CHAPTER 2

1. **Give three examples of business needs for a system.**

   a) Maintain or improve the competitive position
   b) Perform a business function more efficiently
   c) Take advantage of a new business opportunity

2. **What is the purpose of an approval committee? Who is usually on this committee?**

   The approval committee generally serves as the decision making body regarding business investments in information systems projects. This approval committee could be a company steering committee that meets regularly to make information systems decisions, a senior executive who has control of organizational resources, or any other decision-making body that governs the use of business investments.

   This committee generally has a broad organizational representation, and therefore can avoid allocating resources that will serve only narrow organizational interests. The approval committee commonly has project oversight responsibilities as well as monitoring project performance after the project has been accepted.

3. **Why should the system request be created by a businessperson as opposed to an IS professional?**

   It is important to have a clear understanding of how system will improve business. Companies have now realized that identifying business value and understanding the risks associated with the project are necessary to avoid any potential risks involved. Usually the system originates with a businessperson as he understands the need for the system or system improvement in the business unit and will have a much better idea of the value of the proposed system or improvement and therefore is in a better position to create a meaningful system request

   In fact, the ideal situation is for both IT people (i.e., the experts in systems) and the business people (i.e., the experts in business) to work closely to find ways for technology to support business needs. In this way, organizations can leverage the exciting technologies that are available while ensuring that projects are based upon real business objectives, such as increasing sales, improving customer service, and decreasing operating expenses.

4. What is the difference between intangible value and tangible value? Give three examples of each.

Tangible Value: Tangible value can be quantified and measured easily. Tangible value represents the benefits from the systems that are quantifiable and measurable. Example: (a) increased sales (b) reduced operating costs (c) reduced interest costs etc…

Intangible Value: An intangible value results from an intuitive belief that the system provides important, but hard-to-measure benefits to the organization. Intangible value represents benefits that are real, but are difficult to quantify and measure.

Example: (a) increased customer satisfaction (b) improved decision making (c) better competitive positioning, etc.

5. What are the purposes of the system request and the feasibility analysis? How are they used in the project selection process?

The purpose of the system request is to initiate a systems project. A system request is a document that describes the business reasons for building a system and the value that the system is expected to provide.

The project sponsor usually completes this form as part of a formal system project selection process within the organization. Most system requests include five elements: project sponsor, business need, business requirements, business value, and special issues

The feasibility analysis represents a more detailed investigation into the proposed system outlined in the system request. Feasibility analysis guides the organization in determining whether to proceed with a project. Feasibility analysis also identifies the important risks associated with the project that must be addressed if the project is approved.

The system analyst and the project sponsor work together to more fully develop the objectives of the system and to understand its potential costs and benefits to the organization.

The system request and the feasibility analysis are the key inputs used by the approval committee in determining if the proposed system has enough merit to move into the Analysis Phase.

6. Describe two special issues that may be important to list on a system request.

Environmental factors should be considered (e.g., new governmental reporting requirements); competitive factors (e.g., IS-enabled systems introduced or anticipated by competitors); externally imposed deadlines that cannot be altered (e.g., completion by the start of the next fiscal year); and mandated technologies (e.g., including wireless access).

7. Describe the three techniques for feasibility analysis.

Every organization has its own process and format for the feasibility analysis, but most include three techniques:

a. Technical feasibility: Technical feasibility looks at the capability of the organization to successfully develop the proposed system. Included in this assessment is the project size, the types of technologies to be used in the project, and the amount of prior experience with that technology and the business application.

b. Economic feasibility: Economic feasibility addresses the economic justification of the project. Here, we attempt to determine if the value of the project's benefits justifies investing in the project's estimated costs.

c. Organizational feasibility: Organizational feasibility evaluates whether the system is likely to be accepted and used by the organization. Included in this assessment will be the strength of the sponsor's and management's support for the project and the enthusiasm or resistance of the users for the project.

8. Describe a "risky" project in terms of technical feasibility. Describe a project that would not be considered "risky."

A project that would be technically risky would be one that is large in scale, utilizes technology that we have little or no experience with, and is for a business area that is new and unfamiliar to the organization.

A project that would not be considered technically risky would be one that is small in scale, uses technology that is well understood, and is for a business area that is very familiar to the users and developers.

9. What are the steps for assessing economic feasibility? Describe each step.

The four steps for assessing economic feasibility are:

a. Identify costs and benefits of the proposed system.
b. Assign values to the costs and benefits.

c. Determine the cash flow of the project over the analysis period.
d. Determine the project's investment return.

