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Information Gathering: Unobtrusive Methods

Systems Analysis and Design, 8e
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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

Four Main Types of Samples the Analyst Has Available (Figure 5.1)

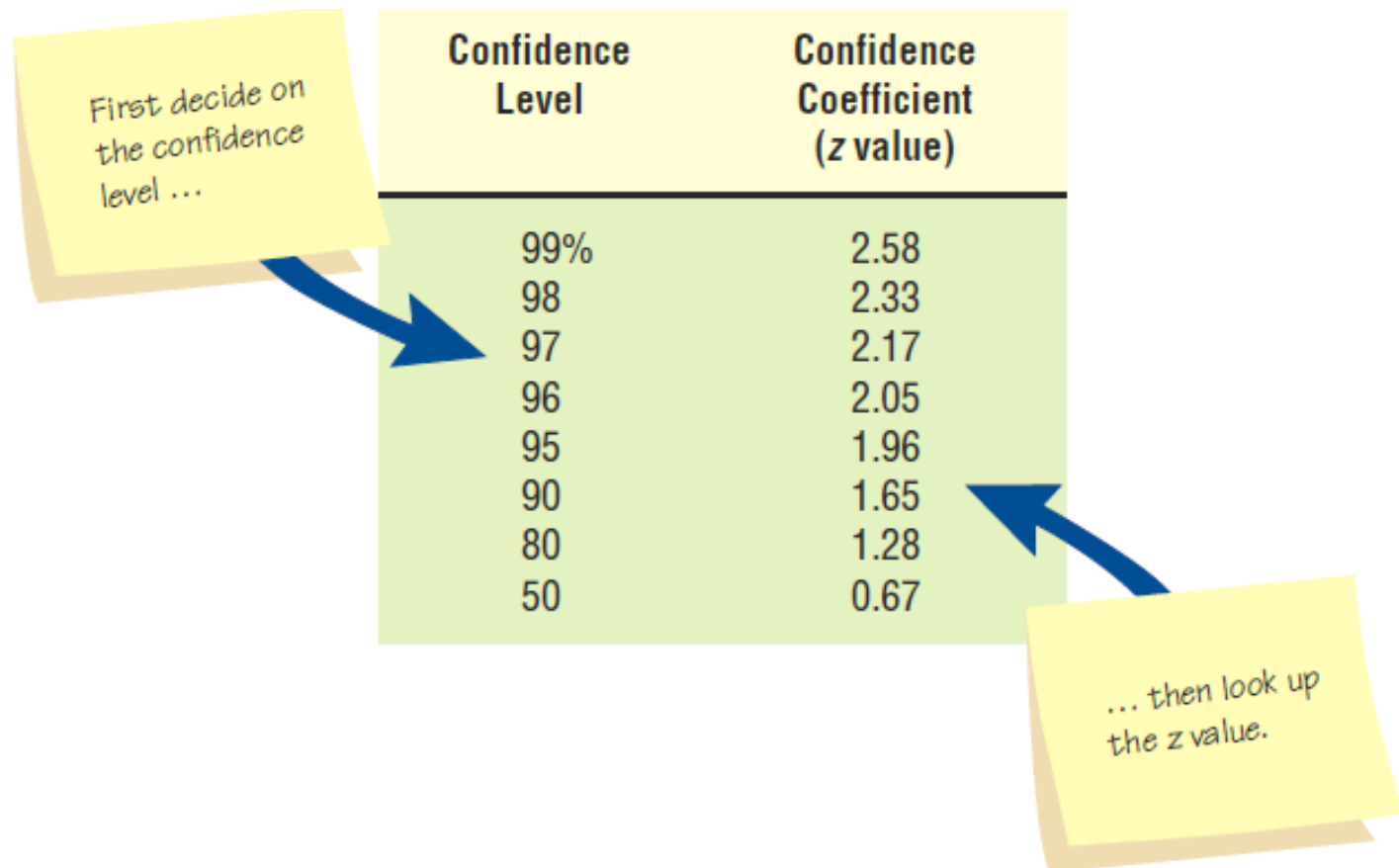
	Not Based on Probability	Based on Probability
Sample elements are selected directly without restrictions	Convenience	Simple random
Sample elements are selected according to specific criteria	Purposive	Complex random (systematic, stratified, and cluster)

The systems analyst should use a complex random sample if possible.

