MEANING AND THE BUILT ENVIRONMENT: AN ETHNOGRAPHIC APPROACH TO ARCHITECTURAL PROGRAMMING



by Raymond Bertrand School of Architecture McGill University, Montreal

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ABSTRACT

The importance of programming the built environment is increasingly recognized, mostly because of the growing complexity of architecture. Nevertheless, little attention has been paid to the meaning of architecture for its users. This thesis reviews the research on meaning in architecture, and proposes new directions in the investigation of meaning within the process of architectural programming.

RESUME

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L'importance de la programmation de l'environnement construit est aujourd'hui reconnue, particulièrement en raison de la complexité croissante de l'architecture Toutefois, peu d'attention a été accordée à la signification qu'a cette architecture pour ses usagers Ce mémoire passe en revue la recherche sur la signification en architecture, et propose de nouvelles avenues concernant l'étude de la signification dans le processus de programmation en architecture

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INTRODUCTION

The problem

For many of us, the movement in the mid 1960's toward programming and user studies held great promise Various studies and theoretical explanations were put forward to corroborate the feeling that something was wrong with the way architecture was being created

However, although this feeling of dissatisfaction was eventually addressed by new projects which reflected the concerns expressed, the work itself of programming built environments had not comprehensively reached a concept central to architecture **meaning**. Some methods were developed to measure meaning, such as the semantic differential test and the cognitive map, but few have looked to alternative approaches to the inquiry into meaning.

The assumption

My working assumption is that an architectural program is already a crude social-physical form. A program is, after all, the description of a setting or facility in social and physical terms. The program lays out the relationships, or patterns, which, by themselves, are related to the meaning users have of that setting, and are the key to whether or not the form makes human sense.

For the purpose of this thesis, I define meaning as: "A process of interpretation which provides a person with a repertoire that enables him or her to deal with the environment".

My approach to the inquiry into meaning has been the application of ethnographic research to programming. This procedure, combined with a conceptual model, could provide a better, more systematic paradigm to the investigation of meaning than the social science methods most frequently used.

Goals and objectives

The principal goal of this thesis, then, is to investigate the concept of meaning in architecture from both the cultural and environmental perspective. Furthermore, the research aims to acquire a knowledge of the programming process, and the possible contribution ethnographic research could make to this process. The intention of this thesis is not to prove the validity of such an approach, but to explore its potential for the investigation of meaning in architecture. The objectives are twofold. First, to conduct a literature review that will gather the necessary knowledge for a critical examination of existing methods and approaches concerned with meaning Second, to propose ways in which ethnographic research may contribute to architectural programming

Summary of the thesis

The thesis is divided into three chapters:

Chapter One is a review of the concept of meaning from different perspectives and its relationship to culture and the built environment. It is divided into three parts: Part one is concerned with the structure of meaning and the major approaches used for its study. Part two looks at the influence of culture and the contribution of ethnography in this field. Finally, part three deals with two approaches that link the concept of meaning with the environment.

Chapter Two deals with the process of architectural programming. It defines the nature and purpose of programming, placing emphasis on behavior programming. For the latter, the second part of the chapter looks at different methods actually used in order to address people's perceptions and attitudes during programming.

Finally, Chapter Three proposes to link Steele's sociophysical model to the ethnographic research procedure. The chapter identifies some areas where ethnography, as the discovering of one's culture, could help the process of programming as well as the description of meaning systems.

CHAPTER ONE: MEANING, CULTURE, AND ENVIRONMENT

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PART ONE: MEANING

THE IMPORTANCE OF MEANING

Within the framework of an environment-behavior approach, a number of specific methods can be used to study how people interpret their environment:

- observation of behavior
- interviews
- questionnaires
- other instruments: historical and cross-cultural examples, trace patterns, regularities, etc.

One can also analyze written and pictorial materials that have not been produced consciously to evaluate environments but came about in an unstructured, unself-conscious manner for other purposes. These can include travel descriptions, novels, stories, songs, newspaper reports, illustrations, films and advertisement.

This material tends to show how people *see* environments. how they feel about them, what they like or dislike about them, and which attitudes seem to be self-evident.

A study conducted in 1966 by Rapoport used descriptions by English students of their classrooms. The descriptions dealt mostly with color, light quality, air conditioning hum and furnishings. The reactions seemed to stress monotony, sterility, starkness, emptiness and isolation from the world. What is of primary interest is the importance of *affective* and *meaning-related* terms used in the descriptions, as well as indications that people use various environmental elements to identify the *purpose* of these rooms as well as their *character* and *mood*.

If people react to environments in terms of the meanings the environments have for them, we can say that:

"Environmental evaluation, then, is more a matter of overall affective response than of detailed analysis of specific aspects, it is more a matter of *latent* than of *manifest* function, and it is largely affected by images and ideals (Rapoport, 1977;60)".

This mechanism can also apply to things other than environments. One example is the interpersonal relations involved in health care where *affect* is most important (Di Matteo, 1979). This reinforces

Rapoport's argument, since affect is read on the basis of nonverbal messages projected by people.

The very concept of environmental quality is clearly an aspect of this; people like certain urban areas, or housing forms, because of what they mean. Material objects first arouse a feeling that provides a background for more specific images, which are then fitted to the objects. In the case of environments, affective images play the major role in decisions.

The global, affective responses seem based on the meaning that environments, and particular aspects of them, have for people. Meaning gains in importance when it is realized that the concept of function, so important in the modern movement, goes far beyond purely *instrumental* or *manifest* functions (Steele, 1973). When latent aspects of functions are considered, it is quickly realized that meaning is central to an understanding of how environments work. The functions are tightly-related to the activity system and any activity can be analyzed into four components:

1. The activity itself,

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- 2. The specific way of doing it,
- 3. Additional, adjacent, or associated activities that become part of the activity system,
- 4. The *meaning* of the activity.

It is 2, 3 and 4 that lead to the differences in form, the success of the design and the acceptability and judgments of environmental quality. This typology relates to the following hierarchy of levels of meaning (Rapoport, 1977;19):

- 1. concrete object
- 2. use object
- 3. value object
- 4. symbolic object

Meaning is not something apart from function, but is itself a critical aspect of function. Rapoport argues that the human mind basically works by trying to impose meaning on the world through the use of cognitive taxonomies, categories, and schemata. The built forms are then physical expressions of these schemata and domains. Based on the above, I would define meaning as:

A process of interpretation which provides a person with a repertoire that enables him or her to deal with the environment.

USEJ 'S MEANINGS AND DESIGNER'S MEANINGS

Designers and users are very different in their reactions to environments, partly because their schemata vary. It is the user's meaning that is important, not the architect's or the critic's. It is the meaning of everyday environments, not famous buildings, historical or modern, that counts.

This explains the use of imitation American Colonial furniture in some american houses: it means "HOME". The stylistic elements help communicate the appropriate meanings. Moreover, it is clear that symbolic and latent rather than instrumental or manifest functions are dominant.

Meanings are in people, not in objects or things (Bonta, 1979). However, things do convey meanings; the question is *how* they elicit or activate these meanings and guide them and also, *which* things or objects work best. Put differently: "How can meanings be encoded in things in such a way that they can be decoded by the intended users?"

While one speaks of crowding as a subjective reaction, this type of reaction is related to, and evoked by, physical and environmental characteristics. In the perceptual realm, the experience of complexity is subjective, but clearly some environments possess certain characteristics that produce the experience of complexity much more than others. These can be specified and designed, as for example in cathedrals or shopping malls, where complexity is intended to stimulate the user.

PERCEPTUAL AND ASSOCIATIONAL DIMENSIONS

In environment-behavior research, perceptual aspects have been stressed. Rapoport says that the differences in reactions of designers and users to environments are a result of:

- designers tending to react to environments in perceptual terms
- users reacting to environments in associational terms.

One example is Hertzbergers' old people's home in Amsterdam built in the mid-70's. It was designed in perceptual terms by the architect, but it was evaluated in associational terms by the users, who saw the white frame and black infill elements in terms of crosses and coffins, having highly negative associations. One must ask "whose" meaning is being considered.



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Figure 1: Hertzberger's old people's home in Amsterdam. (Architectural Review, feb. 76)



The basic question, "meaning for whom", continues to distinguish Rapoport's work from most work on meaning. We must consider what meanings built environment have for the public (users) since meanings are culture-specific and thus, culturally variable.

The meaning of many environments is also generated through personalization - users taking possession of an environment and changing it. From that point of view, the meaning designed into an environment may be inappropriate, particularly if it is a single meaning. A common mistakes, for example, is the tendency to *overdesign* buildings and other environments. Over-planification tends to preclude change (typical of high-style design) while an adaptive environment (typical of vernacular design) is additive, changeable, and open-ended.

This may lead to a conclusion related to the need for underdesign rather than overdesign, which is important in terms of the ability of users to communicate particular meanings through personalization. It is important to use objects in order to transform environments so they communicate different meanings.

Two things emerge from the above:

1. Much of the meaning of the built environment has to do with personalization and *perceived control;* with decoration and movable elements rather than with fixed or architectural elements.

2. Architects have tended generally to be strongly opposed to this concept; the whole modern movement in architecture can be seen as an attack on meaning by discouraging the user's introduction of ornament, decoration and so on.

This argument can be applied strongly to housing where meaning is clearly much more central than it is in public buildings, and where the affective component can be expected to be much more significant. "In housing, giving meaning becomes particularly important because of the emotional, personal and symbolic connotation of the house and the primacy of these aspects in shaping its form as well as the important psycho-social consequences of the house (Rapoport, 1982)".

Allowing changes in the dwelling seems important in establishing and expressing priorities, in defining front/back and in indicating degrees of privacy. Too often, when flexibility and openendedness were considered by designers, it tended to be at the level of *instrumental* functions (what Rapoport calls manifest functions) rather than at the level of *expression* (latent functions). The definitions of "frameworks" could thus be based on an analysis of various forms of expression in different situations.

According to Rapoport (1982), people's images of spaces are related to a schema, to the *concept* of space. There are many ways of defining this concept, and to many of these *associational* elements are central. In that direction Hayward (1978) discovered, among young people in Manhattan, nine dimensions of "home":

- 1. Relationships with others
- 2. Social networks

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- 3. Statement of self-identity
- 4. A place for privacy and refuge

- 5. A place for stability and continuity
- 6. A personalized place

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- 7. Locus of everyday behavior and base of activity
- 8. Childhood home and place of upbringing
- 9. Shelter and physical structure

The neglect of meaning in environmental design research is beginning to change. A growing concern about perceived crowding, density, crime, or environmental quality implies the central role of subjective factors, many which are based on associations and meaning that particular aspects of environments have for people.

Perceptual and associational aspects are linked: the act of perceiving being a necessary condition for an association. Before any meaning can be derived, *cues* must be noticed; i.e. noticeable differences are a necessary condition for the derivation of meaning.

The richness of the cathedrals is an example of complexity and sensory opulence in the perceptual realm. The purpose of this manipulation of the full potential range of perceptual variables (odor, materials, scale, light and shade, sound, kinesthetic, temperature, smell, etc...) was the purpose of achieving a *meaning*, an associational goal. That goal is a vision of paradise, both in terms of the intrinsic characteristics and of the contrast with the characteristics of the surrounding urban fabric.

For instance, most architects have tended to evaluate medieval cathedrals in perceptual terms: space, light, color, structure. Yet the main significance of the cathedrals, *at the time*, was in their meaning as sacred symbols. The essential point is that historical examples should be evaluated in terms of the meanings they had for the designers and the users at the time they were built.

One important question raised by Zeisel (1981), is: "which physical elements in the environment will tend to communicate that character or image defined by particular user groups?" As stated earlier on page 6, it appears that the meaning of activities is the most important characteristic of a function; it corresponds to the symbolic aspects of objects.

Thus, even in "functionalist" terms, meaning becomes very critical...

To use an urban example, parks have important meaning in the urban environment. Their presence is significant, even if they are empty that is, not used in an instrumental sense. They often communicate meanings of positive environmental quality (of the area in which they are located). This is the reason for the importance of recreational facilities, which are desired by the majority but used by very few. While most people express a need for common public open space in residential areas, it is because these "increase the attractiveness" and "increase the space between units", thus lowering the density. In fact, they are not always so used, but they have the *latent* function of acting as social and cultural markers.

