

# Applying TQM Principles to Selecting an Information System

by Patrick McConnell & Vincent G. Ciotti

The last issue of HFM's Journal was devoted to Total Quality Management & Continuous Quality Improvement (TQM/CQI) methodologies, which have become widely accepted in American industry. One of the greatest success story of the application of TQM/CQI principles was Lee Iacocca's recent turn-around of Chrysler Motors. On his first day on the job, he was invited to a welcoming champagne lunch at Chrysler's headquarters offices to meet the ranks of Vice-Presidents and other executive staff. He declined the invitation, instead removing his jacket, rolling up his sleeves, and walking across the street to meet with workers on the assembly-line and hear what was really wrong with the company. Similarly, hospitals need to involve their "assembly line" workers more in decision-making, by empowering end users to play a greater role in decisions that previously were reserved for the executive suite.

This article reviews the actual application of TQM/CQI principles to a process that most CFOs are heavily involved in and that impacts all hospital departments: the selection of a Hospital Information System (HIS). The traditional HIS selection process revolves around issuing the Request For Proposal (RFP), a process that has come under considerable criticism of late as an area needing productivity improvement. The authors recently applied TQM/CQI principles to the process of selecting an information system at North Valley Hospital, and the results were very gratifying.

## BACKGROUND OF THE HOSPITAL

North Valley Hospital (NVH) is a 44 bed acute care hospital with a 56 bed long term care unit located in Whitefish, Montana, which had first installed a turnkey minicomputer system about ten years ago. The system's software was primarily financial in nature, however, automating few hospital departments besides Admitting and the Business Office. The increasing pressures of managed care, growing third party pressures for cost-containment and the need to compete with neighboring facilities made obtaining a more functional replacement system a high priority. Being managed by the Quorum Health Group, NVH placed a great emphasis on TQM/CQI processes, as both the CEO and CFO had recently been through Quorum seminars on quality improvement. They were therefore highly desirous of applying TQM management principles to the process of selecting a new information system.

The hospital's CFO had recently attended an HFMA Annual Institute where he enrolled in a session on a new process for selecting a Healthcare Information System without an RFP. Although not formally espousing TQM methodology, he felt the process could be modified to meet NVH's needs of selecting an HIS while employing the principles of quality management.

## BACKGROUND ON THE PROCESS

The basic principles of TQM/CQI were established by Deming in his post-World War II consulting work in the reconstruction of Japanese industry. According to Robert Reich, a member of the Clinton cabinet, "W. Edward Deming is to management what Benjamin Franklin was to the Republic - a conscience, a guide, a prophet, an instigator." Ten of the basic principles of Deming's method lend themselves in particular to adaptation in the RFP process.

### 1. Constancy of Purpose

This first principles requires the setting of a clear, unswerving course for the selection process, so that those involved in it feel that they have defined roles to play, and are not reacting in "knee-jerk" fashion to the latest whims of management. What is to be avoided here is for the CEO, CFO or even an outside consultant to make unilateral decisions concerning the selection process or arbitrarily "change the rules" in the middle of the game. This requires establishing written objectives for both long-term and short-term steps and publishing them throughout the hospital.

The first step in establishing long-term goals at NVH was to establish a vision for new information systems and to have top management and the Board embrace that vision. A GANTT chart was then drawn up to define the strategic goals for automation over the next 2-3 years (Figure 1). This macro-level plan was driven primarily by the contract expiration of the current system, which was occurring in about 18 months, and defined for hospital managers the multi-year, long-term steps involved beyond just selecting a system, i.e., the need to allow sufficient time for contract negotiations, system installation and the multi-phased priority of the new system's applications.

The second step of defining short-term goals was accomplished by drawing up a "PERT" chart that outlined the tactical steps to be followed in the selection process over the next several months (Figure 2). The PERT chart showed each specific step in the project, the target dates for starting and finishing each step, and the relationship between each task, i.e., which task had to come first, which second, etc (the task "dependencies", in project management parlance).

The GANTT and PERT charts were initially presented to the Board of Directors for approval, and then reviewed with them periodically throughout the process. This "top-down" constancy of purpose was matched with a "bottom-up" equivalent in the next application of Deming's principles.