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.

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 (Figure 5.2)



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

p = 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 $i = \pm 0.02$
- Look up confidence coefficient z -value = 1.96.
- Calculate $\sigma_p = i / z = 0.02/1.96 = 0.0102$.
- Determine n ; $n = 458$.

Investigation

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



Analyzing Quantitative Documents

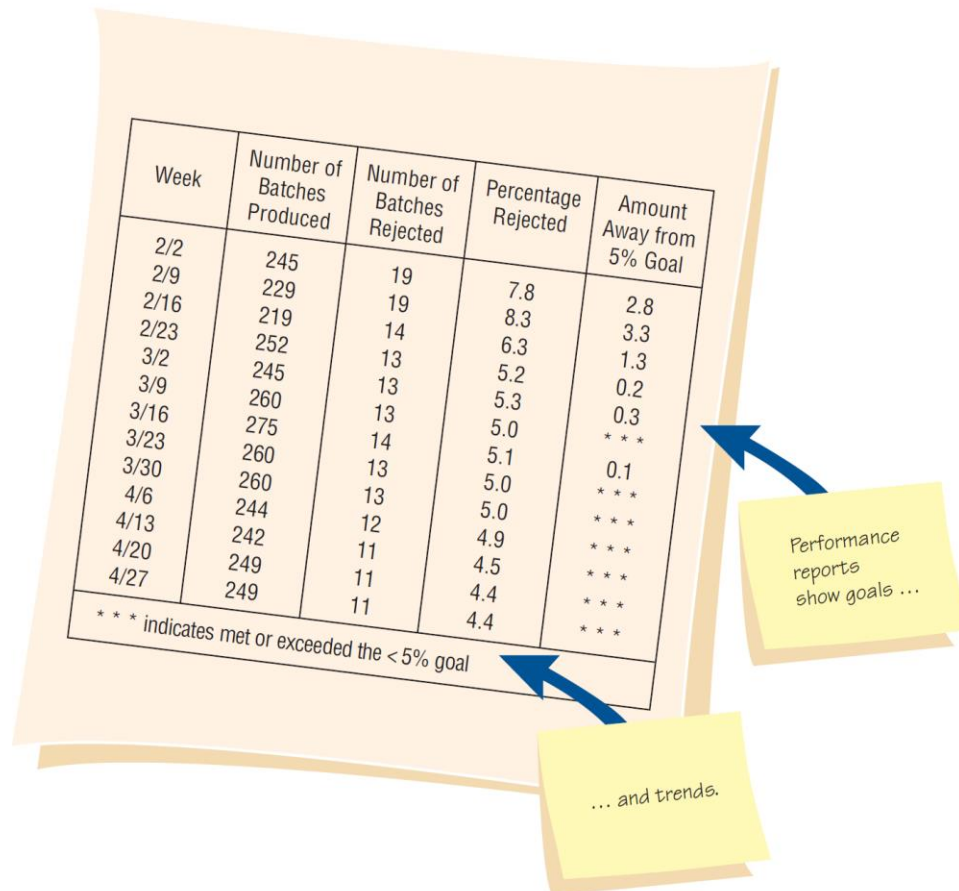
- Reports used for decision making
- Performance reports
- Records
- Data capture forms
- Ecommerce and other transactions



Reports Used for Decision Making

- Sales reports
- Production reports
- Summary reports

A Performance Report Showing Improvement (Figure 5.3)



A Manually Completed Payment Record (Figure 5.4)

Check for errors.

Look for opportunities for improvement in design.

PROJ. NAME OAK, FC # 562 KEY SIGNATURE _____

RENT POTENTIAL										DEPOSIT POTENTIAL		PRORATE					
Base Rent	Refrigerator	Furniture	A/C	Util.	HMSR	TV	Maid	Total Rent	Security	Cleaning	31175/0	81299	31700 Tax	Days	Daily Rate	Totals	
855		55						910						4	30.33	910	
										200	115						

PAYMENT RECORD: Tot. 31175/0 + 81299 + Rent = 910

Memo Only	Date Due	Date Paid	Receipt Number	Paid to Noon	Total Rent	Security	Cleaning	31700 Tax	31175/0	81299	Other Descr./Amt.	Amount Paid	Balance Due
TV 10/3 MO!	9/28	9/28	106642	9/30	910	202	115	44.20	25		44.20	15	1430.52
CH/S9-16	11/1	11/1	10935	11/16	485.28							910	0
Bill 1 MO	11/17	11/18	11200	11/23	212.31							485.28	0
Prorated	11/24											212.31	0
H/S should be created toward refund deposit.													

