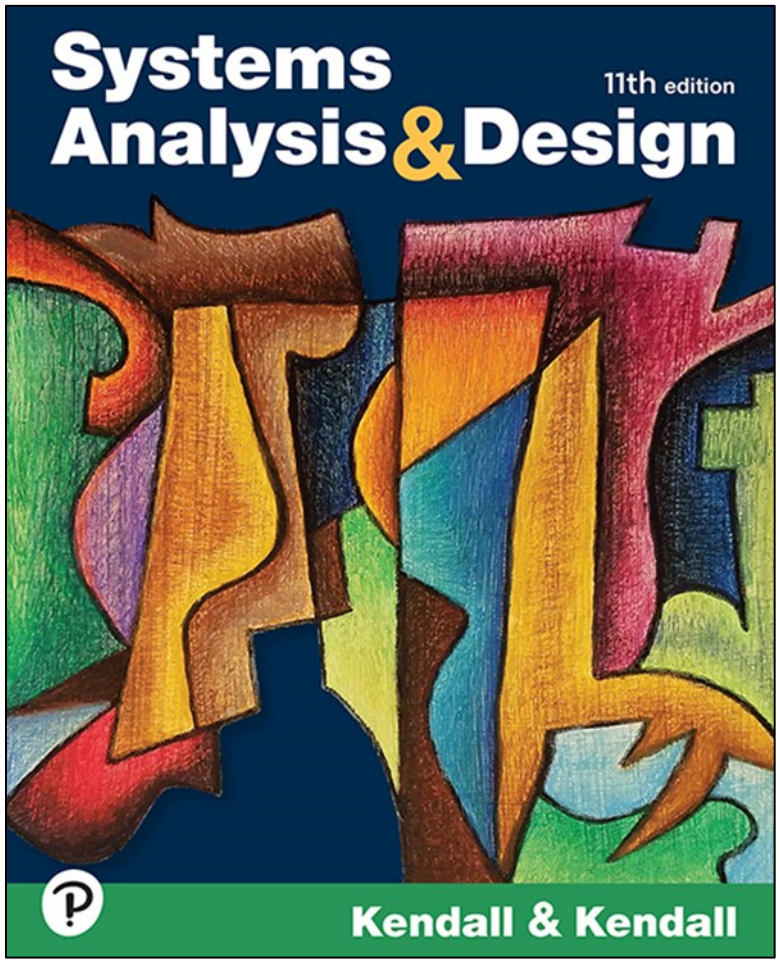
Systems Analysis & Design

Eleventh Edition



Chapter # 4

Information Gathering:
Interactive Methods

Learning Objectives

4.1 Learn the art of interviewing by constructing meaningful questions and conducting the interview.

4.2 Understand the purpose of listening to user stories and why they are useful in systems analysis.

4.3 Grasp the concept of joint application design (JAD) and when to use it,

4.4 Design and administer effective questionnaires.

4.5 Learn different ways to prioritize requirements.

Interactive Methods to Elicit Human Information Requirements

- Interviewing
- Joint Application Design (JAD)
- Questionnaires
- Requirements Prioritization

Major Topics (1 of 2)

- Interviewing
  - Interview preparation
  - Question types
  - Arranging questions
  - The interview report
- User Stories

Major Topics (2 of 2)

- 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

Five Steps in Interview Preparation

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

Question Types

- Open-ended
- Closed
- Probes

Open-Ended Questions

- Open-ended interview questions allow interviewees to respond how they wish without length or structure limitations
- Open-ended interview questions are appropriate when the analyst is interested in breadth and depth of reply

Figure 4.2 Open-Ended Interview Questions

- What's your opinion of the current state of business-to-business ecommerce in your firm?
- What are the critical objectives of your department?
- Once the data are submitted via the website, how are they processed?
- Describe the monitoring process that is available online.
- What are some of the common data entry errors made in this department?
- What are the biggest frustrations you've experienced during the transition to ecommerce?

