Computer & Information Systems (22:198:604)
Fall 2008

Homework 3 Solution

1. Chapter 6. Review Question 5 (Page 183)

Explain why scheduling and budgeting is difficult for systems development. Use an example other than one in this chapter.

Developing an information system cannot be accomplished by following a recipe. There are many unknowns and uncertainties that will be unique for every project. Consequently, estimating the time and cost of a project is extremely difficult. While hardware costs are reasonably predictable, it is the cost of the people involved in developing the system that is uncertain; the labor costs of the business people and technical people who will participate in the project. Most cost projections and timetables at the start of a project will have a wide range of values. For example, at the outset, we might think a project will take two years and cost $1,000,000, but we know the time frame is actually anywhere from one to three years, and the cost is anywhere from $500,000 to $2,000,000. This range will decrease as the project progresses and more is learned about the system under development. After the requirements are determined, for example, we might now believe that the project will cost $1,250,000, +/– $250,000, and the time frame is eighteen months, +/– five months. The estimates will still not be very precise, however. A good project manager will continually refine the estimates as the project proceeds.

2. Chapter 6. Review Question 6 (Page 183)

Explain the dilemma posed by changing technology.

Technology will continue to evolve over time. For a lengthy project, this means that the available technologies at the outset of the project could be very different from the available technologies eighteen months into the project. In the order entry system example mentioned in question 4, not only did the business environment change, that change was driven, in part, by changing technology. In that case, the technology shift was so significant that the order entry system under development was obsolete before it was even completed. In that example, it most likely would be imperative to stop the project and adjust to the new business and technical landscape in order to remain competitive. In other cases, the answer is not so clear cut. The project team must carefully and realistically assess the real promise of the technology (not just the marketing hype). This is where technically-savvy business people can be very useful. Unfortunately, technical people sometimes can get caught up in new technology just for technology's sake, and fail to realistically evaluate its true business value.

3. Chapter 6. Review Question 7 (Page 183)

What are diseconomies of scale? How do they pertain to systems development?

With respect to systems development, diseconomies of scale means that at a certain point, the value adding more people to a project begins to diminish. This suggests, for example, that a project team of forty will not get twice as

much done as a project team of twenty. The team of forty will get less done than you might expect due to communication and coordination difficulties in a team of that size. Early in my career, I was one of many programmers added to a large project that was bumping up against an unyielding conversion date of the start of the new fiscal year. We all began working long hours, seven days a week, but during those days there was a lot of wasted time as we waited for information and instructions on what to do next. We were not really able to work up our full capacity due to the problems in keeping the large team coordinated and in sync. To minimize coordination and communication problems in large projects, it is best for the project to be carved into smaller, relatively autonomous chunks, with teams of no more than twenty assigned to each subproject.

4. Chapter 6. Review Question 9 (Page 183)

Summarize the major tasks in the requirements phase.

Requirements analysis consists of:

- Determining requirements—the project team will use a number of techniques to understand and define the requirements of the new system. Existing system documentation can be studied, users of the current system can be observed, surveys and questionnaires can be sent to users, and interviews can be conducted with key personnel to learn about the deficiencies of the existing system and the things that are needed in the new system. New features and functions in the new system are outlined and the data requirements are established. Other issues, such as new hardware that will be needed, new procedures that will be needed, and the redesign of jobs will be considered as well.
- Obtaining user approval—users should review the requirements before the system is designed so that the correct set of requirements is incorporated into the system. It is much easier and cheaper to change things when they are stated as requirements. Change becomes more difficult and expensive when the components have been designed and implemented.

5. Chapter 6. Review Question 14 (Page 184)

What happens if the requirements definition is incorrect or incomplete?

If the requirements definition is incorrect or incomplete, the system that is built cannot possibly fulfill the need that the business has for the system. To create a new system we must know, with as much precision as possible, exactly what we need. If the developers have to guess, the chances are good that the guesses will be wrong. As a result, the system may work technically, but it may not resolve the problem or provide the opportunity that triggered the development project in the first place.

6. Chapter 6. Review Question 17 (Page 184)

List and describe the four styles of conversion.

- Pilot—This conversion style introduces the system into a limited portion of the business, for example, a single store or branch office. By limiting the scope of the new system initially to a small part of the business,

problems can be worked out without causing major disruptions to the entire organization. After the installation at the pilot location is complete and successful, the system can be rolled out at all remaining locations with little fear of significant business disruption.

- Phased—This conversion style is used when the system is constructed of several independent modules. The system is introduced gradually, in phases, with only one or a few modules included in each phase. This enables the organization to reduce the degree of change associated with each phase. This type of conversion is only possible with systems that are designed with highly independent modules, such as many ERP packages.
- Parallel—This conversion style involves use of the new system and the old system simultaneously for a time. In this way, any failures of the new system will not be catastrophic since the old system still exists as a fall back. While significantly reducing risk, this conversion style is expensive since it requires that users do their jobs with both the old system and the new system. Time and effort is also required to verify that the new system is performing properly by comparing its results to those of the old system.
- Plunge—This conversion style involves "flipping the switch", shutting off the old system and turning on the new. The organization shifts directly from the old system to the new system. Workers may go home on Friday having used the old system, and are confronted with the new system when they arrive on Monday. This approach carries with it a lot of risk, since the business may be seriously disrupted if any failures occur with the new system.

