

Chapter 1: The Systems Analyst and Information Systems Development

Answer to Your Turn 1-1: Being an Analyst

Student answers will vary, depending on their preferences regarding being a: 1) systems analyst, 2) business analyst, 3) requirements analyst, 4) infrastructure analyst, or 5) change management analyst. Verify that the student has correctly associated the skills needed with the type of analyst for which they aspire and that the student has created a plan to acquire those skills. The roles and the names used to describe them may vary from organization to organization.

Answer to Your Turn 1-2: Implementing a Satellite Data Network

While answers may vary, answers might include the following:

1. A Cost-Benefit analysis, along with other financial processes (ROI, etc.) would certainly reveal that a just-in-time (JIT) inventory can reduce inventory costs and increase revenue. A standard communication line, encrypted or not, would not be able to handle the high bandwidth needed for data, voice and video transmissions.
2. A competitor would be able to narrow the gap by adopting the JIT type of inventory management. Voice and video are not necessary to keep the inventory up to date on a timely basis, data transmissions alone would work well.

Answer to Your Turn 1-3: Too Much Paper, Part 1

System Request

Sponsor: Document Manager.

Business Need: Increase efficiency in storing, updating, and retrieving information on employee injury claims.

Business Requirements: Automated system which allows for electronic submission of reports via a secure web site.

Business Value: Reduce response time for employee inquiries, increase effectiveness of storing, updating, and retrieving employee injury claims. Reduce storage costs of paper files.

Special Issues: Must have someone who understands how to create and maintain a secure web site. Must have resources to migrate paper files to data storage. Must

work within HIPAA guidelines to ensure that medical documents are treated according to regulations.

Answer to Your Turn 1-4: Too Much Paper, Part 2

1. Issues arising from digital signatures and electronic documents typically focus on establishing validity for signatures and originators. As these issues can be overcome using certificates and encryption, they don't necessarily affect the project feasibility. However, they do need to be addressed.
2. Answers will vary. The project champion, organizational management, and perhaps most importantly a subset of the stakeholders must believe in and show support for the project. One solution would be to plan and provide for sufficient training that demonstrates how their jobs might be easier to accomplish with the automated system.

Answer to Your Turn 1-5: Discovering Visible Analyst - Lesson 1

Student answers and experiences will vary based on the adoption of the software package, Visible Analyst. It is highly recommended that a CASE tool be used for modeling throughout this course.

Answer to Concepts in Action 1-A: Managerial Causes of IT Failures

Qantas provides for an "ice-breaker" discussion topic for the first class. Perhaps group the students and have them discuss this company and then provide for class discussion about the importance of IT project success.

Answer to Concepts in Action 1-B: BPI on the Farm

Efficiency gains are mentioned in this Concept in Action. What are the drawbacks to this scenario? Is it as easy as it seems? Issues such as Wi-Fi coverage on a farm, perhaps even cellular coverage can come into play as can weather, dust, and other issues inherent with a farming enterprise.

Answer to Concepts in Action 1-C: Interview with Don Hallacy, President, Technology Services, Sprint Corporation

This is an opportune time to identify the responsibilities of the differing roles that an analyst serves.

Answer to Concepts in Action 1-D: Carlson Hospitality

Carlson Hospitality can use the information from the survey to determine whether the one-point increase in market share revenue (\$20 million per point) will offset costs associated with increasing the level of services to high-quality customers which would result in a 10% increase in customer satisfaction.

Answer to Concepts in Action 1-E: Return on Investment

1. One method for determining a return on investment is to complete a Cost-Benefit Analysis using the Present Value Method. Many of the costs for server virtualization are associated with the initial construction: physical manipulation of the servers and software licensing. The ongoing costs of labor in updating and accessing tables would be relatively small. Using this type of analysis would allow the project sponsors to show how the benefits of the virtualization would be realized on a long term basis.
2. Implementing a major change to a system should certainly include a systems analyst. Systems analysts typically have a broad view of the system, and would be able to ascertain how virtualizing the servers will affect the whole system.