Advantages of Open-Ended Questions (1 of 2)

- 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 (2 of 2)

- Provides more interest for the interviewee
- Allows more spontaneity
- 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 expedition”

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

Figure 4.3 Closed Interview Questions

- How many times a week is the project repository updated?
- On average, how many calls does the call center receive monthly?
- Which of the following sources of information is most valuable to you?
  - Completed customer complaint forms
  - Email complaints from consumers who visit the website
  - Face-to-face interaction with customers
  - Returned merchandise
- List your top two priorities for improving the technology infrastructure.
- Who receives this input?

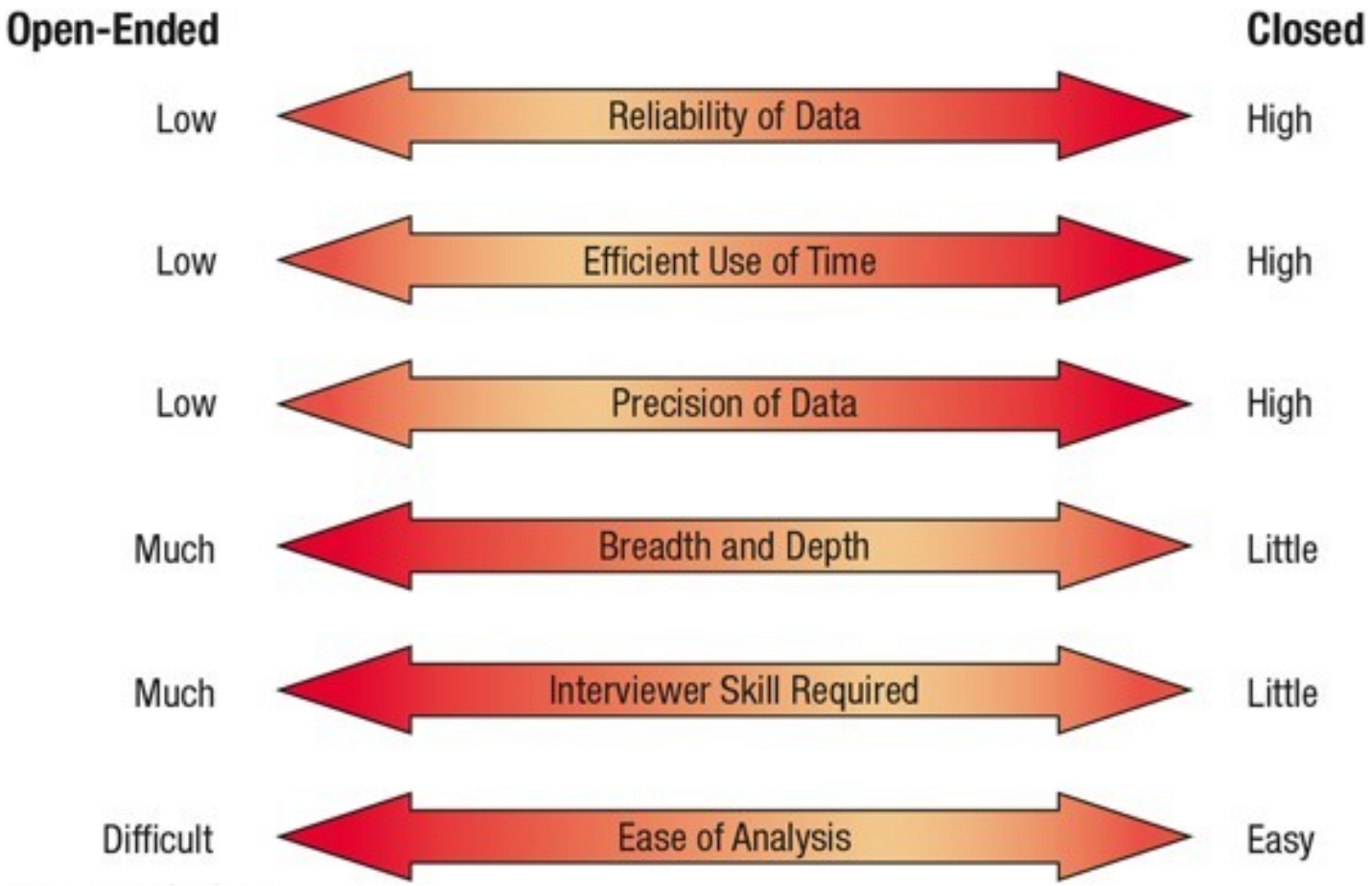
Benefits of Closed Interview Questions

- Save interview time
- Easily compare interviews
- Quickly get to the point
- Maintain control of the interview
- Cover a large area quickly
- Obtain relevant data

Disadvantages of Closed Interview Questions

- May be boring for the interviewee
- May fail to obtain rich details
- May miss some main ideas
- May fail to build rapport between interviewer and interviewee

Figure 4.5 Attributes of Open-Ended and Closed Questions



Dichotomous Questions

- Dichotomous questions are those that may be answered with a “yes” or “no” or “agree” or “disagree”
- Dichotomous questions should be used sparingly
- A special kind of closed question

