LDR609-OA: Health Care Systems Management

Business Plan: 2D to 3D Mammotomsynthesis Upgrade

McDonough District Hospital Department of Imaging Services

Senior Leadership Briefing

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Proposal

Service Definition

McDonough District Hospital (MDH) located in west-central Illinois in the town of Macomb, Illinois hospital is a 48-bed healthcare facility providing an impressive spectrum of advanced medical treatments and personalized health services. The hospital has been a source of healing, caring, and hope to the people of west-central Illinois since 1958. MDH is the only acute healthcare facility in McDonough County. The Residents of McDonough County, IL that prefer 3D mammography currently are traveling to the cities of Galesburg, Peoria, Quincy, or Springfield, IL to facilities that offer the 3D mammogram technology. 3D mammogram (breast tomosynthesis) is an imaging test that combines multiple breast X-rays to create a three-dimensional picture of the breast. 3D mammography is used to look for breast cancer in people who have no signs or symptoms (www.mayoclinic.org).

When patients receive 3D mammograms in other cities, many of them continue their healthcare in those cities. Trends in healthcare reflect that the adult female in the household is the primary influence on where the entire family receives care. Physicians in the McDonough Medical Group are concerned that when their patients leave the health system for 3D mammography, some switch their primary care physician and leave the practice. By partnering with Hologic (who is the current manufacturer of the 2D unit) for the upgrade to 3D, the new technology will be essential with keeping the county residents local and retention in the health system (www.mdh.org).

Market Analysis

1. Customer Definition

McDonough County, IL contains an estimated 32, 600 residents with a median household income of $42,911. 22.3% of residents are below the federal poverty level. Macomb, IL is the county seat and its population is 17, 559. Like the rest of the county, Macomb is considered a rural town. With the distinction of also being the home of Western Illinois University (WIU). WIU is the largest employer in McDonough county (Datausa, 2019).

As previously stated, MDH is the only acute healthcare facility in McDonough County. Residents of McDonough County, IL travel more than seventy miles to the cities of Galesburg, Peoria, Quincy, or Springfield, IL for services and medical specialties not offered at MDH.

The economy of McDonough County, IL employs 13, 800 people. The largest industries in McDonough County, IL are Educational Services (3,102 people), Health Care & Social Assistance (1,727 people), and Retail Trade (1,722 people), and the highest paying industries are Educational Services ($39,829), Utilities ($36,667), and Manufacturing ($36,240) (Datausa, 2019).

2. External Market Assessment

The most common jobs held by residents of McDonough County, IL, by the number of employees, are Office & Administrative Support Occupations (1,905 people), Sales & Related Occupations (1,487 people), and Education, Training, & Library Occupations (1,434 people). Major payers such as WIU, agriculture, law enforcement, retailers and manufacturers, a benefit for the occupational health and outpatient health services offered at MDH. 93.7% of the population of McDonough County, IL has health coverage, with 51% on employee plans, 14.6%

on Medicaid, 11.3% on Medicare, 15.4% on non-group plans, and 1.4% on military or VA plans (Datausa, 2019).

Per capita personal health care spending in the county of McDonough County, IL was $8,262 in 2014. Primary care physicians in McDonough County, IL see 2089 patients per year on average, which represents a 4.87% increase from the previous year (1992 patients). Compare this to dentists who see 2818 patients per year, and mental health providers who see 633 patients per year (Datausa, 2019).

External threats to MDH not offering 3D mammograms are competing HCOs in neighboring towns within a seventy-mile radius encompassing Illinois, parts of Iowa and Missouri. The Residents of McDonough County, IL that prefer 3D mammography currently are traveling to the cities of Galesburg, Peoria, Quincy, or Springfield, IL or Hannibal, MO.

