Information Gathering: Unobtrusive Methods

5

Systems Analysis and Design, 7e

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Learning Objectives

- Recognize the value of unobtrusive methods for information gathering
- Understand the concept of sampling for human information requirements analysis
- Construct useful samples of people, documents, and events for determining human information requirements
- Create an analyst's playscript to observe decision-maker activities
- Apply the STROBE technique to observe and interpret the decision-maker's environment and their interaction with technologies

Unobtrusive Methods

- Less disruptive
- Insufficient when used alone
- Multiple methods approach
- Used in conjunction with interactive methods

Major Topics

- Sampling
- Quantitative document analysis
- Qualitative document analysis
- Observation
- STROBE
- Applying STROBE

Sampling

- A process of systematically selecting representative elements of a population
- Involves two key decisions:
  - What to examine
  - Which people to consider

Need for Sampling

The reasons systems analysts do sampling are:

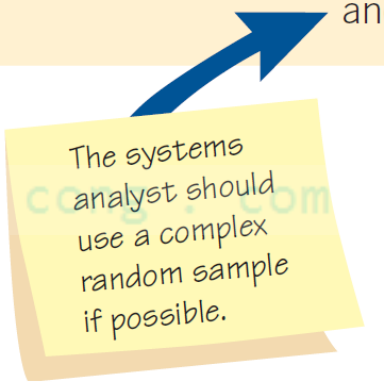
- Containing costs
- Speeding up the data gathering
- Improving effectiveness
- Reducing bias

Sampling Design

- To design a good sample, a systems analyst must follow four steps:
  - Determining the data to be collected or described
  - Determining the population to be sampled
  - Choosing the type of sample
  - Deciding on the sample size

Figure 5.1 Four main types of samples the analyst has available

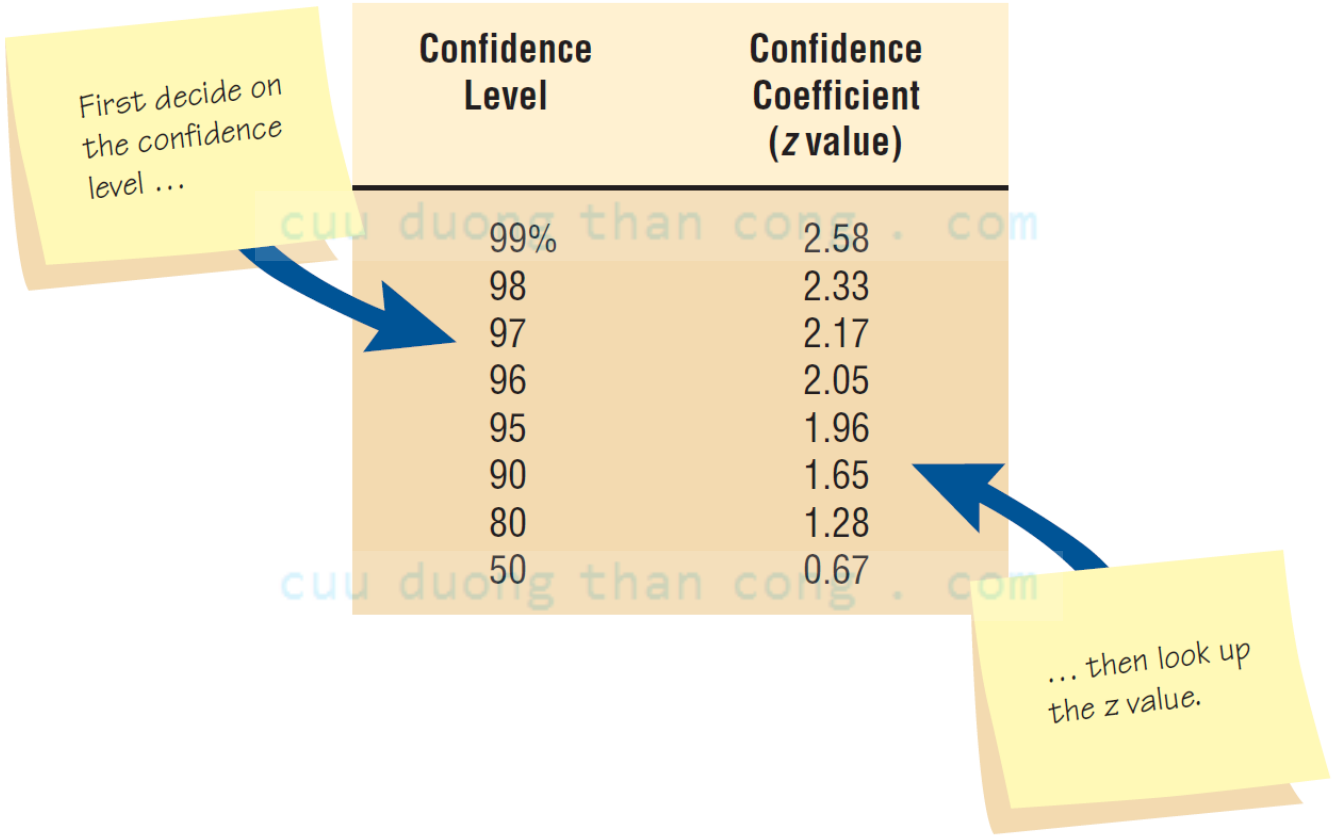
	Not Based on Probability	Based on Probability
Sample elements are selected directly without restrictions	Convenience	Simple random
Sample elements are selected according to specific criteria	Purposive	Complex random (systematic, stratified, and cluster)



