**CHAPTER 21**

**AIS DEVELOPMENT STRATEGIES**

**SUGGESTED ANSWERS TO DISCUSSION QUESTIONS**

**21.1 What is the accountant’s role in the computer acquisition process? Should the accountant play an active role, or should all the work be left to computer experts? In what aspects of computer acquisition might an accountant provide a useful contribution?**

The accountant is likely to be:

* A major user of the computer output
* Responsible for internal controls over data processing in the organization
* An expert in cost estimation and analysis
* A designer of many of the systems that the computer is intended to supplant.

With these responsibilities, the accountant must be actively involved in the computer acquisition process. The accountant's role is probably best carried out by participating on a team or committee together with computer experts, systems analysts, production personnel, engineers, managers, and others whose functions are closely related to the information systems activity.

**21.2 In a Midwest city of 45,000, a computer was purchased and in-house programmers began developing programs. Four years later, only one incomplete and poorly functioning application had been developed, none of software met users’ minimum requirements, and the hardware and the software frequently failed. Why do you think the city was unable to produce quality, workable software? Would the city have been better off purchasing software? Could the city have found software that met its needs? Why or why not?**

Certainly not all instances of use or failure to use packaged software are as dramatic or as clear-cut as this. Nor in all cases will packaged software meet the functional requirements at a reasonable cost in an acceptable time frame. A careful evaluation of packaged software, however, can result in a system that performs admirably and cost effectively for data processing users.

a. Some possible reasons why the city was unable to produce a quality, workable system are:

* Poor management.
* Inexperienced systems analysts and programmers.
* Inadequate needs analysis and requirements definition.
* Management does not understand development well enough to direct and manage it.
* Failure of users and development personnel to communicate.
* Failure to establish checkpoints for monitoring the project.
* Lack of continuity among the people working on the system.
* Failure to plan the development project adequately.

b. The city would have been better off purchasing canned software for the following reasons:

* They could have saved themselves a great deal of money.
* They could have implemented the system much faster.
* They would not have needed as many in-house programmers.
* They could have avoided a lot of hassles, headaches, etc.
* They could have "test-driven" the program to know exactly what they were getting.
* They could also have talked to other users to measure satisfaction with the software.
* Custom packages are much more likely to be bug free.
* The developer can keep the package up-to-date easier and less expensively.
* They probably would have gotten a much better system.

c. There are certainly enough cities, and hence a large enough market, for there to be quality software available. A city of 45,000 shouldn't have an overly complex system, such that none of the available canned packages would have been acceptable. The package might not have been able to meet all of the city's detailed needs and desires, but a package that came close to their needs certainly could have been found without all the problems mentioned above.

An adequate turnkey system was available and it would have saved the city nearly $500,000. In fact, the city’s annual data processing costs exceeded the annual costs of the new turnkey system.

**21.3** **You are a systems consultant for Ernst, Price, and Deloitte, CPAs. At your country club’s annual golf tournament, Frank Fender, an automobile dealer, describes a proposal from Turnkey Systems and asks for your opinion. The system will handle inventories, receivables, payroll, accounts payable, and general ledger accounting. Turnkey personnel would install the $40,000 system and train Fender’s employees. Identify the major themes you would touch on in responding to Fender. Identify the advantages and disadvantages of using a turnkey system to operate the organization’s accounting system.**

Major themes that should be touched upon in responding to Fender's inquiry include:

* The need for a feasibility study to determine whether a new system is technically, economically, and operationally feasible for Fender's dealership.
* The need to identify the dealership’s needs and prepare specifications based on those needs.
* The importance of requesting proposals from competing vendors and systematically comparing them.
* The possibility of using EDP consultants to help and of outsourcing the system.

If students only suggest they obtain more information on this vendor and its hardware and software, then they are missing the point of the case. It is important to take a more general and systematic approach to the system acquisition decision, rather than making a "yes-no" decision on only this one system.

Advantages of a turnkey system

* Less expensive than internally built systems and the total package may be better priced.
* Takes less time and human resources to develop and run.
* Experts are available for both the application software and hardware.
* One-source support for the entire system. The vendor cannot pass the responsibility for a problem off on someone else. A single vendor may also facilitate system start-up and conversion as well as training on how to use the system.
* Warranties are usually available.
* Simplified selection process
* Costs are reduced since it is not necessary to match software with hardware meaning that it is less likely that various items of hardware and software will be incompatible.

Disadvantages of a turnkey system:

* Software or hardware may not be completely suited to company's needs.
* Software modification may not be available or covered.
* Increased vulnerability to continuity of the vendor's business.
* Lack of control over design.

**21.4** **Sara Jones owns a rapidly growing retail store that faces stiff competition due to poor customer service, late and error-prone billing, and inefficient inventory control. To continue its growth, its AIS must be upgraded but Sara is not sure what it wants the AIS to accomplish. Sara has heard about prototyping, but does not know what it is or whether it would help. How would you explain prototyping to Sara? Include an explanation of its advantages and disadvantages as well as when its use is appropriate.**

Prototyping is an approach to systems design in which a simplified working model of an information system is developed. In essence, a prototype is a scaled-down, experimental version of the system requested by the users.

The first step is to identify the basic requirements of the system. The emphasis is on what output should be produced rather than how it should be produced. A "first draft" model is quickly (days or weeks) and inexpensively built and given to users so they can experiment with it. This allows users to determine what they want the system to accomplish and what they like and don't like about it. Based upon their reactions and feedback, the developers modify the system and again present it to the users. This iterative process of trial usage and modification continues until the users are satisfied that the system adequately meets their needs.

The last step is making the system operational. The two choices are to use the already developed prototype or to use the prototype as a model for developing a new system.

Some of the advantages of prototyping include:

* Better definition of user needs
* Higher user involvement and satisfaction
* Faster development time
* Fewer errors in the implemented system
* More opportunity to make changes
* Less costly than other development alternatives

Some of the disadvantages of prototyping include:

* Requires a significant amount of users’ time
* Less efficient use of system resources
* Incomplete systems development
* Inadequately tested and documented systems
* Cost of learning the different versions of the software
* Never-ending development

Prototyping is appropriate when

* there is a high level of uncertainty about what is needed
* it is unclear what questions to ask
* the final system cannot be clearly visualized because the decision process is still unclear
* Speed is an issue
* The system must meet just one or two major critical needs
* There is a high likelihood of failure.

**21.5 Clint Grace has been business over 30 years and has definite ideas about how his ten retail stores should be run. He is financially conservative and is reluctant to make expenditures that do not have a clear financial payoff. Store profitability has declined sharply and customer dissatisfaction is high. Store managers never know how much inventory is on hand and when purchases are needed until a shelf is empty. Clint asks you to determine why profitability has declined and to recommend a solution. You determine that the current AIS is inefficient and unreliable and that company processes and procedures are out of date.</para> <para>You believe the solution is to redesign the systems and business processes using BPM. What are some challenges you might face in redesigning the system? How will you present your recommendations Clint?</para></question></general-problem>**

Business process management (BPM) is a systematic approach to continuously improving and optimizing an organization's business processes. Grace may be resistant to BPM and its attendant changes and new technology because:

* **Tradition:** Grace has been at the business for 30 years and the old way of doing things has been a part of his life. Changing a lifestyle is very difficult.
* **Resistance:** It is human nature to resist radical change and step out of one's "comfort zone." Grace may be so set in his ways that resistance seems inevitable.
* **Time requirements:** BPM is not a "quick-fix.” Redesigning business processes at a chain of regional stores is likely to a lengthy process.
* **Cost:** Resistance is likely because Grace's financially conservative attitude may not mesh with a costly business process redesign.
* **Lack of management support:** Grace has been calling the shots for many years. It may be difficult for him to give full support to the project even if the need for redesign is obvious.
* **Retraining:** After the BPM project is completed, Grace will be faced with the cost of retraining his employees. Retraining is also costly and time consuming.

