(SCSD 2613) - System Analysis and Design

Information Gathering:
Interactive Methods
Part 1

Objectives

- Recognize the value of interactive methods for information gathering.
- Construct interview questions to elicit human information requirements and structure them in a way that is meaningful to users.
- Understand the purpose of stories and why they are useful in systems analysis.
- Understand the concept of JAD and when to use it.
- Write effective questions to survey users about their work.
- Design and administer effective questionnaires.

Interactive Methods to Elicit Human Information Requirements

- Interviewing

- Joint Application Design (JAD)

- Questionnaires

Major Topics

- **Interviewing**
  - Interview preparation
  - Question types
  - Arranging questions
  - The interview report
- User Stories
- **Joint Application Design (JAD)**
  - Involvement
  - Location
- **Questionnaires**
  - Writing questions
  - Using scales
  - Design
  - Administering

Interviewing

- Interviewing is an important method for collecting data on human and system information requirements

- Interviews reveal information about:
    - Interviewee opinions
    - Interviewee feelings
    - Goals
    - Key HCI concerns

Interview Preparation

- Reading background material
- Establishing interview objectives
- Deciding whom to interview
- Preparing the interviewee
- Deciding on question types and structure

2 Main Types of Questions

- Open-ended Question
- Closed Question

Open-Ended Questions

- Open-ended interview questions allow interviewees to respond how they wish, and to what length they wish

- Open-ended interview questions are appropriate when the analyst is interested in breadth and depth of reply

- E.g.,
  - What is your opinion of current e-Learning system, how to improve it?
  - Once a user is registered on your website, what are the next steps/processes?

Advantages of Open-Ended Questions

- Puts the interviewee at ease
- Allows the interviewer to pick up on the interviewee's vocabulary
- Provides richness of detail
- Reveals avenues of further questioning that may have gone untapped

Advantages of Open-Ended Questions (continued)

- Provides more interest for the interviewee

- Allows more freedom

- Makes phrasing easier for the interviewer

- Useful if the interviewer is unprepared

Disadvantages of Open-Ended Questions

- May result in too much irrelevant detail
- Possibly losing control of the interview
- May take too much time for the amount of useful information gained
- Potentially seeming that the interviewer is unprepared
- Possibly giving the impression that the interviewer is on a "fishing journey"

Closed Interview Questions

- Closed interview questions limit the number of possible responses

- Closed interview questions are appropriate for generating precise, reliable data that is easy to analyze

- The methodology is efficient, and it requires little skill for interviewers to administer

