one year.

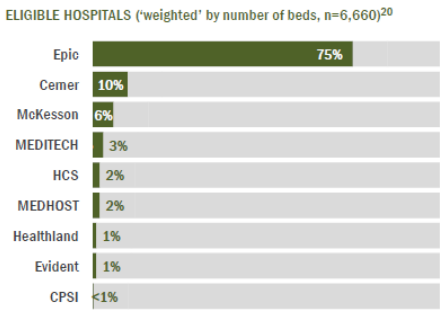


Source: Program participation data collected by Office of Health IT[6] 10/10/2019

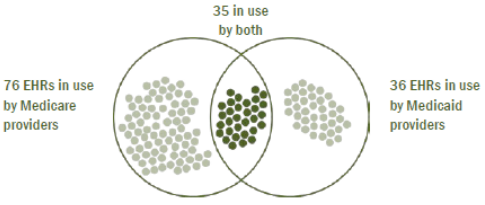
OREGON PROVIDERS USE OVER 145 DIFFERENT EHR VENDORS.

Epic is the most commonly used EHR in Oregon, but providers participating in the Medicaid/Medicare EHR Incentive Programs use over 145 different EHR vendors (144 by Eligible Professionals, 9 by Eligible Hospitals, with 6 overlapping for a total of 147). These providers are primarily physical health providers but include some oral health and behavioral health providers.





76 of the 147 EHR vendors are reported by Medicare participants only, whereas 36 are reported by Medicaid only and 35 are reported by both. This is likely due to the fact that Medicare providers are more likely to be specialty care providers, and specialty providers use a wider variety of EHRs.



Source: Medicaid and Medicare EHR Incentive Programs
Includes all attestations since program year 2013[21] through 10/9/2019

Following is summary of the RFI Submissions reviewed:

#	Product Name	Type	Subspecialty	Medical	Geared to Corrections	Behavioral	Pharmacy	Dental	Admin	Appdix Qs in XLS	Pricing Info	One Pager complete	Other DOCs who are claimed as customers from vendor response to Q8
12	CaregiverDesktop	Comprehensive	Mental Health Focused	Yes	No	Yes	No	No	No	No	No		
13	DrCloudEHR	Comprehensive	Mental Health Focused	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	None
17	Enterprise	Comprehensive	n/a	Yes	No	No	No	No	Yes	No	Yes		None
5	CareVue	Modular	Mental Health Focused	Yes	No	Yes	Yes	No	Yes	No	Yes	Yes	None
1	CareTrax	Modular	n/a	Yes	No	No	No	No	Yes	Yes	Yes		None
18	Medical	Modular	n/a	Yes	No	No	No	No	Yes	Yes	Yes		Did not answer question
10	n/a	Other	n/a							No	No		***System Integrator***
20	Aithent	Other	n/a	Yes	No	No	Yes	No	No	No	No		None
19	Epic	Shared Service	Customized version of gene	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	None
4	myAvatar	Shared Service	Hospital-ready	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes	ND DOC
2	TechCare	Specialty	"Home grown"	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Claim other State DOCs as customers, w/o specifying which ones
8	Pearl EHR	Specialty	"Home grown"	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	TX UTMB (Managed Care for TX DOC), IL DOC & DJJ
15	Sapphire EMR	Specialty	"Home grown"	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	AL, MI, MT, PA, VA DOCs
9	NextGen	Specialty	Customized version of gene	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	SC DOC, MD DPSCS (inc. DOC), MI DOC, NE DCS (is a DOC)
11	Cerner	Specialty	Customized version of gene	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	CT, FL, LA, MS, NJ, OH, RI & Washington DC DOCs
3	Syscon EHR	Specialty	Offender management orie	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes	NV DOC
16	eOMIS/EHR	Specialty	Offender management orie	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	AK, KY (in implementation), AZ, ID, CO, WY

**note* The vendor solution at Federal Bureau of Prisons, ATG did not respond nor did the vendor for Oklahoma, DocSynergy.*

Additional details regarding solutions reviewed see Appendix 5 - Market Scan. While this list is not a complete list of all the EHR Systems available, review of these solutions provided sufficient information to reasonably assess the fit of each of the solution alternatives considered in this business case.

There are many EHR Systems on the market including comprehensive EHR Systems that are designed to be scaled and configured for nearly any care environment, EHR Systems that are highly customized for specific care environments, and EHR Systems with various permutations of comprehensive and specialized designs. While there are a few dominant players in the market, most notably Epic but including vendors such as Cerner and Centricity, there are also many competing solutions, including several vendors that have developed EHR Systems to meet the unique challenges of providing health services in corrections.

Summary of Corrections EHRs

ODOC documented readily available information on correctional institutions in other states and at the federal level. Factors considered were AIC population size and demographics, provider delivery model, health care spend per person, number of institutions and incarceration rate. From the list compiled, the team successfully connected with four states (Ohio, California, Utah and Iowa) and the Federal Bureau of Prisons for interviews using a standardized approach and question set. Major topic areas included feedback on implementation, critical modules/practice areas, their support model, and adoption/training challenges.

Interviews were documented and summarized for lessons learned. Main themes from all states were:

- Overall mixed comments about where to start implementation but consensus on phased approach vs. big bang. Consensus that female facilities were a good place to start for those who did so.
- Planning for data consistency, management and reporting up front is critical to long term success (COVID and vaccinations are two examples)
- Front-line clinician involvement from design through launch is critical to drive adoption of the product. Work arounds at low adoption sites comprised accuracy of reporting, among other down-sides.
- Vendors often provide some amount of "at-the-elbow" support, project management, and training resources. However, expect materials from Vendors to need considerable rework by ODOC in order to be used by staff.

Several states have converted beyond their first EHR to a 2nd and in some cases 3rd solution. For example, Utah implemented a custom solution roughly 15 years ago and is now currently migrating to a commercial solution. Some states have implemented comprehensive EHR products, such as California, which implemented Cerner for medical plus Dentrix for dental. California reported that their system was very successful, but it required significantly more time and resources than was planned to complete the configuration and customization needed to support their health services operations[26]. Many states have successfully implemented corrections specific solutions, such as Ohio, which is using the Fusion solution. Fusion's solution is a Cerner based solution that has been customized for corrections. None of the Corrections agencies reviewed utilized a shared services model with other agencies in their state regarding their EHR Solutions.

[26] https://www.beckershospitalreview.com/healthcare-information-technology/california-prison-system-s-cerner-ehr-implementation-doubles-in-cost-to-nearly-400m.html

Research of Existing Systems from Partner Agencies

Partner Agencies for DOC were identified as the Oregon Youth Authority (OYA) and the Oregon State Hospital (OSH) system. In order to pursue the client service model employed by OYA, ODOC would solicit review and guidance from DOJ and would likely require approval to utilize a Special Procurement Notice since OCHIN serves public and private healthcare organizations. Utilizing a Special Procurement would be contingent on demonstrating that the Special Procurement would provide substantially better benefits than a competitive procurement.