The Sample Size Decision

- Determine the attribute
- Locate the database or reports in which the attribute can be found
- Examine the attribute
- Make the subjective decision regarding the acceptable interval estimate
- Choose the confidence level
- Calculate the standard error
- Determine the sample size

Figure 5.2 A table of area under a normal curve can be used to look up a value once the systems analyst decides on the confidence level



Confidence Level	Confidence Coefficient (*z* value)
99%	2.58
98	2.33
97	2.17
96	2.05
95	1.96
90	1.65
80	1.28
50	0.67

Calculate the Standard Error of the Proportion

$$\sigma_p = i/z$$

i = interval estimate

z = confidence coefficient found in the confidence level lookup table

Determine the Sample Size

$$n = \frac{p(1-p)}{\sigma_p^2} + 1$$

σ_p = standard error

ρ = the proportion of the population having the attribute

Example: A. Sembly Company

- Determine that you are looking for orders with mistakes
- Locate order forms from the past six months
- Examine order forms and conclude that p=5%
- Subjective decision of acceptable interval i = 0.02
- Look up confidence coefficient z-value = 1.96
- Calculate σ_p = i / z = 0.02/1.96 = 0.0102
- Determine n; n = 458

Investigation

- The act of discovery and analysis of data
- Hard data
  - Quantitative
  - Qualitative