10. List two intangible benefits. Describe how these benefits can be quantified.

a. One example of an intangible benefit is reduced response time to customer requests. Estimating the increase in the number of customers that could be served and the average revenue gained per customer could approximate the value of this benefit. So, if we currently have 1000 customers, the average revenue per customer is $100, and by reducing our response time we can increase the number of customers served by 30%, then our benefit will be $30,000 (300 add'l customers @ $100). (Note: this analysis assumes that demand for the product will increase with our increased capacity. If demand remains constant, however, reduced response time will allow us to save money due to less frequent overtime; allow for greater flexibility in absorbing urgent projects; or create other similar value, though the economic impact of these may be more difficult to estimate).

b. A second example of an intangible benefit is improved customer satisfaction. Determining how much repeat business we lose from dissatisfied customers could approximate the value of this benefit. The amount of repeat business lost could be estimated through customer satisfaction surveys or marketing research. Assume we currently have 1000 customers, each customer brings in average revenue of $100, and we currently lose the repeat business of 10% of our customers due to dissatisfaction. If an improvement in customer satisfaction resulted in losing only 5% of repeat business, then the value of that benefit would be $5,000 (50 customers retained @$100).

11. List two tangible benefits and two operational costs for a system. How would you determine the values that should be assigned to each item?

Two tangible benefits are: an increase in sales and a decrease in uncollectible accounts receivable. The best way to measure these benefits is to go to the business people who understand these areas and ask them for reasonable estimates. The sales and marketing managers and the accounts receivable managers will be in the best position to determine these values.

Operational costs are the ongoing costs associated with the new system, and are fairly easy to determine objectively. One common operational cost is that of maintenance agreements for new hardware, which can be determined by contacting hardware vendors about the costs of their maintenance contracts. Another common operations cost is that of new employees that will be needed to run the new system. Salaries and benefits for new employees can be determined by checking local and regional salary and wage surveys for the type of employee needed.

12. Explain the net present value and return on investment for a cost–benefit analysis. Why would these calculations be used?

Net Present Value: The net present value (NPV) method compares the present values of the project's cash inflows and outflows. If the present value of the benefits (inflows) is equal to or greater than the present value of the costs (outflows), then the project is considered economically justifiable. NPV has the advantage of including a required rate of return in the calculation, so the NPV figure captures the costs associated with tying up money in the project. NPV also explicitly considers the timing of the cash flows throughout the system life.

Return on Investment: The return on investment (ROI) method simply compares the total net cash flows from the project with the total outflows in aggregate. While this ROI number gives some sense of how much money the project generates in comparison to its total cost, it omits any consideration of the timing of the cash flows and the time value of money. The ROI method, while simple to compute, is flawed in many ways and should not be used as the only economic indicator of a project's merit.

13. What is the break-even point for the project? How is it calculated?

Break-even point is defined as the point in time at which the costs of the project equal the value it has delivered. It is determined by looking at the cash flow over time and identifying the year in which the benefits are greater than the costs.

In a project situation, if the project team needs to perform a rigorous cost–benefit analysis, they need to include information about the length of time before the project will break-even, or when the returns will match the amount invested in the project. The greater the time it takes to break-even, the riskier the project.

14. What is stakeholder analysis? Discuss three stakeholders that would be relevant for most projects.

Stakeholder analysis is a systematic process that identifies all parties that will be affected by a new information system, and attempts to estimate the consequences of the project for each stakeholder group. A major goal of stakeholder analysis is to ensure that the consequences of a new system are considered for all parties that will be affected by the system.

The most common stakeholders to consider for most systems projects are:

a. The system champion: The system champion is the person or group who initiates the project and provides support for it.
b. The system users: The users are the individuals who will work with the system once it is implemented.

c. The organization's management: The organization management commits resources to the project and has an interest in seeing those resources be used to improve the functioning of the organization.

15. Why do many projects end up having unreasonable deadlines? How should a project manager react to unreasonable demands?

Unreasonable deadlines are often the consequence of trying to complete the project to accomplish some business goal rather than being based on a realistic assessment of how long the project will actually take to complete. For example, in the CD Selections case, the project sponsor wants the Internet marketing system to be operational in time to sell CDs for holiday shopping. Too often such external factors are used to create target dates for project completion. The project manager must develop accurate and realistic time estimates for the project, and use these to convince the sponsor that his/her timelines can't be achieved. The project manager is setting the project team up to fail if he/she goes along with a time frame that is known to be unachievable. If the time deadline is immovable, then the project manager should employ time boxing to negotiate a narrowed project scope that will be achievable in the time allotted.

16. What is the trade-offs that project managers must manage?

The science (or art) of project management is in making trade-offs among three important concepts:

a) The size of the system (in terms of what it does)
b) The time to complete the project (when the project will be finished)
c) The cost of the project.

A larger project will require more time and money; while a short time frame may require more money or reduced project size. Since most projects have time and/or money constraints, the project manager must strike a balance between size, time, and cost in order to define an achievable project.

