Center for Environmental Structure

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THEORY
ORGANIZATION
ACTIVITIES

Theory

The cities and buildings we live in today, do not meet human needs. The environment does not form an organic whole; nor does the urban life within it.

In the current practice of design, two problems are responsible for this:

1. The hundreds of social, psychological, economic and technical questions which occur in any design project, are never thoroughly answered. The schematic design phase is too short for them to be answered in any one project: yet there is no mechanism by which schematic solutions can be carried from one project to another, and so improve cumulatively and systematically over time.

2. Even if we design individual projects well, these individual projects will not function perfectly until they are coordinated with other projects. Today, the professions and agencies concerned with urban problems work independently, each designing one part of the city without any idea of how this one part relates to all the other parts.

The Environmental Pattern Language

To solve these two problems, we have introduced two concepts: the concept of an environmental pattern to solve the first problem, and the concept of an environmental pattern language to solve the second problem.

An environmental pattern is an abstract solution to a restricted design problem. It can be applied many times over, and can be improved cumulatively.

The environmental pattern language is a system which coordinates the patterns with one another. It makes certain that the solutions to various projects are properly related.

These ideas are not new. Experienced designers have always used pattern languages of their own. For example, a hospital designer has a personal vocabulary of prototypical solutions which he uses over and over again, modifying them slightly each time. He knows how the various elements of the prototype fit together; and he knows when to use which variants. The elements of the prototype are patterns; the rules which tell him how these elements fit together, form the pattern language. The patterns and the language improve as he learns from his successes and mistakes; the more hospitals he designs, the better his language becomes.

This process sounds good—in fact it has a fatal weakness. Since all the designers' languages are essentially private, the contents of these languages are never subjected to public scrutiny and criticism. This means that solutions never improve systematically over time. Worse still, because the languages are private, the solutions are inevitably uncoordinated. The environment as a whole stays bad.

Instead of individual designers producing essentially private languages, we need a public language of solutions for all environmental problems. This language would improve by a process more stringent and reliable than self-criticism and self-education, for it would be open to scrutiny by everyone involved with environmental problems. All designers would be able to draw on the insights in this pattern language. All designers would be able to contribute to it.

To make this possible, we have formalized the idea of an environmental pattern, and the idea of an environmental pattern language. The effects of the formalism are these:

1. Any aspect of the environment—whether at the scale of regional land use distribution, transportation networks, the layout of building complexes, the design of individual buildings, the design of interiors, or the details of construction—can be represented as a pattern.

2. The functional basis for each pattern is clearly stated.

3. Each pattern is readily communicable.

4. Each pattern contains a precise statement of the conditions under which it can be applied.

5. Each pattern has a format which encourages criticism and feedback.

6. Each pattern becomes a viable element in a universal pattern language.

The language coordinates these patterns. It has the following effects:

7. It accounts for the functional interdependencies among patterns.

8. It guides the process of combination, so that an individual making use of patterns knows how to put them together.

9. It indicates clearly how newly invented patterns are to be related to patterns already known, in such a way as to maintain the organic unity of the whole.

We hope that the environmental pattern language will ultimately contain hundreds of subsystems and tens of thousands of individual patterns. Every conceivable kind of building, every part of every kind of building, and every piece of the larger environment will then be specified by one or more subsystems of the environmental pattern language.

In summary: An environmental pattern language is a coordinated body of design solutions capable of generating the complete physical structure of a city. The language is designed to grow and improve continuously as a result of criticism and feedback from the field.

Organization

The Center for Environmental Structure is an independent non-profit corporation set up to create an environmental pattern language. It was incorporated in March, 1967, with the help of a starting grant from the Edgar J. Kaufmann Foundation.

The Trustees of the Center are:

The current staff members of the Center are:

Christopher Alexander
Sara Ishikawa
Roslyn Lindheim
Murray Silverstein
Sim Van der Ryn

Activities

The Center has three main activities. First, the Center will undertake contracts to develop specific patterns and systems of patterns, within the pattern language, and to design buildings and parts of cities according to the language. Second, the Center will undertake basic research concerning the pattern language. Third, the Center will publish, and distribute, the coordinated pattern language, as it evolves.

I. Design and Invention of Patterns

The Center will accept grants and undertake contracts with public agencies or private clients to develop systems of patterns. Each system of patterns will define a prototypical building type or range of building types, and will be capable of generating an infinite variety of specific buildings.

For example, the Center might contract with a federal agency to develop housing patterns for the elderly. In

this case we would specify patterns for the types of dwelling units required by elderly populations of different income and demographic makeup, the optimum distribution of these dwelling units throughout a region, their location with respect to shops, bus-stops, parks and different kinds of residential areas, the nature of their arrangement in groups, their size and shape, their internal layout, furnishings, etc.

The invention of all patterns in the pattern language will be based on thoroughgoing analysis of social and psychological problems. Whenever necessary the analysis will be corroborated by new empirical research.

The Center will also participate in contracts to produce schematic drawings for individual building projects. These schematics will be based on systems of patterns already in the language. Contracts of this type provide professional service for clients; at the same time they give us the opportunity to test the patterns which are used, to modify these patterns, to improve the coordination of the patterns, and to invent new patterns.

II. Basic Research

The Center will undertake research not paid for by contracts. This research will deal with any topics important to the development of the pattern language, including both functional questions about cities, and

theoretical questions about the language. There will be occasional seminars on these subjects, open to staff members, university students, and other interested persons.

III. Publication, Distribution and Criticism of Patterns

The pattern language will only succeed if its patterns are created by a wide cross-section of designers from many different fields, and if these patterns are open to continual criticism and improvement.

In order to achieve this aim, the stock of patterns in the pattern language will be organized in a way which closely resembles the organization of a conventional academic journal. Thus:

1. Any member of the public is free to submit original patterns for inclusion in the language.

2. Any member of the public is free to challenge the functional validity of patterns, by submitting critical papers or memoranda, reports of empirical tests and modified patterns, for inclusion in the language.

3. Patterns in the language will be identified by author.

4. A catalog containing summaries of all available patterns and critical papers will be distributed regularly.

5. People may order just those patterns from the catalog which they want to see in full.

This system has several advantages over the conventional academic journal.

1. A person pays only for those patterns which specifically interest him.

2. No pattern ever goes out of print.

3. There is no publication delay whatever.

This system of distribution does have one serious shortcoming. As ordered from the catalog, patterns are discrete atomic elements. The catalog makes no use of the fact that the patterns are tied together by a language.

As soon as possible we shall offer a service which does make full use of the pattern language. In this case the entire stock of patterns, and the language which ties them together, will be stored in a computer. If a user wants to use the language in a design project, he will be able to state the nature of his project, answer certain questions about its context, and then receive a specially created subsystem of patterns.

A user who maintains access to the computer, will always have the entire pattern language at his fingertips, in its latest stage of evolution.