

(SCSD 2613) System Analysis and Design

Information Gathering: Unobstrusive Methods



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.



Unobtrusive Methods

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

Fact-finding – the process of collecting information about system problems, opportunities, solution requirements, and priorities



Requirements discovery – the process, used by systems analysts of identifying or extracting system problems and solution requirements from the user community



Major Topics

Information Gathering: Unobstructive methods

sampling

quantitative qualitative

Observation

STROBE

Structured Observation of the Environment



sampling

WHAT?

WHY?

- A process to select population
- Two key decisions: what to examine and which people to consider
- Contain cost
- Speed up data collection
- Reducing bias
- reduce time to collect all data



HOW?

Determine a data

Determine population

Choose sample

Convenience

Purposive

Sampling Types

> Simple Random

Complex

random





How??



The sample size decision:

- 1. Determine type of errors (percentage), p
- 2. Determine acceptable interval estimate, i
- 3. Choose confidence level and look up the confidence coefficient (z value) in table
- 4. Calculate σ^2 the standard error of the proportion

$$\sigma_p = \frac{i}{z}$$

5. Determine sample size

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



Example

The sample size decision:

Suppose the Toys company, a large manufacturer company for producing toys, Ask you to determine an estimate size of toys that may have been broken during Packaging process. Assume that, the estimation of broken (error) toys is 5% with interval estimate will be 0.02 and confidence level is 95%.



- 1. Determine type of errors (percentage), p 5% or 0.05
- 2. Determine acceptable interval estimate, i 0.02
- 3. Choose confidence level and look up the confidence coefficient (z value) in table 95%
- 4. Or 0.95 and z = 1.96 (lookup table)
- 5. Calculate σ_p the standard error of the proportion

$$\sigma_p = \frac{0.02}{1.96} = 0.0102$$

6. Determine sample size

$$n = \frac{p(1-p)}{\sigma_p^2} + 1 = \frac{0.05(1-0.05)}{(0.0102)(0.0102)} + 1 = 458$$



Four Main Types of Samples the Analyst Has Available

	Not Based on Probabi	lity 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)
	ar us	ne systems nalyst should se a complex andom sample f possible.



Convenience Samples

- Convenience samples are unrestricted, nonprobability samples.
- This sample is easy to arrange
- The most unreliable



Purposive Sample

- A purposive sample is based on judgment
- Choose a group of individuals who appear knowledgeable and are interested in the new information system
- A nonprobability sample
- Only moderately reliable



Complex Random Samples

- The complex random samples that are most appropriate for a systems analyst are
 - Systematic sampling
 - Stratified sampling
 - Cluster sampling



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

First decide 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

... then look up the z value.



Investigation

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



2. Analyzing Quantitative Documents

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

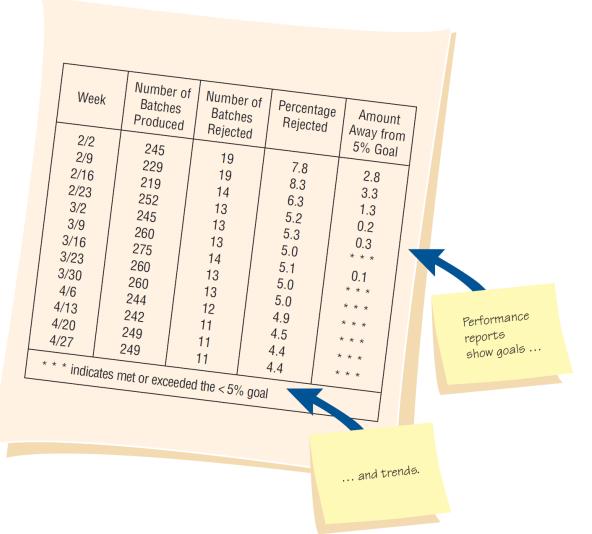


Reports Used for Decision Making

- Sales reports
- Production reports
- Summary reports

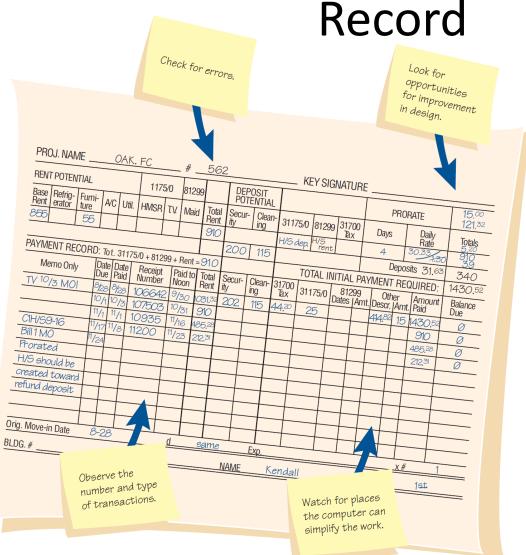


A Performance Report Showing Improvement





A Manually Completed Payment





Records

- Records provide periodic updates of what is occurring in the business
- There are several ways to inspect a record:
 - Checking for errors in amounts and totals
 - Looking for opportunities for improving the recording form design
 - Observing the number and type of transactions
 - Watching for instances in which the computer can simplify the work (calculations and other data manipulation)

