Applying Pattern Language from Places to Programs and Practices: Unveiling the Exploratory Journey of the Study and Community through Oral History and Autoethnography

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In this study, I delve into the evolution of pattern language, tracing its journey from its original application in architecture (places) to its extended utilization in software development (programs), education, professional works, and other practices (practices).

In the first part of this paper, I explore the early days when pattern language, originally focused on architectural Places, was being applied to software Programs and Practices in education and professional works. I construct a detailed narrative of this field's origin story from qualitative interviews with key figures such as Ward Cunningham, Ralph Johnson, Richard Gabriel, Mary Lynn Manns, Joseph Bergin, Eugene Wallingford, and Linda Rising, among others with whom I have established connections primarily through PLoP and EuroPLoP conferences.

In the latter part of this paper, I reflect on further developments in the application of pattern languages of practices, presenting it through my own autoethnography. Over the past 20 years, the practical application of pattern language extended not just to professional works but also encompassed everyday life, journey of life, and the forming society. I begin by providing an overview of the PRELIMINARY PERIOD [1995-2003], which represents the pre-history of my pattern language research, followed by the next 20 years of my research on crafting pattern languages, divided into three phases: the STARTUP PHASE [2004-2012], the EXPANSION PHASE [2013-2019], and the MATURATION PHASE [2020-].For each phase, I examine the progress and innovations from five perspectives: (1) Application to New Domains, which focuses on the fields in which pattern languages were crafted; (2) Methodology of Crafting, which explores the advancements in the crafting methods; (3) Ways of Expressing and Utilizing, which examines new ways of expressing and utilizing pattern languages; (4) Pattern Communities, which discusses participation in and contributions to pattern languages and Christopher Alexander's work. Through this reflection on our works, it becomes evident that a vast array of ideas, methods, and works have been generated in various directions, and that these have been conceived, deepened, and developed through extensive interactions with many people. In the concluding section of this paper, I offer a perspective that views the past developments as a saga, connecting it to the stories of the next generation in the near future.

Our exploration reveals that many groundbreaking projects and communities often emanate from fortuitous beginnings. However, their maturation and ultimate realization require a labyrinth of concerted efforts, iterative trial-and-error, and the vital presence of a collaborative cadre of individuals. This innovation is further nurtured by a supportive and encompassing community of collaborators. These insights were gleaned through the assembly of oral histories and autoethnography. While these features may not be unique to the case studies at hand, they underscore the human agency and collaboration inherent in the transformative work within the domain of pattern language. This paper aims to reconfirm that these influential achievements and communities are dynamically shaped through a process (becoming). I invite the reader to engage with this perspective, in hopes that my work will serve as an important historical account that benefits future generations interested in the continuing evolution of pattern language.

Categories and Subject Descriptors: **[Software and its engineering]**: Software creation and management—*Design patterns*; **[Social and professional topics]**: Professional topics—*Historical people*.

General Terms: Human Factors

Additional Key Words and Phrases: pattern language, oral history, autoethnography, design patterns, pedagogical patterns, educational patterns, pattern languages of practices

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1. INTRODUCTION

Everything has its roots and beginnings. As a researcher of creative practices, I have always been interested in the making processes of various things. In this paper, I particularly focus on the making process of applying pattern language to new domains.

Pattern Language was conceived in the field of architecture by Christopher Alexander (Alexander, Ishikawa, *et al.*, 1977; Alexander, 1979). Alexander unveiled the patterns inherent in the design of good towns and buildings, which can aptly be described as the Pattern Language of 'Places.' His journey is documented in Stephen

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Grabow's book, *Christopher Alexander: The Search for a New Paradigm in Architecture* (Grabow, 1983). Understanding how Alexander came to the concept of Pattern Language, and how he and his colleagues developed it, is an intriguing and academically meaningful question (a topic we hope to address in another paper).

This paper, however, focuses on how Pattern Language has been developed in fields outside of architecture after Alexander's proposal. Specifically, we will examine its application in the field of software development from the late 1980s and its subsequent application to various practices including education and works. This evolution is indeed the development where the PLoP (Pattern Languages of Programs) conference and PLoP-related conferences have been the main venues.

First of all, let me introduce myself, since I will write this paper using the approaches of oral history and autoethnography, where the *first-person voice* is essential. I am Takashi Iba, a Professor in the Faculty of Policy Management at Keio University. My academic background began in complex systems science, especially focusing on socio-economic phenomena, I then journeyed through social systems theory and network science, and have been dedicated to the study of pattern language for the past 20 years. I have crafted pattern languages for more than 90 practical domains, writing over 3,000 patterns with my students and colleagues. Additionally, I have developed methods and processes for crafting pattern languages, devised ways to utilize them, and implemented them in society.

I have been participating in PLoP conferences since 2007. To date, I have participated in a total of 34 PLoPrelated conferences, including 15 appearances at PLoP, 11 at EuroPLoP, 7 at AsianPLoP, 1 each at VikingPLoP and SugarloafPLoP. In total, I have presented a total of 121 papers with my co-authors across these conferences. I served as the Program Chair for PLoP 2017, as the Program Co-Chairs for AsianPLoP 2014, and Conference Co-Chairs for AsianPLoP 2024. Additionally, I have been a recurring member of the Program Committees for PLoP, EuroPLoP, and AsianPLoP. Since 2015, I have also served as a Board Member for The Hillside Group. As both an author and researcher in pattern languages, as well as an organizer of relevant events, I believe I have witnessed many events and contributed substantially to the advancement and community building for pattern languages.

The first part of this paper shows an *oral history* of applying pattern language compiled from interviews conducted by the author with the individuals involved from 2012 and 2014. Oral history is "a history built around people. It thrusts life into history itself and it widens its scope" (Thompson, 2000); It is not "just about events, or structures, or patterns of behavior, but also about how these are experienced and remembered in the imagination" (Thompson, 2000). In this paper, based on interviews with the individuals with whom I have established connections primarily through PLoP and EuroPLoP conferences, I aim to describe the journey of applying pattern language to Programs and Practices.

I would like to preface this by stating that the interviews for this paper were conducted with only a select few of the individuals involved at that time. As such, this paper does not aim to document 'History' with a capital 'H'. It's important to acknowledge that different individuals may have different perceptions or recollections of the same events. This paper, therefore, presents insights I've gathered from a limited circle of my connections, reflecting on their experiences from that era. Nonetheless, I believe that documenting and sharing even a fraction of these origin stories, which haven't been previously disseminated, holds significant value, which is why I have undertaken the task of writing this paper.

The second part of this paper, which is quite long, is an *autoethnography* of myself, as a writer and researcher of many pattern languages of practices. Autoethnography is "a qualitative method—it offers nuanced, complex, and specific knowledge about particular lives, experiences, and relationships rather than general information about large groups of people" (Adams, Jones, and Ellis, 2015); The term "autoethnography" is composed of "the self (auto), culture (*ethno*), and writing (*graphy*)" (Adams, Jones, and Ellis, 2015). Autoethnographers "look inward—into our identities, thoughts, feelings, and experiences—and outward—into our relationships, communities, and cultures" (Adams, Jones, and Ellis, 2015).

It's worth noting, in academic papers, it is customary to refer to individuals by their last names. However, in this paper, given my relationship with the interviewees—where we address each other by our first names—and the fact that the interviewees also refer to other individuals by their first names, the paper will, for consistency, use first names when mentioning individuals (However, when the individual is Japanese, I address them by their surname followed by 'san' in actual situations. This notation is reflected in this paper as well).

With PLoP marking its 30th anniversary in 2023, I would like to dedicate this lengthy yet insightful paper, which includes valuable narratives of our history, to this community with gratitude and respect.

2. TRACING THE BEGINNING OF PATTERN LANGUAGES OF PROGRAMS

How did the concept of a pattern language, initially conceived for architecture, get adapted for application in software development? This chapter seeks to unravel that history. The content showcased here hinges primarily on oral history, gleaned from interviews I conducted with seminal figures in this evolution. Pivotal sources include an interview with Ward Cunningham, who stands as one of the pioneers in advocating the implementation of pattern languages in software (held in Illinois, USA, in 2013; refer to Figure 1), a discourse with Ralph Johnson, one of the esteemed authors of "Design Patterns" (held in Illinois, USA, in 2013; consult Figure 2), and a conversation with Richard Gabriel, the luminary who introduced Writers' Workshops to the software pattern community (engaged in Arizona, USA, in 2012; view Figure 3). Anchoring our discussion on these interviews and interlacing them with other accessible resources, we journey into the story of how pattern languages found their application in the domain of software development.



Fig. 1. Interview with Ward Cunningham (2013).



Fig. 2. Interview with Ralph Johnson (2013).



Fig. 3. Interview with Richard Gabriel (2012).

2.1 Idea of Applying Pattern Language to Software Designs

In 1987, Kent Beck and Ward Cunningham presented the paper "Using Pattern Languages for Object-Oriented Programs" (Beck and Cunningham, 1987) at OOPSLA'87 (Conference on Object-Oriented Programming Systems, Languages, and Applications). This was the first proposition of the idea of applying what Alexander had

advocated in the field of architecture to the field of software, paving the way for Alexander's pattern language concept to be used in fields other than architecture. What led to the development of this idea? The story takes us back to the 1980s. Let's journey back to that era and see how events unfolded.

One day in the 1980s, an unidentified parcel arrived at Ward Cunningham's home in Oregon. Inside the envelope was a book, Alexander's *A Pattern Language* (Alexander, Ishikawa, *et al.*, 1977). Initially, Ward had assumed it was a sort of compilation of architectural standards, but after skimming through it, he recognized that it was something far more profound. However, at the time, he did not understand why he had been sent this book or what he was supposed to think about it. As a result, the book was quietly shelved for a while.

Later, it was revealed that the book was sent by William Croft, a friend from his student days. Croft considered the book extremely important and sent it to a few influential figures in the field of computer science, one of whom was Ward.

Several years later, Ward was discussing with Kent Beck how to become proficient in object-oriented programming. During this conversation, Kent presented a book. He said, "I just happened to have this on my bookshelf" and handed me Alexander's first work, *Notes on the Synthesis of Form* (Alexander, 1964/1971). Kent, a University of Oregon alumnus, knew of Alexander's involvement in the university's campus planning, detailed in another book, *The Oregon Experiment* (Alexander, Silverstein, *et al.*, 1975). Holding the book, *Notes on the Synthesis of Form*, Kent stated, "This is the answer."

Ward began to flip through the book thoughtfully. He found it to be quite technical and procedural, which was to be expected as *Notes on the Synthesis of Form* advocates for a mathematical decomposition of design problems. Ward was drawn to a passage at the beginning of the book, an addition by Alexander during the 1971 reprint.

Today, almost ten years after I wrote this book, one idea stands out clearly for me as the most important in the book: *the idea of the diagrams*. These diagrams, which, in my more recent work, I have been calling *patterns*, are the key to the process of creating form (Alexander, 1964/1971).

I have discovered, since, that these abstract diagrams not only allow you to create a single whole from them, by fusion, but also have other even more important powers. Because the diagrams are independent of one another, you can study them and improve them one at a time, so that their evolution can be gradual and cumulative. More important still, because they are abstract and independent, you can use them to create not just one design, but an infinite variety of designs, all of them free combinations of the same set of patterns (Alexander, 1964/1971).

