

# 7 DEVELOPMENT, APPLICATION, AND ENRICHMENT OF STROBE: REFINEMENT OF AN OBSERVATIONAL TOOL FOR THE INFORMATION ANALYST

Kenneth E. Kendall  
Julie E. Kendall  
University of Nebraska, Lincoln  
U.S.A.

## Abstract

*Realizing that observation of the decision makers' physical environment has been based primarily on common sense, a more structured approach drawing a parallel between the mise-en-scène film critic and the Information Analyst is developed. This method, named **STROBE**, includes observing key elements such as desk placement, office equipment, lighting and color, and clothing worn by decision makers. A spectrum of approaches for applying **STROBE** is then presented.*

## Introduction

Information Analysts (IAs) are responsible for ascertaining the information requirements of key decision makers in the organization. The traditional tools of the IA are interviewing, investigation of hard data, and observation. Too often IAs lean most heavily on interviewing, with investigation of hard data next and observation coming in a poor third as a choice of tools (Awad 1977; Burch et al. 1983; Gore and Stubbe 1983; Leeson 1981; Semprevivo 1976).

Part of this is traceable to training, since most texts emphasize interviewing and investigation and leave observation to the IA's "common sense." Another contributing

factor is that the results of interviewing are often seen as more objective than observation and in this case objectivity is considered to be a praiseworthy trait. It is our position, however, that everything the IA learns about the decision maker is to some extent subjective, (i.e., filtered through the IA's sensibilities) and that subjectivity must be accepted, respected, and used consciously, rather than ignored, denigrated, or suppressed.

Therefore these two ideas compose the core of our paper. We believe that subjectivity is always present, and is necessary and good, and that IAs rely too greatly upon other methods (partly because of their supposed objective superiority) and too little upon observation to ascertain information requirements.

Bearing these ideas in mind, we sought a method for the IA which was not rooted in business or management literature, but rather was grounded in a modern and creative medium, film. Film criticism exists in many different forms including *auteur* criticism and social-issue criticism, but the kind of criticism which rests on observation is called *mise-en-scène* (pronounced *mē z-ăn-sěň*) analysis (Guillermo 1967; Henderson 1976; Johnson 1966; Perry 1970; Salt 1976). Henderson explains:

The term is originally a theatrical one meaning literally (to) put in place. It is, baldly, the art of the image itself—the actors, sets, and background, lighting, and camera movements considered in relation to themselves and to each other. (Henderson 1976, p. 315).

We have adapted *mise-en-scène* criticism for the Information Analyst, so that a useable, openly subjective tool for observation is developed. However, it should be noted that subjectivity does not preclude *mise-en-scène* from being systematic. A systematic approach dictates certain procedural steps that should be followed, while at the same time allowing IAs to bring their individuality (i.e., subjectivity) to bear. We feel that without a systematic approach, observation cannot make a contribution to information requirements analysis.

## Mise-en-scène Theory

Film critics using *mise-en-scène* analysis do a careful visual reading of the film, in order to see if the visual elements modify, reverse, or supplement the narrative or plot line put forth by the actors' dialogue. Film critics using *mise-en-scène* analysis systematically assess what is in a single shot of the film—looking at editing, camera angle, set decor, and the actors and their costumes to find out how they are shaping the meaning of the film as intended by the director (Henderson 1976). For the critic employing *mise-en-scène* analysis, the purpose is to use the film itself as the chief document for understanding, rather than to interpret the film in the context of the director's life or other works.

The approach is systematic, because: (1) it provides standard classification of filmic elements for analysis, (2) it allows the replication of analysis by another critic using the same framework, and (3) the scope of the analysis is limited to what the film itself represents (Kendall and Kendall 1981).

**Table 1. Filmic Elements of *Mise-en-scène* and Their Organizational Equivalents as Revised from the Original Framework**

<i>Concrete Elements</i>	
Filmic Elements	Organizational Elements
Set location	Office location
People positioned within a frame	Decision maker's placement in an office (i.e., desk placement)
Stationary objects	File cabinets, bookshelves, and equipment for storing information
Props (movable objects)	Calculators, CRTs and other items used for processing information
External objects (brought in from other scenes)	Trade journals, newspapers, and other items used for external information
Lighting and color	Office lighting and color
Costumes	Clothing worn by decision makers
<i>Abstract Elements</i>	
Filmic Elements	Organizational Elements
Abilities of actors	Abilities of decision makers to make timely decisions
Focus and depth of field	Attention to multiple objectives
Camera angle	Cognitive maps of decision makers
Number of actors in a shot	Emphasis on individual or group decision making.