Student answers as to how to present the recommendations to Clint Grace will vary depending on the perception of the student. However, some general guidelines are:

* Recognize that it may be hard to convince Grace. Therefore, you must plan your strategy well. You must be able to sell Grace on the benefits of BPM for his ten stores.
* Be aware of potential problems and seek to avoid them.
* Be sensitive to the feelings and reactions of persons affected by the change. Inform Mr. Grace that the reason for BPM is not to come in and without feeling destroy people's jobs.
* Having Grace very involved in the project will help him feel like the ideas that are instituted are his ideas also. Participation is ego enhancing, challenging, and intrinsically satisfying, and it builds self-esteem and security.
* You must provide honest feedback to Grace on all suggestions. Tell him which of his and his employee’s suggestions are being used and how they are being implemented, which suggestions are not being used and why, and which suggestions will be incorporated at a later date and why they are not being incorporated now.
* Show how Grace's competitors are using newer business processes to gain a competitive advantage over his department stores.
* Remember that it is better to take things slow, than to have Grace reject BPM. It is usually better to spend the extra time and money to ensure that a system is well accepted and well designed

**SUGGESTED ANSWERS TO THE PROBLEMS**

**21.1** **Don Otno has been researching software options but cannot decide among three alternatives. Don started his search at Computers Made Easy (CME) and almost wished he had looked no further. Steve Young, the manager of CME, appeared knowledgeable and listened attentively to Don’s problems, needs, and concerns. Steve had software and hardware that would, with a few exceptions, meet Don’s needs. Don could start using the system almost immediately. The system’s price was unexpectedly reasonable.**

**After three hours at Custom Designed Software (CDS), Don left convinced that they could produce exactly what he needed. Cost and time estimates were not established, but CDS assured him that the cost would be reasonable and that the software would be complete in a few months.**

**At Modified Software Unlimited (MSU), the owner said that customized software was very good but expensive and that canned software was inexpensive but rarely met more than a few needs. The best of both worlds could be achieved by having MSU modify the package that came closest to meeting Don’s needs.**

**Don returned to CME and asked Steve about customized and modified software. Steve expressed enough concerns about both that Don came full circle—to thinking canned software was best. That night, Don realized he could not make an objective decision. He was swayed by whichever vendor he was talking with at the time. The next morning he called you for help.**

In practice, a system study must be conducted to determine what Don Otno needs before a credible decision can be made about these alternatives.

**a.** **List the advantages and disadvantages of each vendor’s approach.**

**Advantages of canned (packaged software)**

* Lower cost of development. Some estimates indicate a software package may cost between 1/20 and 1/5 of the estimated cost of in-house development.
* Software is more reliable. Other users have used the system, providing more "testing" in a live environment.
* Lower cost of maintenance as the software supplier performs the maintenance.
* Faster implementation - hence the organization can begin receiving the benefits sooner.
* Staff is freed up to do other work.
* Better documentation, as it must meet the needs of multiple users.
* Software can be "test driven" and evaluated before it is purchased.
* It may offer unique capabilities that are difficult to duplicate.

**Disadvantages of canned (packaged software)**

* It may not be possible to find a package that meets the users' unique and specific needs.
* Operating procedures and practices constraints may require business process changes.
* If the software is to be part of a larger system, it may put constraints on the overall system.
* Inflexibility, as it may not be possible to suppress unneeded files, processing, or outputs.
* Possible inefficiency. Generalized systems (are not written for particular circumstances or requirements) may be inefficient.
* It takes time to evaluate all the available software.
* There may not be anyone in-house sufficiently knowledgeable to fix the software if it fails.

**Advantages of Custom Software**

* + Software that exactly meets (at least theoretically) the user's needs.
  + Easier to modify than canned software.
  + Often more efficient than canned software.

**Disadvantages of Custom Software**

* + Most costly software development approach.
  + Quality programmers may be expensive, hard to find, etc.
  + Program development is time consuming; users have to wait for the software to be written.
  + There may not be any guarantee of product quality.
  + Involves significant supervision and control.
  + It is more likely to contain errors or "bugs" than packaged software.
  + If developed in-house, the user may have to wait an extended period for the software.
  + If developed externally, there is a risk of selecting an inexperienced or poor quality developer. The developer may "low ball" the price and take improper short cuts or try and increase the price later.

**Advantages of Modified Software**

* Software that is more likely to meet user's needs than canned software.
* Usually less expensive than custom software.
* Can be implemented faster than custom software.

**Disadvantages of Modified Software**

* May be hard to find programmers willing to modify code.
* May be illegal to modify the software.
* Modifying the software may invalidate the manufacturer’s warranty and support.
* Changes may not be properly documented, resulting in out-of-date documentation.
* May cause control problems and introduce errors into the program.
* May make program less efficient, more costly to maintain.
* May be more costly than a custom program, especially if modifications are significant.

**b. Recommend a course of action for Don and support your decision.</para></listitem></orderedlist></problem>**

There isn't enough information to reach a definitive answer. It is probable that supporters for all three approaches can be found when discussing this in class. Letting the students support each of the three approaches helps solidify the answer to part a in their minds. The important thing in the discussion is not to get a "right" answer but for the student to recognize that they need more information before they can reach a definitive conclusion.

By way of summary: Generally, packaged software is best if it is available and of acceptable quality, versatility, etc. If the software is acceptable to Otno (that is, it is sufficiently close to what he needs), the low cost and immediate implementation make packaged software an attractive approach.

* 1. **A federal agency signed a 15-month contract for $445,158 for a human resources/payroll system. After 28 months and no usable software, the agency canceled the contract and withheld payment for poor performance. A negotiated settlement price of $970,000 was agreed on. The project experienced the following problems:**
* **The contractor did not understand what software was desired. The RFP did not have fully developed user requirements or system specifications, and user requirements were never adequately defined and frozen. Changes delayed completion schedules and caused disagreements about whether new requirements were included in the original scope of work.**
* **The contract did not specify systems requirements or performance criteria, and the terminology was vague. The contract was amended 13 times to add or delete requirements and to reimburse the contractor for the extra costs resulting from agency caused delays. The amendments increased the cost of the contract to $1,037,448.**
* **The contractor complained of inexcusable agency delays, such as taking too much time to review items submitted for approval. The agency blamed the delays on the poor quality of the documentation under review.**
* **The agency did not require each separate development phase to be approved before work continued. When the agency rejected the general system design, the contractor had to scrap work already completed.**

**a. What caused the problems?**

* The contractor did not fully understand what was required because the agency had not fully developed user requirements or system specifications when it issued the RPF.
* Project phases were not approved before the next phase began. When the conceptual systems design was rejected, the physical systems design work had to be scrapped.
* The contract did not contain acceptance-testing procedures and criteria.
* Documentation standards were never developed and documentation was poor, causing delays in agency approvals.
* Extensive changes were made by the agency. The contract was amended 13 times to provide for additional work or to delete requirements.
* Some changes were not in the contract and some changes altered the scope of the project. These led to disagreements as well as work delays and stoppages.
* Agency red tape and slow approval procedures caused extensive delays in the project.
* The system development contract was vague.

In summary, the problems were caused by poor planning, poor problem definition, inadequate system specifications, poor project management, and poor communication.

