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The Impact of Managed Care on Diagnostic Imaging

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INTRODUCTION

Diagnostic imaging is one of the most capital-intensive specialties in medicine.⁷ As such, it will be one of the specialties that will be targeted for health care reform over the next decade. While most costs associated with providing imaging services will continue to increase, there will be continual pressure to limit the usage of imaging services and to reduce the reimbursement for the work that is performed. In addition, the spread of managed care and other cost-saving programs will lead to increased competition among providers of imaging services.

As radiology becomes more competitive, traditional hospital planning and management techniques should be replaced by those used by entrepreneurial companies enabling them to react much more quickly to changing market conditions.

Most radiology departments have excess capacity. Therefore, before making any additional acquisitions, a thorough analysis should be made to determine if one can make better use of their current resources. Quite frequently, establishing additional staff training, eliminating some architectural barriers, or implementing a customer education program may lead to improvements in productivity and better utilization.

With respect to recommending new acquisitions, a quantitative approach should be developed to minimize the emotion that is frequently associated with purchasing decisions. Also, due to the high costs of diagnostic imaging technology, it is extremely important to not only select the right vendor and product, but also to make sure that terms and conditions are properly agreed on.

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Finally, once a decision has been made to make an acquisition, everything possible should be done to maximize the results that are obtained from it. In recent years, entirely too much attention has focused on the acquisition of “leading edge” diagnostic imaging technology, while other equally important issues have either been underemphasized or overlooked altogether.

TRENDS THAT WILL IMPACT DIAGNOSTIC IMAGING

The most significant change that will occur over the next decade will be the shift in the primary source of referrals from the individual physician to group purchasing. No longer will the referring physician serve as the primary gatekeeper of patients. Instead, this will shift to managed care providers and other payers. In their efforts to reduce health care expenditures, managed care providers and other payers will focus on the following three questions:

- Is this exam *truly* needed?
- Is it the *least* expensive test that will provide *adequate* information?
- What reimbursement will be *approved* for performing this test?

To answer these questions, one must have an accurate cost-accounting data base so that the true costs are known. Second, outcomes measurements will be crucial. Contracts will be awarded based on costs and outcomes.

With respect to determining whether a test is justified and if it is the most cost-effective test to use, we foresee the radiologist needing to confer more frequently with the referring physician in the future as a consultant to help determine which diagnostic imaging tests should be performed. To successfully practice “consultative radiology,” one must not only have cooperation and commitment from key parties, but these parties must also be given the proper tools and space in which to work. Additionally, incentives need to be developed to encourage all parties to reduce the costs of providing imaging services.

Another factor that will have a major impact on the practice of diagnostic imaging will be the merging of hospitals and other organizations in order to meet the demands of managed care providers. As these networks are formed, an audit is needed of what imaging services should be performed at which locations. In some cases, certain procedures being done in the hospital should be transferred to outpatient settings. In other cases, some services should be offered only at certain locations, for one reason or another.

COST CONTAINMENT VERSUS ENTREPRENEURIAL MANAGEMENT

A very common goal is to reduce the costs of providing imaging services; however, in too many cases these cuts impact the quality of service that is provided. In a survey conducted by the American College of Radiology, it was reported that “the inability to schedule patients quickly” and “slow results reporting” were the most frequently mentioned reasons given by

78% of referring physicians who had changed their radiology services. Be cautious not to make cuts that impact the quality of your service.

Instead of focusing solely on reducing costs, one should attempt to increase the productivity of the diagnostic imaging equipment. Radiology is a very capital-intensive specialty. True, there are often some opportunities to reduce costs through extending the life of existing equipment, reducing service costs, and limiting acquisitions, but most of these are limited. The real key is throughput, i.e., increasing the volume of work that is done with your existing resources.

A good example is MRI throughput. Most sites today typically do in the range of 250 to 300 exams per month per magnet, although there are sites that average more than 500 exams per month.² The maximum throughput at a site that we are aware of is well above 800 exams per month on a single magnet. Many of these high-throughput sites have a normal mix of patients and few of them operate more than two shifts.

Among the common traits of these high-volume centers are the use of entrepreneurial management techniques, teamwork, and pride in what they are accomplishing. Goals for throughput are usually established and everyone works together as a team in an attempt to meet or exceed these goals. A concentrated effort is made to not only select the right people for the team, but also to continue to give them an opportunity to grow.