For information requirements analysis, the IA is analogous to the film critic, and *mise-en-scène* analysis is again systematic since it: (1) provides a standard methodology and standard classification for analysis of organizational elements that influence decision making, (2) allows other IAs to apply the same analytic framework to the same organization, and (3) limits analysis to the organization as it exists during the current stage in its life cycle (Kendall and Kendall 1981).

In Table 1, we identify the relationship between elements of *mise-en-scène* analysis for film and for decision makers' information requirements. We have adapted each category so that they accurately capture important organizational elements and yet retain a certain faithfulness to the original intent of *mise-en-scène* criticism.

In elaborating on that original intent, Perry in his *mise-en-scène* analysis of Antonioni's film "L'Eclisse," writes:

The relationship between the people and physical objects, and the presence of physical objects are seen as the most important means by which the film assigns values since it is primarily through physical objects that the inner being and experience of the characters is shown. (Perry 1970, 1992)

Although we are aware that the physical image presented in the organization is not the only way decision makers assign values (they, of course, use both written and spoken symbolic language), the decision maker's interaction with and behavior in the environment is too important to be overlooked by the IA. Table 1 is a summary of the *mise-en-scène* classification system as adapted for organizational use.

## Renaming the Method

The importance and significance of naming the newly adapted method became apparent early on. When we first used *mise-en-scène* analysis, we had close identification with film criticism. We were anxious to move away from that association and into gradual acceptance within the information systems analysis community, so we began searching for a new name for our technique. At the same time, researchers and reviewers were telling us that they were having difficulty conceptualizing how some of the elements of film (transposed as abstract elements in our classification) could be adequately observed through physical objects.

So it was a combination of circumstances that led to our search for an acronym which would bear a relationship to film yet would also be imbued with a meaning all of its own in the information analysis literature. We eventually agreed on STROBE, **STR**uctured **OB**serva**tion** of the decision making environment. However, we still recognize the debt we owe to film theory, and still wish to use *mise-en-scène* analysis as a general term for our method, while STROBE is a name more narrow in scope.

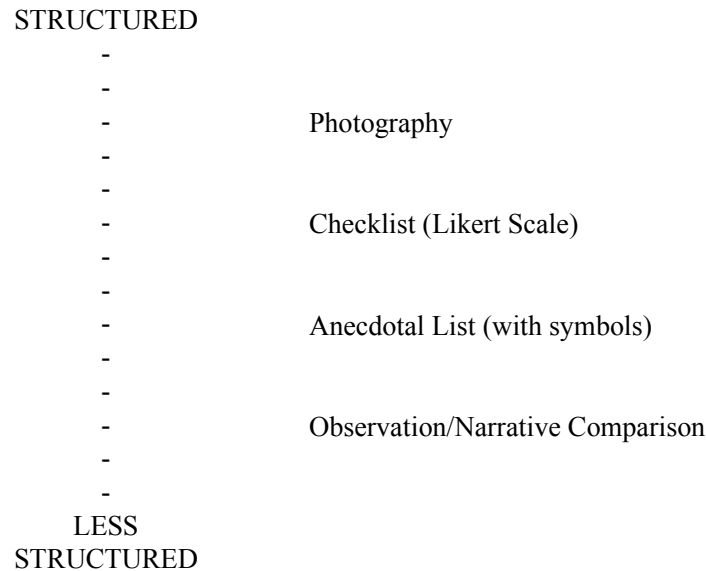
## Application Alternatives

STROBE has been applied in analyzing information requirements of key decision makers in blood centers in the United States, Canada, and Japan. There are several different approaches which can be taken to successfully use STROBE and these range on a continuum from extremely structured to much less structured, as illustrated in Figure 1.

