Rx: How Hospitals and Vendors Can Increase the Impact of Perioperative Technology Investments

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Many technology investments in the perioperative system – particularly those that modify the responsibilities of members of the perioperative team and their interactions – fail to deliver the benefits predicted when they were approved.[1] Not surprisingly, hospital executives are disappointed. But so are vendors – though perhaps not in the short run – as their unhappy customers spread the word, dampening the vendors' sales prospects.

Causes of this unfortunate situation include the possibility that neither the hospital nor the vendor defined clearly what the technology was supposed to accomplish, what problem was to be solved or what outcomes were expected. Another possibility is that the hospital, having narrowed the field to a few contenders, selected unwisely. Or, perhaps the hospital thought that merely implementing the technology would be enough to achieve the desired benefits. It thus failed to introduce the necessary process changes and to manage the inevitable resistance to the new technology. The vendor may have been able to alert the hospital of these pitfalls but chose not to so, perhaps out of fear that it would deter the hospital from making the purchase.

So, how can a hospital derive the full potential impact from an investment in perioperative technology? And how can vendors help their customers and enhance their own long-term interests? For the hospital, our prescription is a three-phase process[2] that consists of: (1) developing an effective business case, which includes a clear statement of how the technology is to improve some aspect of the hospital's performance and a list of metrics that will be used to assess that performance; (2) selecting wisely from among the vendors that make it to the final round, recognizing that the choice may require taking into account factors such as vendor's culture or gauging the vendor's ability to customize solutions; and (3) introducing processes or process modifications facilitated by the technology, dealing with the resistance to change that so often accompanies such changes, and – of course – monitoring the impact of investment.

Our prescription for vendors complements that for the hospital. In discussing a request for proposals, a vendor should prompt the hospital to clearly state the objectives it wishes to achieve by investing in technology. And when the hospital is preparing the business case, the vendor should help by drawing

attention to benefit mechanisms and how to estimate their financial impact. And, although there's little a vendor can do during Phase II, the selection step, there are ample opportunities as the technology is being implemented. Unless the installation is the vendor's first, the vendor will have observed implementations at other institutions, and can thus provide advice on process and change management and on measuring impact.

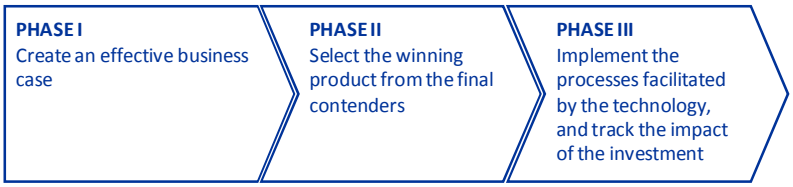
In this paper, we flesh out the prescriptions for hospitals and vendors with illustrations from a real case – a hospital that implemented a perioperative information system. We encourage readers seeking more detail, particularly on how to estimate financial impact in challenging situations or how the concepts could be applied to other technologies, to contact us.

The three-phase prescription

Figure 1 depicts the three-phase prescription and its steps. Phase I begins when hospital management has identified a problem and has appointed someone – most likely the director of perioperative services – to come up with the potential solution and to prepare the business case. It ends with the completion of business cases for one or more contenders and the conclusion that, in addition to pure financials, other factors will need to be considered before a vendor can be picked. Phase II ends with the selection of the preferred vendor and sets the stage for Phase III, the implementation of the processes that are facilitated by the technology. If the business case reveals a clear preferred vendor in Phase I or if only one solution is considered, there is no need for Phase II. Phase III is complete when the processes and technology become fully integrated and accepted. That stage, then, becomes the foundation for the next cycle of improvements.

Figure 1

The three-phase prescription



Steps	1. Describe the business objectives 2. Identify the most important attributes of the technology solution 3. Design the process for interacting with vendors 4. Determine whether the proposed investment is financially sound	1. Incorporate the intangibles into the process and select the winner.	1. Set up a senior-level team to oversee the implementation and to ensure that the full, projected impact of the investment is realized 2. Disband the implementation team when its objectives have been met.