Reading this part, Ward suddenly remembered, "Right, I also have a book on patterns in my bookshelf." The next day, Ward brought Alexander's *A Pattern Language* and the two decided to study "patterns" and "pattern language." At the time, Ward and Kent believed that the object-oriented program designs proposed by others were subpar and did not align with what they considered good object-oriented programming. "We didn't think that hierarchy was as important as method dispatching being able to pass control. And especially, how you divided the responsibilities between two objects seemed to be the crucial decision," Ward said. Thus, they came to believe that in object-oriented programming, it was important to push and pull responsibilities across boundaries.

So, they came up with 'CRC cards' (Class Responsibility Collaborator cards), a method of writing how classes interact with each other on index cards.

Basically, telling a story about how responsibility between the different classes would be shared. And then we would make notes on the cards of what responsibility we give to each class. And what other objects they collaborated with. So that was called class responsibility collaborator cards" (as stated by Ward).

Ward's idea of using index cards was inspired by Apple Computer's 'HyperCard' of the time. HyperCard was software that allowed information to be written onto card-sized screens and then handled, and Ward applied it to object design.

This led to the invention of the CRC cards. However, as they created CRC cards, they noticed that the responsibilities of the objects they had written down fell into certain categories. Some kept appearing repeatedly. So, they decided to "list all the responsibilities that could be given to objects." However, as they started creating the list, it became a never-ending task, and they realized it wasn't as easy as they thought. Thus, they decided to "pursue what Alexander had to say about the subject" (as stated by Ward). It was around this time that they "stumbled across Alexander" (as stated by Ward). Ward describes this moment as follows:

What was attractive to us was he talked about things. It wasn't the process. It was a collection of responsibilities of things. And so, it meshed exactly with our thinking of the moment which I think was original thinking about object-oriented design. And we said, "Well, we got to pursue what Alexander had to say about the subject. And we did. It was a good match (as stated by Ward).

In this way, the two of them delved into Alexander's concepts, namely patterns and pattern language. Ward said they have "a very similar world view and very different skills." They were partners in collaboration, each bringing their strengths to the table. At that time, they agreed that they "write together and whoever did the first draft would put their name first" (as stated by Ward). However, as Ward was not as enthusiastic about writing and was slow with the pen, in most cases, Kent, who was passionate about writing, ended up being the lead author. Consequently, they authored an OOPSLA paper that proposed the application of pattern language to the field of software (Beck and Cunningham, 1987).

At the outset of this paper, there exists a passage that could be considered a declaration.

We propose a radical shift in the burden of design and implementation, using concepts adapted from the work of Christopher Alexander, an architect and founder of the Center for Environmental Structures. Alexander proposes homes and offices be designed and built by their eventual occupants. These people, he reasons, know best their requirements for a particular structure. We agree and make the same argument for computer programs. Computer users should write their own programs. The idea sounds foolish when one considers the size and complexity of both buildings and programs, and the years of training for the design professions. Yet Alexander offers a convincing scenario. It revolves around a concept called a "pattern language (Beck and Cunningham, 1987).

The paper commences with a statement asserting, "We have begun writing a complete pattern language for object-oriented programming" (Beck & Cunningham, 1987). As an illustration, an overview of a pattern called *Collect Low-level Protocol* is included. The paper concludes by stating, "We have completed approximately ten patterns, have sketched out 20-30 more, and expect our finished pattern language to contain about 100-150 patterns" (Beck & Cunningham, 1987).

2.2 The Making of the pioneering book on a Pattern Language of Programs – *Design Patterns*

The book 'Design Patterns' (Gamma, Helm, et al., 1994) is another seminal work in this field. The book is authored by four individuals, one of whom is Ralph Johnson. Previously a faculty member at the University of Illinois, he would go on to maintain an ongoing involvement with the Pattern Language of Programs (PLoP) conference, held annually in Illinois, USA. How did he initially come into contact with the concept of pattern language?

As Ralph answered, he started reading Alexander's work at the recommendation of Kent Beck. As mentioned in previous section, at that time, Tektronix members, including Kent and Ward, were reading Alexander's book and considering how to apply it to software. Ralph didn't start reading immediately after the recommendation, but he understood its relevance to software.

Christopher Alexander talked about how master plans were a bad idea, and how you needed to just try things out and repair. A lot of software is always like that so I could sort of see analogies with software (as stated by Ralph).

At OOPSLA'91, Bruce Anderson held a workshop called "Towards an Architect's Handbook," where they discussed what a handbook for software architects should contain (Anderson, 1991). At that time, Ralph talked about frameworks, while Erich Gamma talked about patterns. Within that context, both Kent Beck and Ward Cunningham were participants. According to Ward, the two conveyed to Bruce that "Kent and I both were telling them how these patterns were and how the architectural handbook should be written."

Upon seeing the patterns introduced by Erich, Ralph realized that they were exactly what he had been teaching in his object-oriented design classes. Ralph had taught these concepts several times in his classes, even giving them names and calling them "here's a particular technique." However, he hadn't considered them noteworthy 'patterns.' Still, he was impressed with Erich's well-formed idea of what 'Design Patterns' should be, and agreed that "yes he's right, these are things that ought to be in a book on software architecture."

Another event occurred when Kent invited Ralph, saying, "You know HotDraw? Let's write a design pattern using Alexander-style patterns, a little pattern language for doing HotDraw." HotDraw was a structured graphic editor framework created by Kent and Ward. Ralph was familiar with HotDraw and had read Alexander's book, but he wasn't particularly moved by the concept of patterns. However, he responded, "Okay, let's try that." They spent an hour examining the patterns that made up HotDraw based on Kent's findings and ended up with about seven patterns. At the end, Kent said, "Well, to demonstrate the usefulness of this, let's teach somebody else the pattern language."

Just then, Norm Kerth came by, so they decided to teach him. Norm didn't know about the HotDraw framework, so it was just right. They decided to have him make a graphic editor, encounter problems, and use patterns to solve them. Ralph was shocked at the results - the patterns worked better than expected.

After that, he immediately refined the pattern text and presented it at OOPSLA'92 the following year (Johnson, 1992). He then got a call from Erich Gamma, who, along with Richard Helm and John Vlissides, was working on a larger pattern catalog, and invited him to join. Ralph answered, "Sure, I'd love to work with you." He was the last to join an already ongoing project.

Ralph quickly proposed, "this is not going to be a paper. It's too big, we have to make a book out of it." To which Erich replied, "Okay well, it'll be a book." The original intention was not to publish a book. "It really was trying to document the patterns, thinking about the software architect's handbook.", Ralph attested.

"One of the things that made the book successful was that the whole writing in the book was pretty open," Ralph recalls. In the pre-WWW era, there were no web pages, but they used FTP servers and mailing lists. Pattern draft files were placed on the FTP server and discussed on the mailing list. In this way, they communicated about all the patterns.

"Approximately five hundred people engaged in the discussion via the mailing list" (as stated by Ralph), which facilitated the procurement of numerous valuable feedback that allowed for the removal of a significant number of flaws in the manuscript. In addition, one of the authors, John Vlissides, formed a group within IBM, his place of employment, where approximately five hundred more individuals read and provided feedback. It was this open process, where many people had the opportunity to read and contribute, that improved both the patterns and the book. Ward describes the situation by stating, "The book was well-read before it was finished."

Initially, among the four authors, only Ralph had read Christopher Alexander's book. Erich had come up with an idea similar to patterns without influence from Alexander. Upon hearing people around him say, "Well, it's a lot like Christopher Alexander," he decided to give the book a read. Ralph later commented, "I think everybody had read Christopher Alexander's book before our book was finished." For this reason, the statement "Christopher Alexander's book caused our book to be written" would not really be accurate, because it hadn't influenced Erich significantly. Erich had initiated this project before he had read Alexander's book. "I mean, the idea of patterns is very natural. Lots of people have come up with the idea of patterns. It gets invented over and over again," Ralph stated.

This is how the book *Design Patterns* was born. In the published book Design Patterns, the initial section titled "What Is a Design Pattern?" opens with a quotation from Alexander. This quotation is from the beginning of the Alexander's book, *A Pattern Language*.

Each pattern describes a problem which occurs over and over again in our environment, and then describes the core of the solution to that problem, in such a way that you can use this solution a million times over, without ever doing it the same way twice (Alexander, Ishikawa, *et al.*, 1977, p. x).

Building upon the quoted text from Alexander, it is stated, "Even though Alexander was talking about patterns in buildings and towns, what he says is true about object-oriented design patterns. Our solutions are expressed in terms of objects and interfaces instead of walls and doors, but at the core of both kinds of patterns is a solution to a problem in a context." (Gamma, Helm, *et al.*, 1994). So, what exactly are design patterns? Let us delve into the section where this is explicitly elucidated.

The design patterns in this book are descriptions of communicating objects and classes that are customized to solve a general design problem in a particular context. A design pattern names, abstracts, and identifies the key aspects of a common design structure that make it useful for creating a reusable object-oriented design. The design pattern identifies the participating classes and instances, their roles and collaborations, and the distribution of responsibilities. Each design pattern focuses on a particular object-oriented design problem or issue. It describes when it applies, whether it can be applied in view of other design constraints, and the consequences and trade-offs of its use (Gamma, Helm, *et al.*, 1994).

In the latter part of the book *Design Patterns*, the similarities and differences between Alexander's pattern language and the concept under discussion are elaborated as follows:

There are many ways in which our work is like Alexander's. Both are based on observing existing systems and looking for patterns in them. Both have templates for describing patterns (although our templates are quite different). Both rely on natural language and lots of examples to describe patterns rather than formal languages, and both give rationales for each pattern. But there are just as many ways in which our works are different:

1. People have been making buildings for thousands of years, and there are many classic examples to draw upon. We have been making software systems for a relatively short time, and few are considered classics.

2. Alexander gives an order in which his patterns should be used; we have not.

3. Alexander's patterns emphasize the problems they address, whereas design patterns describe the solutions in more detail.

4. Alexander claims his patterns will generate complete buildings. We do not claim that our patterns will generate complete programs (Gamma, Helm, *et al.*, 1994).

Therefore, it is explicitly stated that "From Alexander's point of view, the patterns in this book do not form a pattern language" (Gamma, Helm, *et al.*, 1994). This is consistent with the testimony of Ralph, whom we discussed earlier. While *Design Patterns* shares similarities with Alexander's pattern language, it was not necessarily aimed at crafting a pattern language in strict sense.

In 1994, during the OOPSLA conference in Portland, the book *Design Patterns* was released, and there was a queue of people lining up to purchase it at the conference. Ward recalls the atmosphere at that time, stating, "We had a line at the door waiting for the exhibit to open." Once the exhibit opened, a significant number of attendees "streamed past all these exotic exhibits, to the back to where the publishers hung out" (as stated by Ward), highlighting the intense interest in the book.

They all walked straight to the Addison Wesley and bought those books two or three at the time. And started marching out, carrying all these books right past the same people with their fabulous exhibits completely ignored. They got this book because they have seen it, patterns, at that time on this mailing list. But who hadn't seen it is all the other publishers who said, "What the heck is Addison Wesley selling!" (as stated by Ward).

Thus, the 700 copies that the publisher had prepared sold out in just about 15 minutes! "It was a very exciting time, everybody wanting to have the book," Ralph reflects retrospectively.

Why did the book garner such immediate attention? Of course, as Ward pointed out, many people were already involved in the book's creation process, and those around them were also interested. However, this alone may not have generated such overwhelming attention.