### *Analysis of Photographs*

Photographing the environments of decision makers, then analyzing the photographs for elements of STROBE is most closely allied with the original use of *mise-en-scène* for film criticism. Interestingly, this application has parallels in much earlier management work, since at the turn of the century Frank Gilbreth used film in his famous time-motion studies, analyzing frame-by-frame what motions were necessary to complete a task (Rogers and Agarwala-Rogers 1976).

Photographic applications of STROBE have some distinct advantages. One is that a document is made which can be referred to repeatedly. This can be extremely helpful when organizational visits must be limited due to time, distance, or expense. Another is that the IA is "invisible" after the initial photography, and is therefore exercising utmost unobtrusiveness.



**Figure 1. Options for STROBE Implementation**

A third advantage is that the photographer can focus specifically on pertinent elements of STROBE and thereby exclude extraneous elements. A fourth advantage of using photography for STROBE is that organizations can be compared side-by-side since the limitations of time and space are overcome by photography. A fifth advantage is that a photograph can supply detail which is easily overlooked in person when the IA is not only observing, but perhaps also conducting an interview or investigating hard data.

All of these advantages proved important when touring blood centers in Tokyo, Japan. Photographs of the relevant settings revealed many important details that were not noticed during the tours themselves. Another trip to Japan to answer further questions about STROBE was not cost effective, so photography helped to maximize the information gained in the initial visits. Photographs confirmed what the narrative revealed. Most settings were group ones, where many decision makers were together in one room, discussing events face-to-face as they occurred. Private offices were extremely rare.

Photographs of the walls in the Japanese blood centers also confirmed what was put forth in the narrative, that each department was highly goal oriented. Indeed photographs showed numerous charts indicating current and expected performance levels in almost every decision-making setting, and the charts were not there just “for show,” they were referred to frequently and understood by all involved.

There are also drawbacks to using photography for implementing STROBE. First and foremost may be deciding what to photograph.

Unlike the human eye, photographs are very limited as to what they can aim at and “take in.” The editing aspects of photography must be carefully weighed if this application is pursued.

The second drawback is that photography, although it may prove unobtrusive in the long-term, is initially quite obtrusive. The IA will run into problems of decision makers posing, as well as intentionally or unintentionally changing their environments to make them more superficially attractive. This kind of alteration obviously creates problems for the validity of the conclusions drawn through use of STROBE.

A third drawback is the added expense of using photography to implement STROBE. This should be considered when evaluating the other ways to implement STROBE (covered below), which include a checklist approach, using an anecdotal list, and making an observation/narrative comparison.

### *Checklist/Likert Scale Approach*

In other applications we implemented STROBE through a little less-structured technique than photography (Kendall and Kendall 1983, 1984b). We developed five-point Likert-type scales relating to seven decision-maker characteristics that were observable through physical elements in the decision makers’ organizational environments, as shown in Table 2.

This application worked well for us, and in the original example studying 16 high-level blood administrators and medical directors from the United States and Canada, we were able to show high inter-rater reliability, and convergent and discriminate validity of information gained through the STROBE scales, information gained through interviewing, and behavioral scales. Thus we feel justified in recommending the use of the same Likert-type scales to other IAs who would use it as an application of STROBE in conjunction with more traditional methods.

### *Anecdotal List (with Symbols)*

A third, and even less-structured way to implement STROBE is through the use of an anecdotal checklist with meaningful shorthand symbols. We successfully used this approach to STROBE in ascertaining the information requirements for four key decision-makers in a midwestern blood center. This application is detailed in a previous article (Kendall and Kendall 1984a).

As can be seen in Table 3, five shorthand symbols were used by the IAs to evaluate how observation of the elements of STROBE compared with the organizational narrative generated through interviews. The five symbols were: (1) a square with a check mark () , which meant that the narrative was confirmed, (2) a crossed-out circle () , which meant the narrative was reversed, (3) a circle within an eye () , which served as a cue for the IA to look further, (4) a square within a square () , which meant that observation of the elements of STROBE modified the narrative, and (5) a shaded circle () , which meant that the narrative was supplemented by what was observed.

