Case Study Project: E-Healthcare in ABC County Health Department (ABCCHD):

Trade-Offs Analysis and Evaluation

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1   Executive Summary

- As a public health issue within the United States, 43 percent of children under 18 years of age, according to the 2015 study, Basic Fact about Low-Income Children: Children under 6 Years, 2015 according to Jiang et al. (2017), live in poverty. Although the U.S. Census Bureau defines poverty by socioeconomic status (SES) (Koebnick et al., 2012), thresholds vary by the minimum of resources specified by the dollar amount.

- The software will present a multi-objective function for the management and the need to redefine the performance measures for clinical and research purposes.

- Apply epidemiological analysis the ensure the effectiveness of the community-based inventions, infrastructure protection, accurate laboratory diagnosis, faster turnaround of test results, and health promotion efforts.

- By adopting standards for the security of electronically protected health information to be implemented by health care providers, the use of security and privacy standards will facilitate public health efforts (Dimitropoulos & Rizk, 2009; Yasnoff et al., 2001) to address poverty as a social determinant of health.

   I.   Initiation

         a. Define Scope

         b. Obtain Authorization

   II.   Planning

         a. Requirements to Establish the Scope of the Project

         b. Define the Course of Action

   III.   Execution

         a. Complete the Work Defined

      b. Satisfy Project Specifications

IV.   Monitor and Control

      a. Track, Review, and Regulate the Progress and Performance of the Project

      b. Identify Changes and Initiate the Corresponding Change

V.   Close Project

      a. Finalize All Activities, Archive Information, and Complete Planned Work

      b. Measure Success and Failures

2   Business Problem

2.1   Environmental Analysis

- Privacy and cost of privacy

- New e-healthcare system

- Analysis of debate issues to include privacy protection of STD/HIV patients, information access and control, and the cost of privacy

2.2   Mission

a. Assess the community health status and determine whether the community has adequate resources to address the problems that are identified

b. Address identified issues by developing heath policies and recommending programs to carry out those health policies

c. Assure that necessary, high-quality, valuable services are available, including the responsibility for quality assurance through licensing and other mechanisms.

2.3   Problem Analysis

- How should the tradeoff be managed?

a. Should there be a tradeoff between privacy concerns and system efficiency?

    b. Should there be a tradeoff between privacy concerns and the system's cost?

    c. What should be the cost of privacy? How do you determine the price?

    d. What should be the criteria used to evaluate the tradeoff?

- What are the advantages and disadvantages of each alternative?

    a. Which of the three alternatives is the most effective in preventing information abuse and thus safeguards STD/HIV patient records?

    a. Which of the three alternatives is the most efficient?

    b. Which of the three alternatives is the least expensive?

- What are the recommendations?

2.4   Business Opportunity

- Identify the most effective ways to communicate with vulnerable and underserved communities

- Understand the current and future role of e-health

- The transition from paper-based records to Electronic Health Records (EHR)

- STD/HIV prevention counseling

- Test for all persons with a defined population

- Communicate elements of informed consent between patient and provider

3   Available Vendors

3.1   **Vendor 1 – Cerner Corporation** (Cerner.com, 2020)

3.1.1   Description

Cerner solutions are offered on the unified Cerner Millennium architecture and on the HealtheIntentSM cloud-based platform designed to scale at a population level while facilitating

health and care at a person and provider level. Cerner Millennium is a person-centric computing

framework with integrated clinical, financial, and management information systems.

This architecture allows providers to securely access an individual's electronic health

record (EHR) at the point of care. It organizes and proactively delivers information to meet the

specific needs of physicians, nurses, laboratory technicians, pharmacists, front- and back-office

professionals, and consumers.

3.1.2 Benefits (Cerner Annual Report, 2019)

Category	Benefit Description	Value
Financial	• Revenue growth in (2019) • Quarterly dividends and share buyback program (2019) • Repurchase program (2019)	$5.69 billion $1.4 billion $1.4 billion
Operational	• 1000 data connections, 60 connected EHR systems, and 140 connected claims and payer vendors • Team members volunteered their services with 1,300 organizations focused on diversity, civic issues, children's health, and environmental change • Through recycling, diverted 300 tons from landfills	2019 2019 2019
Market	• 3 million healthcare professionals access Cerner's systems per day • Manage 250 customers around the world	N/A
Customer	• Migrated 23.5 million historical records for Veterans • Created international collaboration and innovation between Intermountain and Royal Free London Hospitals	- Provides integrated care to Veterans, services members, and their families - Teledermatology resulted in a 51% reduction in unnecessary clinic referrals
Management Team/Board of Directors	• 10 Board of Directors and 25 members in senior leadership roles (16 years of board tenure) • Named to Women Inc.'s Most Influential Corporate Board of Directors	-70% male and 30% female -Since 1986, 40 years of growth as a leader in digitized health (2019)

