Representing Generative Wholeness with Pattern Language

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Are there features in alternative advanced technological media that might enable or disable the generation of **wholeness** (also known as **life** in *The Nature of Order*, and **quality without a name** in *The Timeless Way of Building*)?

These seminal books of Christopher Alexander were released only in the 19th century sequential medium of paper.

In 1995, Ward Cunningham invented the C2 wiki to allow the pages of the Portland Pattern Repository to be interlinked on the web and enable collaborative editing on the Internet.

For PLoP 2018, David Ing had proposed a focus session on tools (and mediating technologies) through which pattern language is represented, that could inhibit authors from aspiring to systemic pursuits, as well as discouraging the community from easily sharing collective learning.

On this theme, that focus session could be seen as only one of multiple parallel streams of interaction at PLoP 2018 (and the shared sessions with PUARL 2018). Reframing the knowledge gained more inclusively enlarges a retrospective that sequences the schedule of other collaborative pattern language works discussed, i.e.:

(1) "The Online Learning System Pattern Repository" lightning talk by Peter Scupelli and Paul Inventado;
(2) "Representing Generate Wholeness with Pattern Language" focus session led by David Ing;
(3) "A Pattern Language Canvas for Real Time Innovation" focus session led by Wolfgang Stark;
(4) "Future of Pattern Language World Cafe", hosted by Tree Bressen, Doug Schuler and Tom Atlee; and
(5) "A Pattern Language for Rapid Urbanization: Launching a Digital Pattern Language Repository" plenary with Ward Cunningham, Michael Mehaffy and Yodan Rofe.

With the benefit of hindsight and reflection, some initial findings on the current state of technologically-mediated pattern language sharing can drawn across three days of meetings, as a milestone for future explorations.

Categories and Subject Descriptors: H.1.1 [**Models and Principles**]: Systems and Information Theory—*General Systems Theory*; J.4 [**Social and Behavioral Sciences**] Economics, Psychology, Sociology; K.4.3 [**Computers and Society**] Computer-supported cooperative work

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1. INTRODUCTION

Christopher Alexander challenges pattern developers to ask whether "a particular set of patterns, *taken as a system*" will generate a coherent whole. The pattern language should be more than just a "good way of exchanging fragmentary, atomic ideas" and should enable evidence of improvement along two dimensions: "(1) the moral capacity to produce a living structure and (2) the generativity of the thing, its capability of producing coherent wholes" [Alexander 1999, p. 75].

Further, the development of a pattern language can be seen as a form of knowledge work. The books published by the Center for Environment Structure in the 1970s were developed as a hardcopy manuscript by a team in close physical proximity, face-to-face in Berkeley. Since the rise of the Internet and Computer-Supported Cooperative Work, knowledge work largely takes place in mediating spaces, with social interaction enabled by informatic spaces [Ing and Simmonds 2002] .

At PLoP 2018, five conference sessions covered collaborations on pattern languages, either directly or indirectly. In sequence, they were:

—October 24 15:30, "The Online Learning System Pattern Repository" lightning talk by Peter Scupelli and Paul Inventado;

—October 24 17:30, "Representing Generate Wholeness with Pattern Language" focus session led by David Ing;

—October 25 15:30, "A Pattern Language Canvas for Real Time Innovation" focus session led by Wolfgang Stark;

—October 26 09:30, "Future of Pattern Language World Cafe", hosted by Tree Bressen, Doug Schuler and Tom Atlee; and

—October 26 16:20, "A Pattern Language for Rapid Urbanization: Launching a Digital Pattern Language Repository" plenary with Ward Cunningham, Michael Mehaffy and Yodan Rofe.

With many concurrent activities scheduled in parallel at the conference, attendees may not have been present at all of the sessions. Briefly, some online references and cited works can give a general sense of the domains in discussion.