Orig. Move-in Date 8-28

BLDG. # _____ d same Exp. _____

NAME Kendall X# 1

1st

Observe the number and type of transactions.

Watch for places the computer can simplify the work.

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.

Questions to Ask about Official and Bootleg Forms that Are Already Filled out (Figure 5.5)

Farmfresh Reorder of Shorted Dairy Products

Date _____ Store Name _____ Store Number _____

Item Requested	Cases	Item Requested	Cases
Milk (1/2 gals.)		Milk (quarts)	
Whole		Whole	
2%		2%	
1%		1%	
Skim		Skim	
Buttermilk		Buttermilk	
Chocolate		Chocolate	
Yogurt			
Plain		Pineapple	
Vanilla		Dutch Apple	
Peach		Banana	
Blueberry		Mixed Fruit	
Boysenberry		Raspberry	
Strawberry		Lemon	
Ice Cream			
Deluxe Pints		Deluxe Quarts	
Deluxe 1/2 Gallons		Premium Pints	
Skinny Minnies		Premium Quarts	

Requested by (employee number) _____ Total Cases Ordered _____
Reason for Shortage _____
Driver Number _____ Route Number _____

Store _____ Date _____ Driver _____
Product shorted _____ **Cases needed** _____
Dairy manager's initials _____

Official form can overwhelm people by asking for too much information.

There may be no logical order to the form.

Is the total really needed?

"Bootleg" forms arise to simplify the problem.



Analyzing Qualitative Documents

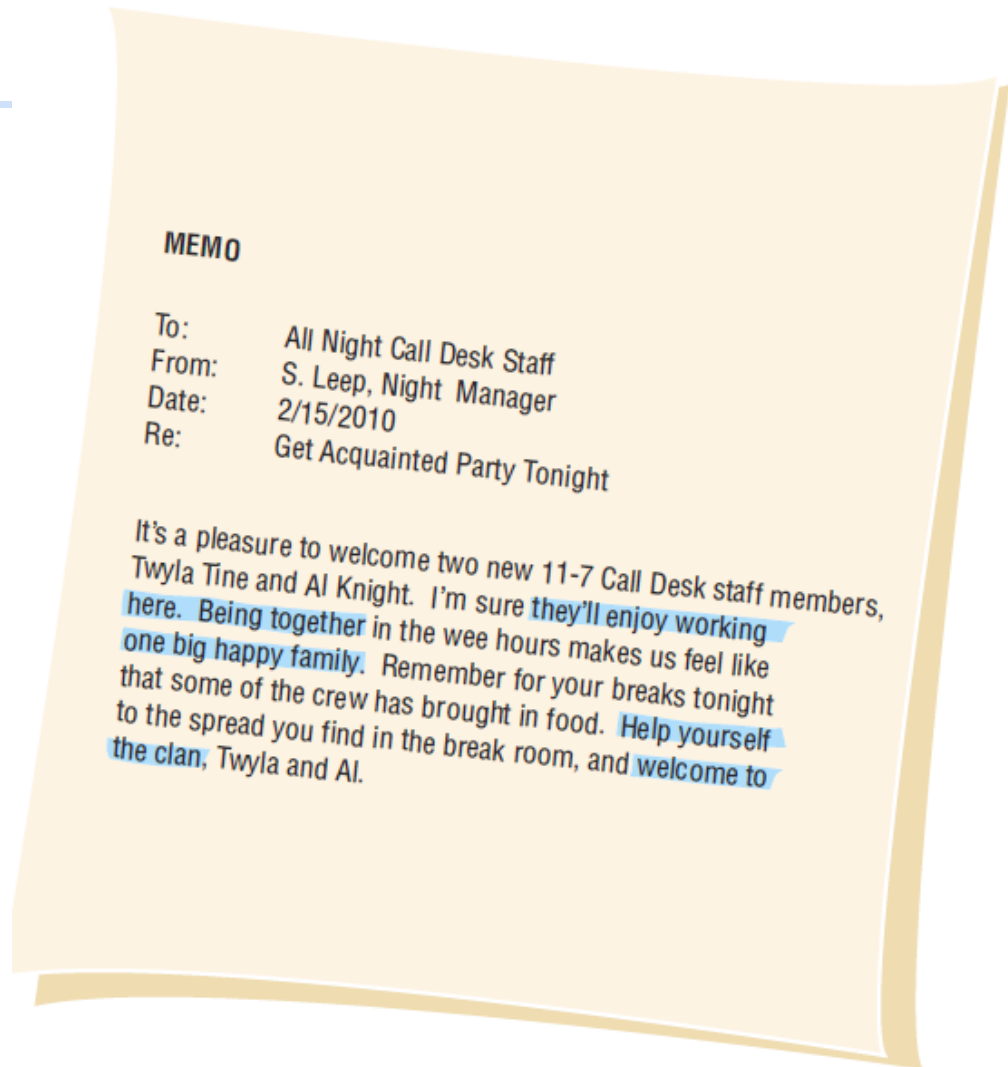
- Key or guiding metaphors
- Insiders vs. outsiders mentality
- What is considered good vs. evil
- Graphics, logos, and icons in common areas or Web pages
- A sense of humor