Probes

- 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

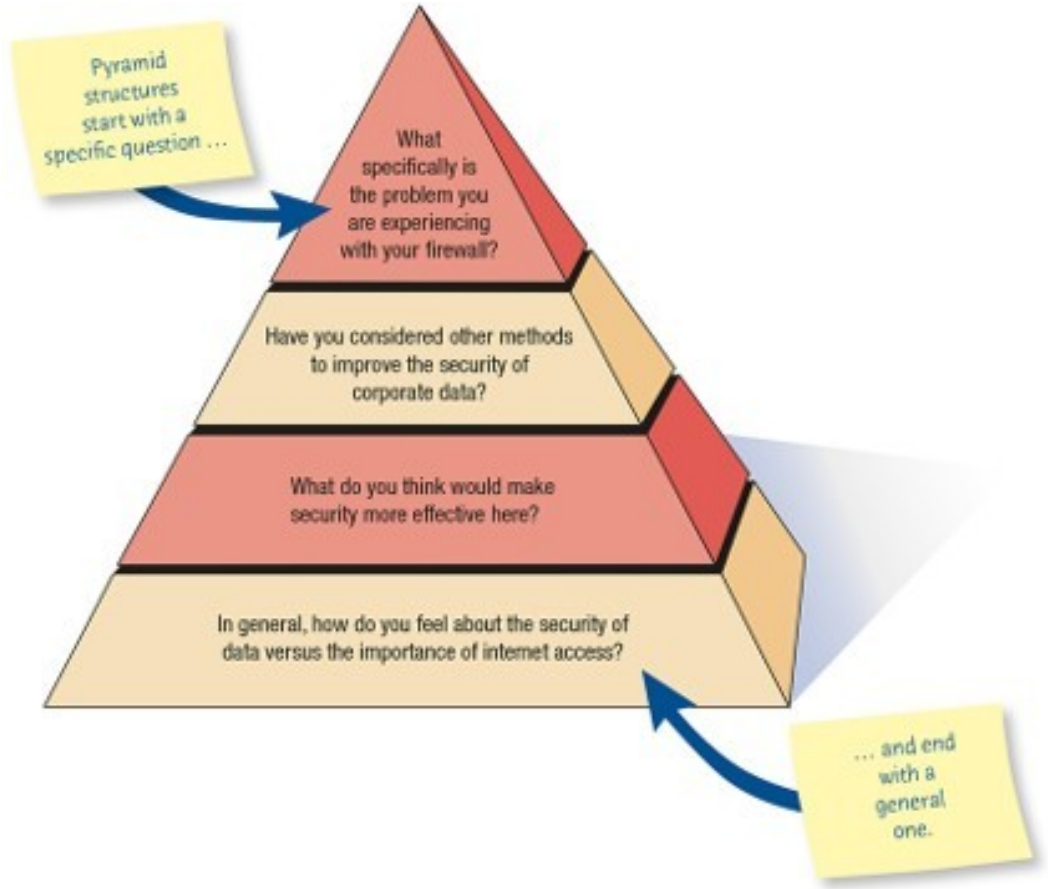
Arranging Questions

- Pyramid
  - Starts with closed questions and works toward open-ended questions
- Funnel
  - Starts with open-ended questions and works toward closed questions
