

Patterns: a Guided Tour

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Re-factory

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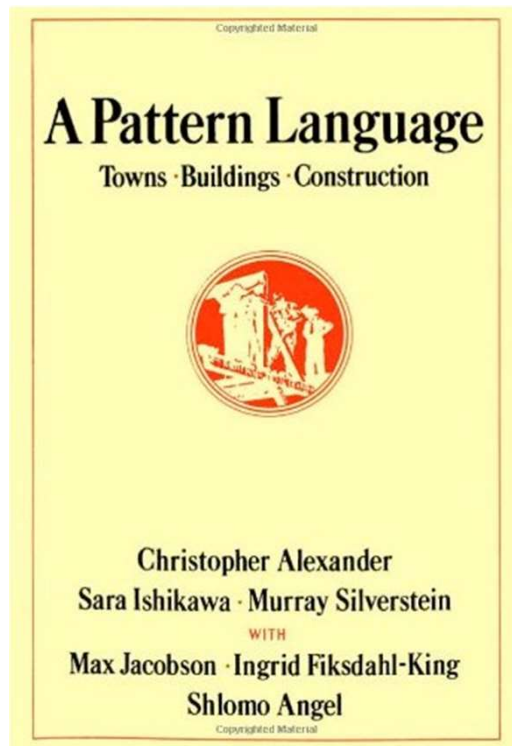


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The Refactory



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The Origins of Patterns, 1977



Christopher Alexander in this book presents a pattern language, an ordered collection of 253 patterns.

The goal was to enable non-experts to architect and design their own houses and communities.

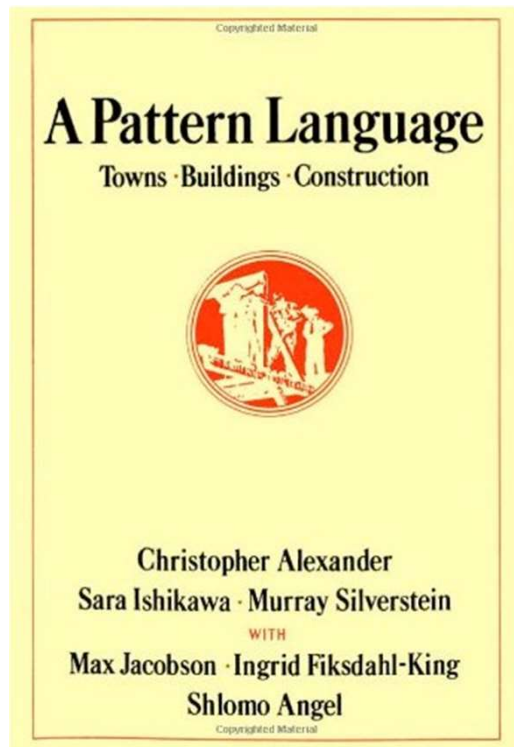
Patterns describe current practice and provide vision for the future.

Patterns integrate knowledge from diverse sources and link theory and practice.

Patterns have a strong “bottom up” orientation.

<http://c2.com/cgi/wiki?ChristopherAlexander>

253 patterns, from global to particular problems



1. Independent Regions
2. The Distribution of Towns
16. Web of Public Transportation
18. Network of Learning
20. Mini-buses
43. University as a Marketplace
83. Master and Apprentices
134. Zen View
253. Things from your life

What is a pattern?

The elements of this language are entities called patterns. Each pattern describes a **problem** which occurs over and over again in our environment, and then describes the **core of the solution** to that problem, in such a way that you can use this solution **a million times over**, without ever doing it the same way twice.

from *A Pattern Language*, Alexander et al, 1977

name

context

20 MINI-BUSES*

. . . this pattern helps complete the LOCAL TRANSPORT AREAS (11) and the WEB OF PUBLIC TRANSPORTATION (16). The local transport areas rely heavily on foot traffic, and on bikes and carts and horses. The web of public transportation relies on trains and planes and buses. Both of these patterns need a more flexible kind of public transportation to support them.

problem

❖ ❖ ❖

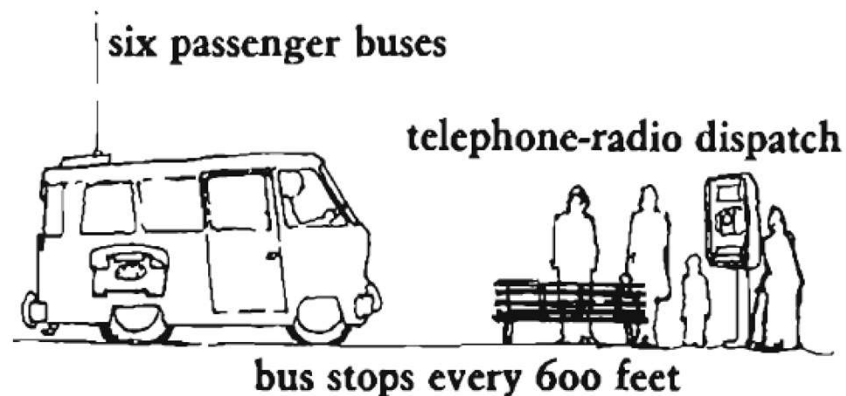
Public transportation must be able to take people from any point to any other point within the metropolitan area.