Phase 1 – Create an effective business case

Step 1 - Describe the business objectives

An effective business case begins with clearly stated business objectives. For the perioperative system, they included increasing OR margins, improving patient satisfaction and retaining clinical staff. As prospective vendors begin their dialogue with the hospital, they must also develop a clear understanding of the hospital's objectives. And a vendor should be prepared to abandon the prospect if the objectives are not clearly defined.

Example. The Hospital was facing very rapid patient growth; its perioperative system suffered from low productivity and was failing to capture about 30% of its supply expenses. The Hospital's executives established a simple, yet challenging business objective: absorb the anticipated growth and do so without additions to the administrative staff. To accomplish the objective, they planned to replace the Hospital's paper-based system for preference cards, scheduling, anesthesia management and charge capture with a computerized scheduling and documentation system. They designated the Director of Perioperative Services to lead the development of the business case

Step 2 - Identify the most important attributes of the technology solution

Since a substantial investment must meet the needs of the perioperative staff and requires the approval of executives, it is essential to begin by identifying the attributes of the technology that they consider to be critical to success. The attributes can then be used as a filter when selecting products for consideration.

Example. At the Hospital, the Director of Perioperative Services was particularly interested in a system that the perioperative staff would find easy to use and was capable of flexible report creation. The CIO and the Chief of Anesthesia insisted that the system integrate readily with existing information systems and anesthesia machines. The CEO and CFO reiterated their condition that the hospital be able to absorb the increased caseload without increasing administrative staffing.

Aside from a clear understanding of the day-to-day needs of the users, it's equally important for a vendor to be aware of the priorities of the hospital's decision-makers. If the vendor's product does not have capabilities deemed essential by the hospital, the vendor should consider abandoning the sales effort. If, by contrast, the attributes represent a good fit at both the user and decision-maker levels, the vendor is well-positioned to provide the optimal solution.

Step 3 – Design the process for interacting with the vendors

When the team – and it generally is a team, not just one person – preparing the business case is confident that it understands the hospital's business objectives, and has confirmed the attributes important to the decision-makers, it is ready to create the list of detailed technology features consistent with the hospital's objectives and the attributes identified in Step 2. The team then prepares and distributes the request for proposals (RFP) and creates a plan for assessing the candidates.

Since the vendors have presumably implemented their technology solutions in several institutions, they can help to position themselves favorably by drawing attention to product features that prospective customers may not have considered, and help them understand why the features are important.

Example. The Hospital created a five-person Selection Team to generate the detailed technology requirements and to serve as the primary interface with the vendors during the selection process. The Team asked the responding vendors to deliver presentations on their products followed by demonstrations at the Hospital. It also contacted the vendors' reference sites to verify the vendors' claims and to assess the impact of their technology, and visited a few of the reference sites for first-hand evaluations.

Step 4 – Determine whether the proposed investment is financially sound

Having assembled the data and information on the performance of the vendors' products and their benefits, it is time to perform the financial analysis. For many OR managers, this is the most challenging step of all because it is not easy to correctly translate the impact of benefits into dollars and because OR managers tend to have limited exposure to financial analysis.

We believe that the most commonly observed financial error is incorrectly estimating the impact of time saved. Suppose that, by virtue of introducing a new process and technology, an average of 20 minutes is saved in OR #6 every day, and let's assume that we've estimated that an average minute of time in this OR translates to an expense of 3 dollars.[3] In this case, it is incorrect to estimate the financial impact on the hospital as: minutes saved daily x average expense per minute x number of operating days per year or 20 x $3 x 250 = $15,000. Time saved makes a real financial impact only if it leads to a reduction in head count or if it can be used to generate additional revenue. For a savings of 20 minutes, neither is likely.

By contrast, suppose instead that 80 minutes are saved. Then, if many short cases are performed in OR #6 and if the hospital expects the demand for short procedures to grow, the hospital might be able to perform more short cases without expanding its clinical staff. In such a case, we have estimated that adding one additional 60-minute case (plus a turnover time of 20 minutes) to an OR's schedule every day results in an annual incremental margin of approximately $500,000.[4] One lesson from this example is that when the number of minutes saved is sufficiently large, the financial impact can be much larger than the product of minutes saved multiplied by the average expense per minute.

