

Evaluating and Selecting A Property Management System

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Computerizing a property requires a game plan. Many have selected a Property Management System without much forethought and have been unhappy with the final results. The author discusses the major factors that must be taken into consideration in the selection of a PMS, based on his personal experience.

Computerization! The cry of management has often been: "Why computerize? It will only disrupt the operation." Many lodging establishments continue to rely on mechanical and handwritten systems to process information, particularly in smaller properties. The resistance to computerization can be explained by several factors.

There are those who have been left feeling inadequate by the technology revolution. What is new or not easily understood can be intimidating. Even learning how to use the keyboard to input information into a computer can become a major hurdle when typing skills are weak.

Others are fearful of what effect computerization will have on day-to-day operations. War stories are circulated about unsuccessful installations where equipment constantly malfunctioned or critical information was destroyed. Some feel that computerization dehumanizes service, while others view it as an expensive proposition.

The first question that must be answered is: "Why computerize?" Today management is faced with an increasingly complex environment where pressures for quality information are paramount in remaining competitive. Manual methods of manipulating data are labor intensive, time-consuming, ineffective, and untimely. Technological advances have encouraged many hospitality operators to rethink how information should be processed, stored, retrieved, and analyzed. Research has led to the implementation of various cost-effective applications addressing almost every phase of operations. One such application that has had a significant impact on the hospitality industry is Property Management Systems (PMS). A PMS normally performs both back and front office functions, as well as supports a variety of other functions such as housekeeping, energy management, and call accounting. Property Management Systems have been designed for

motels, hotels, resorts, and condominiums and rely on computer hardware (physical equipment) and software (computer programs) to process information.

In the last few years the price of a PMS has declined while performance has improved dramatically. As a result, the number of properties using a PMS has increased substantially. In fact, the number of 50 to 100 room properties using a PMS has increased 7,200 percent since 1983. This gigantic leap reflects the growing role of computer applications in the hospitality industry.¹

A PMS should be viewed as a vehicle for solving problems and effectively managing information, but, more importantly, it will improve profitability through more effective utilization of resources. The additional profits generated by its implementation will usually cover its costs within two to five years if the system has been fully utilized. The key advantages of a PMS are as follows: improved labor productivity, enhanced decision-making capability, improved report production, increased information accuracy, improved controls, greater guest satisfaction, reduced operating costs, and increased revenues.²

The second question that must be asked is: "To what extent should the operation be computerized." The areas that usually receive initial consideration are the front and back office functions. Some operations purchase comprehensive systems, while others elect to computerize only a specific function such as reservations. Each computer application must be cost justified. A dollar value must be assigned to the projected benefits and compared to the costs that would be incurred. For example, one resort operator wanted to purchase an elaborate point of sale system that interfaced with the front office system. The idea was discarded when he realized that the cost to do this for a low volume restaurant far exceeded the benefits.

Other operations have decided to computerize one function at a time. This is an effective strategy for implementing change, particularly in operations where there is strong resistance to new methods, procedures, and ways of processing information. One operation started with a word processor. The goal was to get the employees familiar with how the system worked, to show them in a small way how computers can help, to slowly build confidence, and then to eventually expand computerization into other areas.

Buyers Must Be Careful With Choices

When searching for a PMS, one will find numerous vendors who will offer a variety of choices. Unfortunately, many of these products are substandard for a number of reasons. Many were written by novice programmers unfamiliar with hospitality operations and terminology. There is also a high attrition rate; in the last four years, of the 140 suppliers of Property Management Systems, 62 have perished. If a PMS system was purchased from a firm that later declared bankruptcy, the property would be left without any software support unless the sales contract entitled the property to the source code, a sequence of instructions written in either assembly or high-level language by the programmer. In this eventuality, the property would need to hire a programmer for software support, an expensive inconvenience.³

Properties have found themselves with property management systems that did not satisfy essential informational requirements. For example, a resort located in New England was sold a PMS that did not handle meal and package plans. Management was extremely dissatisfied and removed the system. Who was at fault? In this case, the property had failed to stipulate this requirement to the vendor. Management must adhere to the maxim: "Do not expect, but inspect."