OYA currently has an OCHIN implemented solution in place, however the contracts are through their membership of OCHIN. Per a DAS procurement professional, ODOC would need to procure a unique membership and cannot be added to the OYA membership agreement so there would be no procurement process benefit or cost reduction just because OYA is a member of OCHIN. As well, the solution in place does not meet all requirements for DOC including a lack of an eMAR for "med line" documentation and infirmary bed management. OYA also found the eMAR to be critically important and so implemented a second EHR in parallel, SapphireHealth, to enable their medication administration process. OYA conducted their EHR procurement as a client service and with a lower level of EIS oversight and less robust framework for security requirements than ODOC is applying. Furthermore, as revealed in the price book provided by OCHIN in the RFI and confirmed in clarification discussion with the vendor, per encounter, per dispense pricing results in greater operating and maintenance costs than other viable solutions that meet requirements. Notably, OYA discovered billing issues related to correctional care (i.e. high proportion of nurse visits). In short, OCHIN charged for visits that it should not have because of lack familiarity with the care model. OCHIN developed a new report to sort out eligible from ineligible visits and the incorrect charges were voided. This also led to OYA having to shift their processes to match or meet processes that were created by Epic. The continued struggle fitting OCHIN's Epic to a corrections environment also led to integrating Sapphire with Epic for medications.

OSH started implementation planning with NetSmart in 2009, with implementation started in 2011. However, OSH has had to greatly configure the solution the meet their needs. This implementation took a while, mainly due to being originally scoped to cover any facility where patients were under the care of the Oregon Health Authority. This was scaled back to put the state hospitals needs first. Currently, several other separate modules have been integrated into the solution for medication, labs and food/nutrition services. OSH also required billing functionality which ODOC does not. Dental, a requirement for DOC, was left off leaving OSH to continue to do paper records because their requirements were more straightforward, only doing cleaning and extractions.

OSH researched OCHIN (Epic), however extended their contract with NetSmart in 2018 as OCHIN was deemed cost prohibitive in part due to the per encounter, per dispense pricing. The current OSH contract with NetSmart is not leverageable by DOC as determined by DAS procurement services . OSH has begun the business case and procurement strategy to move to the latest version of NetSmart, as hosted in the vendor cloud (at time of writing, the business case is at Stage Gate 2). Currently OSH are using an on-premise hosted solution with third party disaster recovery. The state data center was not able to meet their needs.

The EHR solution vendors- at both OYA and OSH will have the opportunity to respond to the ODOC EHR Request for Proposal with the rest of the ~~HER~~ ehr market and will be assessed by ODOC using the same criteria for all vendors.

Alternatives Analysis

General Assumptions and Constraints

The following assumptions and constraints are applicable for all the actionable alternative approaches analyzed in this Business Case.

- There are electronic-based health record products that meet the majority of ODOC HS business needs[27].
- HIPAA related items will be coordinated with ODOC HS' solution vendor.
- Implementation of an enterprise system will require up-front training for all health services staff.
- An electronic based health record could result in efficiencies lost in some areas (e.g., while treating a patient), efficiencies gained in other areas (e.g., not needing to search for, or transfer around, paper charts), and as a result it is expected that HS will remain staff neutral.
- Due to the movement and transfer of patients between institutions[28], ideally an electronic-based health record rollout needs to occur in a short period of time.
- At a minimum, an electronic-based health record needs bi-directional interfaces with Offender Management System (DOC400), Pharmacy (CIPS), Lab, Radiology, and the CIS Master Scheduler.
- An electronic-based health record system replaces authoritative paper medical chart and related printed health records with electronic format(s), Patient Health Plan.
- The current statewide network provides a consolidated fiber-optic-based network capable of supporting an electronic based health record system.
- There is one end-user for every HS staff member (nearly 600) and the lifetime of a PC is 5 years. It is estimated that 550 computers will need to be purchased by HS over the next 5 years through the regular life cycle purchase program. Personal computer updates will be coordinated through ITS.

Selection Criteria and Alternatives Ranking

One to five scoring across five selection criteria, including risk.

The numerical score for the first 3 selection criteria is a weighted average of the sub-elements scores. ***For example***, the Existing Systems received a 3.8 on continuity of care calculated as follows:

Sub-element	Weighting	Score	Weighted Score (Weighting X Score)
Providing real-time device agnostic access to medical record to Health Services clinicians regardless of location or care setting	70%	3.4	2.4
Electronically exchanging standard medical data with external partners	20%	5	1.0
Effectively transitioning care plans to community providers upon release	10%	4	0.4
Total Weighted Score			**3.8**

The numeral score for cost is based on a ratio of the alternative cost to 5 [(Lowest cost/Alternative cost) * 5].

The numeral score for risk is based on a ratio of the alternative risk to 5 [(Lowest risk/Alternative risk) * 5]

1. **Continuity of Care** – the extent to which the solution provides functionality needed to support Continuity of Care:
   1.1. Providing real-time device agnostic access to medical record to Health Services clinicians regardless of location or care setting (70%)
   1.1.1. Medical
   1.1.2. Dental

[27] See Appendix 5 - Market Scan

[28] See Appendix 13 - As-Is Diagrams (Core)

1.1.3. Behavioral
1.1.4. Pharmacy
1.1.5. Administrative

1.2. Electronically exchanging standard medical data with external partners (20%)
1.3. Effectively transitioning care plans to community providers upon release (10%)

2. **Evidence-based Decision Making** – the extent to which the solution provides functionality needed to support Evidenced-based Decision Making:
   2.1. Real-time reporting for incident response and identification of at-risk AICs and wellness program support (20%)
   2.2. Population studies supporting health policy decisions (30%)
   2.3. Automated best practice and decision support for clinicians to ensure optimal decisions "easy to the right thing, hard to do the wrong thing" (50%)

3. **IT Modernization** – Operate on a modern technology platform:
   3.1. Sustainable Platform that is easy to maintain and adaptable to changes (50%)
   3.2. Reducing or eliminating the technology gap between community care and HS care (20%)
   3.3. Alignment with enterprise technology strategy and standards (30%)

4. **Solution Costs** – Five-year total cost of ownership, including all implementation, maintenance, and operating expenses:
   4.1. Acquisition/Licensing
   4.2. Customization/Configuration
   4.3. Maintenance
   4.4. IT Infrastructure/Equipment
   4.5. ODOC Staffing
   4.6. Professional Services

5. **Degree of Risk** – ODOC total comparative risk for each option based upon sum of the criticality of the top 5 risks where individual risk scores are calculated as the product of probability and impact. Probability and impact are rated on a scale of 1-3:
   5.1. Business Outcomes (Clinical)
   5.2. Technical
   5.3. Implementation/Operational

Solution Requirements

The business/functional requirements will be the first criteria used for comparing alternatives. The requirements are broken down into the ten categories as seen in the table below, which reflect ODOC Health Services' major functional areas. These functional categories were derived from the various information sources.