## **2. Adopt The New Philosophy**

The GANTT and PERT charts were then distributed to hospital staff at a kickoff meeting that established a task force of the managers of all hospital departments impacted by the new system: Nursing, Laboratory, Pharmacy, Admitting, Medical Records, Patient Accounting, Materials Management, and Finance. It also included a physician and board member. This group met monthly throughout the selection process and was responsible for completing most of the tasks. At each monthly meeting, the PERT chart was updated to review progress that had been made, how target dates were being met, and what steps remained, thus keeping everyone's "eye on the prize."

During the project, the Task Force was fed a constant stream of articles on information systems from leading magazines, including the HFM Journal, Hospitals, Modern Healthcare, and Healthcare Informatics to reinforce the vision of the new system and to give the Task Force ideas to help in their evaluation of systems. The articles covered concepts like Computerized Patient Records (CPR), Community Health Information Networks (CHIN), using statistical data to improve patient care, bedside computing and procedure cost data, that became a part of our HIS philosophy.

What is most important, this task force of hospital managers actually voted on every step in the process, to decide which vendors to eliminate and which to include for further consideration. Such a democratic approach may seem daring to those schooled in the "Theory X" approach of management, whereby only the "boss" knew what was best for the organization and middle-managers were paid primarily to implement upper management's decisions. However, since users are responsible for making the new computer system ultimately work, they are the best ones to say which features of which systems are best suited to their needs. As Deming says, "Structures have been put in place in management that will have to be dismantled." How can CEOs or CFOs know enough about every hospital department to decide which module of which vendor's system is best for them, let alone best for the entire institution? Only the users really know what is best for their departments, and the wise executive will listen rather than dictate to them.

## **3. Cease Dependence on Mass Inspection**

The best analogy to the "mass inspection" mentality in the traditional system selection process is the use of the Request For Proposal (RFP) as the prime determinant of system functionality. An RFP purports to contain every feature needed in the "perfect" system for a given hospital, and whichever vendor answers yes to the most questions has the best system. The main problem with the RFP is that vendor proposals are written by their marketing departments, not their technicians or programmers, and so contains so much marketing "fluff" and hype that they are sometimes worth less than the reams of paper they are printed on. Before admonishing vendors for greater veracity, imagine how many negative responses your hospital would put on an RFP from a local HMO inquiring about the quality of patient care at your facility, and the problem is more clear: RFPs ask respondents to eliminate themselves by saying "no," so respondents twist the English language (or their product capabilities) to answer "yes" in any way possible.

Rather than search for rejects, as in past American production principles, hospitals should no longer scrutinize RFPs to see where a vendor answers "no," for most vendors answer 90% or greater of all RFP questions with "yes" responses! In addition, the basic (and false) assumption of an RFP is that any system that meets its written specifications will be all right, while any system or feature just outside it is wrong. "Dr. G. Taguchi who won the Deming Prize in 1960 saw the absurdity of such suppositions and proposed an important improvement of principle." What is missing in such written specifications is the quality of how a given system handles a requirement, not just whether it does or not. It is only through such steps as observing system demonstrations, telephoning actual users, reading technical documentation and visiting actual client hospitals that department heads can judge the quality of how well a given system meets their needs. The goal is to find a system that does not involve keeping manual systems to make the automated system work, a system that lends itself well to preventing errors and processes information efficiently to avoid "re-work" and duplication. Such characteristics cannot be reduced a simple formula in an RFP feature checklist.

## **4. End Practice of buying on price alone**

In the halcyon days of the sixties and seventies when shared systems reigned supreme, it was a simple matter for a CFO to compare the price of leading vendors such as McAuto, SMS or Tymshare, usually in a dollar per patient day formula, and use that comparison of price alone to pick a financial system, since they all offered relatively similar basic financial functionality. Since the advent of DRGs in the eighties and Managed Care in the nineties, the far greater emphasis on clinical systems, however, means such simple price comparisons can no longer be the prime determinant among systems. An inexpensive system that handles data inefficiently and has poor reporting can cost far more in the long run than a more expensive but well-designed one.

Consider also the varied delivery methods available in computer systems today:

- Turnkey Systems - with all hardware and bundled software on site
- Remote Processing - with most hardware and software off-site
- Local Area Networks - where PCs distribute processing and storage on site

It is as difficult to compare costs among such disparate approaches as it is to define them: who pays for increased volumes (visits and/or terminals) in Remote systems? How often (& at what cost) must you upgrade PC memory & disk? Who pays for versions vs. releases vs. new products in turnkey systems? Add the complexity of comparing combinations, such as this vendor's LAN HIS plus that vendor's turnkey Lab versus another vendor's remote "Total HIS," and Deming's admonition to stop considering price alone makes even greater sense.

