Teaching Note

Heritage Health Resources

Scott Shindledecker, Notre Dame of Maryland University
Dawn Grissom, Notre Dame of Maryland University
Elizabeth H. Jones, Notre Dame of Maryland University

Critical Incident Overview

Ann Igbo's small business, Heritage Health Resources, was strapped for cash. Client insurance payments dribbled in and cash flow had become a problem. It looked as if billing automation might offer a solution, but software was expensive. Ann had no experience with running projects, yet she had to determine if the costs and risks would be worth the potential benefit.

In this decision critical incident (CI), a small business owner must determine whether or not the expense of automation would be worth the risks and cost. This CI is useful in upper-level or graduate-level courses in small business management, entrepreneurship, social entrepreneurship, and project management. It is especially useful in integrating concepts about technology competency into such courses.

Research Methods

This decision critical incident was based on the experiences of one of the authors. All names and potentially identifying information have been disguised to provide anonymity of all involved in this case study.

Learning Outcomes

In completing this assignment, students should be able to:

1. Recognize the importance of the project selection process.
2. Describe the steps a firm should take to select the right project(s) before embarking on actual work.
3. Evaluate alternatives to selecting this particular project while considering the costs and tradeoffs involved.

Discussion Questions

1. How should the firm go about deciding to take on a new project? What information is necessary to include in the decision process? (LO 1)
2. Knowing that Heritage Health Resources could be on the brink of experiencing financial hardship, what considerations should be given to selecting the project (go/no go, alternatives)? (LO 2)
3. Explain how the project team should go about establishing cost estimates and the project budget. What is the project budget baseline and how it is used? (LO 2)
4. What should Ann consider when deciding upon alternatives? What are the opportunity costs, i.e., what potential projects would the firm have to delay or stop in order to execute this project? (LO 3)

Answers to Discussion Questions

1. **How should the firm go about deciding to take on a new project? What information is necessary to include in the decision process? (LO 1)**

The first critical step for any firm is to decide if a new project supports the firm's strategic plan and objectives. In this case, Heritage Health Resources' objective for revenue growth cannot be sustained due to increased costs coupled with delayed receivables collection. The firm needs to determine how to characterize this project. Is the initiative strategic, operational, or a must-do project related to legal or safety compliance? An argument could be made for any of the project types; however, the more appropriate choice is operational since the project benefits the firm by improving an existing business process.

Typical information required for business leaders to decide on a project includes financial and non-financial criteria (Larson & Gray, 2011). Financial criteria for decision making can vary from one firm to the next. Typical criteria would include: net present value, return on investment, payback period, and time to peak revenue. Non-financial criteria are more subjective and could include a strategic move to gain competitive advantage, creating a barrier to entry for competitors, development of core competencies, reducing a dependency on a supplier, and technical risk. Because Heritage Health Resources is a small firm, the project selection criteria would likely be relegated to financial factors such as payback period, return on investment, or net present value. Technical risk would be an appropriate non-financial criterion to consider as the project directly impacts cash flow. Heritage Health Resources is already strapped for cash, so a materialized technical risk could place further financial stress on the firm. Most importantly, Heritage Health Resources needs to develop a comprehensive assessment of *all* the costs associated with the billing system project. Some firms tend to short cut this process instead of giving it the due diligence required. This can, and often does, lead to cost overruns in the project execution phase. If a project is part of a portfolio selection process, depending on the firm's culture, the project manager can be purposefully too optimistic, making her or his project appear more financially attractive than other projects. A thorough assessment of project expenses and labor costs is critical to project selection and later provides a foundation for the planning and execution phases of a project.