**How could the agency have better managed the systems development project?**

* Done a better job of defining what the system was to accomplish.
* Designed a complete set of specifications before asking for bids.
* Frozen systems design at an appropriate time so that continual changes weren't made.
* Created a comprehensive, specific, and clearly written contract.
* Required prompt approval of each phase before allowing the contractor to proceed.
* Specified documentation standards and procedures for the contractor to follow.
* Managed the project better.
* Negotiated a better price upfront

**What could the contractor have done differently?**

* Refused to begin until an adequate problem definition and system requirements were developed.
* Insisted that system development be frozen at an appropriate time.
* Insisted on a clear, comprehensive, and specific contract detailing what was expected of them.

b. **Can we conclude from this case that organizations should not have custom software written for them? Explain your answer.**

No, we cannot generalize that companies should not have custom software developed for them. If the agency and contractor had followed good systems design and project management procedures, and had a clear and concise contract, problems with the engagement should have been minor and more easily resolvable.

**21.3** **Wong Engineering Corp (WEC) operates in 25 states and three countries. WEC faced a crucial decision: choosing network software that would maximize functionality, manageability, and end-user acceptance of the system. WEC developed and followed a four-step approach:**

**Step 1. Develop evaluation criteria. WEC organized a committee that interviewed users and developed the following evaluation criteria:**

* **Ease of use**
* **Scope of vendor support**
* **Ease of network management and administration**
* **Cost, speed, and performance**
* **Ability to access other computing platforms**
* **Security and control**
* **Fault tolerance and recovery abilities**
* **Ability to connect workstations to the network**
* **Global naming services**
* **Upgrade and enhancement options**
* **Vendor stability**

**WEC organized the criteria into the following four categories and prioritized them. Criteria vital to short-term and long-term business goals were given a 5. “Wish list” criteria were weighted a 3. Inapplicable criteria were given a 1.**

**1. Business criteria: overall business, economic, and competitive issues**

**2. Operational criteria: tactical issues and operating characteristics**

**3. Organizational criteria: networks’ impact on the information systems structure**

**4. Technical criteria: hardware, software, and communications issues**

**Step 2. Define the operating environment. Several data-gathering techniques were used to collect information from which an information systems model was developed. The model revealed the need to share accounting, sales, marketing, and engineering data at three organizational levels: district, division, and home office. District offices needed access to centralized financial information to handle payroll. WEC needed a distributed network that allowed users throughout the organization to access company data.**

**Step 3. Identify operating alternatives. Using the criteria from step 1, committee members evaluated each package and then compared notes during a roundtable discussion.**

**Step 4. Test the software. The highest-scoring products were tested, and the product that fit the organization’s needs the best was selected.**

**a.** **Discuss the committee’s role in the selection process. How should committee members be selected? What are the pros and cons of using a committee to make the selection?**

The evaluation committee selected a network operating system and other software to support the organization’s distributed structure. They developed and followed a four-step approach:

1. Develop evaluation criteria.

2. Define the current and future operating environment at the company.

3 Identify and evaluate the network operating system alternatives.

4 Test the products that appear to meet their needs and select the best package.

A committee with qualified people from all affected areas has the following advantages:

* + **Encourages planning.** An effective team effort requires planning to ensure the system meets the needs of the business. The result: compromise in the planning stage and not during implementation.
  + **Produces better results.** Organizing a cross-functional team to select an operating system insures that the selection process considers the needs of all parties. The result: fewer out-of-control projects.
  + **Facilitates acceptance of the results.** Behavioral problems are minimized using a cross-functional selection team that supports user participation. The result: smoother system implementation.

Problems that may arise from using a committee include a longer development time, interdepartmental competition for resources, and irresolvable selection process conflicts.

**b. What data-gathering techniques could WEC use to assess user needs? To select a vendor?**

* Interviews with users
* Surveys or questionnaires
* Observations of business activities.

**What data-gathering techniques could WEC use to select a vendor?**

* Library research
* Discussions with current and former customers
* Word-of-mouth recommendations.
* Meetings with vendor candidates to discuss the evaluation criteria selected.
* Asking vendors to develop a demonstration to verify their claims.

**c. What is the benefit of analyzing the operating environment before selecting the software?**

It is difficult to select the proper software if you do not know how it is to be used and what needs it has to satisfy. An analysis of the operating environment provides the information needed to model the desired information system and to make the proper selection. The committee's analysis shows the need to share data at the district, division, and home office levels. In addition, the lower levels needed access to centralized data. The model that emerged made it clear that the company needed a distributed network that allows users throughout the organization access to company data.

**What data-gathering techniques help a company understand the operating environment?**

* Interviews
* Surveys at various management and operational levels
* Observations.

**d. In selecting a system using the point-scoring method, how should the committee resolve scoring disputes? List at least two methods.**

Disputes often arise when using committees. To resolve point scoring disputes, the committee could seek a unanimous consent on disputed issues by compromise and further discussion. If that fails, they could simply average the scores given by each committee member. The committee could also consider throwing out the highest and lowest scores.

**e. Should a purchase decision be made on the point-scoring process alone? What other procedure(s) should the committee employ in making the final selection?**

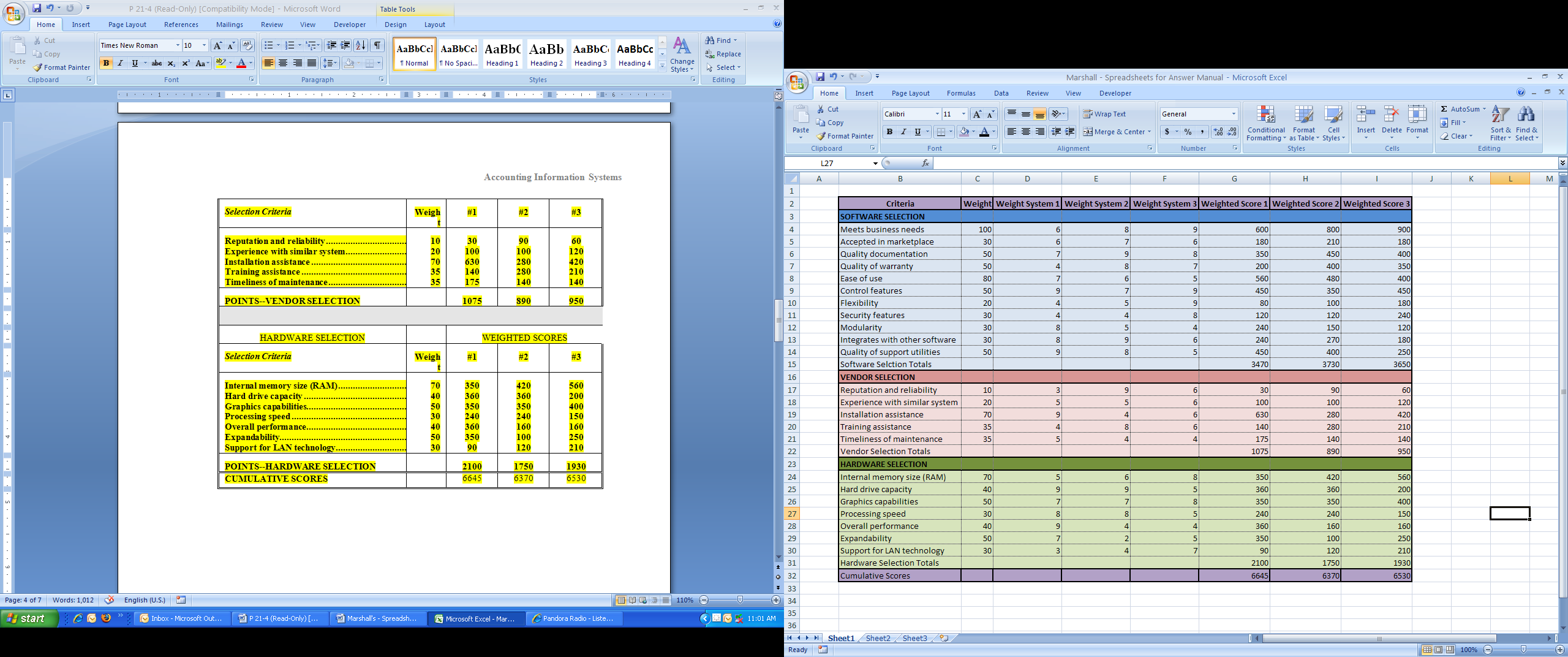
Seldom is a system selected based on point scoring alone. The scores are used to select the most promising candidates. The committee should test the most promising candidates to determine which product best meets the company's needs in the most cost-effective manner.