17. Compare and contrast the Gantt chart and the network diagram.

a) Gantt Chart: In the Gantt chart, horizontal bars are drawn to represent the duration of each task, and as people work on tasks, the appropriate bars are filled in proportionately to how much of the task is finished. Creating a Gantt chart is simple and can be done using a spreadsheet package, graphics software (e.g., Microsoft VISIO), or a project management package.

b) Network Diagram: PERT, which stands for Program Evaluation and Review Technique, is a network analysis technique that can be used when the individual task time estimates are fairly uncertain. Instead of simply putting a point estimate for the duration estimate, PERT uses three time estimates: optimistic, most likely, and a pessimistic. It then combines the three estimates into a single weighted average estimate using the following formula:

$$\text{PERT weighted average} = \frac{\text{optimistic estimate} + (4 \times \text{most likely estimate}) + \text{pessimistic estimate}}{6}$$

The PERT chart is drawn as a node and arc type of graph that shows the time estimates in the nodes and the task dependencies on the arcs. Each node represents an individual task, and a line connecting two nodes represents the dependency between two tasks. Pert Chart is the best way to communicate task dependencies because they lay out the tasks as a flowchart in the order in which they need to be completed. The longest path from the project inception to completion is referred to as the critical path.

18. Some companies hire consulting firms to develop the initial project plans and manage the project, but use their own analysts and programmers to develop the system. Why do you think some companies do this?

Clearly, the tasks involved in initial project plans and managing the project differ from those involved in the technical development of new systems. Firms may wish to take advantage of the expertise of outside firms in this aspect of development. Other companies do the opposite. They use their own staff to initiate and manage projects but hire consultants, temporary personnel, or outsourcing firms to do the actual programming

19. What is a use-case point? For what is it used?

Use-case points is a use cases based project effort estimation approach, which was originally developed based on unique features of use cases and object orientation. From a practical point of view, to estimate effort using use-case points, the use cases and the use-case diagram must have been created.

20. What process do we use to estimate systems development based on use cases?

Use case models have two primary constructs: actors and use cases. For use-case point estimation purposes, actors can be classified as simple, average, or complex. Simple

actors are separate systems with which the current system must communicate through a well-defined application program interface (API). Average actors are separate systems that interact with the current system using standard communication protocols, such as TCP/IP, FTP, or HTTP, or an external database that can be accessed using standard SQL. Complex actors are typically end users communicating with the system. Once all of the actors have been categorized as being simple, average, or complex, the project manager will count the number of actors in each category and enter the values into the unadjusted actor weighting table contained in the use case point–estimation worksheet. The project manager will then compute the Unadjusted Actor Weight Total (UAW). This is computed by summing the individual results that were computed by multiplying the weighting factor by the number of actors of each type.

A use case represents a major business process that the system will perform that benefits the actor(s) in some manner. Depending on the number of unique transactions that the use case must address, like actors, a use case can be categorized as being simple, average, or complex. A use case is classified as a simple use case if it supports one to three transactions, as an average use case if it supports four to seven transactions, or as a complex use case if it supports more than seven transactions. Once all of the use cases have been successfully categorized, the project manager will enter the number of each type of use case into the unadjusted use case weighting table contained in the use-case point–estimation worksheet. By multiplying by the appropriate weights and summing the results, we get the value for the unadjusted use case weight total (UUCW). Next, the project manager computes the value of the unadjusted use-case points (UUCP) by simply summing the unadjusted actor weight total and the unadjusted use-case weight total.

Use-case point–based estimation also has a set of factors that are used to adjust the use-case point value.

21. Name two ways to identify the tasks that need to be accomplished over the course of a project.

The overall objectives for the system should be listed on the system request, and it is the project manager's job to identify all of the tasks that need to be accomplished to meet those objectives.

- One approach for identifying tasks is to get a list of tasks that has already been developed and to modify it. There are standard lists of tasks or methodologies that are available for use as a starting point. (For example: methodology)

- The second approach would be the top to down approach whereby the high-level tasks are defined and then these are broken down into subtasks.

22. What are the problems associated with conventional WBSs?

Most approaches to developing conventional WBSs tend to have three underlying problems:

a) *They tend to be focused on the design of the information system being developed.* As such, the creation of the WBS forces the decomposition of the system design and the tasks associated with creating the design of the system prematurely. Where the problem domain is well understood, tying the structure of the work plan to the product to be created makes sense. However, in cases where the problem domain is not well understood, the analyst must commit to the architecture of the system being developed before the requirements of the system are fully understood.

b) *They tend to force too many levels of detail very early on in the SDLC for large projects or they tend to allow too few levels of detail for small projects.* Since the primary purposes of a WBS is to allow cost estimation and scheduling to take place, in conventional approaches to planning, the WBS must be done "correctly and completely" at the beginning of the SDLC. To say the least, this is a very difficult task to accomplish with any degree of validity. These kinds of cases often lead to inaccurate cost and schedule estimation.

c) *Since they are project specific, they are very difficult to compare across projects.* This leads to ineffective learning across the organization. Without some standard approach to create WBSs, it is difficult for project managers to learn from previous projects managed by others. This tends to encourage the "reinventing of wheels" and allows managers to make the same mistakes that previous managers have made.