In fact, there seems to be another significant factor that contributed to the book's instant success. Renowned software development methodologist Grady Booch extensively promoted the book in his own talks everywhere. Despite it not being his own work, Booch emphasized its excellence during each of his talks. After collectively experiencing the brilliance of design patterns at software-related gatherings (such as the Generative Pattern Workshop, which we will show in the next section), he introduced the concepts of patterns and *Design Patterns* in lectures he gave around the world. Ralph comments on this as follows:

That year, when Grady Booch went out to speak, he would talk about patterns and Christopher Alexander, how this was important, and he would always end up by talking about this book by four people on Design Patterns and it's going to be really important book so everybody should get that book. So, he probably has told a hundred thousand people they should buy a copy of our book that year (as stated by Ralph).

Certainly, the innovative and useful content is a reason for the book becoming both a bestseller and a long seller. However, the immediate surge of attention appears to be due, in part, to the involvement of key figures like Grady Booch, who actively promoted it. So, who were the people driving the advancement of software patterns, and how did their community come into being? In the following sections, we shall delve into the origins and development of the software pattern community.

2.3 Launching Software Patterns Community – The Hillside Group and PLoP Conference

In the context of the dissemination and networking of software design patterns, one organization stands as indispensable: The Hillside Group, a non-profit organization. *The Hillside Group* served as an initial gathering place for enthusiasts and experts of software patterns and eventually hosted international conferences on pattern languages. The formation and significance of The Hillside Group can be traced back based on interviews with Ward Cunningham and Ralph Johnson.

The formation of The Hillside Group was preceded by the crucial 'Generative Patterns Workshop.' In 1993, industry luminaries such as Kent Beck and Grady Booch hosted this invite-only event. The workshop aimed to engage in substantive discussions about patterns, captured succinctly by the sentiment, "We didn't want to talk about them idly" (as stated by Ward). Therefore, the term "generative" was incorporated into the workshop's name, leading attendees to delve deeper into what was meant by "generative."

The workshop took place in the mountains near Denver, Colorado, at a resort complex where Grady Booch owned a condominium. Ward Cunningham described the setting as enchanting, offering both relaxation and scenic beauty. Because it was Summer, attendees could go outside, climb the mountain for a spectacular view, or even visit a ski resort.

At that time, the participant pool was small, involving six to seven individuals, including Ralph Johnson, Jim Coplien, and Ken Auer. Both Cunningham and Beck shared their insights into how patterns could be instrumental in programming and discussed their interpretations of the works written by Christopher Alexander. Ultimately, the consensus evolved to a pivotal question: "Why aren't we writing patterns?" This question led to significant strides in the community's contributions to the field of software patterns.

Let's just take the next for two hours, sit out into the sun on the deck and write a pattern (as stated by Ward).

The proposition of writing patterns culminated in overcoming the inhibiting fear of, "Are we good enough to write a pattern?" The tranquil, nature-rich setting provided a conducive environment for giving it a try. Although initially unsure of their quality, as encapsulated by the sentiment, "I don't know if any of the patterns were very good," these patterns were eventually refined and polished to a level worthy of conference presentations. Ward described the experience as "very satisfying."

Another remarkable experience involved a practical test of the interlinking of patterns as described in Christopher Alexander's *A Pattern Language*. The attendees stepped out of the building and took a walk, assuming a hypothetical design of their workspaces, which they call "the Center for Collaborative Object-

Oriented Development where experts from all sorts of domains would come to work with Expert Object-Oriented Software folks" (Auer, 2022). Crossing a street located on the hillside, they ventured into the forest and turned the pages of Alexander's book to read the *Circulation Realms* pattern. It served as a reaffirmation that patterns offer both problems and solutions. This moment underscored the essential nature of what *Circulation Realms* represented.

This hands-on experiment and the resultant experiences underscored the value of patterns, not just as academic concepts but as practical tools for problem-solving and design. It also validated the efficacy of the workshop, marking it as an inflection point in the broader conversation about software design patterns.

In many modern building complexes the problem of disorientation is acute. People have no idea where they are, and they experience considerable mental stress as a result (Alexander, Ishikawa, *et al.*, 1977).

The solution to resolve this problem is articulated as follows:

Lay out very large buildings and collections of small buildings so that one reaches a given point inside by passing through a sequence of realms, each marked by a gateway and becoming smaller and smaller, as one passes from each one, through a gateway, to the next Choose the realms so that each one can be easily named, so that you can tell a person where to go, simply by telling him which realms to go through (Alexander, Ishikawa, *et al.*, 1977).

Based on the contents of the pattern, participants discussed where people would be situated and how they would approach for work. Then, they physically walked the route, saying, "Your office would be here," as they passed through the forest to another office location. After contemplating the arrangement based on the **Circulation Realms** pattern, they traced related patterns as indicated. In this manner, they experienced about four patterns in real terms.

At this juncture, Ward and his colleagues felt that "the patterns genuinely interlinked" and that "each pattern prepared us for the subsequent phase of our hypothetical discussion" (as stated by Ward).

Thus, the Generative Patterns Workshop provided participants with the invaluable experience of both writing actual patterns and employing functional patterns in practice.

Because both of these experiences were so rewarding, Ward suggested, "We should write a report. A report should be published about what we've discovered." However, as he does not particularly enjoy writing, Ward proposed an alternative: "Let's just create a slide deck." They realized that, since Grady was already frequently giving talks worldwide, having a slide deck would make it easier to disseminate the findings. Regarding Grady's presentation style, Ralph had the following to say:

The way Grady works is giving lots and lots of talks. He would pick a topic and then make a really good speech, and then that year, he would just give this speech over and over and over again. And the next year he'd make another speech and give that speech for the next year. That way he didn't have to constantly be inventing new speeches. He could get a really good one and (give it for the year) that was how Grady worked. So he decided that next year it was going to be on patterns, and so he worked, and he made a speech on patterns (as stated by Ralph).

Thus, the team created a slide deck elucidating the importance of patterns, which Grady would then incorporate into his lectures. Notably, these were the very lectures in which Grady introduced the *Design Patterns*, drawing upon pre-publication manuscripts he received from Ralph and others during the Generative Patterns Workshop.

Returning to the workshop, participants also deliberated on appropriate venues for disseminating the patterns they had developed. Academic conferences like OOPSLA were deemed too theoretical, leading to the conclusion, "Well, we should create a conference where people can publish works like this" (as stated by Ward). Given that they sought a more practical forum, attended by developers, they decided, "We should form an organization exclusively to run the conference" (as stated by Ward).

Additionally, they contemplated, "We should establish a small organization for this purpose" (as stated by Ward). The name "Patterns Interest Group" was proposed, but Ward found it uninspiring. Instead, he suggested,

"We just had a wonderful experience on the hillside. Why don't we call it the Hillside Group?" This would allow them, he reasoned, "to evoke that experience every time we hear the name." And thus, the organization was christened "The Hillside Group."

Later, Kent attempted to register the non-profit organization (NPO) in California, only to discover that the name was already taken. As a result, the team faced the necessity of brainstorming a new name. In this interesting development, Ralph, who was a faculty member at the University of Illinois, suggested establishing the NPO in Illinois. He reasoned, "There wouldn't be too many organizations called 'Hillside Group' because Illinois is really flat, unlike Colorado." Since he was already based in Illinois, Ralph could take care of the paperwork and logistics. Ultimately, the Hillside Group was formally founded as NPO in Illinois in 1994.

To host the Hillside Group's inaugural conference, Ralph was appointed as the conference chair, while Ward, by others' demand, assumed the role of program chair. This conference, held in 1994 at Allerton Mansion in Illinois, became the first PLoP (Pattern Language of Programs) Conference. Joe Yoder reflected on the first PLoP conference, "I met many people such as the Gang of Four, Kent Beck, Ward Cunningham, Frank Buschmann, Norm Kerth, Bob Martin, Jim Coplien, Mary Shaw, Richard Gabriel, and others" (Joseph Yoder).

When the discussion turned to how to conduct the conference, "They wanted PLoP to be different and not a typical academic conference with paper presentations." (Richard Gabriel). At that time, Richard thought of a good place. Richard had experience giving his very first public talk at Allerton Mansion in 1974 (Gabriel and Waltz, 1974), when he was a graduate student at the University of Illinois. That talk was held in the Solarium. Based on this experience, Richard thought that Allerton Mansion would be suitable for holding a meeting different from a typical computer science conference, and others would feel that PLoP was not an ordinary conference.

This Allerton Mansion was built in 1900 as the private residence of Robert Henry Allerton. The vast estate was the center of Illinois agricultural enterprises that Robert's father, Samuel, had accumulated in the late 1800s, known as "The Farms." Robert was passionate about art and was an avid art collector who traveled extensively. He created gardens filled with nature and art. Later, he donated the mansion, grounds, and farmland to the University of Illinois, and since then, the university has managed and operated it as the Allerton Park and Retreat Center. Later, Richard described the Allerton location as follows:

Nearby Allerton Park in Monticello is part of the University of Illinois; I gave my first-ever public talk there in 1974. They had a maze, a sunken garden, fake ancient Greek ruins, a fake Roman arena, and nude / bizarre statues—many on a forested trail along the Sangamon River. Statues ranged from the quaint (Fu dogs, Chinese musicians, koi) to the strange (Last of the Centaurs, the Sun Singer) to the weird (Gorilla Carrying Off a Woman (Dave called it Statutory Ape), Bear and Man of the Stone Age—a bear death-hugging a hunter who had stabbed the bear in the neck, the hunter still holding a rope attached to a bear cub) (Gabriel, 2012).

The uniqueness of the place is evident. Moreover, since Ralph was a faculty member of the University of Illinois, who managed the site, it was thought that arrangements could be made and realized. To assist with the conference students was involved as helpers, and this is how Joseph Yoder became involved (Joe, who was a student at the time, would go on to be involved with PLoP for a long time, later becoming President of The Hillside Group and playing a central role in implementing and managing PLoP Conferences).

What sets the PLoP Conference apart from conventional conferences is its unique format. Instead of authors presenting their papers, the conference holds something called a "Writers' Workshop." Attendees are assigned to fixed groups for the duration of the conference, where they review each other's papers and provide constructive feedback aimed at improvement.

This unusual method, known as the Writers' Workshop, is quite distinctive. But how and why did this unique format get incorporated into a conference focused on pattern languages? In the next section, we will explore the significance and history of this approach, drawing on insights from its creator, Richard Gabriel.

2.4 First Trial of Writers' Workshop

Pattern Language of Programs (PLoP) conference in the software domain deviates from conventional conferences. Instead of authors presenting their papers, it conducts Writers' Workshops. Attendees remain in their assigned groups throughout the conference, offering constructive suggestions and feedback to enhance the quality of papers submitted by other participants. This distinctive approach for software conferences was proposed by Richard Gabriel.

The Writers' Workshop originated in the realm of creative writing, traditionally employed for works such as poetry and fiction. According to Richard, this practice has been a longstanding tradition since around 1888, the late 19th century. While Richard is a computer scientist with a Ph.D. in Computer Science (Gabriel, 1985), he is also a poet, holding a Master of Fine Arts degree in poetry (Gabriel, 2005). Note that MFA is a performance degree of writing poetry and considered a terminal degree, namely the highest level of education for that field. The introduction of the Writers' Workshop to the software domain was facilitated by Richard's unique background (Gabriel, 1996, 2002). Without his influence, it is unlikely that the connection between pattern language and the Writers' Workshop would have emerged.

From the inception of the PLoP conference and its foundational entity, The Hillside Group, Richard and his colleagues viewed pattern language as a type of *literature*. They believed that creating a pattern language was akin to "building literature like poetry, fiction, or a novel" (as stated by Richard).