**Table 2. STROBE Scales for Observing the Physical Environment**  
(From Kendall and Kendall 1984b)

Office lighting, walls, paintings and graphics are warm-toned, creating an informal arena for information exchange

florescent lights, cool-colored walls, no decorations					incandescent lights, warm-colored walls, warm graphics
1	2	3	4		5

Office contains various forms of information brought in from outside the organization, including trade journals, association newsletters, and business newspapers

no outside sources of information					four or more jour- nals or newspapers
1	2	3	4		5

Aids for processing of information are present in the office and are easily accessible

no calculators or CRTs visible					calculators or CRT accessible without leaving chair
1	2	3	4		5

Office houses many pieces of equipment used for storing information

no storage cabinets in office					four or more file cabinets or shelves
1	2	3	4		5

Desk is placed to maximize territory for administrator and limit visitor space

desk placed against wall					desk used as barrier with little space for visitor
1	2	3	4		5

Wears authoritative business suits rather than casual or sporty clothing

wears casual or sporty clothing					wears conservative business suits
1	2	3	4		5

Administrator's office is easily accessible

office located on separate floor from subordinates					office within 50 feet of subordinates
1	2	3	4		5

**Table 3. Anecdotal List with Symbols for Applying STROBE**  
(Kendall and Kendall 1984a)

Narrative Portrayed by Organization Members	Office Location and Equipment	Office Lighting Color and Graphics	Clothing of the Deci- sion Maker
Departments unable to understand each other's information requirements	☑		
Information is readily flowing between chapter manager and subordinates	⊗		
Purchase of new and sophisticated equipment is important to Blood Services	⊙		
Equipment purchased must be limited to equalize service areas	☑		
Organization is stable and conservative; new information system must be cautiously introduced		☑	
Each of the top decision makers viewed their roles differently			⊗
The chapter manager possesses an authoritarian management style			◻
The medical director serves primarily as an advisor to others			⊗
The blood administrator has open and informal communication with co-workers			☑
The assistant administrator is experiencing conflict over her decision making role			◯
<b>Key:</b>	☑	Confirm the narrative	
	⊗	Negate or reverse narrative	
	⊙	Cue to look further	
	◻	Modify narrative	
	◯	Supplement narrative	



When STROBE is implemented in this manner, the first step is to determine key organizational themes growing out of interviews. Then the elements of STROBE should be systematically observed, and a matrix can then be constructed which lists major ideas from the organizational narrative about information gathering, processing, storing, and sharing on one axis and elements of STROBE on the other. When narrative and observations are compared, one of the five appropriate symbols is then used to characterize the relationship between the narrative and the relevant element observed.

Obviously this application is more art than science. It takes careful determination of key organizational storylines as well as the ability to reach reasonable estimations of how STROBE relates to those storylines.

### *Observation/Narrative Comparison*

This fourth and final way to implement STROBE is also the least-structured method. Although filmgoers rarely attend a film with a *mise-en-scène* checklist in hand, few of its elements fail to make at least a subconscious impact on them. As long as the IA is aware of the elements of *mise-en-scène* and they are consciously observed, valuable insights can be gained, even without the aid of a check-list. Having a heightened awareness of the elements of STROBE afforded enough of a base to at least begin making structured observations which could later be used in assessing information requirements.

## **Research Methodology Concerns**

As we worked with STROBE and developed the various methods of application, other researchers and practitioners became interested in using it. Some, however, were quite concerned about the reliability and validity of our observations. In order to answer some of these concerns, we developed scales (as noted earlier) and used a multi-trait multi-method approach to show convergent and discriminant validity (Kerlinger 1973) among interviewing, observation of the physical environment, and behavioral observation (Kendall and Kendall 1984b).

This was called for by other researchers who wanted us to be able to demonstrate that all three methods could identify identical elements in information requirements analysis. Although we were able to demonstrate this, we felt restricted by the methodology.

We feel as Babbie (1973) and others do that multiple methods are important, but when they are used only for the purpose of showing convergence, the following outcomes can hinder rather than help the overall research effort:

1. Researchers may arbitrarily limit the variables that they consider, since not all variables can be converged upon by currently-known research methods. We feel that this artificial stricture works against composing an accurate portrait of information requirements in order to fulfill a scientific objective.
2. In the quest for convergent validity, a tight framework and scales are constructed. This justifies the use of the scales, but limits the IA in employing the other application techniques described earlier.