23. What is an evolutionary WBS? How do they address the problems associated with conventional WBSs?

Evolutionary work breakdown structure allows the project manager to provide more realistic estimates for each iteration or build of a system. They also allow the work plan to be decoupled from the architecture of the system, thus allowing projects to be comparable. By supporting comparability among projects, evolutionary WBSs enable organizational learning to take place.

Evolutionary WBSs allow the analyst to address all three of these problems by allowing the development of an iterative work plan:

a) First, they are organized in a standard manner across all projects: by workflows, phases, and then tasks. This decouples the structure of an evolutionary WBS from the structure of the design of the product. This prevents prematurely committing to a specific architecture of a new system.

b) Second, evolutionary WBSs are created in an incremental and iterative manner. The first evolutionary WBS is typically only done for the aspects of

the project understood by the analyst. Later on, as the analyst understands more about the evolving development process, more details are added to the WBS. This encourages a more realistic view of both cost and schedule estimation.

c) Third, since the structure of an evolutionary WBS is not tied to any specific project, evolutionary WBSs enable the comparison of the current project to earlier projects. This supports learning from past successes and failures.

24. What is an iterative workplan?

Iterative work plans better fit the typical methodologies associated with object-oriented systems development. They allow the project manager to provide more realistic estimates for each iteration or build of a system. Furthermore, they allow the work plan to be decoupled from the architecture of the system, thus allowing projects to be comparable.

25. What is scope creep, and how can it be managed?

Scope creep is the most common reason for schedule and cost overruns. The main factor contributing to this is when new requirements are added to the project after the original project scope was defined and frozen. There are other reasons such as: A user may suddenly understand the potential of the new system and realize new functionality that would be useful; a senior manager may decide to let this system support a new strategy that was developed at a recent board meeting etc.,

The keys are to identify the requirements as well as possible in the beginning of the project and to apply analysis techniques effectively. No matter what kinds of precautions are taken, a few factors may go unnoticed or unattended to but several practices can be helpful to control additions to the existing task list.

- The first thing that a project manager needs to do is to allow only absolute necessary requirements to be added after the project begins.

- Any change that is implemented should be carefully tracked so that an audit trail exists to measure the change's impact.

- In some cases, beneficial changes cannot be incorporated into the present system, in which case these additions could be additions to scope as future enhancements to the systems.

26. What is timeboxing, and why is it used?

Timeboxing is a technique that is used to organize a project when time is a critical issue. With timeboxing, a fixed deadline is established, and the project team prioritizes the functionality of the system so that the essential features are delivered within the set deadline. If some features must be omitted given that time frame, they are postponed to a later version of the system. With this technique, the users are assured of getting a system with essential functionality by the project deadline, and other, less essential features and refinements are added in later system versions

27. Create a list of potential risks that could affect the outcome of a project.

Weak personnel, scope creep, poor design decisions, overly optimistic project estimates

28. Describe the differences between a technical lead and a functional lead. How are they similar?

Technical Lead: The technical lead is typically a project team member who supervises the programmers and more technically oriented project staff.

Functional Lead: The functional lead is a team member who oversees the systems and business analysts on the team. Both positions report to the project manager, and are responsible for managing, controlling, and coordinating the work of their assigned team members

29. Describe three technical skills and three interpersonal skills that would be very important to have on any project.

Desirable technical skills might include programming experience in the chosen programming language, experience in configuring the hardware and communications technology platform correctly, and experience in utilizing the file/database environment effectively. Desirable interpersonal skills might include interviewing skills, negotiation skills, and conflict resolution skills.

30. What are the best ways to motivate a team? What are the worst ways?

Research has shown that technically oriented people are motivated by recognition, achievement, the work itself, responsibility, advancement, and the chance to learn new skills. The worst ways to motivate technical staff include setting unrealistic deadlines, failing to recognize good effort, accepting low quality output, rewarding all team members monetarily regardless of work quality, failing to include team members in important project decisions, and providing poor working conditions.

31. List three techniques to reduce conflict.

Clearly define the roles on the project, hold team members accountable for their assigned tasks, develop detailed operating procedures and make sure the team members understand them, have each team member commit to the project charter.

32. Describe three types of standards, and provide examples of each.

Coding standards define the content and structures that are to be used in programs. An example would be that all programs are to be written following structured programming guidelines.

Procedural standards define processes that are to be followed by all team members. An example would be required attendance at a weekly team progress meeting, and required honest progress reporting at that meeting.

User interface design standards create a common understanding of the appearance and functioning of the screens the end users see. An example would be to create a standard group of icons that are used consistently on all screens.

33. What belongs in the project binder? How is the project organized?

All project deliverables, all internal communication, and all project documentation should be placed in the project binder. The sections of the project binder should follow the phases of the life cycle, and each deliverable produced during the project should be placed in its appropriate place.