The committee should also verify with existing customers that the system works as promised.

**21.4 Mark Mitton, the liaison to the IS department, has eliminated all but the best three systems. Mark developed a list of required features, carefully reviewed each system, talked to other users, and interviewed appropriate systems representatives. Mark used a point-scoring system to assign weights to each requirement. Mark developed Table 21-4 to help him select the best system.**

**a. Use a spreadsheet to develop a point-scoring matrix and determine which system Mark should select.**

Based on the point-scoring evaluation, project number one should be selected. Project #1 scored 6645 points, project #2 scored 6370 points, and project #3 scored 6530 points.



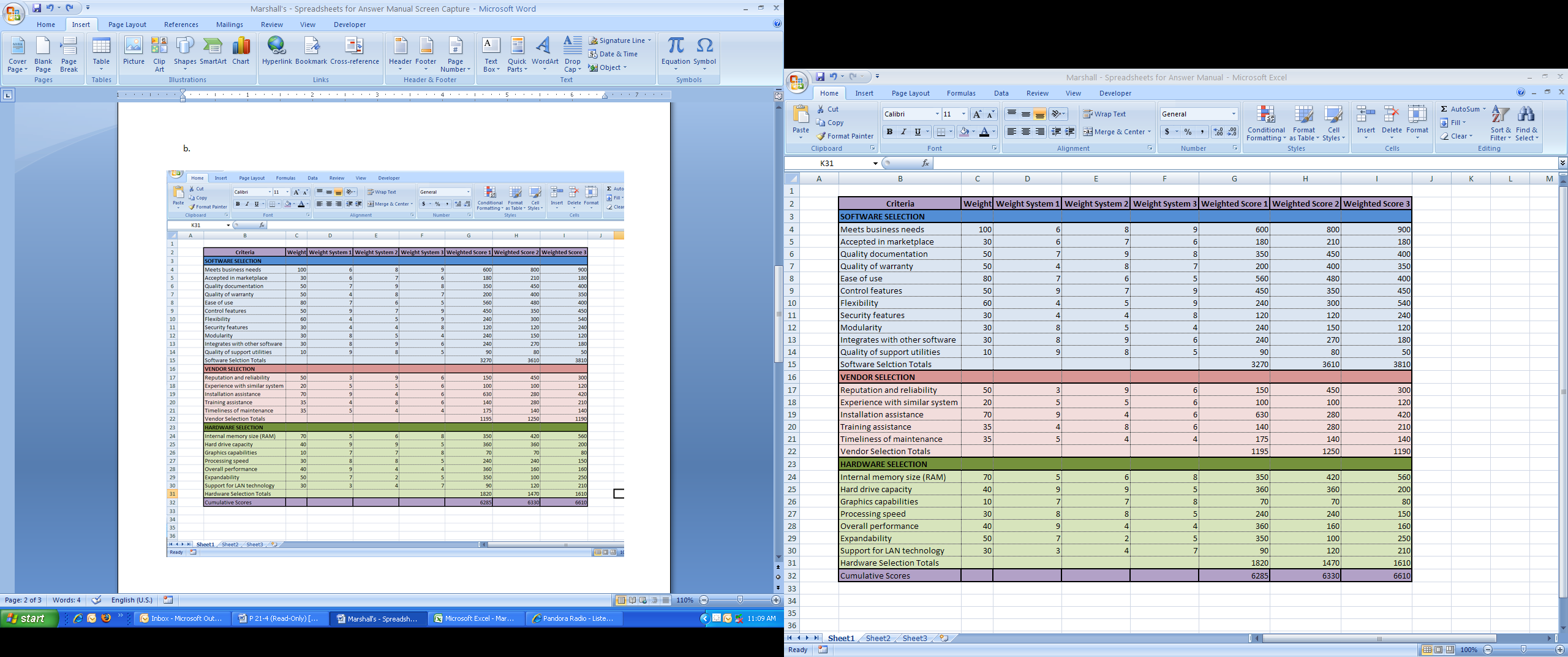
**b.** **</inst>Susan Shelton did not agree with Mark’s weightings and suggested the following changes:**

**</para><link linkend="informaltable0" preference="1" role="generated"/></listitem>**

|  |  |
| --- | --- |
| **<informaltable id="informaltable0" frame="none" float="0"><tgroup cols="2" colsep="0" rowsep="0" align="left"><colspec colnum="1" colname="c01" colwidth="500"/><colspec colnum="2" colname="c02" colwidth="500"/><tbody><row><entry valign="top"><para>Flexibility</para></entry>** | **<entry valign="top"><para>60</para></entry></row>** |
| **<row><entry valign="top"><para>Reputation and reliability</para></entry>** | **<entry valign="top"><para>50</para></entry></row>** |
| **<row><entry valign="top"><para>Quality of support utilities</para></entry>** | **<entry valign="top"><para>10</para></entry></row>** |
| **<row><entry valign="top"><para>Graphics capability</para></entry>** | **<entry valign="top"><para>10</para></entry></row></tbody></tgroup></informaltable>** |

**When the changes are made, which vendor should Mark recommend?**

Based on Susan’s changes, Mark should now select project #3. Project #1 scored 6285 points, project #2 scored 6330 points, and project #3 scored 6610 points.**c. Mark’s manager suggested the following changes to Susan’s weightings:**



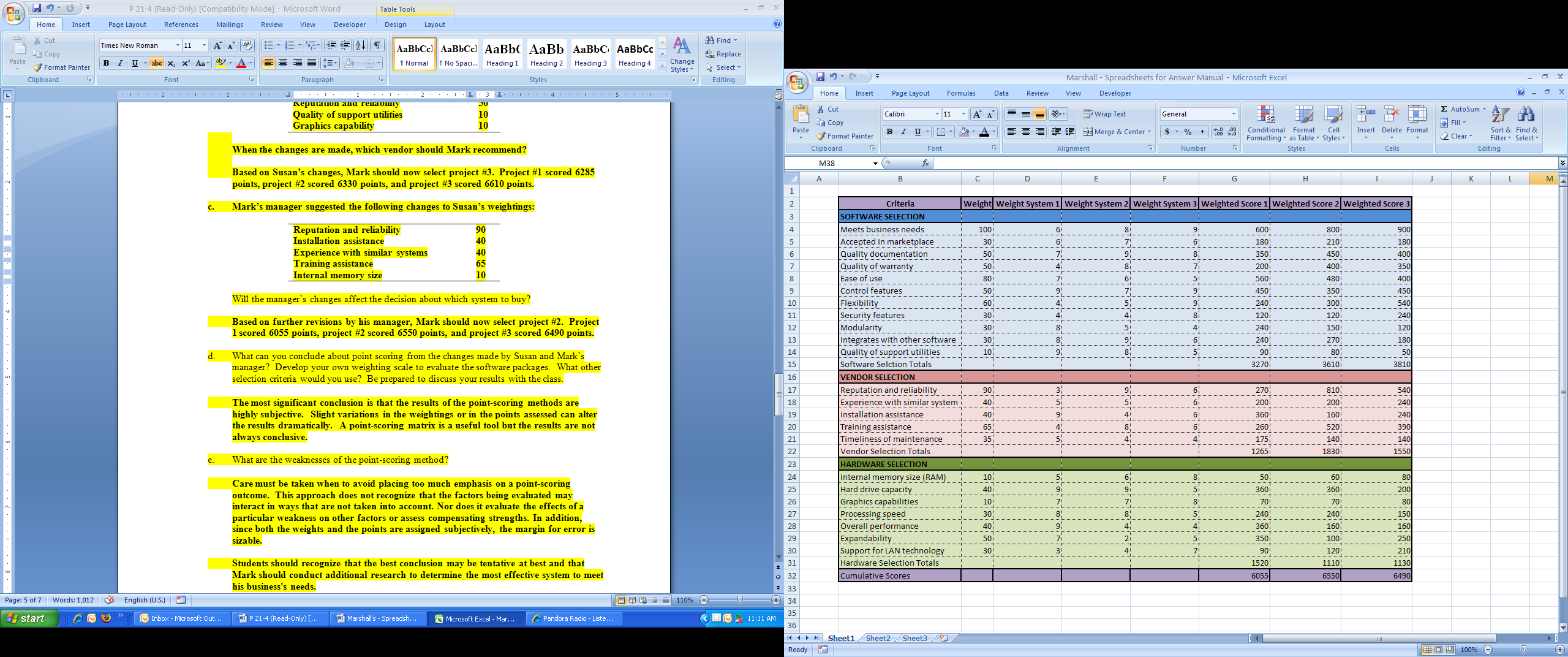
**</para><link linkend="informaltable1" preference="1" role="generated"/>**