7. Chapter 6. Applying Your Knowledge 31 (Page 221)

Suppose that you are one of the members of the Baker, Barker, and Bickel alliance and that the other members have asked you to take the lead on planning the project to develop an IS that will allow the three agencies to rent each other's properties. Because the actual value of the alliance is unknown, you and the other members want to limit your front-end exposure. Use the SDLC to create a plan.

a. List specific tasks that you need to perform during the requirements phase.

- Define scope for initial version of this system so that "proof of concept" can be achieved with limited up-front costs and risks.
- Outline specific feature and functions that are desired in the first version of the system and document them.
- Review requirements with the other members of the alliance and approve them.

b. Assume that you will not be developing your own programs, but will be licensing programs from a vendor and adapting them. List specific tasks that you need to perform during design. Consider all five components in your answer.

- Hardware requirements are compared with existing hardware to determine any additional hardware needed.
- Software
  - Software packages that could fulfill the requirements are identified.
  - Information from software vendors is obtained.
  - Packages are evaluated based on how well they fulfill requirements.

- Need for alteration to packages is documented.
- New programs that have to be written are designed.
- Database is provided with the software.
- Procedures are outlined for using the new system.
- Job descriptions are altered to incorporate the use of the new system for renting each other's properties.

c. *List tasks that you will need to perform during implementation. Consider all five components. Describe how you would implement each of the four conversion techniques.*

- Hardware is purchased and installed at all three locations.
- Software programs are acquired and installed.
- Software program modifications are written and tested.
- Data is loaded into the software package.
- Procedures are tested and implemented in procedures manual.
- Entire system undergoes testing. During this testing period, each of the three alliance members will test the process of renting properties of the other alliance members.
- Training is provided.
- System is put into use by each alliance member. Since this is a new system, the parallel conversion style is not relevant. The plunge conversion is probably the best, in this case, because each alliance member will want to get the full benefit of the system and not miss out on any potential business. Since the scope of this version of the system was deliberately limited, there is not too much risk of disruption if faults are found. If the system doesn't work, it can just be turned off until corrections are made. Pilot conversion is a viable option, but using it would mean that not all the alliance members were benefiting from the new system from the outset. Phased does not seem to fit here (system is probably not a set of highly independent modules).

d. *Describe maintenance activities. Include activities you need to perform to better determine the true value of this alliance.*

- Any failures are reported and corrected.
- Performance of the system in terms of new business and revenues is tracked to evaluate its value to the partners.
- Changes to the system and new features that are desired are recorded. Eventually, these changes will form the basis for the requirements of the second version of this system. If the system proves to be valuable and the alliance wants to move forward with the next version, they begin another cycle of the SDLC.
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8. Chapter 7. Review Question 1 (Page 221)

Summarize the three eras of information systems development. Why was the movement from calculation systems to functional systems easier than the movement from functional systems to integrated systems?

The first era, calculation systems, were developed primarily to automate tedious, repetitive calculations. The second era, functional systems, evolved from the calculation systems, but extended and expanded their scope and capabilities to provide more value to the organization. Unfortunately, these systems tended only to serve the business function for which they were designed. Businesses were hampered by the inability to integrate data and processes across business functions. This led to the current era of integrated, cross-functional systems. These systems are designed to support complete business processes spanning departmental boundaries.

The transition from the first to second era was relatively easy because these systems provided increased functionality within a single department or function. Each department or function operated fairly independently from the others. Transitioning from the second to third era is much harder because departments must coordinate with each other, there are no clear lines of authority, and there can be competition and rivalries between departments.

9. Chapter 7. Review Question 4 (Page 221)

Explain how the organization's competitive strategy relates to information systems design.

To be effective, an organization's goals, objectives, culture, and activities should all be consistent with the organization's competitive strategy. This means that the organization's information systems must also be designed in alignment with the organization's competitive strategy.

10. Chapter 7. Review Question 12 (Page 221)

Describe the customer life cycle.

The customer life cycle consists of four phases:

- Marketing: Customers are attracted via marketing messages about the company's products/services.
- Acquisition: Customers place orders for products/services.
- Relationship management: Existing customers are supporting and encouraged to be repeat customers.
- Loss/churn: Lost customers are identified and (potentially) encouraged to return.

11. Chapter 7. Applying Your Knowledge 17 (Page 221)

Apply the value chain model to a retailer such as Target (target.com). *What is its competitive strategy? Describe the tasks Target must accomplish for each of the primary value chain activities. How does Target's competitive strategy and the nature of its business influence the general characteristics of Target's information systems?*

Target's competitive strategy is discrimination/focus. Target strives to have higher quality and more stylish products at reasonable prices in the discount department store segment of the consumer retail industry. Target uses advertising conveying its hip and stylish products at value prices to attract customers. Target must ensure its inbound logistics keep stores stocked with merchandise. Target's operations ensure a pleasing shopping experience with pleasant, well-designed displays. Target's outbound logistics ensure that customers can readily make their purchases. Finally, Target must provide after sale service to its customers, especially regarding returns and defective products. Target's information systems will focus on store inventory management and distribution.