3. Competitors

MDH is the only hospital in the west-central Illinois region that does not offer 3D mammography. In less than a two-hour drive, patients seeking a 3D mammogram can reach large HCOs or university HCOs like OSF, HHS, Quorum, CHS, SIU Medicine surround McDonough District Hospital from the West to Keokuk, IA, East to Galesburg, IL, North Peoria, IL and South Springfield, IL.

4. Promotion

MDH hosts a Breast Cancer Awareness forum that is open to the public. During the October event, breast cancer survivors, mammogram technologists, and radiologists provide testimonies, presentations, and information regarding the hospital's services for the early detection of cancer. The community is taken on a tour of the mammo suite and radiology department.

McDonough District Hospital, promotion goal has always been to deliver the highest quality care to our patients and the communities we serve. We continue to do that by adding 3D Mammography to our mammography suite. surrounding our value statement, “We embrace our responsibility to promote health and well-being” (MDH.org).

Internal Assessment

1. Strategic Fit

The mission of McDonough District Hospital, in partnership with its Medical Staff, is to provide health services with a personal approach to care that enhances the quality of life. The hospital’s core values are honesty and integrity, respect, exceptional service, commitment to excellence and teamwork. The vision statement of MDH is, “To be your First Choice for First Class Health Services.” Without offering 3D mammography, the hospital is not living up to its core value of excellent service or its vision statement. (MDH.org).

2. Market Position

Department directors from Finance, Clinical Engineering, Materials Management, Information Systems, Patient Financial Services, Patient Registration, Environmental Services, and Public Relations will be members of the project team lead by the Director of Radiology. The implementation of 3 D mammography will assist in increasing the hospital’s, market position in the county and in the city of Macomb because patients will no longer have to travel two hours to receive a 3 D mammogram.

The market position also presented a commercial risk for the organization. The commercial intent (profitability), a constant unknown is their degree of commercial success MDH would have with the introduction of 3D mammography into the regional market. With MDH being the last hospital in west central Illinois region to provide the 3D imaging

technology, the hospital had to address how to successfully introduce a new service to physicians and patients accustomed to going elsewhere for the exam. These risks were considered a medium priority (Shrestha, R., 2013).

3. Organization

The responsibility for directing the 3 D mammography will be the Department of Radiology. Central Scheduling will receive the order from the referring physician office, or the patient will call for an appoint with their mammogram referral.

4. Patient Service Cycle

Upon arrival to radiology for the mammogram, the technologist will screen the patient and explain the authorization for 3D mammography. 3D Mammography is approved for all women who would be undergoing a standard mammogram. Multiple clinical studies, regardless of breast type or density, benefit from 3D Mammography. Very low x-ray energy is used during the exam, just about the same as a film screen mammogram. The total patient dose of a Genius 3D mammogram is well within the FDA safety standards for mammography. Medicare currently reimburses for the 3D Mammography. The State of Illinois requires insurers and Medicaid to cover 3D mammography. However, insurance coverage can vary. The patients are informed that if you choose 3D mammogram imaging unless you are covered by traditional Medicare, you may be responsible for paying all or a portion of your 3D exam.

Financial Analysis

1. Demand Assumptions

With the upgrade from 2D to 3D mammography, volumes are expected to rise as patients are choosing to drive out of town or out of state for 3D mammograms.

2. Resource Assumptions

The single 3D mammo unit will operate Monday, Wednesday and Friday from 7:30 am to 5:00 pm. On Tuesdays and Thursdays, the unit will have hours from 7:30 am to 7:30 pm and Saturday from 8:00 am until 12:30 pm. Four FTEs will staff the mammography department.

3. Pricing Assumptions

3D mammography price at $300.00 per procedure with an annual inflation increase of 3%-5 %.

