Activity Kit

CHOOSING AN APPROPRIATE APPROACH TO USING PATTERN LANGUAGE THEORY

Activity Kit
A guide for
CHOOSING AN APPROPRIATE
APPROACH TO USING PATTERN
LANGUAGE THEORY

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Disclaimer
The recommendations provided in the Activity Kit are based on the research findings in the author's master thesis titled "Choosing an Appropriate Approach to Using Pattern Language Theory". The Activity Kit is true to the best of the author's knowledge, although it is not yet fully complete. The author disclaim any liability in connection with the use of the Activity Kit.

Two caveats related to the completeness of this Activity Kit need to be stated here. First, the purpose list does not exhaustively enumerate all the purposes that can be achieved with PLT. Second, in addition to the four tools, more tools are needed to support the execution of some activities. So don't hesitate to be creative in using the Activity Kit.

Preface

The pattern language theory (PLT) is a design methodology that can tackle complex systems. It is particularly suitable for projects that involves multiple stakeholders or disciplines.

The pattern language theory (PLT) was first proposed by Christopher Alexander initially for urban design domain in 1970s. With its broadening application in other domains, such as computer science, education, service design etc., the original PLT approach proposed by Alexander has been applied differently, with different activities and roles involved. These differences are related to project facilitators' diverse value system and project purposes. However, practitioners new to the theory may fail to perform an appropriate approach well aligned with their values and purposes.

This Activity Kit, therefore, aims to provide guidance for practitioners and researchers to take an appropriate approach — including performing activities relevant to their purposes, involving the right people and pattern language, and making use of proper tools — to use PLT in a more effective way.

The Activity Kit is designed primarily as a resource for those who are new to PLT but should also prove useful to more experienced practitioners.

Contents

Keywords

Pattern Language Theory (PLT)
The methodology that utilises patterns and pattern languages to deal with complex systems.

Pattern Language
A network of patterns — each of which documents a problem and corresponding solution.

Approach
The way to use the pattern language theory.

Further Reading

To better understand the concept of pattern language theory, the trilogy of Alexander are recommended to read:

1. A Pattern Language

2. The Timeless Way of Building

3. The Oregon Experiment

Chapter 0. Guide for Readers

This chapter introduces how should readers use this Activity Kit.

Chapter Overview

In Chapter 1, the concept of Pattern Language Theory is introduced.

In Chapter 2, 12 activities commonly involved in PLT projects are introduced. First, an overview of the 12 activities is presented in a table. Second, the activity icons are presented in an icon map. Finally, the details of each activity are presented.

In Chapter 3, 8 common project purposes that can be realised with PLT are presented in a table. For each purpose, the activities that should be performed are visualised with an icon map introduced in Chapter 2.

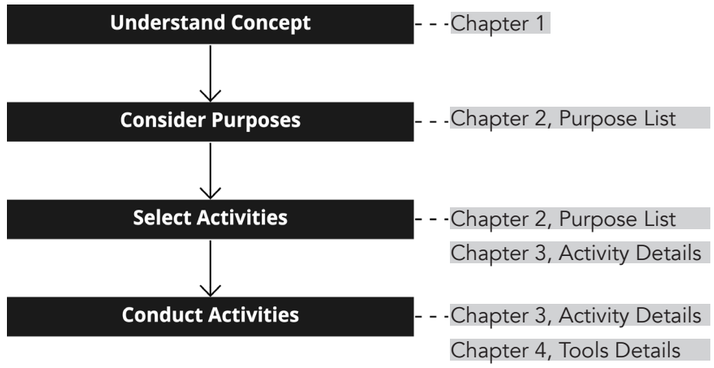
In Chapter 4, 4 tools that can assist the activities are introduced in detail.

Guidance to Use

If you are new to the concept of PLT, it is suggested to start from Chapter 1 and then scan through the overview tables at the start of Chapter 2, 3, 4. In this way, you can gain an overview of the Activity Kit.

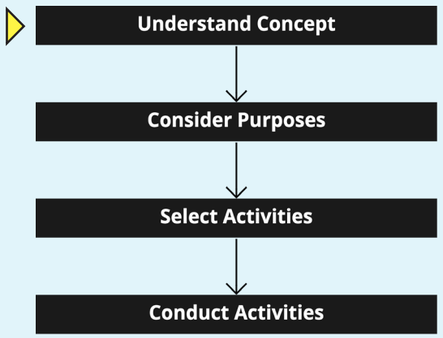
If you have a project to work with, you can find out what activities to perform in this Activity Kit. First, consider which purpose(s) in the Chapter 3 overview table suits your project. Second, find out which activities are recommended in the icon maps. These would be the activities suggested to involve for your project purpose.

When you are carrying out the recommended activities, read the details of all activities. The tools detailed in Chapter 4 may support your process.



Chapter 1. Introduction to Pattern Language

This chapter introduces the concept of pattern language and presents an example. Ways of using or contributing to a pattern language are visualised. The benefits of Pattern Language Theory are introduced.



Here is a video introducing the concept of the pattern language theory.

What is Pattern Language?

This page introduces the concept of pattern and pattern language step by step.

1. Pattern

A pattern is the invariants* in the solutions to a recurring problem.

** invariants: things that do not change or always exist in different situations*

2. Formatted Pattern

A pattern can be formatted into a card consisting these elements:

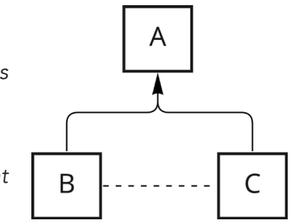
1. Name
2. Visual
3. The context
4. The problem
5. The forces
6. The solution
7. Related pattern
8. References

3. Related Patterns

Look at the 5th element: related patterns. This element signifies the relations between individual patterns.Two common relations are:

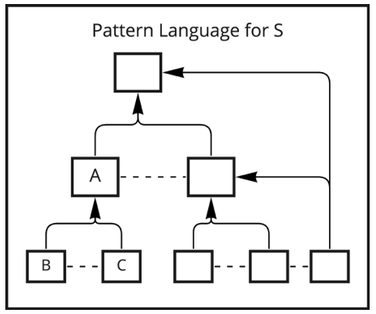
1. A requires B
To fulfil Pattern A, Pattern B needs to be fulfilled first.