Answers to End of Chapter Questions

1. *List and describe the six general skills all project team members should have?*

[1] Technical skills (knowledge of how to employ technology in development system solutions). [2] Business skills (knowledge of how to apply IT to business problems to achieve a valuable solution). [3] Analytical skills (ability to solve complex problems). [4] Interpersonal skills (oral and written communication skills with both technical and non-technical audiences). [5] Management skills (ability to manage others and cope with an uncertain environment). [6] Ethical skills (ability to deal with others honestly and ethically).

2. *What are the major roles on a project team?*

Business analyst – emphasis on the business issues addressed by the system: value of new system; identification of problems and opportunities; revision of business processes and policies.

Systems analyst – emphasis on IS issues of the system: how IT can be used to support business processes; **design** of new business process and IS; and enforcement of IS standards.

Infrastructure analyst – technical issues associated with integrating new system components to existing technical **infrastructure**.

Requirements analyst – eliciting the requirements of the new system from all stakeholders. They understand the business well, are excellent communicators, and are highly skilled in obtaining system requirements.

Change management analyst – emphasis on facilitating organizational adaptation to new system. Helping to identify and overcome resistance to change and assuring adequate training and documentation of new system.

Project manager – ensuring that progress is made on the project; time schedules and budgets are met; supervision of project team; and manage relations with project sponsor and users.

3. *Compare and contrast the role of a systems analyst, business analyst, and infrastructure analyst.*

These three roles emphasize different perspectives on the system. The business analyst represents the sponsor/users interests, while the systems analyst knows how to apply IS to support business needs. Together, the systems analyst and the business analyst can design a system that conforms to the IS standards while adding value to the business. The infrastructure analyst has more technical knowledge and provides the team with technical constraints, or identifies infrastructure changes that the new system will require.

4. *Compare and contrast the role of requirements analyst, change management analyst, and project manager.*

These three roles also emphasize different perspectives on the system. The requirements analyst focuses on eliciting the requirements from the system stakeholders. The change management analyst focuses on people and managing issues surrounding the installation of the system. The project manager ensures that the project is completed on time and within budget and that the system delivers the expected value to the organization.

5. *Describe the major phases in the systems development life cycle (SDLC).*

The planning phase focuses on determining if there is justification to build an information system and developing a plan to accomplish the development project. The analysis phase is focused on understanding the existing situation and determining the needs and requirements expected from the new system. The design phase refines the system requirements (from analysis) and develops specifications for how the new system will fulfill those requirements. The implementation phase involves constructing (or installing) the new system, testing, converting, training, and providing support for the new system.

6. *Describe the principal steps in the planning phase. What are some major deliverables?*

Step 1 – Project Initiation: the project sponsor works with the IS department to develop a preliminary assessment of the project's feasibility. It is important to make an initial evaluation of the project's value (is it worth doing; is it technically possible for us; will it be used?). The system request and the results of the feasibility analysis are usually presented to management for approval. If the project is accepted, we move to:

Step 2 – Project Management: the project work plan is created, project staffing is determined, and project management controls and procedures are established. These elements comprise the project plan.

The deliverables in the planning phase include the feasibility analysis and the project plan.

7. *Describe the principal steps in the analysis phase. What are some major deliverables?*

Step 1 – Analysis Strategy: based on the nature of the project, the project team will formulate the approach that will be used to develop the requirements for the new system. The strategy usually includes the following steps:

Step 2 – Analyze the current system: gather information from the project sponsor and users of the current system regarding its strengths and weaknesses. Use the problems identified to formulate objectives for the new system.

Step 3 – Create new system concept: based on the gathered information, develop a general concept of the new system, including functions and capabilities it will have.

Step 4 – Modeling activities: express ideas for the new system's processing and data requirements with process models and data models.

Step 5: Prepare and present system proposal: assemble the analysis results, system concept, process model and data model into a proposal for the new system. Project sponsor and/or approval committee will determine if system has enough merit to continue development.

The primary deliverable for the analysis phase is the system proposal, which combines the information generated during this phase into a document that expresses the initial conceptual design for the new system and the basis for the design decisions.

8. *Describe the principal steps in the design phase. What are some major deliverables?*

Step 1 – Design Strategy: based on the nature of the project, the project team will determine the appropriate means of developing the system (in-house custom development, purchase of pre-written software, or outsourcing development to a 3rd

party. Following this, the steps below outline the various design tasks that must be performed:

Step 2 – Design the system architecture: describe the basic hardware, software, and networking that will be used in the new system.