Vendors also have a role to play at this stage: They should have a list of benefit mechanisms associated with their products and credible methods for calculating their financial impact.

Example. The analysis performed by the Director of Perioperative Services at the Hospital revealed that most of the potential financial impact was expected from raising charge capture for supplies from about 70% to nearly 100% and from increasing the number of short cases without adding nurses or anesthesiologists.

To determine whether a proposed investment is sound, we strongly recommend using the Net Present Value (NPV). It is the difference between the discounted cash flows associated with (a) the benefits, and (b) the investments and expenses associated with the introduction of the technology.[5]

Having calculated the NPV, the team must also create a list of the metrics – financial and operational – that will be monitored during implementation to confirm that the investment has achieved its objectives. We'll return to this in the discussion of Phase III.

Phase II – Select the winning product from the final contenders

It is rare for a hospital to consider only one vendor for a technology solution, particularly when the investment is substantial. Thus, a NPV must be calculated for each viable candidate because the products will have different features, prices and terms, and because they are likely to have different impacts on the hospital. Although the calculation of the NPV may reveal a clear winner, more frequently, the NPVs for two or more products may be nearly equal. To make the final selection, the decision-makers will therefore need to take into account subtle but important differences among the final contenders that – despite their best efforts – they couldn't express in financial terms. Examples of these intangibles include the vendor's reputation, the perceived mesh in culture between the vendor and the hospital, and the vendor's reputed responsiveness to problems.

One method for dealing with the intangibles uses a scorecard. The first step is to decide how much relative weight to assign to the financials, i.e. NPV, and how much to the intangible factors. In the second step, weights are assigned to the intangibles. For example, if the financials are assigned a relative weight of 45%, the product with the highest NPV receives 45 points, with the others proportionally less. Continuing with this example, suppose that the three intangible factors are the versatility of the system, vendor's reputation for service and the ease of use of the product, and, suppose further, that they are assigned weights of 25, 15 and 15, respectively.. The weighting is consistent with the importance that the hospital gives to versatility. Proceeding in this manner, a score can be calculated for each contender and the vendor picked.

Figure 2 illustrates this example with two "finalists" having relatively similar NPVs. Despite its relatively low versatility score, System B emerges as the preferred vendor on the basis of ease of use and the vendor's reputation for service.

Figure 2

Category	*Max Score*	*System A NCF = $2.4M*	*System B NCF = $2.6M*
Net cash flow	45	42	45
Versatility of system	25	20	10
Vendor's service reputation	15	5	15
Ease of use	15	5	12
Total Score	**100**	**72**	**82**

Example. Although the Hospital did not follow the numerical details of this process, it did follow it in spirit. After starting with five candidates, it narrowed the field to two final contenders. It selected the winner by taking into account two intangibles: (1) the likelihood that the vendor would be thriving in ten years and (2) the cultural fit between the Hospital and the vendor.

Phase III – Implement the process facilitated by the technology and track the impact of the investment

After selecting the vendor, and in parallel with the implementation of the technology, it is essential to introduce the processes and process modifications required to take full avantage of the technology. In fact, the overall impact of the investment will hinge on how skillfully the hospital manages the process changes and the inevitable responses from all affected participants.

Step 1 - Set up a senior-level team to oversee the implementation

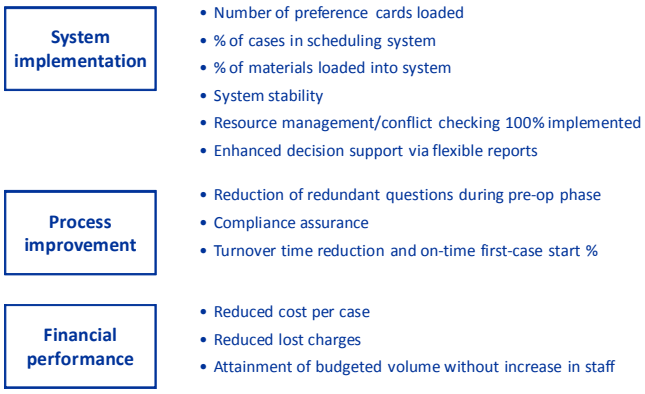
Because of the challenges anticipated during implementation, we recommend that the hospital set up a senior-level team to oversee the implementation and to ensure that the full, projected impact is realized. The senior-level team should begin by drawing up a charter for the implementation team that is approved via an iterative process, and then the two teams should decide on the set of metrics to measure progress towards the achievement of the projected benefits. In doing so, they should build on the set of metrics listed in the business case.