2. C complements B
Pattern C and Pattern B complement each other (in fulfilling Pattern A).



4. Pattern Language

A series of patterns that are related in such ways makes a Pattern Language. In other words, a pattern language is a network of patterns. With each pattern solving one problem, a complete pattern language can solve a series of recurring problems in a complex system S.



An Example

For ease of understanding to people from different disciplines, I take "making chocolate chip cookies" as an example to demonstrate the concepts of pattern and pattern language.

1. A Pattern

Here is a pattern summarised from Grandma's solutions for how much chocolate should be added:

recurring problem → How much chocolate to add?

solutions vary in different contexts → Grandma gives a different number each time.

but there is an invariant → Each time Grandma tries maintaining the texture of the basic dough.

2. Formatted Pattern

This pattern can be formatted as such:

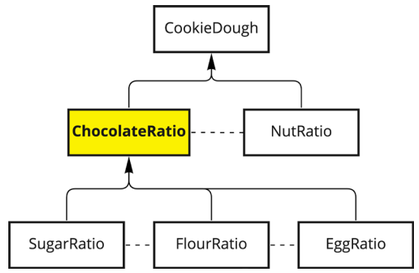
Pattern Name: *ChocolateRatio*

Context: You are baking chocolate chip cookies in small batches for family and friends. You have finished the basic dough with sugar, flour and egg and you are ready to add chocolate to the dough.
Problem: Determine the optimum ratio of chocolate chips to cookie dough
Forces: Most people consider chocolate to be the best part of the chocolate chip cookie. Also that too much chocolate may prevent the cookie from holding together, decreasing its appeal. Since you are cooking in small batches, cost is not a consideration.
Solution: Therefore, use the maximum amount of chocolate while maintain the dough texture you already achieved with *SugarRatio*, *FlourRatio*, and *EggRatio*.

Consider these patterns first: SugarRatio, FlourRatio, EggRatio
Consider next: *NutRatio* or *CookieDough*

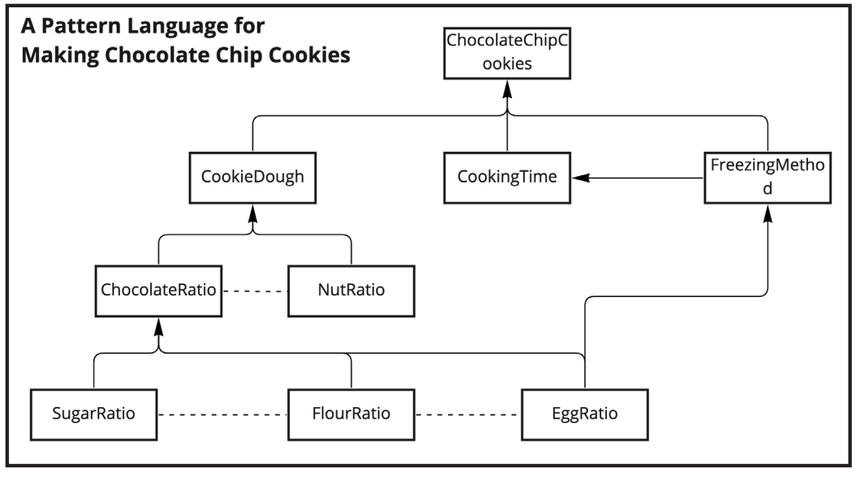
3. Related Patterns

By the items of "Consider these patterns first" and "Consider next" in the formatted pattern, the patterns related to the ChocolateRatio pattern (highlighted) can be visualised as such:



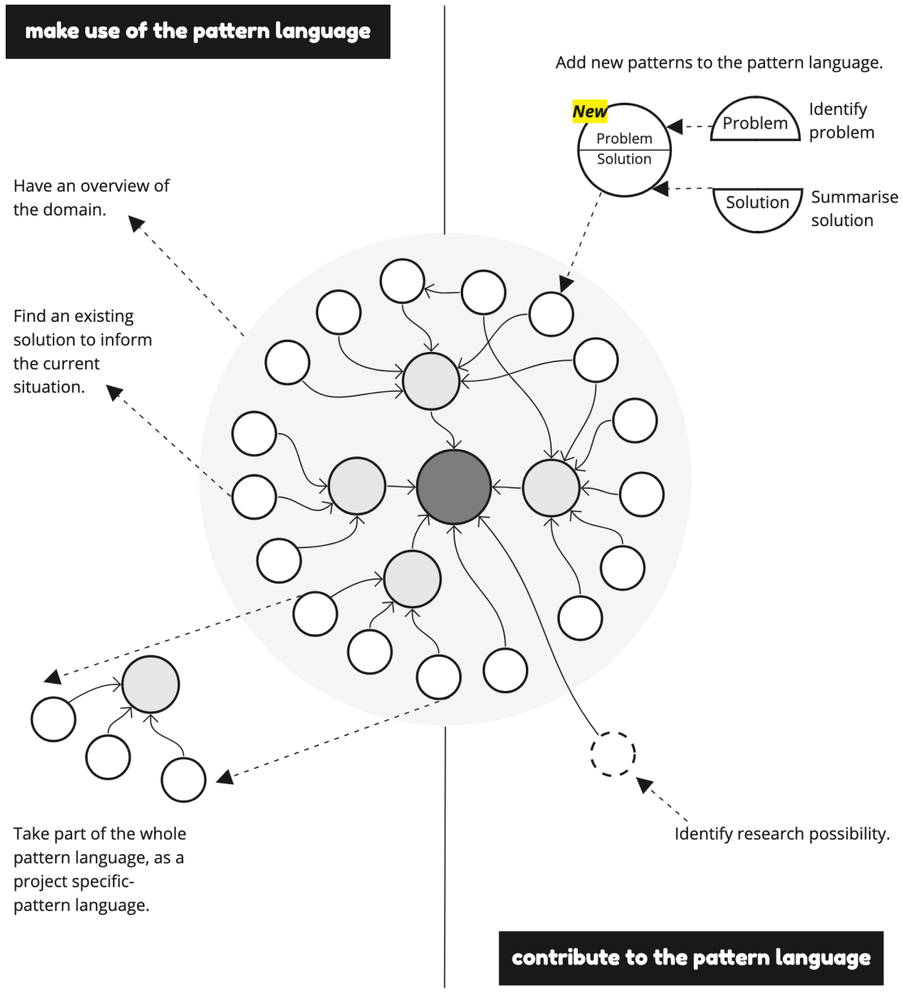
4. Pattern Language

If all patterns related to each other are visualised, a complete pattern language for "making chocolate chip cookies" is as below:



How can you interact with a pattern language?

We can consider a pattern language as a living database storing common problems and solutions for a domain. Practitioners and researchers can both make use of and contribute to this database in a wide range of ways. In this page, several ways are visualised to inspire you. You can be creative in exerting PLT's values with more complex interactions to achieve your own project purpose. You can also refer to ***Chapter 4*** for more achievable purposes.



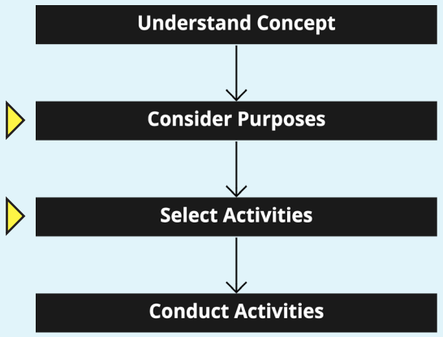
Benefits of Pattern Language

Using PLT can bring about the benefits of facilitating (1) knowledge management, (2) consistency and (3) participation. These benefits attribute to the ***format of individual pattern*** and ***the relations between patterns***.

	1. Knowledge Management	2. Consistency	3. Participation
pattern's format concretises knowledge into a formatted artefact	**knowledge externalisation** Help stakeholders externalise tacit needs, knowledge, experience.	**consistency over-time** Patterns as artefacts cannot be distorted throughout a process.	**understanding users' needs** Maintain the authenticity of insights gained from users.
	knowledge communication Help stakeholders exchange insights without distortion.	**consistency between projects** Avoid reinventing the wheel for the same problem in a domain.	
patterns' relations amplifies the power of patterns by leveraging their connectedness to solve complex design problems (Khambete et al., 2015)	**new knowledge creation** Enable spotting new relations between tangible patterns.		**information justice** Provide an open-sourced knowledge base.

Chapter 2. Purposes

Through research, it was found a lot of users of PLT had taken an approach not well suited to their project purposes. Therefore, before deciding on what activities to perform, you would like to first reflect on the purposes to use PLT. This can prevent you from taking unnecessary activities and help you find a recommended combination of activities.



This chapter presents 8 common project purposes that can be achieved with PLT and a combination of recommended activities for each purpose are introduced.

Purpose List

The Purpose List is a table presenting 8 common purposes that can be achieved with PLT. For each purpose, the specific target users and the recommended activities are also presented. Here is one item of the list for an example:

	Purpose	Specific User	Recommended Activities
1	Looking for an overview of a domain.	Novice to a domain	

You can read the "purpose" column to see if any item can represent your need.

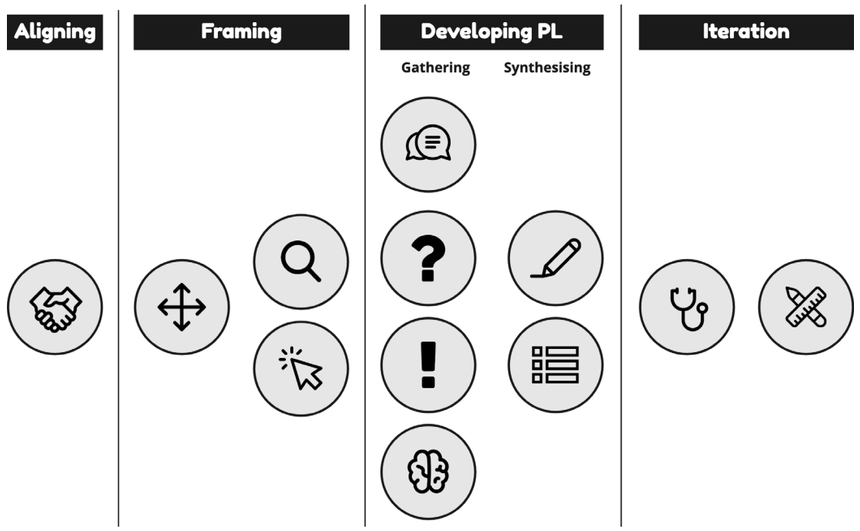
This column shows the target users of each purpose.

*This column uses "**activity icon map**" to present the recommended activities for each purpose.*

The complete list is presented on the next page.

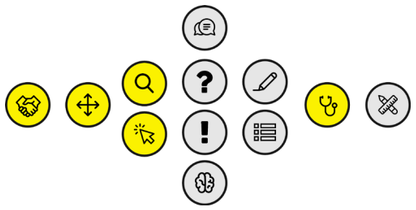
Activity Icon Map

To show the readers which activities are recommended at a glance, the activity icon map is used. This map provides an immediate representation of the recommended activities.