- E.g.,
  – How many users are registered in your system?
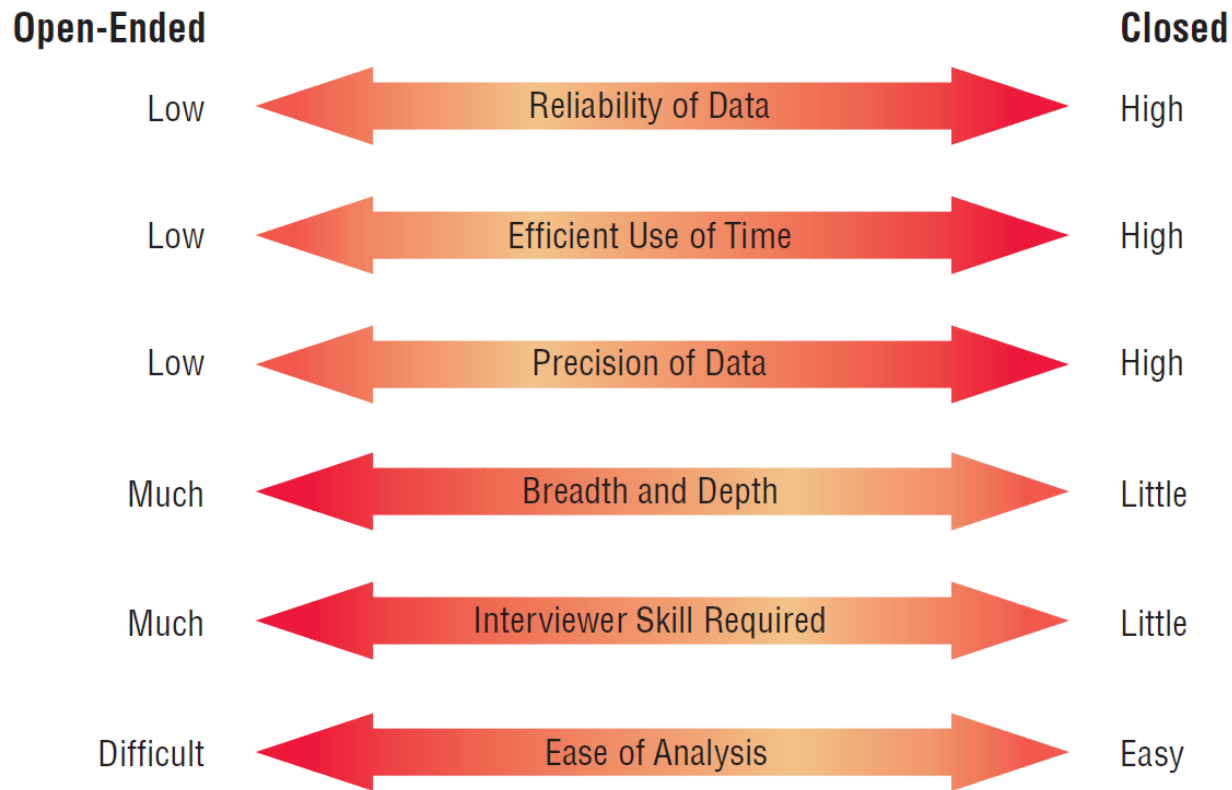 – Who receives the online customer's complaint?

Benefits of Closed Interview Questions

- Saving interview time
- Easily comparing interviews
- Getting to the point
- Keeping control of the interview
- Covering a large area quickly
- Getting to relevant data

Disadvantages of Closed Interview Questions

- Boring for the interviewee
- Failure to obtain rich detailing
- Missing main ideas
- Failing to build rapport between interviewer and interviewee

Attributes of Open-Ended and Closed Questions (Figure 4.5)

Open-Ended		Closed
Low	←— Reliability of Data —→	High
Low	←— Efficient Use of Time —→	High
Low	←— Precision of Data —→	High
Much	←— Breadth and Depth —→	Little
Much	←— Interviewer Skill Required —→	Little
Difficult	←— Ease of Analysis —→	Easy

Bipolar Questions

- A special kind of closed question

- Bipolar questions are those that may be answered with a "yes" or "no" or "agree" or "disagree"

- Bipolar questions should be used carefully

Probe Questions

- Probing questions elicit more detail about previous questions

- The purpose of probing questions is:
  - To get more meaning
  - To clarify
  - To draw out and expand on the interviewee's point

- May be either open-ended or closed

- E.g., "Why?" or "Please explain more for me"

Arranging Questions

- Pyramid
  - Starting with closed questions and working toward open-ended questions

- Funnel
  - Starting with open-ended questions and working toward closed questions

- Diamond
  - Starting with closed, moving toward open-ended, and ending with closed questions