Analyzing Qualitative Documents

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

Analysis of Memos Provides Insight into the Metaphors that Guide the Organization's Thinking (Figure 5.6)



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

A Sample Page from the Analyst's Playscript Describing Decision Making (Figure 5.7)

Playscript Analysis		Company: Solid Steel Shelving Analyst: L. Brackett	Scenario: Quality Assurance Date: 1/3/2010
<u>Decision Maker (Actor)</u>	<u>Information-Related Activity (Script)</u>		
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
Environment—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, and policy handbooks indicate the person values internal information.

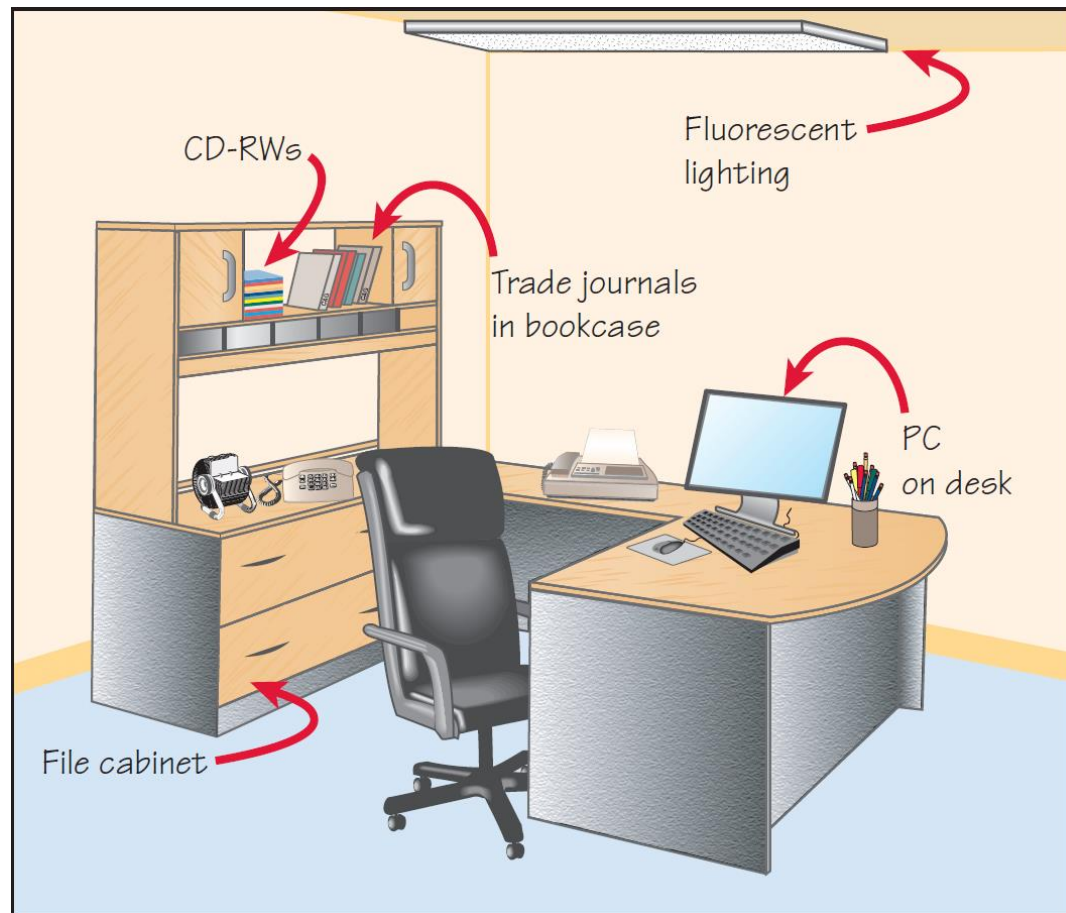
Office Lighting and Color

- 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