Such meanings are evaluated in terms of the purposes of settings, and how they match particular schemata related to particular lifestyles and (ultimately) culture.

THE STUDY OF MEANING

The study of meaning is now present in many disciplines:

• *In anthropology*: symbolic anthropology proposes the idea of meaning in a way that provides an effective rallying point for much that is new and exciting in anthropology. The interest, according to Broadbent et al. (1980), was mostly in the study of metaphor (language process consisting of a transfer of sense, concrete into abstract, by analogic substitution). More generally, anthropology has brought us the development of structuralism (Levi-Strauss, 1963).

• In geography: the development of phenomenology and the concept of "place" (Tuan 1974; Relph, 1976). It is proposed that the human world can be studied in terms of *signs* (which guide behavior), *affective signs* (which elicit feelings), and *symbols* (which influence thought).

• *In psychology:* the concept of affordance (Gibson, 1977) which deals with the potential use of objects and the activities they will allow.

All of these approaches are closely related to culture. But in any case, according to Rapoport (1982), the notion of meaning in terms of potential uses is rather ambiguous because it is often confused and too theoretical.

Meaning has also been approached using particular methodologies:

• *The semantic differential*: which is the most used (Osgood, 1957). This method has spawned a great number of environmental research efforts.

• *The repurinry grid:* more recent, it is related but competing. This method is mostly based on the personal construct theory (Kelly, 1955).

These methodologies are *experimental* in nature. Therefore, they limit the kind of work that can be accomplished, who can do it, and where.

Such theory clearly must be based on the broadest possible sample in space and time: on all forms of environments, in all possible cultures, in all accessible periods. Moreover, these methodologies are partly independent of particular theoretical orientations of *how* environments and meaning are related.

From a theoretical perspective, Broadbent et al. (1980) suggest that environmental meaning can be studied in at least three major ways:

1. Using linguistic models, mainly based on semiotics. These are currently the most common.

2. Relying on the study of symbols. These are the most traditional.

3. Using *non-verbal communication* models, from anthropology, psychology and ethology (the study of animal behavior). These have been the least used in studying environmental meaning.

According to Rapoport, the third approach is the simplest, the most direct, and the most immediate. These models lend themselves to observation and relatively easy interpretation of many other studies. The first two methods have some problems that often lead to difficulties in application.

1. The semiotic approach

This approach has been used a lot, and studies have been conducted since the early 70's. The International Bibliography on Semiotics (1974) provides a comprehensive index on the subject. The use of semiotics in the study of environmental meaning can be criticized mainly because:

First, there has been little apparent advance since it came into use (Broadbent et al., 1980). Another reason is that empirical research done under the semiotic approach does not really seem to relate to semiotic theory (Krampen, 1979).

Second, if everything can be a sign, then the study of signs becomes so broad as to become trivial. This approach does not deal with the complexity of meaning levels.

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While in the long run such linguistic models may prove extremely powerful and useful, at the moment their usefulness is extremely limited. One problem with semiotic analysis, and with the use of linguistic models in general, is the extremely *high level of abstraction* and the difficult and esoteric vocabulary, full of neologisms, which it has developed. As a result, designers have encountered serious problems with such approaches and have resisted grasping the important topic of meaning Clear examples of actual environments and their analysis in simple terms tend to be lacking in the application of semiotics (Broadbent et al., 1980).

Now, regarding the system, semiosis is the "process by which something functions as a sign" (Rapoport, 1982). This process contains three main components:

1. The sign vehicle (what acts as a sign),

2. the designation, designata, (to what the sign refers), and

3. the interpretant (the effect on the interpreter by virtue of which a thing is a sign).

This, however, ignores many complex and subtle arguments about index, icon, and symbol as opposed to sign, signal, and symbol and their definitions, relationships and hierarchies (Firth, 1973).

Semiotics, as the "study of the significance of elements of a structured system", can similarly be understood as having three major important components (these, in Rapoports' view, help us in understanding some of the problems with servicits). These are:

1. syntactics: the relationship of sign to sign within a system (that is, the structure of the system),

2. *semantics*: the relation of signs to things signified (that is, how signs carry meanings, the property of the elements), and

3. *pragmatics*: the relation of signs to the behavioral responses of people, their effects on those who interpret them as part of their total behavior (that is, the reference to a reality external to the system).

Cae major problem with semiotic analysis is that it has tended to concentrate on the syntactic level, which is the most abstract. Yet it is by examining which elements function in what ways in pragmatic situations, how they influence emotions, attitudes, preferences and behavior, that they can best be understood and studied.

In terms of the concern with the interpretation of how ordinary environments communicate meanings and how they affect behavior, *pragmatics*, then, would seem to be the best approach. At that level, it is the *insertion* of the elements (and their meanings) in the *context* and the *situation* that

are important. The situation and the context explain the events: it becomes important to define the situation and situational context and to realize that these are culturally defined and learned.

In linguistics itself, there has been increasing criticism of the neglect of pragmatics (Bates, 1976). The development of socio-linguistics was part of this re-evaluation, the point being that:

"The nature of any given speech event may vary depending on the nature of the participants, the social setting, the situation - in one word, the *context* " (Gumperz and Hymes, 1972; Giglioli, 1972).

2. The symbolic approach

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The symbolic approach includes structuralism, symbolic anthropology, and even cognitive anthropology. This approach has traditionally been used in the study of historical high-style architecture and vernacular environments. It suffers from an excessive degree of abstraction and complexity, stresses structure (syntactics) over context (pragmatics), but seems more approachable and more immediately useful than semiotic analysis.

This approach has been useful in those situations, mainly traditional cultures, where strong and clear schemata are expressed through the built environment. Research by Lévi-Strauss (1957) on the Bororo tribe is an example. Symbolism is central to all of this research, and the meaning often becomes apparent only through observation.

There are problems with this approach. The discussion deals with a specific problem: in nontraditional cultures such as our own it is difficult to use symbols when they are ever less shared and hence ever more idiosyncratic.

This major problem, according to Rapoport (1982), has to do with the common distinction between *signs* and *symbols*. Signs are supposed to be univocal, that is, they have a one to one correspondence to what they stand for; they have only one proper meaning. Symbols, on the other hand, are supposed to be multivocal, that is, they have a one to many correspondence and are susceptible to many meanings. This compounds the difficulty of using symbols in analyzing or designing environments in the pluralistic situations that are now typical.

Given that all human communication and behavior generally is symbolic, there is a basic question about the extent to which *symbolism* should be a separate category. Some definitions are so general that everything becomes a symbol, for example: "...any object, act, event, quality or relation which serves as a vehicle for a conception." (Geertz, 1966;5)

One point is made by the suggestion that symbols are neither signs nor something that stands for something else; rather, they are "a form of communication" (McCully, 1971,21). To say that **A** is a symbol of **B** does not help much; the *meaning* of that symbol and what elements *communicate* that meaning still remains to be discovered.

3. The communication approach

The main question raised by the communication approach addresses how unfamiliar information, mainly latent functions, is decoded. The communications approach is to accept the task to concentrate on built environments and their contents, and to try to approach the analysis in a simple and direct manner (Rapoport, 1982).

If, as stated by Schneider (1976), culture is defined as "a system of symbols and meanings that form important determinants of action and social action as a meaningful activity of human beings", it implies some generalization of understanding, that is *common codes of communication*. The question that arises is: how can we best decode this provises of communication?

In that direction, the study of nonverbal behavior has developed greatly in recent years in a number of fields, mainly in psychology and anthropology (see Rapoport, 1982). The concern has been mainly with the subtle ways in which people indicate or signal feeling states and moods, or changes in those states or moods.

For instance, studies have been made on: the face and facial expressions, the variety of body positions and postures, touch, voice, sounds, gestures proxemics, spatial arrangements, and so on. Out of these studies, it has been clearly demonstrated that people communicate *verbally and nonverbally*.

The concept of nonverbal communication in the environment, which will be discussed in detail later, can be used in at least two different ways:

1. The sense of analogy or metaphor: since environments provide nonverbal cues for behavior, it follows that they must represent a form of nonverbal behavior.

2. Nonverbal cues not only communicate, but have been shown to be very important in helping other, mainly verbal, types of communication.

There are methodological suggestions for the study of environmental meaning. 'n some research, the links between different forms of communication have been studied by observing cues and then making inferences (Ruesch and Kees, 1970). For example, one can also study the amount of information provided by getting people to interpret photographs or situations, or the situations themselves (Sanoff, 1977).

If we wish to study meaning in its full, natural context, we need to begin with the occurring phenomenon in its entirety. This relates to ethological studies. In ethology, the view is that one cannot decide *a priori* what to record and what to ignore. The first step is to describe the repertoire and the data themselves, then inform subsequent research. Both at the conceptual and methodological levels the overlap between ethology and nonverbal communication studies is very close (Sebeok, 1977).

Finally, all three approaches to the study of meaning do have a number of general characteristics in common. This comes from the fact that in any communication process, certain elements are essential (Hymes, 1964;216):

- 1. a sender (encoder)
- 2. a receiver (decoder)
- 3. a channel
- 4. a message form
- 5. a cultural code (the form of encoding)

6. a topic (the social situation of the sender, the intended receiver, the place, the intended meaning)

7. the context or scene (partly external to what is being communicated)

So far, environmental meaning has seldom been studied using nonverbal models. The emphasis has been on human interactions at the microscale (Sommer, 1969, Broadbent, 1980).

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PART TWO; CULTURE

THE NATURE OF CULTURE

Culture has been defined in hundreds of ways. Culture, as used by Spradley (1979), refers to "the acquired knowledge that people use to interpret experience and generate social behavior".

By culture, Steele (1973) means "the shared history and customs, the accumulated knowledge and common language, and the totality of products of a collection of people over time". Culture influences the norms of the immediate groups in which a person is located; it affects the development of the immediate environment through handed-down assumptions about how problems of various types should be solved. Finally, a group's culture alters the natural environment over long periods.

Anthropologists have often defined culture as the accumulation of social and technical features that have developed in a certain geophysical context.

Ethnography, on the other hand, is the work of describing a culture. The essential core of this activity aims to understand enother way of life from the native (user's) point of view. The goal of ethnography, as Malinowski put it (1922), is "to grasp the native's point of view, his relation to life, to realize his vision of *his* world".

Rather than *studying people*, ethnography means *lear*. *• 9 from people*. The essential core of ethnography is this concern with the meaning of actions and event. **•** o the people we seek to understand. Some of these meanings are directly expressed in language; many are taken for granted and communicated only indirectly through word and action.

Thus, in every society people make constant use of complex meaning systems to organize their behavior, to understand themselves and others, and to make sense out of the world in which they live. These systems of meaning constitute their culture.

By restricting the definition of culture to shared knowledge, we do not eliminate an interest in behavior, customs, objects of emotions. We have merely shifted the emphasis from these phenomena to their meaning. This concept of culture (as a system of meaningful symbols) has much in common with symbolic interactionism, a theory which seeks to explain human behavior in terms of meanings. Blumer (1969) identified three premises on which this theory rests:

• The first premise is that humans beings act toward things on the basis of the meanings that the things have for them.

• The second premise is that the meanings of such things are derived from, or arise out of, the social interaction that one has with one's fellows. Culture, as a shared system of meanings, is learned, revised, maintained, and defined in the context of people interacting.

• The third premise of symbolic interactionism is that meanings are handled in, and modified through, an interpretative process used by the person dealing with the things he encountered.

We may then see this interpretive aspect more clearly if we think of culture as a cognitive map. In the recurrent activities that make up everyday life, we refer to this map. It serves as a guide for acting and for interpreting our experience; it does not force us to follow a particular course. But rather than a rigid map that people must follow, culture is best thought of as a set of principles for creating dramas, for writing scripts and, of course, for recruiting players and audiences (Frake, 1977). This analogy refers to the theater with its stage and actors.

CULTURAL MEANING

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This section deals with a basic question of environment-behavior studies: the effect of environment on behavior.