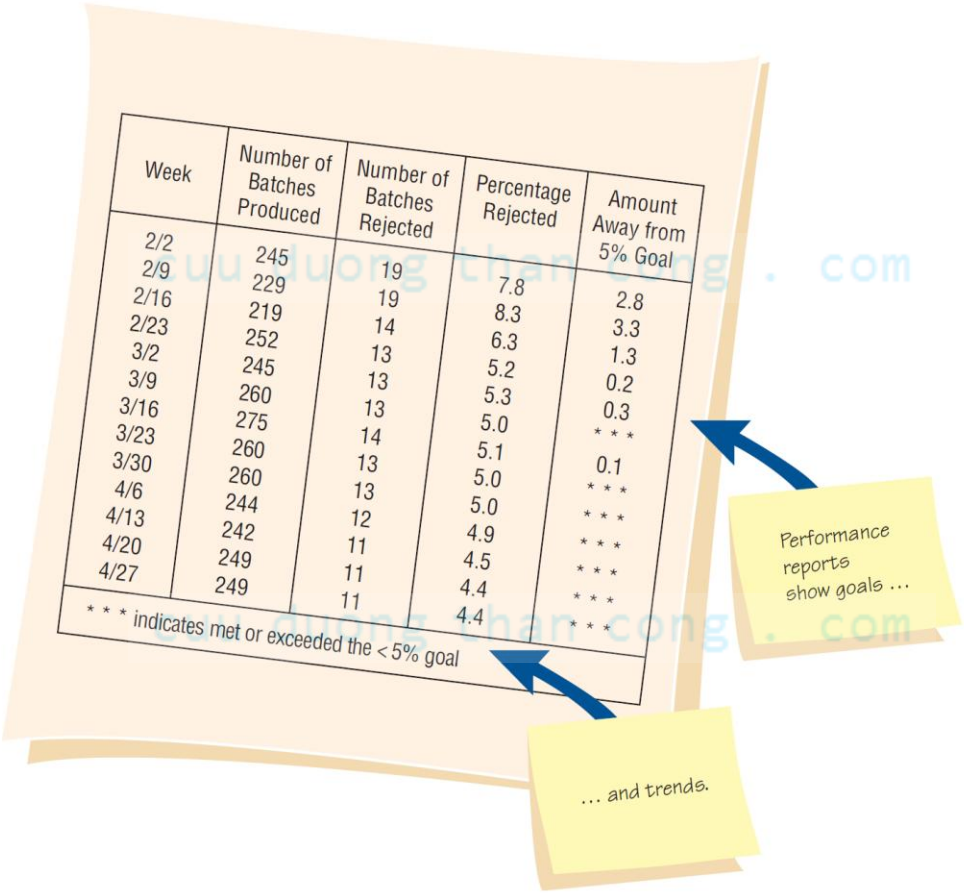
Analyzing Quantitative Documents

- Reports used for decision making
- Performance reports
- Records
- Data capture forms
- Ecommerce and other transactions

Reports Used for Decision Making

- Sales reports
- Production reports
- Summary reports

Figure 5.3 A performance report showing improvement



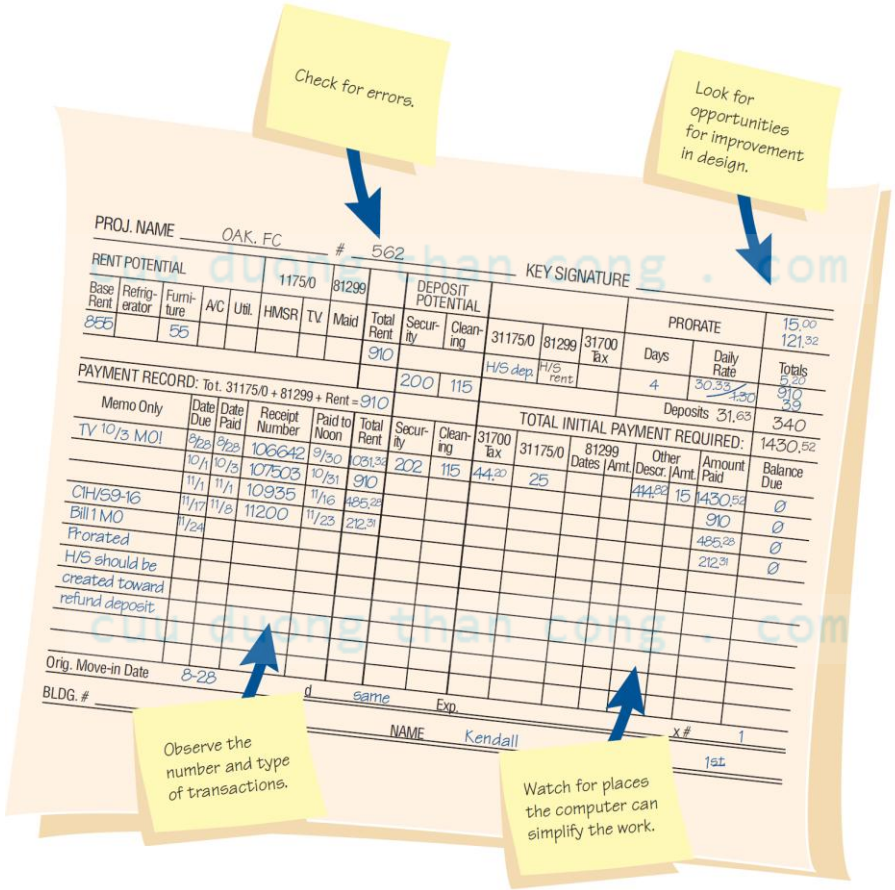
Week	Number of Batches Produced	Number of Batches Rejected	Percentage Rejected	Amount Away from 5% Goal
2/2	245	19	7.8	2.8
2/9	229	19	8.3	3.3
2/16	219	14	6.3	1.3
2/23	252	13	5.2	0.2
3/2	245	13	5.3	0.3
3/9	260	13	5.0	* * *
3/16	275	14	5.1	0.1
3/23	260	13	5.0	* * *
3/30	260	13	5.0	* * *
4/6	244	12	4.9	* * *
4/13	242	11	4.5	* * *
4/20	249	11	4.4	* * *
4/27	249	11	4.4	* * *

* * * indicates met or exceeded the < 5% goal

Performance reports show goals ...