At NVH, we used a "cost of ownership" formula to make a rough comparison of costs, whereby the initial purchase price was added to the ongoing costs for 5, 7 and 10 years to make an "apples to apples" comparison (Figure 3). Thus, the users had some idea of the comparative cost of systems, but it was hardly the sole determinant, and indeed factored minimally into their overall ranking of functionality. After all, just how much of a bargain is a "low cost" Nursing System that adds an extra half-hour of nursing time per shift due to poorly designed screens!? In addition, finalist vendors' price concessions vary so greatly, some discounting as much as 50% while others discount very little, such that price comparisons on proposals alone should never be the sole criteria for selection.

## **5. Improve Constantly & Forever the System of Production & Service**

Rather than pouring through hundreds of questions in an RFP to compare systems, users at NVH instead were asked to pick the top 10 - 20 features that they felt were critical to their departments' internal operations and productivity. For example, in Admitting, the simple question of how long it took to admit a patient meant far more than how many insurance companies the system could handle. In nursing, how few screens an RN had to scroll through to complete a simple order was more important than the total number of screens a system had. After the department heads compiled their "top 10" wish-list items, they filled them in on checklists, and scored each vendors system based on hands-on experience at demos, telephone reference checking and perusal of actual user manuals (borrowed from semi-finalist vendors).

Rather than an absolute "yes/no" response, each feature was graded on a 1-5 scale using the following criteria:

- 5 = Very Good
- 4 = Good
- 3 = Average
- 2 = Poor
- 1 = Very Poor

This simple mathematical formula, when applied across scores of phone calls, site visits and demos gave NVH as mathematically quantifiable a result as any RFP, but with quality the basis for the results, not quantity. Spreadsheets and graphs were developed to document the department heads' research and they were presented to Upper Management and the Board of Directors to justify the system ranking (Figure 4).

## **6. Institute Training & Retraining**

Throughout the selection project, the members of the selection committee received numerous training sessions from our consultant, who had extensive experience working with vendors and repeated sessions he had given at HFMA Annual Institutes on such topics as "Vendor Sales Techniques," so department heads could become smarter buyers. In addition, the CFO routed numerous articles among the committee that were topical, including several from past June issues of the HFM journal that concerned information systems.

Most importantly, Deming's emphasis on education was carried over into the questionnaires that department used when telephoning vendor references and visiting other users, which included such questions as:

- How well (or poorly) did the vendor perform:
- initial (conversion) training
- ongoing (release/refresher) training
- What was the experience level of the vendor's trainers?
- Did they provide enough class hours, both on-site and at headquarters?

The answers to these questions obtained from hospitals who had actually gone through the vendor's training proved far more valuable than merely asking a vendor to include a class catalogue as part of an RFP.

## **7. Institute Leadership**

Since information systems still report to finance in the bulk of US hospitals, this duty fell heavily on the CFO's shoulders, who acted as the primary contact person for vendor marketing representatives. Some key principles employed by the CFO at North Valley when leading the vendor search included:

- VOTING LAST - in the periodic tallies taken to rank vendors, so as to not unduly influence lower-ranking department heads.
- AVOIDING "GIFTS" - vendors representatives are notoriously eager to buy lunches & dinners to curry favor with "decision makers." By setting an example of abstinence, the CFO could ask department heads to do likewise and insure an equal playing field.
- LOCAL TRAVEL - like lunches and dinners, vendors are eager to fly hospital executives to visit their "flagship sites" and corporate headquarters for the proverbial "dog and pony show." Again, the CFO set an example for the selection committee by insisting on all members being taken to local users only, with no expensive cross-country boondoggles or executive meetings.

The CEO's leadership role was an interesting inversion of the usual "chairman" position over the system selection: the CEO at North Valley allowed the committee to select the vendor independently, without interfering in the detailed steps of the process. Periodic updates from the CFO and consultant sufficed, and numerous calls and invitations from vendor representatives were assiduously avoided. The CEO only attended the last committee meeting when the final decision was made, to insure that the department heads had done their homework and had valid reasons for their likes and dislikes of vendor systems.

As paradoxical as it may seem, hospital management led the most by what they did not do rather than what they did: they trusted user department managers to know their needs best, check out system capabilities via first-hand experience and vote for their department's best interest. They did not insist on the system being on their favorite hardware, or with the same software from their last hospital, or even from a vendor whose president they had lunch with.