1.1 Scupelli-Inventado lightning talk

The *Open Pattern Repository for Online Learning Systems* is at `https://www.learningenvironmentslab.org/openpatternrepository/` . This project was identified as a challenge at a focus group at PLoP 2015, and a progress report has been filed in the Europlop 2017 proceedings.

> The repository currently contains 669 design patterns. Out of all patterns in the repository, 170 contain the full text, 460 contain patlets, while the rest are aliases to existing patterns. [....]
> The three major themes that emerged during the focus group discussion were navigation, pattern formats, and community support. [Inventado and Scupelli 2017]

The *Open Pattern Repository* is "powered by Mediawiki", which is the technology originally developed for Wikipedia, and supported by the Wikipedia Foundation.

1.2 Ing focus session

This focus session was scheduled in parallel with activities with the following abstract:

> Are there features in alternative advanced technological media that might enable or disable the generation of wholeness (also known as "life" in The Nature of Order, and "quality without a name" in The Timeless Way of Building)? The seminal books of Christopher Alexander have been published only in the 19th century sequential medium of paper. In 1995, Ward Cunningham invented the C2 wiki to allow the pages of the Portland Pattern Repository to be interlinked on the web and enable collaborative editing on the Internet.

The thesis of this workshop is that tools (and media) through which pattern language is represented may inhibit authors from aspiring to systemic pursuits, as well as discouraging the community from easily sharing collective learning. The workshop will be conducted as a participatory session, with an intent to summarize findings for the proceedings. The workshop will be organized as three steps:
—Formulating the Mess
—Typifying Affording Values
—Programming for a Living Meshwork
The workshop group may choose to converge on a single approach, or diverge and experiment. Progress is likelier if activity occurs more frequently than an annual meeting, so we will be looking at planning for more frequent discussions as well. [Ing 2018]

This session was lightly attended, by a few pattern language practitioners whose authorship was conducted primarily as independent writers. Opening up the context for the focus session, questions surfaced on (i) the privileges of authorship for recognition; (ii) legalities of copyright and Creative Commons licensing; and (iii) potential issues with maintaining and revising a pattern language that evolves with cocreators who may come and go.

1.3   Stark focus session

This focus session is part of a cooperation project in Germany, describing "Real Time Innovation" at `https://www.sce.de/en/realtimeinnovation.html` . At PLoP 2018, participants were given the opportunity to try out a card deck that was being finalized for release. The session abstract read:

Real-Time Innovation processes deal with collaborative approaches for innovation in unpredictable environments – a growing challenge and demand in many industries and for modern societies. Real Time Innovation processes do not require only expert knowledge but rely heavily on implicit and tacit knowing and an intuitive and entrepreneurial mindset.
In a series of interviews with innovative entrepreneurs and innovation experts in Germany we tried to detect patterns of implicit knowing for successful innovation processes. Based on this, we developed both a pattern language for real time innovation processes representing the implicit and tacit knowing for innovation, and a dynamic flow-chart which represents a process-oriented model canvas for innovation. The combination of explicit, expert-based knowledge (flow-chart) and implicit/tacit knowing (patterns) can be applied as an innovative planning and assessment tool for intrapreneurial innovation inside companies and entrepreneurial networks both in business and society.
In the Focus Group, we would like to test a beta-version of the pattern-based innovation tool on Real Time Innovation with participants and evaluate the tool in order to develop a digitalized version of the pattern language for Real Time Innovation. Outcome: Learn and test an innovative approach on Real Time Innovation based on patterns. [Ing 2018]

This session attracted about a dozen people. Individuals were invited to select some cards that they felt spoke to them, and then combined as groups to discuss how these ideas might collectively fit together towards an innovation agenda.