System Requirements Must Be Identified

In order to understand what PMS will be best suited for a particular property, it is essential to specify system requirements and parameters. To carry out this task, a PMS committee should be formed comprised of representatives from the various departments targeted to be computerized. The findings should be incorporated into a report called a property profile to be distributed to vendors. This will enable the property to clearly define what it desires in a PMS as well as to communicate its needs to vendors.

A problem that often arises is unrealistic expectations concerning the capabilities of a PMS. Many people feel that a computer can do everything. To ensure a pragmatic approach in the development of system requirements, the PMS committee should familiarize itself with products that are currently available on the market by obtaining relevant product literature. The easiest way to secure sales literature is from the vendor by mail or telephone. Other sources of information include industry trade shows, trade journals, and trade associations such as the American Hotel and Motel Association (AH&MA) and the International Association of Hospitality Accountants (IAHA).

A Property Profile report covers a number of details relating to the computing needs of the property. Its development begins with the specification of required reports that are of high value and improve operational performance and decision-making capability. The committee's responsibility will be to vote on the retention and modification of old reports and the creation of new ones. Sample reports should be included in the property profile showing the required information and desired format.

Management should specify the tasks that it would like the PMS to perform. A detailed checklist of desired functions should be devised for each affected work area. There should be a description of staffing levels and business volumes for each area under consideration. This will aid in the assessment of hardware and software requirements and also pinpoint opportunities for improvement in labor productivity.

The report should familiarize the vendor with the products and services offered. This will educate the vendor as to the desired service levels and the types of service that appeal to the property's clientele.

The report should describe the layout of the facility and identify the areas where hardware will be located. This will assist the vendor in determining the hardware configuration.

Finally, the report should briefly review the employees' level of job knowledge, experience with computers, typing skills, and attitudes toward automation. This will help the vendor assess the training needs (See Table 1).

Table 1
Property Profile Description

Section I:	Type of Facility: An overview of the property, products, and services.
Section II:	Reports: List report requirements and attach sample copies. For example, possible report requirements for reservations may include advance deposit report, forecast report, blocked rooms report, reservation rate variance report, group activity report, etc.
Section III:	Desired Functions: Tasks that management would like the PMS to perform for each affected work area. For example, possible tasks for the back office may include accounts payable, accounts receivable, payroll, budgeting, financial reporting, inventory control, etc.
Section IV:	Work and Staffing Volumes: Specification of work volumes and current staffing requirements. For example, statistics for reservations may include number of reservation clerks, hours of coverage, average number of calls per hour, average wage rate for reservation clerks, total number of new reservations entered per day, average number of confirmations printed and mailed, etc.
Section V:	Layout of Facilities: Blueprints of the work areas affected by automation.
Section VI:	Employees: Their level of job knowledge, experience with computers, typing skills, and attitudes toward automation.

Request For Proposal Is Next Step

Once management has completed the fact finding mission, the results should be incorporated into a report, commonly referred to as a request for proposal (RFP). This report should contain the following sections:

- **Property Profile.** A description of the operation and its computing needs.

- **Solicitation Instructions and Conditions.** A guideline for submission of vendor proposals and a description of how vendor responses will be evaluated. Table 2 provides three approaches that can be used to appraise vendor answers.
- **System Specifications.** A detailed description of desired features and requirements for each of the following areas: system cost, software, hardware, hardware and software support, and training and installation.

These requirements should be presented in a questionnaire format as illustrated in Table 4.

The primary benefit of the RFP is that a vendor will be required to respond to a standardized format. This will ease the evaluation process when comparing the suitability of different Property Management Systems.

It is mandatory that the RFP include guidelines for submission. To protect the property's interest, all bids must be in writing. For promises relating to the price and performance of a PMS to be legally binding, it must be included in a written contract.⁴ Therefore, it would be prudent to include the following conditions in the RFP:⁵

- Vendor's responses to RFP questions shall be included in and incorporated into any sales contract which may result.
- Vendor statements and claims within or appended to the RFP regarding product performance and capabilities shall be considered part of the proposal and therefore part of any sales contract which may result.
- The proposed prices, terms, and conditions shall remain valid for a certain number of days following submission.