In most cases, cues in the environment have the purpose of letting people know the kind of domain or setting in which they find themselves. In conceptual, taxonomic terms, it lets people know whether they are in front/back, private/public, men's'/women's', or high status/low status environments. In many cases the environment acts on behavior by providing cues whereby people judge or interpret the social context or situation and act accordingly. For Rapoport (1982), it is the social situation that influences peoples' behavior, but it is the physical environment that provides the cues.

People, then, typically act in accordance with their reading of environmental cues. This suggests that these settings somehow communicate expected behavior if the cues can be understood. The language used in these environmental cues must be understood; the code needs to be read.

If the code is not shared or understood, the environment does not communicate. This situation corresponds to the experience of being in an unfamiliar cultural context. Before cues can be

understood, they must be noticed. In terms of behavior in environments, situations include social occasions and their settings - who does what, where, when, how, and including or excluding whom.

For instance, Blumer's model (1969) deals with the interpretation of situations. It offers a starting point for how people interpret social situations from the environment and then adjust their behavior accordingly. Blumer speaks of *physical*, *social*, and *abstract* objects, but in the built environments these are combined and they interact. One acts, he says, toward objects in terms of the meaning they have for him. In other words, objects provide indications to people in terms of how they should act. Social organization and culture supply a specific set of behavioral options, which are used to interpret situations and to help people act appropriately.

In a sociological context, a model by Perinbanayagam(1974) is compared to the one by Blumer. It suggests that the situation (activity within an environment) is understood in terms of *dramaturgical view*. It is useful because this perspective includes a stage, hence a setting, as well as props and cues. It also combines the notion of "behavior setting" (Barker, 1968) with that of "role setting" (Goffman, 1963). With this perspective, the idea of "setting" becomes much more concrete.

Meanings are not re-constructed through interaction in each case. Once learned, they become expectations and norms. Much of culture is made up of habitual, routinized behavior that is often automatic. The automatism depends on the restrictions given by the culture. Once the rules operating in a setting are largely known, and the cues identify that setting without ambiguity, these rules then elicit appropriate meanings, appropriate definitions of the situation and, finally, appropriate behavior.

Settings need to communicate their intended nature and they must be congruent with the situation in order to elicit congruent acts. Settings can also be understood as cognitive domains made visible. This conceptualization, according to Rapoport (1982), has two consequences:

First, there are important and continuing relationships to culture and to psychological processes, such as the use of cognitive schemata and taxonomies, that tend to be neglected in the sociological literature.

Second, conflicts can easily arise in pluralistic contexts when settings may elicit different meanings and behaviors, or where groups may reject meanings, even when fully understood.

We find major differences between traditional (mainly vernacular) and contemporary environments. The congruence present in traditional cultures and environments, the rules of the environment's organization, and the sacred role of some spaces have tended to disappear. Traditional environments tended to elicit the proper behavior. Today, there are major incongruences among various cultures, and not least, between planners and designers on one hand, and the users on the other. A better understanding of this reality should enable us to design better environments.

CULTURAL INFERENCES

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People everywhere learn their culture by observing other people, listening to them, and then making *inferences*. The ethnographic research employs this same process of going beyond what is seen and heard to *infer* what people know. It involves reasoning from evidence (what we perceive) or from premises (what we assume). Children, for instance, acquire their culture by watching adults and making inferences about the cultural rules for behavior; with the acquisition of language, the learning accelerates.

In fact, human behavior, including interaction and communication, is influenced by roles, contexts, and situations that, in turn, are frequently communicated by cues in the setting making up the environment. Rapoport (1982) says that:

"Since all behavior occurs in some context, and that context is based on meaning, it follows that people behave differently in a different context by decoding the available cues for their meaning, and these cues may be in the physical environment."

Context, then, becomes an important issue for the study of meaning. The contextual logic is present in everyday experience. For instance, the same town can be seen as clean, safe or quiet, or dirty depending on whether one came from the city or a rural area.

In social psychology, subjective definitions of crowding also depend on context, so that the same number of people in the same size area are judged differently depending on the context; for example a library, an airport waiting room, a cocktail party, or something else (Desor, 1972). This is significant since upon entering a setting containing a given number of people in a given space, a judgment is made whether it is crowded or not, depending on the context.

The appropriateness of behavior and the definition of the situation, then are culturally variable.

Settings ------ communicate ----- the situation & rules that elicit the proper behavior.

This is done through *inference*, where settings are identified as stages and coherence prevails among settings, appearance, manners and behavior. The same physical space may become several different settings, housing different occasions, eliciting different behaviors according to the event. For example, the same open space may successively house a market, a soccer game, or a performance; each with appropriate behaviors.

In general, successful settings are those that successfully reduce the variance by clear cues and consistent use, which increase their predictability (Rapoport, 1982).

According to Spradley (1979), in doing field work, ethnographers make cultural inferences from three sources:

- 1. From what people say,
- 2. From the way people act, and
- 3. From the artifacts people use.

At first, each cultural inference is only a hypothesis about what people know. These hypotheses must be tested over and over again until the researcher becomes relatively certain that people share a particular system of cultural meanings. None of the sources for making inferences - speech, behavior, and artifacts - are foolproof, but together they can lead to an adequate cultural description.

Because language is the primary means for transmitting culture from one generation to the next, much of any culture is encoded in linguistic form. Spradley (1979) has focused primarily on language because it is such an essential part of all ethnographic field work, and because such a narrow focus can facilitate the task of learning about people in their built environment.

On the other hand, in the reading of the environment, the users play an active role: they interpret the cues. Since the "objective" and "subjective" definitions of situations may differ, appropriate rules and behavior may be incongruent with each other. The setting permits a variety of responses, but

constrains them as well. Once the situation is defined culturally, behavior is limited if the cues are noticed, read and understood, and if one is prepared to obey them. Environments do not determine behavior, since one can refuse to act appropriately.

This refusal to act appropriately, according to Rapoport, is a new problem that was seldom encountered in traditional cultures; in traditional contexts, people tended to respond appropriately and almost automatically.

One must say, then, that designers cannot influence this element, as they the other two. They can, however, ensure that cues are (1) *noticed and*, *once noticed*, (2) *understood*. The following figure illustrates this process:



Figure 2: Encoding/decoding of environmental information.

The grounded theory

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Much social science research has been directed toward the task of *testing* formal theories. One alternative to formal theories, and a strategy that reduces ethnocentrism, is to develop theories grounded in empirical data of cultural description. Glasser and Strauss (1967) have called this "grounded theory". Ethnography offers an excellent strategy for discovering grounded theory.

Decision-making theory, for example, could be informed by first discovering the cultural rules for decision-making in a particular organization.

A RELATIONAL THEORY OF MEANING

People everywhere order their lives in terms of what things mean. All of us make use of meanings most of the time without thinking about it. The furniture of a room has a variety of meanings. A bell rings and we know its meaning: i.e. to end a class. Meaning, in one form or another, permeates the experience of most human beings in all societies.

Symbols

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For Spradley (1979), all cultural meaning is created by the use of symbols. A symbol, according to him, is "any object or event that refers to something". Remember that all symbols involve three elements: the symbol itself, one or more referents, and a relationship between symbol and referent (Broadbent et al., 1980). This triad is the basis for all symbolic meaning

The symbolic approach, as we saw, partially answers the question about the nature of meaning. There is still a distinction between *denotation* and *connotation*. Denotative meaning involves the things words refer to (what Spradley calls referential meaning). For example *Elephant* denotes a large mammal. Connotative meaning includes all the suggestive significance of symbols, over and above their referential meaning. *Elephant* connotes many other ideas, like someone being fat or strong.

For purposes of ethnographic research, it is more useful to look at cultural meaning systems from the perspective of a relational theory of meaning. The rationale for this is that it will shift our attention away from what a particular symbol denotes and connotes to *the system of symbols that constitute a culture*.

Meaning systems

Cultural knowledge is more than a collection of symbols, whether popular terms or other kinds of symbols. It is rather an intricate patterned system of symbols.

Spradley bases his relational theory of meaning on the following premise: the meaning of any symbol

is its relationship to other symbols. For example, rather than asking "What does <u>kitchen</u> refer to?", we must examine how this symbol is related to others in the culture of the users. The meaning of <u>kitchen</u> lies in its relationship to other symbols including cleanliness, living-room, dining-room, and many others. The researcher who wants to discover the meaning of <u>kitchen</u> must find out the nature of those relationships.

Discovering the use, rather than trying to uncover the meaning itself, is the principle that leads directly to decoding the full meaning of symbols in any culture. It also applies to participant observation and the study of nonverbal symbols; watching the way people use symbolic objects instead of merely inquiring about their meaning. In this aspect, this approach relates to Rapoport's point of view by giving importance to the context of use.

In any cultures, many symbols include other symbols. Thus we can use a general term like "house" or "habitat" to refer to hundreds of specific buildings. When symbols are related by inclusion, we speak of them as categories (Spradley, 1979). Cultural symbols are then cultural categories; folk (popular) terms are simply the primary type of cultural symbol under investigation.

When symbols function as categories they serve to reduce the complexity of human experience. Without symbolic categories for everything we experience, we would become hopelessly enslaved to the particular. One of the most important functions of every human language is to provide people with ready-made categories for creating order out of the complexity of experience.

Spradley summarizes as follows the basic assertions of the relational theory of meaning:

Cultural meaning systems are encoded symbols.

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• Language is the primary symbol system that encodes cultural meaning in every society. Language can be used to talk about all other encoded symbols.

• The meaning of any symbol is, to a large extend, defined by its relationship to other symbols in a particular culture.

• The task of ethnography is to decode cultural symbols and identify the underlying coding rules. This can be accomplished by discovering the relationships among cultural symbols.

PART THREE: ENVIRONMENT

ENVIRONMENTAL MEANING

Regarding the basic dimensions of the environment, Rapoport (1982) takes three points of departure:

Nonverbal behaviors provide the context for other behaviors and are to be understood in contexts.

• Nonverbal behaviors have been studied mostly by observation and subsequent analysis and interpretation.

• The use of nonverbal models in studying environmental meaning involves looking directly at various environments and settings and observing the cues in them; identifying how they are interpreted by users.

This method refers to a set of distinctions that were first proposed by Hall (1966) in his book <u>The</u> <u>Hidden Dimension</u>. These are the *fixed-feature*, *semifixed-feature*, and *nonfixed-feature* elements.

1. Fixed-feature elements

Fixed-feature elements are those that change rarely and slowly. Most of the architectural elements (walls, ceilings and floors) belong to this category as do streets and buildings in the city. The ways in which these elements are organized; their size, location, sequence, arrangement and so on, communicate meaning. This is prevalent within the Navaho culture, for example, where it is found that the settlement pattern seems more important than the dwelling; at the same time, the latter is invested with considerable meaning and is often used to identify the group (Snyder *et al.*, 1976, 1977).

The reading of those elements varies with the culture. For instance, studies have shown that traditional African cities were often seen as disorganized by Europeans because their order reflected human relationships (social, religious, ethnic, occupational, hierarchical) rather than geometrical ones (Hull, 1976).

2. Semifixed-feature elements

Semifixed-feature elements include furniture, furnishings, plants, signs and other elements. They can change fairly quickly and easily. These also become mostly important *in* our own context, where

they tend to communicate more than fixed-feature elements. Fixed-feature elements are also under the control of codes, regulations, and the like, while semifixed-feature elements are much less controlled.

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These elements are of particular importance in studying meaning in our current environment. Often what differs in spaces that are identical in plan and construction are the contents (kind of objects), the activities, and the occupants. This shows the importance of semifixed elements, but also stresses the importance of context. It is the relationships of these objects, behaviors, and people to the setting that have meaning and that can be read.

One contemporary example, in which the semifixed elements disappeared when the event ended not only shows the meaning of space but also the significance of boundaries. It is a photograph of two Latin American Presidents, meeting in the center of a bridge crossing their border (Rapoport, 1982; from Time 1967). A graphic representation of this photograph is shown here.