CHAPTER 2

PROJECT INITIATION

A. Locate a news article in an IT trade magazine (e.g., *Computerworld*) about an organization that is implementing a new computer system. Describe the tangible and intangible value that the organization likely will realize from the new system.

JULY 19, 2004 (COMPUTERWORLD) - In the late 1990s, Raytheon Co.'s Network Centric Systems (NCS) business unit in North Texas migrated to a new mainframe system that didn't include a materials tracking program. The result was pure bedlam. "A lot of stuff got lost, and we had no way to find it other than to go and look for it, and that could be a 15-minute or a 15-day process," says Vince Hrenak, vice president of supply chain at Raytheon. "We used to have multiple people sitting by the phones to take the calls asking where parts were."

NCS formed a cross-functional team to search for a remedy. It evaluated at least a half-dozen software packages as well as proposals solicited from commercial systems integrators before ultimately deciding to develop its own system. McKinney, Texas-based NCS had "a lot of specific business rules wrapped around custom processes," explains Rob Vettor, senior business technologist and chief architect of the new MTrak system. "What we wanted to gain was the advantage of avoiding software costs plus having a customized solution to our unique business problems," says Gene Feighny, MTrak's lead software engineer.

Now, a little more than two and a half years later, what began as a pilot project at NCS has blossomed into an enterprise-wide supply chain application that supports 13 Raytheon sites and serves more than 20,000 users. And with cost savings directly attributed to MTrak totaling $8.6 million, other Raytheon sites are lining up to get MTrak. MTrak will eventually be deployed to 45,000 employees and is expected to cut costs by another $17 million. The $18 billion defense contractor projects total savings of $26 million over four years. "This is a rare victory, in my experience," says Hrenak.

http://www.computerworld.com/softwaretopics/erp/story/0,10801,94558,00.html

The tangible value from this system is easily measured as $ 8.6 million dollars and is directly calculated from cost savings figures. The projected total tangible value over the next four years is $ 26 million. The intangible value would is not easily measured, but includes increased efficiency in material logistics, improved communication, better utilization of human resources, and potential sales of the Mtrak technology to other entities.

B. Car dealers have realized how profitable it can be to sell automobiles using the Web. Pretend you work for a local car dealership that is part of a large chain such as CarMax. Create a system request you might use to develop a Web-based sales system. Remember to list special issues that are relevant to the project.

System Request—Web-based sales system

Project Sponsor: Matthew Moore, Sales Manager

Business Need: This project has been initiated to reach new Internet customers and to better serve existing customers using Internet sales support.

Business Requirements:

Using the Web, customers should be able to search for vehicles, and identify the brick-and-mortar stores that have them in stock. They should be able to request vehicles not carried or not in stock, and receive notification if their requested vehicle becomes available. The functionality of the system is listed below:

- Search through CarGo's inventory of vehicles
- Identify the retail dealers that have them in stock
- Schedule an appointment to view the vehicle
- Place a request for a vehicle not currently in stock
- Receive notification that a requested vehicle is in stock

Business Value:

We expect CarGo's sales will increase as a result of a wider scope of potential customers who can view our inventory, and request out of stock vehicles through CarGo's Internet presence. We expect the improved services to increase the number of customers who view vehicles at CarGo, and attract additional customers through the request/notification process because 60% of customers seek a specific vehicle model. CarGo should benefit from increased customer satisfaction and brand recognition due to its Internet presence.

Conservative estimates of tangible value to the company includes:

- $750,000 in sales generated through web-based sales system
- $1,875,000 in sales from walk-in customers who are later notified via Web-based system
- $50,000 yearly reduction of telephone expenses associated with customer queries

Special Issues or Constraints

- The Marketing Department views this as a strategic system. The Internet system will add value to our current business model, and it also will serve as proof of concept for future Internet endeavors. For example, in the future, if CarGo may want to sell vehicle service, or offer lease programs directly over the Internet.

- The system should be in place for the summer season next year.

Using the model System Request form provided in the textbook, have students prepare a System Request for the car dealer to improve its web-based sales. Have students work in small groups, and then present their ideas to the class. Pay particular attention to the Functionality and Expected Value sections. How well have the students conveyed their ideas? Have both tangible and intangible benefits and costs been included? Do their requests seem persuasive? You might have them post their requests around the room with blank pages for members of other groups to

list questions or critiques of these requests.

C. Suppose that you are interested in buying yourself a new computer. Create a cost–benefit analysis that illustrates the return on investment that you would receive from making this purchase. Computer-related Web sites (e.g., Dell Computers, Compaq Computers) should have real tangible costs that you can include in your analysis. Project your numbers out to include a three-year period of time and provide the net present value of the final total.