discussion

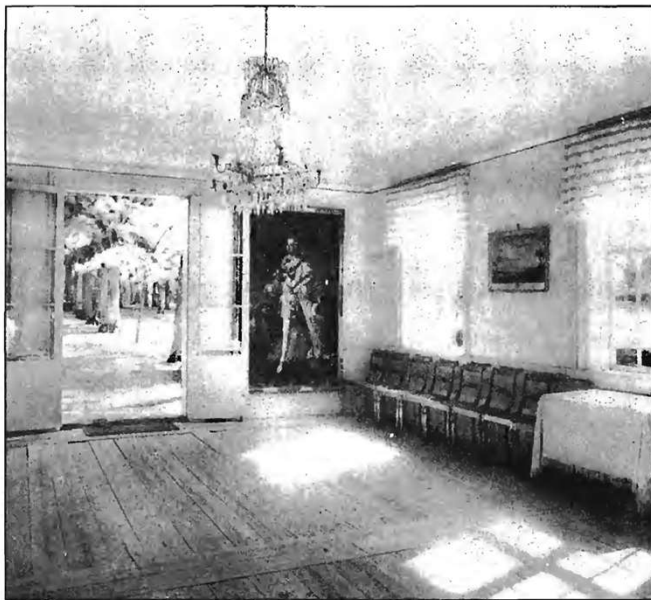
Buses and trains, which run along lines, are too far from most origins and destinations to be useful. Taxis, which can go from point to point, are too expensive.

solution

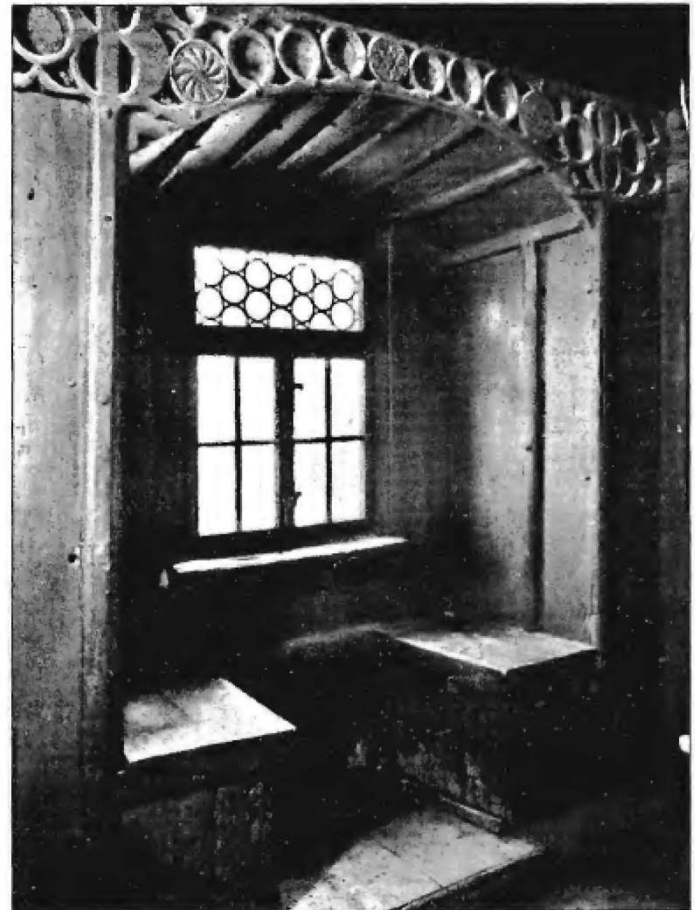
Establish a system of small taxi-like buses, carrying up to six people each, radio-controlled, on call by telephone, able to provide point-to-point service according to the passengers' needs, and supplemented by a computer system which guarantees minimum detours, and minimum waiting times. Make bus stops for the mini-buses every 600 feet in each direction, and equip these bus stops with a phone for dialing a bus.



159 LIGHT ON TWO SIDES
OF EVERY ROOM**



180 WINDOW PLACE**



251 DIFFERENT CHAIRS



253 THINGS FROM
YOUR LIFE*



So What is a Pattern?

Patterns can be thought of “**Good Practices**”

Proven Solutions to Repeating Problems

Proven Practices to Repeating Situations

Embody Experiences of What Works...