- Diamond
  - Starts with closed, moving toward open-ended, and ends 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

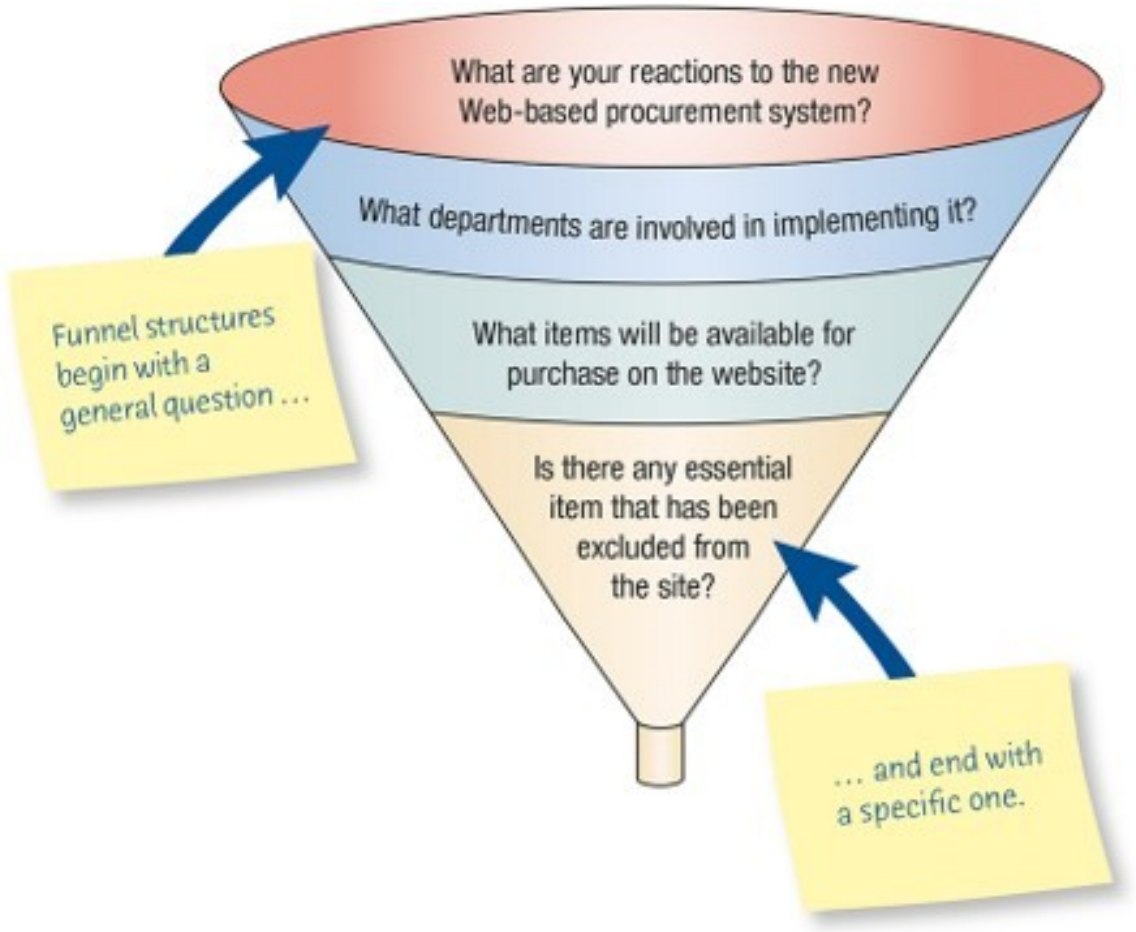
Figure 4.7 Pyramid Structure for Interviewing Goes from Specific to General Questions