- Existing documentation provided by DOC (Policies & Procedures, OAR)
- Stage Gate 1: 2017 ODOC EHR Business Case authored by RDI[29]
- Direct experience with and observation of existing software and documentation methods used by DOC Health Services
- Extensive interviews and As-Is definition sessions with key stakeholders across all care delivery disciplines within health services[30]

Category	Sub-Category	Criticality
General / Core	Intake	Nurse-driven standardized assessment covering biopsychosocial factors, risks and medical history. Able to support the assessment even if not prior registered (see below) and without physician orders.
	Patient Registration	New patient chart creation at the Point of Care (POC) by CCCF staff within 10 minutes, see above Intake. In addition, able to prebuild charts from central location, including registration, demographic, translation needs, active medications, allergies, labs, images, and prior history such as hospital discharge summaries, and outpatient after visit summaries.

[29] See Appendix 14 – ODOC EHR Stage Gate 1 Business Case
[30] See Appendix 7 - ODOC EHR As-Is Analysis

	Scheduling	Schedule able to accept rules-based inputs (shift lengths, days of week, appointment length, same day access restrictions, etc.) to automate clinician schedule where appropriate. Schedule is manageable by individual clinicians and centrally. Permissions' based calendaring to control changes to individual schedules or rules, etc.
	Referrals	Able to electronically refer patient to group or clinician internally with the appropriate notifications and information transfer to the receiver. Also able to support external referrals in some form. Able to include referrals on after-visit summaries.
	Encounters	encounter types for all authorizing prescribers, including nurse practitioners and physician assistants. Able to associate ICD and CPT codes despite not billing patient. Encounters support rooming processes including medication reconciliation, symptoms/complaints capture, vitals, and other common chart prep. Supports provider in filing progress note, routing orders, and closing out the encounter
	Other Encounter Types	In addition to the above, some other support for nurse-driven visits and encounters with clinical support staff, like medical assistants, social workers, etc.
	Post-Encounter Materials	System automatically generates "after-visit summaries" for provider encounters. Able to "prescribe" and document patient education. Support for storing and printing patient education materials.
	Care Planning	Able to capture and update goals of care both during or outside of an encounter. Care planning elements available to all clinicians.
	Discharge/Release	Some support for the transfer of care upon release including medication orders. Able to print or provide electronic version of chart for patient at time of release.
	Consults	Receives, documents, and transmits requests for consult from one clinical user to another. Also able to route to group.
	Orders	Orders for authorized providers consistent with scope of practice for each clinical type. Orders requiring action by another clinician are routed appropriately. Orders can be pended, require co-signing, or trigger reviews.
	Flowsheet & Results	Able to capture and store discrete clinical data, including vitals, lab results, etc. Discrete data viewable over time and multiple captures. All discrete data fields are reportable down to the patient level.
	Progress Notes	Notes are reportable, configurable and can serve as triggers for other actions, like encounter closure. Support for dictation and other clinician efficiency tools, see below
	Medication Management	System documents medication Orders, see above. In addition, supports documentation of meds given by staff to patients via a "Medication Administration Record". Supports bar coded medication administration. Able to alert clinicians to contraindications and drug-to-drug interactions, see below
	Alerts/Decision Support	System is capable of generating real-time alerts and/or notifications to a individual or group of users. Alerts and notifications are configurable as hard or soft stops and can require User action.
	Clinician Efficiency Tools	System supports common clinician efficiency tools (smart phrases for commonly-used progress note content). Able to group clinical interventions into a single order set, protocol, etc. Common orderables can be grouped into clinician-specific preference lists
Corrections Specific	"Medline" support	Support documentation of medication dispense for many patients in a row in rapid succession without clinician interruption
	Involuntary care	able to capture and document adherence to protocols, etc. Missed dose alerts for mandatory dispenses, etc.
	Billing not applicable	Unneeded billing functionality does not disrupt clinical care when not in use like required charge capture, etc.
	Offender Management overlap	Able to account for the additional complexity caused by the logistics of AIC housing like with segregation care, infirmary bed management, PREA status, and custody level

	Multi-step Intake	able to guide clinician through complex, multi-step onboarding process that combines elements of registration, health screening, and standardized assessment
Behavioral & Mental Health	Treatment Programs	Able to support medication assisted therapy and other common substance abuse treatment programming.
	Case Management	System supports specialized encounters and note types that conform to the unique needs of case management
Imaging	Image Capture	Support for imaging Orders, see above. Order routed to Tech as appropriate. Imaging-appropriate encounter type to support documentation of the image capture.
	Archival & Display of Images	Able to attach summary findings and images from external providers to a patient's chart. Stored images viewable with the EHR.
Lab	Specimen Tracking	Support for lab draw/specimen collection Orders, see above. Order routed to Tech as appropriate. Lab-appropriate encounter type to support documentation of the collection.
	Data Storage	Lab values from primary lab automatically load into flowsheets. Summary reports from other labs can be attached to patient's chart.
Pharmacy	Medication Orders	System documents medication Orders by authorizing prescribers. System maintains formulary and can alert physicians to non-formulary orders.
	Medication Administration Record	In addition, supports documentation of meds given by staff to patients via a "Medication Administration Record". Supports bar coded medication administration.
	Pharmacy safety alerts	System automatically alerts clinicians to contraindications and drug-to-drug interactions. System can be configured to generate report and/or alert for refill orders missed doses, etc.
Dental	Dental History & Assessment	System able to capture common dental interventions, including cleanings and perio charting/screening, down to the individual tooth.
	Digital Imaging	Able to capture and store digital x rays.
	Procedures	Supports the documentation of in-office procedures, including prosthesis, extractions, crowns, etc.
Physical / Medical	Infirmary Management	System support documentation of clinician rounding, lines/drips management, wound care, etc.
	Monitoring	System can accept interfaced or transferred monitoring data from common medical equipment.
Administrative	Records Management	Charts restored and archived centrally based upon automatic rules and/or through manual intervention.
	Reporting	Able to report on discrete fields for individuals and populations. Able to generate productivity reports on demand and on a predetermined schedule. Reports can be automatically sent to individuals or groups. Reports can pull from or use clinical data to filter and/or sort (i.e. # of patients 65 or older with 3 or more chronic conditions).
	Practice Management	Systems supports administrators in generating dashboards, reports, and other data visualizations.
Other / Technical	Telemedicine	Support for documentation of Telemedicine visits.
	Security	Compliant with the relevant elements of the State Security Plan
	Bar Code Scanning	Native support or tight integration with bar code scanners.

Alternatives Identification

Alternative 1: Existing Solutions – solutions that have been successfully implemented in State of Oregon and might be available as a shared service.