It is essential that members of the senior-level team have a major stake in the outcome of the implementation. Typical candidates include members of the OR Executive Committee, the CIO and the CFO. In addition, the hospital should ask the vendor to designate one of its managers to participate in meetings of the senior-level team. In fact, if the hospital does not extend the invitation, the vendor should offer to participate in the sessions. By doing so, both parties stand to benefit: the hospital is likely to find that the vendor will then respond more rapidly to any product problems, while the vendor will be able to fully leverage its expertise to ensure a successful implementation, thereby guaranteeing a strong referral. The vendor may also benefit via the possibility of identifying further product enhancements.

Example. The Hospital chose to designate the Information Systems Executives (Chief of Surgery, Chief of Anesthesia, Vice President of Patient Services, Vice President of Finance, the CIO and the Clinical Chiefs) to oversee the implementation of the system. It assigned day-to-day responsibility for the implementation to a seven-member project team comprising managers responsible for the perioperative system, led by the Director of Perioperative Services. Together, the two teams selected nearly 20 metrics to monitor the progress of the implementation. Note that the set , shown in Figure 3, includes both financial and operational metrics.

Figure 3

Subset of metrics used to monitor the implementation at the Hospital



Most of the metrics were used to track the Hospital's performance in process management. At least two, however, "system stability" and "enhanced decision support via flexible reports" assessed the ability of the system to live up to the performance advertised by the vendor. The flexibility of report generation was subjectively evaluated by the ease with which new reports could be prepared.

Step 2 - Disband the implementation team when its objectives have been met

The implementation project team cannot retain ownership for the new processes indefinitely. At a time judged appropriate by the senior-level team and the implementation project team, responsibility for the ongoing management of the new technology and the process changes it has stimulated must be integrated into a routine management process.

Example. By assigning oversight responsibility for implementation to managers who would also have long-term responsibility for the information system, the Hospital avoided the need to transition responsibility from one oversight group to another. However, the Hospital did not invite a representative of the vendor to participate in meetings of the Information Systems Executives when the implementation of the new system was on the agenda. The implementation project team was disbanded six months after the start of the implementation.

Summary

As capital budgets shrink, it is imperative that hospital executives manage technology investments with great care. They must begin by defining what they want to accomplish and then determine how technology will help. And, having made the investment, they must ensure that the combination of process changes and technology delivers its projected benefits.

Since technology vendors have a vital stake in the success of their customers, it is important for the vendors to help them along in this process. They can do this by helping to clarify the hospital's objectives, offering guidance when the hospital is in danger of making unwise decisions, and assisting the hospital achieve its business objectives. By doing so, the vendors will create a delighted customer and thereby set the stage for many more in the future.

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[1] According to a Standish Group Survey, 83% of IT projects missed their objectives and 31% were cancelled. The Chaos Report (1995). Detailed results for technology investments by hospitals are unlikely to differ substantially from the results of other institutions.

[2] Our method is modeled on "Making Technology Investments Profitable" Jack M. Keen and Bonnie Digrius, John Wiley & Sons, Inc. (2003).

[3] We assume that, with the exception of the surgeon, the others in the OR are employees of the hospital and that the anesthesiologist is responsible for covering two operating rooms.

4 Krupka, D.C. Sathaye, S. & Sandberg, W.S. "Reducing non-operative time: methods and impact on operating room economics", Int. J. Healthcare Technology Management, Vol 9, No. 4 (2008).

5 See, for example ""Principles of Corporate Finance, Fifth Edition" Richard A. Brealey and Stewart C. Myers, McGraw Hill (1996).