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

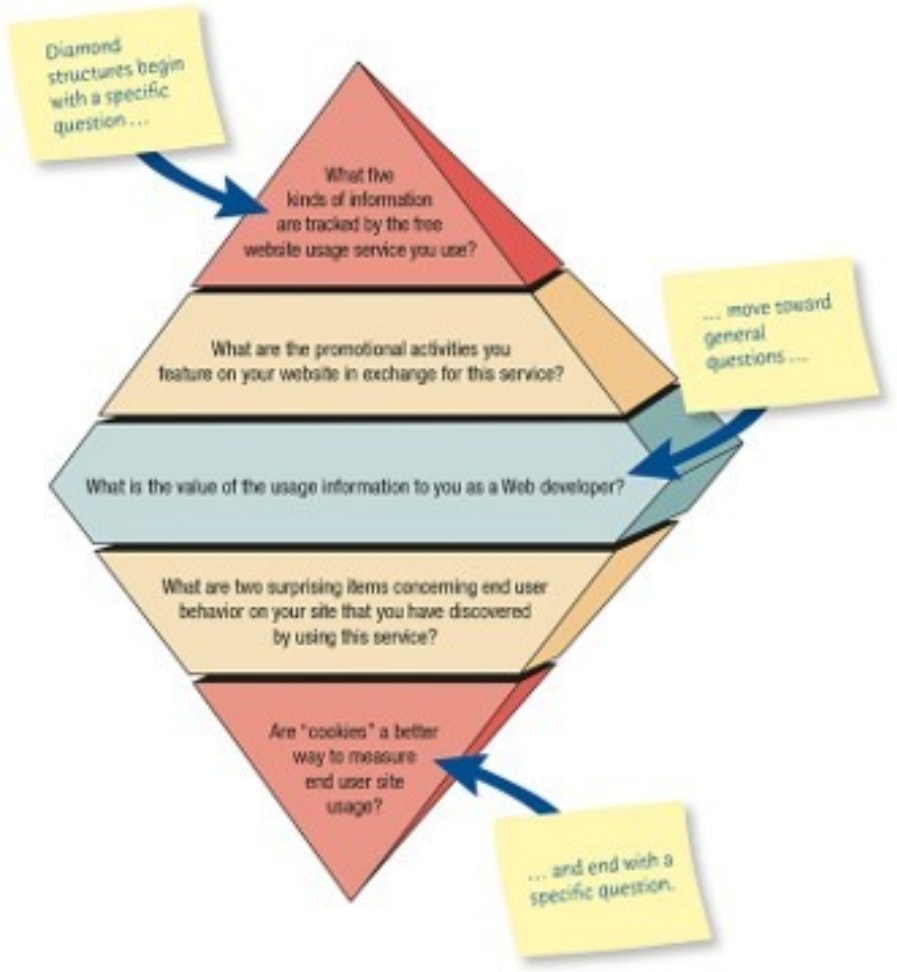
Figure 4.8 Funnel Structure for Interviewing Begins with Broad Questions Then Funnels to Specific Questions



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

Figure 4.9 Diamond-Shaped Structure for Interviewing Combines the Pyramid and Funnel Structures



Closing the Interview

- Always ask “Is there anything we haven’t touched on that you feel is important for me to know?”
- 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 be seeking

Listening to Stories

- Listening to stories is not efficient
- It takes considerably more time than asking interview questions
- Listening to stories may be more rewarding
- Stories are more easily remembered than interview responses