1.4   Bressen-Schuler-Atlee World Cafe

The last day of the PLoP conference on October 26 coincided with the first day of the PUARL conference. After a joint opening session for PUARL-PLoP-PURPLSOC, a World Cafe on "The Future of Pattern Language" was convened as a plenary session. Wolfgang Stark asked participants to focus on questions about (i) "what is important about the pattern language approach"; (ii) what does it matter; and (iii) how can we incorporate into collaborative efforts? As conversation starters, a mix of randomly selected samples from three card decks were available on the tables.

—The Group Words Card Deck `https://groupworksdeck.org/deck` team was represented by Tree Bressen, who served as the overall facilitator for the World Cafe.

—The Liberating Voices Pattern Cards `https://www.publicsphereproject.org/news` were provided by Doug Schuler.

—The Wise Democracy Pattern Language Card Deck `https://www.wd-pl.com/5048-2/` was provided by Tom Atlee.

Individuals were encouraged to sketch out their perspectives on flipchart paper at each table, and then rotate after 15 to 20 minutes.

Another account of the World Cafe event was blogged by Dave Pollard at `https://groupworksdeck.org/news/ploppuarl-2018-pattern-language-conference` .

1.5   Cunningham-Mehaffy-Rofe plenary session

The three plenary speakers casually spoke as a panel about their work in pattern language, both historically and on the horizon:

—Michael Mehaffy outlined an forthcoming book, "an ambitious new edition of patterns tentatively titled *A Pattern Language for Growing Regions: Economy, Technology, Quality of Life*" `http://www.sustasis.net/2018_Accomplishments.html` . Publication in print is currently being finalized for print, and an online web draft is still in private review.

—Ward Cunningham stepped through `http://puarl.ward.wiki.org/view/welcome-visitors/view/puarl-2018` , as a federated wiki site demonstrate how content could be incrementally presented. Development of this technology is ongoing, having been started in 2011.

—Yodan Rofe recalled case studies of pattern language use, including the last chapter of *The Boulevard Book History, Evolution, Design of Multiway Boulevards* `https://mitpress.mit.edu/books/boulevard-book` in which the guidelines were a pattern language. The challenges with establishing online collaboration, in his experience, were more social that technological.

In the 21st century, developing a pattern language beyond a static printed book has promise. Forming an online community of pattern language collaborations is a social movement. Is there an audience for the content, ready to listen? Can an online medium that is really used by people be generated?

1.6   Reframing questions to sweep in learning from the full conference

The original scope for the focus session was 120 minutes. In hindsight, the inquiry can be broadened across three days of conference sessions. Thus, this post-meeting report reflects an open system of learning, where additional knowledge can be swept in. The proposed outline of three steps is retained, with findings synthesized on the original questions. The original three steps were:

(1) Communicative Framing (for Formulating the Mess)

(2) Dialectic Sensemaking (for Typifying Affording Values)

(3) Narrative Synthesizing (for Programming for a Living Meshwork)

As a contribution to the proceedings, the writing of this report is by a single author. It has not been validated with conference attendees, either in their small group discussions, or in responses to remarks prepared in advance by presenters.

This proceedings report reflects a snapshot in time of the state of collaboration technologies in use (and not in use) in developing pattern languages. It may serve as a preliminary touchstone from which future work may be based.

2. COMMUNICATIVE FRAMING

The first step of appreciating the issues was to be ignited by the trigger question:

—For whom does the pattern language generate value (or benefits)?
  —The whom could include: the sponsor; the client; the provider, etc.
  —What value (or benefit) could be unfolding wholeness, life, quality without a name, beauty, regeneration, etc.

The challenge with pattern language, from a systems approach, is that these values or benefits are properties of the whole, not necessarily in the parts.

> What I am proposing ... is a view of programming as the natural, genetic infrastructure of a living world which you/we are capable of creating, managing, making available, and which could then have the result that a living structure in our towns, houses, work places, cities, becomes an attainable thing. That would be remarkable. It would turn the world around, and make living structure the norm once again, throughout society, and make the world worth living in again. [Alexander 1999, p.82]

Here's a claim: much of pattern language work has focused attention on the parts, so that the full sight of the whole is lost. While value might gained by (i) reusing individual parts – as patterns in a catalog, Alexander was aiming for (ii) generating wholes assembled from the "kit of parts", that would exhibit wholeness, living structure and/or the quality without a name.