When the Hillside Group first got together, interested in patterns and pattern languages, one of the things we thought was people who are writing pattern languages are creating literature, that is explaining how to do things, explaining deep concepts, or explaining advanced techniques. And the audience could be wide. It could be beginners or could be experts (as stated by Richard).

Given this perspective, Richard reasoned that if the Writers' Workshop approach was appropriate for poetry, it could also be beneficial for pattern languages. Before delving into the inception of the Writers' Workshop for pattern language, let's provide an overview of what it entails.

In a Writers' Workshop, participants other than the paper's author engage in discussions aimed at refining the paper. As a prerequisite, all attendees are expected to have thoroughly read all papers for their assigned Writers' Workshop group before the conference. For each paper, a dedicated session typically lasting an hour to an hour and a half is allocated, during which participants—excluding the paper's author—discuss potential improvements to the patterns presented and the paper as a whole. A unique rule during these sessions is the author's mandated silence: they must adopt a "fly on the wall" stance. Fellow attendees must not address or engage the author directly, and the author, in turn, should not respond or react. The intention is for the author to remain as inconspicuous as if they were not present in the room at all. Though the author, in the capacity of the "fly," is attuned to the conversation and notes feedback, they are not there as an active participant. Typically, while the Workshop participants sit in a circle for these discussions, the author sits slightly outside this circle, attentively listening and jotting down areas for improvement.

Even if participants harbor misconceptions, the author is not permitted to correct them during the session. Any such misunderstandings are presumed to arise from inadequacies in the paper's presentation. The author must accept this situation, recognizing that the misunderstandings stem from deficiencies in their writing. Moreover, making excuses is not an option. When a reader peruses a paper from a remote location, the author is not there to clarify. Therefore, all pertinent details should be sufficiently encapsulated within the paper itself, and any elements that might warrant excuses should be eliminated. The Writers' Workshop offers author a rare glimpse into how their paper is interpreted when read by others. This is crucial because there's often a disconnect between the idea in the author's mind and how it materializes in writing. As Richard articulates:

It's very hard when someone writes something, to be able to understand exactly what it is saying and what it's not saying, because they have the concepts, ideas, or the story in their head. When they see the words on the page, it reminds them of what they were thinking, so they think that the words on the page are saying everything that needs to be said (as stated by Richard).

Even with diligent self-review by the author, there are inevitably aspects of the paper that escape one's notice. The Writers' Workshop provides an opportunity to overcome this limitation.

The idea of the Writers' Workshop is to simulate having actual readers and seeing what they see in the writing: see what it is saying, seeing if it's said well (as stated by Richard).

Concerns that the author might feel slighted or offended are generally unwarranted. Participants are mandated to provide constructive feedback, not mere criticism. As a result, author receives a plethora of valuable comments that aid in refining their work.

The design of the Writers' Workshop is to protect the author, so there are never hard feelings, never the feeling that people are attacking him (as stated by Richard).

In software pattern conferences, this approach has furnished author with numerous insights and significant feedback. Over the past 30 years, not only in the PLoP conferences but also in European conferences like EuroPLoP, VikingPLoP in the Nordic region, SugarloafPLoP in South America, and AsianPLoP in Asia, the Writers' Workshop has been consistently implemented. Author, supported by their community, has been refining their patterns and papers through this collaborative process.

So, how did the adoption of the Writers' Workshop for pattern language come about? Richard, recalling the inception, shared the tale. It took place during a retreat of The Hillside Group. At that time, The Hillside Group held annual retreats attended by many, including Kent Beck, Ward Cunningham, Ralph Johnson, and John Vlissides. In a cabin near Santa Cruz, California, amidst the Redwoods, Richard proposed conducting a Writers' Workshop.

His proposal was, however, met with resistance. Responses ranged from concerns like, "That's going to be really discouraging," to "We're trying to build a community grounded on trust and mutual support. If the cornerstone of our conference is these Writers' Workshops, it implies we're primarily criticizing participants' work, and that's not a sustainable approach." Despite Richard elucidating the concept by drawing parallels from the world of poetry and fiction, some remained skeptical, dismissing the idea with remarks like, "that sounds really stupid" or "I think that's a bad idea." It was at this juncture that Ward intervened, expressing the following sentiment:

But if we're talking about being supportive, our good friend Richard Gabriel has just suggested this, and he really believes this works - why don't we try it (Ward's remarks, as recalled by Richard).

It sounds like the group had a culture of experimentation and was open to taking risks for potentially big rewards. Ward had a rapport with Richard, saying "We had done enough together to trust each other." Although the others might have been somewhat perplexed by the unconventional idea, no one opposed it, perhaps out of respect for Ward's role as program chair and the need for him to make executive decisions. It's also likely that the team was aware that they were venturing into new territory and that to innovate often requires taking calculated risks.

In environments like this, trust is crucial, as are open-mindedness and a willingness to try new things—even if they defy conventional wisdom or established methods. When such conditions are met, the potential for innovation is high. The trust between Ward and Richard, along with the group's experimental mindset, likely paved the way for the introduction of new, innovative formats like the Writers' Workshop at the PLoP Conference. This could be seen as a case study in how a group's collective willingness to take risks can lead to innovative solutions that become foundational to a new way of doing things.

Ward happened to have with him a pattern he had written about Smalltalk programming. He proposed to the group that they use his piece as a case study for a Writers' Workshop and offer feedback on it. This proposition changed the dynamics. There was a collective agreement to "give it a shot."

With everyone gathered to read the pattern and Richard acting as the moderator, the Writers' Workshop was conducted. An hour later, when the session concluded, the group, with contemplative expressions, collectively remarked, "That works." Consequently, at the inaugural PLoP conference held at Allerton House, the Writers' Workshop methodology was adopted and has been an integral part since. Reflecting on this cooperative and collaborative community, Richard had the following observations:

It's created a kind of community that's unusual in the computer science, software engineering, software world, because usually when people are writing papers, they think they're doing science which is still competitive, and PLoPs are not competitive at all. (as stated by Richard)

The adoption of Writers' Workshops for technical writing and their subsequent spread is a testament to the innovation and experimental nature of the group involved in the first PLoP conference. As Ralph stated, "I think we were the first people to use Writers' Workshops for technical writing, but now a lot of people do." This shows that the risk taken was well worth it; the technique has proved to be so effective that it has been adopted beyond the original context.

The fact that even groups at the University of Illinois, who have never participated in PLoP, are now using Writers' Workshops indicates how impactful this approach has been. It provides a more collaborative and constructive way to improve writing quality and the clarity of ideas, which are critical factors in technical disciplines. According to Ralph, "Now at University of Illinois, in the software engineering group, they offer workshops to papers going off to conferences. This is a very good technique for improving writing."

Moreover, the flexibility of the Writers' Workshop format, as mentioned by Richard, allows for its application beyond paper writing, extending its usefulness to improving presentations as well. This speaks to the adaptability and broad applicability of the method, further validating the "big risk and big rewards" ethos of the original group.

It's an interesting journey from the first Generative Patterns Workshop and the formation of the Hillside Group to the enduring influence of the PLoP conferences. The open-mindedness and experimental spirit that characterized this group led to the development and adoption of techniques that have had a broad and lasting impact on the way technical ideas are shared and refined.

Lastly, let me introduce a delightful and perhaps surprising ending to the Writers' Workshop for those attending for the first time. The culmination of the Writers' Workshop is marked by participants offering a round of applause to the author. For the preceding 90 minutes, the author had assumed the role of a "fly on the wall," silently observing as the participants engaged in discussion. The author, undoubtedly filled with gratitude, walks away armed with a wealth of insightful ideas.

What exactly is the nature of this applause directed at the author? Could it be a recognition of the following? Despite all that has been discussed during the Writers' Workshop, it is the author who has invested significant time and effort into crafting the pattern. Moreover, the pattern has been written with someone else - a broader audience - in mind. This applause serves as a gesture of appreciation for the author's dedication and a thank-you for their contribution to humanity. That's how I perceive it. Thus, in the realm of software patterns, such sessions have laid the foundation for a cooperative and collaborative community.

To summarize the events I've introduced up to this point, a timeline representation can be seen in Figure 4. It's important to note that this does not cover all occurrences within this community and should not be viewed as a complete the record of 'History.' Rather, it should be considered a reference timeline that encapsulates how pattern language has been applied to Programs.

	A Pattern Language of Places Publication	Pattern Languages of Programs Community	Pattern Languages of Program Publication
1964	Alexander's Notes on the Synthesis of Form		
-			
1975	Alexander, Silverstein, et al.'s The Oregon Experiment		
1977	Alexander, Ishikawa, <i>et al.</i> 's A Pattern Language		
1979	Alexander's The Timeless Way of Building		
1980		Cunningham received an unidentified	
1985	Alexander, Davis, <i>et al.</i> 's <i>The</i> <i>Production of Houses</i> The opening of Eishin Gakuen Higashino High School	parcel, the book, <i>A Pattern Language</i> Cunningham & Beck discussed how to become proficient in object-orient- ed programming.	
1987	Alexander, Neis, et al.'s A New Theory of Urban Design		Beck & Cunningham's OOPSLA '87 paper "Using Pattern Languages for Object- Oriented Programs"
1991		Anderson's OOPSLA'91 Workshop "Towards an Architect's Handbook"	
1992			Johnson's OOPSLA'92 paper "Documenting Frameworks using Patterns"
1993		Generative Patterns Workshop in Denver, Colorado	
1994		The Hillside Group was formally founded as NPO The first Conference on Pattern Languages of Programs (PLoP) at Allerton House, Illinois	Gamma, Helm, et al.'s Design Patterns: Elements of Reusable Object-Oriented Software
1995		The Second Annual Conference on the Pattern Languages of Programs (PLoP) at Allerton House, Illinois	Pattern Languages of Program Design
1996	Alexander's OOPSLA 96 Keynote "The Origins of Pattern Theory, the Future of the Theory, and the Generation of a Living	The Third Annual Conference on The Pattern Languages of Programs (PLoP) at Allerton House, Illinois	Pattern Languages of Program Design 2 Gabriel's Patterns of Software
	World"in California	The First European Conference on The Pattern Languages of Programs (EuroPLoP) at Kloster Irsee, Germany	book

Fig. 4. A brief timeline of the beginning of pattern languages of programs.

3. TRACING THE BEGINNING OF PATTERN LANGUAGES OF PRACTICES

Originally conceived in the field of architecture and later adapted for software development, pattern languages have subsequently been applied in various practical domains including education and professional work. This chapter aims to explore the pioneering development of educational patterns (pedagogical patterns) as well as the iconic patterns of practice, *Fearless Change*, illustrating how they were formulated.

The following is described based on interviews I conducted with key figures, supplemented by historical materials. The sources are interviews with Mary Lynn Manns (conducted in North Carolina, USA, in 2014; see Figure 5), Joseph (Joe) Bergin (conducted in New York, USA, in 2014; see Figure 6), Eugene Wallingford (conducted in Germany in 2013; see Figure 7), and with Linda Rising (conducted in Tennessee, USA, in 2013; see Figure 8).



Fig. 5. Interview with Mary Lynn Manns (2014).



Fig. 6. Interview with Joseph Bergin (2014).



Fig. 7. Interview with Eugene Wallingford (2013).



Fig. 8. Interview with Linda Rising (2014).

3.1 A Spark of Insight and Holding Workshops where Participants Brought Patterns

To provide an overview the history of Educational Patterns, I'd like to start with a brief overview of the personal history of Mary Lynn Manns, one of the key figures in the field. This is because Mary Lynn's expertise and experiences have significantly influenced the formation of Educational Patterns.