Pyramid Structure

- Begins with very detailed, often closed questions

- Expands by allowing open-ended questions and more generalized responses

- Is useful if interviewees need to be warmed up to the topic or seem reluctant to address the topic
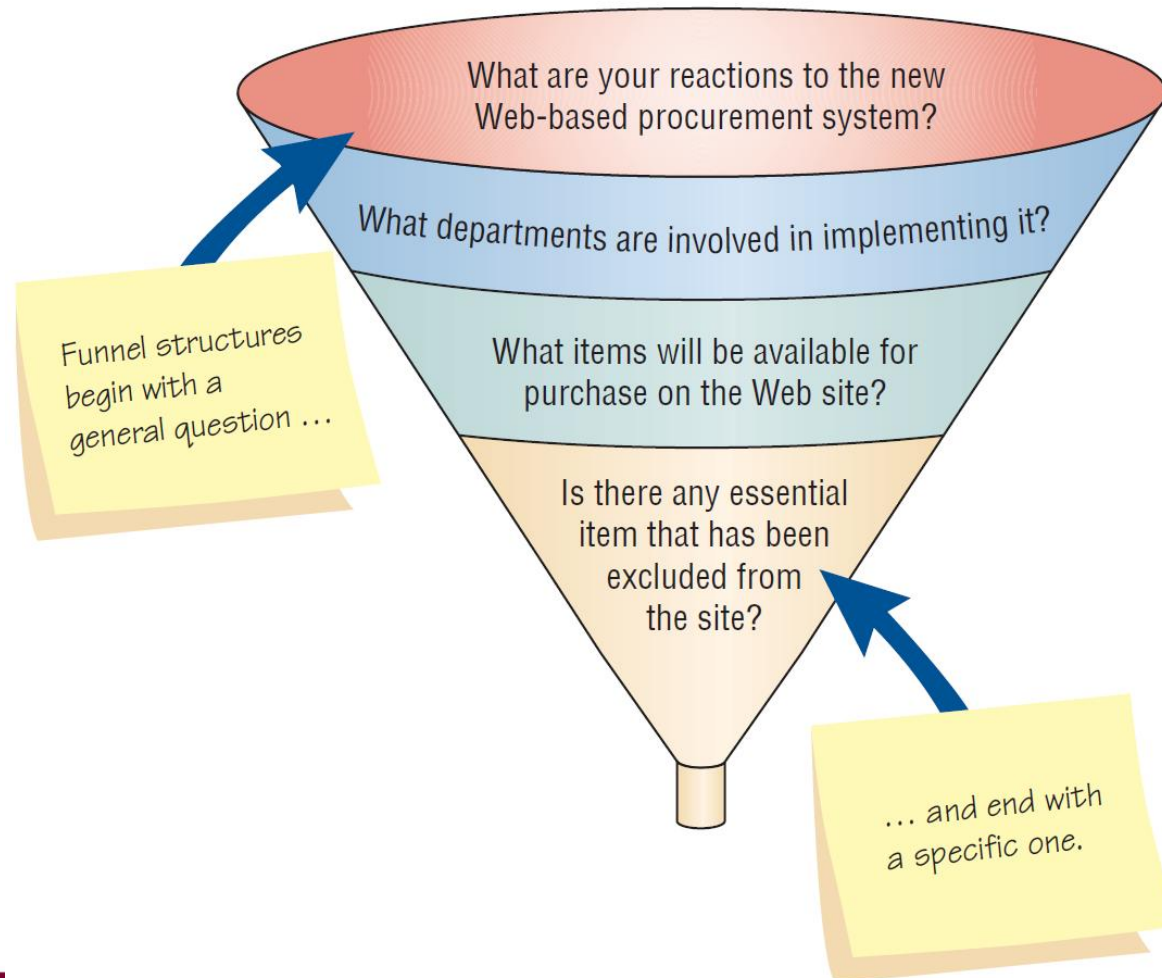
Pyramid Structure for Interviewing Goes from Specific to General Questions
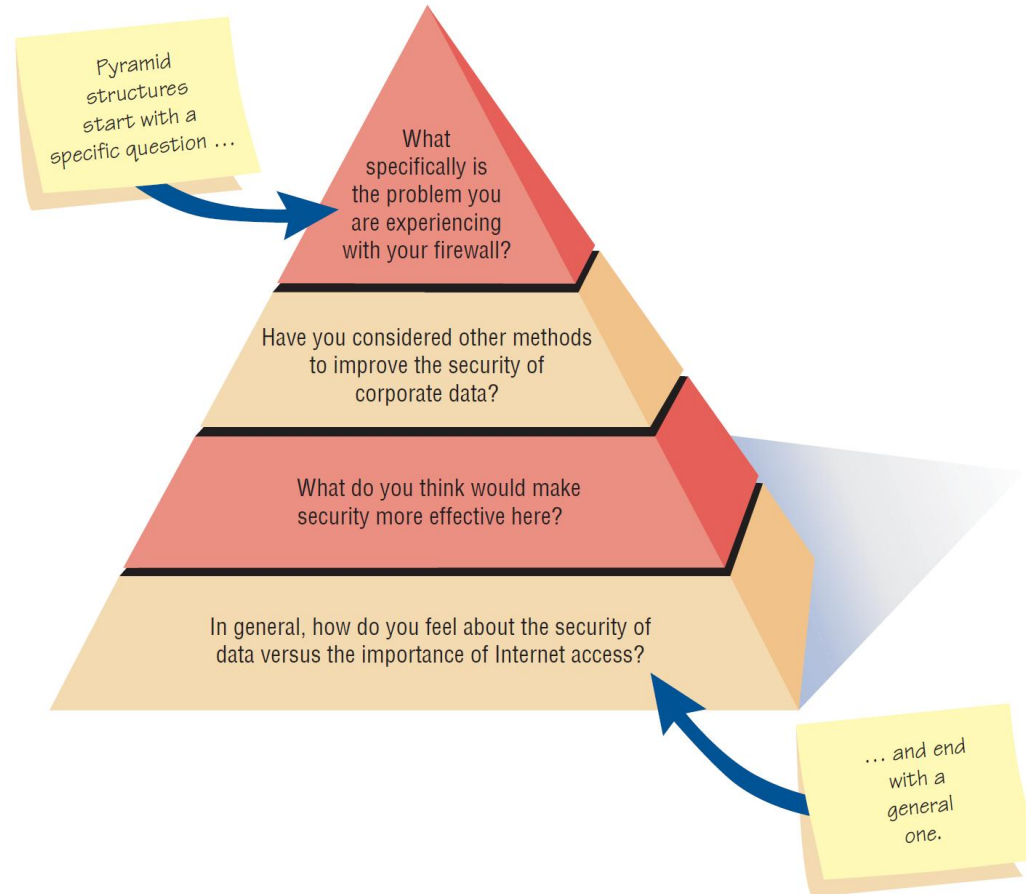
Funnel Structure