|  |  |
| --- | --- |
| **<informaltable id="informaltable1" frame="none" float="0"><tgroup cols="2" colsep="0" rowsep="0" align="left"><colspec colnum="1" colname="c01" colwidth="500"/><colspec colnum="2" colname="c02" colwidth="500"/><tbody><row><entry valign="top"><para>Reputation and reliability</para></entry>** | **<entry valign="top"><para>90</para></entry></row>** |
| **<row><entry valign="top"><para>Installation assistance</para></entry>** | **<entry valign="top"><para>40</para></entry></row>** |
| **<row><entry valign="top"><para>Experience with similar systems</para></entry>** | **<entry valign="top"><para>40</para></entry></row>** |
| **<row><entry valign="top"><para>Training assistance</para></entry>** | **<entry valign="top"><para>65</para></entry></row>** |
| **<row><entry valign="top"><para>Internal memory size</para></entry>** | **<entry valign="top"><para>10</para></entry></row></tbody></tgroup></informaltable>** |

**<para>Will the manager’s changes affect the decision about which system to buy?**

**</para></listitem>**

Based on further revisions by his manager, Mark should now select project #2. Project 1 scored 6055 points, project #2 scored 6550 points, and project #3 scored 6490 points.



**d. What can you conclude about point scoring from the changes made by Susan and Mark’s manager? Develop your own weighting scale to evaluate the software packages. What other selection criteria would you use? Be prepared to discuss your results with the class.**

The most significant conclusion is that the results of the point-scoring methods are highly subjective. Slight variations in the weightings or in the points assessed can alter the results dramatically. A point-scoring matrix is a useful tool but the results are not always conclusive.

**e. What are the weaknesses of the point-scoring method?**

Care must be taken when to avoid placing too much emphasis on a point-scoring outcome. This approach does not recognize that the factors being evaluated may interact in ways that are not taken into account. Nor does it evaluate the effects of a particular weakness on other factors or assess compensating strengths. In addition, since both the weights and the points are assigned subjectively, the margin for error is sizable.

Students should recognize that the best conclusion may be tentative at best and that Mark should conduct additional research to determine the most effective system to meet his business's needs.

**21.5** **Nielsen Marketing Research (NMR), with operations in 29 countries, produces and disseminates marketing information. Nielsen has been the primary supplier of decision support information for more than 70 years. NMR’s most recognizable product is the Nielsen television ratings. Nielsen is one of the largest users of computer capacity in the UnitedStates. Its information system consistently ranks above average in efficiency for its industry. NMR hired IBM to evaluate outsourcing its information processing. NMR wanted to know whether outsourcing would allow it to concentrate on giving its customers value-added services and insights, increase its flexibility, promote rapid growth, and provide it with more real-time information.**

**What are the benefits and risks of outsourcing for NMR?**

THE **BENEFITS** OF OUTSOURCING:

* IT is changing so rapidly that companies spend a lot of their information system money on new technology. Outsourcing is a way to alleviate this cash drain. NMR could use the cash savings to provide a better product to its customers.
* It is difficult to find well-trained people to maintain and develop these complex information systems. It is also very costly to have an in-house group of information systems experts. NMR may be concerned about the cost of maintaining an in-house information systems staff and their ability to remain current in the ever-changing technological environment.
* When a company improves its information system or introduces new technology, the employees who operate and manage the system (and sometimes the users) must be retrained. Outsourcing would eliminate much of the time and costs required for training.
* Outsourcing may make it easier for Nielsen to concentrate on the things it does best (its "core competencies") and leave the data processing business to computer companies who are more qualified. Companies who adopt outsourcing for this reason believe that their information systems are essential, but not that it is essential for *them* to operate the systems.
* Outsourcers offer special expertise for anything from assisting with development and design to handling the complete design and installation of a new system. This could help NMR's information processing stay abreast of the most up-to-date changes in systems technology.
* Outsourcing can help solve cost pressures and economic difficulties that force companies to consider head-count reductions, cutbacks on employee training, data center consolidations, budget and resource cutbacks, and other costs.
* Companies can benefit from the economies of scale the outsourcers achieve from standardizing users' applications, buying hardware at bulk prices, splitting development and maintenance costs between projects, and operating at higher volumes.
* Outsourcing development projects can help a company benefit from the skills of trained industry specialists who have installed hundreds of systems.
* When companies downsize they can be left with an information system that is too large for their needs. Outsourcing can help solve this problem.
* Outsourcing can help decrease the fixed costs associated with seasonal businesses that require heavy computer usage for part of the year and very light usage the rest of the year.

AMONG THE **RISKS** OF OUTSOURCING ARE THE FOLLOWING:

* A major risk is entering an inflexible agreement that does not provide the company an "out" for future unanticipated circumstances.
* Another risk is losing too much control over your information system by outsourcing. NMR will want to make sure that it works closely with the outsourcer to oversee the development and operation of the information system.
* It is possible to lose a fundamental understanding of information system needs and how the system can provide competitive advantages. If NMR decides to outsource it will be very important to maintain a close partnership with the outsourcer, helping NMR stay current and apprised of information system needs and strategies. NMR could lose its reputation and ability to provide a quality product if this risk is not completely controlled.
* Once a company decides to outsource, the company is usually locked into outsourcing. If NMR decides to abandon outsourcing and begin processing its own data again they may have to buy or rent new buildings and equipment along with hiring a new data processing staff. The costs and effort involved in doing this are considerable.
* NMR may not realize all of the projected outsourcing benefits. Critics contend that in many cases the goals of outsourcing never come to pass.
* NMR may not receive the quality of service they desire. Some companies complain that outsource providers are slow to adopt new technologies and are slow to respond to changing business conditions.

**Do the benefits outweigh the risks? Explain your answer.**

Without knowing the results of the evaluation that NMR commissioned, there is no "right" answer as to whether the benefits would outweigh the risks. Even when the results are known, there may not be a "right" answer. The purpose of the question is to get the students to pick a side of the debate and support it. Class discussion should bring out the pros and cons of outsourcing.