All of these sites are very service oriented. They provide better service than do others in their region. They know their customers and work very hard to satisfy both their customers' needs and desires. In most cases, they have built a personal relationship with not only referring physicians, but also with the office staff who are involved in the scheduling of exams.

Concepts regarding increasing the responsibilities of technologists and their assistants are frequently implemented at these high-throughput sites. Also, in many cases, there is some type of incentive to reward the staff for exceeding performance goals. These incentives may be strictly monetary or may enable staff to attend one or two continuing education programs per year.

THE RIGHT TEAM

An initial step is to form a team that is responsible for imaging services. This team or steering committee should include representatives of administration, the medical staff, and the radiology department. These individuals should have the authority to represent their groups, the time to devote to this activity, and a genuine interest in participating. They should be responsible for not only recommending acquisitions, but also for monitoring the implementation and long-term success of various programs.

In addition to the creation of a steering committee, we typically recommend the following four subcommittees:

Subcommittee	Tasks
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Marketing	• Monitor services provided by others and their quality of service
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- Monitor satisfaction of customers
- Recommend action to maintain and improve customer base

Operations	• Be responsible for day-to-day operations, staffing, etc.
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- Seek ways to develop and use personnel more effectively

Equipment	• Recommend new acquisitions or upgrades
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- Monitor performance of existing equipment

Facilities	• Monitor current facility
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- Recommend improvements to current facility
- Participate in design of new areas

All too often only a few people are involved in the above activities. Typically, the chief radiologist, radiology manager, and a vice president sit on the steering committee. However, in many situations, other individuals may be assigned to these positions or be added to the group. Do what works best for your group.

The subcommittees, however, open up an opportunity for additional personnel to participate. Look for individuals who have an interest in these types of issues and encourage their input. Quite often, an outside party can provide needed skills to complement your efforts in these tasks or to serve a very valuable role as a facilitator to make these efforts productive.

Marketing is a particularly important issue to address. Who are your customers? What do they honestly feel about your services compared to others? What factors will influence where their patients are sent in the future? What action should you take to maintain your current customer base? What opportunities exist for growth? These types of issues need to be dealt with in an open and efficient manner.

For example, small details are often overlooked during facilities planning. Why not periodically look for ways to improve your work flow? The facilities committee should continually seek ways to improve the work flow in your current department. Small things such as improving the lighting or adding a phone line or a countertop can improve staff efficiency and morale.

The operations committee should continually explore ways to make more effective use of personnel. We foresee a great increase in expanding the responsibilities of technologists to

include some work currently performed by radiologists, while simultaneously delegating tasks done by technologists to others.

FUNCTIONAL PLANNING

Everything possible should be done to optimize the work flow from the viewpoint of physicians, staff, and the patient.³ In many hospitals, the key factor limiting productivity is the physical layout of the imaging department. We have found the graphic illustration of work flow shown in figure 1 to be particularly effective in helping develop an optimum design. Who are the key people involved in the entire exam process? What are their key needs? What type of work environment will enable each to work most productively? How should individual work areas link together?

Developing a design that meets today's needs can be a real challenge. Not only should inpatients be separated from outpatients, but also "sick-sick" patients should be separated from those who are less ill. Likewise, one typically attempts to separate male patients from female. However, we foresee more and more cases in the future where a support person will accompany the patient into the exam area either to provide support or to participate in consultations. Where can these conversations occur?