4. Pro Forma Financial Statements (table 1)

Revenue Stream

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Exams per year (5% annual volume increase)	2,600	2,730	2,867	3,010	3,050	14,256
Revenue per year	**780,000.00**	**832,650.00**	**880,169.00**	**918,050.00**	**930,250.00**	**4,341,119.00**

Operational Expenses

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Employee costs incl. Benefits	236.870.40	236.877.50	$236,962	$237,004	$237,103	$711,068
Facility costs	$0	$0	$0	$0	$0	$0
Operating costs	$0	$0	$0	$0	$0	$0
Service costs	$0	$58,000	$58,000	$58,000	$58,000	$232,000
Total Operational Expenses	**$0**	**$58,000**	**$294,962**	**$295,004**	**$295,103**	**$943,068**

Capital expenses, depreciation, etc.

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Depreciation Equipment (if cash deal)	$0	$0	$0	$0	$0	$0
Other depreciation	$140,000	$140,000	$140,000	$140,000	$140,000	$700,000
Lease payments (if FMV or CL)	$0	$0	$0	$0	$0	$0
Total CapEx, depreciation, etc.	**$509,402**	**$509,402**	**$509,402**	**$509,402**	**$509,402**	**$2,547,008**

Profit (before taxes)

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Profit before taxes (negative in red)	**$270,598**	**$265,248**	**$75,806**	**$113,644**	**$125,746**	**$ 851,042**

Profit (after taxes)

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Income Tax	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
PROFIT after taxes (negative in red)	**$1,015,535**	**$982,982**	**$1,136,520**	**$1,301,996**	**$1,479,983**	**$5,917,016**

Cash Flow

	Year 1	Year 2	Year 3	Year 4	Year 5	TOTAL
Cash Flow (negative in red)	**$574,010**	**$1,231,363**	**$1,384,802**	**$1,550,174**	**$1,728,393**	**$6,468,743**

Return on Investment/ Present Value

Net present value of cash flow	**$851,042**
5 Year Average Annual Net Revenue	**$170,208**
Internal Rate of Return (IRR)	**n/a**
Return on Investment:	**2.36 years**

Implementation Plan

1. Implementation Timetable

Upon budget and capital approval from the MDH Board of Directors, the financing for the purchase agreement for the 3D equipment and software will commence. Department directors from

Finance, Clinical Engineering, Materials Management, Information Systems, Patient Financial Services, Patient Registration, and Environmental Services will be members of the project team lead by the director of Radiology and the project manager from Hologic. During the four-month 3D project, Senior Leadership will receive weekly updates from the Directors of Radiology, Engineering, Information Systems and the Hologic project manager (Block, J.)

The scope of the four-month conversion project is to upgrade the current Hologic 2D mammography unit to the latest version of Hologic's 3D mammography system and install the Secure ViewTM imaging workstations in the radiologists reading room. The project team will consist of several interdependent phases developed before the start of the project.

The first stage is the Procurement Strategy Phase is comprised of a committee of stakeholders including radiologists, administrators from finance, IT, clinical engineering, purchasing and Senior Leadership. The committee's purpose was to develop the RFP documentation, select a vendor and finalize the purchase agreement and service contract (Chantziantoniou, K., 2016).

The Initiation Phase is the fourth stage of the project. The project team now functions to identify; the key stakeholders and hot spots (with impact level or risk factor), keep project task activities going per the timeline, resolve issues and activate contingency plans, ensure institution standards and/or expectations are being maintained and maintain project documentation. The major milestones to be accomplished in the Initiation Phase is to meet with the vendor (Hologic) to establish installation requirements. Meet with Clinical Engineering, the radiologists and mammo technologists to establish project scope/expectations, create an implementation project plan and identify a 3D mammo go-live date. During this phase, Business Development and Marketing will be engaged to begin their project preparation to roll out marketing materials, press releases,

brochures and mailers. Information regarding a soft opening and grand opening of the 3D suite should be publicized at the appropriate time to the community, physicians, media and on the hospital's website. This phase will also account for the project plan, scope, timing, responsibilities and acceptance. Furthermore, in this phase, the team will conduct pre-kickoff meetings with different parties to prepare the project plan. Finally, the team will develop and sign-off on the project plan by institution and vendor (Chantziantoniou, K., 2016).