The RFP should specify how the proposal will be evaluated. There have been various schemes devised for ranking proposals. A simple method is to assign a score of 1 for "yes" or 0 for "no" for each system requirement, and the proposal that has the highest collective score is viewed as best. One method that allows more flexibility in response is to have a rating scale which uses a range of numerical values to indicate the degree of acceptability. Table 2 provides three rating scale examples.

Table 2
Rating Scale Examples

Collins Rating Scale⁶

- 4 = satisfies system requirement
- 3 = satisfies system requirement with minor modifications

- 2 = satisfies system requirement with major modifications
- 1 = does not satisfy system requirement

Lonam Rating Scale⁷

- 4 (yes) = meets the system requirement
- 3 (yes-but) = meets the system requirement partially or in a manner different than stated
- 2 (no-but) = does not meet the system requirement, but development is planned or can be custom programmed
- 1 (no) = does not meet the system requirement

Buchholz Rating Scale⁸

- 1 = more than meets the requirement—above average
- 2 = meets the requirements—average
- 3 = does not meet the requirements—below average

To take into account the relative importance of certain requirements, an additional value may be assigned to the rating scale resulting in a weighted average.⁹ The process of assigning weights can become a rather tedious and subjective process. Table 3 describes the mechanics entailed in this scoring approach. Perhaps an easier way of assessing the importance of a function is to categorize it as essential or nonessential. An essential requirement could be assigned a weight of 1 and a nonessential requirement a weight of .50. For example, an essential function that received a score of 4 would have a weighted average of 4 (4 X 1.0) as compared to a weighted average of 2 (4 x .50) for a nonessential function. Another approach to this task is to simply keep separate score sheets for essential and nonessential requirements.

The evaluation process requires the translation of system requirements into precisely worded questions that accurately describe the desired features. An ambiguous and superficial questionnaire results in vague vendor responses. For example, the question “How does your system handle travel agent commissions?” can lead to a multitude of answers, whereas a series of focused and in-depth questions, as shown in Table 4, identify specific performance capabilities. A well-designed questionnaire elicits exact and relevant answers facilitating a judicious assessment of vendor proposals.

Table 3
Weighted Average Approach
To Scoring Vendor Evaluations

STEP 1: Identify system requirements.

- System cost
- Software performance
- Hardware performance
- Hardware and software support
- Training and installation

STEP 2: Prioritize system requirements through assignment of weights.

System requirements	Assigned Weight
Software performance	.30 (most important requirement)
Training and installation	.25
Hardware and software support	.20
Hardware performance	.20
System cost	.05 (least important requirement)
	1.00

STEP 3: Define rating scale.

- 4 = Satisfies system requirement
- 3 = Satisfies system requirement with minor modifications
- 2 = Satisfies system requirement with major modifications
- 1 = Does not satisfy system requirement

STEP 4: Compute the average score for each system requirement.

Each system requirement can be graded on various criteria as illustrated in Table 4.

System requirements	Average Score		
	Vendor 1	Vendor 2	Vendor 3
Software performance	3.5	3.0	3.8
Training and installation	3.8	4.0	3.0
Hardware and software support	3.0	3.2	3.0
Hardware performance	3.5	4.0	4.0
System cost	2.0	4.0	3.0

STEP 5: Calculate the final score.

Multiplying the average score by the assigned weight and add up the weighted averages.

System Requirements	Final Score		
	Vendor 1	Vendor 2	Vendor 3
Software performance	$3.5 \times .30 = 1.05$	$3.0 \times .35 = .90$	$3.8 \times .30 = 1.14$
Training and install.	$3.8 \times .25 = .95$	$4.0 \times .25 = 1.00$	$3.0 \times .25 = .75$
Hardware and software sup	$3.0 \times .20 = .60$	$3.2 \times .20 = .64$	$3.0 \times .20 = .60$
Hardware performance	$3.5 \times .20 = .70$	$4.0 \times .20 = .80$	$4.0 \times .20 = .80$
System cost	$2.0 \times .05 = .10$	$4.0 \times .05 = .20$	$3.0 \times .05 = .15$
Final Score	3.4	3.54	3.44
	(Best Choice)		