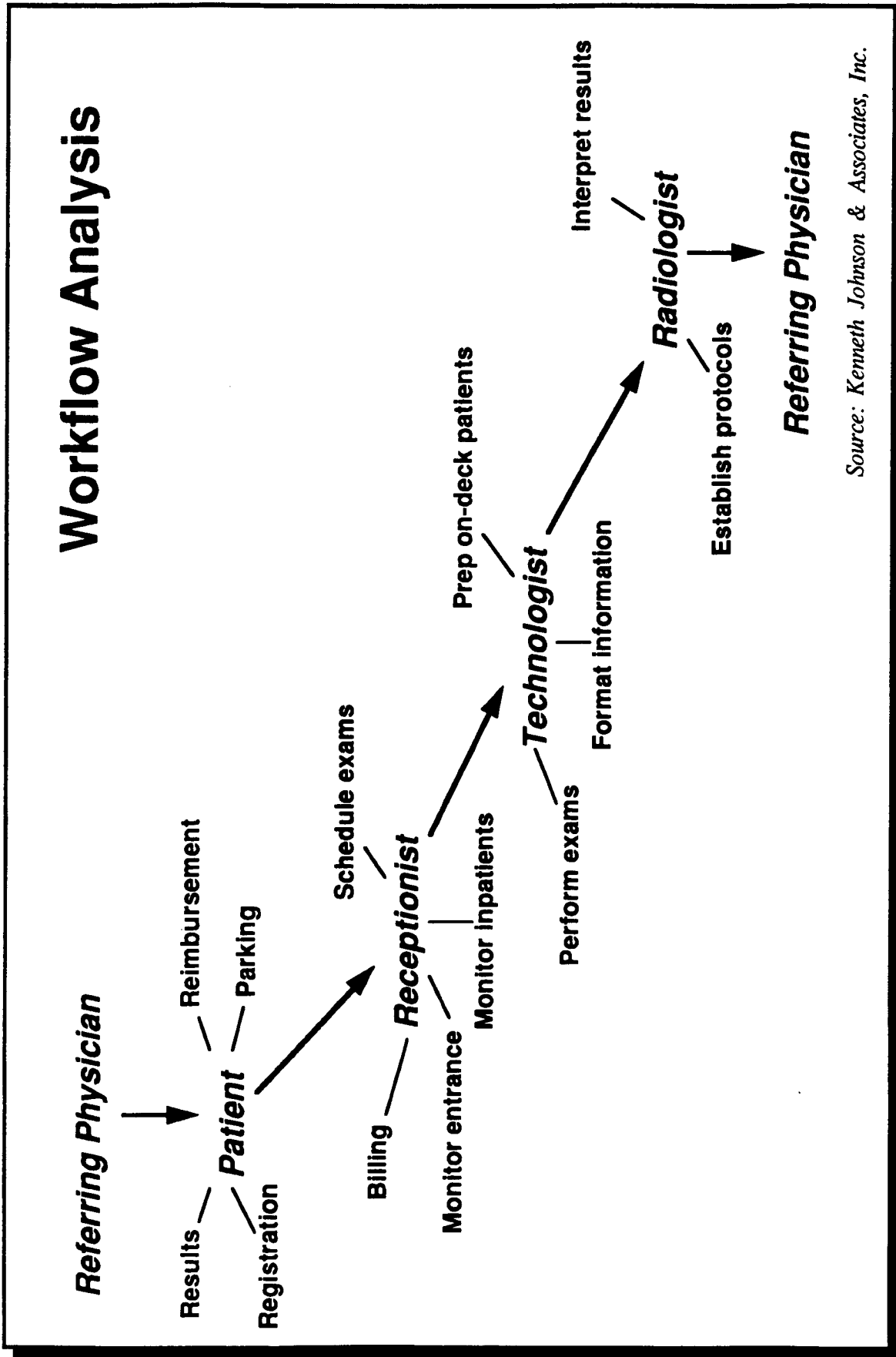
To optimize your design we recommend the following:

1. Identify a site to use as a role model for your design.
Can you find a facility that is similar to what you are creating? Visit it. Ask staff what they like about their facility. Ask staff what they would do differently if they could start over. Be certain to encourage your personnel who will work in these areas to open a dialogue openly with their counterparts at these sites.

When designing an entire department, it is rare to find an entire facility that represents what you desire, but it is usually possible to identify role models for individual sections of a department, i.e., a good file room/reception area, a nice angiography or MRI suite, etc.

2. Simulate your design.
Few people can fully interpret architectural plans. Whenever possible, the use of scale models or a full-size mock-up of key areas should be used to enable everyone to better understand what is being created.
3. Focus on details.
Details such as where phones are located, what type of lighting is used, the size and height of counters, etc., have a major impact on how well a design works.

Figure 1. FLOWCHART USED TO DEVELOP WORK FLOW



Source: Kenneth Johnson & Associates, Inc.

TECHNOLOGY NEEDS

Before any acquisition is made, an audit should be performed of all imaging needs. This should include equipment needed for scheduling exams and the storing and distributing of information as well as the diagnostic equipment itself. No longer can the useful life of equipment be judged by age alone. Changes in technology may cause some equipment to become obsolete in a very short time, while other diagnostic equipment may be used well beyond its predicted life expectancy if it is properly maintained.

