Benefit-Cost Analysis for Electronic Medical Record in the Surgical Intensive Care Unit at Good Hope Medical Center

Managerial Health Finance

Benefit-Cost Analysis for Good Hope Medical Center

Introduction

An Electronic Medical Record (EMR) is defined as a digital version of a patient's paper chart that streamlines workflow by allowing for shared information across the care team (Centers for Medicare and Medicaid Services, 2015). There are many advantages of digital records, including strengthening relationships between medical personnel and patients, improving the flow of communication and improving patient outcomes by easily sharing information across the healthcare team (*Electronic Health Records* n.d.). Benefit-cost analyses are conducted in order to determine the ratio of benefits to costs. If the benefits outweigh the costs, it makes sense for the hospital to spend the money; otherwise it does not (Jones et al., 2019). A benefit-cost analysis was conducted of a new Electronic Medical Record for Good Hope Memorial Hospital's Surgical Intensive Care Unit. The purpose of this analysis is to determine whether or not the benefit outweighs the cost in order to make a decision whether the technology should be purchased or not. A summary of findings, along with concise recommendations regarding this opportunity and future actions are discussed to present to the Board of Directors.

Summary of Findings

As described in the introduction, the focus on the cost benefit analysis (CBA) is to determine whether the technology should be purchased or not. The CBA is used in organizations such as Good Hope Memorial Hospital when introducing new projects or making purchases. This type of analysis is used to compare the costs in relation to the benefits. Components of a cost benefit analysis include: determining goals of the project, calculating benefits and costs for the total number of years until realization, and discounting cost/benefits at the appropriate rate (Jones et al., 2019). The expectation was that after completion of the analysis, a recommendation of whether to purchase or not would be

presented to the CEO and Board of Directors for review. The cost benefit analysis measures the staff time, patient services, operating cost of the system, cost of the system, and current interest rate. The equipment was realized in five years. The total revenue would increase as a result of the new EMR by $25,000 each year, hence a total of $125,000 over five years. The total expenses including equipment and installation resulted in $810,000 for the initial year. The total expenses including operating cost and maintenance contract resulted in $6,000 annually. The total annual expense decreased and included RN salaries and benefit resulted in $175,200. The decrease accounts for savings of staff time as a result of implementing the EMR.

Revenue increases and expense decreases are calculated as a sum, and subsequently subtracted from the expense increases on an annual basis. Also, present value factor is incorporated into the calculations at an interest rate of 14 percent and accounting for every year that passes (see Appendix A). This last process is to convert all costs and benefits to their value at the present time, otherwise known as discounting cash flows (Jones et al., 2019). As a result the present value of the total benefit from the EMR is $670,213. The benefit-to-cost ratio was calculated by taking the total benefits and divided by costs, resulting in a ratio of .82. Based on the analysis, for every dollar spent, there is a return of eighty-two cents (see Appendix A). Technology is said to be beneficial to purchase if this ratio is greater than one and in this case it was not.

Recommendations

Given the results of the benefit-cost analysis, Good Hope Hospital should not move forward with the EMR system as it has been presented. The hospital would face financial loss with the expenses that have been outlined. However, there are alternative options that could be

explored moving forward. If the EMR system costs were lessened, a new benefit-cost analysis could be conducted which might lead to more favorable results. Good Hope Hospital could negotiate with the current company to shift costs or might also look into other companies for lower-cost options in installation and maintenance expenses. If the equipment itself was priced at $600,000 and the maintenance contract was lowered to $3,000, then Good Hope Hospital would receive $1.10 for each dollar spent, rather than 82 cents (See Appendix B). In short, any change in cost that results in over a dollar back for each dollar spent would lead to a favorable recommendation. However, with the prices as they currently are, the Hospital would not benefit financially with this EMR system purchase.

Conclusion

The benefit-cost analysis determines the ratio of benefit compared to the cost. Appendix A (see attached excel) depicts that benefit for the new Electronic Medical Record for Good Hope Memorial Hospital's Surgical Intensive Care Unit does not outweigh the cost. Thus, it does not make sense for the hospital to spend more money without making any profit. However, as shown in Appendix B, by decreasing the equipment system cost and maintenance cost, the hospital will be able to earn a small profit after purchasing this equipment. This type of analysis can be utilized organization-wide to determine if various technologies or business endeavors will be beneficial and cost-effective to the organization.

Appendix A.

