

# Pattern Manual for Service Systems Thinking: A proposal for discussion

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# Pattern Manual for Service Systems Thinking: A proposal for discussion

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## Abstract:

What is properly required to take the learning on generative pattern languages from the built environment and software development communities, to a world of service system thinking?

This position paper winds back to early days of Center for Environmental Studies, and presents an alternative view on the 1968 Multi-Service Center work, informed by 21<sup>st</sup> century developments in service systems science. The conventional format for a pattern language has settled into a three-part rule of relations between context, problem and solution. An alternative format of (i) voices on issues (who + what), (ii) affording value(s) (how + why), and (iii) spatio-temporal frames (where + when) is proposed, with a straw man example.

Methods from the 1985 Eishin campus project, published in 2012, are compared against practices that have become common in agile development.

The conceptual shifts from built environment to service systems thinking are expressed as (i) amplifications, (ii) rephilosophizations, and (iii) reinterpretations. The generation and legitimization of pattern languages is considered across a community, with a shift from publishing in books on paper to collaborating with online technologies such as wiki.

At the 2014 PLoP and the 2015 PURPLSOC conferences, the idea of extending the pattern language for environment structure into a new domain of service systems thinking was introduced. In 2016, this idea has been further developed as a baseline for further discussion.

**Keywords:** *service systems; systems thinking; issue-seeking; interactive value; wayfaring*

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October 2016	"Curriculum Making for Trito Learning: Wayfaring along a meshwork of systems thinking" <a href="#">[view abstract and presentation slides]</a>	David Ing	presentation at <a href="#">RSD5 Relating Systems Thinking Design</a>
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# Agenda

1. Pattern Manual 1967 + Service Systems

2. Alexandrian example → services

3. Methods clarified since 1973

4. A new format:  
amplifying, rephilosophizing,  
reinterpreting prior doxa

5. Generating and legitimizing  
in communities



# The outline of a pattern format was described at the chartering of the *Center for Environment Structure* in 1967

Every time a designer creates a pattern (or, for that matter, entertains any idea about the physical environment), he essentially goes through a three-step process.

He considers a PROBLEM, invents a PATTERN to solve the problem, and makes mental note of the range of CONTEXTS where the pattern will solve the problem. [.....]

The format says that whenever a certain **CONTEXT** exists, a certain **PROBLEM** will arise; the stated **PATTERN** will solve the **PROBLEM** and there should be provided in the **CONTEXT**.

While it is not claimed that the PATTERN specified is the only solution to the PROBLEM, it is implied that unless the PATTERN or an equivalent is provided, the PROBLEM will go unsolved (Alexander, Ishikawa, & Silverstein, 1967, pp. 1–4).

# After 2007, service systems have been recognized as the largest part of developed economies globally

A service system can be defined as "**a dynamic value-cocreation configuration of resources**, including people, organizations, shared information (language, laws, measures, methods), and technology, all connected internally and externally to other service systems by **value propositions**"

(Maglio, Vargo, Caswell, & Spohrer, 2009, p. 399).

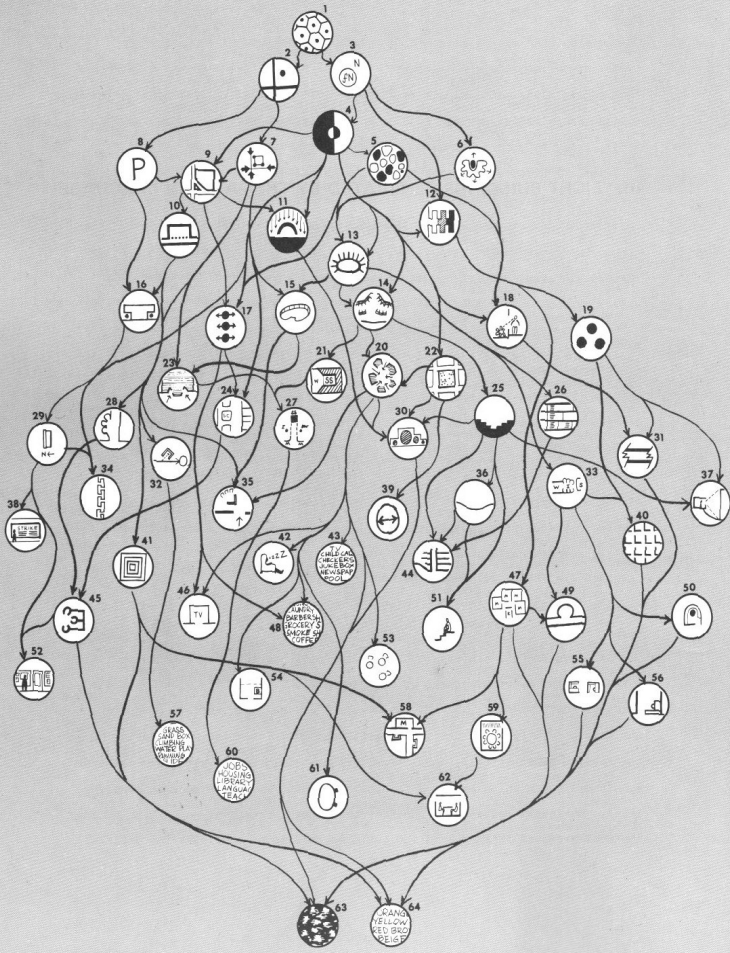
The smallest service system centers on an individual as he or she **interacts** with others, and the largest service system comprises the global economy. Cities, city departments, businesses, business departments, nations, and government agencies are all service systems.