Under Option 1, ODOC would procure an EHR already used by another State agency. ODOC would then collaborate with that agency to either extend the use of their current setup or leverage existing agreements to obtain the same product but with different configuration. The distinction of this option is the opportunity to create a shared service model with a partner agency. In the case of OSH that would involve working with them on a shared services contract with their current vendor (NetSmart) when they migrate to a cloud-based solution. In the case of OYA that would involve working with them and their current vendor (OCHIN/Epic) to operate in a shared "service area" and share services for ongoing system support and operations related activities.

Alternative 2: Comprehensive Solutions - vendors that provide a full range of EHR functionality, across many different clinical settings and environments in the community.

Under Option 2, ODOC would procure an EHR solution from a single solution provider. The single solution would be a mature product that has been successfully implemented broadly in health care settings. It would be a tightly integrated software solution that support each of the key business areas within Health Services, including: physical health information, dental health information, behavioral health information, and administrative service functions. Among other vendor solutions, this alternative includes OCHIN, Epic, and NetSmart if they were not purchased as a shared service with a partner agency.

Alternative 3: Corrections Specific Solutions – vendors offering EHRs that are tailored specifically to the Corrections environment. These may be part of a wider offering across other aspects of offender management.

Under Option 3, ODOC would procure an EHR solution from a single solution provider. The single solution would be a product that has been customized to support health services in a corrections environment and might not be in use more broadly in other health care settings. It would be a tightly integrated software solution that supports each of the key business areas within Health Services, including: physical health information, dental health information, behavioral health information, substance abuse treatment, pharmacy, and administrative service functions. Among other vendor solutions, this alternative includes vendors such as Fusion, which is based on a comprehensive product like Cerner, with the addition of corrections specific configurations and customizations.

Other Alternatives Ruled Out – Modular design, in-house development, and enhanced Document Management System

Using a modular design, ODOC would procure multiple "best of breed" software solutions based on the specific requirements of each of the key business areas within Health Services, including: physical health information, dental health information, behavioral health information, and administrative service functions. A modular technical infrastructure would be developed to support the integration of software products in order to provide a comprehensive EHR solution. This option was ruled out due to insufficient information and unknown risks.

A fifth option of in-house development was immediately ruled out due to "tech debt" and other challenges that would have put the solution out of alignment with the EIS Strategic Framework. In addition, a 6th option of enhanced document management system was also immediately ruled out due to patient safety concerns

Alternatives Analysis

1. Existing System at Partner Agency

1.1.1. Continuity of Care – 3.8

1.1.1.1. Providing real-time access to medical record to Health Services clinicians regardless of location or care setting (70%) [3.4] – Existing systems provide real-time access in *most* but not all settings. The Oregon State Hospital version of NetSmart will not support the dental program requirements, particularly as it relates to tooth charting with is high volume service for that program. While OYA is a youth corrections setting, the youth corrections setting different from adult corrections in many ways, including health profile and age of patients, housing and care setting, types of health services provided by the agency "in-house", length of the stay, and number of patients and facilities. Similar to many of the comprehensive, community-based EHRs, OYA's version of OCHIN/Epic cannot meet many of ODOC's requirements criteria "out of the box" such as rigorous intake processing, med line support and off-line features for varied care settings.

1.1.1.2. Electronically exchanging standard medical data with external partners (20%) [5] – OYA's version of OCHIN/Epic includes post-visit summaries, data extracts and other tools to send out information. In addition, the CareEverywhere tool is available to many Oregon providers, which allows for information exchange on 400 of 12,000 data elements with other Epic users. NetSmart at the Oregon State Hospital does produce visit summaries, extracts, and reports but has no information exchange equivalent to CareEverywhere in the Oregon market.

1.1.1.3. Effectively transitioning care plans to community providers upon release (10%) [4] – OYA's version of OCHIN/Epic can not meet the discharge planning requirement. but meets all other basic criteria, like the ability to print out summaries for the patient.

1.1.2. Evidence Based Decision Making – 4.5

1.1.2.1. Real-time reporting for incident response and identification of at-risk AICs and wellness program support (20%) [5] – both existing systems meet high-level requirements

1.1.2.2. Population studies supporting health policy decisions (30%) [5] – both existing systems meet high-level requirements. Both systems come preconfigured with basic administrative reports. Both systems need report builder resources if intending to be used for population studies.

1.1.2.3. Automated best practice and decision support for clinicians to ensure optimal decisions "easy to the right thing, hard to do the wrong thing" (50%) [4] – OYA's version of OCHIN/Epic cannot provide decision support for ODOC medication lines as currently implemented. OYA's version of OCHIN/Epic and NetSmart as OSH are capable of meeting drug-to-drug interaction and other basic safety prompts.

1.1.3. IT Modernization – 4

1.1.3.1. Sustainable Platform that is easy to maintain and adaptable to changes (50%) [3] Adoption of OYA's version of OCHIN/Epic introduces an additional "middle-man" for both upgrades and enhancements. In addition, OCHIN employs shared governance for system changes. In order to get significant system changes approved ODOC will need to get agreement regarding the definition and priority of the change from other OCHIN members that are not in corrections settings and have much smaller patient populations than ODOC.

1.1.3.2. Reducing or eliminating the technology gap between community care and HS care (20%) [5] – both existing systems are on par with systems used elsewhere in the community.

1.1.3.3. Alignment with enterprise technology strategy and standards (30%) [5] – adoption of either NetSmart or OYA's version of OCHIN/Epic results in no growth of supported systems. Both systems offer SaaS solutions.

1.1.4. Solution Costs – 4

Existing System							
	Project Costs	O&M (Year 1)	O&M (Year 2)	O&M (Year 3)	O&M (Year 4)	O&M (Year 5)	**Total**
Acquisition/Licensing	$3,862,300	$0	$0	$0	$0	$0	**$3,862,300**
Customization/Configuration	$1,052,800	$300,000	$300,000	$300,000	$300,000	$300,000	**$2,552,800**
Ongoing Software Licensing & User/Transaction Based Fees	$0	$2,477,260	$2,477,260	$2,477,260	$2,477,260	$2,477,260	**$12,386,300**
Hosting - Internal or External	$0	$0	$0	$0	$0	$0	**$0**
IT Infrastructure/Equipment	$3,500,000	$100,000	$100,000	$100,000	$100,000	$100,000	**$4,000,000**
ODOC Staffing	$5,068,557	$677,368	$200,000	$200,000	$200,000	$200,000	**$6,545,925**
Professional Services	$4,925,000	$500,000	$300,000	$300,000	$300,000	$300,000	**$6,625,000**
Project Costs + O&M Yearly Spend	**$18,408,657**	**$4,054,628**	**$3,377,260**	**3,377,260**	**$3,377,260**	**$3,377,260**	**$35,972,325**