- Begins with generalized, open-ended questions

- Concludes by narrowing the possible responses using closed questions

- Provides an easy, nonthreatening way to begin an interview

- Is useful when the interviewee feels emotionally about the topic

Diamond Structure

- A diamond-shaped structure begins in a very specific way

- Then more general issues are examined

- Concludes with specific questions

- Combines the strength of both the pyramid and funnel structures

- Takes longer than the other structures

Diamond-Shaped Structure for Interviewing Combines the Pyramid and Funnel Structures
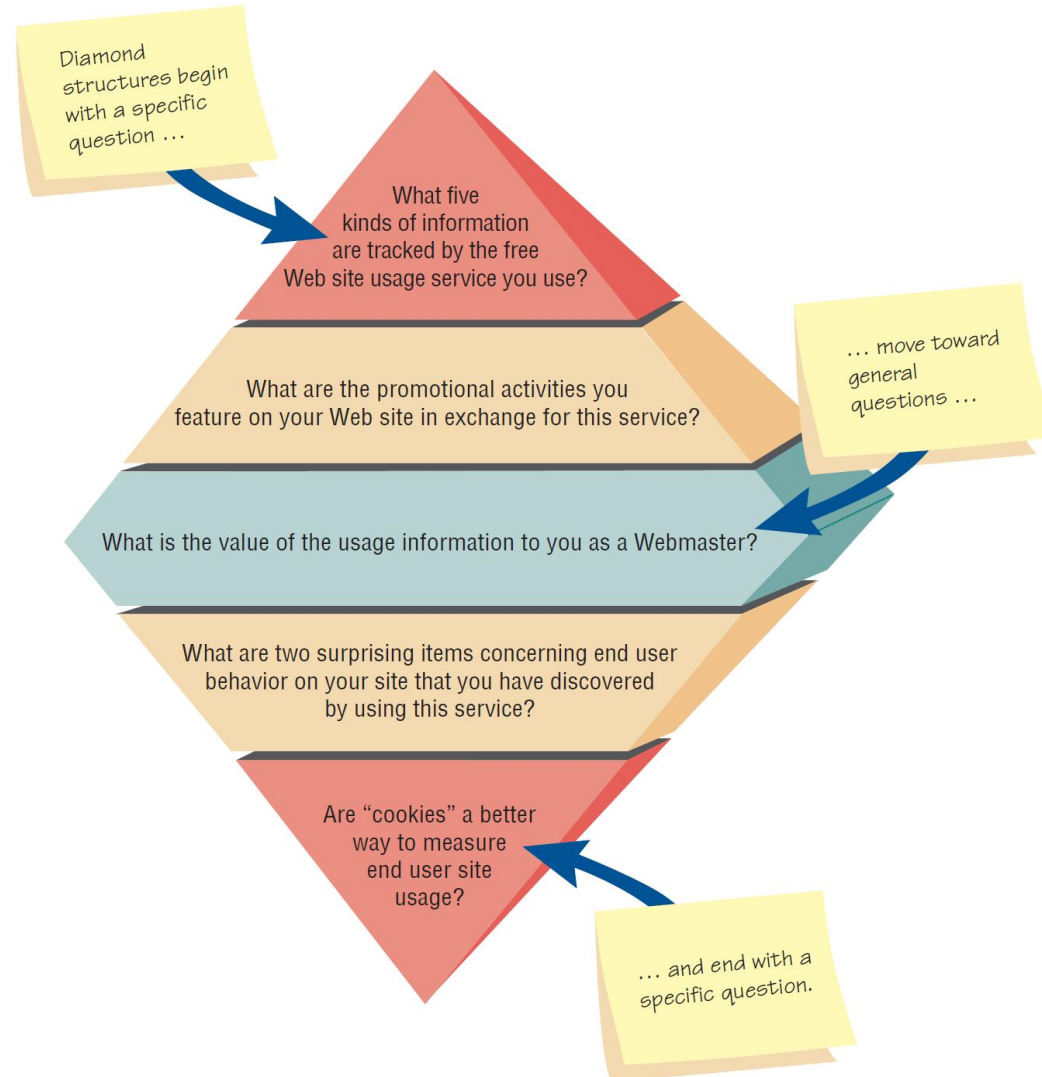
Closing the Interview

- Always ask "Is there anything else that you would like to add?"

- Summarize and provide feedback on your impressions

- Ask whom you should talk with next

- Set up any future appointments

- Thank them for their time and shake hands.

Interview Report

- Write as soon as possible after the interview

- Provide an initial summary, then more detail

- Review the report with the respondent

Stories

- Stories originate in the workplace
- Organizational stories are used to relay some kind of information
- When a story is told and retold over time it takes on a mythic quality
- Isolated stories are good when you are looking for facts
- Enduring stories capture all aspects of the organization and are the ones a systems analyst should look for

Purposes for Telling a Story

- There are four purposes for telling a story:
  1. Experiential stories describe what the business or industry is like
  2. Explanatory stories tell why the organization acted a certain way
  3. Validating stories are used to convince people that the organization made the correct decision
  4. Prescriptive stories tell the listener how to act

- Systems analysts can use storytelling as a complement to other information gathering methods

Joint Application Design (JAD)

- Joint Application Design (JAD) can replace a series of interviews with the user community

- JAD is a technique that allows the analyst to accomplish requirements analysis and design the user interface with the users in a group setting

Conditions That Support the Use of JAD

- Users are restless and want something new

- The organizational culture supports joint problem-solving behaviors

- Analysts forecast an increase in the number of ideas using JAD

- Personnel may be absent from their jobs for the length of time required

Who Is Involved in JAD?

- From 8 to 12 participants
  - **Executive sponsor** : The ultimate authority to make decisions about the project
  - **IS analyst:** Develop logical models and specifications, and build the prototype
  - **Users**: Main focus of JAD, Represent multiple levels of the organization
  - **Session leader:** Organizes and schedule JAD activities, Guide the JAD sessions, Mediate disputes.
  - **Observers:** Watch and listen the session
  - **Scribe**: Ensure that the results of JAD sessions are documented and delivered as planned

Where to Hold JAD Meetings

- Offsite, away from your organization for 2 to 4 days
  - Comfortable surroundings
  - Minimize distractions
- Attendance
  - Schedule when participants can attend
  - Agenda
  - Orientation meeting