Every service system is **both a provider and client of service** that is connected by **value propositions** in value chains, value networks, or value-creating system ....

(Maglio & Spohrer, 2008, p. 18)



# Pattern language intends to give 3 types of help



1. It gives him the opportunity to use the patterns in the way which pays full respect to the **unique features** of each special building: the local peculiarities of the community, its special needs ...
2. It tells him which patterns to consider **first**, and which ones to consider **later**. Obviously he wants to consider the **biggest ones** ... before he considers the **details**.
3. It tells him which patterns "**go together**" ... so that he knows which ones to think about at the same time, and which ones separately (Alexander et al., 1968, pp. 17–19).



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# By 1979, pattern as {context : problem : solution} is clarified as {context : system of forces : configuration}

Each pattern is a three-part rule, which expresses a relation between a certain context, a problem, and a solution (Alexander, 1979, p. 247).

We see, in summary, that every pattern we define must be formulated in the form of **a rule** which establishes a relationship between a **context**, a **system of forces** which arises in that context, and a **configuration** which allows those forces to resolve themselves in that context.

It has the following generic form:

Context → System of forces → Configuration

(Alexander 1979, p. 253)

# Excerpts from three sample patterns for Multi-Service Centers

(i) Pattern name (plus headline)	21. Self-service <b>The waiting area contains a self-service facility, where job listing, welfare rights information and other do-it-yourself services are open, without restriction, to the public.</b>	28. The intake position <b>Intake procedures are informally handled by field workers, in a lounge setting, near the major entrance.</b>	32. Child-care position <b>The child care station is visible along the path from the entrance to the services.</b>
(ii) Completions of larger patterns	14. Free waiting	7. Entrance locations 10. Open to street	7. Entrance locations 10. Open to street
	◇ ◇ ◇	◇ ◇ ◇	◇ ◇ ◇
(iii) Range of contexts (physical feature, set of conditions)	Any multi-service center.	A multi-service center with field workers (block workers, contact workers, community organisers, etc.)	A child care station in any building where mothers have prolonged business (multi-service center, supermarket, etc.)
(iv) Problem to be solved (system of forces that arises)	Most service programs today effectively perpetuate the structural asymmetry of the dole .... If service programs ever hope to break the chain of poverty, this structural asymmetry ... must be destroyed ....	Many existing centers create the feeling that people coming to the center are being processed, like cattle, by receptionists and intake workers. ... the "intake function" will be handled on an informal basis by community organisers and contact workers ...	When small children are left off at care centers they are often extremely anxious; they feel deserted ... ... create circumstances under which the child decides, of his own accord, that wants to play in the center.
(v) Solution (configuration of abstract spatial relational forces)	<b>1. The MSC contains a <i>self-service area</i>. 2. ... contains all of the basic information required by people who need help. 3. ... in both languages. 4. ... visible from all points in the waiting area. 5. ... contiguous ... with service area. 6. ... no receptionists or intake workers located at entrance ... 7. ... advice area contains at least one easily accessible assistant ...</b>	<b>... no formal intake process ... 1. ... field workers, in rotation ... in a conversation and interview area. 2. The intake area should be ... next to the main entrance(s) ... no receptionists. 3. ... should contain one or more open alcoves, at least 7 feet in diameter, and furnished with comfortable seats.</b>	<b>The child care station should be on the path from the building entrance to the place of business, and visible from this path; and ... it looks into the child care station for roughly 20 feet along its length.</b>
	◇ ◇ ◇	◇ ◇ ◇	◇ ◇ ◇
(vi) Completions to smaller patterns	27. Self-service progression	43. Sleeping OK	57. Child care contents