Step 3 – Design the user interface: the overall structure of the system, the user's navigation through the system; the inputs and outputs of the system, and the appearance of the screens are designed.

Step 4 – Design the database and/or files: develop specifications for the data storage structures that will be implemented for the new system.

Step 5: Design the programs: develop plans and outlines for each program that will be written to implement the functions and capabilities of the new system.

The primary deliverable for the design phase is the system specification, which combines all the design specifications mentioned above. The system specification is the basis for the construction work that will be performed by the programmers.

9. *Describe the principal steps in the implementation phase. What are some major deliverables?*

Step 1 – Build the system: programs are written and tested, and various infrastructure components are installed. Testing is conducted to verify system performance.

Step 2 – Train the users: develop and conduct training programs so that end users are thoroughly familiar with the new system's functions and work procedures.

Step 3 – Convert to the new system: transition from the old system and procedures to the new system and procedures.

Step 4 – Support the new system: evaluate the development process for lessons learned from this project, and establish methods for identifying and implementing change to the new system as needed.

The primary deliverables for the Implementation phase includes the completed and documented programs, users manuals and procedures manuals, training materials, and plans for system support.

10. *Which phase in the SDLC is most important?*

While each phase is important to the overall systems analysis, special attention must be given to the planning and analysis phase. The planning phase is intended to determine the feasibility of a project and to create a project plan. If the feasibility analysis is poorly done or misunderstood or the project is ill-planned, then the chance

of success is extremely low. Similarly, if the analysis phase is shortened or omitted altogether, then the requirements of the system will not be fully defined and may result in either a system that does not address business needs or one that does not get completed due to continuous rework.

11. What does gradual refinement mean in the context of SDLC?

Generally, the clarity of understanding and the depth of detail of the new system are gradually refined during the phases of the SDLC. Initially, the requirements are only vaguely understood. This understanding is improved during the Analysis phase. Further detail is developed during Design, and then is fully expressed during Implementation.

12. Describe the four steps of business process management (BPM). Why do companies adopt BPM as a management strategy?

BPM is a methodology used by organizations to continuously improve end-to-end business processes. It follows a cycle of systematically creating, assessing, and altering said processes. The four steps of BPM are:

Step 1: defining and mapping the steps in a business process,

Step 2: creating ways to improve on steps in the process that add value,

Step 3: finding ways to eliminate or consolidate steps in the process that don't add value, and

Step 4: creating or adjusting electronic workflows to match the improved process maps.

By studying and improving their underlying business processes, organizations can achieve several important benefits, including: enhanced process agility, improved process alignment, and increased process efficiencies.

13. Compare and contrast BPA, BPI, and BPR. Which is most risky? Which has the greatest potential value?

The three techniques applied within BPM for business processes are that of Automation (BPA), Improvement (BPI), and Reengineering (BPR). It is entirely possible that all three of these techniques could be used on the same project depending on the scope and impact the planned change will have on the steps of BPM.

As a rule, when technology is applied to a process to enhance agility and provide more ability for change the project would be a BPA. When a process incorporates industry "best practices" or perhaps finds ways to eliminate or consolidate steps in the

process it would be termed BPI. The BPR technique changes the fundamental way in which the organization operates. In effect, BPR makes major changes to take advantage of new ideas and new technology.

BPR is considered to contain the most amount of risk of the three techniques due to the significant organizational and operational changes that result.

The answers can certainly vary with regard to greatest potential. In many cases it will be a “hybrid” blend of all three that could hold the most potential for the organization.

14. Give three examples of business needs for a system.

- To maintain or improve the competitive position.
- To perform a business function more efficiently.
- To take advantage of a new business opportunity.

15. Describe the roles of the project sponsor and the approval committee.

The project sponsor is the individual or department responsible for initiating a systems request. Typically during the Planning phase the project sponsor works with the IT department to conduct a feasibility analysis. The approval committee (or steering committee) then evaluates the systems request along with the results of the feasibility study to determine whether or not to approve the request.

16. 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 investments in information systems projects. 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; monitoring project performance after the project has been accepted. The composition of the approval committee will vary from organization to organization, but generally consists of high-level managers from throughout the organization. The committee is often chaired by the CIO.

