Determining System Requirements

System Requirements Determination
Objectives

1. Provide insight into using interviewing to determine system requirements, including the preparation of an interview plan.
2. Show how questionnaires are designed, distributed, and used to determine system requirements.
3. Discuss the advantages and pitfalls of observing workers to determine system requirements.
4. Demonstrate how the analysis of business documents provides system requirements information.
5. Illustrate how Joint Application Design promotes efficient and quick system requirements determination.

The Process of Determining Requirements

- During requirements determination, you and other analysts gather information on what the system should do from as many sources as possible: from developers, administrators and users of the current system, from observing users, from reports, forms and procedures.

- Several characteristics of a good system analyst:
  
  1. Impertinence    *) You should question everything.
  2. Impartiality    *) Your role is to find the best solution to a business problem or opportunity.
  3. Relax constrains *) Assume anything is possible and eliminate the infeasible.
  4. Attention to details *) Every fact MUST fit with every other fact.
  5. Reframing       *) You MUST challenge your self to look at the organization in different ways.
Traditional Methods for Determining Requirements

- Traditional techniques for collecting requirements include
  1) interviewing and listening,
  2) administering questionnaires,
  3) observing users, and
  4) analyzing procedures and other documents.

1. Interviewing and Listening:

- **Interviewing and listening** involves talking with users individually or as a group to discover their views about the current and target systems; it also involves careful preparing an interview outline and guide before conducting the interview.

- **Interviews** are best done when only a few people are involved, when you need open-ended questions or the questions vary from individual to individual, or when a more personal method is needed.

 Types of Interview Questions:

- **Open-ended questions** are usually used to probe for information for which you cannot anticipate all possible responses or for which you do not know the precise question to ask.

- **Closed-ended questions** provide a range of possible answers from which the interviewee may choose (True/False, Multiple Choice, Ratings a response, Ranking items, etc.)

 Interview Guidelines:

 1) Do not phrase a question in a way that implies a right or wrong answer.
 2) Do not ask questions that imply YES (TRUE) or NO (FALSE) answers.
 3) Listen very carefully to what is being said, and take careful notes.
 4) Once the interview is over, go back to your office and type up your notes within 24-48 hours.
 4) Be careful during the interview not to set expectations about the new or replacement system unless you are sure these features will be part of the delivered system.
Interview Guide is a document for developing, planning and conducting an interview.

Each question in an interview guide can include both verbal and non-verbal information.

**Group Interviews**

- Interview several key people together
  - Advantages
    - More effective use of time
    - Can hear agreements and disagreements at once
    - Opportunity for synergies
  - Disadvantages
    - More difficult to schedule than individual interviews
2. Questionnaires:

- Administering questionnaires involves designing a questionnaire and determining who should respond to it; this method is typically used when there are too many key users to interview individually.

- Questionnaires are best when many people are involved, each person is to answer roughly the same questions, and people are remote or do not need personal care.

**Interviews versus Questionnaires:**

- Interviews provide large amounts of rich, detailed information, but they are expensive to conduct in terms of the time they demand.

- Questionnaires, on the other hand, can reach many people at once, making them relatively less costly than interviews, but the data collected in this way will not be as rich or as plentiful as is the case with interviews.

- Both techniques involve careful planning and execution to be successful.

- Deciding which technique to use will be dependent on such factors as
  - the size and complexity of the information system under study,
  - the size and complexity of the organization in which the system resides,
  - the funding available, and the expertise and preferences of the analysts.

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**Free Web Survey Library**

http://www.questionpro.com/a/showLibrary.do?categoryID=6&mode=1

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**Survey Template Library**

- Evaluation of Information Technology
  - Questionnaire: Evaluation of use of tax information services and which services would be useful available online.
  - Questions: 4

- Web Building Activities
  - Questionnaire: Conceptualization and implementation of web building expenditures and activities.
  - Questions: 18

- Web Content Service Evaluation
  - Questionnaire: Evaluation of a web site's success and feedback survey.
  - Questions: 18

- Website Value Profile
  - Questions: 18

- Coffee Break Evaluation
  - Questionnaire: Evaluation of coffee break content and feedback survey.
  - Questions: 18

- University Website Online Evaluation of University website and evaluation of products and services to be offered.
  - Questions: 18

- Website Evaluation
  - Questionnaire: Website evaluation and feedback survey.
  - Questions: 18

- Web Service Evaluation
  - Questionnaire: Service evaluation and customer feedback for an Internet service provider.
  - Questions: 18

- Website Design Evaluation
  - Questionnaire: Conceptualization and feedback survey.
  - Questions: 18

- Website Value Proposition
  - Questionnaire: Conceptualization and feedback survey.
  - Questions: 18

- Web Site Feedback
  - Questionnaire: Feedback on the website and the services provided.
  - Questions: 18

- Surveying on the Internet
  - Questionnaire: Evaluation of the website and the services provided.
  - Questions: 18

- Online Survey
  - Questionnaire: Evaluation of the website and the services provided.
  - Questions: 18
Modern Methods for Collecting System Requirements

Modern Methods for Collecting System Requirements
• Joint Application Design (JAD)
• Group Support Systems
• CASE Tools
• Prototypes

Joint Application Design
• Joint Application Design or JAD is a structured process in which users, managers, and analysts work together for several days in a series of intensive meetings to specify or review system requirements.