Cost Benefit Analysis	2004	2005	2006[G]	Total
Schoolwork[A]	3,000	3,100	3,200	
Communication[B]	400	425	450	
Entertainment[C]	600	600	600	
Travel Moblity[D]	400	400	400	
Digital Photo Storage[E]	100	100	100	
Bill Payment [F]	50	50	50	
Total Benefits	**4,550**	**4,675**	**4,800**	
PV of Benefits[H]	**4,550**	**4,289**	**4,040**	**12,879**
PV of All Benefits	**4,550**	**8,839**	**12,879**	
Computer & Case (notebook)	3,000	0	0	
Total Development Costs	3,000	0	0	
Printing Costs	75	80	85	
Electricity	20	20	20	
Maintenance	120	120	120	
Storage Media (CD's)	35	35	35	
Total Operational Costs	250	255	260	
Total Costs	3,250	255	260	
PV of Costs	**3,250**	**234**	**219**	**3,703**
PV of All Costs	**3,250**	**3,484**	**3,703**	
Total Project Benefits--Costs:	**1,300**	**4,420**	**4,540**	
Yearly NPV:	**1,300**	**4,055**	**3,821**	**9,176**
Cumulative NPV:	**1,300**	**5,355**	**9,176**	

Return on Investment: **247.82%**
Break-even Point: **1 year**
Intangible Benefits: Ease of use of new design compared to old computer
Increases your value to an internship co. since you have computer
Future potential for virtual-office applications to improve group work

Assumptions:

[A] - If annual tuition is $30,000, then assume 10% annual computer benefit or $30,000*.10 = $3000
[B] - Includes email, messaging (voice & video), conferencing, and long distance expense savings
[C] - Includes net surfing, music, video, gaming, etc.
[D] - Includes 3 flights annually with 4 hours of computer work during travel, personal time = $25/hr
[E] - Includes savings from printing photos and maintaining hard photo albums
[F] - Includes postage and check savings
[G] - Assume will be student throughout 2006
[H] - Assume student loan rate is 9%, so interest rate = 9%

D. Consider the Amazon.com Web site. The management of the company decided to extend their Web-based system to include products other than books (e.g., wine, specialty gifts). How would you have assessed the feasibility of this venture when the idea first came up? How "risky" would you have considered the project that implemented this idea? Why?

It's important to consider the three components of feasibility: technical, economical, and organizational.

The technical feasibility to expand the range of products sold on Amazon looks very promising. Since the current IT system can easily be modified to include the additional items, the risk of adding the additional sales application to the business process is minimum. In addition, its important to consider the scope of the new items offering as a large offering will require more complex system work than a small offering that can more easily be implemented into the current process. Larger projects carry more risk.

The Economic feasibility can easily be addressed through a cost-benefit analysis. Amazon will require some development costs to broaden their product range, however since the basic system is in place the costs of additional development will be minimum. Operation costs will increase slightly, however since many of the functions that drive operational costs are currently covered by the existing system, additional operational costs will be minimum also. Most significant are the benefits or additional revenue generated by wider product offerings. Its important Amazon carefully selects products that will generate the most sales, and provide the highest profit. This careful selection will help minimize economic risk.

The organizational feasibility is very good. Additional product offering will gel with the current market strategy, and add increased benefits. Many stakeholders will benefit from the new system such as customers, shareholders, vendors, and employees. The project will be less risky if an effective champion leads the company though the implementation of the new project.

Overall, I would consider this to be a low risk project.

E. Interview someone who works in a large organization and ask him or her to describe the approval process that exists for approving new development projects. What do they think about the process? What are the problems? What are the benefits?

I spoke to a former operations employee of a medium sized airline. We discussed the airlines implementation of a new frequent fliers IT system that replaced the former paper system. The new system utilized magnetic strip membership cards that were used by customers to check-in as well as a database to store customer information.

The operations department first conceived the idea to improve the frequent flier program, and then researched various methods. Once they decided to pursue the plastic card database option they obtained samples from vendors, and sent the request to company headquarters. There, a team compared the features of the new system to the ones of competitors, and identified advantages and disadvantages. In addition they performed a detailed cost analysis, and feasibility study.

The new system was approved and provided effective data management and fit well with the company's long-term goals. The most significant problem of the approval process was the length of time it took from conception to approval to implementation. The benefits of the process were the resulting well-planned system that provided effective passenger data and traceability, and the increased customer satisfaction.

H. Visit a project management Web site, such as the Project Management Institute (www.pmi.org). Most have links to project management software products, white papers, and research. Examine some of the links for project management to better understand a variety of Internet sites that contain information related to this chapter.

Purpose: to gain a broader appreciation for IT project management and resources available for further study in the area.

www.pmi.org

A brief inspection of the page shows that there is more information that would be of general interest to project managers than there is information on how to use IT in project management. It might be of interest to have your students do something of a scavenger hunt for "project management software products" information using this page with detailed instructions for finding the information again. Sharing nuggets found with the rest of the class members would be helpful.

I. Select a specific project management topic such as CASE, project management software, or timeboxing and search for information on that topic using the Web. The URL listed in exercise A or any search engine (e.g., Bing, Google) can provide a starting point for your efforts.