The fifth stage of the project is the Preparation Phase. This phase should be completed at least one month before the scheduled go-live. There are several activities involved in the Preparation Phase (table 2).

Create detailed technical specifications of the infrastructural environment floor space, equipment footprint, electrical power, ambient climate and network. Environmental Services scheduled to clean the room.	Radiologists must complete eight hours of online training for 3D mammography interpretation.
New policies and procedures for 3D mammography should be approved and communicated to the medical group and other referring physicians.	Mammographers must complete eight hours of continuing education on patient positioning, quality assurance, exposure techniques and radiation safety for the 3D mammography unit.
Patient education documents should be approved giving the patient the option to decline 3D mammography if they chose and receive 2D imaging.	Procure goods and pre-stage equipment (vendor factory location). Ship goods to the hospital’s loading dock destination.
Analysis of 3rd party integrations and agreement on the functional and technical integration specification – mention actual HIS/RIS vendor/product.	A site readiness check shall be conducted not later than three weeks before the planned delivery date of the hardware and software. This allows for some time to fix any issues found before the hardware arrival.
Schedule a physicist to perform QC testing on the X-ray tube, detector and the radiologists’ workstation monitors.	Submit the physicist report and education documentation for the radiologists and technologists to the FDA for approval to conduct 3D mammography at least one month in advance of the go-live date.

The sixth stage of the project is the Deployment Phase. This phase should be completed at least two weeks before go-live. The major activities occurring during this Development Phase (table 3).

The Radiology Director shall sign-off for the delivered hardware as set out in the project plan.	Test the basic functionality of the network bandwidth and storage capacity in PACS.
Implement and test the integration with the Hospital Information System (HIS) and PACS.	After FDA certification is received: Conduct mammography application training.
Deploy the radiologist Secure View™ imaging workstations and test that 2D and 3D images are received.	A 3D mammography scheduling dictionary is built into the HIS scheduling system and tested.
Adjust the hanging protocols for the radiologist Secure View™ imaging workstations.	Check VPN connection for Hologic remote support.
Marketing and Business Development contacted to roll out their marketing platform three weeks before go-live.	3D mammography CPT codes, exam charges and exam orderable are built into the HIS. Charges Interfaces are tested. The hospital's Chargemaster is updated.

2. Evaluation

The sixteen-week McDonough District Hospital conversion Hologic 2D to 3D mammography upgrade project involved continual monitoring, control and evaluation by members of the project management team from MDH and Hologic (table 4).

EVALUATION AND MONITORING METHOD	EVALUATION AND MONITORING FREQUENCY	RESPONSIBLE PARTY	SENIOR LEADERSHIP UPDATED	COMMENTS
Project huddles	7:30 am daily	Project Team	(as needed)	Evaluation of any additional resources required.
Project management conference calls.	Weekly on Wednesdays at 11 am.	Project Team	CFO and VP of Clinical Services (as needed)	Evaluation and monitoring of any outstanding

				action items or deliverables.
Email distribution of conference call minutes.	Emailed by 3 pm on Thursday for review.	Hologic PM	CFO and VP of Clinical Services	Identifies progress and accountability.
Gantt chart and Milestone analysis	Weekly review during each conference call.	Hologic PM and Director of Radiology	CFO and VP of Clinical Services	Monitoring tools tied to the project's timeline, budget, and scheduled.

The evaluation is the seventh and final phase of the project. This phase is crucial for the success of the project. All stakeholders are to agree and abide by a well-documented and well-designed acceptance procedure. The physicist, IT and Hologic conduct this phase of acceptance in several steps, taking place at different moments during the project and each with its activities, significance and documentation. This phase should be completed two weeks before the go-live. In this phase, the Hologic and/or IT can to fix any minor issues that were identified during testing (Chantziantoniou, K., 2016).

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