...and What Doesn't Work

Captures or Describes Knowledge of Experts

Embody “Quality” Attributes for

Solutions to specific Designs

“Patterns are an
aggressive disregard
of originality”



Brian Foote



Context

In which situations
can I use this pattern?

Problem

What does it try to solve?
What question does it answer?

Solution

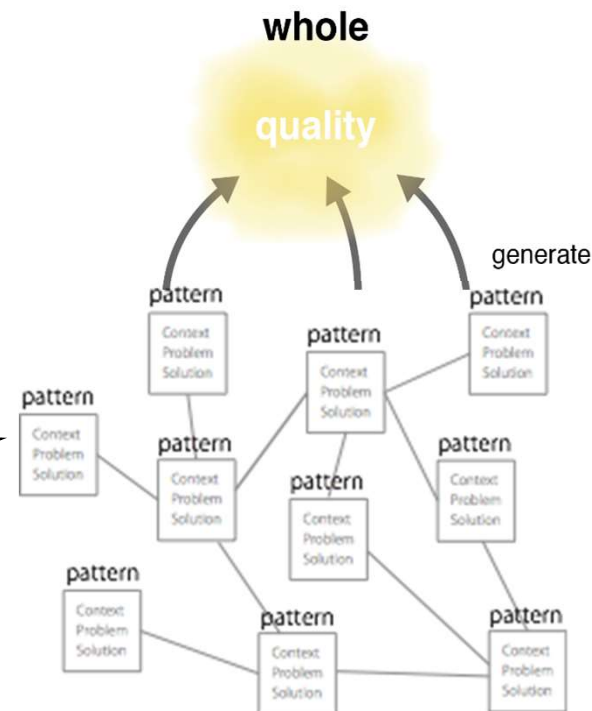
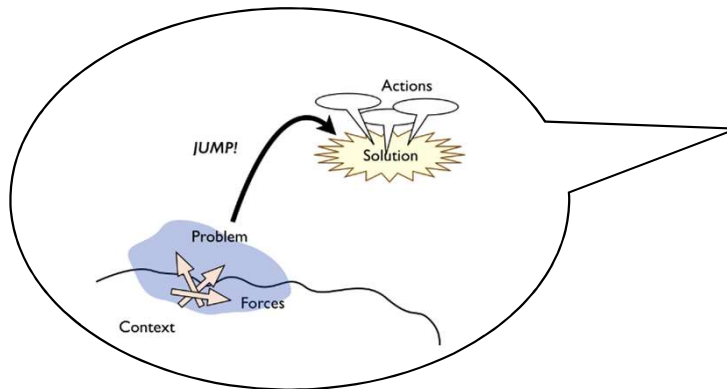
What can I do
that usually works?

Pattern Language

A pattern language consists of **patterns** that describe kinds of *problems* that frequently occur in a certain *context* and good *solutions* for them...the **language** also **includes** descriptions of the **flows** between the **patterns** and **common sequences** of use

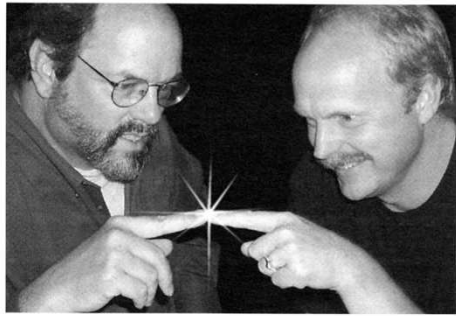
Pattern Name

vocabulary
for design



Adapted from Takashi Iba 2016

Software Patterns, 1987..1994..



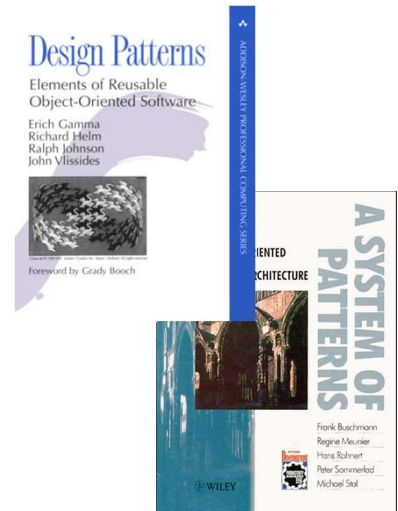
Kent Beck & Ward Cunningham, "Using Pattern Languages for Object-Oriented Program", *OOPSLA '87*, 1987.



A new software patterns discipline started by a group later called "The Hillside Group", 1993.



Erich Gamma, Richard Helm, Ralph Johnson, John Vlissides (aka Gang of Four), published the first book on "Design Patterns", the "bible", 1994.



*Pattern languages have become successful
in design in many fields today...*



From Michael Mehaffy's keynote at PURAL 2018