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In our own culture, both in domestic and civic situations, semifixed-feature elements tend to be used extensively, and are under much greater control by the users, so they tend to be used to communicate meaning. In the case of domestic situations, we find the whole range of elements expressed through "personalization"; the use of color, materials, furnishings, shutters, mailboxes, and so on. In civic situations, we find that the same building can act as settings for various purposes, depending upon the props used. Those elements have been, according to Rapoport, largely ignored by designers and architecture historians who have stressed fixed-feature elements.

In all cases, we are dealing with latent aspects of activities (how they are done, the associated activities, and, particularly, their meaning) so that these are critical in the fit between setting and activity. Also, the research regarding this fit is often done rather simply and in straightforward ways by the observation of semifixed-feature elements and behavior.

3. Nonfixed-feature elements

Nonfixed-feature elements are related to the human occupants, their spatial relations, positions, expressions, and many nonverbal behaviors. In fact, the study of nonverbal behavior has been developed in, and almost entirely for, this domain (Rapoport, 1982). The questions commonly asked concern what is being communicated, or hidden, by such behaviors as anger, revulsion, or fear, and what role these behaviors play in an interactive sense.

THE NONVERBAL COMMUNICATION APPROACH

Regarding the culture specificity, there are three major views about nonverbal communication in the nonfixed-feature realm:

1. That it is an arbitrary, culture-specific system, similar to language. The extreme belief is that nonverbal behavior may be as culture-specific as linguistic behavior (Lloyd, 1972).

2. That it is pan-cultural, and thus very different from language (Eibl-Erbesfeld, 1979).

3. That it is both those approaches. While rejecting the linguistic approach, this is a resolution of conflicting views (Ekman, 1972).

Those three models are balanced between universality and culture-specificity. The third model suggests that in the case of facial expression, for example, there is a universal program involving facial muscles and their movements in association with states such as happiness, anger, etc. The elicitors of these, based on setting and experience, are culturally variable as are the rules of what is allowed, where and when.

It appears that as one moves from the nonfixed domain, to the semifixed, and finally fixed-feature elements, the repertoire grows and there is more variability and specificity related to culture. The tendency is to a more "languagelike" model, but one which is less arbitrary than language. Ekman's model, however, is useful because different groups may select repertoires more or less restricted in size and more or less constant in use.

At the same time, there is a constant tendency to stress differences. In most cases, a distinction or noticeable difference tends to be established between various elements; it is these that express meaning. Domains such as sacred/profane, front/back, men/women, public/private are distinguished. The process seems universal, the means variable. These differences are interesting in examining status, hierarchy and power. For one thing, they are related to social rank and position. If we examine how space and physical objects communicate rank and power, we find that height is frequently used, although this can only be understood in context.

One example is the way rank was communicated in Palaces. It appears that the Emperor of Byzantium had a throne that rose through mechanical means while those before him prostrated themselves (Canetti, 1962). Horizontal space can also be used in the same manner, as for example the French castle in which one had to travel through a series of rooms to reach the Lord.

While in all the cases the meanings described would have been immediately comprehensible due to redundancy, context and the use of natural cues, the specific reading of the meaning requires some cultural knowledge. The codes must be known in order for the meaning of the pattern underlying buildings, cities and whole countries to be understood.

The rules of combination of the codes may be limited, and there may eventually be an area of overlap between the study of environmental meaning in terms of nonverbal cues and more formal structuralist, linguistic and cognitive anthropology models. Many of these are based on the notion of oppositions, (contrasts) so that many theorists in the area argue that symbols occur in sets and that the meaning of particular symbols is to be found in the contrast with other symbols rather than in the symbol as such (Spradley, 1979; Broadbent et al., 1980). Individual symbols would then have layers of meaning that depend upon what is being contrasted with what (Leach, 1976). This notion of contrast, or opposition, seems to form part of the context.

In defining domains, and in grouping environmental elements into domains, it is necessary to judge whether, and how, elements are the same or different. Once domains are defined, and their equivalence or difference established, cues need to be used to make them visible. This is the role and purpose of the contrasts. For example, the modern movement in architecture, and all avant-garde in itself, has meaning simply by contrast with what is not avant-garde, through being identified with an elite minority. Without noticeable differences or contrasts, meaning is more difficult to read.

To end on the nonverbal communication approach, the following diagram helps us understand the different elements involved in Rapoport's model. These elements range from the elicitors (which are culturally variable) to the built environment, and finally to behavioral consequences (which are the result of comprehension).



Figure 4: The nonverbal communication model.

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THE FUNCTIONS OF SETTINGS

The most immediate physical surroundings of a person or group as they engage in specific activities are their settings. Barker (1968) used the term "Behavior Setting" to refer to a stable pattern of place and behaviors that represent a psychological milieu for a person when he is present in it.

Steele (1973) used the concept of setting in a more restricted sense as "the collection of things surrounding a person physically and providing him with immediate sensory stimuli". A setting then represents city streets, buildings, furniture, decoration, and the people who are in it.

According to Steele, the concept of setting has three levels. The first concerns the actual *things*: structures, air, light, etc. The second concerns the *properties* of those things: temperature, color, textures, configurations. The third level has to do with an implied property of the setting and its things; the *human consequences* of the arrangement and its properties. These include comfort, visibility of people to one another, moods that a place evokes, memories: in a word the meaning.

Steele proposes six basic dimensions that represent the various functions of physical settings. The first purpose of this breakdown into dimensions is to help sort out the various functions that settings play for people. The second purpose is to overcome a general tendency in organizational literature to treat the physical setting in terms like Herzberg's notion of a "hygiene" factor, that is, one that acts only as an agent contributing to or reducing morale.

FUNCTIONALITY REDEFINED

In architecture, Sullivan's dictum "Form follows Function" was developed to counterbalance the influence of the Beaux-Arts, or decorative, tradition in design. Concerned architects hoped that this movement would lead to an architecture oriented less toward sculpture for its own sake and more toward the needs of the people using it. This attempt though, according to Steele, has not resulted in a more user-oriented architecture.

There are two reasons why this attempt has failed. First, there is no elegant "one best solution" to a particular functional need. Thus, an analysis of the functions of a particular structure does not automatically provide designers with the right design.

The second, and even more limiting, reason is that designers and users have both had a relatively
meager understanding of the functions that settings play for people and a very limited vocabulary for analyzing and discussing these functions in ways that could lead to design criteria. It seems that this lack of understanding has led to little recognition that the form-follows-function guide is inadequate if several functions are provided within a given structure. Also, the design implications of these functions often conflict with one another. If one does not recognize different functions of space, it is obviously quite difficult to balance conflicts among those different functions.

THE SOCIOPHYSICAL APPROACH

Steele (1973) developed a system for categorizing the functions that immediate physical settings play for people. These categories were inspired by two main sources: Maslow's theory of basic human needs, and his own and others' observations of the activities in which people engage in different settings. The system is constituted of six functions, they are:

- Shelter and Security
- Social Contact
- Symbolic Identification
- Task Instrumentality
- Pleasure, and
- Growth

Function one: Shelter and Security

A most fundamental function of the immediate physical surroundings, is to provide shelter and security from undesirable variations in the environment. This protection corresponds to Maslow's notion about physiological and safety needs.

Concerning the physical aspects of shelter, large numbers of people live in settings that lack adequate protection. Stressful settings exist in many kinds of environments: mining, manufacturing, construction, etc. The stresses are bad weather, noise, extremes in temperature, noxious smells, and cramped quarters. The development of health and safety standards has corresponded to an interest in restructuring settings to make them more physically tolerable.

The second side of the security function is that settings should provide psychic security to its users:

a sense of not being overwhelmed by one's surroundings. In particular, overcrowding and its accompanying bombardment of sights, touches, sounds, and smells tends to disrupt important social functions and, therefore, be psychologically threatening. Crowding is in large part a psychological and social phenomenon, not an engineering phenomenon. Whether a layout seems crowded will depend on the norms and needs of the people who use it.

Goffman (1959) described a specific way in which physical settings provide psychic shelter for their users, especially for groups that are organized for some purpose. He suggests that social systems maintain stability and that members carry out their "performances" by having settings that are separated into front-stage areas, where contact with the public takes place, (i.e. the restaurant dining room) and back-stage areas, that are generally reserved for insiders only (like the kitchen). These areas, according to Goffman, provide a setting where role performers can from time to time step out of their social roles. When the setting is structured so that it is difficult to separate front and backstage areas (if customers must pass through the kitchen to get to the restrooms), the protective function is unreliable, and tensions are higher.

The word that most resembles the psychological security issue in physical settings is privacy. When people complain of not having enough privacy, they are usually saying that they have no way of controlling their relation to their social surrounding because:

- 1. They cannot control who comes into contact with them,
- they cannot prevent their conversations from being overheard, or
- 3. they cannot prevent being observed by others.

Privacy is therefore a result of having control over amount and quality of the visual and auditory cues being sent and received. To determine the appropriate amount of privacy for different people or groups, one must understand the user's style, his needs, and what he is trying to do.

Function two: Social Contact

This function deals with the extent to which physical settings facilitate or inhibit interpersonal contact. This dimension includes two aspects: first, the impact of the setting on the amount and quality of the social contacts it provides; and second, the kinds of contacts the users want and whether there is a good fit between their wishes and the actual impact of the setting. To explain these aspects, Steele looks at three properties of the setting:

- arrangements of facilities,
- · locations of people in relation to one another and to activities, and
- the amount of mobility allowed by the setting.

Arrangements of facilities

Spatial arrangements have several kinds of impact on the amount of interpersonal interaction. One influence, first identified by Osmond (1966), is the "sociopetal" and "sociofugal" aspect of settings. These are the tendency of arrangements to bring people together (as in a small waiting room of a doctor's office), or to push them apart (as in airport waiting rooms).

The arrangement of furniture in offices is an obvious area where the ideas of moveable props need to be applied. Spaces can be arranged to keep people apart or bring them together, depending on where the furnitures are placed. Occupants of offices often use their props to regulate the distance between themselves and others.

• Relative locations

On a larger scale, interaction is also affected by the relative locations of different facilities, people, and activity areas. For instance, people whose work areas are in higher contact locations than others generally have more opportunity to make social contact.

Another locational factor that influences interaction is the presence or absence of central gathering spaces; places that are not "owned" by anyone but are likely to be used by many members of a group or system. A good setting for accidental or informa! contact needs several characteristics. First, the setting must be central; people must pass through it on their way to other places. Second, there must be places to sit or rest. Third, people must be able to stop in the setting to converse or watch others without blocking the flow of traffic (e.g. the office water cooler or coffee machine).

Mobility

The last effect of settings on social contact is the extent to which physical mobility is allowed or required. In general, the more people can move around, the more likely they are to come in contact with one another.

Finally, over a certain period of time, the setting influences our experiences and makes us feel comfortable and prefer certain kinds of social contact. These preferences then influence the way we choose and structure our settings, so that the influence of the person-setting process is circular (Steele, 1973).

Function three: Symbolic Identification

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This function is concerned with the extent to which a setting provides information about the nature of the people who are connected with it. It answers the question: "What does this place tell us about the people who use or own it; about their values, goals, personal preferences, and the like?" This is the most basic form of the communication function of space, as addressed by Rapoport. As such, the emphasis is on what the setting actually tells a perceiver, not on what the owner or user intends to communicate about himself.

The most important type of symbolic identification may lie in the nature of an organization or group as a social system. For instance, all the physical facilities of a group make a statement about the nature of that social system. One choice is where to locate the setting geographically. The second major way a system communicates its identity is through the attributes of its facilities. An example is the visible difference in values between a firm that has early traditional decoration and furniture (stability, tradition, consistency) and one that uses an amalgamation of new styles (change, innovation, variety). These settings project different images to the people who enter the spaces.

Physical facilities also communicate information about the social structure of an organization, particularly about the relative status or centrality of different subunits within the system. For instance, the reception area is often more decorated than the back offices to show the visitors a good image of the company.

Accuracy of messages

Steele points out that physical settings do not always contain messages that are accurate in terms of the realities of the social system. Subordinates, he says, often are quite clear that the boss's "open door" is a symbol of free contact only in his mind, and that one had better not go through that open door too often. This phenomenon tells us that systems often shape themselves physically to describe what they wish they were, or what they used to be. The messages of a system's spaces must be tested against its actual workings.