2. **Knowing that Heritage Health Resources could be on the brink of experiencing financial hardship, what considerations should be given to selecting the project (go/no go, alternatives)? (LO 1)**

Ann needed a structured approach in order to make a go/no go decision on her project. "Effective cost management begins with developing an estimate of the cost of the resources needed to complete project activities" (Turnbaugh, 2005, p. 276). Cost estimates provide the project team with the amount of funds required to complete a project. This process is particularly important to an organization such as Heritage Health Resources. The company is already facing financial challenges and has to be very careful about how it allocates its limited resources. It is important for cost estimates to be as accurate as possible in order to provide the best information to the project sponsor (Ann), so that she can make an informed decision. Another important consideration is that the cost estimate should indicate whether it is viable for Heritage Health Resources to undertake this project. The firm should consider sustainability costs for the software such as software support, upgrades, and bug fixes. When cost estimates are developed, they should take project risks into consideration and develop mitigation strategies to insure project completion, e.g., the firm could elect to operate both insurance claims processes in parallel until they are convinced the new system is stable.

There are various methods that can be used to estimate costs (Henry, McCray, Purvis, & Roberts, 2007; Project Management Institute [PMI], 2013). Analogous (top-down) estimating is frequently used to estimate project costs based on values like scope, cost, budget, etc. It draws information from similar or previous projects as a basis. Actual costs are used from prior projects. This method is considered a gross value estimation tool. It is not as costly or time consuming, but is also not as reliable as some of the other methods. Parametric estimating looks at the statistical connection of historical data and other variables in order to develop project cost estimates. This method has been shown to be very reliable. It originated for use in estimating costs of military projects (Kwak & Watson, 2005). It can be applied to an entire project or just parts of one. Bottom-up (definitive) estimating is another method; it looks at the costs of project tasks broken down into the smallest units, and sums them up to provide a total cost estimate for the project (Jahangir, 2003). The accuracy of this technique usually depends on the size and complexity of the individual tasks as well as the firm's level of experience with this type of work. Three-point estimating uses three estimates (most likely, optimistic, and pessimistic), which are then calculated into a range. It provides an expected cost for work. Of these four, bottom-up would be most appropriate for use in estimating costs for Heritage Health Resource's project since there are no other projects with which it may be compared. It is relatively simple to use and would provide reliable information for Ann to use in making decisions about the potential project.

When cost estimates are being developed, consideration should be given to including contingency reserves (PMI, 2013). "Contingency reserves are the budget within the cost baseline that is allocated for identified risks, which are accepted and for which contingent or mitigating responses are developed". Contingency funds are usually calculated as some percentage of the whole project budget. These reserves can be used for tasks identified in the work breakdown structure (WBS), the whole project, or a combination of both.

A bottoms-up work breakdown structure for Heritage Health Resources' new billing system project might look like Table TN 1, and the calculations for Net Present Value might look like Table TN 2.

Table TN 1: Heritage Health Resources Work Breakdown Structure

ID	Task Name	Cost
1	***Billing system (total project costs)***	***$9,600.00***
2	**Procurement of hardware and software**	**$5,000.00**
3	*Computer and peripherals*	*$2,000.00*
4	*Therapist Helper software*	*$3,000.00*
5	**Installation and setup**	**$1,300.00**
6	*Contractor*	*$900.00*
7	*Internal associate - labor to assist contractor*	*$400.00*
8	**Training**	**$400.00**
9	*Train the trainer (contractor on site)*	*$200.00*
10	*Internal associate to train therapists (labor)*	*$200.00*
11	**Support costs**	**$300.00**
12	*Annual support agreement and software upgrades*	*$300.00*
13	**Project management labor**	**$1,000.00**
14	**Contingency reserve (20%)**	**$1,600.00**

Table TN 2: Heritage Health Resources Project Selection Using NPV (Net Present Value)

Assumptions								
Accounts receivable delay (months)			2					
Monthly Receivables			$ 15,250					
Annual Receivables			$183,000					
Annual Expenses			$165,648					
Cost of Automation Project			$ 9,600					
Weighted Average Cost of Capital			15%					
Automation Project		**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**
Required Discount Rate	15%							
Outflows	$	(9,0000)	(165,648)	(165,648)	(165,648)	(165,648)	(165,648)	(837,840)
Inflows	$		183,000	183,000	183,000	183,000	183,000	915,000
Net Inflows	$		17,352	17,352	17,352	17,352	17,352	77,160
NPV	$ 48,567							
Do nothing		**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Total**