Figure 2 illustrates the format developed at Massachusetts General Hospital⁴ for technology assessment. Equipment is graded on 10 criteria with a score of 0 to 5 (0 = unacceptable, 1 = marginal, 2 = poor, 3 = fair, 4 = good, and 5 = excellent). The overall scores are then totaled and an average rating is established.

The criteria for rating the equipment are:

1. Image quality--Does the diagnostic information that is generated enable the radiologist to properly satisfy the requests of referring physicians?
2. Technical capability--Can the system perform the full range of needed studies?
3. Radiation level--Are the patient's, radiologist's, and technologist's exposures minimized?
4. Safety--Is the system safe to operate? Are there any mechanical or electrical hazards?
5. Reliability--Does the system have good uptime? What is the mean time between failure? Are problems intermittent or have there been extended downtimes?
6. Maintenance--Are parts available? Are maintenance costs excessive?
7. Ease of operation--Can staff properly utilize its capabilities?
8. Throughput--Can the system meet the needs of the medical staff in a timely manner?
9. Compatibility with hospital information systems, radiology information systems, and picture archiving and communications systems--Will the system interface with these technologies as they are implemented?
10. Marketing--Is equipment competitive with that used by others in your region?

Figure 2. FORM USED TO QUANTIFY TECHNOLOGY NEEDS

Equipment Rating for _____	
Name _____	Date _____
Grading System	
0 = unacceptable, 1 = marginal, 2 = poor, 3 = fair, 4 = good, 5 = excellent	
Score	Criteria
_____	1. Image quality
_____	2. Technical capability to perform desired studies
_____	3. Radiation level, radiation safety (patient or staff)
_____	4. Safety, mechanical factors
_____	5. Reliability, mean time between failure
_____	6. Maintenance cost.
_____	7. Ease of operation: human factors
_____	8. Throughput
_____	9. Compatibility with RIS, HIS, PACS
_____	10. Marketing impact
_____	Total scores
Overall rating: _____	
A 0 in any category = unacceptable (replace), 1.0 - 1.5 = marginal, 1.6 - 2.5 = poor, 2.6 - 3.5 = fair, 3.6 - 4.5 = good, and 4.6 - 5.0 = excellent	
<i>Source: James H. Thrall, M.D.</i>	

Any equipment receiving a score of less than 1 in any category should be taken out of service immediately until the problem is either repaired or the system is upgraded or replaced.

However, even this rating system is subjective. For example, a piece of equipment may have limited functions, but if more advanced equipment is available in the institution, then this system may be acceptable for continued use.

DECIDING WHAT TO PURCHASE

Many factors need to be considered, such as not only what technology should be acquired from the physicians s viewpoint, but also where should it be located, who will use the service, and what costs are incurred.⁵ To address these issues, one should begin by listing all possible options. Then, the pros and cons of each should be analyzed.

Typically, the following options might be considered. Which of these can be eliminated from consideration? Which should be given serious consideration?

OPTION	PROS
CONS	
1. Do nothing, i.e., make no changes	
2. Upgrade the current system	
3. Replace with refurbished equipment	
4. Purchase a new system	
5. Outsource to another provider	
6. Stop providing the service	
7. Relocate the service to another location	

Figure 3. FORM USED FOR RANKING VENDORS' PRODUCT OFFERINGS
Note rating system: 1 = Most Desirable, 2 = Acceptable, and 3 = Unacceptable

Vendor Ratings for: _____ Date: _____

Fixed Mobile Budget: _____ Delivery: _____

	Vendor 1	Vendor 2	Vendor 3	Advantage to
MODEL				
Diagnostic Considerations				
Throughput Factors				
Costs -Installation -Service/maintenance -Upgrades				
Arch Considerations				
Corporate Concerns				
Other Issues				
Terms & Conditions				
Price				
OVERALL RATING*				

Source: Kenneth Johnson & Associates, Inc.

DECIDING ON THE BEST PROPOSAL

Before recommending a specific product, a matrix (shown in figure 3) should be developed that identifies what factors to consider in order to arrive at a recommendation. A common error is to focus prematurely on just one or two vendors. Initially, all reasonable vendors should be considered. They should be put into one of three categories: (1) most desirable, (2) acceptable, and (3) unacceptable. However, because a good deal of time often passes before a final purchase agreement is signed, it is not uncommon for vendors to move back and forth from one category to another.