Purpose: to extend the student's awareness of resources available to pursue specialized topics; resources for a special topic of interest.

Two variations on this exercise would be to allow students to decide on their own topics. It would be of interest to see the variety of topics selected. Or the instructor can provide topics for students. The instructor can either provide all students with the same topic, such as CASE tools to see what sort of variance in items found will be (and demonstrate the vast array of materials); or can provide a variety of topics, perhaps having students pull them from a hat. In either case, students are likely to find a vast array of materials on the web that are not particularly helpful and sometimes that look helpful but really boil down to advertising or hype. It will be important to review what the students find and provide some feedback regarding how to evaluate these materials.

J. Pretend that the career services office at your university wants to develop a system that collects student résumés and makes them available to students and recruiters over the Web. Students should be able to input their résumé information into a standard résumé template. The information then is presented in a résumé format, and it also is placed in a database that can be queried using an online search form. You have been placed in charge of the project. Develop a plan for estimating the project. How long do you think it would take for you and three other students to complete the project? Provide support for the schedule that you propose.

Purpose: to practice converting a project idea into specific tasks, and to add consideration of specific people to task planning.

It is not a bad idea to do the exercise in class where you can "enforce" sequential progress from listing tasks to adding a deadline to adding time lengths and personnel to each task. If you assign all three, you might ask students to keep a log of how they go about the task – performing this ad hoc, the students may consider times for each task as they think of it rather than list all tasks then assign times. Does it matter which way they do this? Chances are, they will need to go through more than one iteration anyway. Assigning this set of exercises to 4 person teams could be interesting as they should list all tasks then allocate out the activities among themselves performing some sort of negotiation. Depending on the background of the students, they may or may not need to plan in some training to be prepared to handle all the tasks.

K. Refer to the situation in exercise J. You have been told that recruiting season begins a month from today and that the new system must be used. How would you approach this situation? Describe what you can do as the project manager to make sure that your team does not burn out from unreasonable deadlines and commitments.

Purpose: to practice converting a project idea into specific tasks and to add discussion of time and personnel tradeoffs.

The mini-case presents the students the students with a deadline in addition to the previously described functional requirements. It is important to consider "starting backwards" in terms of when the project is to be completed and when each task must be started in order to complete on time. This is a good place to discuss ways to break tasks up into smaller units, but additionally the cost of coordination and putting smaller units back together.

L. Consider the system described in exercise J. Create a workplan listing the tasks that will need to be completed to meet the project's objectives. Create a Gantt chart and a network diagram in a project management tool (e.g., Microsoft Project) or using a spreadsheet package to graphically show the high level tasks of the project.

Purpose: to practice converting a project idea into specific tasks and to provide an experience of charts.

It can be helpful to introduce the idea of mini-milestones and deliverables at this point. This can also be a good exercise for using MS Project or a similar tool if one is available for displaying the results. Interestingly, the activities can be presented in hierarchical fashion conforming to the various aspects of the project as presented in the exercise description. The question should arise from students as to how detailed the final task

descriptions should be. This is a good place to discuss variations among stakeholders – even within the project team – and the different users of and uses for the task plan.

You may show a Gantt and Pert charts as part of the PowerPoint slides used in lecturing. Students get the idea for this very quickly. MS Project is effective for listing the mini-milestones or work tasks; MS Project very easily transforms these automatically into chart format for printing out. If your students do not have MS Project available in the lab, you might still find one for display in class.

M. Suppose that you are in charge of the project that is described in exercise J and the project will be staffed by members of your class, do your classmates have all the right skills to implement such a project? If not, how will you go about making sure that the proper skills are available to get the job done?

Purpose: to focus on skills required for project completion.

How are students to go about this? It would seem logical to list out skills needed to perform each of the tasks identified in exercises J through L and also to list out the skills that each student possesses. Note that activities needed to enhance skill sets must also be added into the overall listing of tasks with their time and costs accounted for.

It would be interesting to assign exercise M to each member of each group that participated in J through L to perform individually. Students in comparing their findings will see if the student's assessment of her or his skills matches the assessment made by fellow team members. How will they reconcile these differences? How exact can the specification of skills needed for each task be made?

N. Complete a use-case point worksheet to estimate the effort to build the system described in exercises J, K, L, and M. You will need to make assumptions regarding the actors, use cases, and the technical complexity and environmental factors.

Purpose: To provide an experience of use-case point estimation.

The danger, of course, is the students cannot categories the complexity of actors or use cases, and they may have difficult to adjust the efforts based on the factors discussed in page 26. Students can follow the steps discussed in page 24 to page 26 and the example in page 26 to try different assumptions of the complexity categorization and the adjustment.

O. Consider the application that is used at your school to register for classes. Complete a use-case point worksheet to estimate the effort to build such an application. You will need to make some assumptions about the application's interfaces and the various factors that affect its complexity.