Function four: Task Instrumentality

The focus of this function of settings is on their usefulness for the accomplishment of tasks being performed within them. The main question raised concerns the "fit" between the activities and the setting where those activities take place. In order to simplify the reading of this fit, Steele has broken down tasks into three categories of component activities:

- physical activities that take place outside people,
- interactive activities that take place between people, and
- mental activities that occur within people.
- Physical activities

There are many different physical activities that illustrate the impact of settings on work. The main attributes that affect task activities are related to the size of spaces, the materials used and the environmental conditions.

• Activities with interaction

The emphasis here is on interaction as a means to task accomplishment, rather than as an end in itself. Here again, a certain number of aspects influence task interaction; they are related to the distance between areas, interference factors which may affect contacts between people, organizational factors and the flexibility of spaces.

Individual activities

This third type of task activity is that which takes place inside the individual: thinking, concentrating, associating, remembering, and so on. The properties which influence an individual's internal activities are mostly related to physiological conditions which permit or restrict the task, the *mood* of the person, and environmental stress that can affect the task.

Function five: Pleasure

This dimension is concerned with settings as ends in themselves, that is, the extent to which they provide *pleasure* for the people who are using them. The measure of this dimension is how people

feel in a particular setting. This pleasure can take various forms, including feelings of happiness, joy, excitement, wonder, and appreciation of great beauty. These feelings are what we all know from our own life experiences. There are places we enjoy and will often go out of our way to visit or pass through, and there are places we find distasteful or unpleasant and will avoid when we can.

Steele describes three major factors that combine to determine whether a setting will be pleasurable for a person. One is the nature of the setting itself - the qualities that give its definition and character. The other two are related to the person; his past history and his current mood or internal state.

• Qualities of the setting

Qualities of the setting define how a place looks, sounds, smells and feels for the person, and are the source of the sensory stimuli. When we talk about pleasure from settings, we usually mean whether or not a person finds the particular combination of qualities aesthetically pleasing.

Personal history of past experiences

A person's biography influences the qualities which will stimulate his feelings toward a particular setting. Growing up in different cultures produces different preferences for art, music, literature, architecture, and so on. People are conditioned to like settings that match their previous experiences in particular homes and offices (Steele, 1973).

• The person's internal state

This relates to the mood and concerns of the person at a particular time. The mood operates as a filter to provide what Sommer (1969) also called "connotative meaning" to the stimuli that a person receives from his surroundings. For example, most people would get pleasure from being in a forest. However, if a person there were worried about being lost, he would probably get little satisfaction from the natural beauty of the setting. From this discussion, Steele assumes that when people have a choice;

1. They will tend not to go to those unpleasant settings,

2. they will hurry to finish what they are doing there so they can leave as soon as possible,

3. they will psychologically block out their displeasure and dissatisfaction with the setting, thus reducing their awareness of how they feel.

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Function six: Growth

This last major function of physical settings is to promote growth in the people who use them. The central question for this function is whether the setting facilitates the user's development of his potential abilities and personal qualities.

Steele describes two main factors in settings which influence the growth processes. One is the setting's physical qualities which affect perception and the opportunity for action. The other is the setting's effect on social interaction, which in turn affects the amount of support for the growth process.

Physical qualities

Many characteristics of physical settings help determine whether a person will be stimulated toward growth: diversity, visibility, changeability, and demand are the main ones.

The diversity of stimulation can ensure that the setting will trigger new perceptions, new thoughts and feelings, and new connections between previously unconnected elements. The more surprising the physical features of a setting are, the more likely we are to respond non-automatically and with an experimental attitude.

Visibility is a variable which allows people to see how things work. It is more likely to promote growth, especially in understanding the setting and the person's opportunity to use it. An example of this would be the ability to see through a clock.

Changeability is the extent to which a physical setting can be easily and quickly altered. Moveable furnitures provide a manipulable setting where people can take action to change a place and get feedback as to whether their choices were effective for what they were trying to do.

The "demand" quality is the extent to which the setting requires that something be done to it, and that some choices be made and action taken on them, in order for the setting to be used. An incomplete or inappropriate setting is more likely to promote growth in its users than a structured setting that people can "get by" with, as in our earlier reference to "overdesigned" settings.

• Social interaction

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Characteristics of settings that affect this process include the amount of contact the setting allows, the visibility of people to one another, and the messages that the setting sends out about possible new patterns of contact. The amount of contact allowed by the settings tends to either promote or block personal interaction, while the visibility of social systems tends to promote the growth of their members. Also, the messages about new possibilities provide users possible new ways of relating to one another.

Finally, to ensure growth, it is particularly important, according to Steele (1973), to be fully aware of the characteristics and the developmental history of individuals or groups for which a stimulating setting is to be designed.

CHAPTER TWO: ARCHITECTURAL PROGRAMMING

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THE NATURE OF PROGRAMMING

Programming is a word of relatively recent origin. It was extrapolated from a noun of long standing (program) by way of a verb (to program) in order to identify the process by which a program is achieved. There is perhaps more diversity in the use of the term and its meaning within the design profession than there is outside it. The more common phrases used include *architectural programming*, *functional programming*, *space programming*, *operational programming* and *facilities programming*. Generally, however, it is used in reference to the client's requirements for a facility and to the design needs of a project

The "problem" metaphor is prevalent in the literature on the design process (Peña, 1977). A client's project is discussed as a problem and the architect's design as a solution. Design is seen as a problem-solving process. Programming enters the picture with the recognition that problems are no simpler than solutions. A problem needs to be identified or defined before it can be solved. A program, then, is a problem definition or a problem statement. Programming is a way of defining comprehensively and precisely what the problem is, while designing is comprehensively and precisely solving the problem. The following figure illustrates this analogy:



Figure 5. The analogy of programming.

As we can see from the above figure, there is an interface between definition (program) and solution (design). The interdependence of the program and the design is unquestioned by architects. However, there are different approaches to the way this relationship operates in the development of design information. There are at least four approaches to the programming / designing interface: *integrated*, *segregated*, *interactive* and *integrated-interactive* (Palmer, 1981; Robinson & Weeks, 1983).

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Figure 6: Approaches to Programming and Design.

The *integrated* approach stipulates that programming should not be separated from designing. The proponents of this view state succinctly: "Programming is design". Programming is not a "predesign" service, but an integral first part of the design process. Because of this peculiar form of design, the implication is that an architect must program and that the programmer should be an architect.

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For the *segregated* approach, programming is an initial step in the design process. Therefore it should be a separate, distinct activity performed prior to starting the design. Furthermore, it is seen as preferable that separate professionals or teams (e.g. social scientists vs architects) perform the two activities.

"Programmers and designers are separate specialists because the problems of each are very complex and require two different mental capabilities: one for analysis, one for synthesis. (Peña, 1977)"

In the *interactive* approach, a design project may begin with programming or part of it. As the project proceeds, segments or versions of the program and the design are developed in alternating sequence and in response to each other. The individual feedback of programming information feeds the design, the design response feeds the program, and so on. The link between interactions is review and evaluation by the participants.

Finally, the *integrated-interactive* approach uses program and design explanation, simultaneously developing criteria and hypotheses to formulate architectural alternatives. The final outcome is a set of possible alternatives depicted both verbally and with a range of visual content. This process ends up being highly individual, often unconventional and typically far-ranging. Also, unlike Peña's statement, this view states that the design process ought not be a process of problem definition and problem solution, but a process of "problem exploration, alternative generation and evaluation" (Robinson & Weeks, 1983).

This last approach may prove to be useful in linking post-occupancy evaluation with programming, because it combines verbal and formal elements. In that manner the design process is documented and made explicit so that the program can be related to the design product or to the building. In addition to this advantage, documenting the process allows the procedure itself to be validated and examined during post-occupancy evaluation, and improved during further programming.

DEFINITIONS OF PROGRAMMING

A program is information that the designer can use. According to Palmer (1981), it is: "an organized collection of the specific information about the clients requirements which the architect needs in order to design a particular facility". This includes not only the expressed requirements of the client, but all of the human, physical and external factors which will influence the design. A program is communication. It transmits and interprets the needs of the client to the designer.

Since a program is information, programming involves developing, managing and communicating the information. Palmer defines programming as "a process of identifying and defining the design needs of a facility and communicating the requirements of the client to the designer".

Most architects, and others who program, agree that it is a process. But there is a range of opinions among them as to what constitutes this process, and where it fits within the design process. Some see it as a separate service from design, others see it as being combined with designing. The following persons have stated their approach to programming in Palmer (1981):

MICHAEL BRILL

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Buffalo Organization for Social and Technological Innovation Inc. (BOSTI)

"Architectural programming tries to describe the desired range of specific human requirements a building must satisfy in order to support and enhance the performance of human activities...The program is a document, the final output of the investigation phase of the design process. Its purpose is to predict those environmental conditions that are supportive and responsive to the user's activity patterns...Within the total process of architectural design, the program provides a critical link between the present problem and the future solution by establishing the criteria for an intervention strategy".

WALTHER MOLESKI

Environmental Research Group

"Programming is simply that part of the design process which enables the architect to identify and define the problems which must be solved, the potential effects that the solutions will have on the people who will use or come in contact with the building and the constraints that will control the design process. The program should explicitly state the objectives of each group in terms of the goals they wish to achieve, the issues that they want to resolve and the problems that they feel must be corrected.

The programming process must investigate the organizational, social and individual aspects of overt behavior. Also, the program must consider the physical, psychological, sociological and cultural attributes of the users."

WILLIAM M. PEÑA The CRS Group

"The first two steps of the total design process are distinct and separate:

(1) programming (analysis), and

(2) schematic design (synthesis).

Programming is problem seeking and design is problem solving. Programming is seeking and finding the whole problem so that the design solution may be comprehensive.

Programming is an organized process based on standard procedures which can be used on large and small projects, simple and complex building types and with single or multiple clients..."

HENRY SANOFF

School of Design, North Carolina State University

"A program is a communicable statement of intent. It is a prescription for a desired set of events influenced by local constraints and it states a set of desired conditions and the methods for achieving those conditions.

The program conveys current information on the progress of the project and its various stages of development...In sum, it is an operating procedure for systematizing the design process. It provides an organizational structure for the design team and a clear, communicable set of conditions for review by those affected by its implementation."

THE PURPOSE OF PROGRAMMING

An architect, designer or facility planner must know, at least, what type of facility the client needs, what functions it will perform, the amount of space required, the restrictions on land use and facility form, and the size of the budget. The primary purpose of programming is then to *supply the information needed for design* (Palmer, 1981).

The types and categories of information needed for any particular project vary. Programming helps

the designer organize and identify specific information needs. Frequently, not all the data are available for translation into a program, and producing the information will require a certain amount of research.

This research is sometimes necessary because of the gap that now lies between the designer of the facility and the people who will be using it. In effect, since the ancient time the distance between the two groups has enlarged, mostly in public buildings because users have increased in numbers and more professionals are taking part in design-related issues. The following figure shows the increase of distance between designer and user through history:



Figure 7: Designer-user relations at different periods in history.

Thus, the purpose of programming a project becomes investigation and analysis of project design needs. This is even more pertinent when the client does not have a clear idea of what the project goals are or should be. Questions about the facility can lead the architectural programmer into extensive data collection, projection analysis and even into nonarchitectural research such as behavioral research or technology application. It is easy to see that the objective of programming is much more than acquiring and organizing information; it often means developing and producing the information as well.

Another purpose of programming, as described, is *communication*. The program must serve the information needs of both the client and the designer. Programming enables both to understand and agree on the design goals, project needs and criteria for design. Programming helps achieve effective communication in information development and in decision making.

THE PROGRAM PARADIGM

Models, or paradigms, provide a way of understanding informations operations and their relationships and so also serve as means for organizing and presenting ideas about both. The programmer's view of design as a process often helps to establish the role of programming in that process.

In all professions there is not only a concern for the quality of the product but also a value placed on the quality of the process that produced it. In architectural design this means it is important to not only arrive at a good building design, but also continually work to improve the process for arriving at solutions. This, according to White (1972), requires an analysis of *values* and *attitudes* with respect to major design process issues even though in time they may evolve and change.