> When I first constructed the pattern language, it was based on certain generative schemes that exist in traditional cultures. These generative schemes are sets of instructions which, carried out sequentially, will allow a person or a group of people to create a coherent artifact, beautifully and simply. The number of steps vary: there may be as few as half a dozen steps, or as many as 20 or 50. When the generative scheme is carried out, the results are always different, because the generative scheme always generates structure that starts with the existing context, and creates things which relate directly and specifically to that context. Thus the beautiful organic variety which was commonplace in traditional society could exist because these generative schemes were used by thousands of different people, and allowed people to create houses, or rooms, or windows, unique to their circumstances. [Alexander 1999, p. 81]

While there might be some value in replicating a pattern as a part, there's a greater whole that comes from sequencing patterns into tangible artifact.

2.1 A starter context for Communicative Framing

Pattern sequences are central to Alexander's writings, with a pattern of interest described both with antecedents and postcedents.

From *A Pattern Language* [1977], suppose that we focus on **127 Intimacy Gradient**. The chapter begins ...

> **127 INTIMACY GRADIENT ****
> ... if you know roughly where you intend to place the building wings – WINGS OF LIGHT (107), and how many stories they will have – NUMBER OF STORIES (96), and where the MAIN ENTRANCE (110) is, it is time to work out the rough disposition of the major areas on every floor. In every building the relationship between the public areas and private areas is most important. [Alexander et al. 1977, p. 610]

... and ends with ...

> At the same time that common areas are to the front, make sure that they are also at the heart and soul of the activity, and that all paths between more private rooms pass tangent to the common ones

– COMMON AREAS AT THE HEART (129). In private houses make the ENTRANCE ROOM (130) the most formal and public place and arrange the most private areas so that each person has a room of his own, where he can retire to be alone – A ROOM OF ONE'S OWN (141). Place bathing rooms and toilets half-way between the common areas and the private ones, so that people can reach them comfortably from both – BATHING ROOM (144); and place sitting areas at all the different degrees of intimacy, and shape them according to their position in the gradient – SEQUENCE OF SITTING SPACES (142). In offices put RECEPTION WELCOMES YOU (149) at the front of the gradient and HALF-PRIVATE OFFICE (152) at the back.... [Alexander et al. 1977, p. 613]

In figure 1 , this pattern can be represented with the larger-slower scale above, and the smaller-faster-scale below.
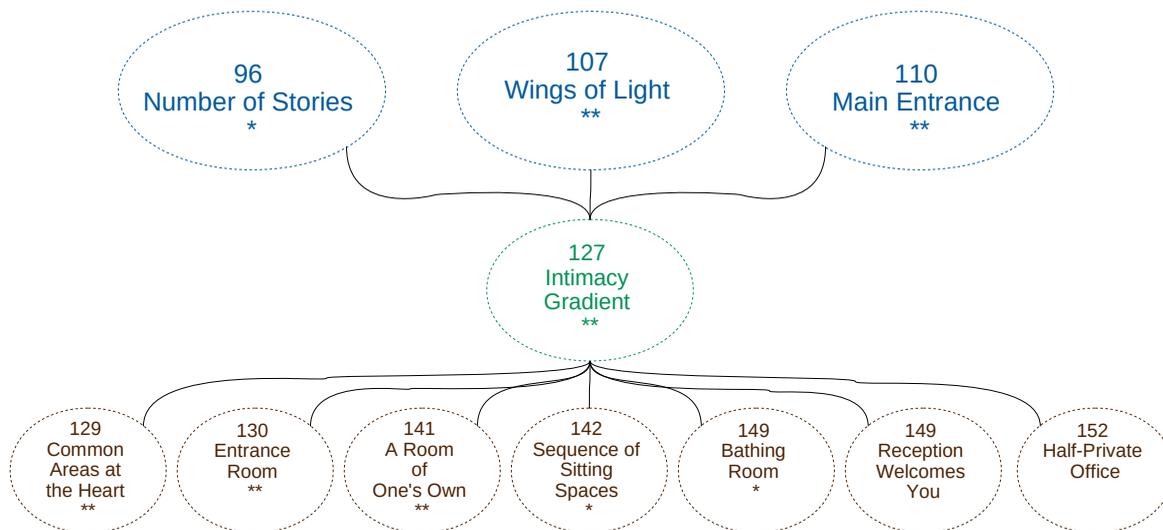