Stories are Made up of Elements

- All stories have these elements:
  - The call to adventure
  - The quest
  - The struggle
  - The transformation
  - The resolution
  - The moral
  - The epilogue

Reasons for Telling Stories

- Rich information from listening carefully to the stories is in itself valuable
- The information gleaned from the stories will make more sense and be more valuable if seen in context

Business Stories

- Business stories can be broken down into four important main types:
  - Experiential stories
  - Explanatory stories
  - Validating stories
  - Prescriptive stories

Stories and the Organization

- Engage organization participants by reacting to stories
- Match one story to another by recounting it to other participants, and collaborating with the stories
- It is a way to deeply understand some of the problems associated with information systems

Purposes for Telling a Story

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

- The people involved are:
  - Executive sponsor
  - IS analyst
  - Users
  - Session leader
  - Observers
  - Scribe

Where to Hold JAD Meetings

- Offsite
  - 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 from key organization members about:
  - Attitudes
  - Beliefs
  - Behaviors
  - Characteristics

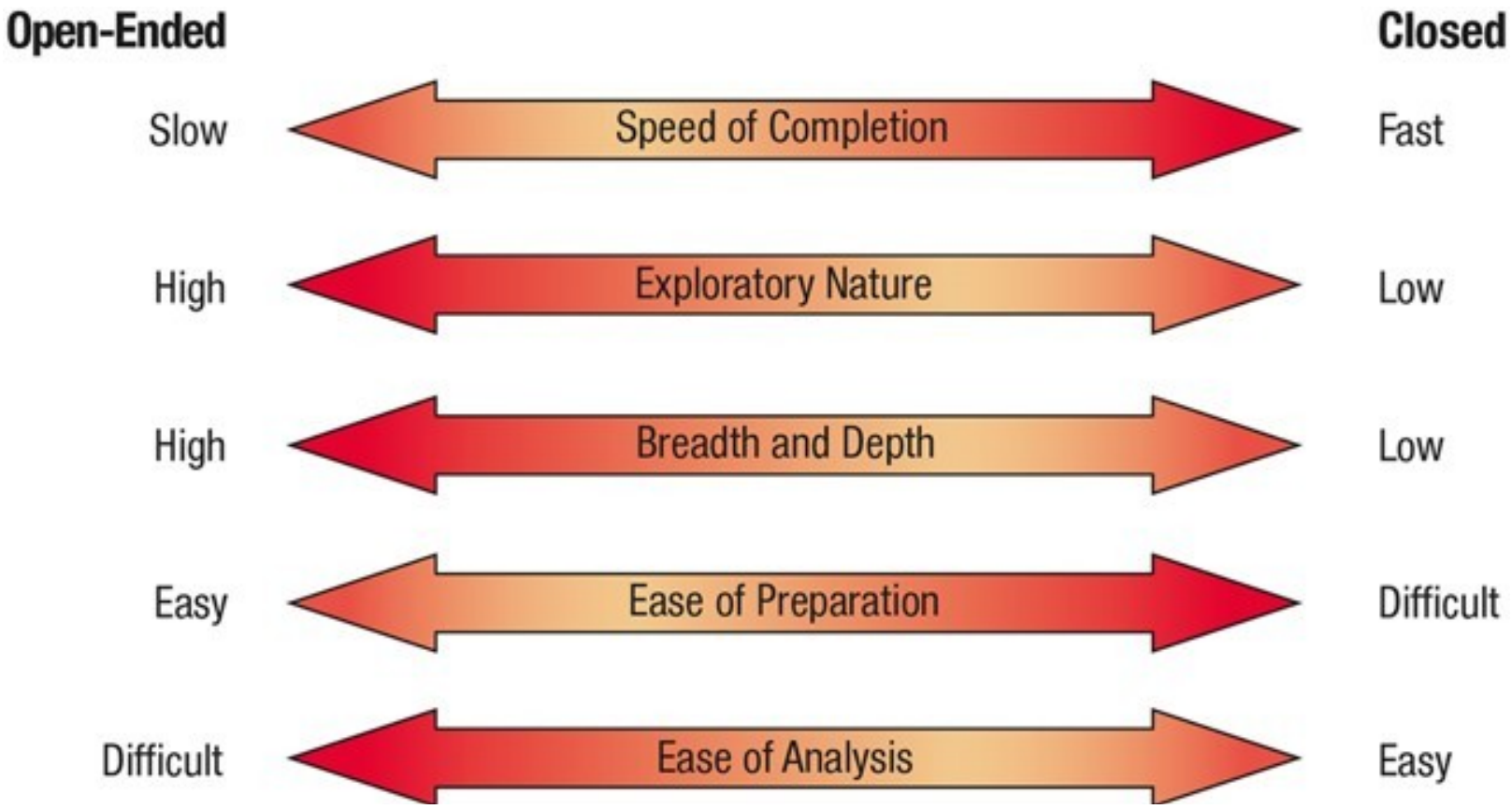
Planning for the Use of Questionnaires

- Organization members are widely dispersed
- Many members are involved with the project