1.1.5. Risks – 3.3

#	Risk	Probability	Impact	Criticality
1.1	Vendor lack of experience with corrections environment and lack of pre-configured corrections workflows makes it likely that additional time and effort will be required to develop and refine workflows and system configurations, including re-work. This includes lack of planned integration with OMS.	High(3)	Medium(2)	High(6)
1.2	Key system changes required by DOC may not be approved by shared service members, requiring DOC to develop manual or system workarounds.	High(3)	Medium(2)	High(6)
1.3	In order to support ODOC vendor will have to buy additional functionality (EPIC modules or additional programs modules) that have not been previously implemented by vendor. There	Medium(2)	High(3)	High(6)

	could be delays to or unanticipated implementation problems with integrating new modules into the shared service environment.			
1.4	The level of customization required is not well understood and is likely to cost more than anticipated. There may also be additional license cost and overhead costs as DOC will be required to purchase modules typical in a community-based care setting with features that will not be required by DOC.	High(3)	Medium(2)	High(6)
1.5	DOC's lack of experience with EHR systems and automated workflows makes it likely that newly defined workflows will be less than optimal at first and will require re-working of the business process and configuration decisions.	High(3)	Medium(2)	High(6)
	Total Risk Score			**30**

2. Comprehensive

2.1.1. Continuity of Care – 3.5

2.1.1.1. Providing real-time access to medical record to Health Services clinicians regardless of location or care setting (70%) [3] -- Comprehensive solutions meet requirements for real-time access but require extensive configuration and some customization to do so across all ODOC settings. Treatment programs, segregation units, and medication dispense lines are not easily addressed "out of the box" by comprehensive solutions.

2.1.1.2. Electronically exchanging standard medical data with external partners (20%) [5] – Comprehensive solutions are built to handle transitions of care between independent providers and delivery systems. Comprehensive solutions offer the best tools available.

2.1.1.3. Effectively transitioning care plans to community providers upon release (10%) [4] – all the tools one would need to do great discharge planning are available in comprehensive products. However, such tools need extensive configuration to support case management of complex patients like those in the care at ODOC.

2.1.2. Evidence Based Decision Making - 5

2.1.2.1. Real-time reporting for incident response and identification of at-risk AICs and wellness program support (20%) [5]

2.1.2.2. Population studies supporting health policy decisions (30%) [5] – Comprehensive solutions generally meet high-level requirements. Systems generally come preconfigured with basic administrative reports. Systems usually need report builder resources if intending to be used for population studies.

2.1.2.3. Automated best practice and decision support for clinicians to ensure optimal decisions "easy to do the right thing, hard to do the wrong thing" (50%) [5] – Comprehensive solutions tend to provide tools for alerts, warnings, etc. directly to clinicians. Comprehensive solutions also enable automatic Orders safety measures, like drug-to-drug interactions checks. Finally, Comprehensive solutions offer sufficient reporting capability to support clinical audits and other root cause analysis.

2.1.3. IT Modernization – 4.2

2.1.3.1. Sustainable Platform that is easy to maintain and adaptable to changes (50%) [4] – comprehensive solutions are very adaptable and receive regular upgrades. However, products in this category use non-specific functionality to allow for wider applicability which must then be configured/customized for "the last mile". Maintenance of comprehensive solutions is therefore flexible and adaptive, but hard to do since have you to know both the underlying build and the config on top.

2.1.3.2. Reducing or eliminating the technology gap between community care and HS care (20%) [5] – most Oregonians receive care from providers using comprehensive EHRs. Comprehensive solutions tend to be on the leading-edge of EHR innovation, in part, due to the diversity of clients i.e. a good idea slowly works its way into standard build for the benefit of clinicians elsewhere in the continuum.

2.1.3.3. Alignment with enterprise technology strategy and standards (30%) [4] – comprehensive solutions meet State security standards and meet most strategic objectives. Adoption of one of these solutions would increase the number of systems supported by the State.

2.1.4. Solution Costs – 3.2

Comprehensive (commercial)							
	Project Costs	O&M (Year 1)	O&M (Year 2)	O&M (Year 3)	O&M (Year 4)	O&M (Year 5)	**Total**
Acquisition/Licensing	$14,551,837	$0	$0	$0	$0	$0	**$14,551,837**
Customization/Configuration	$1,000,500	$300,000	$300,000	$300,000	$300,000	$300,000	**$2,500,500**
Ongoing Software Licensing & User/Transaction Based Fees	$0	$1,082,085	$1,595,985	$1,595,985	$1,595,985	$1,595,985	**$7,466,025**
Hosting - Internal or External	$0	$0	$632,760	$632,760	$632,760	$632,760	**$2,531,040**
IT Infrastructure/Equipment	$3,500,000	$100,000	$100,000	$100,000	$100,000	$100,000	**$4,000,000**
ODOC Staffing	$5,068,557	$677,368	$200,000	$200,000	$200,000	$200,000	**$6,545,925**
Professional Services	$4,925,000	$500,000	$300,000	$300,000	$300,000	$300,000	**$6,625,000**
Project Costs + O&M Yearly Spend	**$29,045,894**	**$2,659,453**	**$3,128,745**	**3,128,745**	**$3,128,745**	**$3,128,745**	**$44,220,327**

2.1.5. Risks – 3.8

#	Risk	Probability	Impact	Criticality
2.1	Vendor lack of experience with corrections environment and lack of pre-configured corrections workflows makes it likely that additional time and effort will be required to develop and refine workflows and system configurations, including re-work. This includes lack of planned integration with OMS.	High(3)	Medium(2)	High(6)
2.2	The level of customization required is not well understood and is likely to cost more than anticipated. There may also be additional license cost and overhead costs as DOC will be required to purchase modules typical in a community-based care setting with features that will not be required by DOC.	High(3)	Medium(2)	High(6)
2.3	DOC's lack of experience with EHR systems and automated workflows makes it likely that newly defined workflows will be less than optimal at first and will require re-working of the business process and configuration decisions.	High(3)	Medium(2)	High(6)
2.4	In order to support operations, it may be necessary to employ additional report writing and configuration analysts to support corrections specific needs and administration across all locations.	Medium(2)	Medium(2)	Medium(4)
2.5	Interfaces with OMS and partner systems may require additional system integration work on the part of DOC to develop and maintain information exchange between systems.	Medium(2)	Medium(2)	Medium(4)
	Total Risk Score			**26**

3. Corrections Specific

3.1.1. Continuity of Care – 4.7

3.1.1.1. Providing real-time access to medical record to Health Services clinicians regardless of location or care setting (70%) [5] – Corrections-specific EHRs are designed to account for common clinical programs like at ODOC, including dental and substance abuse treatment. In some cases, corrections-specific EHRs account for offender management.

3.1.1.2. Electronically exchanging standard medical data with external partners (20%) [4] – Many corrections-specific EHRs are purpose-built versions of comprehensive solutions and so have similar capabilities including report generation, extracts, view-only access options, and in some cases more. Corrections-specific EHRs do not have a CareEverywhere equivalent in Oregon.

3.1.1.3. Effectively transitioning care plans to community providers upon release (10%) [4] – Capabilities vary widely by product but generally meet high level requirements. Several corrections-specific products are designed as extensions of offender-management, which allows for integration of non-medical aspects of release.