Not until one is fairly close to reaching a final decision should the list be narrowed down to just two or three options. At this point, the chart shown in figure 3 can be simplified to that shown in figure 4, i.e., to determine which vendor can best satisfy your diagnostic needs and financial constraints.

Figure 4. MATRIX USED TO MAKE A FINAL VENDOR SELECTION

<i>Ratings</i>	<i>Diagnostic Need</i>	<i>Financial Impact</i>
<i>I. Most desirable</i>		
<i>II. Acceptable</i>		
<i>III. Unacceptable</i>		

TERMS AND CONDITIONS, PENALTIES FOR FAILURE TO PERFORM

The outcome of a purchase agreement with a vendor should be to create a partnership in which both parties will be committed to the success of the venture. However, one should be cautious of open-ended promises such as “two-hour response, installation will take 4 to 6 weeks to complete,” etc. What do these truly mean? What recourse occurs if *your* expectations are not met? All too often, what sound like ironclad guarantees have no clout or do not achieve what you had anticipated.

A good example is the standard boilerplate included in most MRI contracts. “If system downtime exceeds 15%, your next year’s service agreement will be reduced by 10%.” If your system was down for 15% of the year, why would you even consider allowing that organization to continue to service the equipment? Not only that, but you were probably billed a great deal of overtime in its efforts to fix the system during the past year.

Your expectations should be clarified before signing a purchase agreement, and penalties for failure to perform as expected should be agreed on. For example, with respect to the expectation that the installation should take 4 to 6 weeks, we have frequently included in the agreement that the warranty will be extended one month for every additional week the installation takes beyond 6 weeks. Many other issues such as who will perform systems acceptance, when preventive maintenance will be performed, etc., should be clarified in a similar manner.

REALISTIC EXPECTATIONS

Most imaging projects are not completed on time and incur cost overruns. However, this should not occur if proper planning techniques are employed.⁶ Figure 5 identifies benchmark events for to successful completion of the four stages of a project: pre-purchase, installation, start-up, and continuing results. Every step in this sequence must be completed for the project to succeed. A key to success is to have one individual serve as the facilitator throughout the project.