As well as providing a useful visual representation of the different activities, the map helps to define the process relationship between them. Icons on the left of the map represent tools that are generally used before ones on the right. While this is not set in stone – Aligning, for example, can be used throughout a project – it is broadly the case.

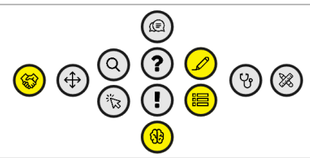
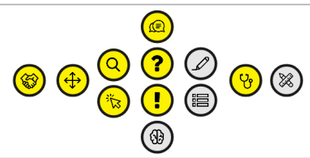
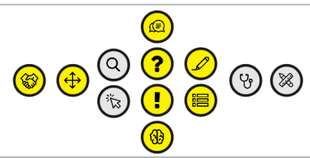
In this chapter, the icon map provides an immediate visual representation of the tools being used. The activities recommended for practitioners are highlighted in yellow. The map for Purpose 3 (to create a toolkit for participatory project), for example, shows that 5 tools (yellowed) are used:



The details of each activity are introduced in the next chapter.

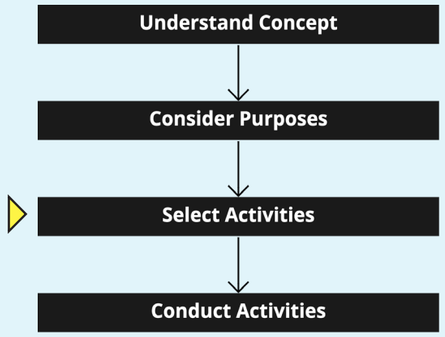
Purpose List

The Purpose List presents an overview of 8 common purposes that can be achieved with PLT. For each purpose, specific target users and the recommended activities are also presented here.

	Purpose	Specific User	Recommended Activities
1	Looking for an overview of a domain.	Novice to a domain	
2	Looking for reusable solutions/measurements to diagnose or make decisions for the current situation.	practitioners	
3	To create a toolkit for participatory (design) project.	facilitating a participatory project	
4	To identify and externalise reusable solutions from past project experience.	facilitating multiple projects in a same domain	
5	To understand needs or externalise knowledge of stakeholders (and retain the authenticity of these insights throughout the project).	researchers	
6	To elicit visions from stakeholders (and retain the authenticity of these visions throughout the project).	researchers	
7	To identify future research priorities.	researchers	
8	To build an ever-growing knowledge database for a domain.	Stakeholders that facilitate multiple projects in a same domain	

Chapter 3. Activities

This chapter introduces 12 activities worth performing in individual projects. An activity icon map is introduced here. Each activity is elaborated in detail.



Activity Overview

A table presents an overview of the 12 common activities needed for supporting PLT application. They are organised into 4 categories: Aligning, Framing, Gathering Intelligence, and Iterating. This overview includes a brief description of each activity and what ***tools*** can support each activity. Details of the tools will be introduced in the next chapter.

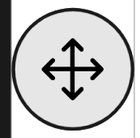
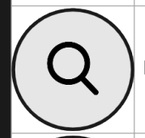
Category 1: Aligning

The value system of involved practitioners is an essential element of using PLT. To help practitioners elicit their and their stakeholders' concealed values, an exclusive aligning activity is needed.

	Activity		Description	Supporting Tool
Aligning		**Aligning Stakeholders**	**Stakeholders** reflect on and communicate about their underlying values.	**Navigation Panel** **Approach Axes**

Category 2: Framing

Three activities are involved to help practitioners in framing and scoping.

	Activity		Description	Supporting Tool
Framing		**Choosing Approach**	1. **Project facilitators** understand and choose the suitable approach to use PLT in a near, mid and/or long term. 2. **Project facilitators** reflect whether the current approach aligns with underlying purposes and values.	**Navigation Panel** **Approach Axes** **Approach Detail Tables**
		**Finding PL**	**Project facilitators** find related pattern languages that can be directly used or adapted for the project or a new domain.	
		**Selecting Patterns**	**Project facilitators** select patterns from a domain-PL to formulate a project-PL. This process helps define the project scope.	

Category 3: Developing PL

Two stages are involved in the development of a pattern language, namely Gathering and Synthesising. In the Gathering stage, four activities are involved. In the Synthesising stage, two activities are involved.

		Activity	Description	Supporting Tool
Developing Pattern Language	Gathering	**Interview/ Focus Group**	Getting insights from **stakeholders**.	
		Problem Sharing	**Inexperienced practitioners** externalise the problems they meet.	**Pattern Format**
		Experience Sharing	**Experienced practitioners** externalise good solutions from experiences	**Pattern Format**
		Brainstorm/ Prototyping	Eliciting visions and dreams from **stakeholders**.	
	Synthesising	**Writing Patterns**	Concretising insights from other activities into patterns.	**Pattern Format**
		Curating Patterns	Reconfiguring new patterns and making connections in between	

Category 4: Using PL

The Diagnosing with PL and Designing with PL in Chapter 3 are combined into the Iteration group. Although the functions of Artefact (patterns or pattern languages) are different in the two activities, these two are both activities for Using a pattern language.

	Activity	Description	Supporting Tool
Using the PL	**Diagnosing with PL**	Diagnose or evaluate the situation according to the solutions provided by related patterns.	
	Designing with PL	Develop and detail project solutions based on related patterns.	

Activity Details

The detailed information of each activity are introduced with a card. You can find how to perform an activity in the cards.

Aligning

Aligning Stakeholders

Aim To elicit stakeholders' underlying value.
To facilitate communication.
To seek alignment in a long term.

Participants Any stakeholder. (Whether end-users are involved also reflect stakeholders' value.)

Timing Usually at the beginning of a project. Also could be used throughout the process to check the project progress.

Tool Navigation Panel
Approach Iceberg

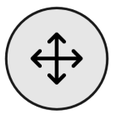
Use After ... ...