Descriptions always involve the comprising components of what we are describing and their relationships to other things we know. Our knowledge of something becomes more complete as we become aware of its relationships or view it from different standpoints. An example is knowing or describing a building. It is impossible to describe it as a whole. Only through the accumulation of specific individual aspects of the building can it be described or known (structural systems, mechanical concept, form, light pattern, geometry, response to context, etc.). In fact, even those categories are too broad to describe as wholes and would need to refer to *components* within themselves in order for an adequate description to be arrived at.

It is clear that it would require an enormous amount of time and ressources to analyse thoroughly

the components and issues of all the factors for a particular facility. For each project, the programmer must select what is relevant and important for the facility. Palmer (1981) proposed certain factors to be fundamental. According to him most programs, unless specially oriented, address three basic types of information:

HUMAN FACTORS	PHYSICAL FACTORS	EXTERNAL FACTORS
Activities	Site conditions	Legal restrictions
Objectives	Building / facility	Climate
Organization	Systems	Time
Interactions	Space	Costs
Policies	Functions	
Preferences	Circulation	
	Internal environment	
	Useful life	
	Energy use	

White (1972) describes our "view of design" as a result of our values and attitudes with respect to many individual and specific aspects or issues regarding design. The broader and more comprehensive the list of aspects to which we relate our design method, he says, the more complete will be our description and the more thorough our knowledge and awareness of our view of design.

SYSTEMATIC THINKING

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By nature, the programming process is investigative, analytical and systematic. This characterization is somewhat contrary to the inclination of designers, who tend to synthesize rather than analyze information and solve rather than define problems. The act of programming requires a different kind of discipline than the design practitioner may be used to. It involves:

- Accumulation of all pertinent facts before making judgments or decisions,
- Objective evaluation of data rather than application of data, and
- Making conclusions based on verified, project-specific facts rather than on intuition and previous experience.

However, that does not mean that intuition and previous experience are excluded from programming. In fact, they are extremely important sources of preliminary data and criteria for judging conclusions. The intuitive, creative process of designing can be enhanced greatly by conclusive programmatic data that have been tested for relevance, reliability and validity through systematic, objective and analytical means. Programming is still evolving as a process and perhaps that explains the differing viewpoints (separate from, or included with the design) on its nature and purpose.

However, programming is viewed as a decision-making process - a part of the design decisionmaking process. It enables and produces a progression of increasingly refined decisions involving the interaction of client, programmer and designer.

BEHAVIOR PROGRAMMING

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The designer's concern in behavior programming is the accommodation of people. The successful resolution of conflicts is based on a clear understanding of people's objectives and the method of establishing priorities in order to make decisions. So, the understanding of the needs and behavior of people is a prerequisite for the formulation of goals for a building program.

According to Sanoff (1977), people are goal oriented. There is a constant aiteration and modification of the environment by the people, which reflects the continual and growing need for a balance between people and the environment. When there is a lack of balance, the consequences are generally dissatisfaction or malfunction.

In the world of design today, there are increasingly more complex operations to be performed and a large body of information to be gathered. The need to program is a coherent one and arises from the following:

- The recognition of the relationship of architecture to its immediate environment,
- The need to incorporate the user as a vital ingredient toward change, and
- The multi-disciplinary nature and growing complexity of the built environment.

According to Sanoff (1977), the basic ingredient for resolving conflicts and decisions is the problemsolving process, which facilitates the development of a program. For others, the model may be less systematic, but the result is always getting information in order to gain knowledge about people's activities, perceptions or attitudes.

METHODS OF DATA COLLECTION

Several techniques are used to collect data during programming, but only a few address the behavior of the users. Aside from certain aspects of background data research, the techniques depend on various forms of user report, that is, they require people to supply data from their personal knowledge, experience and perception related to the environment being programmed. The use of those techniques is better understood by remembering that in data collection the programmer does three basic things: asking questions, observing and recording data.

Palmer (1981) gathers the various techniques used in behavior research into three groups related to the previous :

• REPORT METHODS:	- surveys - interviews - questionnaires
OBSERVATION TECHNIQUES:	- direct - participant - behavior mapping - instrumented
• ATTITUDE MEASUREMENT:	- semantic differential scale - adjective checklists - ranking charts

The techniques most suited to collecting data about people's behaviors are the *interviews*, observations and attitude measurements.

1. Interviews

This is perhaps the most common, and certainly the most direct means of obtaining detailed information for programs. Interviewing works best in one-to-one situations, but can also be used in group sessions.

The purpose of interviewing is to obtain specific data on people's attitudes, perceptions, preferences and requirements. The interview permits the programmer and the person to interact directly and immediately. The person's doubts about the meaning of interview questions can be answered and the programmer can ask for additional data or immediately clarify questionable responses. The chief drawback of the interview technique is that individual responses are subjective, or even opinionated. People sometimes give answers they believe the questioner wants to hear, or try to put a best or worst face on a situation. What people think and say about their behavior and environments may be somewhat different from the way they actually behave or respond to a setting. The subjectivity of human responses to interviews and questionnaires is one of the main reasons for using appropriate survey procedures. Following up interviews with observation techniques or checking responses against questionnaire data can verify the data obtained.

Despite some limitation on the generalizing of data, interviewing is an essential technique for programming. Interviews provide a wide variety of necessary information, such as:

- Client goals and philosophy
- Background and historical data
- Demographic and social data
- Preferences, values, attitudes and opinions
- Identification of conflicts and problems
- New ideas, personal evaluations
- Descriptive information on operations, procedures, activities, settings, etc.
- Projections of space, equipment, operational and other needs

Interviews are often used in tandem with questionnaires. Data that can be supplied in a straightforward manner can be recorded by questionnaire, while interviews are used to verify the results and explore issues not fitting a rigid format. Like the interview, questionnaires can tell the programmer what a person thinks, believes and feels about behavior and environments. Again, however, this information is based on the person's own experience and subjective understanding and should be tested against data obtained by other means.

Nevertheless, questionnaire procedures enable the programmer toquantify and measure as precisely as possible information about attitudes, such as preferences, values and feelings, and to document factual data. The questionnaire requires the respondent to focus on questions that isolate the desired information and often forces a choice among limited options. An interview, on the other hand, provides an opportunity for the client to explain an answer or the reason for a particular choice. â

2. Observation techniques

Aside from asking questions, observation is the most direct and reliable means for the programmer to get information about the way people act in their environments (see Chapter One). Through a variety of observation techniques, the programmer can learn how people use space, the effect of their surroundings on behavior, and how they act toward each other in particular settings. Observation can verify information obtained by other means and elicit new data not revealed by a previous interview or questionnaire.

Observation alone, however, is not adequate for determining user needs or requirements. It is limited to identifying only existing conditions and activities and cannot reveal, except by inference, how people feel about their environment or how they perceive it (Zeisel, 1981). It will also not indicate how the environment should be changed to better accommodate behavior or user needs. Observational data will only provide the programmer a definitive picture of what people do in a socio-physical setting and what the physical setting is.

The three data objectives of observation techniques, according to Palmer (1981), are:

- 1. Activities (kinds, frequency, duration, sequence)
- 2. Environmental settings (physical and other characteristics)
- 3. Interactions (among people and between people and environmental settings)

Also, there are three main forms of observation techniques actually used for programming:

- direct observation,
- participant observation, and
- behavior mapping.

Direct observation is merely watching people's behavior in specific environmental settings and recording what is observed. It is a matter of finding out who does what and where. Systematic observation, however, is not random recording. The behavioral data obtained by observation must be meaningful to the program and to the eventual design of the building or place.

In structured observation, the programmer is seeking to identify the patterns of behavior. The interest is focused on measuring and detailing activity, settings, interactions and relationships between people and environment.

Observation techniques are particularly useful for programming because they provide factual data on how people actually use settings. Although attitudes toward environments, perceptions and descriptions of requirements are important, actual behavior is a concrete test of environment's capacity to meet human needs. For example, studies of older suburbs by Gans (1967) were applied some years later to plan new towns in the United States. As a way of discovering and recording environmentally-significant behaviors, observation provides:

- Patterns of behavior in a setting
- Patterns of use of spaces
- Relationships among spaces
- · Influences of environment on behavior and vice versa
- Amount of space needed for particular activities
- Dysfunctions in the environment
- Characteristics of a setting
- Grouping of people
- Uses of furnishing and equipment

In *participant observation*, the observer actually takes part in the activity under investigation, joining the group or "living in" the situation in order to experience the activity or setting as do those who are actually involved in it. Anthropologist Margaret Mead, for instance, pioneered the technique in popular studies of cultural life. Architects have applied the technique in less extensive studies to get, for example, a prisoner's perspective of jail by allowing themselves to be institutionalized for a short time before starting work on a new facility design.

Behavior mapping, also referred to as Ecology Mapping (Sanoff, 1977), is a method of recording and displaying behavioral data in relation to physical settings. An observer notes activities and their frequencies on a map sketch or floor plan, which, when completed, will show the layout of behavior for a particular place at a particular time. Behavioral maps are especially helpful in programming because this kind of visual display of behavioral data can be easily translated by the designer. The data produced by mapping includes:

- Location and time of activities
- Frequency of activities in locations
- Movement of people
- Relation of people to the setting
- Influence of setting on behavior

- Recurrent patterns of behavior
- Intensity of activities
- Differences in behavior among categories of people

3. Attituáe measurements

Among the instruments used to survey what people know, think and feel about their social and physical environment and about their behavior, there is a variety of "tests" which mainly measure attitudes (Palmer, 1981). Attitude measurements are concerned with identifying and quantifying patterns of group values, feelings, perceptions, priorities, preferences and goals. They can then be measured, studied and related to other factors that influence the design of the facility.

It is important for the programmer to understand the values of the group that will use a building (Hershberger, 1985). But it may be especially important for the designer, who may discover that his or her own interests and values differ significantly from those of the facility users.

Attitude tests serve the double purpose of not only articulating and quantifying individual attitudes, but of identifying and measuring the attitudinal patterns that exist within a group of individuals.

Semantic differential is one of the most widely used tools to measure people's attitudes toward architectural concepts and features. This method of measuring meaning was developed from the work of Osgood et al. (1957). Since this test was first used, it also has been one of the most criticized. The main issue in the intellectual controversy about the method is the very aspect it is intended to measure: meaning (Broadbent et al, 1980). Meaning is such a subjective matter that researchers who use the semantic differential have been pressed by others to verify the validity of their measurements.

Some of the researchers have responded that, of course, you cannot eliminate subjectivity from meaning, but you may be able to find a consistency of subjective meaning within a specific group toward a particular object or concept. In addition, you might be able to find that the meaning pattern in one group differs significantly from the meaning pattern of another. Semantic differential does not directly identify group preferences or perceptions. These are determined by interpretations of the measurements of descriptive meanings, which are the direct product of the test. Osgood's original text on the subject, <u>The Measurement of Meaning</u>, identified three major classifications of human meanings: *evaluation* (as in good-bad), *potency or power* (as in strong-weak) and *activity* (as in fast-slow).

The rationale of the process is to limit the range of meanings that a person could use to describe an object, and at the same time allow latitude for the variations within the limits of meaning that could be expressed. By narrowing the scope of subjectivity, it is expected that individual responses can be compared, grouped and collectively measured.

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The negative aspect of this method, though, is related to the interpretation of the adjective or word. For instance, one of the common processes was the tendency of the human mind to classify the world into domains which are bipolar such as nature/culture, us/them, men/women, front/back, etc. Built environments often give physical expression to those domains. But recently the binary nature of such oppositions has been modified by the realization that frequently an important middle term (or terms) exists that mediates or resolves the opposition.



Figure 8: Semantic differential scale.

The adjective checklist is another kind of measure of user perception of an environmental setting or architectural space. It is simply a list of adjectives which individuals can use, by checking off the appropriate ones, to describe a particular object. An adjective checklist can also be arranged so that it consists of pairs of antonyms, as in the semantic differential test, allowing individuals to choose between opposite descriptors. An example from Behavioral Team is illustrated below.