Observe a Decision Maker's Office for Clues Concerning His or Her Personal Storage, Processing, and Sharing of Information (Figure 5.9)



Applying STROBE

- The five symbols used to evaluate how observation of the elements of STROBE compared with interview results are:
 - A checkmark means 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.

An Anecdotal List with Symbols for Use in Applying STROBE (Figure 5.11)

Anecdotal List with Symbols for Applying STROBE

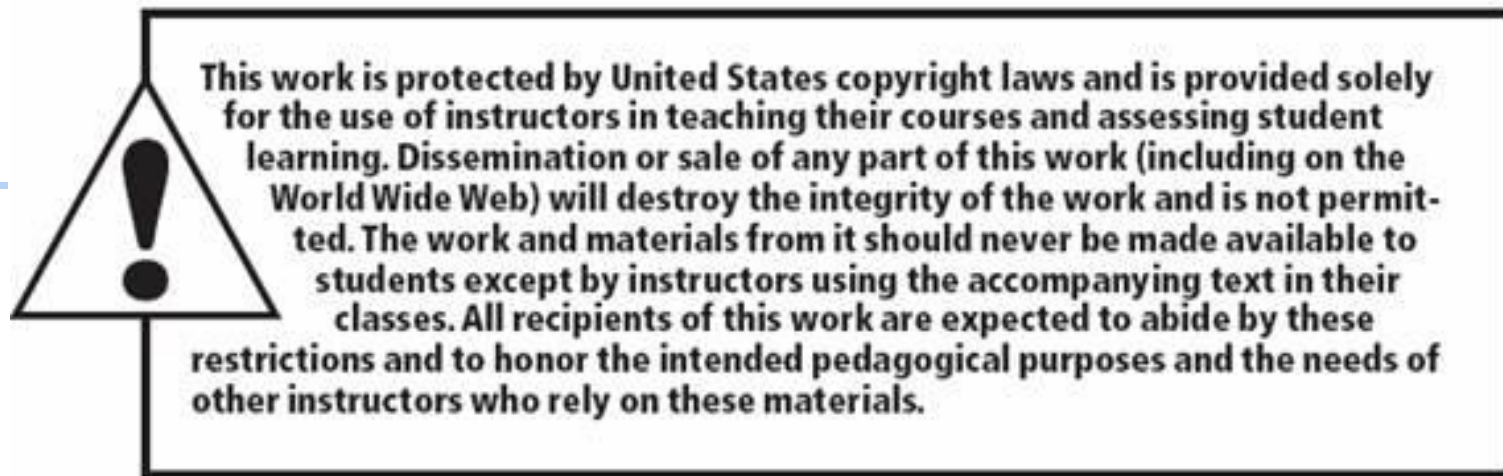
Narrative Portrayed by Organization Members	Office Location and Equipment	Office Lighting, Color, and Graphics	Clothing of the Decision Maker
Information is readily flowing on all levels.	✗	●	●
Adams says, "I figure out the percentages myself."	✗	●	●
Vinnie says, "I like to read up on these things."	✓	●	●
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



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