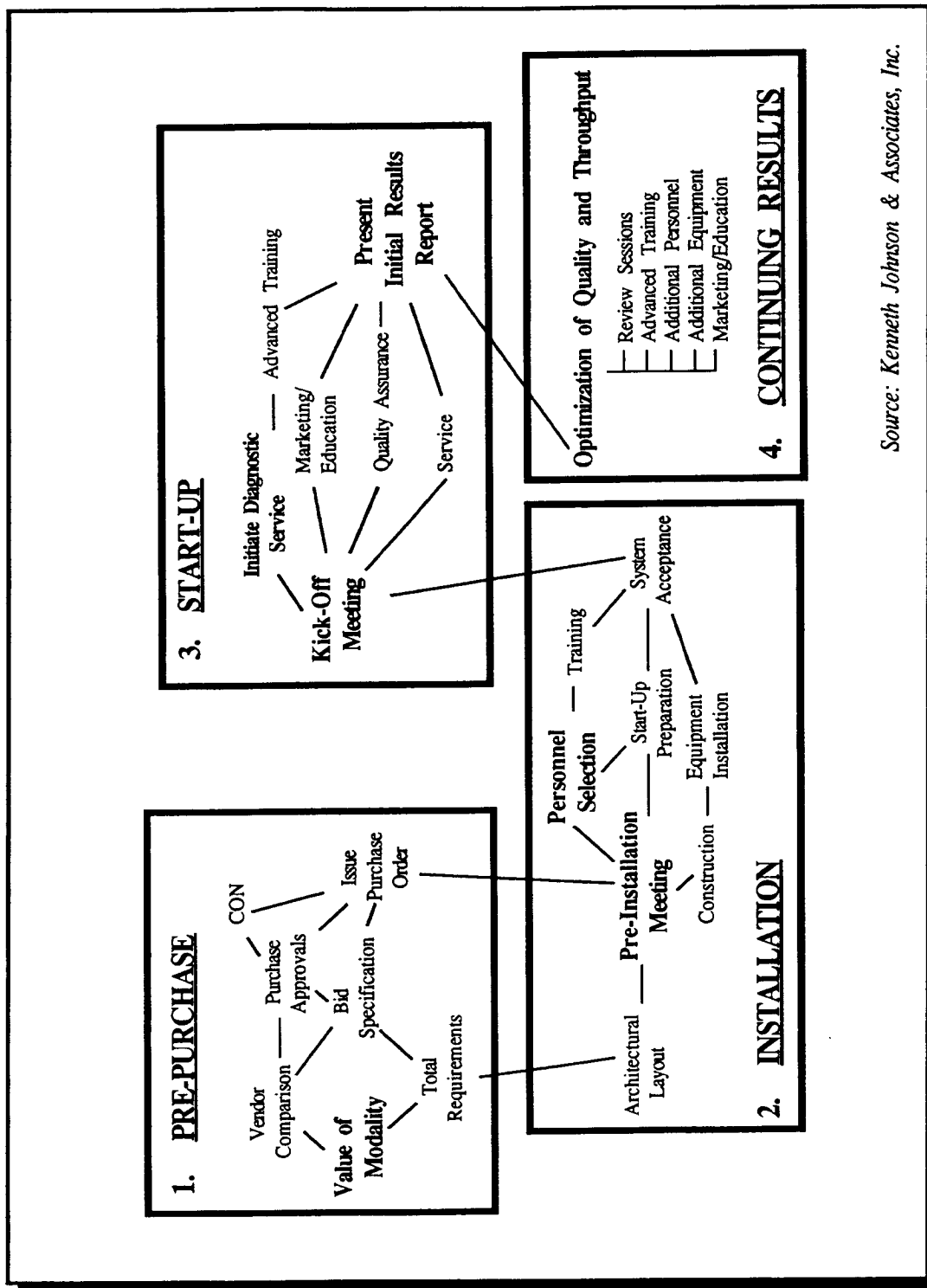
PROGRESS MEETINGS

Three progress meetings are particularly important to the success of a project: the pre-installation meeting, the kick-off meeting, and the initial results meeting.

The Pre-Installation Meeting

Representatives of all key parties are brought together for a final walk-through of the design to make certain that it has been optimized. Those participating in this meeting should include representatives of the hospital administration, radiologists, staff personnel, the sales representative who sold the equipment, as well as those who will install it, the architect, contractors, and others.

Figure 5. FLOWCHART USED TO IDENTIFY BENCHMARK EVENTS FOR EACH PHASE OF A PROJECT



Source: Kenneth Johnson & Associates, Inc.

The purpose of the pre-installation meeting is not only to make certain that the design has been optimized, but to clarify individual responsibilities and the target dates for completing various tasks. Benefits of this meeting are that final refinements are made to the design and everyone will have a better understanding of what is expected, the major benefit is that all key players now know each other and are more committed to the success of the project than they would have been otherwise.

The Kick-Off Meeting

In many ways, this meeting is similar to the final rally in the locker room before going out onto the playing field for an athletic event. Everything possible should be done to make the initiation of services as successful as possible. Typically, this meeting is held three to four weeks prior to initiating clinical use of the new service. The installation team provides an update of the status and the likelihood of having the system fully operational by the target date for initiating clinical services. Also, final plans for conducting systems acceptance and preparations for applications training are reviewed. In addition, plans for an open house and the marketing program are finalized in preparation for initiating the service.

Initial Results Review Meeting

Another important meeting is the initial results review meeting, which is held after six months' use of the new equipment. Is it performing as expected? Should any upgrades be added? Should anything be returned to the vendor that did not perform as anticipated or that has not been used? Should any personnel changes be considered or should additional training be given? Have volume projections been met? Should any particular marketing programs be modified or implemented?

CONCLUSION

We are entering a new era in which economic factors will have a major impact on diagnostic imaging. Therefore, one must be cautious in making major investments in imaging technology. Realistic objectives must be established before any acquisition is approved. However, once a decision is made to proceed, everything possible should be done to achieve success. These efforts should not only be focused on the initial start-up period, but also on ways to optimize the use of existing resources.

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ABOUT THE AUTHORS

Both authors are widely published and speak frequently on topics related to keeping current with trends in diagnostic imaging and how to optimize the use of diagnostic technology.

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