... and trends.

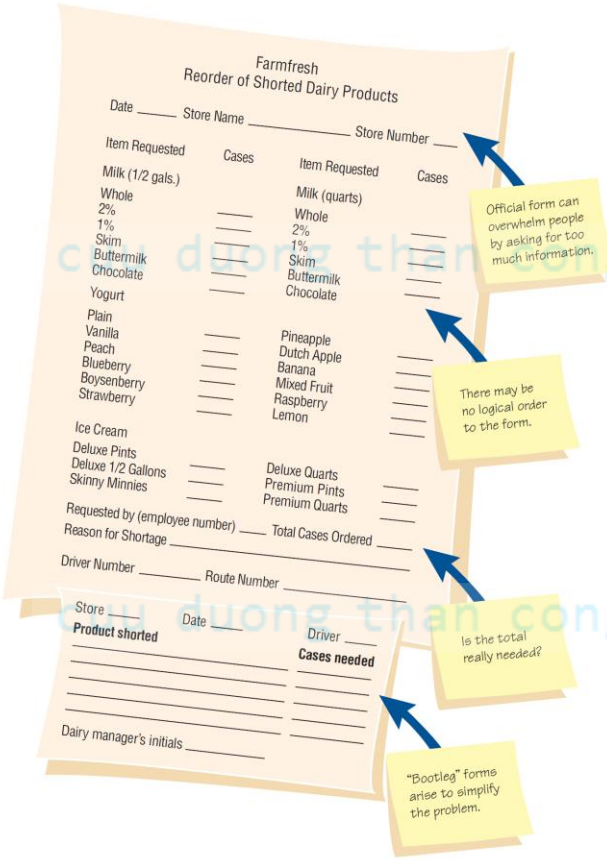
Figure 5.4 A manually completed payment record



Data Capture Forms

- Collect examples of all the forms in use
- Note the type of form
- Document the intended distribution pattern
- Compare the intended distribution pattern with who actually receives the form

Figure 5.5 Questions to ask about official and bootleg forms that are already filled out