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

Usually, the system request originates with a businessperson because the need for the system or system improvement is recognized in the business unit. It is unlikely the IS professionals in the organization will be able to recognize all the business needs and opportunities for systems and improvements in the business units since they are not involved directly in those areas. Also, the businessperson 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.

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

Tangible value represents the system benefits that are quantifiable and measurable. Intangible value represents benefits that are real, but are difficult to quantify and measure. Examples of tangible benefits might be increased sales, reduced operating costs, and reduced interest costs. Examples of intangible value might include increased customer satisfaction, improved decision making, improved problem recognition.

19. *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. The system request pulls together preliminary ideas on the reason for the system and its expected value to the organization. The feasibility analysis represents a more detailed investigation into the proposed system outlined in the system request. 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.

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

Any special circumstances that could affect the outcome of the project must be clearly identified. Examples of special issues that may be important to include are: environmental factors that 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); mandated technologies.

21. *Describe the three dimensions of feasibility analysis.*

Technical feasibility looks at the capability of the organization to successfully develop the proposed system. Included in this assessment are 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. 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. 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.

22. *What factors are used to determine project size?*

Some factors that can be used to determine project size include: the number of people on the project team, the expected time to complete the project, the breadth/scope of the project, the number of distinct features to be included in the system, the degree of integration required between the system and existing systems.

23. *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.

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

To assess economic feasibility, one should:

1. Identify costs and benefits of the proposed system. List tangible costs and benefits, including one-time and recurring costs.
2. Assign values to the costs and benefits. Work with business users and IT professionals to quantify each of the costs and benefits. Try to estimate intangible costs and benefits as well.
3. Determine the cash flow of the project over the analysis period. Project the costs and benefit annually over the analysis period, usually 3-5 years.
4. Determine the project's net present value. Calculate the present value of each year's costs and benefits, using the appropriate required rate of return for the project. Subtract the cumulative PV of costs from the cumulative PV of benefits to determine the project's net present value. If it is a positive number, the project is considered acceptable.
5. Determine the project's return on investment. Use the ROI formula to calculate the return the organization will get on its investment in the project. $ROI = (\text{Total benefits} - \text{Total costs}) / \text{Total costs}$.
6. Calculate break-even point. Determine the point in time when the project has generated enough cash flow to recapture its cost.
7. Graph break-even point. Plot the yearly costs and benefits on a line graph. The point of intersection is the break-even point.

25. *List two intangible benefits. Describe how these benefits can be quantified.*

One example of an intangible benefit is reduced response time to address 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).

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 determined 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).

26. *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.

27. *Explain how an expected value can be calculated for a cost or benefit. When would this be done?*

An expected value consists of a combining set of possible outcomes along with the associated probability of each outcome. For example, the Production department may estimate possible increases in costs for parts based on economic indicators. They estimate that there is a 40% chance the costs will increase to \$300,000, a 25% chance the costs will increase to \$400,000 and a 35% chance the costs will increase to \$350,000. Overall the expected value of the rise in costs would be estimated to be $\$342,500 = (\$300,000 * .40) + (\$400,000 * .25) + (\$350,000 * .35)$.

Estimating the expected value of a cost or benefit would be done when assigning costs and benefits when determining economic feasibility.

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

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. 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.

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

The break-even point is the point in time when the project has generated enough cash flow to recapture its cost. The year in which the project breaks even is the first year in which the cumulative NPV is a positive number. The exact point during that year at which break even occurs is calculated by: $(\text{Yearly NPV (for first positive year)} - \text{Cumulative NPV at that year}) / \text{Yearly NPV (for the first positive year)}$

30. *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 the system champion, the system users, and the organization's management. The system champion is the person or group who initiates the project and provides support for it. The users are the individuals who will work with the system once it is implemented. 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.

Solutions to End of Chapter Exercises

A. Go to www.bls.gov and perform a search for "systems analyst." What is the employment outlook for this career? Compare and contrast the skills listed with the skills that were presented in this chapter.

Student answers will vary. The search returned more than 8,500 responses from the bls website. This is an eye opening exercise for all students to complete. These skills are consistent with those presented in this chapter.