After earning her Ph.D. at De Montfort University in the United Kingdom, Mary Lynn Manns was teaching Management Information Systems at the University of North Carolina in Asheville and conducting research on professional programmer training. This research on 'technical education and training' blossomed into two directions: *Pedagogical Patterns* and *Fearless Change*, dealing with leadership for change when introducing new technology into organizations, which we will discuss later in this chapter. Let's start by looking at the educational patterns.

At the OOPSLA '94 panel held in Portland, Oregon in 1994 (Cohen, Manns, *et al.*, 1994), Mary Lynn presented her survey research on methods used for object-oriented technology training across various organizations. The survey examined both successful and unsuccessful methods, revealing that adopting object-oriented technology requires a shift in perspective rather than simply changing to a new language, methodology, or tool. It also concluded that training needs to be carried out at all levels of the system development process and that well-planned training curricula are crucial, rather than a random assortment of courses.

Such curricula should include elements beyond traditional classroom instruction. These elements include some form of motivation for potential trainees to learn object-oriented technology, projects during or immediately after training to maintain interest in the technology, well-designed mentoring programs provided during classroom training or projects, systems for sharing and viewing object-oriented technology materials at appropriate times, regular discussions about changes and challenges when introducing object-oriented technology to the organization, mechanisms to share successes and failures among object-oriented projects within the organization, and plans for both internal education and external training that consider turning organizational members into future trainers.

The following year, in 1995, Mary Lynn attended a software engineering education conference held in New Orleans, Louisiana, and gave a presentation titled "Object-Oriented Technology Education and Training: Bridging the Gap Between Academia and Industry" (Manns and Puhr, 1995). It was at this conference that she first became aware of pattern languages. She heard the term "pattern language" for the first time during the conference, and when she went out for dinner with some people she had befriended at the conference, one of them introduced her to Gamma's *Design Patterns* at a bookstore they visited. After reading it, she became interested in the concept of patterns and wondered if it could be applied to her field of expertise, educational methods.

Then, during the dinner after the education symposium of OOPSLA 1995 held in Austin, Texas, a conversation with Maximo Prieto, Phil McLaughlin, and Helen Sharp initiated from the remark, "Wow, we learned so much today and we hardly remember any of it!" (as stated by Mary Lynn). This led to the notion that it might be possible to "gather ideas from educators and combine them into patterns" (as stated by Mary Lynn). They thought, "If a pattern, in the sense of a design pattern or an architectural pattern as Christopher Alexander proposed, would be effective, we could term them 'teaching patterns' or 'pedagogical patterns,' to encapsulate the strategies from educators" (as stated by Mary Lynn). When they sought advice from those knowledgeable

about patterns, the response was overwhelmingly, "Why don't you try it and see if it works?" Consequently, they decided to take on the challenge and began writing patterns for education.

Thus, in 1996, Mary Lynn initiated "The Pedagogical Patterns Project" along with the three individuals who had discussed the idea of educational patterns. The project's goal was to understand the best practices in teaching object technology. Initially, it was common for someone to bring their personal success story, which served as a basis for creating a proto-pattern. Numerous workshops were held in the United States and Europe to elucidate the practical experiences of teachers. The patterns created in this manner were then posted on a website, where viewers were allowed to leave comments.

Mary Lynn and her team held continuous workshops at various venues. In July 1996, they conducted a workshop at the ECOOP Educators Symposium in Linz, Austria, and in August, at the Object Technology Education Symposium STOT during TOOLS USA, held in California, USA. At these and other workshops, pedagogical patterns were mined and discussed.

At OOPSLA, they hosted their first full-day workshop (Sharp, Manns, *et al.*, 1996). According to Eugene Wallingford, "The OOPSLA conference was a significant object-oriented programming conference that was, especially in the '90s, quite popular, with large audiences into the mid-2000s. We had a one-day workshop for educators before the conference started. So that would be a group anywhere between 35 and 100 educators."

The workshop was titled "Pedagogical Patterns—Successes in Teaching Object Technology." Participants in the workshop were required to write and submit at least one pattern beforehand. There were 18 prospective participants, and a total of 20 patterns were submitted. An additional two patterns were submitted later. All participants were asked to read all the submitted patterns and think about the strengths and weaknesses of each pattern, as well as aspects that could be better explained. They were also asked to consider how they might be able to utilize them in their own environments. Furthermore, they were requested to explore potential relationships among the patterns submitted in this round.

On the day of the workshop, following a general project overview, participants broke into groups of four or five. Each participant introduced their pattern within a few minutes, after which others shared their thoughts and reflections, providing valuable feedback for later refinement. This process was repeated for three rounds, with participants changing groups each time. The workshop was highly successful. After lunch, participants shared stories of their efforts in teaching object technology, then reported on the feedback they received on their patterns. The feedback was generally positive and constructive. A common suggestion was to make the pattern names more memorable and reflective of their essence.

By the end of the workshop, everyone had identified patterns they could take back and implement in their own contexts. They also planned to refine their patterns, including the pattern names. It was agreed that a pattern would not be considered as such unless it was useful to at least three people. Participants committed to taking these patterns back to their own settings, implementing them, and then reporting back on what worked, what needed adjustment, and so on. Ultimately, the goal was to foster this community through the workshop and to create a handbook of educational patterns.

Joseph Bergin, who would later become a key figure in the educational pattern community, was one of the individuals who attended Mary Lynn's workshop. He recalled being extremely excited about the idea of creating educational patterns from the very beginning. The first time he heard about it, he thought it was a powerful idea.

Initially, Joe asked if there was a pattern called *Fixer Upper*, which in American parlance refers to a house sold cheaply that requires substantial repair, indicating that the buyer needs to make the necessary fixes themselves. Mary Lynn responded that there wasn't such a pattern, prompting him to write it (this pattern was later included in the book, *Pedagogical Patterns*).

In this way, the number of participants gradually increased, as symposia for educators and workshops focusing on educational patterns at conferences were held. In 1998, Mary Lynn and others hosted an educators' symposium at OOPSLA.

3.2 The Struggle of Crafting Pattern Language in New Domains

Reflecting on that time, Mary Lynn said, "The community just kept growing rapidly, people were very interested in contributing and sharing ideas, and it was very early in the days of patterns, so people were not so clear as we are today on what was a good pattern and what was not."

We were among the first people to write patterns outside the domains of architecture and software development, not the first but among the first anyway. So we had a lot of struggles

between all the people in this community who were working on these patterns, to truly understand what is a good pattern and what isn't (as stated by Mary Lynn).

Regarding the challenges of crafting educational patterns, Eugene had the following to say:

One of the things that we struggled with the writing patterns was Alexander's patterns were of structures and structures takes a different form than computer science but there still is structure there are parts they communicate they relate and they're not quite physical, but they relate to code which has a physical form. Teaching was a little bit different so some of patterns you know, we struggled with finding ways to make connections to specific structures, in some cases there is a physical structure that goes with the curriculum development or how you organize a classroom physical space. But so many the patterns that we needed to talk about were really structures about human relationships. I think in figuring out how to start to make sense those things that was one of the challenges (as stated by Eugene).

Despite the continuous struggles, it was a fantastic time when they felt we were learning and growing along with the pattern community through ongoing discussions. Eugene also spoke about the difficulties he encountered in the process of crafting educational patterns.

The other challenge that happens when you have lots of different groups writing patterns there's a lot of overlap in their relationships how do you find things that overlap, and maybe create one or one set of patterns out of them and then begin to relate them together. When a single person or a small group writes pattern language, it's sometimes a little bit easier to design the language a little bit, to think ahead about how you're going to write it whereas this was a widely distributed activity so there was no one in charge no one to say, 'Oh this is what we're doing.' I suppose if one or two people had gotten a book project you could provide some top-down organization in that way. On the other hand I'm not sure that other than difficulties in creating language that would a better approach. There's so much expertise so much experience for teaching and learning that the best thing we could have done think was just let lots of different groups participate however they thought best and start to bring things together (as stated by Eugene).

Eugene recalls Helen Sharp and Jutta Eckstein, who took on key roles in educational patterns:

They were doing some of their own things because Helen works in a different context in the UK. Jutta was primarily an industry trainer but also very interested in how you prepare short courses, how you engage students, how you design the curriculum. Their motivations are different but some of the same forces are at play. So that was a second group that I noticed, and we came together and did some work around 2001, to 2002. We had some papers, both at PLoP and EuroPLoP, that were collaboratively written. Patterns that we had written individually or started individually, but we knew they laid into one another, and we put together a paper that could be workshopped at one time (as stated by Eugene).

They presented at workshops, observed reactions from other teachers, and inquired whether they could utilize them in our own classes. Eugene mentioned that feedback was garnered not only from pattern language conferences but also from conferences aimed at educators.

A lot of times it would be "we tried that" and "it worked" or "I tried that, but it didn't work so well for me." If it didn't work that would give us something to talk about later. You know, 'what are we missing' or 'is this pattern not good enough' is there another pattern that needs to be here. So it was really through those informal conversations at teaching conferences (as stated by Eugene).

A point of interest during these interactions was the cultural differences:

Some things will work in some classrooms in some countries but not in other classrooms in other countries. We saw some things that work better for male instructors versus female instructors (as stated by Mary Lynn).

Many discussions ensued from these observations:

Our goal was to keep generalizing a pattern, not to the point that it was unusable, but to the point that it could work across all cultural and gender boundaries (as stated by Mary Lynn).

Although easily said, it was not an easy task in practice. Patience was needed to continuously revise and improve. What supported this arduous process was the enthusiasm of the teachers who collaborated with us. "I think the beautiful thing about the pattern community is that you have this opportunity because you're all involved in patterns," Mary Lynn comments. Furthermore, she gained the bonus of expanding her network in the field of education. Within this network, she felt many educators were grappling with similar issues and concerns. Mary Lynn said, "Whether you're from England, Germany, the United States, Japan, we all struggle with the same things and we have similar challenges." The patterns crafted in this way have been widely utilized by many.

From around 2000 to 2003, they energetically wrote papers on Pedagogical Patterns, submitted them to Writers' Workshops at EuroPLoP (Eckstein, 2000; Eckstein, Manns, *et al.*, 2001; Eckstein, Bergin, and Sharp, 2002a; Eckstein, Manns, *et al.*, 2003) and PLoP (Bergin, Eckstein, *et al.*, 2001; Eckstein, Bergin, and Sharp, 2002b), and presented their work at conferences (Sharp, Manns, and Eckstein, 2000) and in journals (Eckstein, Manns, and Voelter, 2001; Sharp, Manns, and Eckstein, 2003).

Now, let's shift our focus to the story of Joseph Bergin. Joe, an introverted individual, according to him, was one of the teachers who benefited from pedagogical patterns. Being introverted, he was often uncomfortable and prone to worry. Yet, as patterns taught him "This is supposed to work," trying them out indeed worked, and he found support in that. Drawn to this approach both in crafting and using patterns, Joe became a proponent of the idea within the Computer Science Education Research Association (SIGCSE) community, attracting more pedagogical patterns from others. In addition to writing papers with Jutta, Mary Lynn, and others, Joe also wrote various papers on his own and submitted them to Writers' Workshops at EuroPLoP and PLoP (Bergin, 2001, 2002, 2003, 2006).