**21.6 A large organization had 18 months to replace its old customer information system with a new one that could differentiate among customer levels and provide appropriate products and services on demand. The new system, which cost $1 million and was installed by the IS staff on time, did not work properly. Complex transactions were error-prone, some transactions were canceled and others were put on hold, and the system could not differentiate among customers. The system was finally shut down, and transactions were processed manually. New IS management was hired to build a new system and mend the strained relationship between operations and IS.**

**So what went wrong? IS couldn’t—or wouldn’t—say no to all the requests for systems enhancements. Eager to please top management, IS management ignored the facts and assured them they could build a scalable system that was on time and on budget. Another big mistake was a strict project schedule with little flexibility to deal with problems and unforeseen challenges. Developers never spoke up about any glitches they encountered along the way. More than a dozen people (including the CIO) lost their jobs because of their roles in this disaster.**

**a. What could IS management have done differently to make this project successful?**

* + Negotiated more time to complete the project.
  + Provided monthly progress reports to management
  + Informed top management of unforeseen problems and challenges that caused delays or put the project significantly behind schedule.
  + Been more open with management in communicating costs and potential problems.
  + Frozen requirements so that development could proceed unhindered by new requests.

1. **What in-house development issues are demonstrated in this case?**
   * Custom software development is difficult, time consuming, and error prone.
   * Time schedules can be tight and projects are often not finished on time.
   * Requirements and systems planning are often lacking.
   * There can be inadequate communication and cooperation between users and developers.
2. **How could the in-house issues have been addressed to prevent the system’s failure?**

* It should have been made clear to management that in-house development is difficult, time consuming, and error prone. This could have been facilitated by citing examples of in-house development projects, preferably from within their own industry, so that management could have gotten a clearer picture of the risks and benefits of in-house development.
* A carefully thought-out and documented project plan should have been prepared.
* A backup plan with worst-case scenarios and project completion times should have been prepared.
* Key personnel should have been designated as liaisons between management and the project team so that credible and timely information could have been communicated back and forth.

In the end, the company scrapped the software and hired two vendors to help them with the project. One vendor designed and built the system and the other vendor supervised the work of the first vendor.

**21.7 Meredith Corporation publishes books and magazines, owns and operates television stations, and has a real estate marketing and franchising service. Meredith has 11 different systems that do not communicate with each other. Management wants an executive information system that provides them with the correct and timely information they need to make good business decisions. Meredith has decided to use prototyping to develop the system.**

**a. Identify three questions you would ask Meredith personnel to determine systems requirements. What information are you attempting to elicit from each question?**

* What is Meredith's background and what are its goals and objectives? It is difficult to help a company without knowing where it is coming from and where it hopes to go.
* What is the nature of the problem and what are its causes? Oftentimes company employees have a good idea as to the cause of the company's problems and have good suggestions for resolving them.
* What is the timetable for the project? How soon is the system needed? If the company must have a solution in a short amount of time, prototyping should be considered. The answer may also affect the decision as to whether the prototype should be operational or nonoperational.
* What processes are involved? Identifying the business processes will allow the consultant to identify the basic system requirements.
* What does Meredith expect from their new executive information system? What information does Meredith need to make effective decisions? When developing an information system, the question of what information is needed is more important than how the information should be processed.
* What input data does Meredith need to capture and process in order to produce the desired information? Where does the data originate and how does it enter the system? How and where is it stored?

**b. Explain how prototyping works. What would the system developer do during the iterative process step? Why would you want the fewest iterations possible?**</para></listitem>

1. At Meredith, the prototype process would begin by interviewing personnel in order to identify system requirements for the prototype. The focus should be on what output should be produced and not how the output should be produced. Some of the questions to ask Meredith personnel are shown in the answer to part a.

2. After identifying system requirements, an initial prototype would be developed that meets the agreed-upon requirements. The goal would be to develop the prototype quickly and turn it over to the users.

3. The users experiment with the prototype and determine what is good and what is bad about it. Their feedback is used to modify the prototype. Within reason, there should be as many iterations as needed to capture accurately user requirements. The more efficiently this can be done; that is, the fewer iterations needed, the less the system will cost, the faster it can be developed and implemented, and the happier the company and the users will be.

4. When the prototype is completed, it is either made operational or used as the specifications for developing a more functional system.

Prototyping tools are efficient, easy to use, and can create files, screens, reports, and program code much faster and with much less effort than conventional programming languages.

**c. Would you want the prototype to be operational or nonoperational? Why? If it were an operational prototype, what would have to happen? If it were a nonoperational prototype, how would the prototype be used?**

The answer to these questions will vary depending on the student's view of the situation. Some of the points the student should bring up are:

**Operational Prototype.** Because Meredith needs the system so quickly, an operational prototype would be advantageous. To make the prototype operational, the developer must make any changes in the system that are required to incorporate needed controls, improve operational efficiency, provide backup and recovery, and to integrate the prototype with the systems with which it interfaces. Changes must also be made, if necessary, so that the system will accept real input, access real data files, process data, make the necessary computations and calculations, and produce real output.

**Nonoperational Prototype.** In many instances, it is not practical to modify the prototype to make it a fully functional system. The process of making a prototype operational may take as long as recreating the system in a basic programming language and may not be as efficient. In such cases, the prototype is discarded and the system requirements identified during the prototyping process are used to develop a new system. The systems development life cycle is followed to develop the system, with the prototype as the model for development.

**d. Suppose the company decides the prototype system is not practical, abandons it, and takes some other approach to solving its information problem. Does that mean prototyping is not a valid systems development approach? Explain your answer.**

Just because the prototype system is not used does not mean prototyping is not a useful development technique. On the contrary, prototyping has saved the company thousands of dollars and a great deal of time by finding out quickly that the system is not functional. That is much more cost effective than going through the much more costly traditional SDLC process.

**21.8 Norcom, a division of a large manufacturer, needed a new distribution and customer service system. The project was estimated to take 18 months and cost $5 million. The project team consisted of 20 business and IT staff members. After two years, the CIO was fired, and the company hired a CIO with expertise in saving troubled projects. The new CIO said three grave errors were committed.**

1. **IT picked the wrong software using a very naïve request for proposal process.**
2. **IT did not formulate a project plan.**
3. **No one “owned” the project. The IT staff assumed the users owned the project, the users believed the IT staff owned it, and management believed the vendor owned it.**

**The CIO developed a 2,000-line plan to rescue the project. Three months later, the system failed, even with IT staff and consultants working on it day and night. The failed system was to have been the company’s preeminent system, but it could not even process customer orders correctly, resulting in complaints about late shipments and receiving the wrong goods.**

**After three years and $4 million, the new CIO polled the staff anonymously. Only two said the project could be saved, and they had staked their careers on the project. The message that the project was not worth saving was very hard for the CIO to give. It was likewise hard for the division president to receive it; he could not accept the idea of killing a project that cost so much money. He finally accepted the decision and all the ramifications involved, including corporate IT taking control of all IT operations at his division.**

**a. List the primary components of an RFP.**

* Detailed system specifications, with a clear distinction between mandatory and desired requirements.
* Applications required and desired.
* Inputs and outputs required and desired
* Files and databases required and desired
* Frequency and methods of file updating and inquiry.
* Unique characteristics or requirements.

1. **Identify possible components or deficiencies in Norcom’s RFP that could have led the new CIO to claim that it was naïve or insufficient.**

* The RFP lacked the software specifications needed to prepare a good RFP response.
* Norcom did not have a project plan, which should have guided the RFP development. The formulation of a good RFP would have required the creation of a project plan.

1. **Identify possible approaches Norcom could have used to evaluate RFP responses.**

* Norcom could have requested help with the RFP process and the necessary documents from someone with extensive RFP experience, such as a systems consultant.
* Norcom could have brought in a more effective and experienced CIO earlier.
* Norcom management could have created clear lines of authority and ownership of the project.

