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

<table>
<thead>
<tr>
<th>Not Based on Probability</th>
<th>Based on Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample elements are selected directly</td>
<td>Convenience</td>
</tr>
<tr>
<td>without restrictions</td>
<td>Simple random</td>
</tr>
<tr>
<td>Sample elements are selected according</td>
<td>Purposive</td>
</tr>
<tr>
<td>to specific criteria</td>
<td>Complex random (systematic, stratified, and</td>
</tr>
<tr>
<td></td>
<td>cluster)</td>
</tr>
</tbody>
</table>

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
**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.

<table>
<thead>
<tr>
<th>Confidence Level</th>
<th>Confidence Coefficient (z value)</th>
</tr>
</thead>
<tbody>
<tr>
<td>99%</td>
<td>2.58</td>
</tr>
<tr>
<td>98</td>
<td>2.33</td>
</tr>
<tr>
<td>97</td>
<td>2.17</td>
</tr>
<tr>
<td>96</td>
<td>2.05</td>
</tr>
<tr>
<td>95</td>
<td>1.96</td>
</tr>
<tr>
<td>90</td>
<td>1.65</td>
</tr>
<tr>
<td>80</td>
<td>1.28</td>
</tr>
<tr>
<td>50</td>
<td>0.67</td>
</tr>
</tbody>
</table>

First decide on the confidence level …

… then look up the z value.
Calculate the Standard Error of the Proportion

\[ \sigma_p = \frac{i}{z} \]

\( i \) = interval estimate

\( z \) = confidence coefficient found in the confidence level lookup table
Determine the Sample Size

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

\( \sigma_p = \text{standard error} \)

\( \rho = \text{the proportion of the population having the attribute} \)
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 $\sigma_p = i / z = 0.02/1.96 = 0.0102$
- 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
**Figure 5.3** A performance report showing improvement

<table>
<thead>
<tr>
<th>Week</th>
<th>Number of Batches Produced</th>
<th>Number of Batches Rejected</th>
<th>Percentage Rejected</th>
<th>Amount Away from 5% Goal</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/2</td>
<td>245</td>
<td>19</td>
<td>7.8</td>
<td>2.8</td>
</tr>
<tr>
<td>2/8</td>
<td>229</td>
<td>19</td>
<td>8.3</td>
<td>3.3</td>
</tr>
<tr>
<td>2/16</td>
<td>219</td>
<td>14</td>
<td>6.3</td>
<td>1.3</td>
</tr>
<tr>
<td>2/23</td>
<td>252</td>
<td>13</td>
<td>5.2</td>
<td>0.2</td>
</tr>
<tr>
<td>3/2</td>
<td>245</td>
<td>13</td>
<td>5.3</td>
<td>0.3</td>
</tr>
<tr>
<td>3/9</td>
<td>260</td>
<td>13</td>
<td>5.0</td>
<td><strong>...</strong></td>
</tr>
<tr>
<td>3/16</td>
<td>275</td>
<td>14</td>
<td>5.1</td>
<td><strong>...</strong></td>
</tr>
<tr>
<td>3/23</td>
<td>260</td>
<td>13</td>
<td>5.0</td>
<td><strong>...</strong></td>
</tr>
<tr>
<td>3/30</td>
<td>260</td>
<td>13</td>
<td>4.9</td>
<td><strong>...</strong></td>
</tr>
<tr>
<td>4/6</td>
<td>244</td>
<td>12</td>
<td>4.5</td>
<td><strong>...</strong></td>
</tr>
<tr>
<td>4/13</td>
<td>242</td>
<td>11</td>
<td>4.4</td>
<td><strong>...</strong></td>
</tr>
<tr>
<td>4/20</td>
<td>249</td>
<td>11</td>
<td><strong>...</strong></td>
<td><strong>...</strong></td>
</tr>
<tr>
<td>4/27</td>
<td>249</td>
<td>11</td>
<td><strong>...</strong></td>
<td><strong>...</strong></td>
</tr>
</tbody>
</table>

* * * 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

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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
STROBE

Structured OBservation 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, 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
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