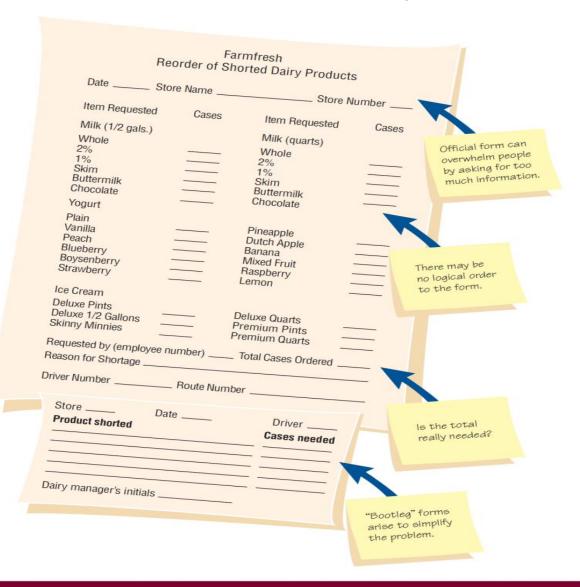


Data Capture Forms

- 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





Questions to Ask About Forms

- Is the form filled out in its entirety?
- Are there forms that are never used?
- Are all copies of forms circulated to the proper people or filed appropriately?
- Can people who must access online forms do so?
- If there is a paper form that is offered as an alternative to a Web-based form, compare the completion rates for both
- Are "unofficial" forms being used on a regular basis?



3. 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 websites
- Manuals
- Policy handbooks



Analysis of Memos Provides Insight into the Metaphors that Guide the Organization's **Thinking**

MEMO

To: All Night Call Desk Staff From: S. Leep, Night Manager Date:

2/15/2013 Re:

Get Acquainted Party Tonight

It's a pleasure to welcome two new 11-7 Call Desk staff members, 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.



5. 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 decisionmakers behavior and recording their actions using a series of action verbs
- Examples:
 - Talking
 - Sampling
 - Corresponding
 - Deciding



Sample of Analyst's Playscript

Playscript Company: Solid Steel Shelving Scenario: Quality Assurance

		Date: 1/3/2013	nce		
	Decision Maker (Acto	or) Information-Related Activity (Script)			
Quality Assurance Manager		e Asks shop floor supervisor for the day's production report			
	Shop Floor Supervisor	Prints out daily computerized production report			
	Quality Assurance Manager	Discusses recurring problems in production runs with quality assurance (QA) 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			
	Shop Floor	Calls steel suppliers to discuss deviations from quality standards			
	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 marking			
1	Vice President of Production	Sends draft to vice president via email Reads drafted letter			
Q M	uality Assurance anager	Returns corrections and comments via email Reads corrected letter on email			
	F	Rewrites letter to reflect changes			



6. STROBE

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



STROBE

- Often it is possible to observe the particulars of the surroundings that will confirm or negate the organizational narrative
 - Also called stories or dialogue
 - Information that is found through interviews or questionnaires



STROBE Elements

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



Office Location

- Who has the corner office?
- Are the key decision makers dispersed over separate floors?



Desk Placement

- Does the placement of the desk encourage communication?
- Does the placement demonstrate power?



Stationary Office Equipment

- Does the decision maker prefer to gather and store information personally?
- Is the storage area large or small?



Props

• Is there evidence that the decision maker uses a PC, smart phone, or tablet computer in the office?



External Information Sources

 Does the decision maker get much information from external sources such as trade journals or the Web?



Office Lighting and Color

- Is the lighting set up to do detailed work or more appropriate for casual communication?
- Are the colors warm and inviting?



Clothing

- Does the decision maker show authority by wearing conservative suits?
- Are employees required to wear uniforms?



STROBE and Decision-Maker Characteristics

Characteristics of Decision Makers	Corresponding Elements in the Physical Environment
Gathers information informally	Warm, incandescent lighting and colors
Seeks extraorganizational information	Trade journals present in office
Processes data personally	PCs, or tablet computers present in office
Stores information personally	Equipment/files present in office
Exercises power in decision making	Desk placed for power
Exhibits credibility in decision making	Wears authoritative clothing
Shares information with others	Office easily accessible



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

A=-			
Narrative Portrayed by	lotal List with Symbol	s for Applying STRO	BE
Information is readily	Office Location and Equipment	Office Lighting Color, and Graphi	
flowing on all levels.	>		cs Decision Maker
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."	0		
The operations at 55			
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		ue to look further	
		odify the narrative	
	Su	pplement the narrati	ve



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