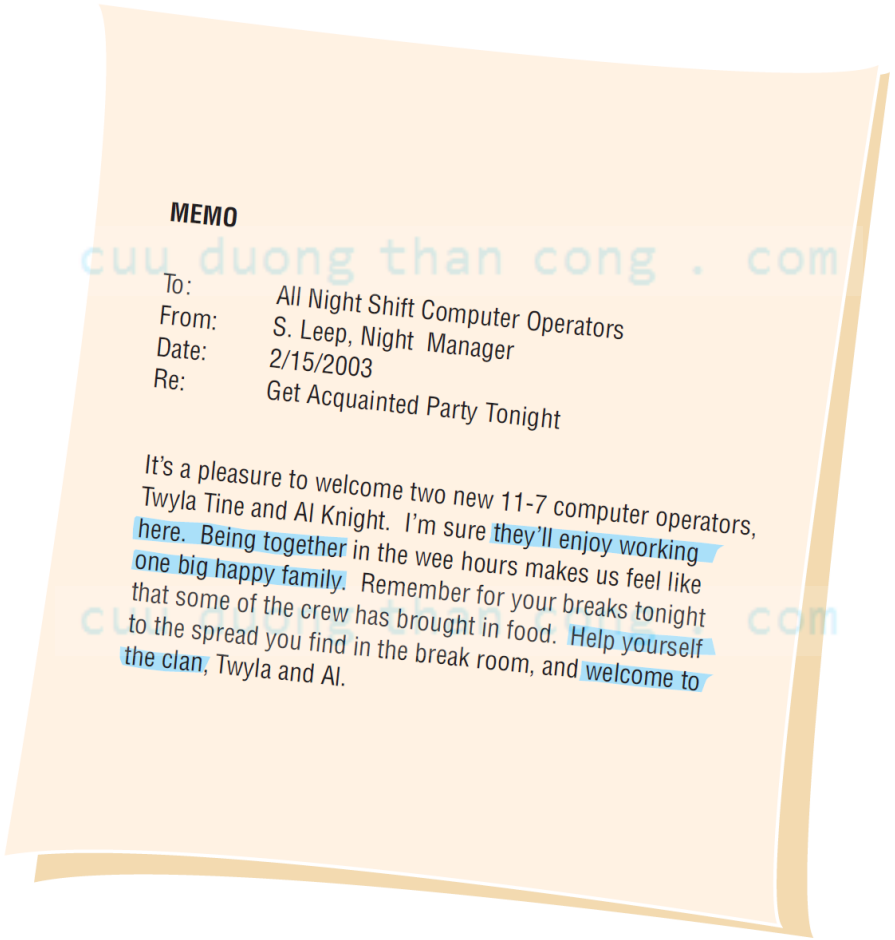
Analyzing Qualitative Documents

- Key or guiding metaphors
- Insiders vs. outsiders mentality
- What is considered good vs. evil
- Graphics, logos, and icons in common areas or Web pages
- A sense of humor

Analyzing Qualitative Documents

- Email messages and memos
- Signs or posters on bulletin boards
- Corporate Web sites
- Manuals
- Policy handbooks

Figure 5.6 Analysis of memos provides insight into the metaphors that guide the organization's thinking



MEMO

To: All Night Shift Computer Operators
From: S. Leep, Night Manager
Date: 2/15/2003
Re: Get Acquainted Party Tonight

It's a pleasure to welcome two new 11-7 computer operators, Twyla Tine and Al Knight. I'm sure they'll enjoy working here. Being together in the wee hours makes us feel like one big happy family. Remember for your breaks tonight that some of the crew has brought in food. Help yourself to the spread you find in the break room, and welcome to the clan, Twyla and Al.

Figure 5.7 Posted signs reveal the official organizational culture

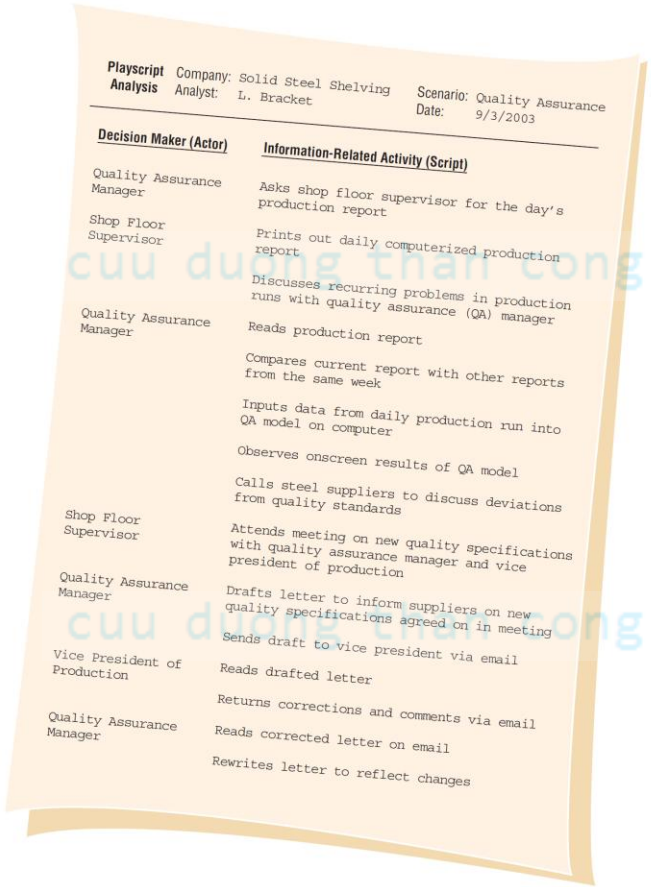
Observation

- Observation provides insight on what organizational members actually do
- See firsthand the relationships that exist between decision makers and other organizational members
- Can also reveal important clues regarding HCI concerns

Analyst's Playscript

- Involves observing the decision-makers behavior and recording their actions using a series of action verbs
- Examples:
  - Talking
  - Sampling
  - Corresponding
  - Deciding

Figure 5.8 A sample page from the analyst's playscript describing decision making



Playscript Analysis Company: Solid Steel Shelving Analyst: L. Bracket Scenario: Quality Assurance Date: 9/3/2003