	• 24,400 employees worldwide (2019)	

3.1.3 Costs (Cerner Annual Report, 2019)

Category	Expense Description	Value	Expense Type
People	• Funding Round – Carevive Systems (2020) • Funding Round – Voalte (2015) • Funding Round – Cureatr (2015)	$14,955,871 $17,000,000 $13,000,000	OPEX OPEX OPEX
Physical	• Locations – 6 million gross ft of real estate in the Kansas City Metro Area and Malvern, Pennsylvania • Total software development	$1,858,772 $737,136	NWC CAPEX
Marketing	• Acquired the Health Services business from Siemens AG • Sales and client services	$1.3 billion $2.68 billion	OPEX OPEX
Organizational	• Domestic operating expense • International operating expense	$2,398,422 (2019) $276,914 (2019)	OPEX OPEX

3.1.4 **Feasibility** (Investors.cerner.com, 2005)

Component	Rating (1-10)	Method Used to Determine Feasibility
New Technology	9	Cerner Millennium architecture results in a decrease in errors while increasing solutions converted to operating cycles
New People	10	Recognizing that relationships are among critical success factors, their approach is to encompass implementation and adoption; quality of care, patient safety, and provider relations to ongoing service exchange
New Processes	9	In the prevention of medication errors, Computerized Physician Order Entry (CPOE) uses decision-support to determine condition is appropriate for the type of medication

New Assets	9	Focused on causes and cures in healthcare, CernerOpen Platforms drive collaborative third-party relationships to innovate with IT successfully

3.1.5 **Risks** (Cerner Annual Report, 2019; Investors.cerner.com, 2005)

Description	Likelihood	Impact	Risk Mitigating Actions
Involuntary termination, pre-tax charges of $34 million	Medium	Medium	Minimize legal risks
Contract with customers	Medium	High	Examples of intellectual property that involve software solutions can be accounted for as separate performance obligations
Market fluctuations within variable interest rates	Low	Very High	Interest rate swap with a securities underlying asset at its spot price

3.1.6 **Issues** (FHIR.Cerner.com, 2020)

Issue Description	Priority	Action Required to Resolve Issue
API Usage	High	Use appropriate scopes for SMART Application Launch
Center Client Deployment	High	Distinguish between Patient Chart and Organizer view
Security	High	Define trust boundaries during runtimes and verify flow diagrams display authentication and authorization actions

3.1.7 Assumptions

According to Healthcare IS (2020), it is incumbent upon businesses to develop customer knowledge; customers understand the subjectivity of contractual agreement and a self-assessment of the software devilment process.

3.2   **Vendor 2 – Allscripts** (Developer.allscripts.com, 2020)

3.2.1   Description

Founded in 1981, Chicago-based Allscripts Healthcare Solutions, Inc. is a publicly-traded American company that provides 24,000 physicians, 2,500 hospitals, and 20 million consumers with original records. Integrating automated decision support systems, Allscripts also provides solutions for best practices to sustain patient engagement, ensure ACOs remain compliant with Stark Law and the Anti-Kickback Statutes (Gordon, 2013), and explores applications for advanced analytics in banking and fiancé (Malec & Malec, 2014).

3.2.2   Benefits (Allscripts.com, 2020; *Investors.allscripts.com, 2019)*

Category	Benefit Description	Value
Financial	• Annual revenue (2019) • Gross profits (2019) • Shares of stock issued (2019)	$1,771,677 $713,580 272,609
Operational	• Support Wounded Warrior Project • New York State's most extensive health system •	- 2019 - 2020
Market	• License content from OptumInsight and 3M Health Information Systems that are incorporated in solutions • EPSI, the Integrated database, has helped recover millions	- 2016 - 1999
Customer	• Provides 24,000 physicians, 2,500 hospitals, and 20 million consumers with intelligent records Pro-Diary now logs motion as standard • Diversified customer base	- Serves as the foundation to put health information into the consumer's hands - No more than 10% came from any one client
Management Team/Board of Directors	• Paul Black serves as CEO and spent 13 years with Cerner • 9,600 employees worldwide	- Guides the company's vision to build a brighter future of cultural networks of health - The union represents all employees