When Joe retired from his full-time professorship in 2011, he stated, "I think it's time to get these off the website and into a more readable form in a book." He aimed for publication along with his colleagues. Looking back, Eugene later commented about Joe, "He retired from his full-time teaching position, so that gave him more time to do some of the things he really wanted to do." The book was self-published, but they believed it was essential to provide it in book form, since educators love books. "Joe wanted a very simple step," Eugene said:

Let's just take some of our best-known patterns, the ones that we've talked with many people about, many people have used, write them up in a form," and "it's just a simple fact that if you put something in a thin book and make it available on Amazon, it's more accessible to people (as stated by Eugene).

Although many patterns had already been written by numerous people, the book on educational patterns was compiled by a small group of volunteers. The people involved in the compilation were Joseph Bergin, Mary Lynn Manns, Jutta Eckstein, and Helen Sharp. Joe was in New York and Mary Lynn was in North Carolina, so they were in the same eastern North American time zone, but Helen was in the UK, five hours ahead, and Jutta was in Germany, six hours ahead. Despite the time differences, when one person revised a pattern description, they would send it to everyone else, who would further rewrite it and send it back within a few hours. Through this global collaboration, they managed to write 5-6 patterns a day. Through these repeated revisions, the final product became better. "It's a very powerful technique," says Joe. Thus, in 2012, the book *Pedagogical Patterns: Advice for Educators* was published (Pedagogical Patterns Editorial Board, 2012).

However, Joe notes, "I don't think we've really achieved pattern languages and pedagogical patterns are certainly not in the same sense that Alexander and his group did with architectural patterns." He believes that the software patterns crafted so far have not reached the level of pattern languages conceived by Alexander and his group.

One of the reasons it is harder for us to come up with pattern languages is that we have a much larger field that we work in and so it's harder to focus things down to the same point that we're able to do it. It took 10 years to write that book. Very hard work, lot of theory behind it. Lot of practice. I don't think we have reached that, certainly not in pedagogical patterns (as stated by Joe).

Educational patterns began to attract more people interested in crafting pattern languages around the theme of education, and the next generation of researchers started to get involved. Nowadays, numerous educational patterns are presented annually at PLoP and EuroPLoP. After a period of absence from attending conferences, Eugene expressed his pleasure upon rejoining EuroPLoP to discover that the study of educational patterns had been advanced by subsequent researchers.

It was interesting for me to watch, mostly as an observer at the last couple of PLoPs, pedagogical patterns starting to come back. It was Christian Köppe, Christian Kohls, mostly I think European educators who had picked up the ball and had really integrated. And then I could see that some of our Japanese colleagues too starting to write pedagogical patterns too and were engaging with PLoP. So this is a very exciting time for me again, because we had a Writers' Workshop that was nothing but pedagogical patterns, experienced teachers, experienced students. Just looking at a couple of papers that were written, I think that there's great opportunities for this work to go forward, and that's good. In a sense its's an outgrowth of the earlier work, but it's bringing in some new influences and taking it in new directions (as stated by Eugene).

Indeed, Christian Köppe has crafted many pattern languages related to education and has published them both individually and with co-authors in EuroPLoP and PLoP conferences. Examples include Teaching Design Patterns (Köppe, 2011a, 2011c), Lecture Design Patterns (Köppe, 2013; Köppe and Schalken-Pinkster. 2013a, 2013b; Köppe and Portier, 2014; Köppe, Portier, Bakker, and Hoppenbrouwers, 2015), Flipped Classroom Patterns (Köppe, Niels, *et al.*, 2015a, 2015b, 2016), Teaching in a Foreign Language (Köppe and Nijsten, 2012a, 2012b), Assessment (Köppe, 2011; Köppe and Pruijt, 2014; Bergin, Kohls, *et al.*, 2015a; Bergin, Kohls, *et al.*, 2015b; Warburton, Bergin, *et al.*, 2016a; Warburton. Mor, 2016b; Köppe, Manns, and Middelkoop, 2018, 2019), and Hybrid Education (Köppe, Nørgård, and Pedersen, 2017; Kohls, Köppe, *et al.*, 2018; Köppe, Kohls, *et al.*, 2018). Other individuals have also crafted pattern languages such as A Pedagogical Pattern for Computer Programming Classes (Charão, Neto, 2016), Educational Design Pattern Language for Massive Open Online Courses (MOOCs) (Fassbinder, Barbosa, and Magoulas, 2017), and Assessment for hybrid education (Kohls, Nørgård, and Pubbert, 2022).

Another active researcher, Christian Kohls, who is a core member of the European pattern community, has been exploring and presenting patterns for the design of learning and collaboration spaces, based on his experiences at his university (Kohls, 2017a, 2021, 2022; Dubbert, Dural, *et al.*, 2017; Münster and Kohls, 2017; Dubbert and Kohls, 2021; Wilk and Kohls, 2012; Kohls, Dubbert, and Kehrer, 2023).

We have also been crafting and presenting educational patterns. These include pedagogical/educational patterns for creative learning (Iba, Ichikawa, *et al.*, 2011; Shibuya, Seshimo, 2013; Harashima, Kubota, 2014a) and Online Education Patterns (Hayashi, Shibata, *et al.*, 2021; Adachi, Shibata, *et al.*, 2021; Inoue, Adachi, *et al.*, 2023) for the era of fully online education during the pandemic.

3.3 Introducing Technology into the Workplace

Fearless Change (Manns and Rising, 2004) is a book published in 2004 by Mary Lynn Manns and Linda Rising, introducing forty-eight patterns for "change leadership". Mary Lynn speaks about *Fearless Change* in the following way:

We've done this by interviewing over the period of almost now 18 or 20 years, interviewing people who are leaders of change and talking to them about the strategies they use when they lead change in an organization. And when we hear something more than once, we say, 'Well, we heard this strategy from more than one person. This is something could be indeed a pattern,

because it's been used by more than one person in more than one organizational context' (as stated by Mary Lynn).

How did the crafting of the pattern language of *Fearless Change* begin, and how was it crafted? How did these two individuals, who were originally not acquainted, meet, and what kind of collaboration led to the formation of this pattern language?

As mentioned above, *Fearless Change* was born out of a collaboration between two individuals with different specialties: Mary Lynn Manns and Linda Rising. Since I've already introduced Mary Lynn's personal history, I will now delve into Linda Rising's personal story. As we explore her narrative, it will become evident that she has exemplified change leadership throughout her life.

Linda Rising graduated from college in 1963, a time when the fields of "computer science" and "software engineering" did not yet exist. She majored in chemistry and worked in the field for a while after graduation, but then returned to school to study mathematics. It was during this period that she met Karl Rehmer, whom she would later marry. He suggested that she consider "computer science" instead of pursuing a Ph.D. in mathematics because "there are no jobs," but Linda was not interested.

I was not interested. I thought computer science was in its infancy, people who were writing programs at the time didn't know what they were doing. They used to carry around huge boxes. They were about this big. They were full of cards. They would go through those cards over and over trying to find whatever the mistake was when really it was probably in punching one of those cards. I mean it was an enormous overhead big waste of time I thought. So I really was not interested in doing that (as stated by Linda).

Nevertheless, Linda's interest was piqued when Marcia Meredith, who had been studying for her doctorate alongside Douglas Hofstadter, author of *Gödel, Escher, Bach*, spoke about artificial intelligence in a lecture. Consequently, she returned to school and obtained a master's degree in computer science. Afterward, Linda taught for a while at Indiana University-Purdue University Fort Wayne. Later, Linda set a goal to obtain her doctorate by the age of 50 and proceeded to the graduate school at Arizona State University. Indeed, one month before her 50th birthday in 1992, she earned her doctorate in computer science. From this experience, Linda is said to encourage people with the following:

I encourage people if they want to do something to not believe that you are too old to go back to school or do whatever it is that you want to do. You should just do it. That is a pattern. Just do it (as stated by Linda).

Two years later, in 1994, the *Design Patterns* book was published. Linda recalls the event of attending OOPSLA'94:

In 1994, the gang of four book was published and I was at OOPSLA waiting in line, which was behind the Addison Wesley desk, all the way down to the exhibit hall outside and on to the street. It was huge and everyone wanted to buy that book. When I bought my copy of the gang of four book, I took it back to my company and said, "we should look at these patterns." We started reading the book and we started talking about mediator, observer, visitor, factory method (as stated by Linda).

Afterwards, she met Jim Coplien, and as they talked about Christopher Alexander's patterns and the "Quality Without a Name," she began to realize that they could be more than just about software design. She thought, "There could be patterns for anything." And she proposed, "We thought there could be patterns for our industry." And "The executives and businesspeople supporting our interest in patterns thought it would be beneficial to capture patterns that reflected the way we worked," she recalls.

Linda and her colleagues decided to begin with system testing patterns. In the telecommunication industry, system testing was a time-consuming process, and they thought a small pattern language for system testing could prove beneficial to their work. By "Pattern Mining," conducting talks with testers and system test administrators – those directly involved in system testing – they gradually constructed a pattern language. The first pattern

anguage that Linda crafted was for system testing.

This initiative was likely one of the first attempts to craft patterns through interviews. Traditionally, experts would write patterns based on their own knowledge. However, relying solely on experts presented its own challenges, as Linda notes: "If you're going to depend upon the experts, they don't always have the time." Hence, they wouldn't necessarily be able to write the patterns themselves. "When we approached the system testers, they said, "We don't have the time, we don't really want to write the patterns. We're not sure it would be a useful exercise for us, but we're happy to help you," she says.

Thus, Linda and her colleagues held workshops in 1996, conducted lengthy interviews with the system testers, wrote the patterns, and then had the testers review them. This process was repeated. The patterns were then presented at the PLoP conference in 1996, receiving feedback from those unfamiliar with system testing, leading to further pattern refinement (DeLano and Rising, 1996). The paper was compiled in the books, *Pattern Languages of Program Design 3* (Martin, Riehle, and Buschmann, 1998) and *The Patterns Handbook* (Rising, 1998b).

Linda then embarked on the crafting of a pattern language for "customer interaction." The company Linda was working for, AG Communication Systems, was one of the early adopters of Agile development in the mid-1990s, a period prior to the publication of books on Agile development. As Agile development began, developers started talking to customers, a previously unheard-of practice. In this situation, "the problem was that developers were talking to customers, and in our company, that never happened" (as stated by Linda).

In light of this, her supervisor came to her and asked, "Linda, you've written testing patterns. Maybe there could be some customer-interaction patterns." To this she replied, "Well, I don't know of any, perhaps somebody has already written them, but I couldn't find any." (Linda). This started the creation of the customer interaction pattern language.

The process was the same as with system testing. "We did Pattern Mining with the marketing and business guys, who helped us write patterns for customer interaction, and then we taught those patterns to our Agile development teams." (as stated by Linda). Hence, the second pattern language Linda crafted was for customer interaction. This pattern language was presented and refined at the international PLoP conference in 1997, 1998, and 2002 (Rising, 1997, 1998a, 2002).

Linda, together with her colleague David DeLano, conducted a workshop titled "Introducing Technology into the Workplace" at OOPSLA in 1996. This workshop was attended by five other individuals, in addition to Linda and David. The original objective of this workshop was to craft patterns for introducing patterns into organizations, but what they ultimately derived were sixteen patterns for broadly introducing new technologies, and three patterns specifically centered around the introduction of patterns.

These included patterns such as **Dedicated Champion**, **Corporate Angel**, **Do Food**, **Brown Bag**, and **Involve Everyone**, which all eventually appeared in the book version of *Fearless Change* - with the pattern names intact. Additionally, the pattern called **Local Leader**, which closely resembled **Local Sponsor**, was also included. This marked the first steps in the crafting of *Fearless Change*. A paper entitled "Introducing Technology into the Workplace", which consolidated the workshop's content by David and Linda, was presented at the Writers' Workshop at PLoP held in Illinois in 1997 (DeLano and Rising, 1997).