Fig. 1.   Intimacy Gradient, with patterns larger-slower and smaller-faster

The textual description (not shown for Intimacy Gradient, above), draws attention reductively into the pattern, rather than the larger collection (whole) within the ecology.

A Pattern Language, in [1977], did not focus so much on the value(s) in the whole. In *A Pattern Language Which Generates Multi-Service Centers* in [1968], there is a "miniature drawing of the language cascade", reproduced in Figure 2 .

Suppose that we're interested in **32 Child Care Position**. Here's the text for that pattern.

PATTERN
IF: Any child care station in any building where mothers have prolonged business (multi-service center, supermarket, etc.)
THEN: The child care station should be on the path from the building entrance to the place of business, and visibile from this path; and the path should be laid out so that it looks intothe child care station for roughly 20 feet along its length [Alexander et al. 1968, p. 183]

The relation from **32 Child Care Position** downward to **57 Child Care Contents** isn't in that text, only in the diagram.

Fig. 2.   Miniature drawing of the language cascade, from Alexander, Isikawa, Silverstein (1968)

If we trace upward from **32 Child Care Position**, we can see the text of relation in the parent, **10 Open to Street**, as well text referring to siblings.

> PATTERN
> IF: Any multi-service center,
> THEN: The following activities, if they are part of the multi-service center program, should be visible from the street:
> > . Information-conversation station (see Pattern 35).
> > . Child care station (see Pattern 32).
> > . Community projects (see Patterns 4 and 17).
> > . Waiting arena and activity pockets (see Patterns 20 and 43).
> > . Intake (see Pattern 28).
> > . Town hall meeting room (see Pattern 41).
> > . Self-service (see Pattern 21).
>
> As far as possible, the outer face of the center is transparent at ground level, with glass and openings looking into the activities named. [Alexander et al. 1968, p. 105]

There are challenges lining up the text in **32 Child Care Position** to the relations linked in the diagram, reinterpreted in Figure 3 . Discrepancies can be noted.
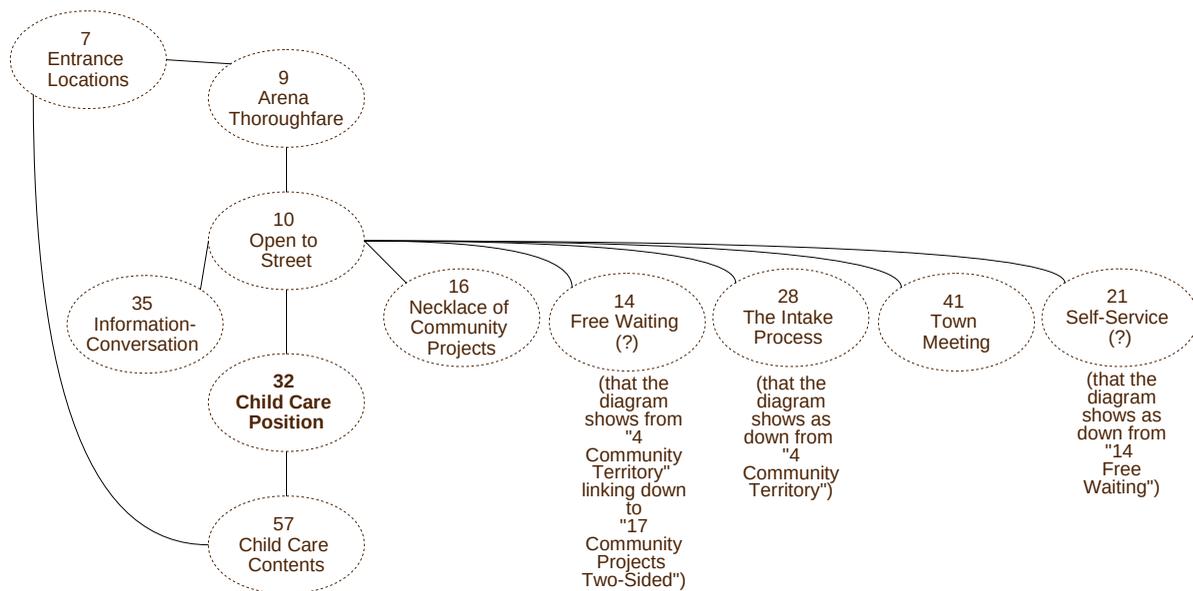