**21.9** **Quickfix is rapidly losing business, and management wants to redesign its computer repair processes and procedures to decrease costs and increase customer service. Currently, a customer needing help calls one of five regional service centers. A customer service representative records the relevant customer information, finds the closest qualified technician, and calls the technician’s cell phone to see whether the repair fits into his or her schedule. If not, the representative finds the next closest technician. When a technician is located, customer repair information is provided over the phone. The technician calls the customer and arranges to pick up the computer and replace it with a loaner. Making these arrangements takes one to two days and sometimes more if technicians are not available or do not promptly return calls.**

**If a broken computer cannot be quickly repaired, it is sent to a repair depot. These repairs take another four to seven days. If problems arise, it can take up to two weeks for an item to be repaired. When a customer calls to see whether the computer is ready, the service representative calls the technician to find out the status and calls the customer back. The repair process usually takes five phone calls between the customer, the service representative, and the technician.**

**There are several problems with this process that have led to a significant drop in business: (1) it is time-consuming; (2) it is inconvenient for a customer to have a computer removed, a new one installed, and then the old one reinstalled; and (3) service representatives do not have immediate access to information about items being repaired. Quickfix decides to use BPM principles to redesign its business processes.**

**a. Identify the repair processes that occur and decide which should be redesigned.**

1. Customer calls Quickfix requesting service.

2. Customer service representatives record customer information and repair needs.

3. Technicians are scheduled to make the repair.

4. Computer is repaired.

All four processes should be redesigned

**b. Describe how the repair process can be redesigned to solve the three problems identified.**

Design a new information system with the following features.

* A single, centralized database that stores all the data about customers, technicians, and the items being serviced.
* Software is available that automates the customer service process. The principles in the chapter about buying software should be followed to select the system that best meets Quickfix’s needs
* The hardware needed to run the software and access the database mentioned above.
* Quickfix could minimize its hardware and building costs and maximize efficiency by creating one centralized customer service center instead of the five regional centers.
* Alternatively, it could opt for keeping two to five service centers, each with its own equipment. With multiple sites, each could serve as backups to the other sites. Service centers closer to the customers might provide better customer service.

The repair process could be redesigned in many different ways. Some ideas are:

* In addition to phone requests for service, Quickfix could design their new system to accept requests via fax, emails, texts, entries on the customer service section of its web site, etc.
* When a repair request is received, a customer service representative enters the necessary data into a customer order maintained in the information system. The design should minimize the amount of data the service representative enters, while still giving customers the flexibility of notifying Quickfix in the way that is most convenient to them.
* The system uses the customer's address to search the list of authorized technicians maintained in the company's database. The system produces a list of the four closest technicians and their schedule for the next week. The system lists the technicians in order of priority, based on location and availability. The customer service representative selects one of the technicians to perform the repair service and the system sends them an electronic notification and an electronic copy of the customer order.
* If the technician is unable to perform the work on a timely basis, he responds electronically and another technician is scheduled.
* To repair computers faster, technicians could use specially equipped trucks equipped with the necessary spare parts. This would allow them to do most repairs at the customer's business instead of sending the computer to a repair center.
* Each repair truck could be equipped with a global positioning systems (GPS) technology that helps the technician locate the customer.
* The GPS could also be used to facilitate emergency orders. The system could locate the technician closest to the customer with the emergency and dispatching her to handle the emergency as soon as she is available.
* Technicians carry notebook computers with built-in radio frequency and cellular phone technology modems that give them a direct, high-speed access to the company's information systems via the internet. Using these modems, the technicians can communicate with the central office from almost anywhere using a virtual private network (VPN) ensuring a secure transmission of data.
* Each morning the technicians logon to the Customer Service Center and retrieve their schedule for the day. Their schedule is organized and prepared by the computer at the Customer Service Center to minimize travel time. As each repair job is completed, the technicians enter the data on the customer order and send it into the Customer Service Center over the VPN.
* If the computer cannot be repaired at the customer's site by the technician, the customer service representative enters this into the system and picks up the computer. The technician arranges for the repair center to pick up the broken computer and deliver a loaner computer. The repair locations are also connected to the centralized system and as computers are scheduled for repairs based on estimated arrival time. As the repairs are made, the technicians update the customer order.
* Since repair time will be greatly decreased, there will be many fewer phone calls asking about the status of the repair. For those who do call, the centralized information system provides the customer service representative with much more information. She can tell the customer when the repair is scheduled, who will do it, and how to get hold of him including his cell phone number and email address. If the computer has been sent away for repair, the representative can tell the customer when it is scheduled for repair and when it will be returned.

In a world with no costs, Quickfix would do all of the above. However, we live in a world where we must always weigh costs versus benefits and only implement the things the above items that make financial sense.

**c. What benefits can be achieved by redesigning the repair process?**

* Increased customer service and satisfaction because most computers are repaired immediately at the customer's business. This should also save money because the amount of time it takes to repair computers is reduced
* A significant improvement in communication speed due to the centralized system and the use of the latest advancements in technology. Customer service representatives will know the exact status of any customer repair order.
* Reduced costs from closing regional centers, service representatives having to do less data entry and significantly less scheduling work, lower shipping and handling costs, and handling few calls.
* Increased revenues from technicians being able make more service calls in any given day and the ability to handle higher margin emergency calls,

**21.10 Conduct a search (using written materials, the Internet, electronic databases, etc.) for successful and failed implementations of information systems. Per your professor’s instructions, prepare an oral or written summary of a successful and a failed implementation. Include in your summary the approach used to acquire or develop the system (purchase software, develop it, modify it, outsource it).**

Student answers will vary depending upon what they find.

**SUGGESTED ANSWERS TO THE CASES**

**21-1** **Steve Cowan owns Professional Salon Concepts (PSC), a hair salon products distribution company. After working for his father, a barber and beauty salon products distributor, he started his own business selling Paul Mitchell products. Business was poor until Steve conducted a free seminar demonstrating how to successfully use his products. He left with a $1,000 order and a decision to sell to salons that allowed him to demonstrate his products.**

**Steve’s strategy paid off as PSC grew to 45 employees, 3,000 customers, and sales of $7 million. PSC carries 1,000 products, compared with 10,000 for most distributors. The smaller product line allows PSC to achieve a 24-hour order turnaround, compared to over two days for the competition. Steve occasionally has to work late packing orders and driving them to the UPS hub a few towns away so he can meet the 2:00 A.M. deadline.**

**After buying a computer and installing a $3,000 accounting package, Steve thought everything was going great until Terri Klimko, a consultant from a PSC supplier, stopped by. Terri asked the following questions to find out how well he knew his business:**

* **Do you know exactly how much you ship each month and to whom?**
* **Do you know how much each customer bought, by supplier?**
* **Can you rank your customer sales?**
* **Can you break your sales down by product?**
* **Do you know how the profit per client breaks down into product lines?**
* **Do you know how revenues per salesperson vary over the days of the week?**

**When Steve answered no to each question, Terri told him that people who cannot answer the questions were losing money. Upset, Steve terminated the session by politely dismissing Terri. Although unimpressed with Terri’s advice, Steve was impressed with her and they were soon married. Shortly afterwards she joined the company.**

**Steve asked Terri to help the salons become more profitable. She developed a template to help salon owners determine how much each hairstylist brings in per client, how many clients receive extra services, and which clients buy hair products. The Cowans soon became more like partners to their customers than trainers. If a salon had employee problems, the Cowans would help settle it. If a salon needed help with a grand opening, they lent a hand. The more PSC products the salons bought, the more time the Cowans gave.**

**PSC sold turnkey systems and support services at cost to help salons answer Terri’s questions. Unfortunately, PSC’s computer could not answer those same questions. Steve asked consultant Mike Fenske for help. Mike entered all of PSC’s raw data into a database and wrote a program to produce the desired information. The system worked but had problems. It was so slow that accounts payable and purchasing information was handled manually, it did not answer Terri’s growing list of questions, and only a few months of detailed information were available at a time. To alleviate these problems, Steve hired Mike as the company controller.**

**After reading an industry report, Steve realized it was time to purchase a new system. Steve and Mike decided to evaluate and select the software themselves and rely on the vendor for installation help. They spent months researching software and attending demonstrations before settling on a $20,000 system. The vendor began installing the system and training PSC personnel.**