- Exploratory work is needed
- Problem solving prior to interviews is necessary

Writing Questions

- 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

Figure 4.13 Trade-Offs between the Use of Open-Ended and Closed Questions on Questionnaires



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

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 totaled

What type of software do you use the most?

1 = Word Processor

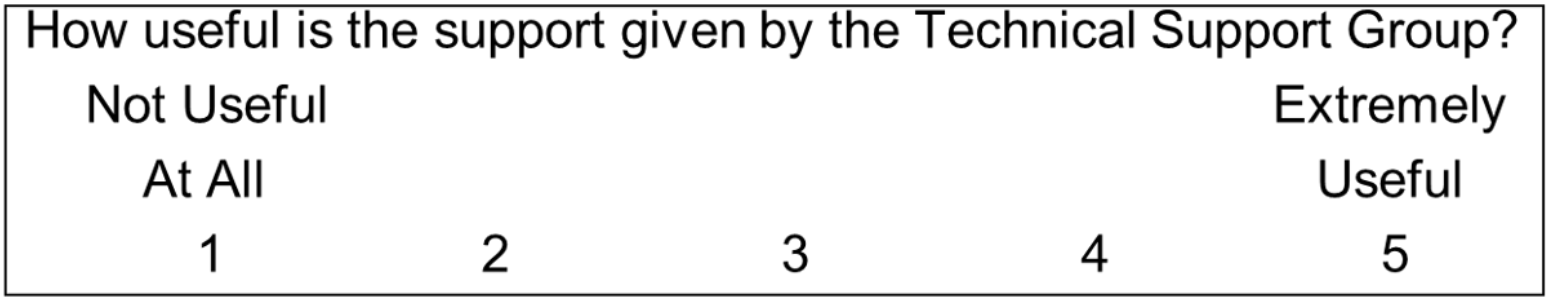
2 = Spreadsheet

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



Validity and Reliability

- Validity is the degree to which the question measures what the analyst intends to measure
- Reliability of scales refers to consistency in response—getting the same results if the same questionnaire was administered again under the same conditions

Problems with Scales

- Leniency
- Central tendency
- Halo effect

Leniency

- Caused by easy raters
  - Solution is to move the “average” category to the left or right of center

Central Tendency

- 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

Halo Effect

- When the impression formed in one question carries into the next question
- Solution is to place one trait and several items on each page

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

Figure 4.14 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		Most often used for an action (e.g., a respondent pushes a button marked “Submit” or “Clear”)