Move on to ... **Choosing Approach**

Basic Procedure
1. Participants read the Navigation Panel and Approach Iceberg individually.
2. Participants consider which values and approaches are ideal for them.
3. Participants share their ideas and discuss.

Expected Outcome Ideally, stakeholders might align on their values. Another possibility is although an ultimate value consensus is achieved, stakeholders have to acknowledge that their current (short-term) values are divided.

However, even if no consensus was reached, this activity provides a chance for stakeholders to reflect on and articulate their values more explicitly, rather than remaining them tacit.



Framing

Choosing Approach

Aim To understand the differences between approaches to applying PLT.
To consider/decide/reflect on a short-, mid- and/or long-term approach.

Participants Project facilitators

Timing Usually at the beginning of a project. Also could be used throughout the process to check the project progress.

Tool Navigation Panel
Approach Iceberg
Approach Detail Table

Use After ... **Aligning Stakeholders**

Move on to ... ...

Basic Procedure
1. Supported by **Aligning Stakeholder**, participants discuss their values and choose the ideal approach accordingly.
2. Participants discuss whether this ideal approach is viable in the current situation. If not, consider which approach is immediately applicable (short-term), and which can act as the transitional approach (mid-term).
3. Draw the route connecting short-, mid- and/or long-term approaches.
4. Participants read the Approach Iceberg and Approach Detail Table to understand what are the main components of the chosen approach. For a in-progress project, participants can reflect on the current approach and consider what changes are needed.

Expected Outcome This activity helps project facilitators choose the suitable approach to using PLT in a short, mid and/or long term.

Framing

Finding PL

Aim To find existing intelligence and avoid inventing the wheel twice.
To adapt related knowledge to a new domain.

Participants Project facilitators

Timing Before considering developing a new pattern language, it is suggested to find existing or relevant pattern languages first.

Tool -
New tool is required.

Use After ... **Aligning Stakeholders**

Move on to ... **Selecting Patterns**
Gathering Intelligence Activities

Basic Procedure
1. Search for a pattern language for your domain.
2. Consider more general searching terms or other relevant domains.
3. Consider using solution databases or other synonyms to replace "pattern language".

Expected Outcome This activity helps project facilitators find reusable or adaptable pattern languages, and avoid reinventing the wheel.

Framing

Selecting Patterns

Aim To select patterns relevant to the project scope and help redefine the project scope.
To prepare for writing and curating new patterns.

Participants Project facilitators

Timing After a broader or relevant pattern language is found.

Tool -
New tool is required.

Use After ... **Finding PL**

Move on to ... *Gathering Intelligence* Activities
Iterating Activities

Basic Procedure
1. Define or refine your project scope.
2. Scan through the pattern language from the patterns at a larger scale. Look for the pattern best describing the overall project scope. This would be the starting pattern for the project.
3. Read the starting pattern and find the patterns that are connected with your starting pattern. Among these patterns, include the ones at a smaller scale than your starting pattern.
(Only include the patterns that are at a larger scale than your starting pattern when you also plan or hope to help improve them. Also do not include the patterns that are confusing or doubtful for you.)
4. Then move on to the second largest pattern and include its smaller related. Repeat this step until all patterns have been scanned through.
5. Take note of any missing patterns or the patterns that need adaptation according to your need.

Expected Outcome A project-pattern language ready for use or adaption is filtered out.

Framing

Interview/Focus Group

Aim To learn about stakeholders' knowledge or experience.
To learn about stakeholders' needs.

Participants Any stakeholder. (Depending on the approach decided in **Choosing Approach.**)

Timing Usually used as a research activity at an early stage of a project.
Also could be used throughout a project as needed.

Tool 5 Whys (for understanding real needs)
Pattern format (to remain the authenticity of insights in future activities)

Use After ... ...

Move on to ... **Pattern Writing**, **Pattern Curating**, or *Iterating* Activities

Basic Procedure
1. Before interviewing, align on who to interview (experts or end-users), what to look for (knowledge or needs etc.).
2. Normal interview/focus group procedure.
3. After the interview, try documenting insights in the format of a pattern. Consider having interviewees to verify or review the half-finished patterns generated from their insights.

Expected Outcome Interview or focus group insights documented in a pattern format.

Gathering Intelligence

Problem Sharing

Aim To make stakeholders aware of the importance of inexperienced practitioners in pattern language
To assist inexperienced practitioners externalise the problems they meet.

Participants Stakeholders who facilitate the development of domain-pattern language, inexperienced practitioners

Timing At any stage of a project.

Tool Pattern format (to remain the authenticity of insights in future activities)
New tool is required.

Use After ... ...

Move on to ... **Pattern Writing**, **Pattern Curating**, or *Iterating* Activities

Basic Procedure
1. Introduce the importance for inexperienced practitioners to share the difficulties they meet.
2. Participants individually reflect what difficulties they have met or what knowledge is needed.
3. Have participants share the problems they thought of.
4. After the session, consider letting participants document their insights into the problem part of a pattern by themselves or having participants to verify or review the half-finished patterns generated from their insights.

Expected Outcome Recurring problems requiring solutions are documented in a pattern format.

Gathering Intelligence

Experience Sharing

Aim To assist experienced practitioners externalise the tacit solutions they have.

Participants Stakeholders who facilitate the development of domain-pattern language, experienced practitioners, the inexperienced practitioners who have input the involved problems

Timing After the problem part of a pattern has been document

Tool Pattern format (to remain the authenticity of insights in future activities)
New tool is required.

Use After ... **Problem Sharing**

Move on to ... **Pattern Writing**, **Pattern Curating**, or *Iterating* Activities

Basic Procedure
1. Introduce the importance for practitioners to share their experience.
2. Participants individually reflect how the proposed problems had been solved in their experience. Encourage participants to output thinking with a pattern template.
3. Have participants share their ideas.
4. Have participants collectively synthesise their solutions into a pattern format.
5. After the session, consider having other practitioners to verify or review the half-finished patterns generated from their insights.