3.1.2. Evidence Based Decision Making – 4.7

3.1.2.1. Real-time reporting for incident response and identification of at-risk AICs and wellness program support (20%) [5]

3.1.2.2. Population studies supporting health policy decisions (30%) [4] – Corrections-specific solutions generally meet high-level requirements. Systems generally come preconfigured with basic administrative reports. Systems usually need report builder resources if intending to be used for population studies.

3.1.2.3. Automated best practice and decision support for clinicians to ensure optimal decisions "easy to the right thing, hard to do the wrong thing" (50%) [5] – Some workflow standardization is driven automatically via the pre-configuration/customization done by these Vendors to address aspects of care unique to the corrections environment. corrections-specific solutions are generally less mature than Comprehensive solutions for alerts, warnings, etc. directly to clinicians. corrections-specific solutions have sufficient (but maybe not sophisticated) automatic Orders safety measures, like drug-to-drug interactions checks. Finally, corrections-specific have more rudimentary tools than comprehensive but will have more usable "off the shelf" reports. Corrections-specific solutions typically offer sufficient reporting capability to support clinical audits and other root cause analysis.

3.1.3. IT Modernization – 3.7

3.1.3.1. Sustainable Platform that is easy to maintain and adaptable to changes (50%) [3] Significant changes will generally require coordination and work from both the underlying platform owner and the Corrections-specific vendor. Systems are often highly adaptable but rarely easy to maintain.

3.1.3.2. Reducing or eliminating the technology gap between community care and HS care (20%) [5] Corrections-specific solutions are all similar in capability to EHRs elsewhere in Oregon.

3.1.3.3. Alignment with enterprise technology strategy and standards (30%) [4] comprehensive solutions meet State security standards and meet most strategic objectives. Adoption of one of these solutions would increase the number of systems supported by the State.

3.1.4. Solution Costs – 5

Corrections-specific (commercial)							
	Project Costs	O&M (Year 1)	O&M (Year 2)	O&M (Year 3)	O&M (Year 4)	O&M (Year 5)	**Total**
Acquisition/Licensing	$2,954,200	$0	$0	$0	$0	$0	**$2,954,200**
Customization/Configuration	$1,232,720	$300,000	$300,000	$300,000	$300,000	$300,000	**$2,732,720**
Ongoing Software Licensing & User/Transaction Based Fees	$0	$809,637	$809,637	$809,637	$809,637	$809,637	**$4,048,185**
Hosting - Internal or External	$0	$331,200	$331,200	$331,200	$331,200	$331,200	**$1,656,000**
IT Infrastructure/Equipment	$3,500,000	$100,000	$100,000	$100,000	$100,000	$100,000	**$4,000,000**
ODOC Staffing	$5,068,557	$677,368	$200,000	$200,000	$200,000	$200,000	**$6,545,925**
Professional Services	$4,925,000	$500,000	$300,000	$300,000	$300,000	$300,000	**$6,625,000**
Project Costs + O&M Yearly Spend	**$17,680,477**	**$2,718,205**	**$2,040,837**	**2,040,837**	**$2,040,837**	**$2,040,837**	**$28,562,030**

3.1.5. Risks – 5

#	Risk	Probability	Impact	Criticality
3.1	DOC's lack of experience with EHR systems and automated workflows makes it likely that newly defined workflows will be less than optimal at first and will require re-working of the business process and configuration decisions.	High(3)	Medium(2)	High(6)
3.2	Because of limited health information exchange (HIE) options vendor may have more difficulty integrating with HIE and ODOC may have to employ manual processes to exchange health information with partners for continuity care.	Medium(2)	Medium(2)	Medium(4)
3.3	Vendors have a moderate level of implementation experience, but limited State of Oregon experience, and might experience delays or cost increases from unexpected challenges.	Medium(2)	Medium(2)	Medium(4)

3.4	Interfaces with OMS and partner systems may require additional system integration work on the part of DOC to develop and maintain information exchange between systems.	Medium(2)	Medium(2)	Medium(4)
3.5	In order to support operations, it may be necessary to employ additional report writing and configuration analysts to support Oregon corrections specific needs and administration across all locations.	Medium(2)	Low(1)	Medium(2)
	Total Risk Score			**20**

Analysis Summary

	Continuity of Care	**Evidence-based Decision Making**	**Modern Technology Platform**	**Total Projected Cost (Implement + 5 yr M&O)**	**Investment Risk**
Existing/ Shared Service EHR Solution	**Strong Alignment (3.8/5)**	**Superior Alignment (4.5/5)**	**Strong Alignment (4/5)**	**$35,972,325 (4/5)**	**Medium (3.3/5)**
Comprehensive EHR Solution	**Strong Alignment (3.5/5)**	**Superior Alignment (5/5)**	**Superior Alignment (4.2/5)**	**$44,220,327 (3.2/5)**	**Medium (3.8/5)**
Corrections Specific EHR Solution	**Superior Alignment (4.7/5)**	**Superior Alignment (4.7/5)**	**Strong Alignment (3.7/5)**	**$28,562,030 (5/5)**	**Low (5/5)**

Conclusions and Recommendations

The previous business case, prepared in 2016, focused on whether ODOC should (1) procure and implement commercial off-the-shelf (COTS) on-premises EHR, (2) procure and implement a Software as a Service (SaaS) EHR, (3) develop a custom EHR, or (4) procure and implement a document imaging system. The conclusion of the Stage Gate 1 analysis (see Appendix 14 – ODOC EHR Stage Gate 1 Business Case) was "that an on-premises COTS or SaaS based EHR would effectively meet the mission-critical business and technical needs of ODOC HS." The analysis and recommendations of this business case represent a continuation and refinement of that conclusion. All solutions considered for this business case are COTS, SaaS or are offered as either by the solution vendor.

Conclusions

The alternatives analysis revealed that procuring an existing solution through a shared service contract with a partner State of Oregon agency is not viable because: (1) current OYA and OSH contracts cannot be easily adapted to a shared service model with ODOC, (2) as implemented the existing solutions lack functionality that is needed by ODOC, and (3) procuring an existing system is expected to be more costly than the alternatives.

While any of the proposed alternatives could be successful in transforming health services and modernizing their technology platform, the Corrections-specific solutions were determined to be the best alternative. These solutions, generally, include the core functionality provided by the other alternatives, and they have been "right-sized" and "optimized" for health services in a corrections environment. "Right-sized" meaning they do not include functionality that might be required in a typical clinic or hospital environment but is not essential in a corrections environment. This results in acquisition cost savings and more streamlined technical footprint. "Optimized" meaning functionality has been enhanced or added to support the unique requirements of an EHR in corrections.

Each of the three alternatives includes the core functionality and workflows required to support clinical care. With respect to medical care these features are quite mature across alternatives. Other program areas within Health Services, including behavioral, pharmacy, and dental, have varying degrees of maturity across vendors. Some vendors do not adequately support these program areas while other vendors have tailored solutions exclusively for dental or behavioral health programs.