Required Discount Rate	15%							
Outflows	$	0	(165,648)	(165,648)	(165,648)	(165,648)	(165,648)	(828,240)
Inflows less collection delay	$		155,392	155,392	155,392	155,392	155,392	776,960
Net Inflows	$		(10,256)	(10,256)	10,256)	(10,256)	(10,256)	(51,280)
NPV	$(34,380)							

Clearly, doing nothing is not an option as the business stands to lose $34,380. This is for illustrative purposes, as the business would likely not be able to operate with negative cash flow for more than a few months without borrowing funds.

Students should easily recognize that the NPV for doing nothing is negative (- $34,380), whereas the NPV for automation is positive ($48,567). Clearly, a strong case can be made for selecting the automation project; however, astute students will recognize the true NPV is the difference between the two, or $82,946.

Students should be challenged to evaluate other options. Once the NPV model is created, it is easy to extrapolate other scenarios such as hiring another employee or outsourcing.

3. Explain how the project team should go about establishing cost estimates and the project budget. What is the project budget baseline and how is it used? (LO 2)

According to the *PMBOK Guide* (PMI, 2013), determining the budget "is the process of aggregating the estimated costs of individual activities or work packages to establish an authorized cost baseline" (p. 208). Budget baselines are time phased (Larson & Gray, 2011). This means that the budget is tied to specific project tasks identified in the WBS and the schedule. The budget baseline is used as a tool to monitor project performance. It is a component of the performance measurement baseline (PMB). The PMB combines project scope, schedule, and cost requirements and is used to compare performance against planned work (PMI, 2013). To provide further understanding of how time-phased budgeting works, see Table TN 1 for an example for Ann's project. The table shows how the contractor labor cost for software installation activities (from the WBS) totals $900.

The cost baseline also determines project funding requirements. This information is important for the project management team in order to ensure that resources are allocated efficiently and appropriately in order to complete project work. As mentioned in the previous section, contingency reserves are a part of the budget baseline. An additional component of the budget is the management reserve (MR). The MR is a pre-determined percentage of the total project budget that is reserved for contingencies to cover major unexpected issues that may crop up (Larson & Gray, 2011). MR is used for project "unknown unknowns" (PMI, 2013, p. 206), and is not considered a part of the budget baseline. It is, however, a part of the total project budget. When these funds are used, they are then added to the cost baseline. Even though Ann has limited cash flow, an adequate contingency reserve and MR should be established because this

project is so important to the continuation of her business. Additionally, as is often the case, contingency funds will be necessary to address changes that are nearly certain to arise. Table TN 3 shows the beginning budget process.

Table TN 3: Time-Phased Work Package Budget for Contractor Labor Costs

Work Package: Software installation
Work Package ID: 3.2.2
Work Package Duration: 2 weeks
Project: Therapist Helper Deployment
Date: mm/dd/yyyy
Total Labor Cost: $900

Work Package	Resource	Labor Amount	Work Periods in Weeks		
			1	2	Total
ID: 3.2.2	Contractor	$/Week	$450	$450	$900

4. **What should Ann consider when deciding upon alternatives? What are the opportunity costs, i.e., what potential projects would the firm have to delay or stop in order to execute this project? (LO3)**

There are several alternatives Ann could consider to address the immediate problem with cash flow. The point is, Ann should perform her due diligence to evaluate alternatives regardless of the attractiveness of the incumbent solution. In other words, the first thing she should consider is alternatives. Ann might be tempted to jump to a decision; however, taking on a $10,000 project should justify, especially for a small business, spending a few hours eliciting feedback from subject matter experts in a brainstorming session. Considerations for project alternatives might include:

1. An alternative with a shorter time line and lower resource impact but with potentially higher costs in the long run. Example: Ann could decide to secure a small business line of credit to address the immediate cash flow problem. This would provide the breathing room the firm needs and release resources to work on a potentially higher priority project.