## **8. Drive Out fear**

By this precept, Demings was targeting the "Theory X" style of management whereby subordinates were supposed to perform better to avoid punishment. By allowing user department managers to play a dominant role in the system selection process, management immediately gave them a show of confidence in their knowledge of their departments and investigative ability. Everyone's opinion was valued and there were no reprisals. What is more, the process itself installed far more confidence in user managers than the traditional RFP-based process, since it was the committee's own eyes and ears that determined system functionality, not:

- a consultant's vaunted "expert" opinion,
- the CEO or CFO's experience at their last hospital ,
- a seminar someone attended or article they read on the "perfect" system.

Proof of that confidence lay also in selected Board members attending periodic meetings where they heard first-hand of the results of telephone reference checking, user manual perusal, site visits and other evaluative techniques that had proven valuable during their own company's computer experiences.

## **9. Break Down Barriers Between Staff Areas**

More than any other Demings principle, the non-RFP selection process built strong bonds among all user departments involved, through their shared experiences over the 6 month project. During travels to user sites and while observing vendor

demons, they had hours to build personal bonds and gain greater appreciation for other department's problems and concerns. During periodic review meetings they heard each department head vote for reasons of their internal productivity, and overall efficacy to the institution governed voting far more than political concerns. Even ancillary departments who desired a "best of breed" approach so they could have their own independent system came to realize the problems of interfaces and releases when the conversed with peers at other sites.

The periodic meetings allowed each department head to speak their mind, hear others' pinions and develop a consensus among all departments about which system was best for the hospital's total benefit. Granted, any one department may have preferred vendor A to vendor B, and no one vendor garnered a totality of all of the votes. However, through the gradual winnowing process of over 10 vendors initially considered, to 5 vendors requested to submit bids, to 3 semi-finalists vendors receiving site visits, to 2 vendors being finally selected for contract negotiations, department heads built a cooperative empathy and team spirit that bodes well for a successful system installation.

In addition, a "computer-literate" member of the medical staff joined the committee, since physician utilization and link-up from home/office PCs was an important component of the system. This one physician's opinion did not become the "be-all, end-all" of the system evaluation, but rather enabled department heads to hear the physician's view point of each system, and the probability of physician usage. Conversely, by reporting back at periodic medical staff meetings, the physician was able to keep peers abreast of the selection process, and make them aware that their input was being included.

### **10. Eliminate Slogans, Exhortation & Targets For Work Force**

This Deming's principle led us to ignore much of the sales and marketing hype of the vendors, who are constantly extoling their approach to automation as the approach, for example:

- You need an "Open" system (whoever would buy a "closed" one?)
- Only RISC-based computers offer price-performance (but are they risk-less?)
- Remote computing will save you money (but won't it cost any?)
- UNIX-based systems are superior (what good are they for an RN or tech?)
- We need to build a Partnership (between our AP and your AR!?)

Instead, our admonition to the task force was to select a system that would make their job easier and improve patient care. The only constraint department heads felt was for the time-frames of the overall project, as defined in the PERT chart. True, some were too busy to make their phone reference calls on time, others missed site visits and some found insufficient time to peruse vendor user manuals. However, the majority made time, cast their votes and felt confidence in what they experienced with their own eyes and ears. This contrasts well with the fear they would have felt if the CFO and/or consultant had picked the system in a vacuum based on an RFP analysis and then they were going to have to deliver FTE reductions promised to the Board.

### **CONCLUSION**

The result at NVH met or exceeded management's expectations. Department heads became totally involved in the selection process to where they "bought into" the selection of the finalist vendor with near unanimity. Even the few members who did not have "their" vendor selected as the winner realize why that vendor would not have been best for the whole institution and accepted the others decision with magnanimity. Involvement of the Medical Staff and Board of Directors insured that both a "top-down" and "bottom-up" approach was used, with far greater probability of a successful system installation. Involvement (and cost) of outside consultants was kept to a minimum, again insuring that the entire hospital team made the decision and hence will make the system work, without outside assistance.

In this age of rapidly evolving computer technology, the process by which computer systems are selected needs to be modernized to keep up with the systems themselves. By applying the principles of TQM/CQI to the RFP process, hospitals can both shorten the time and cost involved in selecting a new system, while improving the probability that the new system will be accepted and installed successfully by end users.

### **ABOUT THE AUTHORS**

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