Existing solutions and Comprehensive solutions have much in common. In fact, both Existing solutions considered are implementations of Comprehensive solutions at State of Oregon agencies. Each of the Existing solutions have been configured for State of Oregon but

include only a subset of the features available in Comprehensive EHR solutions. Corrections-specific solutions generally include modules similar to the Comprehensive solutions. Corrections-specific solutions include at least 2 vendors that are based upon products from Comprehensive solutions vendors with corrections specific customizations.

Only the Corrections-specific solutions include pre-configured features to support workflows that are unique to corrections such as:

- Medications are dispensed in "med lines", up to three times per day and in many locations. Hospitals typically dispense medications individually. Clinics don't generally dispense medications, relying on retail pharmacies.
- In addition, some medications and other care is mandatory for some AICs. Nearly all care outside of a corrections setting is done with consent and therefore EHRs often don't account for documentation needs of involuntary care.
- ODOC does not bill insurance companies and therefore would be severely burdened by charge capture technology included in nearly all EHRs.
- Clinical care is complicated by offender management. Custody level, segregation, PREA status, and other restrictions complicate care delivery relative to other outpatient care settings where patient flow starts and ends at the front desk.
- Intake of new patients in a corrections environment is complex, multi-step process that mixes elements of registration, health screening, and assessment.

Existing solutions have partially considered some of the corrections' specific features, but the workflow and scale of these in ODOC is significantly different. In order to implement either an Existing or Comprehensive solution ODOC would have to work with the selected vendor to configure or customize features similar to functionality that is already mostly developed in the Corrections-specific solutions.

Recommendations

ODOC proposes to procure an EHR solution through a competitive procurement. A competitive procurement will encourage all vendors with viable solutions to think creatively about how they can support ODOC in achieving the project objectives. It is also the best way to acquire a Corrections-specific solution yet would also allow other shared service and commercial vendors to compete on a level playing field while encouraging them to be innovative in their approach and pricing.

The EHR project will work with procurement to ensure COBID certified vendors are given the maximum opportunity to participate in the project. Additionally, ODOC anticipates hiring a number of limited duration staff to support the EHR implementation. Hiring of limited duration staff will be done in consultation and alignment with Oregon's standards for diversity and inclusion.

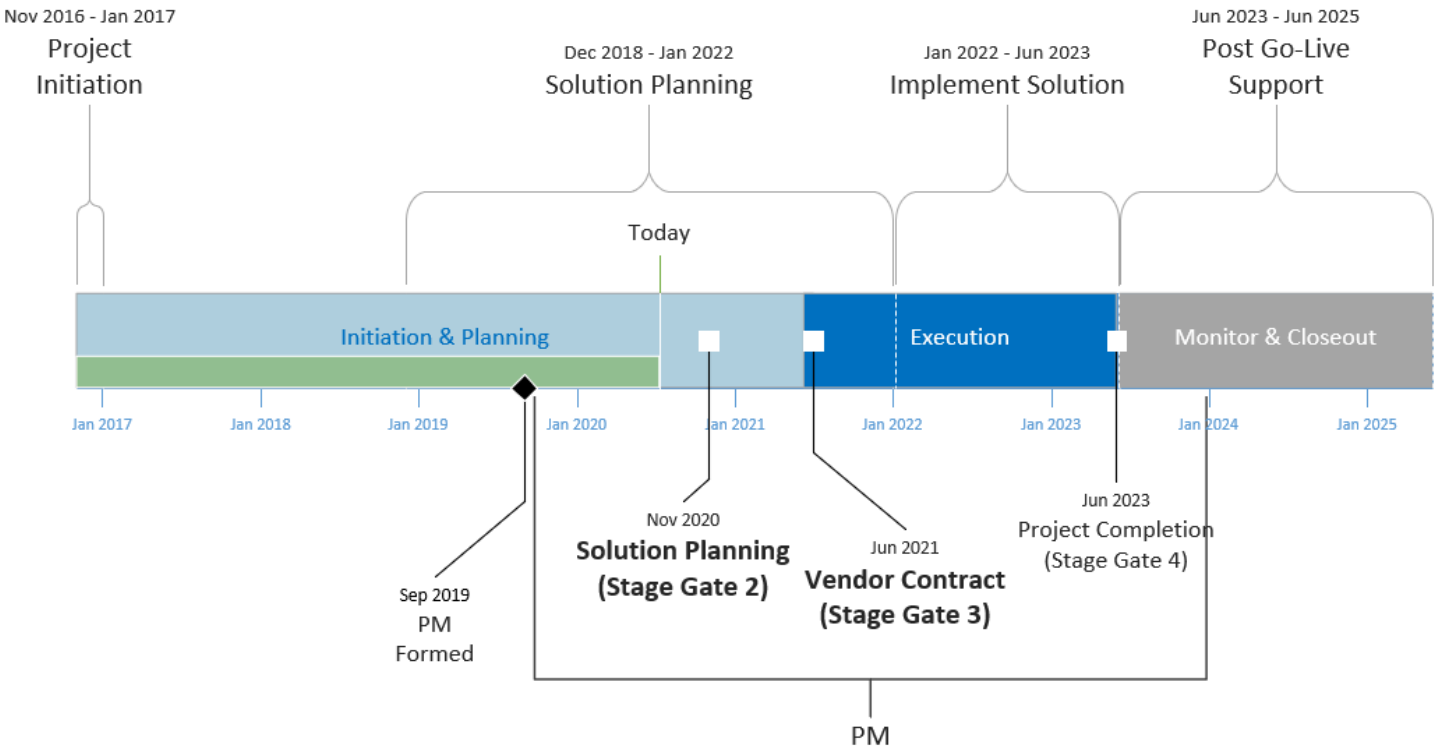
The return on an investment in a modern EHR System goes well beyond improved worker productivity. In fact, there will not be less work to do. More importantly, it will provide Health Services staff with better access to information that will enable them to focus more on the health care of individuals and across the population. It will create the infrastructure needed for continuity of care within the corrections environment and after release. An EHR will dramatically improve Health Services' ability to identify high-risk individuals, which is critically important at times of crisis, such as during the COVID-19 pandemic, so that appropriate precautions and care can be targeted to benefit high-risk individuals as well as the entire population. Upon release having an EHR will enable the smooth transition of care planning information from Health Services to community providers. That continuity of health care services from DOC to the community is a foundation of keeping newly released AIC's healthy, and stable health is a critical element of an individual's success in the community.

ODOC proposes to fund the EHR Implementation in part by leveraging elements of the current Agency budget supplemented by additional General Fund allocations. The ODOC staffing will be comprised of existing ODOC FTEs and $5 million is being requested for 23.5 additional FTEs, most of which are planned as limited durations positions. The IT Infrastructure will be largely funded through the current operational budget and $3.5million is being requested for additional IT infrastructure costs. Software and related professional services are partially funded by the previously approved $1.5million for planning and $18.4 million is being requested for the design, implementation, and transition to operations. A budget request of $18.4 million will be submitted for the 21-23 biennium to fund the EHR Implementation project through completion.