# Alexandrian format and pattern #32 for Multi-Service Centers

(i) Pattern name (plus headline)	32. Child-care position <b>The child care station is visible along the path from the entrance to the services.</b>
(ii) Completions of larger patterns	7. Entrance locations 10. Open to street  ◇ ◇ ◇
(iii) Range of contexts (physical feature, set of conditions)	A child care station in any building where mothers have prolonged business (multi-service center, supermarket, etc.)
(iv) Problem to be solved (system of forces that arises)	When small children are left off at care centers they are often extremely anxious; they feel deserted ... ... create circumstances under which the child decides, of his own accord, that wants to play in the center.
(v) Solution (configuration of abstract spatial relational forces)	<b>The child care station should be on the path from the building entrance to the place of business, and visible from this path; and ... it looks into the child care station for roughly 20 feet along its length.</b>  ◇ ◇ ◇
(vi) Completions to smaller patterns	57. Child care contents

# Try voices on issues, affording value(s), spatio-temporal frames

(i) Pattern label	Tapping into the grapevine	Signing in for services	Minding children
	◇ ◇ ◇	◇ ◇ ◇	◇ ◇ ◇
(ii) Voices on issues (who and what)	(a) For a client, what jobs and training are available? (b) For a neighbour, in what ways can we share and update community news?	(a) For a client, what services are available to me, now and on appointment? (b) For a parent, what do I do with my kids while I'm busy? (c) For a child, what can I do while my parent is at the MSC?	
(iii) Affording value(s) (how and why)	Displaying up-to-date news and local information, so that individuals can know ways to independently act. Adding, revising and moderating community contributions so that individual and authoritative viewpoints are balanced.	Matching client needs with MSC resources, so that holistic treatments are received. Triaging and scheduling so that urgent cases are prioritized, and wait times are tolerable	Leaving a child at a supervised play area so that whereabouts are known. Availing distractions for toddlers through teens, so that coming with parents is less of a chore
(iv) Spatio-temporal frames (where and when)	Access to information onsite MSC for clients who don't have devices, and on the open Internet for the public	On demand lookups of trending and prior MSC busy and slow periods transparently visible onsite and on the Internet, enabling clients to adjust and/or rebook	Facilities and programs are known both to children and parents in advance of appointments
	◇ ◇ ◇	◇ ◇ ◇	◇ ◇ ◇
(v) Containing systems (slower and larger)	For municipal, regional and national agencies, are community health and social services in their jurisdictions well provide?		For extended family, schools and community workers, what personal responsibilities inhibit service engagement?
(vi) Contained systems (faster and smaller)	For neighbours in mutual support, friends and family ties, who should know about news?	For friends or assistants speaking on behalf or interpreting for a client, is the situation understood?	For other parents at the MSC at the same time, would you look after my kids like I look after yours?



# Proposed service systems thinking pattern format, minding children

(i) Pattern label	Minding children
	◇ ◇ ◇
(ii) Voices on issues (who and what)	<p>(a) For a client, what services are available to me, now and on appointment?</p> <p>(b) For a parent, what do I do with my kids while I'm busy?</p> <p>(c) For a child, what can I do while my parent is at the MSC?</p>
(iii) Affording value(s) (how and why)	<p>Leaving a child at a supervised play area so that whereabouts are known.</p> <p>Availing distractions for toddlers through teens, so that coming with parents is less of a chore</p>
(iv) Spatio-temporal frames (where and when)	Facilities and programs are known both to children and parents in advance of appointments
	◇ ◇ ◇
(v) Containing systems (slower and larger)	For extended family, schools and community workers, what personal responsibilities inhibit service engagement?
(vi) Contained systems (faster and smaller)	For other parents at the MSC at the same time, would you look after my kids like I look after yours?