3. Leading from this, it is foreseeable that richness of the data could be sacrificed. While scales are statistically attractive, observation allows full play of the IAs' senses. Coupled with IAs' training and discipline, this is a powerful combination. Much that is not scaled can still be observed and used.
4. By attending too much to detail demanded by the methodology, the researcher fails to examine the relationships of the physical objects to one another. The researcher might focus on detail and miss the true meaning of the situation.

Cummings (1981) predicts a trend in methodology that achieves construct validity primarily through convergence. A researcher cannot afford to focus on a single issue such as convergence. The researcher must develop a balance between scientific demands and a global perspective.

## Conclusion

In this paper, we have recounted our experiences with developing, applying, and gaining acceptance for our STROBE technique. In doing this, it became apparent that all research methodologies, be they traditional or non-traditional, have their limitations. If researchers work only to demonstrate convergence, they accept blinders which keep them from seeing that problems with the research or project can still occur, despite scientific perfection. By highlighting convergence over other attributes of methods, the wrong questions may be answered, and important questions may be overlooked.

If researchers in MIS aim only for convergence through their use of multiple methods, they may be unnecessarily limiting the variables they consider, limiting their application alternatives, focusing on a small part of the problem and not realizing the actual situation, and finally, sacrificing richness of data to what they perceive as scientific rigor.

## References

- Awad, E. M. *Systems Analysis and Design*. Homewood, IL: Richard D. Irwin, Inc., 1977.
- Babbie, E. R. *Survey Research Methods*. Belmont, CA: Wadsworth Publishing Company, Inc., 1973.
- Burch, J. G. Jr., F. R. Strater, and G. Grudnitski. *Information Systems: Theory and Practice*, 3<sup>rd</sup> ed. New York: John Wiley & Sons, 1983.
- Cummings, L. L. "Organizational Behavior in the 1980s," *Decision Sciences* (12:3), 1981, pp. 365-377.
- Gore, M., and J. Stubbe. *Elements of Systems Analysis*. Dubuque, IA: Wm. C. Brown Co. Publishers, 1983.
- Guillermo, G. P. "Shadow and Substance: Murnau's Nosferatu," *Sight and Sound* (36:3), 1967, pp. 108-153 & 159.
- Henderson, B. "The Long Take," in *Movies and Methods*, B. Nichols (ed.). Berkeley, CA: University of California Press, 1976.
- Johnson, W. "Coming to Terms with Color," *Film Quarterly* (20:1), 1966, pp. 2-22.
- Kendall, K. E., and J. E. Kendall. "Observing Organizational Environments: A Systematic Approach for Information Analysts," *MIS Quarterly*, March 1981, pp. 43-55.

- Kendall, K. E., and J. E. Kendall. "Observing Organizational Environments: Is It Really of Any Use to the Information Analyst?" in *Proceedings of the Fourth International Conference on Information Systems*, C. A. Ross and E. B. Swanson (eds.), Houston, Texas, 1983.
- Kendall, K. E., and J. E. Kendall. "STROBE: A Structured Approach to Observation of the Decision-making Environment," *Information & Management* (17:1), 1984a, pp. 1-11.
- Kendall, K. E., and J. E. Kendall. "Structured Observation of the Decision-making Environment: A reliability and Validity Assessment," *Decision Sciences* (15:1), 1984b, pp. 107-118.
- Kerlinger, F. N. *Foundations of Behavioral Research*. New York: Holt, Rinehart, and Winston, Inc., 1973.
- Leeson, M. *Systems Analysis and Design*. Chicago: Science Research Associates, Inc., 1981.
- Perry, T. "A Conceptual Study of Antonioni's Film L'Eclisse," *Speech Monographs* (37:2), 1970, pp. 79-100.
- Rogers, E. M., and R. Agarwala-Rogers. *Communication in Organizations*. New York: The Free Press, 1976.
- Salt, B. "Statistical Analysis of Motion Pictures," *Film Quarterly* (28:1), 1974, pp. 13-22.
- Semprevivo, P. C. *Systems Analysis: Definition, Process, and Design*. Chicago: Science Research Associates, Inc., 1976.