- B. *Think about your ideal analyst position. Write a job posting to hire someone for that position. What requirements would the job have? What skills and experience would be required? How would the applicants demonstrate that they have the appropriate skills and experience?*

Student answers will vary, depending on their preferences regarding being a systems analyst, business analyst, infrastructure analyst, or change management analyst. Try to verify that the student has correctly associated the skills needed with the type of analyst position for which they aspire. Demonstration of skills and experience should come from prior actual positions held, responsibilities and accomplishments in those positions, and references.

- C. *Locate a news article in an IT trade web site (e.g., Computerworld.com, InformationWeek.com) about an organization that is implementing a new computer system. Describe the tangible and intangible value that the organization seeks from the new system.*

Students' answers will vary. Verify that the tangible examples are easy to quantify and measure. Verify that the intangible value examples represent those benefits that are more difficult to quantify (e.g., customer goodwill or repeat business).

- D. *Car dealers have realized how profitable it can be to sell automobiles by using the Web. Pretend that 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

Sponsor: Sales Manager.

Business Need: Increase sales, increase market share, broaden geographic reach to potential customers.

Business Requirements: Web-based access to vehicle inventory including pictures. Search capabilities. Ability to process requests for more information about a vehicle.

Business Value: Increase sales by 4%; increase market share by 1.5%; broaden reach to customers within 250 mile radius of dealership.

Special Issues: Must have someone who will keep Web-site content up to date constantly. Who will handle customer inquiries? How will this person be compensated? Will the compensation of our current sales force be affected? How will the sales force feel about this new system? Will having our own Web-based sales system affect our participation in the CarMax chain?

- E. *Think about your own university or college and choose an idea that could improve student satisfaction with the course enrollment process. Currently, can students enroll for classes from anywhere? How long does it take? Are directions simple to follow? Is online help available? Next, think about how technology can help support*

your idea. Would you need completely new technology? Can the current system be changed?

Create a system request that you could give to the administration that explains the sponsor, business need, business requirements, and potential value of the project. Include any constraints or issues that should be considered.

On most campuses this is a “hot topic” which would make this an excellent exercise to complete on the classroom whiteboard as a way of introducing the system request form and how to complete it.

- F. *Think about the idea that you developed in Exercise E to improve your university or college course enrollment process. List three things that influence the technical feasibility of the system, the economic feasibility of the system, and the organizational feasibility of the system. How can you learn more about the issues that affect the three kinds of feasibility?*

Technical Feasibility – Student responses will vary

Economic Feasibility – The cost associated with such a system will be a large unknown for the students. They might not realize that the existing system is probably a part of a much larger and very expensive enterprise system.

Organizational Feasibility – Understanding the organizational makeup is paramount. Is the current system free standing within the college or university, or is it a part of a system-wide (multi-campus operation?)

- G. *Amazon.com was very successful when it decided to extend its offerings beyond books to many other products. Amazon.com was unable to compete successfully with eBay.com’s auction site, however, and eventually abandoned its own auction site. What feasibility factors probably had the most significance in this failure? Explain.*

Most certainly it was Economic. The company lost vast sums of money annually. Technically it was not a challenge to compete, Organizationally, Amazon did not want to lose, but finally Economically it had to be abandoned.

- H. *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?*

Students' answers will vary.

- I. *Reread the “Your Turn 1-2” box (Implementing a Satellite Data Network). Create a list of the stakeholders that should be considered in a stakeholder analysis of this project.*

A list of stakeholders would include the project sponsor (also known as project champion), managers in the organization (particularly inventory), and users at the regional and national headquarters.

Answers to Textbook Minicases

1. *The purpose of this minicase is to encourage students to recognize the value of the structure of the four phases of the SDLC to smaller projects, even end-user computing projects such as this. This minicase provides an opportunity for the class to be divided into small groups, each responsible for one of the main sections of the minicase, and then have the small groups present and discuss their answers.*