# Alexandrian format mapped to proposed service systems thinking

Alexandrian format (for production systems)		Proposed format for service systems thinking	
(i) Pattern name (plus headline)	A place or spatial feature, phrased as noun or adjective-noun, headlined with essence of the problem	(i) Pattern label	An interaction phrased as a present participle
(ii) Completions of larger patterns	Introductory context for the pattern, explaining how it helps to to complete certain larger patterns.	(v) Containing systems (slower and larger)	Constraining conditions in which the pattern operates, potentially where multi-issue messes are dissolved
	◇◇◇		
(iii) Range of contexts (physical feature, set of conditions)	Where this pattern is applicable, the range in which the system of forces can be brought into balance with physical relationships.	(iv) Spatio-temporal frames (where and when)	Occasions at which dwelling in issues and affordances are salient and at hand
(iv) Problem to be solved (system of forces)	Empirical background, evidence for validity, range of ways the pattern can be manifested.	(ii) Voices on issues (who and what)	Archetypal roles of stakeholders, with concerns and interests posed as questions
(v) Solution (configuration of forces)	<b>The field of physical and social relationships which are required to solve the stated problem in the stated context.</b>	(iii) Affording value(s) (how and why)	Objects and/or events that enable modes of practised capacities for independent or mutual action
	◇◇◇		
(vi) Completions to smaller patterns	Ties from pattern to smaller patterns in the language	(vi) Contained systems (faster and smaller)	Opportunistic conditions which the pattern contains, potentially allowing ad hoc resolving of a specific issue at hand



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# Alexandrian methods -- pattern language, budget, reality of the land

## Alexandrian methods for built environments

(i) Pattern language for the community

- (a) Interviewing on hopes and dreams
- (b) Making a first sketch of a pattern languages
- (c) Making a first draft pattern language from teachers' comments
- (d) Checking seven principles for completeness of the languages
- (e) Refining the language
- (f) Creating pattern language as a list of key centers

(ii) Construction budget

- (a) Making a record of all of the spaces and areas which were defined by the pattern languages
- (b) Trimming all space to available budget, as an average percentage reduction for all items of interior space, and then exterior space
- (c) Asking faculty to re-allocate the spaces, keeping the same trimmed totals, conforming with the available resources

(iii) Reality of the land

- (a) Laying out the site plan on the ground
- (b) Finding the two fundamental systems of centers, and combine them
- (c) Visualizing the evolving site plan with marks on the land (e.g. flags)
- (d) Fixing first hardline drawings of detailed positions on the site (position, orientation, dimension)
- (e) Judging detailed building positions on the land (with flags)
- (f) Recording the site plan on paper



# Agile methods – user stories, scoping, reviewing iteratively

Agile methods originating from software development (e.g. scrum)

(i) Writing user stories (with Behavior Driven Development)

- (a) Card (new capability on front side):  
As a [role], I want to [action/function] so that [value]
- (b) Conversation:  
Details as conditions of satisfaction (represented by product owner)
- (c) Confirmation (acceptance tests, on back side):  
Given [some initial context], when [an event occurs], then [ensure some outcomes]

(ii) Scoping; estimating value, costs and dates

- (a) Scoping projects (i.e. portfolio, solutions, releases)
- (b) Estimating size (e.g. story points), derive duration (aggregating into themes, splitting epics)
- (c) Identifying risks (e.g. technical, organizational, delivery)

(iii) Reviewing iteratively; tracking work item backlogs

- (a) Demonstrating iterations to stakeholders, conducting retrospective reviews
- (b) Tracking sprint velocity (though kanban, backlog, burn-down)
- (c) Coordinating daily for blockers (e.g. Scrum stand-up)

# From System-B to System-A, c.f. from waterfall to agile

From System-B to System-A		From waterfall methods to agile	
(i) Pattern language for the community	From preprogrammed assembly to local adaptation with feedback and correction	(i) Writing user stories	From detailing specifications to conversing on narratives
(ii) Construction budget	From overemphasizing tangible aspects to negotiating collective feelings	(ii) Scoping; estimating value, costs and dates	From projecting and committing to converging on estimates
(iii) Reality of the land	From drawing abstract layout plans to adjusting the wholeness on the real site	(iii) Reviewing iteratively; tracking work item backlogs	From dividing-and-conquering to collaborating for learning



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# Amplifications from Alexandrian to service systems thinking

1. Shared meaning on the situated

The pattern is merely a mental image, which can help to predict those situations where forces will be in harmony, and those in which they won't. But the actual forces which will occur in a real situation, although objectively present there, are, in the end unpredictable, because each situation is so complex, and forces may grow, or die, according to subtle variations of circumstance (Alexander, 1979, pp. 285–286).