Fig. 3.   Attempted reinterpretation around Child Care Position

—In the original diagram, **7 Entrance Locations** connects (i) directly to **32 Child Care Position**, and (ii) indirectly through **9 Arena Thoroughfare** and **10 Open to Street**. These relations don't show up explicitly in the text.

The [1968] work was not prepared as carefully as the subsequent [1977] book, so perhaps the disconnect between the diagrams and text should be seen as lack of sufficient funding and time.

2.2 Findings on Communicative Framing

Given the distinctions drawn above, let's parse the question "For whom does the pattern language generate value (or benefits)" into separate but related concerns.

—The "whom" may be (i) the client of the artifact as a whole; (ii) the assembler of the artifact into a whole; or (iii) the builder of an component part.

—The 'value" may associated with (i) the artifact generated by a sequence of patterns; or (ii) a component in a catalog of patterns.

A straw man assessment of the "whom" and "value" has been generated as an exposition in Table I . The primary interest is not in the validity of each collaboration per se, but trends across the conference as a whole.

Table I. Assessment of Whom and Value at PLoP 2018 sessions

	Whom			Value	
	A client of the artifact as a whole	An assembler of the artifact into a whole	A builder of a component part	Artifacts generated by a sequence of patterns	Components in a catalog of patterns
Scupelli-Inventado "Online Learning System Pattern Repository"	?: End clients not identified?	?: Assemblers not identified?	Yes: replication of pre-existing works	?: Method to sequence not clear	Yes: Listings of prior sources and authors
Stark "Pattern Language Canvas for Real Time Innovation"	?: Cards might be used in cocreation with clients?	Yes: Cards can be linked by team of entrepreneurs	?: First version in review; open loop on revision?	Yes: Cards can be reordered	Yes: Individual cards may spark ideas
Bressen-Schuler-Atlee "Future of Pattern Language World Cafe"	Possible: Cards might be used in cocreation with clients.	Yes: Cards can be linked by working teams	?: Result of many years of work; appetite for revisions?	Yes: Cards can be reordered	Yes: Individual cards may spark ideas
Cunningham-Mehaffy-Rofe "Pattern Language for Rapid Urbanization ... Repository"	Possible: Wiki-cards might be used in cocreation with clients.	Possible: Representation as graphs (nodes + edges), can be coded or programmed	Yes: Architected as personal collections in a cooperative federation	?: UI now primarily of lineups of wiki cards; calls for more UI exploration	Yes: Forking and revising cards + their parts (e.g. paragraphs)

This assessment was conducted by the author as an individual, and has not been validated with conference participants.

On the "whom", we can read down on the first three columns of the table.