Benefits of JAD

- Time is saved, compared with traditional interviewing

- Rapid development of systems

- Improved user ownership of the system

- Creative idea production is improved

Drawbacks of Using JAD

- JAD requires a large block of time to be available for all session participants

- If preparation or the follow-up report is incomplete, the session may not be successful

- The organizational skills and culture may not be conducive to a JAD session

Questionnaires

Questionnaires are useful in gathering information (using open-ended and/or closed) from key organization members about:

- – Attitudes of people

- – Beliefs of people

- – Behaviors

- – Characteristics

Planning for the Use of Questionnaires

- Choose words carefully,
  - department or unit, managers or supervisors

- Organization members are widely dispersed

- Many members are involved with the project

- Exploratory work is needed

- Problem solving prior to interviews is necessary

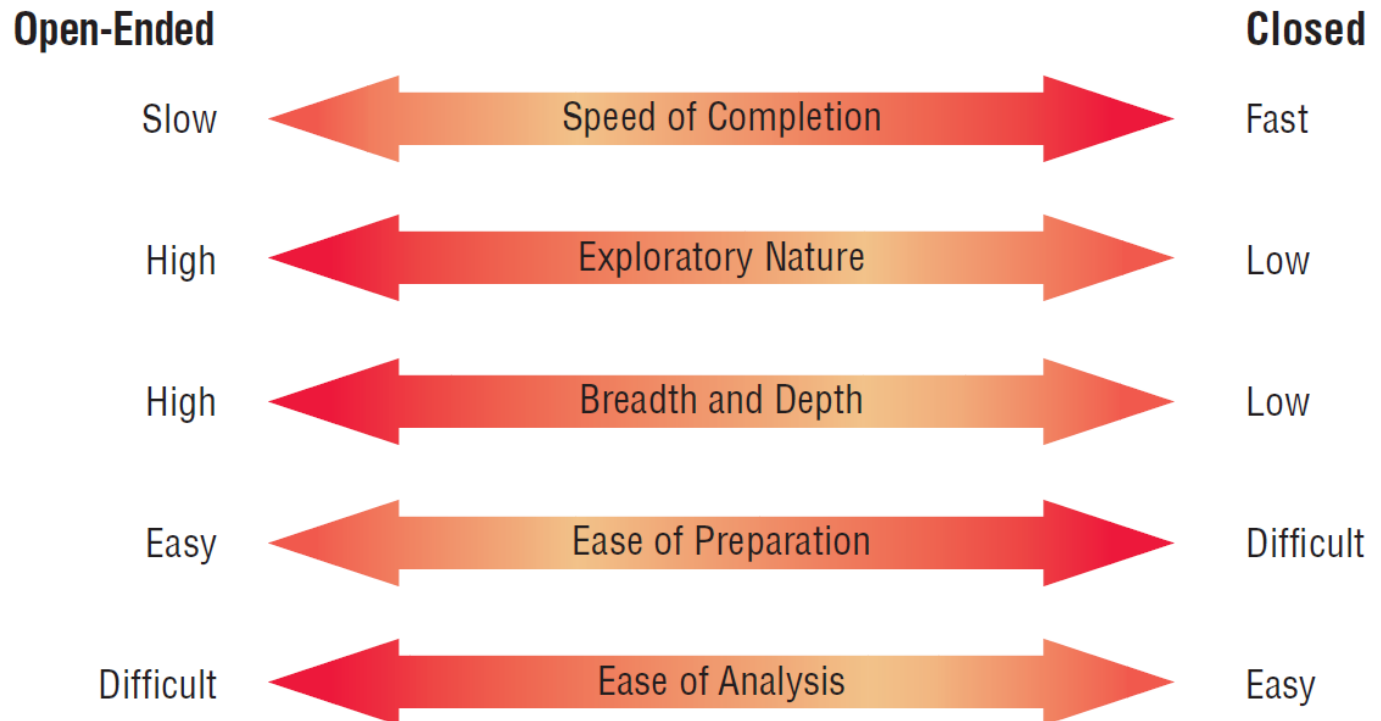Questions are designed as either:

– Open-ended
- Try to anticipate the response you will get
- Well suited for getting opinions

– Closed
- Use when all the options may be listed
- When the options are mutually exclusive

Trade-offs between the Use of Open-Ended and Closed Questions on Questionnaires

Open-Ended		Closed
Slow	Speed of Completion	Fast
High	Exploratory Nature	Low
High	Breadth and Depth	Low
Easy	Ease of Preparation	Difficult
Difficult	Ease of Analysis	Easy

Questionnaire Language

- Simple
- Specific
- Short
- Not patronizing
- Free of bias
- Addressed to those who are knowledgeable
- Technically accurate
- Appropriate for the reading level of the respondent
- Choose words carefully

Measurement Scales

- The two different forms of measurement scales are:
  - Nominal
  - Interval

Nominal Scales

- Nominal scales are used to classify things

- It is the weakest form of measurement

- Data may be calculated

What type of software do you use the most?
1 = Word Processor
2 = Spreadsheet
3 = Database
4 = An Email Program

Interval Scales

- An interval scale is used when the intervals are equal

- There is no absolute zero

- Examples of interval scales include the Fahrenheit or Centigrade scale

How useful is the support given by the Technical Support Group?

NOT USEFUL				EXTREMELY
AT ALL				USEFUL
1	2	3	4	5

Validity and Reliability

- Reliability of scales refers to consistency in response—getting the same results if the same questionnaire was administered again under the same conditions

- Validity is the degree to which the question measures what the analyst intends to measure

Problems with Scales

- The rater (respondent) may do certain common errors in the answers. Major types of rater errors are
  - **Leniency**
  - **Central tendency**
  - **Halo effect**

Leniency

- Caused by easy raters

- Leniency error is the tendency of a manager to rate an employee higher than his actual performance.

- Reasons that a manager might do this could include avoiding confrontations, or feeling that by giving the employee a high rating, he will work harder to live up to the rating.

- Central tendency occurs when respondents rate everything as average
  - Improve by making the differences smaller at the two ends
  - Adjust the strength of the descriptors
  - Create a scale with more points

How useful is the support given by the Technical Support Group?

NOT USEFUL AT ALL				EXTREMELY USEFUL
1	2	3	4	5

Halo Effect

- When the impression formed in one question carries into the next question.

- The halo effect is when a manger forms a positive impression of an employee's skill in one area and then gives her high ratings across all rating criteria

- Solution is to place one trait on each page of questionnaire

Designing the Questionnaire

- Allow ample white space

- Allow ample space to write or type in responses

- Make it easy for respondents to clearly mark their answers

- Be consistent in style

Order of Questions

- Place most important questions first

- Cluster items of similar content together

- Introduce less controversial questions first

Administering Questionnaires

- Administering questionnaires has two main questions:
  - Who in the organization should receive the questionnaire?

  - How should the questionnaire be administered?

Methods of Administering the Questionnaire

- Convening all concerned respondents together at one time
- Personally administering the questionnaire
- Allowing respondents to self-administer the questionnaire
- Mailing questionnaires
- Administering over the Web or via email

Ways to Capture Responses When Designing a Web Survey

Name	Appearance	Purpose
One-line text box		Used to obtain a small amount of text and limit the answer to a few words
Scrolling text box		Used to obtain one or more paragraphs of text
Check box		Used to obtain a yes-no answer (e.g., Do you wish to be included on the mailing list?)
Radio button		Used to obtain a yes-no or true-false answer
Drop-down menu		Used to obtain more consistent results (Respondent is able to choose the appropriate answer from a predetermined list [e.g., a list of state abbreviations])
Push button	Button	Most often used for an action (e.g., a respondent pushes a button marked "Submit" or "Clear")

- Reduced costs
- Collecting and storing the results electronically

Summary

- **Interviewing**
  - Interview preparation
  - Question types
  - Arranging questions
  - The interview report
- **Stories**
- **Joint Application Design (JAD)**
  - Involvement and location
- **Questionnaires**
  - Writing questions
  - Using scales and overcoming problems
  - Design and order
  - Administering and submitting