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() ably run	[] enjoyable	{ } line ups	1
1 acceptable	[] essential	[] logical	
adequate	[] exciling	1) long waits	}
[] niry	[] experimental	[] luxurious	
[] ambitious	[] extravagant	[] mixed fealing	
[] anonymous	[] eyesore	[] monotonous	
[] attractive	[] fancy] needed	
() available	 far-sighted 	1) notsy	
[] beneficial	[] fast	[] novel	
[] bland	[] flashy	() open	
[] bold	[] flexible	[] over rated	
[] boring	() fragile	[] personalized	
[] bright	[] friendly	() plain	
[] brutal	() fun	[] pleasant	
[] careless	[] gaudy	[] polished	
[] cheap	[] good signs	[] poor service	
[] cheerful	[] hard	poor signs	
[] chilly	hazards	[] practical	
[] clean	[] healthy	() pretentious	
[] clever	[] helptul	[] relaxing	
() close	[] high class		
[] clumsy	[] hot	[] snie	
	[] hurded	[] scary	
[] comionable		[] second fale	
[] complex	[] at at	() smail	
[] confusing	Impersonal	[] sophisticated	
[] congested	[] important	[] spacious	
[] convenient	[] impressive	Li special	
[] coordinated	[] improvement	[] spienoid	
[] cosily	[] inadequate	[] sumulating	
[] cosy	[] memcient	[] Silliy	
[] cramped	() innovalive		
[] damageable	[] interesting		
[] dependable		[] typical	
[] desirable	[] inventive	[] unicontainty	
[] dingy		[] Universit	
	[] integritation	[] unroven	
[] durable	[] binky	f Lunrealistic	
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CHAPTER THREE: AN ETHNOGRAPHIC APPROACH

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In this chapter I will explore the combination of Steele's functions of settings with Spradley's ethnographic approach. This procedure should enable us to judge the advantages of an ethnographic research method over traditional ones to investigate meaning during programming.

Steele's sociophysical approach provides us with a "conceptual model". The ethnographic research, on the other hand, is based on the relational theory of cultural meaning (investigated in Chapter Two) and provides us with an "operational model". These approaches, according to me, may provide the architect one good approach to the inquiry of meaning in a culture.

Creating environments that are functional in that they satisfy building codes, or they "work" in terms of the flow and transactions of people is absolutely necessary but insufficient. Not only must the facilities work and be rewarding and useful for those who inhabit and use them, but they should symbolically convey an attitude about what is taking place inside. Since the built environment is conveying messages reflecting the inner life, actions, and social conceptions of the users, it becomes necessary to evaluate the meaning and desirability of existing settings.

SOURCES OF DATA FOR EVALUATION

Within the methods studied earlier, two main sources of data are used for evaluating the functions:

1. Observations

Observations are a prime source of data for the ratings of work settings. The programmer can move around and get an overall "feel" for the place, including his own responses to it. Also very helpful are patterns of use which can be observed:

- where people go freely and where they do not,
- the symbolic messages that are received while looking around,
- the extent to which flexibility in a setting is being used or not,
- where people choose to be when they have real choice, and
- who can get together and who cannot.

2. Interviews

Interviews with users are essential since the programmer's reactions to a place may differ from those of the people who have to use it all the time or whose experiences differ from his or hers. It is

especially important to get user reactions on the *security, growth* and *pleasure* dimensions, since they depend so much on the state of the individual user. The users also can direct the researcher to symbolic messages that he would not pick up, not knowing the spatial language of a particular organization or group.

A time-saver, the *touring interview* is really a combination of observation and interviews. The programmer walks around with a user and asks him to talk about what he sees and feels. The aim is to get inside the world of the user. The touring interview can be used with a very different environmental scale. The idea was first suggested by Lynch and Rivkin's (1959) "walk around the block" technique for studying how a city area affects people. The tour process can then be used for a city, a building, a floor or even an office.

CONFUSION WITH SOCIAL SCIENCE ROLES

By far the greatest barrier to a productive program is using methods that confuse the relationship between researcher and client/user, as in using traditional social science roles. The act of investigation necessarily means that the researcher and the person studied assume roles. Each person in the relationship constructs a definition of what is going on; these definitions have a profound impact on the programming process. Spradley (1979) shows that at least three roles that contrast with informant (the person studied) are used in the social sciences; they are *subject, respondent*, and *actor*.

Social science research that use *subjects* usually has a specific goal: to test hypotheses. Investigators are not primarily interested in discovering the cultural knowledge of the subjects: they seek to confirm or disconfirm specific hypotheses by studying the subject's responses. Subjects do not define what it is important for the investigator to find out; informants do. The major differences can be summarized by noting the fundamental questions asked by each approach (from Sprad'ey, 1979):

Research with subjects	Research with informants
1. What do I know about a problem that will allow me to formulate and test a hypothesis?	1. What do my informants know about their culture that I can discover?
2 What concepts can I use to test this hypothesis?	2 What concepts do my informants use to classify their experience?
3. How can I operationally define these concepts?	3. How do my informants define these concepts?
4 What scientific theory can explain the data?	4. What folk theory do my informants use to explain their experience?
5 How can I interpret the results and report them in the language of my colleagues?	5. How can I translate the cultural knowledge of my informants into a cultural description my colleagues will understand?

A *respondent* is any person who responds to a survey questionnaire or to queries presented by an investigator. Respondents may be confused with informants because both answer questions and "appear" to give information about their culture. One of the most important distinctions between the two roles has to do with the language used to formulate questions. Survey research with respondents almost always employs the language of the social scientist. Ethnographic research, on the other hand, depends more fully on the culture of the informant, and uses the informant's language.

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According to Spradley (1979), survey research has many values and it generates important information It even results in descriptions of people, but not in cultural descriptions, that is, the result of an investigation of their meaning system. Survey research, in general he says, begins with questions rather than a search for questions.

Finally, an *actor* is someone who becomes the object of observation in a natural setting. A scholar, for example, who watches a group of gorillas is studying actors; however gorillas can never become informants.

The use of observation is a good strategy for both listening to people and watching them in natural settings. Those studied thus become actors and informants at the same time; informant interviews may even be conducted casually while doing participant observation. But, for Spradley, when we merely observe behavior without also treating people as informants, their cultural knowledge may become distorted. Two persons can interpret the same event in completely different ways. The father who strikes a child may be "spanking" him as punishment or "teasing" him in play.

Ethnography adopts a particular stance toward people with whom it works. Ethnographers say "I want to understand the world from your point of view, I want to understand the meaning of your experience, to feel things as you feel them, to explain things as you explain them. Will you become my teacher and help me understand ?" (Spradley, 1979).

This frame of reference is a radical departure from treating people as either subjects, respondents or actors.

A DIAGNOSIS OF THE MEANING SYSTEM

Step one: Observing for the functions of space.

The six functions proposed are, in real life, not nearly as discrete as described in Chapter One. For instance, a setting often promotes one function because it affects another function positively. A setting that provides *pleasure* may also promote *social contact* because it draws more people to it than would a nonpleasurable one. A setting that facilitates *social contact* will often also stimulate *growth* because it makes people see similarities and differences in one another.

In some instances settings are negative on one or more dimensions while being positive on others. A house that rates high on *security* and *pleasure* can be so comfortable that it stimulates no problemsolving or experimentation, and thus is low on *growth*.

Steele proposed to diagnose the categories as follows: Particular elements of a setting are selected that are likely to influence its use. Each element may be a particular thing, such as a wall, a desk, a lighting arrangement. the color of a particular room, etc. It may also be the pattern of a set of elements, such as an arrangement of chairs, or the relative location of spaces to one another. For each of the six functions, questions are raised in considerations with their nature:

1. *Security and shelter*: Does the element provide protection from the physical and psychological stresses. Is it possible for users to withdraw when necessary, and does this element help, hinder, or not affect that process?

2. Social contact: Does the element promote, inhibit, or not relate to social contact, and for whom? Does it structure relative locations, control mobility, send signals about who ought to be interacting, and so on?

3. *Symbolic identification*: What messages does the element send about the owners or users, and about the image they want? What information is there about the system, persons in the system, and individuals?

4. *Task instrumentality*: What tasks are being done here and how does the element help or hinder in physical tasks, interactional tasks, and tasks that require isolation?

5. Pleasure: To what extent does the element provide pleasure for those who are using it? What are

the visual, auditory, olfactory, and tactile stimuli that influence a person's enjoyment? What messages does the place send that may trigger memories of past experiences that a user brings with him into the place?

6. *Growth*: To what extent does the element promote growth for the specific people who use it? What is the degree of diversity, problem-solving demand, surprise, and visible feedback about results of actions? How much does the place stimulate growth-producing contacts?

Three points should be emphasized:

• First, it is important to be specific. Any single item or combination can be studied as long as we are specific about what it is we are looking at.

• Second, we must be precise about the person or group for whom the questions are intended.

• Third, an evaluation of the functions may be different for the same person at different times.

Thereof, this first step entails to proceed with the observation of an existing environment and record data on each of the functions. The main purpose of the functions system is not to produce numerical results that are reliable, but rather to provide a qualitative repertoire through which the various functions of the setting can be sorted out and seen more clearly.

To this end, it is useful to use a simple coding sheet which allows the programmer to make entries for each function and collect data on other issues relevant to the program. A rating under the form of +, 0, or - can be used to indicate the degree to which the setting responds according to the observer. Also, the observer should try to provide as much qualitative content as possible, in order to explain the ratings. This is essential on the *Symbolic* function in order to determine what messages the setting provides and to whom. Other elements useful to the program are *activities* performed in the setting and *equipment* used.

On the following page is a proposal for a programming sheet that would incorporate such elements and would provide a useful instrument for the analysis of the conceptual model. The programming sheet includes areas for ratings and comments on the functions, blocks for activities and equipment, and blocks for pictures of the actual setting. The sheet is to be used for each of the concerned spaces of the facility being evaluated. The example of an office space is also provided on the form.





Figure 10: Functions of space programming sheet.

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Step two: Interviewing for the culture of spaces.

The second operation to conduct is to proceed with the identification of domains within each of the six functions. This procedure in identifying domains makes use of the semantic relationship as a starting point and uses interviews to inquiry each function of settings.

From a growing body of research, it appears that the number of semantic relationships in any culture is quite small, perhaps less than two dozen. In addition, certain semantic relationships appear to be universal (Spradley, 1979). These facts make semantic relationships an extremely useful tool in ethnographic analysis. Using these relational concepts, the programmer can discover most of a culture's principles for organizing symbols into domains. Domain analysis begins by using semantic relationships to discover Steele's functions.

Semantic relationships

Semantic relationships are not the most obvious part of any expression. In fact, they usually lie beneath the surface, hidden by the more apparent folk terms for things and actions. In their studies of Papago Indians, Casagrande and Hale (1967) examined different folk definitions in search of common characteristics. An important similarity was found since all the definitions linked two or more folk terms together by means of a semantic relationship. They concluded that: "a definition can be regarded as a statement of a semantic relationship between a concept being defined and one or more concepts, presumed to be known to the hearer (reader), and having properties considered relevant to the term being defined".

A number of other investigators have agreed that the number of semantic relationships is quite limited. In order to identify types, one must reduce what people actually say to a basic structure of two terms and a relationship (Spradley, 1979). Oswald Werner (1977) has suggested, for example, that many semantic relationships discovered to date can be reduced to three types:

- 1. Taxonomy or inclusion (a house is a kind of building)
- 2. Attribution (a house has rooms)
- 3. Queuing or sequence (a house goes through the stages of planning, design, construction, etc.)

The interest of this principle is the use of semantic relationships as a tool for discovering the functions. For this purpose, the use of universal semantic relationships is useful.

• Universal Semantic Relationships

Universal semantic relationships include all the general types proposed by investigators in ethnographic research. It has been proposed that these are types that occur in all human cultures (V/alker, 1965). For example, all known languages employ the relation of strict inclusion (X is a kind of Y; a kitchen is a kind of room). The programmer can then take any proposed list of universal relationships and use them to search for domains.

From his own research and working with other ethnographers, Spradley found the following proposed universal semantic relationships the most useful for analyzing semantic domains. These relationships are the basis for the investigation of the six functions of settings.