Decision Maker (Actor)	Information-Related Activity (Script)
Quality Assurance Manager	Asks shop floor supervisor for the day's production report
Shop Floor Supervisor	Prints out daily computerized production report
	Discusses recurring problems in production runs with quality assurance (QA) manager
Quality Assurance Manager	Reads production report
	Compares current report with other reports from the same week
	Inputs data from daily production run into QA model on computer
	Observes onscreen results of QA model
	Calls steel suppliers to discuss deviations from quality standards
Shop Floor Supervisor	Attends meeting on new quality specifications with quality assurance manager and vice president of production
Quality Assurance Manager	Drafts letter to inform suppliers on new quality specifications agreed on in meeting
	Sends draft to vice president via email
Vice President of Production	Reads drafted letter
	Returns corrections and comments via email
Quality Assurance Manager	Reads corrected letter on email
	Rewrites letter to reflect changes

STROBE

STRuctured **OB**servation of the **E**nvironment—a technique for observing the decision-maker's physical environment

STROBE Elements

- Office location
- Desk placement
- Stationary equipment
- Props
- External information sources
- Office lighting and color
- Clothing worn by decision makers

Office Location

- Accessible offices
  - Main corridors, open door
  - Major traffic flow area
  - Increase interaction frequency and informal messages
- Inaccessible offices
  - May view the organization differently
  - Drift apart from others in objectives

Desk Placement

- Visitors in a tight space, back to wall, large expanse behind desk
  - Indicates maximum power position
- Desk facing the wall, chair at side
  - Encourages participation
  - Equal exchanges

Stationary Office Equipment

File cabinets and bookshelves:

- If not present, person stores few items of information personally
- If an abundance, person stores and values information

Props

- Calculators
- Personal computers
- Pens, pencils, and rulers
- If present, person processes data personally

External Information Sources

- Trade journals or newspapers indicate the person values outside information
- Company reports, memos, policy handbooks indicate the person values internal information

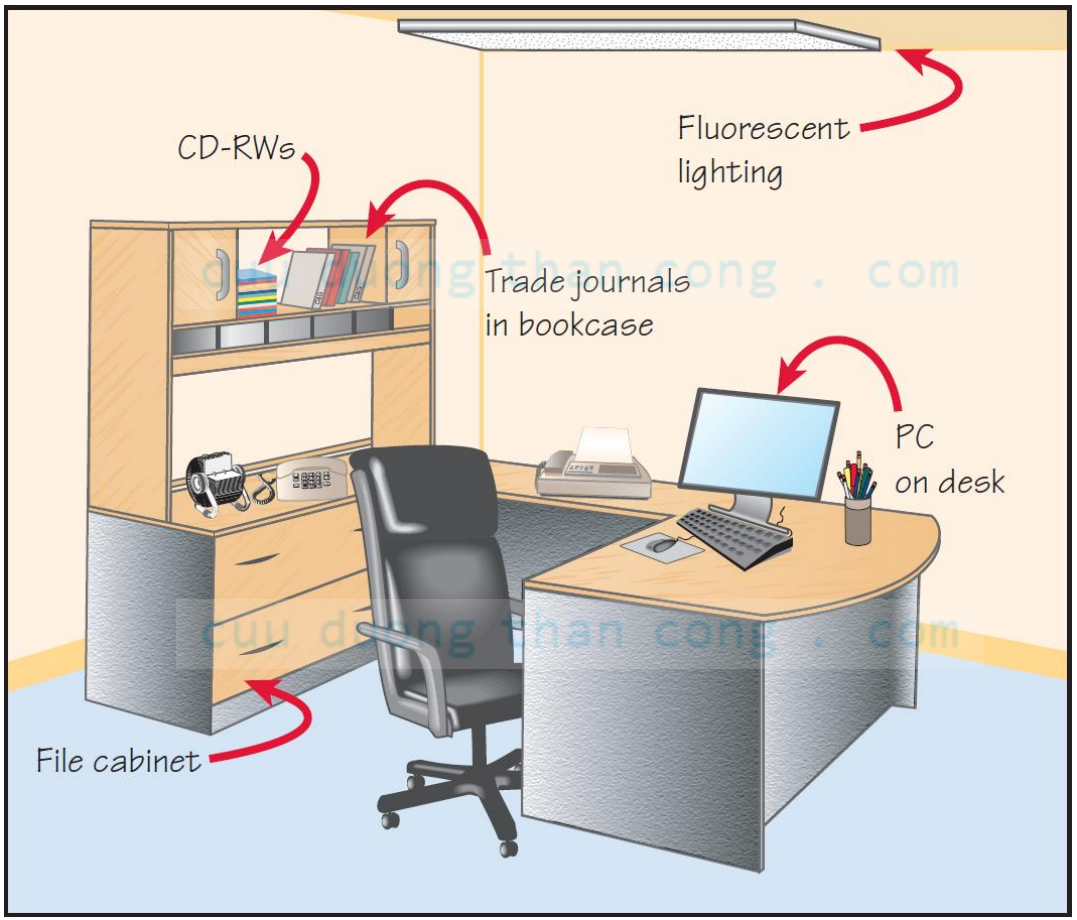
Office Lighting and Color

- Warm, incandescent lighting indicates:
  - A tendency toward more personal communication
  - More informal communication
- Brightly lit, bright colors indicate:
  - More formal communications (memos, reports)