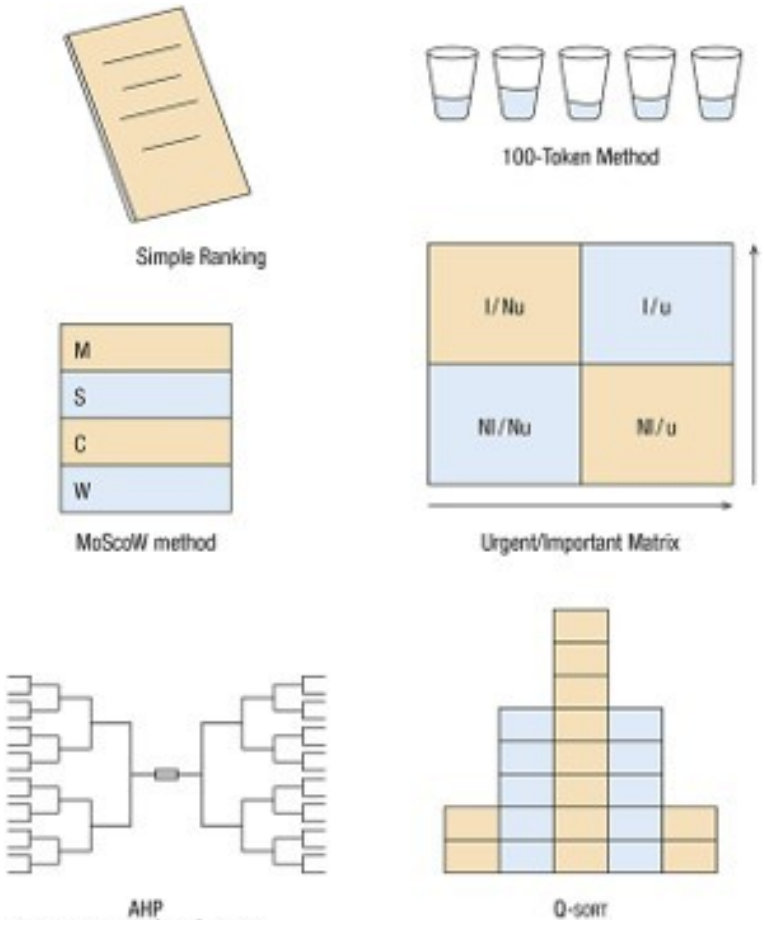
Electronically Submitting Questionnaires

- Reduced costs
- Collecting and storing the results electronically

Requirements Prioritization

- Six methods used for requirement prioritization include:
  - Simple Ranking
  - 100-token Method
  - MoSCoW Method
  - Urgent/Important Matrix
  - Analytic Hierarchy Processing (AHP)
  - Q-Sorts

Figure 4.15 Six Methods Used for Requirements Prioritization



Simple Ranking

- Interested parties are asked to rank-order a list of requirements
- Works best with a short list of 10 or less

100-Token Method

- Each participant within a group is given 100 tokens which they can distribute as votes across the available items.
- The votes do not need to be distributed equally; rather a weighted distribution can be used to reflect the higher priority that some items warrant.

MoSCow Method

- Participants are asked to put the requirement into one of the four categories
  - Must
  - Should
  - Could
  - Won’t

Urgent/Important Matrix

- Prioritizing requirements bases on the level of urgency and importance of each task
- Matrix is drawn in which the x-axis shows urgency and the vertical y-axis represents importance

Analytic Hierarchy Processing (AHP)

- More complex and time-consuming method
- Pairs of alternatives are presented to participants and each participant decides which of the two are more important.

Q-Sorts

- Participants are assigned the task of sorting a number of requirements by placing a specific number of requirements in a predetermined distribution pattern (e.g., a normal distribution) along a spectrum of ranking categories from most important to least important.

Summary (1 of 2)

- Interviewing
  - Interview preparation
  - Question types
  - Arranging questions
  - The interview report
- Joint Application Design (JAD)
  - Involvement and location

Summary (2 of 2)

- Questionnaires
  - Writing questions
  - Using scales and overcoming problems
  - Design and order
  - Administering and submitting
- Stories
  - Story elements
- Requirement prioritization
  - Six methods to help users prioritize

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