Table 4
Questionnaire Example
Software Specifications For Travel Agent Commissions

Travel Agent Commissions	4 Yes	3 Yes With Minor Mod.	2 Yes With Major Mod.	1 No
1. On-line access to all travel information				
2. Allows the user to cross-reference reservation information with the travel agent file				
3. Computes travel agents commission and has the following commission structures:				
• fixed percentage of room revenue by guest type				
• fixed amount per guest				
• fixed amount per reservation				
• fixed amount per room night				
• percentage of total revenue				
• percentage of total room revenue				
4. Automatically prints commission checks with check reconciliation capability				
5. Handles prepaid commissions				
6. Has the ability to keep track of commissions due to travel agents and sales agents				
7. Provides monthly and yearly statistics which show for each travel agent:				
• number of no shows and cancellations				
• number of room nights				
• number of reservations				
• total sales revenue				
• total room revenue				
• total commission paid				
• total commissions due				

- **Explanation of Form:** To facilitate the collection of pertinent

and meaningful information requires the conversion of system specifications into a list of detailed questions. The vendor is responsible for placing a checkmark next to the choice which most closely indicates the degree to which their product satisfies that particular requirement. This process will allow a thorough and fruitful assessment of vendor proposals.

In evaluating Property Management Systems, a trap that many operators fall prey to is getting carried away with the options and forgetting about essential system requirements while losing sight of budgetary constraints. The purpose of putting together a RFP is to ensure that the selection criteria are firmly intact during the tough decision-making process.

One person should be designated for dealing with vendors. This will prevent vendor confusion when seeking clarification on RFP details but, more importantly, will ease the negotiation process. Many properties have been duped because the expertise of the designated representative was deficient. This person must be prepared to handle a variety of questions in a competent manner. Knowledge of the topic can be strengthened through formal classroom instruction, attendance at seminars and trade shows, or home instruction courses provided by the Educational Institute of the American Hotel and Motel Association.

Intelligent decision-making capability is based upon knowledge. A lack of knowledge will leave the property in a weaker negotiating posture and vulnerable to the whims of a salesperson.

Evaluating Software Is Critical

Poor selection of Property Management Systems can frequently be attributed to a lack of quality choices. It has been fallaciously assumed that all these systems are basically the same. However, there are numerous products on the market which vary significantly in capability and performance. The PMS committee should identify four or five software packages that satisfy basic requirements.

A product has been recently developed by the accounting firm of Pannel, Kerr and Foster to facilitate software selection. The PKF Hotel Software Options Program allows users to identify hotel management systems which fit specific criteria as identified for the user's hotel. The program is contained on a single diskette and can be operated on any IBM compatible hardware.

When evaluating software packages, there are four questions that must be answered:

- Does it satisfy system requirements?
- Does it have the ability to interface with existing systems (such as telephone and point-of-sale) as well as future systems planned for installation?
- Is it easy to operate?
- Is the software vendor reputable and customer-oriented?

The likelihood of identifying an ideal PMS is slim. It is important to realize that a typical property serves as the standard in the development of most software programs. Unique requirements needed for a property can be negotiated with the vendor. However, modifications to the program will normally increase the cost of the product and, in some instances, delay its implementation. To protect the property's interest, include any revisions to the software and the required completion dates in the sales agreement.

The sales representative plays a critical role in the selection process. A competent sales representative should thoroughly understand hospitality operations and automation. He or she must have the ability to translate the needs of a manual operation into system specifications. Many products have been misrepresented because the sales representative was misinformed and unqualified. A prudent step would be to scrutinize the sales representative's credentials.

Be wary of vendors who are more interested in closing a sale than satisfying a customer. To ensure that the system is capable of performing the task, check references carefully, do an on-site inspection of a property already using the system being considered, ask other vendors, and/or visit the vendor's headquarters.

A product feature of a PMS that has frequently been misrepresented is its capability to interface with other programs and hardware devices. An interface refers to the interaction that occurs between two systems. An intelligent, integrated software package will make provisions for numerous interfaces. The primary benefit of a systems interface is that it eliminates clerical work. For example, a call accounting interface allows telephone charges to be posted directly to the guest folio without human intervention. Other popular interfaces include in-room movie systems, guest information services, electronic locking systems, energy management systems, and point-of-sale systems.