Clothing

- Male
  - Formal two-piece suit - maximum authority
  - Casual dressing (sport jacket/slacks) - more participative decision making
- Female
  - Skirted suit - maximum authority

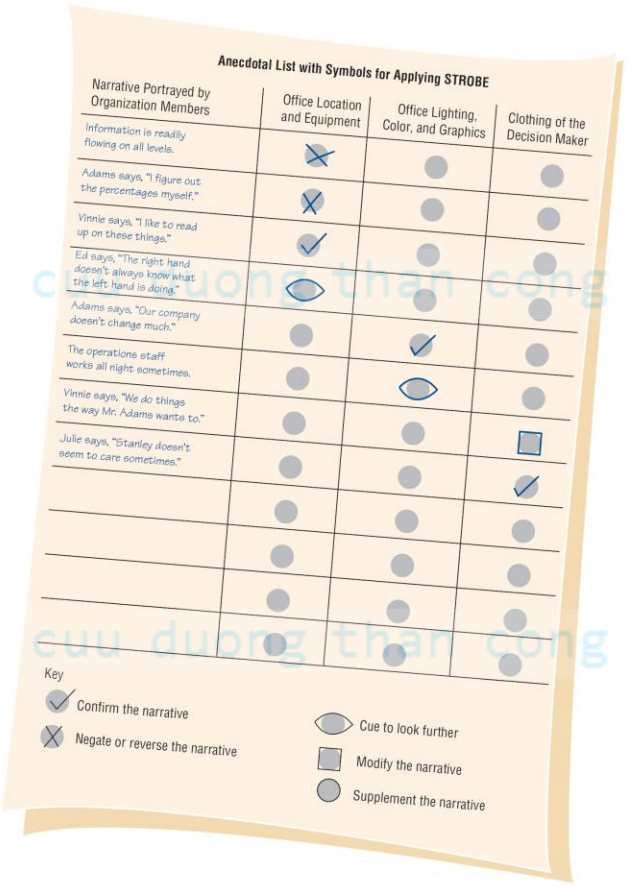
Figure 5.10 Observe a decision maker's office for clues concerning his or her personal storage, processing, and sharing of information



Applying STROBE

- The five symbols used to evaluate how observation of the elements of STROBE compared with interview results are:
  - A checkmark, the narrative is confirmed
  - An "X" means the narrative is reversed
  - An oval or eye-shaped symbol serves as a cue to look further
  - A square means observation modifies the narrative
  - A circle means narrative is supplemented by observation

Figure 5.12 An anecdotal list with symbols for use in applying STROBE



Anecdotal List with Symbols for Applying STROBE

Narrative Portrayed by Organization Members	Office Location and Equipment	Office Lighting, Color, and Graphics	Clothing of the Decision Maker
Information is readily flowing on all levels.	✗	●	●
Adams says, "I figure out the percentages myself."	✗	●	●
Vinnie says, "I like to read up on these things."	✓	●	●
Ed says, "The right hand doesn't always know what the left hand is doing."	◯	●	●
Adams says, "Our company doesn't change much."	●	✓	●
The operations staff works all night sometimes.	●	◯	●
Vinnie says, "We do things the way Mr. Adams wants to."	●	●	□
Julie says, "Stanley doesn't seem to care sometimes."	●	●	✓
	●	●	●
	●	●	●
	●	●	●
	●	●	●

Key

- ✓ Confirm the narrative
- ✗ Negate or reverse the narrative
- ◯ Cue to look further
- □ Modify the narrative
- ● Supplement the narrative

Summary

- Sampling
  - Designing a good sample
  - Types of samples
  - Sample size
- Hard data
  - Quantitative document analysis
  - Qualitative document analysis
- Observation
  - Playscript
- STROBE
  - STROBE elements
  - Applying STROBE