A. *Planning:*

- i. *What is the purpose of the Planning Phase for a project such as this?*
In a smaller, end-user computing situation, the Planning phase ensures that the project scope is understood prior to “diving in” to the project work. A system request may not be formally prepared, but the business purpose of the project and the value to the business should be articulated. Feasibility should be considered for any project. Technical feasibility evaluation should encourage the developer to identify places where he/she might need assistance from the IS professionals. Economic issues and organizational feasibility concerns should help determine if the project has enough value to justify the time and costs, and organizational feasibility assessment should help alert the developer to organizational acceptance issues. While a formal project plan may not be required, it is important to organize the project and lay out the timetable for work on the project. If additional help will be needed, the individuals who can provide that help must be lined up at the appropriate time.
- ii. *What are the typical outcomes of the Planning Phase?*
Typically, the Planning phase produces a System Request, preliminary Feasibility Assessment, and Project Plan, including workplan and staffing plan. The main point of the planning phase is to more thoroughly understand the project, verify that it has value and is worth doing, and be prepared to tackle the project.
- iii. *How did not doing this step affect Megan’s project outcome?*
Megan did not adequately appreciate the scale of the project she was taking on. Her approach, “...set up the basics for the system and then tweak it around until I got what I wanted...” demonstrates that a haphazard attitude toward such a project results in a poor outcome. She also did not adequately understand the interests and reactions of her assistant and the members of her sales staff.

B. *Analysis:*

- i. *What is the purpose of the Analysis Phase?*
The purpose of the Analysis Phase is to develop a thorough understand of the functional requirements of the new system. In other words, we should clearly know what things the new system needs to provide to its users.
- ii. *What is the key outcome produced during the Analysis Phase?*
The Analysis Phase produces the System Proposal, which is documents the functional requirements of the system in clear, unambiguous terms.
- iii. *In what ways do you think this project was hurt by not going through a typical Analysis Phase?*

Megan had a list of things she thought would be useful in the new system, but she did not take the time and effort to understand the details of the features she had identified. She also did not apparently talk to any of the ultimate users of the system: her assistant and the members of her sales staff. If she had taken the time to involve these individuals, she could have gotten a much better grasp of the features and functions that they really need, and they would have had the benefit of contributing their ideas to the system's requirements.

C. Design:

i. What is the purpose of the Design Phase?

The Design Phase allows the developer a chance to consider options for implementing the system. The make versus buy decision is considered along with a detailed assessment of the alternatives. If any custom development is undertaken, the work that will be done is carefully laid out using various design tools.

ii. How do you think this project could have been improved by going through a typical Design Phase?

Megan was given some advice on the development environment to use (WordPress). This may or may not have been good advice. If a more careful Design process had been followed, Megan could have done an assessment of all her options. For example, there may be a software product that she could have purchased that would have been suitable for her purposes that would have been far easier for her, rather than the setup involved with a WordPress site. If she chose to move ahead with the WordPress platform, she could have been better prepared if she had worked on the design of each of the site features prior to implementation in Word Press.

iii. Do you think Megan's assistant and sales force members could have helped at all during the design phase? If so, how?

At the very least, Megan could have met with her assistant and sales force members and discussed the design for the main system features. Their ideas and reactions probably would have led to a much better outcome for the project.

D. Implementation:

i. What type of work is done in the Implementation Phase for a project like this?

Implementation involves the construction of the system, testing of the system, training of the users, developing documentation, putting the system into production, and maintaining the system.

ii. What is usually done during the Implementation Phase to ensure that the users of the system are satisfied with it?

Training and final testing are activities that enable the users to be able to use the system and to be satisfied that the system performs as it should.

iii. Megan's approach to "construction" was to throw something together and "tweak it around." How do you think that approach contributed to the problems she is now experiencing with her project?

As the answers to the previous sections make clear, Megan's haphazard approach to the project was a significant factor in the poor outcome of this project. Even projects that seem simple and small in scope benefit from an orderly, well-thought-out approach. Many end-user computing projects like this end up wasting a lot of time and resources. Knowing and following an orderly development project that is based on the SDLC should greatly enhance the chances of a successful project that provides value to the business and provides useful features for the users.