Disillusioned operators have found themselves with a software product that will not communicate with other systems. It is important to investigate interface options; otherwise, the number of cost effective applications could be severely restricted forcing the operator to begrudgingly live with the system, discard the system, or invest in the costly development of interfacing capabilities.

Ease of Operation Is Important

A "user-friendly" software package allows the user to easily move through the program without encountering frustrating obstacles.

Programs that require users to memorize abstract abbreviations, codes, and information to carry out standard routines should be avoided. Poorly designed software will force users to frequently reference documentation to operate it, sacrificing valuable guest contact time as well as hindering worker productivity. A well-conceived software program will provide self-explanatory choices, painlessly guiding the user through the successful completion of tasks.

The execution of tasks can be aided by the format of the computer screen display, a visual apparatus that shows text and graphics. Infor-

mation should be presented in an organized fashion, allowing the user to quickly spot the appropriate command or choice. It should not overwhelm the user with too much information. A nicely formatted screen display resembles a restaurant menu and cleverly utilizes such things as color, underlining, and highlighting to enhance the user's comprehension rate.¹⁰

The user's response, whatever it may be, should not cause the program to abort. This will intimidate the learning process if the user cannot correct mistakes without starting over. The program should allow the use of abbreviations to common responses (i.e., Y for yes), saving time and effort.¹¹

To ensure that a program runs properly, it should be thoroughly tested to uncover logic flaws. Testing a program requires executing it using bogus input data. The risk of discovering bugs or logic flaws becomes less as the product ages and is subjected to rigorous industrial use. Customer-oriented vendors have established user advisory groups who help in product refinement.

Software Vendors Must Be Reputable

To ensure continued software support, it is important to select a software vendor both reputable and customer-oriented. The following questions should be included in the RFP:

- How long have you been in business? How does this compare to your competitors? Who do you feel are your four best competitors?
- How many properties have you installed?
- What is your financial status? May I see your financial reports? What has been your average growth in sales? What are your sales projections for the next five years?
- Describe management. Who are your key personnel? What has been their length of employment?
- Do you provide telephone customer support, including the evening shift (4 p.m. to midnight) and the night audit (midnight to 8 a.m.)?
- Do you provide a software maintenance contract? How much does it cost and what does it cover?
- Is system documentation provided? Is it easily understood?
- What measures have been taken to safeguard the database? Do you have a standard operating procedure that outlines the dumping of critical information to hard copy or printed paper copy? Are there provisions for easily backing up information to another storage medium (i.e, floppy disk, magnetic tape, etc.) on a daily basis? Is backup information stored in a protected, fireproof area? Does the program provide security access codes to prevent unauthorized use? Does the program alert management to possible tampering and security violations?

- Can the software be upgraded? What will be the cost for software updates? Are there any plans for software enhancements? Do you have a user advisory group to assist in the formulation and refinement of products and services?
- Will you provide a warranty guaranteeing software support for 10 years? In the event of bankruptcy, will the source code and documentation be put into an escrow account?
- Who are your references?

Software vendors, in most cases, are unable to deliver local service and must rely on a telephone hotline service to solve problems. Serious problems may require that a technician visit the property. In some cases, the problem may render the PMS inoperable. To handle this potentially crippling situation, the vendor should provide an alternative way of functioning until the system can be restored. The staff should be fully trained in emergency backup procedures or the property could suffer a disastrous collapse. Unprepared properties may find themselves with no means of generating a guest folio or tracking financial transactions.

A recent development in software support is the use of modems, a communications device that allows two computer systems to interact via telephone lines. This device allows a technician to gain access to the program from a remote location, enabling a more rapid diagnosis and system recovery.

Detailed Training Plan Should Be Developed

A successful installation is the by-product of a structured and well-organized training program. A detailed training plan should be developed by the PMS vendor answering the following questions:

- **When should the training take place?** Training begins before the installation of the computer system and continues through the various stages of implementation. By extending training sessions over a greater time period, the learning process is eased, alleviating employee anxiety; introducing a computer system during a tense, seasonal rush can block normal learning behaviors.