3.2.3   Costs (Investors.allscripts.com, 2019)

Category	Expense Description	Value	Expense Type
People	• Merged with Misys Healthcare Systems in 2008 • 362 shareholders of common stock • Sold all Class A Common Units	- $16,500,000 - Dividends have not been paid within the last two years - $566 million	OPEX OPEX OPEX
Physical	• HQ in Chicago, IL • Leases 1.3 million square ft of building space worldwide	- Unknown	- CAPEX - Intangible
Marketing	• Stock Purchase Program (2018) • Client services revenue (2019) • Increased contract backlog	- Repurchase $250 million common stock for $9.3 million - $645 million - $4.4 billion	OPEX CAPEC OPEX
Organizational	• Net tax loss from discontinued operations (2019) • Administrative expenses (2019)	- $206,516 - $449,774	OPEX OPEX Intangible

3.2.4   Feasibility (Investor.allscripts.com, 2020)

Component	Rating (1-10)	Method Used to Determine Feasibility
New Technology	8	Work to migrate the U.S Department of State medical health units to a cloud-based EHR solution
New People	7	The USA is home to almost one million people with Parkinson's, and doctors diagnose as many as 60,000 new cases per year
New Processes	9	Inversely related to displacement efficiency, the less structured process may omit variable problems. Working off of the same database, integrated EHR systems reduce human resources and save money
New Assets	7	Down 3% from Q1 2019, Allscripts reported $417 million in revenue (Fiercehealthcare.com, 2020)

3.2.5   Risks (Investors.allscripts.com, 2019)

Description	Likelihood	Impact	Risk Mitigating Actions
Healthcare fraud	Medium	Very High	HIPAA and HITECH violations could hurt business necessities, financial channels, and operational efficiency
The Affordable Care Act (Protection & Act, 2010)	Medium	Medium	Could increase government involvement in healthcare
Cultural differences in interaction practices	Low	High	Achieve market acceptance for products and services

3.2.6   Issues (EHRintelligence.com, 2019; Healthcareitnews.com, 2018).

Issue Description	Priority	Action Required to Resolve Issue
Criminal investigation, EHR vendor Practice Fusion receives grand jury subpoena	High	Remain compliant with Stark Law and the Anti-Kickback Statutes
SamSam ransomware caused service outages to 1,500 clients	High	- Close access to Remote Desktop Protocol (RDP) ports from outside the firewall - Communicate the breach immediately to restore customer confidence
Lawsuits assert that the product is inferior	High	Provide free upgrades

3.2.7   Assumptions

Assuming that your vendor is affiliated with your local hospital, taking advantage of initiatives to lower the overall cost of healthcare, such as e-prescriptions, reduces maintenance. It provides solutions for best practices to sustain patient engagement.

4   Recommended Option

Compare the alternative options available and rate them to identify a recommended option for implementation.

Criteria	Cerner Corporation	Allscripts Healthcare Solutions, Inc.
Benefits • Increased revenue • Reduced expenditure • Improved efficiency • Enhanced quality • Other	*10*	*8*
Costs • People • Physical • Marketing • Organizational • Other	9	*7*
Feasibility • Technology components • People components • Process components • Asset components • Other	9	*9*
Risks • Resourcing • Technology • Organizational • Other	9	*7*
Total Score	**37**	*31*

4.1   Vendor Recommended

Assessing interoperability solutions to the Internet of Things (IoT) puts the needed

information at providers' fingertips. Within the EHR, providers spend less time searching,

entering, and retrieving patient information and more time responding to patient questions (Joos,

Wolf, & Nelson, 2019). Shared freely across geographical and technological interactions, a

comprehensive indexing system facilitates patient communication and personalized medicine for

clinical decision support. The challenges you face in the historical perspectives of hospitals and

health services are both unique and complex, and without a coherent set of policy objectives,

ineffective the system remains disjointed and inefficient despite the rising cost of healthcare

(Lafferty, 2016)

As a person-centric computing framework, which includes integrated clinical, financial,

and management information systems, the architecture allows providers to securely access an

individual's electronic health record (EHR) at the point of care. It organizes and proactively

delivers information to meet the specific needs of physicians, nurses, laboratory technicians,

pharmacists, front- and back-office professionals, and consumers. Exceeding $6.6 billion in

Research & Development (R & D), Cerner will continue to deliver a set of financial and

operational metrics that leverage Business Intelligence (BI) to clinical healthcare, enabling the

clinician to make more informed decisions at the point of care.

5   Appendix

5.1   Supporting Documentation

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