Revenue Increases	
Year One	$25,000.00
Year Two	$25,000.00
Year Three	$25,000.00
Year Four	$25,000.00
Year Five	$25,000.00
Total	**$125,000.00**

Present Value Factor		
Years	**(1+.14)^T**	**1/ (1+.14)^ t**
1	1.14	0.877192982
2	1.2996	0.769467528
3	1.481544	0.674971516
4	1.68896016	0.592080277
5	1.925414582	0.519368664

Interest Rate 14%

Revenue Decreases

Expenses Increases	
Equipment	$800,000.00
Installation	$10,000.00
Total	$810,000.00
Operating Cost	$2,000.00
Maintenance Contract	$4,000.00
Total Expenses	$6,000.00

Expenses Decreases				
RN_Salaries and benefits	$175,200.00	RN Salary Annually		
		Saves 10 hours per day		
Total	$175,200.00	Salary $40/hour	$400.00	saved per day
		20% Fringe Benefit	$80.00	saved per day
			$480.00	saved per day
			$175,200.00	saved per year

Investment/ Cost Analysis

	Construction	Equipment	Installation	Other	Total Investment	Present Value Factors	Present Value
Year 0		$800,000.00	$10,000.00		$810,000.00	1	$810,000.00
	Revenue Increases (+)	**Revenue Decreases (-)**	**Expense Increase (-)**	**Expense Decrease (+)**	**Total Benefit**	**Present Value Factors**	**Present Value**
Year 1	$25,000.00		-$2,000.00	$175,200.00	$198,200.00	0.877192982	$173,859.65
Year 2	$25,000.00		-$6,000.00	$175,200.00	$194,200.00	0.769467528	$149,430.59
Year 3	$25,000.00		-$6,000.00	$175,200.00	$194,200.00	0.674971516	$131,079.47
Year 4	$25,000.00		-$6,000.00	$175,200.00	$194,200.00	0.592080277	$114,981.99
Year 5	$25,000.00		-$6,000.00	$175,200.00	$194,200.00	0.519368664	$100,861.39
Total	**$125,000.00**		**-$26,000.00**	**$876,000.00**	**$975,000.00**		**$670,213.10**

0.827423575

For every dollar spent, we only get 82 cents back

We would not recommend buying it because less than 1 and we will be losing money

Appendix B.

Revenue Increases	
Year One	$25,000.00
Year Two	$25,000.00
Year Three	$25,000.00
Year Four	$25,000.00
Year Five	$25,000.00
Total	**$125,000.00**

Present Value Factor		
Years	**(1+.14)^T**	**1/ (1+.14)^ t**
1	1.14	0.877192982
2	1.2996	0.769467528
3	1.481544	0.674971516
4	1.68896016	0.592080277
5	1.925414582	0.519368664

Interest Rate 14%

Revenue Decreases

Expenses Increases	
Equipment	***$600,000.00***
Installation	$10,000.00
Total	$610,000.00
Operating Cost	$2,000.00
Maintenance Contract	***$3,000.00***
Total Expenses	$5,000.00

Expenses Decreases				
RN_Salaries and benefits	$175,200.00	RN Salary Annually		
		Saves 10 hours per day		
Total	$175,200.00	Salary $40/hour	$400.00	saved per day
		20% Fringe Benefit	$80.00	saved per day
			$480.00	saved per day
			$175,200.00	saved per year

Investment/ Cost Analysis

	Construction	Equipment	Installation	Other	Total Investment	Present Value Factors	Present Value
Year 0		$600,000.00	$10,000.00		$610,000.00	1	$610,000.00
	Revenue Increases (+)	**Revenue Decreases (-)**	**Expense Increase (-)**	**Expense Decrease (+)**	**Total Benefit**	**Present Value Factors**	**Present Value**
Year 1	$25,000.00		-$2,000.00	$175,200.00	$198,200.00	0.877192982	$173,859.65
Year 2	$25,000.00		-$5,000.00	$175,200.00	$195,200.00	0.769467528	$150,200.06
Year 3	$25,000.00		-$5,000.00	$175,200.00	$195,200.00	0.674971516	$131,754.44
Year 4	$25,000.00		-$5,000.00	$175,200.00	$195,200.00	0.592080277	$115,574.07
Year 5	$25,000.00		-$5,000.00	$175,200.00	$195,200.00	0.519368664	$101,380.76
Total	**$125,000.00**		**-$22,000.00**	**$876,000.00**	**$979,000.00**		**$672,768.98**

1.102899974

By decreasing the Equipment price to $600,000 and maintenance price to $3,000 we will be receiving $1.1 per dollar spent. This way we will be receiving some profit out of this equipment

References

Centers for Medicare and Medicaid Services. (2015). Electronic Health Records. Retrieved from https://www.cms.gov/Medicare/E-Health/EHealthRecords

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Jones, C.B., Finkler, S.A., Kovner, C.T., & Mose, J.N. (2019). *Financial Management for Nurse Managers and Executives (*5th ed.). St. Louis, Missouri: Saunders Elsevier. (ISBN: 978-0-3234-1516-3).