- **What employees will be trained?** A list of employees must be obtained by the vendor in order to develop training schedules. An employee profile should be developed specifying the following information: job title, job knowledge, length of employment, typing ability, computer literacy, and work schedule. This information is used to determine the content and format of the training sessions. The intensity of these sessions depends on the quality of the existing work force.

However, it is not the responsibility of the vendor to teach typing or basic job knowledge such as reservations, registration, and guest accounting terminology. The vendor's role is to identify employee deficiencies that would impede the normal learning of the computer system. The responsibility of the property is to correct cited deficiencies by engaging in pre-installation training programs that will provide

employees with the prerequisite skills needed to successfully operate the computer.

Management must also be trained. It is very important that management understands how to operate and use the system. Without management participation, the probability is great that the system will be poorly utilized. However, educating managers can present some interesting challenges. Managers may feel uncomfortable and awkward being in the same training classroom with subordinates. It may provoke feelings of insecurity and embarrassment to have employees watch them struggle to learn the keyboard or the program. Overcoming feelings of inadequacy may be accomplished through individualized instruction or "manager only" training sessions.

A PMS coordinator or representative should be trained as a systems troubleshooter. The PMS coordinator will receive specialized training on every aspect of hardware and software operations. This will enable the PMS coordinator to handle minor problems and to serve as a liaison between the property and the vendor in solving major problems. The best suited candidate for this position would be one who has had exposure to computers and has a basic understanding of the areas affected by automation.

• **What should be covered in the training program?** The training program should take an employee through four basic learning phases: learning the keyboard, learning the format and organization of the program, learning to carry out job responsibilities utilizing the computer, and utilizing the computer to perform job responsibilities in the actual work environment.

These training objectives should be attained in a fairly short time span. A trainee should feel comfortable with the system after four or five hours of instruction. The property should select a system without a long learning curve which requires months for an employee to master it. With the traditionally high turnover rate in the hospitality industry, a property could quickly find itself with an untrained work force. Furthermore, employees have blackmailed employers for higher wages because they alone could operate the system. A responsive vendor will provide on-going training programs to protect a property from these disconcerting predicaments. However, the cost of post-installation training can be astronomical. This creates the need to negotiate a clause in the sales agreement defining a reasonable cost for this future service.

Training Should Involve Simulation

The most effective method of training is one that emphasizes the actual operation of the computer system in a simulated environment. This requires the setting up of computer equipment in a dedicated training room. The first learning exercise will introduce the trainee to the operation of the hardware, focusing primarily on the keyboard. The second learning exercise will introduce the trainee to the program and its basic components. The successful completion of these two tasks can be accomplished through computer-assisted instruction

(CAI), which moves the trainee through a carefully planned sequence of events, eliminating the need for personalized instruction. This program can be left with the property for training of new hires. Unfortunately, not every vendor provides this product.

Learning to carry out job responsibilities utilizing the computer requires that the database, a collection of facts and figures pertaining to the property such as room numbers and room types, be loaded into the computer. This experience provides the trainee the opportunity to learn the system in a non-threatening environment where realistic work situations are reproduced. This encourages trainees to experiment, thereby accelerating their progress and reducing computer phobia.

The final phase of training occurs after the system has been fully installed and is operational. A trainer will assist the user, if needed, while performing actual work tasks utilizing the new system. This step takes on added importance when it involves guest contact positions. The presence of the trainer to gently remind front desk clerks how to check-in a guest prevents them from becoming frazzled during heavy business periods. Stressful situations may impair memory recall, causing an employee to self-destruct. Employees have walked away in tears, screaming that the system is incomprehensible.

The best insurance against this frightening possibility is a solid training program. But, unfortunately, there are those who do not understand the significance of training and try to minimize this cost. A major hotel chain discontinued PMS test sites because the operations vice president was upset with the increase in labor costs due to training. This short-sighted, frugal view of training has led corporate America into the doldrums. According to Tom Peters, the noted co-author of *In Search of Excellence* and *A Passion for Excellence*, a lack of training is the primary culprit in the demise of American corporate supremacy. Peters stated that the Japanese invest 350 percent more in the training of their employees.¹²

Training should also cover standard operating procedures for tasks for which the handling of information will change. For example, one hotel continued to supply the switchboard operator with slips for the telephone rack, not realizing that the PMS printed a telephone directory. The PMS vendor should have recommended the elimination of the telephone rack and the printing of an updated telephone listing on an hourly basis.