Purpose: To provide an experience of function point calculation.

You can do this with hypothetical numbers in class. Students can pick numbers "randomly" or for a case that they are working on just to demonstrate how to do the calculation. The danger, of course, is the students missing that the numbers are in fact based on "reality" and their specifics are critical to further decision-making. If you do this with the registration system at your school, it might be helpful to bring in someone from the IT department. Your students will be surprised at how much of the system resides under the covers and is not readily visible to them as users.

Q. Pretend that your instructor has asked you and two friends to create a Web page to describe the course to potential students and provide current class information (e.g., syllabus, assignments, readings) to current students. You have been assigned the role of leader, so you will need to coordinate your activities and those of your classmates until the project is completed. Describe how you would apply the project management techniques that you have learned in this chapter in this situation. Include descriptions of how you would create a workplan, staff the project, and coordinate all activities— yours and those of your classmates.

Purpose: To integrate the various project management approaches already presented.

It may be of value to insure that the students follow through on each of the project management activities. If they don't do these sequentially, they should still do all of them. Note that the identification of risks may lead to additional activities that need to be listed, timed, and assigned to individuals.

R. Select two project management software packages and research them using the Web or trade magazines. Describe the features of the two packages. If you were a project manager, which one would you use to help support your job? Why?

Purpose: To consider software that supports project management.

A Google search on "project management software" yielded over 2 million pages returned. A very good place to look however (as of June 2002) is the following website:

http://www.project-management-software.org/project/

A large number of software tools are listed and partly evaluated on this site. Students may find some they can download and check out for free.

Instructors may ask students to define criteria for assessing these software tools. It is interesting to see the differences in what students list if they do this before or after examination of a particular tool.

T. In 1997, Oxford Health Plans had a computer problem that caused the company to overestimate revenue and underestimate medical costs. Problems were caused by the migration of its claims processing system from the Pick operating system to a UNIX-based system that uses Oracle database software and hardware from Pyramid Technology. As a result, Oxford's stock price plummeted, and fixing the system became the number-one priority for the company. Suppose that you have been placed in charge of managing the repair of the claims processing system. Obviously, the project team will not be in good spirits. How will you motivate team members to meet the project's objectives?

Purpose: to focus on motivation and personnel issues.

The instructor might want to encourage students to use what they know about what motivates them to work harder as well as what they learned in management courses to supplement the discussion in the book. A side benefit of this exercise is that the instructor may infer something about the factors the class members see as motivating themselves – for use in motivating the students to perform at a high level.

Overall note regarding this chapter: For many students, participating in projects is fairly routine, but applying what they have learned to participate specifically in IT projects is not necessarily intuitive. Understanding the dimensions and quirks of IT project activities ultimately takes experience and practice – this chapter and these exercises should heighten awareness of what to look for, but will be unlikely to result in expert project managers.

Chapter 2 -- Mini Cases

1. A list of questions that Harry needs to have answered about his project.
    1. What is your specific objective for this Internet system? (There is a big difference between a web site that advertises and promotes products versus one that enables order entry).

    2. What specific things do you want customers to be able to do via the web site? (Review products; see store locations; search for products; place orders; process credit card payments; track order status; track shipment).

    3. How were the revenue estimates you gave developed? How accurate do you feel your estimates are?

    4. What budget are you considering for this project?

    5. What outside help will we be able to utilize in this project?

    6. Do you foresee an adverse response by the storeowners, perhaps a feeling that this will take sales away from them?

    7. Are there any other adverse consequences we should anticipate from this system?

2. Prepare a spreadsheet model that computes the expected value of the annual revenues to be produced by this new system.

Students' spreadsheets may differ; the following sample suggests an appropriate format:

New Response Time	# Calls/Truck/Week	Likelihood	Annual Revenue Increase
2 hours	20	20%	$600,000
3 hours	18	30%	$450,000
4 hours	16	50%	$300,000

3. What strategies do you suggest that Emily implement in order to help assure a successfully functioning project team?

There are a number of strategies that may be helpful to Emily; here are few key examples:

- Develop a project charter that clarifies the rules and group norms that Emily expects to follow
- Establish clear responsibilities for each team member
- Emphasize accountability for assigned tasks; don't let team members deflect responsibility to others

- Establish clear lines of communication, and emphasize shared responsibility for project success
- Get top management to commit to some type of recognition for the team to reward success.

4. Calculate the effort for this project.

a) 112 TUFP
b) PC = 13; APC = .78
c) TAFP: 112 * .78 = 87.36 => 88
d) (.35 * 88 * 15) + (.65 * 88 * 130) = 7898 lines of code
e) 1.4 * 7.9 = 11.06 person-months
f) 2.5 * (11.06)1/3 = 5.575 months

5. Unified Process-based approach

See "Feasibility Analysis"

See "Figure 2-1"

See "Staffing the project"