3.4 Two Paths Converging: The beginning of the Collaborative Journey

During her participation in PLoP, Linda met Mary Lynn in 1998 at ChiliPLoP in Arizona. Their meeting led to a shared realization: "We discovered that we were both trying to do the same thing. We were trying to introduce patterns into our organizations, and we wondered if there were patterns for introducing patterns." (as stated by Linda).

Mary Lynn was already studying knowledge management from both technological and managerial perspectives. "What I was recognizing is that people seemed to agree that we needed a way to capture knowledge, and the technology was getting better, but we had no way of capturing it in a way that made it useful and shareable," she explains. Indeed, it was during her engagement with this research that Mary Lynn encountered the concept of patterns and pattern languages, which led her and her colleagues to start crafting educational patterns. "That changed my idea of what knowledge management could be," she notes. Mary Lynn, specializing in Management Information Systems where computer science and business intersect, eventually came to the following realization:

While the technology was getting better, the formatting and the way of communicating. So I think patterns are about the form, the formatting, people format them in different forms, and

that's OK. They're about connecting them into a pattern language, and the language you can really talk about. But the third entity is the community. And to me it wasn't the form that really changed my life, or the idea of connecting the patterns into a language and growing it. But what really is exciting about patterns is watching the community truly work together to help each other to grow more and more patterns (as stated by Mary Lynn).

The most important characteristic that continues to excite Mary Lynn is the mutual aid within the community to nurture and grow patterns. It was when Mary Lynn began researching change leadership patterns, she met Linda at the ChiliPLoP conference held in Arizona in 1998. According to Eugene's description, ChiliPLoP stood as a unique venue within the plethora of PLoP-related conferences:

The ChiliPLoP was... Here you come with papers you've already written, and you workshop them. But what happens if you meet three or four people at PLoP. You think 'Oh, we should be working together. Let's get together and write some patterns, let's map out a book, let's change some part of the world.' Where would you do that? You can't do that at PLoP. It's Writers' Workshops. So ChiliPLoP was built around the notion of a hot topic. And the hot topic could be any topic. So what the hot topics did was really up to them. It was really a matter of bringing together groups of people, working on a particular something, and let them coalesce for a couple of days, with a similar sort of setting, so this very open, natural setting, let people's minds run free, a little creativity, to achieve a common goal (as stated by Eugene).

The conference, named ChiliPLoP, carried a dual significance. Firstly, it's held in the American Southwest, a region renowned for its chili peppers. Secondly, the name implies that it deals with 'hot' topics. It was at this unique conference that the two met and immediately hit it off.

You can take new, wonderful technology, and when you bring it into an organization, it creates all kinds of chaos, and people complain. And most importantly, new technology is not really about changing the technology, it's about changing the processes. And so, that's really hard for people (as stated by Mary Lynn).

The discussion occurred during a coffee break between Mary Lynn and Linda. Someone who overheard them said, "You two should write a book on this." The two were taken aback. Mary Lynn recalls her thoughts at that moment:

Well, first of all, we hardly know each other. And secondly, this is just a topic we're pondering. We don't feel that we're experts enough to write a book on how to introduce technology into an organization (as stated by Mary Lynn).

Despite these reservations, they decided to give writing a shot.

Since we were at a patterns conference, we thought, wait, instead of writing a book about theory or practice, because there's plenty of those, how about we write a book about introducing technology into an organization, and here are the patterns, the strategies, to do it. And of course, because patterns shouldn't come from one or two people, in other words Linda and I, instead they should come from the community, we thought we should start interviewing people and going to conferences, and trying to mine these patterns from people who are interested in that topic (as stated by Mary Lynn).

And thus began Mary Lynn and Linda's collaborative journey.

3.5 Nurturing Patterns within the Community–*Fearless Change*

Linda and Mary Lynn were both contemplating how organizations could embrace patterns. In 1998, Mary Lynn began introducing patterns into US WEST Advanced Technologies, and added new patterns for this introduction. She integrated these with Linda's patterns into a single language and compiled them into a paper titled "Evolving a Patterns Culture". This paper was presented at the Writers' Workshop at PLoP held in Illinois in 1999 (Manns, 1999). At this stage, patterns such as **Personal Touch**, **Big Jolt**, and **Hometown Story**, which also appeared in the final book version of *Fearless Change*, were added.

Moreover, Linda had the experience of introducing and promoting agile development in her company, where she found these patterns helpful not only for introducing patterns but also for implementing agile development. Similarly, Mary Lynn also experienced the usefulness of these patterns when trying to introduce new ideas at the university. As a result, they felt they had enough experience to elevate these patterns into more abstract ones, which could be used for introducing anything. Linda reflects, "That was our first experience in increasing the abstraction level in a pattern language. It can be done. But you have to be careful, because if you make the patterns too abstract, then they're not useful anymore." Consequently, this pattern language transitioned from being about introducing patterns into organizations to becoming a tool for introducing any new ideas into an organization.

In this way, at the ChiliPLoP 2000 conference, Linda and Mary Lynn conducted a three-day hot topic session titled "Introducing & Sustaining Interest in Patterns in an Organization" (Rising, Carlson, *et al.*, 2000). In this session, participants were asked to read the patterns from David and Linda's "Introducing Technology into the Workplace" and Mary Lynn's "Evolving a Patterns Culture" in advance, write and submit at least one pattern that was not covered in these works, read all the patterns written by other participants by the day of the session, and provide constructive feedback to at least one person.

On the day of the session, the first day involved a general discussion about the patterns written so far, followed by a discussion about each individual pattern. This continued on the second day, and if a potential new pattern emerged, it was discussed. Furthermore, they collaboratively brainstormed new challenges and considered possible solutions. On the third day, they discussed newly emerged patterns and their interrelationships, as time permitted. Finally, they confirmed what had been achieved and identified remaining future tasks. These activities constituted the three-day session.

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In addition, they launched a working group titled "Introducing & Sustaining Interest in Patterns in an Organization" at the Object Technology (OT) conference in the UK. What they did there, according to Mary Lynn, was the following:

We have this little way of mining with index cards and people writing their problems down, and we'd change the cards around and people would try to write a solution, and we'd change them around again and people would write solutions again. Then we'd put flip charts on the walls and write positive and negative consequences. So we had this little method that we used at the majority of these workshops. So we took all these notes from the workshop, and we came back and drafted them and turned them into pattern drafts (as stated by Mary Lynn).

Subsequently, in 2000, Mary Lynn and Linda co-authored a paper titled "Evolving a Patterns Culture" and submitted it for a Writers' Workshop at the EuroPLoP conference (Manns, Rising, and O'Callaghan, 2000). In this version, new patterns such as *Evangelist, Innovator, e-Forum, In Your Space*, and *Pattern Mentor* (referred to as *Mentor* in the book version) were added to the patterns present in the book *Fearless Change*.

Furthermore, at OOPSLA in 2000, Mary Lynn and Linda conducted a workshop titled "Introducing Patterns (or any new idea) into Organizations" (Manns, Rising, and O'Callaghan, 2000), where they, along with nine participants, added more patterns. Notably, the phrase "any new idea" was introduced. In this workshop,

participants first shared their experiences of introducing patterns or other innovations into their organizations, mined patterns from these experiences, and provided mutual feedback to contribute to the pattern language. They also searched for more concrete examples of patterns.

At the Object Technology (OT) conference the following year in 2001, they conducted a simulation and discussed the theme of "Introducing Patterns (or any new idea) into Organizations" at the OOPSLA tutorial. Papers were submitted to PLoP in 2001 (Manns and Rising, 2001) and EuroPLoP in 2002 (Manns and Rising, 2002) and were presented at the Writers' Workshops. It is noteworthy that the title of this EuroPLoP paper marks the first use of the term "Fear Less." The patterns they had nurtured up to this point were now bundled under the concept of "Fear Less." As Mary Lynn describes, "We then took them to PLoP conferences, got more feedback from our shepherd, and our workshop, and then came back and worked on them some more." This process was repeated until, "Then eventually before the book came out, it went to reviewers, who looked at it some more, as did the copy editor" (as stated by Mary Lynn).

What was the collaboration between Mary Lynn and Linda like? Mary Lynn describes it as follows:

Well, Linda and I work very well together. People say, 'How do you write a book with someone else?' I think Linda and I are very respectful with each other's time. There are times when Linda has to travel, and she has to not be around to answer email. There are times when my schedule at work gets out of control. So we just talk to each other, and say 'Okay, so now you're going to work on writing this, and you're not going to hear from me for a week.' So we respect each other very much in our commitment to the work, but our inability to work at it 24/7. So I think that's the main reason we're successful at this (as stated by Mary Lynn).

Of course, there are times when they disagree:

And we're very good at disagreeing. When we disagree with each other, we don't have a problem telling each other. And we have these long email streams, saying 'What about this?' 'What about that?' And we can come to a consensus after a long email stream of discussion. And we now also have Skype calls (as stated by Mary Lynn).

Linda also provided her perspective on their collaboration as follows:

It was a very good thing to collaborate, and I recommend it. I think it worked well because Mary Lynn and I are very different. She's an academic, she's a university professor, and even though I've taught in a university, I haven't taught in a long time. So I have mostly industry experience. So we could see different kinds of innovation, different kinds of problems, different kinds of ideas for solutions, and if we could see that they were the same, then we could be pretty sure that it was a pattern. Because she could say that it could work in the university, I could say that it would work in industry, and that gave us some assurance that what we were saying was not just one, single, isolated thing. Plus, I do a lot of traveling, and she has a real job, so she doesn't. So I get to see lots of different cultures, so we kind of balance out each other. So I think that all patterns should have 2 collaborators. Pair writing. Pairing is always good. For anything (as stated by Linda).

In the field of software development, there exists a technique known as "pair programming," where two individuals collaborate on programming tasks typically done by a single person. While this may appear to be inefficient at first glance, there are reports suggesting that the process yields higher efficiency and quality compared to having two individuals work separately and then combine their efforts. Linda and Mary Lynn engaged in a similar collaborative approach for their writing endeavors:

Writing... you can get stuck, and you don't move forward. It's called writer's block. It's a classic problem. So you're out of ideas, whereas if there's two of you, you can help each other, and that's a very good thing (as stated by Linda).

Building on this collaborative foundation, they submitted their jointly written patterns to pattern language conferences. There, they received feedback from other participants, which they subsequently used to further refine and polish their work:

We'd put those together and we both would have contributed. We never put anything in the collection if didn't agree that we both used them. And then we would look for known uses and those have to be someone else, not ours. We had to have at least three known uses. Every single pattern in *Fearless Change* went to a Writers' Workshop either at PLoP or VikingPLoP or EuroPLoP and most of those patterns went several times. So, we had many different shepherds, many different workshop participants, so they all had a huge amount of feedback. So not only two writers, but three known uses, shepherds, and Writers' Workshop feedback (as stated by Linda).

And Linda says, "We took all of those the patterns to PLoPs. We had shepherds, we had Writers' Workshops, feedback and I think that's why the patterns are so good". Similarly, Mary Lynn expresses her sentiment by saying, "They weren't our patterns, they came from the community, the people that we kept interviewing and talking to, and the people coming to our workshops.". These patterns have evolved with the involvement of many people, including those who were interviewed, those who were spoken to, and those who participated in the workshops. This is how *Fearless Change*, a pattern language for introducing new ideas into organizations, was born.