Effective standard operating procedures also optimize guest contact time. Procedures that require extensive use of the computer when carrying out guest-related routines force the user to eye the screen rather than the guest and increase the time requirements to complete the task. A customer-friendly system should not require a guest to watch a clerk laboriously input information into the computer. This time should be profitably spent tending to the needs of guests. Servicing the guest takes top priority, requiring that clerks be trained to efficiently use their time during slow periods to do clerical work. The policies, procedures, and methods should all say to the guest, "This apparatus is here to meet your needs."¹³

Hardware Impacts Upon Performance

The hardware component of the PMS has a pervasive impact on software performance. Failure to select the right type of computer and the appropriate hardware configuration can create system entropy. Hardware that is slow to respond to user requests, is difficult to operate, or frequently malfunctions hinders the ability of employees to get work done. However, technological strides in hardware design will continue to improve hardware efficiency and reliability and will eventually eliminate these troublesome and degenerative problems that have often plagued PMS installations. To face the challenging task of determining hardware requirements, the following questions must be answered:

• **Which comes first, selection of hardware or software?** A property owner bought hardware from an in-law and later discovered that there was not a suitable software package that would operate on it. Different brands of hardware (i.e., IBM, Apple, Digital, etc.) require specific operating systems (i.e., MS-DOS, CP/M, UNIX, etc.) to execute software instructions. The operating system coordinates the interaction between the software and hardware by controlling the execution of programs. Hardware that requires an unpopular operating system severely restricts the number of software choices.

Software and hardware may be provided by different vendors or one vendor may provide both the hardware and software. There must be a decision whether to go with a multi-vendor or single-vendor. A wide range of views can emerge on this topic when weighing the advantages and disadvantages of each option.

Vendors who provide both hardware and software market their product as a "turnkey system." The primary advantage of a turnkey system is that only one vendor must be contacted to resolve a problem. In a multi-vendor environment, resolving problems can regress to finger-pointing. Avoiding this dilemma requires the development of clear, acceptable guidelines for communication between vendors.¹⁴

It would be much easier to purchase the entire PMS from one vendor. However, a PMS vendor may not supply a particular component for an application; another may provide a more appropriate software application, or equipment from one vendor may cost less than the same item offered by another. The bottom line is that the entire system should smoothly function when all the parts are assembled.

• **What type of computer should be purchased?** Minicomputers and microcomputers are commonly used at the property level. Technological developments continue to increase the power of computers while reducing space and cost requirements. These developments have blurred the traditional distinctions made between different computer types. The hardware trend for hospitality applications clearly indicates increased usage of powerful microcomputers.

An important factor in computer selection is the speed at which the system processes information. The heart of a computer is the

central processing unit (CPU) which determines how quickly the system processes information. The CPU of a minicomputer processes information more quickly than that of a microcomputer. The speed in which tasks are carried out depends on the number of users, the size of the property (volume of transactions), and the type of computer. If the computer size (or CPU size) is underestimated, response time will be slow, resulting in bottlenecks in areas where speed is essential in handling guest requests. It can also create a backlog of administrative work. One operation suffered such acute response degradation that it had to double its processing capability. To get a system that satisfies a property's requirements, visit other similar properties that have the proposed computer system to observe response time at the front desk, in reservations, and in accounting.

A computer must provide adequate storage capacity. Early microcomputer systems would only allow the storage of 20 or 30 million bytes of information. Most of the storage space would be monopolized by one or two software applications. Foreseeable space shortages would trigger frequent, visual warnings commanding the deletion of outdated file information to prevent the "freezing up of the system." Unfortunately, this old, useless data was often guest history information which, if kept, could have been profitably used in marketing and sales applications. It is important to select hardware which allows for growth in use and new applications.