—*A client of the artifact of as a whole* might be served by a pattern language collaboration, but probably still wouldn't pass the criticisms levelled of missing wholeness, living structure or quality-without-a-name [Alexander 1999]. A review of the pattern language generated with clients, as demonstrated with the stakeholders in the Eishin School [Alexander 2012], would be atypical.

—*An assembler of the artifact into a whole* is encouraged in the card-based pattern language collaborations. The artifacts generated are different in nature from the components.

—*A builder of a component part* could most easily be served with a pattern catalog. Creating the catalog requires so much effort, however, that the original authors may have become exhausted, and a next generation of editors would have to take on responsibilities to maintain and update the first edition.

On the "value", we can read down the two rightmost columns of the table.

—*Artifacts generated by a sequence of patterns* have value in the easy rearrangement of decks of physical cards, as compared to on online environments (e.g. two-dimensional browser metaphors). Selecting and deselecting individual patterns into a project language hasn't yet been developed in the user interfaces for wiki technologies – either in mobile or desktop forms.

—*Components in a catalog of patterns* are the primary value that pattern language collaboration currently offer. Write-once read-mostly mode is the style imbued with printed cards and books, while wiki provides an opportunity for ongoing revision.

Summarizing across the variety of collaborations discussed at PLoP 2018, the aspirations set by Christopher Alexander for pattern language would seem to have been mostly unfulfilled. The Hillside Group should have pride that the organization has endured for more than two decades, having been formed in 1993. Focusing on beneficiaries of the pattern language, and the values they receive, is a direction for improvement.

3.   DIALECTICAL SENSEMAKING

The second step of elevating or lowering expected benefit of an option can be discussed with a trigger question:

—Which option features help or hinder collective development of a generative pattern language?

3.1   A starter context for Dialectical Sensemaking

As a dialectic foundation on which to base these discussions, some alternative technologies (with associated methods) can be considered:

(1) Traditional wiki (e.g. Dokuwiki, https://www.dokuwiki.org/dokuwiki with Graphviz plugin https://www.dokuwiki.org/plugin:graphviz)
(2) Tiddlymap (i.e. Tiddlywiki5 on node.js, with a Tiddlymap plugin, http://tiddlymap.org/)
(3) Federated wiki with Graphviz or Cytoscape https://github.com/fedwiki/wiki/issues/63 leading to http://ward.asia.wiki.org/view/knowledge-graphing/view/graph-libraries
(4) Labeled Property Graph database (e.g. OrientDB with Graph Editor https://orientdb.com/docs/3.0.x/studio/working-with-data/graph-editor/).
(5) Systems Biology Graphical Notation (SBGN) http://sbgn.github.io/sbgn/
(6) Obeo Designer Community at http://www.eclipse.org/sirius/download.html , based on Eclipse Sirius at http://www.eclipse.org/sirius/
(7) eLiberate from the Public Sphere Project at http://www.publicsphereproject.org/content/eliberate-0

These technological platforms range from the more mature and stable, to the actively developed and rapidly evolving. Communities could choose to converge on a uniform architecture, or decide on a variety of ways that might (or might not) be translatable to each other.

3.2   Findings on Dialectical Sensemaking

Since the focus group on alternative technological platforms did not include active users of online collaboration platforms, this list was not salient to the members in this parallel session.

The Scupelli-Inventado Open Pattern Repository, on initial inspect, appears to exercise only the conventional features of the Mediawiki technology, not having added additional executable code.

Few in the pattern language community have attempted to use federated wiki. In late 2018 and early 2019, some new energy has come into the open sourcing community, to make the technology more understandable, and integrate or interchange with complementary packages as cooperative rather than competitive tools. For

federated wiki novices, the explanation of basic features have been clarified (e.g. labelling the primary metaphor of a "card" rather than a "wiki page", and referring to "collections" rather than "web sites"). Keeping federated wiki focused on its distinctive features, exploratory coauthoring sessions may be better conducted on shared Markdown environments (e.g. next-generation Etherpad sites), to work through points of view before converging on writing a more durable wiki record. Ward Cunningham continues to host weekly video chat sessions on Wednesdays, beginning at 10 a.m. PT, with the location posted onto Twitter 15 minutes before it starts. The open source community is pursuing ways that setup tasks for hosting federated wiki sites may be eased.