1. Strict inclusion	X is a kind of Y
2. Spatial	X is a place in Y, X is a part of Y
3. Cause-effect	X is a result of Y, X is a cause of Y
4. Rationale	X is a reason for doing Y
5. Location for action	X is a place for doing Y
6. Function	X is used for Y
7. Nieans-end	X is a way to do Y
8. Sequence	X is a step (stage) in Y
9. Attribution	X is an attribute (characteristic) of Y
	From Spradley, (1979)

Figure 11: Universal Semantic Relationships.

• Steps in domain analysis

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The following steps represent a set of tools for identifying domains, modified from Spradley (1979). Ethnographic tools make the learning process faster, more explicit, and more systematic than standard social science methods.

1. Select one of the functions. The programmer begins with the identification of one of the six functions of settings. For this example, we may stay in the office environment.

2. Select a single semantic relationship. In order to facilitate the discovery process, it is best to begin with a iniversal semantic relationship. For English-speaking informants, it is suggested to start with strict inclusion (X is a kind of Y) and means-end (X is a way to Y). The former relation focuses on nouns, the latter one on verbs.

3. *Prepare a domain analysis worksheet.* The analysis worksheet helps to visualize the structure of each domain: cover term, semantic relationship, included terms, and boundary. Each worksheet requires the programmer to enter certain information before beginning the search:

1. The semantic relationship selected,

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2. a statement of the form in which it is expressed, and

3. an example from our own culture of a sentence that has an included term, the semantic relationship, and a cover term.

1. Seman 2. Form: 3. Exam	ntic Relationship: <u>Strict Inclusion</u> X (is a kind of) Y ple: <u>An oak (is a kind of) tree</u>	
Included terms	Semantic Relationship	Cover Term
	is a kind of	
Structur	ral Questions. What are the kinds of O	ffices?

Figure 12: Domain analysis worksheet.

The first three steps in domain analysis lead directly to a set of ethnographic hypotheses. In the first example we have generated the following hypotheses about the user's culture:

1. That the user will recognize a domain (category) called kinds of offices.

2. That each of the included terms will be recognized by the person as a member of this domain (kinds of offices).

3. That this domain may have additional included terms yet to be discovered.

Hypotheses such as these must be tested. The programmer cannot assume the truth of such assertions without reviewing field notes, making observations, and checking with informants. To test these hypotheses, questions must be formulated that can either confirm or contradict them.

4. Formulate structural questions for each domain. These specific ethnographic questions enable the programmer to elicit from an informant such items as cover terms and included terms. Eventually he can discover the boundary of any particular folk domain. Structural questions are also specifically designed to test the ethnographic hypotheses that have emerged from domain analysis.

A structural question makes use of the semantic relationship of a domain and terms from either one side or the other of the semantic relationship (either the cover term or an included term). Taking the basic information from domain analysis, the programmer simply rewrites it as a question. For example, in step three we hypothesized that kinds of offices was the name of one domain. This can be rewritten as a question: "Are there different kinds of offices?" If the informant responds positively to this question, then the hypothesis is confirmed. Once confirmed, the programmer could formulate a second kind of structural question: "What are all the different kinds of offices?" This could elicit most of the included terms known to informants.

5. *Make a list of all hypothesized domains.* There are two goals of the domain analysis: to identify categories of thought and to gain a preliminary overview of the cultural scene studied. The first four steps in making a domain analysis should be repeated to all six functions of settings relevant to the program. In order to gain an overview of the cultural scene and select domains for more intensive study, the programmer should make a separate list of all the domains that have been hypothesized.

The following statements, taken from a study by Adams (1988), may reflect how people would react to each of the functions using semantic relationships questions. For each of the statements, the programmer inscribes the related semantic relationship.

1. Security and Shelter:: People wish their office...

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• was less noisy.	(attribution)
• had more privacy.	(attribution)
 did not locate noisy office equipment near their workspace. 	(function)
 would allow needed privacy at times. 	(attribution)
 had a uniform heating and cooling system. 	(attribution)
2. Social contact: People wish their office...

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• was nicer, so they could bring customers in.	(cause-effect)
had more conference rooms.	(attribution)
 was within walking distance to shops, restaurants and health clubs. 	(spatial)
 had a place to sit outside at lunch. 	(location for action)
3. Symbolic identification: People wish their office	
• was in a better neighbourhood.	(spatial)
• would create a positive professional impression on employees and visitors.	(cause-effect)
 would not necessarily look like an office. 	(attribution)
• would create a feeling that they are working for a company that cares about	it
our self-being.	(means-end)
4. Task instrumentality: People wish their office	
• had better lighting.	(attribution)
• used more computer equipment.	(means-end)
 had less glare from lighting. 	(attribution)
 did not necessitate going outside to the breakroom and mail room 	(location for action)
 would incorporate furniture, workspace and storage that is 	
appropriate for automation.	(rationale)

5. Pleasure: People wish their office...

 would incorporate lighting that creates a natural effect. 	(means-end)
• had more windows.	(attribution)
• was less noisy.	(attribution)
• had a nice cafeteria.	(attribution)
• had a view.	(attribution)
 had a better colour scheme. 	(attribution)
 had more comfortable carpet. 	(attribution)

6 Growth: People wish their office ...

 had exercise / shower facilities 	(spatial)
 was in a better neighbourhood 	(spatial)
 was accesible to window, skylights and open space. 	(attribution)

By following the steps in the domain analysis, the programmer have now identified many different domains in the "cultural scene" selected. The questions developed from domain analysis enable the programmer to unravel the meaning system of the cultural scene in its own terms. From the above example, a series of objectives could already be stated.

- Develop neighbourhood zones for each functional area to increase identity,
- Provide views to perimeter window areas,
- Reduce through trafic in order to provide intimacy,
- Improve quality of break areas,

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- Develop spaces that provide alternative places to work,
- Provide better working relationships between department's managers and support staff.

The programmer must, though, limit his investigation in some way. Specific questions can thus be asked in order to gain more knowledge on particular functions depending on the issues addressed. For example, *spatial* and *function* domains that are related to *task instrumentality* will permit to gain more knowledge on utilization of spaces while the rationale domain will provide the reason for that utilization.

In practice, the ethnographic research adopts a compromise between in-depth and surface strategies of studying the meaning systems. The programmer studies a few, selected domains in depth, while still attempting to gain a surface understanding of a cultural scene as a whole. It is important for the programmer to keep a balance between these two strategies or styles of research. Interviews and observations must range *widely* over many topics, they must also go *deeply* into particular topics. Several criteria, according to Spradley, may be choosen for selecting specific domains for in-depth analysis.

1 Informant's suggestions Suggestions by informants can give clues to specific domains that would cover specific topics. For example the impact of job status on space allocation in an office, as related to the Symbolic Identification function.

2. *Theoretical interest*. The programmer may select domains which are relevant to a theoretical framework he has given himself. For example the importance of Growth as related to patient's health in a health care facility.

3. *Strategic ethnography*. Several major problem areas in a specific culture can help guide the programmer in selecting a cultural scene for research. For example, while programming a correctional center the programmer may want to address the extent to which the jail is a dehumanizing experience for inmates.

4. Organizing domains. Sometimes a large domain pulls together the relationships of many other domains. This domain could become the main one that ties all the other information together. For example Task Instrumentality may be most important in an industrial facility.

USE OF THE FUNCTIONS FOR PROGRAMMING

From the answers to the questions, one can see that the evaluations are not an end in themselves. They provide a means for developing a view of what exists and for suggesting the directions that new alternatives might take. We can define four main purposes of the functions in helping the program.

1. Changing an organization's spaces to provide a better setting for the users. The aim of this process is to improve a setting so that it is better for the health of the system and its members. The six functions help diagnose what the present settings are providing, and thereby suggest ways in which they can be improved.

Of course, the process of improving settings need not be as elaborate as building a new facility. It may be as simple as allowing people to arrange furniture in an employee lounge in the way they wish, or replacing lighting fixtures that have made an area so unpleasant that people stay away from it whenever possible.

2. Changing physical settings to support an organization development process. In the course of organization development activities, managers become more aware of the impact physical facilities may have on whether the plans for physical changes are actually being carried out or not.

One example is the trend, during the 70's in United States and Canada, toward changing the orientation of the prison system from one of punishment to one of rehabilitation. Any attempt to shift

the institution of penology from a custodial and punishment function toward a rehabilitative function would be difficult if the physical structures are not changed in the process. In their original form, these structures strongly reinforced a degradation of the prisoner's self-image, whereas the goal of the rehabilitation is to enhance that self-image to the point where the prisoner no longer feels the need to engage in antisocial behavior.

3. Using sociophysical approaches to enhance the problem-solving ability of an organization. Spatial problem-solving is a good training ground for more general skills, because of its concreteness and visibility. Using the six functions system for diagnosis helps to take a cost-benefit approach in other problem areas, as well as helping the client make better spatial decisions.

4. Using organization development processes to facilitate physical setting changes. This means that the knowledge we have now developed about social system and processes could be put to good use in helping physical alterations to succeed. Every system must replace its facilities as they wear out or become inal equate, and attention to the change process itself will help the system ensure that the change will be one for the better.

Discussion

This chapter has proposed an alternative approach to investigate the concept of meaning during programming. As said in the introduction, the goal of this thesis was not to validate such approach, the task would have been arduous given the time allocated for thesis writing. In fact, as the reader must have concluded, the thesis raises more questions than it answers. This fact is important since programming *is* questionning.

On the other hand, the main issue of this chapter, which has been the attempt to combine a conceptual model (Steele's functions) with an operational model (Spradley's procedure), has proven to be useful. The interpretation people have of their environment has consequences for what they do in that environment and to it. The better designers understand this process, the better able they are to understand the side effects on people of decisions they make about environmental design. It is at this point left to the reader to explore its applicability to different settings; offices, housing or public spaces.

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CONCLUSION

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Implications

This thesis has proposed an investigation into the concept of meaning and its application to the process of programming. Keeping in mind that meaning is a central element of all human behavior, and that architecture "encloses" behavior, one can appreciate the importance of meaning in the built environment.

The ethnographic procedure, used with the sociophysical model, could provide a direction toward the discovery of different cultures' meaning. Hence, this could help researchers and designers to build better facilities. Architectural programming still needs to be developed, and the comprehension of how people represent their environment is a vital dimension in this development.

While using the procedure of ethnographic research and the sociophysical approach, the programmer can discover the meaning people have of their environment. This concept has powerful implications both for programming and design. For instance, it provides:

• Use of the functions of settings as a repertoire for defining the sociophysical needs of a facility.

• Use of setting types that have already been developed for specific types of facilities as a framework for analyzing a similar facility.

• Use of findings from domain and taxonomic analysis as a basis for evaluating user's representation (meaning) of a specific project.

Finally, the semantic relationships representing a building, for example, could be compared with the actual spaces of the facility. This could then provide the programmer with a set of patterns, showing how the users structure their meaning of the actual environment.

Limitations

Architectural programming, as said, involves functional, behavioral and technical dimensions. This thesis has looked solely at the way a program addresses meaning, that is, part of the behavioral realm. Programming is a holistic process, in that sense the above three dimensions are intimately linked together. Nevertheless, the successful methods for discovering meaning systems to use in programming are scarce at this point.

Efforts have been put into the development of a theoretical framework for programming and methods proper to this process. The concepts, though, were mostly borrowed from evaluative research. This framework can provide a link between programming and post-occupancy evaluation Programming, as a continuous activity throughout the building process, should benefit from data obtained in post-occupancy studies, and other evaluation activities. The proposed approach of this thesis in the inquiry of user's meaning system could be useful in providing such data.

Further research

Finally, given the increasing importance of programming and the growing body of building-related research to which architects must respond, efforts should be made to understand better the relevance of particular conceptual models, such as the ethnographic approach. In particular contexts, such as hospitals, offices or public spaces. Also, the intimate link between programming and post-occupancy evaluation could be explored from an ethnographic point of view, as representing the users' understanding toward a specific environment or setting.

As the profession becomes oriented to an attitude valuing the accumulation of knowledge, the creation and sharing of programming / design documents will permit improvement of the design process, and the accumulation of information sources benefiting the profession as a whole.

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