• It’s better than traditional techniques because you have all key personnel in one place at one time, saving everyone time and resulting in high levels of system ownership as more people have more of a role in the development process.

• Weaknesses include the level of commitment necessary to make the JAD work, the high degree of required planning, and the typical lack of computer support.
Joint Application Design (JAD)

- Intensive group-oriented requirements determination technique
- Team members meet in isolation for an extended period of time
- Highly focused
- Resource intensive
- Started by IBM in 1970s

JAD Participants

- **Session Leader:** facilitates group process
- **Managers:** active, speaking participants
- **Users:** active, speaking participants
- **Systems Analysts:** should mostly listen
- **CIS Staff:** should mostly listen
- **Sponsor:** high-level champion, limited participation
- **Scribe:** record session activities
Modern Methods for Determining Requirements

- **Prototyping** can be used during requirements determination to collect user requirements and present them in the form of a *working system prototype*.
  1) Users can look at, play with, and compare the prototype to their system requirements.
  2) Analysts can then adjust the prototype to better fit what the users have in mind.

- **Group support systems** provide unique benefits for group requirements determination through
  1) allowing everyone the *opportunity for equal participation* through typing instead of talking, and
  2) *anonymity* allows the shy and those afraid of criticism to participate.

- **CASE tools** can support requirements determination by supporting JAD and prototyping with diagramming, form and report design, repository access, and prototyping tools. The best-suited CASE tools are *upper CASE tools*.

Prototyping:

- Quickly converts requirements to working version of system.
- Once the user sees requirements converted to system, will ask for modifications or will generate additional requests.
- Most useful when:
  - User requests are not clear
  - Few users are involved in the system
  - Designs are complex and require concrete form
  - History of communication problems between analysts and users
  - Tools are readily available to build prototype

- **Drawbacks**
  - Tendency to avoid formal documentation
  - Difficult to adapt to more general user audience
  - Sharing data with other systems is often not considered
  - Systems Development Life Cycle (SDLC) checks are often bypassed
Prototyping: Examples

• Concept cars
• Computer games
• CIS

Radical Methods: Business Process Reengineering

In some organizations, management is looking for new ways to perform current tasks.

Business Process Reengineering (BPR) is the search for, and implementation of, radical change in business processes to achieve breakthrough improvements in products and services.

• As part of the BPR effort, key business processes should be identified.

• Key business processes are the structured, measured set of activities designed to produce a specific output for a particular customer or market.

• Benefits of BPR include radical improvements in speed, quality, and customer satisfaction.
Business Process Reengineering: An Example

Design by Computer:

One of the most time consuming and expensive business processes is the design stage in product development, which had traditionally relied on paper and drafting tools.

Dassault Systems has met the challenge of reengineering this process and has created **CATIA CAD System**, the top selling CAD/CAM allows engineers to design and develop products on a computer. This eliminates huge amounts of paper work and slashes the time required to design and develop a new product.

**CATIA CAD System** is used by nearly every aircraft manufacturer and was used by Boeing to design the 777.

DaimlerChrysler used **CATIA CAD System** to design the new Jeep Grand Cherokee. By debugging the production line on screen, the company saved months and eliminated $800 million of costs.

Source: [http://www.accountingformanagement.com/process_reengineering.htm](http://www.accountingformanagement.com/process_reengineering.htm)

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Business Process Reengineering: An Example

Process reengineering have been used by many companies to deal with a wide variety of problems.

For example, the EMI Records Group was having difficulty filling orders for its most popular CDs. Retailers and recording stars were rebelling—it took the company as much as 20 days to deliver a big order for a hit CD, and then nearly 20% of the order would be missing. Small, incremental improvements would not have been adequate, so the company reengineered its entire distribution process with dramatic effects on on-time delivery and order fill rates.

Reynolds & Reynolds Co. of Dayton, Ohio, produces business forms. Filling an order of a customer used to take 90 separate steps. By reengineering, the number of steps was slashed to 20 and time required to fill an order was cut from three weeks to one week.

Massachusetts General Hospital is even using process reengineering to standardize and improve surgical procedure.

Source: [http://www.accountingformanagement.com/process_reengineering.htm](http://www.accountingformanagement.com/process_reengineering.htm)
Business Re-Engineering due to active implementation of CIS: Caterpillar Corp., Peoria, IL (1970s-1980s)

Caterpillar Corp.: in 1994 produced the same level of output as did in 1979, but with 40,000 fewer employees.

Radical Methods: Disruptive Technologies

Disruptive technologies enable the breaking of long-held business rules that inhibit organizations from making radical business changes.

- Disruptive technologies enable companies to apply information technology innovatively.
Determining System Requirements:
Homework Assignment: 2 exercises
Required outcome: a single DOC file