2. Student answers may vary; A sample answer is provided below:

- ◆ *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).*
- ◆ *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).*
- ◆ *How were the revenue estimates you gave developed? How accurate do you feel your estimates are?*
- ◆ *What budget are you considering for this project?*
- ◆ *What outside help will we be able to utilize in this project?*
- ◆ *Do you foresee an adverse response by the store owners, perhaps a feeling that this will take sales away from them?*
- ◆ *Are there any other adverse consequences we should anticipate from this system?*

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

Decker Company Revenue Estimates								
New Response Time	Service Calls per Truck per 'Week	Increase in Service Calls	Average Revenue per Call	Revenue Increase per Truck per Week	Annual Revenue Increase	Likelihood Estimate	Expected Annual Revenue	
2 hours	20	8	150	1200	600,000	20%	120,000	
3 hours	18	6	150	900	450,000	30%	135,000	
4 hours	16	4	150	600	300,000	50%	150,000	
Total Expected Value:							405,000	

4. *As the numbers indicate, this would not be an economically feasible project for a number of reasons. It would take more than the projected 4- year life span to breakeven on the initial investment, the return on investment is a very low number (-1), and the net present value is currently projected as a number less than zero.*

		2005	2006	2007	2008	Total
Benefits	Chapter 1	The Systems Analyst and IS Development				
	Increased Sales	30,000	33,000	36,300	39,930	
	Reduced Inventory	15,000	15,000	15,000	15,000	
Total Benefits		45,000	48,000	51,300	54,930	199,230
Present Value Total Benefits		41,284	40,401	39,613	38,914	160,212
Development Costs						
	Systems Analysts	40,000				
	Programmer Analysts	35,000				
	GUI Designer	8,000				
Telecommunications Specialist		2,500				
	System Architect	5,000				
	Database Specialist	675				
	System Librarian	3,750				
	Development Training	14,000				
	Hardware	18,700				
	Software	15,650				
	Total Development Costs	143,275				
Operational Costs						
	Labor: Programmer Analysts	8,750	9,100	9,643	9,843	
	Labor: System Librarian	300	312	325	337	
	Hardware Maintenance	995	995	995	995	
	Software Maintenance	525	525	525	525	
	Preprinted Forms	3,300	3,300	3,300	3,300	
Total Operational Costs		13,870	14,232	14,788	15,000	57,890
Total Costs	143,275	13,870	14,232	14,788	15,000	201,165
Total Benefits - Total Costs	(143,275)	31,130	33,768	36,512	39,930	(1,935)
Cumulative Cash Flow	(143,275)	(112,145)	(78,377)	(41,865)	(1,935)	
Present Value Total Costs	143,275	12,725	11,979	11,419	10,626	190,024
NPV (PV Total Benefits - PV Total Costs)						(29,812)
ROI	-1%	(-1,935/201,165)				
Breakeven Point = not realized within this schedule						
Supplemental Minicase						

1. Refer to Minicase 2 in Chapter 1 of the textbook. Harry has met with Bill and determined that Bill would like a system that allows customers to browse through products on-line, find store locations nearest them, and also place orders for products with credit card payments. Based on this scope, Harry is preparing an assessment of the feasibility of this system to present to the Board of Directors. He is working on the technical feasibility issues currently. Prepare a summary of the technical risks that appear to be associated with this proposed system.

Answer:

- ◆ *This business application is new to the organization. No one has experience or understands Internet-based commerce. Many businesses are doing this, so we are not breaking new ground; we just don't have any in-house expertise in this type of business venture.*
- ◆ *We do not have any in-house experience with the technologies associated with Internet-based commerce. No one on staff has done anything like this before. Given the short time frame, it will be difficult for the existing staff to get up to speed on the needed technology and determine how to use it effectively for this project.*
- ◆ *We have a very small IS staff who are currently kept busy maintaining our existing systems. Given this small staff, this is a sizeable project for us to undertake.*

This project represents a very high technical risk for this IS department. Point out that this is an ideal situation to outsource or hire consultants to do. Technically, our current staff is probably incapable of developing this system in a timely manner.

2. Jay Martin, the director of Marketing at Pier Systems, Inc., requested a new system be developed to assist his sales staff in more effectively managing their customer contacts. As a side benefit of this system, Jay will receive detailed information about each salesperson's daily productivity, including number of customer contacts, time spent per contact, orders placed per contact, and revenues generated per contact. This detailed information about sales staff productivity has not been previously available to Jay.