Expected Outcome The solution part of a pattern.

Gathering Intelligence

Brainstorm/Prototyping

Aim To learn about stakeholders' visions.
To learn about stakeholders' needs.

Participants Any stakeholder. (Depending on the approach decided in **Choosing Approach.**)

Timing Usually used as a research activity at an early stage, or an inspiration/co-creation activity at a later stage of a project.
Also could be used throughout a project as needed.

Tool Prototyping (for concretising tacit ideas)
Pattern format (to remain the authenticity of insights in future activities)

Use After ... ...

Move on to ... Pattern Writing, Pattern Curating or *Iterating* Activities

Basic Procedure
1. Before the workshop, align on who to involve (experts or end-users) and what to look for (knowledge or needs etc.).
2. Normal brainstorming/prototyping procedure.
3. After the workshop, try documenting insights in the format of a pattern. Consider having participants to verify or review the half-finished patterns generated from their insights.

Expected Outcome Brainstorming or prototyping insights documented in a pattern format.

Gathering Intelligence

Brainstorm/Prototyping

Aim To learn about stakeholders' visions.
To learn about stakeholders' needs.

Participants Any stakeholder. (Depending on the approach decided in **Choosing Approach.**)

Timing Usually used as a research activity at an early stage, or an inspiration/co-creation activity at a later stage of a project.
Also could be used throughout a project as needed.

Tool Prototyping (for concretising tacit ideas)
Pattern format (to remain the authenticity of insights in future activities)

Basic Procedure 1. Before the workshop, align on who to involve (experts or end-users) and what to look for (knowledge or needs etc.).
2. Normal brainstorming/prototyping procedure.
3. After the workshop, try documenting insights in the format of a pattern.
Consider having participants to verify or review the half-finished patterns generated from their insights.

Expected Outcome Brainstorming or prototyping insights documented in a pattern format.

Use After ... ...

Move on to ... Pattern Writing, Pattern Curating or *Iterating* Activities

Gathering Intelligence

Pattern Curating

Aim To write up gained insights or half-finished patterns into a complete pattern using a shared pattern template.

Participants Depending on the approach decided in **Choosing Approach.**

Timing After **Pattern Writing**

Tool Pattern format
Writer's workshop (Appleton, 2000)

Use After ... **Pattern Writing**

Move on to ... *Iterating* Activities

Basic Procedure 1. Check for redundancy between patterns and make sure that the different patterns aligned with the shared values and visions of the group.
2. Review written patterns through moderated discussions among participants.
3. Make connections between patterns to develop a structure.
4. Arrange the categories and patterns into a graphic mind map. Make connections with existing pattern languages if needed.
5. Editing and iteration.

Expected Outcome Patterns with a structure, or combined with existing pattern languages.

Iteration

Diagnosing the Situation

Aim To find the gap between the current state and a desired state.
To evaluate the current situation using pattern as a yardstick.

Participants Depending on the approach decided in **Choosing Approach.**

Timing After the project-pattern language is formulated in **Selecting Patterns**.
Usually used as a research activity at an early stage of a project.
Also could be used throughout a project as needed.

Tool -
New tool is required.

Use After ... *Aligning*, *Framing* Activities

Move on to ... **Designing for the Situation**

Basic Procedure Common procedure for evaluation.

Expected Outcome Gaps that require working on.

Iteration

Designing for the Situation

Aim To fix the gap defined in **Diagnosing the Situation**.

Participants Depending on the approach decided in **Choosing Approach.**

Timing After **Diagnosing the Situation**.

Tool -

Use After ... *Aligning*, *Framing* Activities

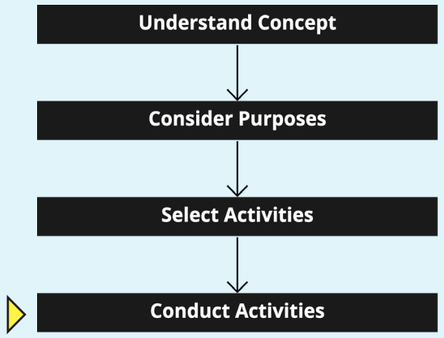
Move on to ... **Diagnosing the Situation**

Basic Procedure Common procedure for designing.

Expected Outcome Design outcomes ready for diagnosing and iterating.

Chapter 4. Tools

This chapter presents 4 tools that can facilitate relevant activities. These are Approach Axes, Navigation Panel, Approach Detail Table, and Pattern Template.



Approach Axes

An approach to using PLT in a project can be measured in two ways. First, actions can either be implemented by a top person (top-down) or by grass-roots (bottom-up). This division is described with an Axis of Change-making Direction. Second, the aim can either be reusing extant solutions (decision-making) or promoting industry revolution (vision-making). This division is describe with an Axis of Innovation.

This tool can be used to support two activities:

Aligning Stakeholders
Promoting understanding the differences between approaches.

Choosing Approach
Helping position the near, mid, and/or long term approach to using PLT.