2. Systems thinking and complexity

## Systems generating systems

1. There are two ideas hidden in the word system: the **idea of a system as a whole** and the idea of a **generating system**.
2. A **system as a whole** is not an object but a way of looking at an object. It focuses on some holistic property which can only be understood as a product of interaction among parts.
3. A **generating system** is not a view of a single thing. It is a kit of parts, with rules about the way these parts may be combined.
4. Almost every 'system as a whole' is generated by a 'generating system'. If we wish to make things which function as 'wholes' we shall have to invent generating systems to create them.

In a properly functioning building, the building and the people in it together form a whole: a social, human whole. The building systems which have so far been created do not in this sense generate wholes at all (Alexander, 1968, p. 605).

3. Method content + development process

Volume 1, The Timeless Way of Building [TWB], and Volume 2, A Pattern Language [APL], are two halves of a single work. This book [APL] provides a language, for building and planning; the other book [TWB] provides the theory and instructions for the use of the language. This book [APL] describes the detailed patterns for towns and neighbourhoods, houses, gardens and rooms. The other book [TWB] explains the discipline which makes it possible to use these patterns to create a building or a town. This book [APL] is the sourcebook of the timeless way; the other [TWB] is its practice and its origin (Alexander et al., 1977, p. ix).



# Rephilosophizations from Alexandrian to service systems thinking

1.	From structuralism to alternative stable states	<ul style="list-style-type: none"><li>• Criticism of teleology</li><li>• Three types of change in biological evolution: (i) environmental change; (ii) somatic (cellular) change; and (iii) genotypic change (Bateson 1963)</li><li>• Teleonomic processes through closed programs or open programs</li><li>• Regime shifts (ecosystem ecology, community ecology)</li></ul>
2.	From dwelling to journeying	<ul style="list-style-type: none"><li>• Being served over a period of time (a journey) rather than in a moment of time (dwelling)?</li><li>• Heidegger world-time and time-as-ordinarily-conceived</li><li>• Places existing not in space, but as nodes in a matrix of movement (Ingold 2000)</li></ul>
3.	From semi-lattice to meshwork	<ul style="list-style-type: none"><li>• "A City is Not a Tree" focuses on physical invariants</li><li>• Social relations with movement and time (e.g. gaining and losing friends)</li><li>• Each person not as a point, but as a line (Ingold 2011)</li><li>• Meshworks as trails of movements or growth</li></ul>

# Reinterpretations from Alexandrian to service systems thinking

1.	From problem-solving to issue-seeking	<ul style="list-style-type: none"><li>• Design is problem-solving; [architectural] programming is problem-seeking (Peña &amp; Focke, 1969, p. 4).</li><li>• Issues-based approach appreciating how values influence and impact defining problems (Rittel &amp; Webber, 1973, p. 159).</li><li>• Problem Structuring Methods (e.g. Soft Systems Methodology, Strategic Choice Approach, Strategic Options Development and Analysis)</li></ul>
2.	From quality-wholeness to interactive value	<ul style="list-style-type: none"><li>• "Quality without a name" – "an objective quality that things ... can possess that makes them good places or beautiful places. (Gabriel 1996)</li><li>• 15 geometric invariants, mutually-reinforcing centers</li><li>• Services separating value from the outcome</li><li>• Interactive value: enjoyment takes place over time</li><li>• Outcomes of service systems: use-value, exchange value</li></ul>
3.	From anti-patterns to wayfaring	<ul style="list-style-type: none"><li>• Dead patterns leak out, infect other patterns (Alexander 1979)</li><li>• Anti-patterns as non-solutions; to be coupled with patterns in pairs (towards problem-solving)</li><li>• Wayfaring more equivalent to piecemeal growth (than transport from origin to destination)</li></ul>



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# Pattern manual as an initial position for a community of practice

## A Pattern Language

- The original 253 patterns in effect became frozen in time
- The publisher has not released the content of the patterns into the public domain
- A severe constraint on the further use, modification and addition to pattern languages (Cunningham & Mehaffy, 2013, p. 6)

→

- Federated wiki?

## *The design of inquiring systems*

<i>Way of knowing</i>	<i>Inquiring System</i>	<i>Philosopher</i>
First	Inductive Consensual (agreement)	John Locke
Second	Analytic Deductive (fact nets)	Gotfried Wilhelm Leibniz
Third	Multiple Realities (representations)	Immanuel Kant
Fourth	Dialectic (conflict)	Georg Wilhelm Friedrich Hegel
Fifth	Systems Approach (progress, sweeping in)	Edgar Arthur Singer; C. West Churchman



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