**Three days prior to conversion, Steve met a distributor who described how his system met his detailed accounting and customer reporting needs as well as his inventory management and order fulfillment needs. Steve was so impressed that they stopped the conversion, went to North Dakota to check out the distributor’s system, and flew to Minneapolis to visit DSM, the software developer.**

**DSM did a great job of demonstrating the software and provided Steve and Mike with great references. The only hitch was DSM’s inability to demonstrate two features that were particularly important: adjusting orders automatically to reflect outstanding customer credits and back orders, and determining the least expensive way to pack and ship each order. DSM’s salespeople assured them that those features would be up and running by the time the package was delivered to PSC.**

**Their economic feasibility analysis showed $234,000 in yearly savings:**

**$144,000 Most PSC orders consist of several boxes, 95% of which are sent COD. The old PSC system had no way to prepare orders for multiple-box shipments; a five-box order required five sales invoices and five COD tickets. The new system allowed PSC to generate one sales order and ship one box COD and the other four by regular delivery. Not having to ship every box COD would save $144,000 a year.**

**$50,000 PSC paid a CPA firm $50,000 a year to prepare its financial statements. The new software would prepare the statements automatically.**

**$40,000 Because the old system did not have credit-managing capabilities, it was hard to detect past-due accounts. Earlier detection of past-due accounts would result in faster collections, fewer lost customers, and fewer write-offs.**

**Unknown The major reason for acquiring the system was to improve customer service by making more detailed customer information available.**

**After estimated annual maintenance costs of $10,000, there was an annual return on investment of $224,000. Because the system would pay for itself in less than a year, Steve bought it and wrote off his $20,000 investment in the other system.**

**When DSM installed the software, Steve found out that the promised features were not available and that there was no immediate plan to add them. Although Steve and Mike were upset, they had to shoulder some of the blame for not insisting on the two features before signing the deal. They found a program that automatically determined the cheapest way to pack and ship an order. DSM agreed to pay half of the $10,000 cost to integrate it into the program. DSM offered to create the module to reflect customer credits and back orders for another $20,000, but Steve declined. These problems pushed the conversion date back several months.**

**PSC spent three months preparing to implement the new system. Training PSC employees to use the new system was particularly important. Adding a customer to the database required only one screen with the old system, the new software required six screens. Employees were taught to shout “Fire!” when they had a problem they could not handle. Mike or a DSM programmer explained the error and how to correct it. During implementation, the new system was tested for glitches by processing real data. Looking back, Mike admits three months were not nearly enough for the training and testing. They should have used twice as much time to identify and eliminate glitches.**

**When PSC converted to the new system, telephone operators were confronted with situations they had not been trained to handle. Soon everyone was yelling “Fire!” at the same time. In less than one hour, so many operators were waiting for help that the programmers stopped explaining the correct procedures and simply ran from operator to operator correcting problems. Mistakes were repeated numerous times, and the situation intensified. Some employees, frustrated by their inability to work the new system, broke down and cried openly.**

**In the warehouse, Steve was not having much fun either. On a normal day, PSC has 200 to 300 boxes ready for 3:30 P.M. shipment. On conversion day, a lone box sat ready to go. Facing the first default on his 24-hour turnaround promise, Steve, Terri, Mike, and a few others stayed past midnight packing and loading boxes on trucks. They barely made it to the UPS hub on time.**

**The next day, order entry and shipping proceeded more smoothly, but Steve could not retrieve data to monitor sales. That did not make him feel too kindly about his $200,000 system or DSM. It took Steve weeks to figure out how to get data to monitor sales. When he did, he was horrified that sales had dropped 15%. They had focused so hard on getting the system up and running that they took their eyes off the customers. To make matters worse, Steve could not get information on sales by customer, salesperson, or product, nor could he figure out why or where sales were falling. Things quickly improved after “Hell Week.” Orders were entered just as quickly, and warehouse operations improved thanks to the integrated add-in program. The new system provided pickers with the most efficient path to follow and told them which items to pack in which boxes based on destination and weight. The system selected a carrier and printed labels for the boxes. Order turnaround time was shaved to 20 minutes from five hours.**

**Months after the system was installed, it still did not do everything Steve needed, including some things the old system did. Nor did it answer all of Terri’s questions. Steve is confident, however, that the system will eventually provide PSC with a distinct competitive advantage. He is negotiating with DSM to write the credit and back-order module.**

**Steve believes the step up to the new system was the right move for his growing company. With the exceptions of taking the DSM salesperson’s word and not taking enough time to practice with the system, Steve feels PSC did as good a job as it could have in selecting, installing, and implementing a new system.**

**<para>1. Do you agree that PSC did a good job selecting, installing, and implementing the new system? If so, why? Or do you feel PSC could have done a better job? If so, what did it do wrong, and what should it have done differently?**

PSC could have done a better job by doing the following:

* Steve knows Terri is outstanding and he could have used her to manage better the computerization process.
* People who buy based on a demonstration or recommendations risk buying a demo expert's personality rather than a system.
* PSC shouldn't have paid for the software in full until it was satisfied with the implementation. Vendor guarantees about performance and features should have been written into the initial contract.
* PSC employees that would use the system should have been involved in system selection.
* PSC should have developed a written project plan for tracking all tasks, from the software-selection process to implementation. Such a plan can highlight weaknesses in the process and reveal timing problems.
* Pain is inevitable in this sort of process. However, up-front pain isn't as bad as back-end pain. PSC didn't have a strong enough implementation plan.
* Instead of gambling on a "D-day" switchover to the new system, the company should have done more extensive pilot testing and had a backup plan in case of problems.
* Spending $200,000 for the system described in the case may be overkill. PSC might have gotten most of the key benefits from a $20,000 system; the extra benefits may not have been worth the extra cost.

**2. How could PSC have avoided the missing features problem?**

* Steve should have prepared a specification document that defined all the features he wanted in the new system and had each vendor bid to those specifications. The specifications could then become part of the contract, and nasty surprises such as missing features can be avoided.
* Never buy "vaporware" - features that are promised but aren't quite ready.

**3. How could PSC have avoided conversion and reporting problems?**

* PSC should have developed and documented a plan for testing the system. The plan should include tests for all the features specified as well as the various real operation problems people and the system will face. PSC should not have gone on-line until the system could pass all the tests. It is important not to forget that people and processes are as much a part of the system as the computer and the software.
* Steve should have made sure, via testing, that he could get all the reports and information he wanted before going on-line. Steve should have looked at the information needed on a daily, weekly, and monthly basis, and established procedures tied to those frequencies.
* More time should have been allocated for user training.

**4. Evaluate Steve’s </inst>economic feasibility analysis. Do you agree with his numbers and his conclusions?**

* Not all accountants’ fees can be saved. Even if the system prepares the statements, PSC will probably still need tax help as well as an independent audit or review of the statements.
* Can PSC save $40,000 a year on faster collections, and fewer lost customers and customer write-offs when 95% of $7 million in sales are COD?
* Are there more costs involved than maintenance, such as improvements to the system, higher personnel costs, etc.

**5. How could PSC's customers use the new multi-box shipping approach to defraud PSC?**

* Customers could order a very large shipment, refuse the one COD package, and keep the rest of the products and not pay for them.

**6. How would you rate the service PSC received from DSM? What did it do well and what did it do poorly?**

The developer gets a bad grade for:

* Their salespeople selling features that they had no intention of providing.
* The conversion problems. The developer should have anticipated the problems and made sure PSC prepared their people better.

The developer gets a good grade for:

* Resolving one of the disputes over missing features by paying half of the cost and integrating the purchased program with their software.
* Helping solve the conversion and first day system operations problems. In all fairness to the vendor, the conversion problems were not all their fault. PSC purchased the system and has the ultimate responsibility for the system.