Axis of Change-making Direction

Bottom-up change led by end-users ⟷ **Top-down** change led by experts

common expressions	*end-users*, *individual*, *participatory*, *engagement*, *ownership*, *social*, *political*, *depolarise*, ...	might mention *participation of experts* from multiple disciplines, rather than the *participation of end-users*
key user of PL	user-designer	professional designer
source of patterns	user-designer	professional designer
expected benefits specific to this dimension	participation	
key value	**egalitarian** social justice	**mastery** efficiency

External Characteristics

Internal Values

Axis of Innovation

Decision-making reusing good solutions ⟷ **Vision-making** seeking transformation

common expressions	*solving recurring problems*, *learning from existing experiences*	*visionary*, *predictive*, *transformative*
key activity	1. Diagnosing with PL 2. Designing with PL	1. Developing the PL 2. Selecting Sub-PL for Project
source of patterns	by extracting from experience	by envisioning
expected benefits specific to this dimension	consistency between teams/projects	consistency over-time
key value	**reusing known solutions**	**industry transformation**

External Characteristics

Internal Values

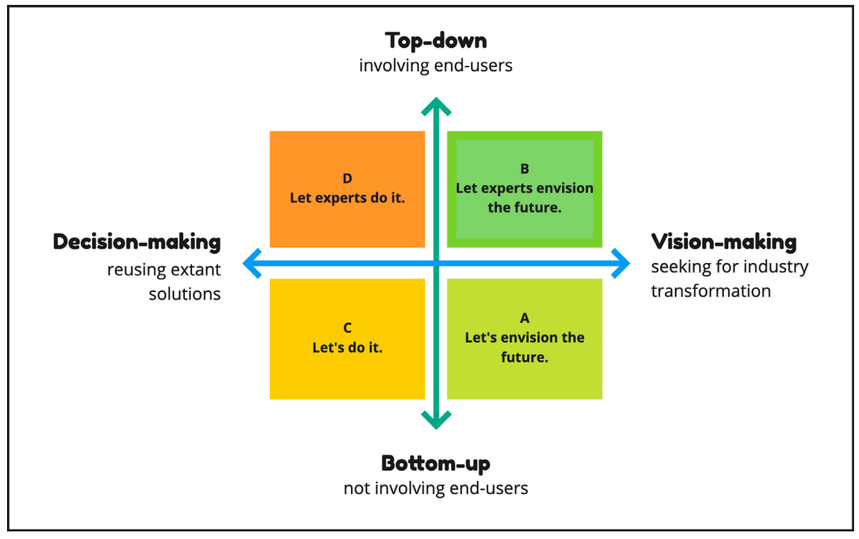
Navigation Panel

This Navigation Panel combines the Axis of Innovation and the Axis of Change-making Direction. A complete plane hence is divided into four areas, each representing an approach to using PLT.

This tool can be used to support two activities:

Aligning Stakeholders
Providing a discourse system for stakeholders to express their underlying values that are relevant to PLT approaches.

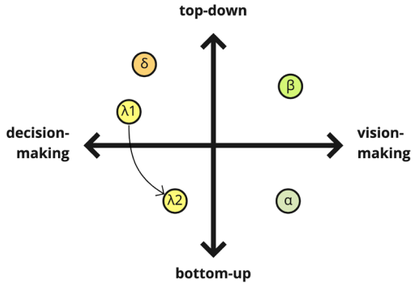
Choosing Approach
Helping position the near, mid, and/or long term approach to using PLT. Also useful for comparing As-is and To-be states.



For example, four cases are mapped in the Navigation Panel:

- α: *Palmieri et al., 2021*
- β: *Köppe et al., 2017*
- λ: *Alexander, 1975*
  - *1: developing pattern language*
  - *2: using pattern language*
- δ: *Athavankar et al., 2014*

These cases are chosen as references for their consistency between internal values (de jure), and external characteristics (de facto). The details of the four cases can be found in the Appendix.



Approach Detail Table

This table presents the details of the four PLT approaches.

This tool can be used to support two activities:

Choosing Approach
Helping position the near, mid, and/or long term approach to using PLT.

		A bottom-up vision-making	B top-down vision-making	C bottom-up decision-making	D top-down decision-making
internal values	**Value**	1. social justice 2. transformation	1. transformation	1. social justice 2. mastery of immediate problem	1. mastery of immediate problem
	special purpose	1. participation 2. consistency over time	consistency over time	1. participation 2. consistency between teams/projects	consistency between teams/projects
slogan		Let's envision the future.	Let experts envision the future.	Let's do it.	Let experts do it.
external characteristics	**User of PL**	user designer	professional designer	user designer	professional designer
	Developer of PL	**user-designer**	**professional designer**	**user-designer** by empirical experience	**professional designer** by empirical experience
	Innovativ eness	envision new possibilities	envision new possibilities	reuse existing solutions	reuse existing solutions
Example cases		te Duits, 2022	Köppe et al., 2017	Silva e Santos, 2012	Noble, 1998; Zhao et al., 2007

Pattern Template

The template helps practitioners develop patterns in a structured way. It also allows practitioners to modify it as needed.

This tool can be used to support the activities in Developing PL category:

1. Helping externalise knowledge, experience, problems, and needs into tangible texts, which can remain authenticity and originality throughout a project.
2. Helping externalise tacit insights into explicit patterns.
3. Helping standardise the form of new patterns.

1. **name**

2. **context**: in what situation is this pattern applicable

3. **problem**: the detailed problem in this context, and the forces that produce the problem

4. **solution**: the invariants of working solutions, and the consequences of using this pattern

5. **related patterns**: other patterns that should be considered earlier, or that can be considered later

6. **references**: known examples of this pattern

A visual can also be included to improve readability.

Tool Overview

An overview of these tools is presented in this table.

	Tool	Description	Function
1	**Approach Axes**	The **Axis of Innovation** and the **Axis of Change-making Direction** for differentiating PLT approaches.	1. Helping choose the suitable approach according to underlying values or purposes. 2. Helping backcast and reflect on the underlying values or purposes according to approach.
2	**Navigation Panel**	A two-dimensional plane for mapping different approaches to using PLT.	1. Providing a discourse system for stakeholders to express their underlying values that are relevant to PLT approaches. 2. Helping position the near, mid, and/or long term approach to using PLT.
3	**Approach Detail Tables**	An overview of the four PLT approaches.	1. Helping choose the suitable approach. 2. Introducing the details of each approach. 3. Providing example cases for reference.
4	**Pattern Format**	A template for the patterns in a pattern language. Defined by the stakeholders who facilitate the development of domain-pattern language	1. Helping stakeholders to externalise tacit knowledge or experience. 2. Helping remain the authenticity and original taste of the insights gained from stakeholders.