2. An alternative to reduce payroll and expand the business but with the loss of some control in the business. Example: Heritage Health Resources could partner with another firm that already has an established billing system. This alternative has multiple benefits, including the potential to increase revenue through additional insurance providers and a reduction of operating costs through shared office resources and staff. Unfortunately, none of the companies she usually worked with billed insurance companies as part of their own business models, so it was not an option for her at the time. Additionally, this alternative is in conflict with Ann's goal of owning her own business.

3. An alternative that frees up resources to work on other projects but with the loss of some control in the business. Example: Ann could decide to outsource billing and collections.

She would give up some control of her business but still retain the lion's share of operations. The cost benefit analysis would include increased operating costs associated with outsourcing and decreased labor costs of internal resources that will no longer process insurance claims. Capital investment would be minimal for this project alternative, which could make it an attractive option since the firm is strapped for cash. This alternative may provide a fast track to scale up the business. Ann would have to decide to either reduce her payroll or reassign her insurance claims staff to other core business activities.

There is little information regarding potential projects the firm was either currently executing or considering. Students should be encouraged to imagine the types of projects a small business might be considering during a healthy growth period, such as:

- Capital investment to expand office space or move to better location
- Promotional and advertising campaigns through social media, a company web site, print ads, attendance at trade shows
- Hiring additional staff to reduce the number of roles assigned to each employee and to build new capabilities
- Staff training and development programs

The opportunity costs associated with these potential projects should be considered before these efforts are delayed or canceled. The firm could potentially be facing a time-critical decision such as the availability of a new prime location that would greatly increase customer awareness, foot traffic, and convenience for walk-in appointments.

Students could be asked to further evaluate project alternatives using the non-financial and financial criteria discussed in questions one and two.

General Discussion

Project selection is a very important function of project management. Alignment of projects with organizational strategy is critical to project success. Project managers can no longer afford to limit their efforts to project planning and execution. This is old-school thinking. In modern organizations, project managers must be focused on business aspects as their role expands from getting the job done to achieving business results and winning in the marketplace (Larson & Gray, 2011).

Epilogue

The firm decided to go forward with the project. The project dramatically improved cash-flow as expected. The firm did not consider the costs of maintenance that resulted in additional costs for software upgrades, but these were manageable. The firm decided to hire a consultant to install and maintain the new claims processing system. This turned out to be a great decision as implementation problems were kept to a minimum with the bulk of the effort being limited to learning to use the new system. The business was able to handle more claims in a fraction of the time, resulting in the ability to take on more clients, hire more staff, and increase revenues.

References

Henry, R. M., McCray, G. E., Purvis, R. L., & Roberts, T. L. (2007). Exploiting organizational knowledge in developing IS project cost and schedule estimates: An empirical study. *Information & Management, 44*(6), 598-612. doi:10.1016/j.im.2007.06.002

Jahangir, M. M. (2003). Costing R&D projects: A bottom-up framework. *Cost Engineering, 45*(2), 12-16.

Kwak, Y., & Watson, R. J. (2005). Conceptual estimating tool for technology-driven projects: Exploring parametric estimating technique. *Technovation, 25*(12), 1430-1436. doi:10.1016/j.technovation.2004.10.007

Larson, E. W., & Gray, C. F. (2011). *Project management: The managerial process* (5th ed.). New York, NY: McGraw-Hill.

Project Management Institute (2013). A guide to the project management body of knowledge: PMBOK guide (5th ed.). *Newtown Square, PA: Project Management Institute, Inc.*

Turnbaugh, L. (2005). Risk management on large capital projects. *Journal of Professional Issues in Engineering Education & Practice, 131*(4), 275-280. doi:10.1061/(ASCE)1052-3928(2005)131:4(275)