Jay has been a strong and vocal advocate of this new system, although he has heard some grumbling in the sales staff ranks about it. The sales staff has enjoyed considerable autonomy in the way they conduct their work day, and this system will provide a much clearer picture of how each salesperson spends his/her time. Other top managers have expressed interest in the system, although much managerial attention has been focused recently on the implementation of a major new computer-based manufacturing and production system, which has been far behind schedule and plagued with problems. Based on his discussions with his IS contact, Jay feels certain this system is technically and economically viable. How would you assess the Organizational Feasibility of this system?

Answer: The project has an enthusiastic and committed project champion. Organizational management is supportive, but their attention is on another project that has not gone well. It does not seem likely that organizational management will provide more than modest support and enthusiasm for this project, as their energy is diverted toward the other implementation under way. The end user support is very questionable. The material provided does not really reveal the benefits that the sales staff will gain directly. The end users will have to be handled very carefully to gain their support and diminish their fears about this new system. All in all, the organizational feasibility risk of this system seems quite high at this time.

Experiential Exercises

1. Purpose: To help students gain an appreciation of the terms phase, step, technique, and deliverable, and how those terms relate to understanding a process of significant length and complexity.

Divide class into groups of 3. Each group will address the same task. The task is to discuss the experience of being a student at your institution, from pre-admission to graduation, in terms of phases, steps, techniques, and deliverables. Precede the group work with a general discussion of these terms.

Although answers will vary, phases may include pre-admission to the institution, enrollment as student, pre-professional study, admission to professional program, professional study, and graduation. Steps may be courses of study to follow, course sequences and prerequisites, general education requirements, professional program requirements, etc. Techniques may include such things as study habits, research

methods, speed reading classes, study groups, etc. Deliverables will be course requirements (papers, projects, exams), course grades, transcripts, certificates, and diplomas.

After each group has developed its ideas, class discussion should focus on comparing results and clarifying the meaning of each term through the examples presented.

2. Purpose: To help students understand and appreciate the role of the project sponsor in an IS development project.

Assign students to identify a person in an organization who has initiated and sponsored the development of an information system application. This person will generally be a business-oriented manager rather than an IS staff member. Either singly or with a partner, the students should arrange an interview with this person to discuss their experiences as a project sponsor. [As an alternative, the instructor may arrange for a person who has served as a project sponsor to visit a class session and be interviewed by the entire class about his/her experiences in the project sponsor role.]

It may be helpful to 'force' students to develop a list of interview topics before undertaking the interview. Have the students prepare an interview agenda for your approval prior to the interview. Questions should be targeted toward understanding the project, the circumstances that motivated the project, and the involvement the sponsor had throughout the development process.

Students should prepare a written summary of their interview, and/or make a class presentation of their interview results. If class presentations are made, class discussion should focus on identifying common themes or similarities between the interviewees, and also identifying significant areas of difference.

3. Purpose: to help students understand the difference between tangible and intangible values.

The following 2 exercises come from CIO Magazine. The purpose is to show that everything can be measured - even intangibles.

Exercise 1: Is it logical to say that more X (an intangible) is better than less, but it is in no way different or observable? Then in what way is X "better?" If you believe X is a good thing, then you must also believe that it is somehow different from not having X. And if it is different in a way that is relevant, then it must be observable. So ask what the observable consequence is. Once you have identified an observable consequence, thinking of a way to measure it is pretty easy.

Exercise 2: Create a thought experiment in which you imagine you have cloned an entire organization into twin organizations, A and B. The two are identical in every way except for one thing: Organization A has more of intangible X than organization B. Now, imagine that you are an objective observer standing outside these organizations looking in. What do you imagine you observe to be different between A and B? If X is such a

desirable thing, then there has to be some difference. What is it? Are certain things getting done cheaper or faster? Are the customers of A likely to come back for more business than the customers of B? Is employee turnover lower? Are mistakes of some type less frequent? Just think it through-and be specific.

4. Purpose: to help students understand the different roles played on a systems development project team.

Have students undertake a Web search for job descriptions similar to Business Analyst, Systems Analyst, Project Manager, Technical Specialist (equivalent to Infrastructure Analyst). Have students develop a summary list of job responsibilities, qualifications, and experience required for each job category. Class discussion focuses on developing a “master list” for each job category, and comparing and contrasting the positions.