Chapter 5. Conclusion

The Pattern Language Theory shows the wisdom of circulating human intelligence within a domain. With the connections between individual patterns, a pattern language offers a domain framework plus a living knowledge base. This knowledge base constantly takes in new knowledge and in turn inform relevant projects

This Activity Kit assist practitioners and researchers in choosing effective activities to make better use of pattern language theory in their projects or contribute to the pattern language.

Yet as acknowledged, the Activity Kit is not fully finished yet. Users may find other more useful combinations of the activities to support fulfilling their own purposes. More tools await being developed to support the activities.

Appendix

In Chapter 4, four cases are presented when introducing the Navigation Panel. These cases are chosen as references for their consistency between internal values (de jure), and external characteristics (de facto). In other words, the four cases present an honest application of pattern language, with the actions well aligned with the purpose. The details of the four cases can be found in this table.

		Case α Palmieri et al., 2021	Case β Köppe et al., 2017	Case λ Alexander, 1975	Case δ Athavankar et al., 2014
	Approach Type	**A** bottom-up & vision-making	**B** top-down & vision-making	**C** bottom-up & decision-making (developing PL is **D** top-down & decision-making)	**D** top-down & decision-making
internal values	(articulated) **value**	1. **social justice**: "de-polarise the envisioning of the future" 2. **mastery of future**: "de-polarise the envisioning of the future" 3. **transformation**: challenge the dominant, rather than confirming it	1. **transformation**: presents an alternative way of designing for future higher education 2. **mastery of future**: presents an alternative way of designing for future higher education	(in the process of using PL) 1. **social justice**: users know their needs best; human needs for control, creativity and ownership 2. **mastery of immediate problem**: achieve the QWAN 3. **tradition**: the invariants of empirical best practices; find the QWAN in old buildings	1. **mastery of immediate problem**: to create service systems that lead to a delightful customer experience 2. **tradition**: documenting the underlying principles in good design practices
	purposes of applying PL	1. **knowledge management**: understanding, exploring and concretising sustainable dwelling futures into tangible and public (sharable) artefact; open-ended (spotting new relations between pattern artefacts) 2. **consistency**: conversation between different scales of stakeholders 3. **participation**: detailed individual life instead of giving a "fit-for-all" answer; political context with actors at different scale levels	1. **knowledge management**: "each individual pattern is formatted in a manner that makes it possible for others to evaluate and possibly modify it without losing the essence of it " 2. **consistency**: "without losing the essence of it"	(in the process of using PL) 1. **knowledge management**: analyse the approach to achieve QWAN 2. **consistency**: each design team use the same pattern language package 3. **participation**: engage end-users; better understanding end-users' needs	1. **knowledge management**: patterns are employed as a way of capturing expertise; "capture the knowledge of participants from different disciplines and integrate it " 2. **consistency**: a shared vocabulary for creative exchange
external characteristics	**main activity**	Developing the PL	Developing the PL	using PL 1. Selecting Sub-PL for Project 2. Diagnosing with PL 3. Designing with PL	using PL 1. Selecting Sub-PL for Project (2nd workshop) 2. Designing with PL
	team composition	**experts, professional designers, user-designers** co-producing: researcher and inhabitants curating: researchers reconfiguring: inhabitants and civil servants respectively	**experts, professional designers** "a hybrid group of experts within design patterns, hybrid pedagogy, educational technologies and online education"	**experts, professional designers, user-designers** (in the process of using PL) "a planning board, design teams each composing professional designers and user-designers"	**experts, professional designers** "experts from different disciplines"
	detailed process (for reference)	1. co-producing: (researchers and individual resident) using prototypes to present existing living pattern and blue for dreams and projections 2. curating (researchers): curated results are included in an open-ended catalogue a. selecting: select the stories related to — or at least to part of — larger-scale and longer-term discourses on sustainable dwelling futures b. translating: translate the selection into a collection of patterns; illustrate and make compatible c. deconstructing: i. visual deconstruction: images of prototype ii. narrative deconstruction: describing their actions, interactions, materiality and storytelling 3. reconfiguring a. inhabitants reconfigure the patterns in relation to sustainable future on neighbourhood scale b. civil servants and local experts reconfigure them towards more sustainable futures on a town level	1. Value-based workshop: identify the core individual values of the hybrid participant group; establish a collective value framework 2. Vision-driven workshop: activate the collective values in individual visions; transform these into a collective position or manifest that guide the development of design patterns 3. Brainstorm session: generate concrete examples of hybrid education from the group's own development and teaching practice 4. Sorting workshop: the post-it notes were clustered and then sorted into higher-level categories; the clusters were given a common heading 5. Pattern writing workshop: write op the different categories and examples as design patterns using a shared pattern template 6. Convergent-divergent hybrid pattern writing workshops: the online-onsite sub-groups met together to discuss, merge, exchange and elaborate on the different evolving design patterns within the groups	(in the process of using PL) 1. review current situations and the diagnosis: produce a project description including a. the kinds and amount of spaces required b. indication of space to be preserved, renovated or rebuilt 2. user-designer team start their design and output a schematic design 3. individual designs are officially presented to the planning board for finance and coordination	1. Identifying Scenario: identify a set of scenarios that would capture the understanding of the real life situations 2. Identifying patterns: to identify patterns for the different stages of the service blueprint / experience journey maps. 3. Generating solution ideas: the patterns identified for every stage of the service blueprint, are given to the design teams to generate solution ideas 4. Detailing solution ideas: the patterns and solution ideas that emerged from the teams of the previous workshop were further worked on by two distinct teams

CHOOSING AN APPROPRIATE APPROACH TO USING PATTERN LANGUAGE THEORY