A strategic question must be answered: "Can the system be expanded?" According to Richard M. Brooks, director of rooms management of Stouffer Hotels, "It is important to make sure that the technology is upgradeable."¹⁵ New demands on the system may create the need for more storage space (i.e., convention and group planning program); the need to interface with other devices (i.e., energy management program); the need to handle more users (i.e., property plans to add 200 more rooms); the need to enhance guest services (i.e., self-checkout); the need to improve guest security (i.e., electronic locking system); the need to increase telephone revenue (i.e., call-accounting); and the need to reduce late food and beverage postings (i.e., POS interface), etc. A well-designed system will allow for the existing hardware to be modified or expanded to accommodate more processing capabilities, greater data storage, and more operations.

• **What should the hardware configuration be?** The design of the computer system should be based on the physical layout of the property and the projected workloads. The heart of the system, housed in a protected, isolated area, can support work stations strategically located throughout the property. A basic work station or terminal includes a monitor (TV-like device that shows text and graphics), keyboard (typewriter-like device that allows a user to input information into the computer), and a printer (a device that produces printed copy such as a guest folio). Users interface with the system through these work stations, which are part of a communications network.

The vendor must conduct a site inspection to accurately assess the equipment needs and architectural considerations. The technician must map out a strategy for installing communication and electrical cables. Areas, such as the front desk, may have to be redesigned to accommodate computer equipment. Poor site preparation can lead to grave problems. Failure to conduct electrical testing can result in the irreparable damage of computer equipment. Communication cables, haphazardly installed, can repeatedly cause system crashes. A conscientious vendor will have a pre-installation checklist covering these factors.

A well-designed facility is essential in an environment where people and computers work together. Poor lighting, glare, noisy printers, cramped work space, heat and ventilation problems, improper terminal height are all factors that can hinder the quality of the work environment. An experienced vendor understands how to adapt the equipment and environments to human skills and physiological requirements.¹⁶

Vendors have the sales-driven tendency to recommend more equipment than is actually needed. To avoid paying for unused computer capacity, an operator must closely analyze each work area and identify the users and the amount of computer time each user needs. For guest contact positions, it is important to provide the capability (measured in work stations) to accommodate peak business periods whereas computer time for administrative tasks can be evenly scheduled over a normal working day. Equipment costs can be saved through the sharing of resources. Work stations can be used by different users. Printers can be set up to support more than one work station. For example, a printer can be conveniently located between two front desk work stations. However, a vendor may argue that trying to be frugal may backfire and adversely affect the operation. A cost-effective approach to this scenario would be to install the necessary communication cables that would allow a future work station, if needed, to be quickly brought on line.

• **Is the equipment reliable, readily available, and easily serviced?** Avoid the temptation of selecting a system based solely upon price. Quality may be inadvertently traded for cost. In a hotel environment, the special emphasis should be on service. System downtime can be costly and aggravating and will happen periodically. The following questions should be included in the RFP:

- Can routine maintenance be easily done by employees or must the computer vendor perform this task?
- How often is there computer downtime?
- What is the average time that the computer is down?
- Does the vendor respond promptly when there is a problem?
- Does the equipment need a regulated environment?

- Are there built-in precautions to safeguard the system from power fluctuations? Is the system equipped with a battery pack to compensate for interruptions (i.e., black-outs and brownouts) in the power supply?
- Does a local computer organization service the equipment?
- Are a complete set of repair parts readily available?
- Do you provide a hardware maintenance contract? How much does it cost and what does it cover?

To avoid the pitfall of being saddled with an inadequate PMS, do not rely solely on the recommendations of vendors. Prepare a game plan. Study your property and identify its needs. Put together a detailed list of questions to ask the vendor and verify the answers.

If, during the final evaluation of a PMS, the answer is "yes" to the following questions, the right PMS has been found:

- Does the software satisfy system requirements?
- Is the software easy to operate?
- Is the software vendor reputable and customer oriented?
- Does the vendor provide a well-organized and structured training program?
- Have the equipment needs been correctly estimated?
- Can the hardware be expanded?
- Does the proposed hardware configuration fit well into the existing work environment?
- Is the equipment that the PMS operates on reliable, readily available, and easily serviced?
- Does the PMS have the ability to interface with existing systems as well as future systems planned for installation?

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