HIGH-LEVEL TIMELINE BY PHASE, BIENNIUM, TASK, COST

Phase (endorsement received)	Biennium	Description	Total
Concept (Stage Gate 1)	2015-2019 (Funded)	• Business Case – High Level • PM / BA through June 30, 2017	Completed
Initiation & Planning (Stage Gate 2)	2019-2021 (Funded / Supplemental	• Professional Services ($411 thousand) • Data Processing Services	$1,500,000 (funded) $474,000 (Supplemental)

	Request)	• Staffing ($63 thousand) • Facilities Work	
Execution (Stage Gate 3)	2021-2023 (Requested)	• Professional Services ($4.9 million) • Data Processing Services ($5 million) • Staffing ($5 million) • Facilities Work/equipment ($3.5 million)	$18,400,000
Monitor & Closeout (Stage Gate 4)	2023-2025 (Planned)	• Professional Services ($800 thousand) • Data Processing Services ($3 million) • Staffing ($877 thousand) • Facilities Work ($200 thousand)	$4,877,000



Consequence of Failure to Act / Risk of not investing

While there are clear risks associated with procuring and implementing an EHR system, the risk of inaction— choosing the status quo— poses the continuation of persisting business and technical problems hindering the ability to provide patient healthcare. Instead of improving overall data quality, security, and sharing of health care decisions, paper file folders will continue to accumulate, creating more operational challenges with storage and/or facing the risk of a potential confidentiality breach. Furthermore, the timely accessibility to health records data will continue to pose issues, as an estimated $3 million per year is spent on activities associated with locating and moving paper health records. This is not to mention the day-to-day physical and scheduling strains associated with the paper file folders themselves, which an EHR solution could address and make efficient.

Without providing HS staff and administrators more modern digital toolsets designed to help share and leverage patient medical history, staff will continue to resort to manual processes and supplemental technology systems as “workarounds” due to the deficiencies of the current paper/electronic patchwork system(s). This business process avoids the seamless integration of patient- and evidence-based information making accurate, precise, compliant, and meaningful measurement reporting (e.g., CORE, KPMs, and other performance initiatives) more difficult. ODOC health care grievances will also be more difficult to track and respond too. Choosing not to modernize business processes and systems, ODOC will miss an opportunity to advance technologically to what would be considered acceptable national healthcare standards and fall further behind Federal, State Executive Orders, DAS, OSCIO, other governing agencies, and national health systems.

Finally, not acting does not only affect internal efforts; it limits the potential participation and streamlining of services/partnerships with outside parties who have a stake in the quality of ODOC health services, e.g., hospitals, doctors, critical care facilities, and other ODOC partners. With limited participation and exchange of information, the continuity of care provided to patients is limited, making it more difficult for ODOC to achieve its mission to provide the highest level of public safety possible and reducing the risk of future criminal behavior.

Project Risk Summary

#	Risk	Criticality	Mitigation
1	Resistance to changing existing business processes to effectively utilize the new software may delay or reduce the realization of planned business benefits	High	Develop organizational change management strategy and establish an OCM program to engage stakeholders to identify and define process changes.
2	Over customization of the EHR solution may increase the cost and time to implement and increase M&O complexity.	High	Place an emphasis on configuration instead of customization and adhere to strong change control process.
3	Lack of available HS's staff to participate in project work groups may cause project delays and/or result in solution configuration choices that negatively impact operations.	High	Identify resource requirements, develop and manage to staff management plan, including the addition of limited duration staff to minimize the effect on HS operations.
4	Changes in policy and/or collective bargaining agreements may affect the implementation schedule	Medium	Allow for contingency time in the schedule to address changes and adhere to strong change control process.
5	Lack of availability of key-skilled vendor resources with corrections experience may impact the schedule	Medium	Emphasize experience with corrections in procurement of solution vendor and include in contract terms and conditions the requirement for state approval of key vendor project staff.

Critical Success Factors

Based on best practices and analysis of the risks identified with the project the project team has identified six (6) critical success factors for this project. Each of these critical success factor categories is discussed below.

Establish and follow a strong governance model

The primary purpose of a governing structure is to resolve issues and remove roadblocks. Therefore, the project team must ensure that it continues to engage the project sponsor and stakeholders in the ongoing project work. The EHR Implementation Project has a strong governance structure with an executive sponsor, an executive steering committee, project management team, engaged project team.

Select a proven solution and experienced implementation vendor

It is essential that ODOC select proven EHR solution and an implementation vendor with experience implementing in an environment similar to ODOC. This will provide ODOC with a modern platform that is flexible, scalable and more easily supportable and maintainable, resulting in it being easier to make system modifications in response to future changing business needs and evolving statutory requirements.

The EHR project will work with procurement to ensure COBID certified vendors are given the maximum opportunity to participate in the project.

Engage a qualified vendor to perform the implementation project

It is important that the ODOC select a qualified vendor to implement the EHR. The vendor needs to have multiple prior successful EHR implementations of similar size and scope with the selected software solution. Likewise, there should be a strong preference for a vendor with prior State of Oregon and/or corrections EHR implementations.

Provide adequate resources including both financial resource and ODOC staff

It is a fact of life that projects are limited by the amount of resources available and these limitations influence the project's success. Resources fall into three categories: time, money and workforce. There are several ways to compensate for shortages or inadequacies in any of these limitations. Each project must be managed within its specific environment using a combination of strategies.

Minimize customization and implement a structured change management process to control scope

Emphasize business transformation by adopting best practices designed into the proven EHR solution and making changes to HS' business practices that will improve operations and minimize customization of the solution. It is essential that the ODOC engage rigorous scope management practices. This includes implementing a structured change control process which includes review and approval by the project steering committee and project sponsor for any material changes in project scope, schedule and budget.

Make organizational change management a critical part of the implementation solution

With implementation of an EHR nearly all Health Services staff will be affected by the project in some way. A key success factor will be to prepare Health Services staff for the functionality of the new system and for significant changes in business processes.

Appendix 1 – Governance Structure

Appendix 2 - EHR Solution Analysis Financials

Appendix 3 - Staffing Plan

Appendix 4 - OCM Plan

Appendix 5 - Market Scan

Appendix 6 - OHA report on EHRs and HIEs

Appendix 7 - ODOC EHR As-Is Analysis

Appendix 8 - As-Is Diagrams (Intake)

Appendix 9 - As-Is Diagrams (Medical)

Appendix 10 - As-Is Diagrams (BHS)

Appendix 11 - As-Is Diagrams (Dental)

Appendix 12 - As-Is Diagrams (Release)

Appendix 13 - As-Is Diagrams (Core)