4. NARRATIVE SYNTHESIZING

The third step is architecting a way in which learning and reflection in action can take place.

4.1 A starter context for Narrative Synthesizing

The method can follow an action research cycle, as shown in Figure 4.:
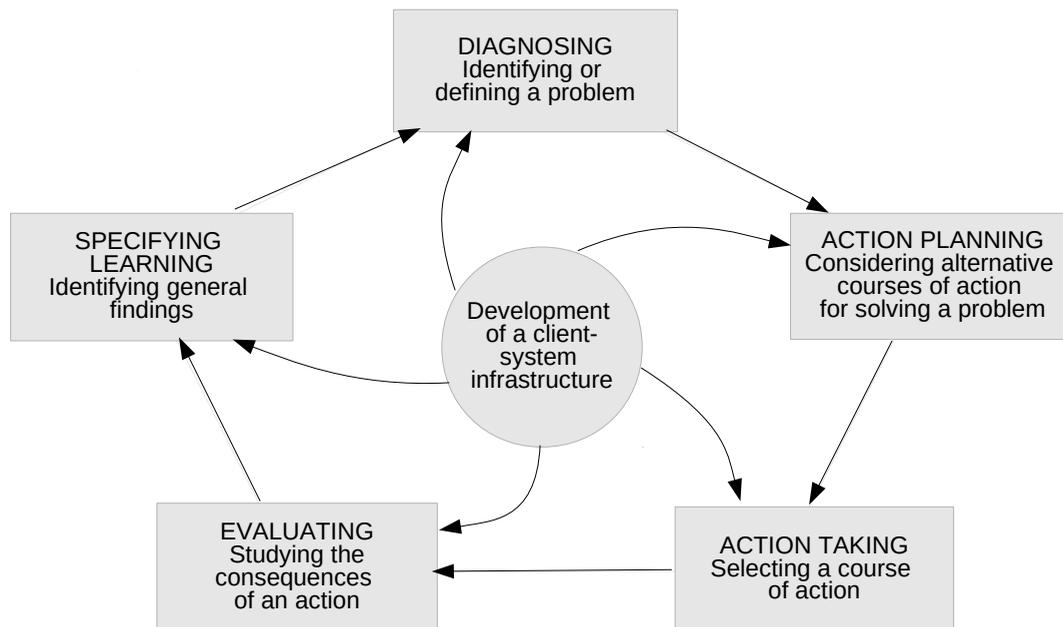

Fig. 4. Action research cycle, from Susman and Evered (1978)

There are a variants of action research (or action learning) cycles. One well known depiction is:

(1) Diagnosing;

(2) Action Planning;

(3) Action Taking;

(4) Evaluating; and

(5) Specifying Learning [Susman and Evered 1978]

4.2 Findings on Narrative Synthesizing

Since online collaboration amongst large teams of pattern language writers has not yet taken a strong hold, formalizing an action research cycle may not have been seen as a strong priority. The open sourcing development of the federated wiki platform could be portrayed as a project that has been slowly learning on an action research cycle, but the team's emphasis has been more on the technology than an application of pattern language.

5. LOOKING FORWARD

The overall finding from the focus session proposal, and the larger context of attending the PLoP and PUARL 2018 conferences, is that technology-enabled collaboration for pattern languages is still nascent.

At PLoP 2017, members of the pattern language community were encouraged to join in experimenting with the federated wiki platform as a collective way to share our work. The 2018 meetings reflect little progress or interest over the past year.

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