As a side note, *Fearless Change* book was later translated into Japanese and published. I, having interacted with the two authors at PLoP, was asked to write the foreword for the Japanese version. So, I wrote 2-page foreword about how pioneering this book was in the field of practical pattern languages from my own perspective.

3.6 The Journey Continues – More Fearless Change

Even after the publication of *Fearless Change*, Mary Lynn and Linda continued their Pattern Mining and addition, and published their patterns at conferences (Manns and Rising, 2008, 2009, 2010, 2012). This eventually led to the publication of a second book, *More Fearless Change* (Manns and Rising, 2015). Regarding this, Mary Lynn states:

We've learned about our first 48 patterns which were published 10 years ago, since then. And then we have a collection of 15 new patterns, which have gone through the PLoP conferences, the shepherding, and the workshopping (as stated by Mary Lynn).

Before the publication of the second book, Linda conveys:

Most people publish the book, and that's it. They never do anything more. But we have continued to work on them; add stories and refine them, so what we're going to publish is what we've learned about the patterns, and we have 15 new ones. We're also going to talk about pattern maintenance because Alexander said, very clearly, "patterns are alive" and what he meant by that, I think, is that they grow, and change. Whatever you have in your book right now, next year, it won't be the same. Some of them will be bigger, some will be smaller, some of them will be not so useful, and unless you maintain it, it becomes less useful over time. It's an ongoing effort (as stated by Linda).

We have continued to maintain and grow those patterns and we're doing exactly what Alexander recommended. He said that patterns are living things. The process of writing patterns never ends (as stated by Linda).

Linda observes, "This is rare in our field. Even Alexander probably never had this experience." Certainly, it's worth acknowledging that although Alexander did not add additional patterns after publishing his book, his pattern language initially included a comprehensive set of 253 patterns. This suggests a level of completeness that arguably minimized the need for subsequent additions. However, it is also conceivable that over the course

of decades or even centuries, modifications and additions may become necessary. In the field of architecture, it's worth noting that co-authors and other contributors have been making such additions.

Furthermore, an important clarification is in order. The absence of updates to pattern languages developed in the last 10 to 30 years should not be interpreted as diminishing their value. One plausible explanation for the lack of changes could be their relative novelty, coupled with the fact that they may not yet require modification. Pattern languages aim to capture timeless essences rather than fleeting trends, and therefore well-crafted patterns are not easily rendered obsolete or in need of alteration. However, as Mary Lynn and Linda have pointed out, it's crucial to maintain an attitude of ongoing inquiry. The publication of a set of patterns should not be viewed as a final act but rather as a dynamic endeavor that requires continued engagement and reflection.

Thus, in 2015, the sequel *More Fearless Change*, was published (Manns and Rising, 2015). I was requested by the two to contribute a recommendation to the original English edition. This recommendation appears at the beginning of the book.

This book, *More Fearless Change*, is creative work. I use these patterns with my students to take innovation into practice, and also with my collaborators working in industries to promote organizational change. This book is a significant read for people in academia and in the workplace–Takashi Iba. (Manns and Rising, 2015)

It was an honor and a pleasure for me to be asked for such an opportunity. It felt characteristic of Mary Lynn and Linda, who spread joy by involving others in a positive way and crafting together.

Lastly, there is another fearless "journey" that Linda is pursuing based on *Fearless Change*. This journey is utilizing *Fearless Change* patterns to support the development of emerging countries. As we have seen in this section, "in the beginning they were patterns for introducing patterns and we made them abstract, so they're patterns for introducing any ideas," Linda reflected. Then, if so, she wondered if these could further be applied to the enhancement of development in emerging nations.

In this vein, Linda, along with her husband Karl Rehmer, penned a paper titled "Patterns for Sustainable Development". This work was workshopped at PLoP in both 2009 and 2010 (Rising and Rehmer, 2009, 2010). In the paper, out of the seven envisioned patterns, four patterns: **Organizational Cornerstones**, **Cultural and Environmental Awareness**, **Early Wins**, and **Constructive Participation** are introduced. Linda explains the beginning of making this pattern language as follows:

I discovered a book recently called Two Ears of Corn. And it's about introducing innovation into developing countries, countries that are way behind. So what happens in the U.S. is that we go help other countries, we identify their problems, and we solve them. And we do it in a way that is not sustainable. So we look at the problem and we say "oh you need better roads here, so we'll build roads. Well, you don't have any clean water, so we'll dig some wells. You need better animals, so we'll bring in animals. You need better seeds to grow crops, so we'll bring in the seeds. And we'll have training on how to use those new technologies. And then we go home. And we leave the people without a real understanding of what it is and what we know is that the roads begin to fall apart, the wells dry up, the animals die, the seeds blow away, and the people are worse than they were when we first got there. So what I've learned is that there are patterns, for helping the developing world that are really the same patterns as the *Fearless* Change. They're just at a higher level. They're for another domain, so they need to be translated, so that instead of being for an organization, they're for countries. So that's our project. My husband and I are translating the patterns, so they'll be useful for introducing new ideas into the developing world. And we think that it will take us the rest of our lives. It's good to have a project (as stated by Linda).

Such pattern languages related to international aid for developing countries can be considered one of the forerunners for pattern languages for approaching societal issues. Interestingly, as early as 2002, Linda, along with her co-authors, had already written a paper titled "Patterns for Building a Beautiful Company," which was also connected to social issues (Rising, King, *et al.*, 2002). In response to the Enron and WorldCom scandals of the time, they sought to explore how to create "whole (in the sense of complete) firms built on a foundation of possibility, integrity, and beauty," rather than merely pursuing profits.

This work was carried out well before our own efforts in crafting pattern languages that based on awareness of social issues. We ventured into this domain on our own, only to (re)discover this paper later and be surprised by its pioneering nature. Due to our lack of diligence, we were unaware of or did not consciously consider this paper's existence.

As we traced in some sections, pattern languages, originating from the field of architecture and subsequently applied to software development, have been further employed in practices of professions and works. The application of Pattern Language to Practice, which I have discussed so far, is summarized in a chronology from Figures 9 to 12.

	Pattern Languages of Programs	Pattern Languages of Practices (Pedagogical Patterns)	Pattern Languages of Practice (Patterns for Professionals & Fearless Change)
94	The first PLoP conference	Manns' OOPSLA'94 presentation on	
	Gamma, Helm, <i>et al.</i> 's <i>Design Patterns</i>	object-oriented technology training	
995	Pattern Languages of Program Design	Manns & Puhr's SEI CSEE 1995 paper "Object-Oriented Technology Education and Training"	DeLano & Rising's PLoP'96 paper o System Test Pattern Language
		A conversation at the education symposium and the Pedagogical Patterns Project was initiated	
996	The First EuroPLoP conference	Sharp, Manns, <i>et al.</i> 's OOPSLA'96 Workshop "Pedagogical Patterns"	
	Pattern Languages of Program Design 2		
	Gabriel's Patterns of Software		
	Fowler's Analysis Patterns		
97			Rising's PLoP'97 paper "Customer Interaction Patterns"
			DeLano & Rising's PLoP'97 paper "Introducing Technology into the Workplace"
			Rising's PLoP'98 paper "Customer Interaction Patterns"
998	The First ChiliPLoP conference		Manns & Rising met at ChilliPLoP '98
	Pattern Languages of Program Design 3		
	The Patterns Handbook		
9	Fowler's Refactoring		Manns' PLoP'99 paper "Evolving a Patterns Culture"
000	Pattern Languages of Program Design 4	Eckstein's EuroPLoP 2000 paper "Learning to Teach and Learning to Learn"	Rising, Carlson, <i>et al.</i> 's ChiliPLoP 2000 Hot Topics "Introducing & Sustaining Interest in Patterns in ar Organization"
			Manns & Rising's EuroPLoP 2000 paper "Evolving a Patterns Culture"
			Manns, Rising, & O'Callaghan's OOPSLA 2000 session "Introducing patterns (or any new idea) into organizations (poster session)"

Fig. 9. A brief timeline of the beginning of pattern languages of practices [1994-2000].

Around the time the original *Fearless Change* book was published, in Japan we began crafting our own pattern languages for supporting practices of everyday life. Over the next two decades, pattern languages for a broad range of areas, including everyday life, welfare, and society formation. I would like to delve into the initiatives we have been involved in the next section.

I	Pattern Languages of Programs	Pattern Languages of Practices (Pedagogical Patterns)	Pattern Languages of Practices (Patterns for Professionals & Fearless Change)
:001		Bergin's SIGCSE'01 paper "A pattern language for initial course design"	Manns & Rising's PLoP 2001 paper "Introducing Patterns (or any new idea) into an Organization"
		Eckstein, Manns, <i>et al.</i> 's EuroPLoP 2001 paper "Patterns for Experiential Learning"	Manns, Rising, & O'Callaghan's OOPSLA 2001 Tutorial "Introducing Patterns (or any new idea) into Ornanizations"
		Bergin, Eckstein, <i>et al.</i> 's PLoP 2001 paper "Patterns for Gaining Different Perspectives"	Orgunizations
002	Gabriel's Writers' Work- shops & the Work of Making	Bergin's EuroPLoP 2002 paper "Introvert - Extrovert"	Manns & Rising's EuroPLoP 2002 paper "Fear Less"
	Things	Eckstein, Bergin, & Sharp's EuroPLoP 2002 paper "Feedback	Rising's PLoP 2002 paper "Customer Interaction Patterns"
		Patterns"	Rising, <i>et al.</i> 's PLoP 2002 paper "Patterns for Building a Beautiful Company"
003	PLoP 10th Anniversary	Sharp, Manns, and Eckstein's Computer Science Education 2003 article "Evolving Pedagogical Patterns"	
		Bergin's EuroPLoP 2003 paper "Two Pedagogical Patterns for Course Design"	
		Eckstein, Manns, <i>et al.</i> 's EuroPLoP 2003 paper "Teaching from Different Perspectives"	
004	Coplien & Harrison's Organiza- tional Patterns of Agile Software Development		Manns & Rising's Fearless Change
005			
006	Pattern Languages of Program Design 5 EuroPLoP 10th Anniversary	Bergin's PLoP 2006 paper "Active learning and feedback patterns: version 4"	
007			
008		Larson, Trees, & Weaver's PLoP 2008 paper "Continuous Feedback Pedagogical Patterns"	Manns & Rising's PLoP 2008 paper "Additional Patterns for Fearless Change"
009			Manns & Rising's PLoP 2009 paper "Additional Patterns for Fearless Change II"
			Rising & Rehmer's PLoP 2009 paper "Patterns for Sustainable Develop- ment"

Fig. 10. A brief timeline of the beginning of pattern languages of practices [2001-2009].

I	Pattern Languages of Programs	Pattern Languages of Practices (Pedagogical Patterns)	Pattern Languages of Practices (Patterns for Professionals & Fearless Change)
2010			Rising & Rehmer's PLoP 2010 paper "Patterns for Sustainable Develop- ment"
			Manns & Rising's PLoP 2010 paper "Additional Patterns for Fearless Change III"
2011		Köppe's EuroPLoP 2011 paper "A Pattern Language for Teaching Design Patterns (Part 1)"	Cukier & Kon's PLoP 2011 paper "Extending Patterns for Fearless Change"
		Köppe's EuroPLoP 2011 paper "Continuous Activity"	
		Köppe's PLoP 2011 paper "A Pattern Language for Teaching Design Patterns (Part 2)"	
		Iba, Ichikawa, <i>et. al.</i> 's PLoP 2011 paper "Pedagogical Patterns for Creative Learning"	
2012		Pedagogical Patterns	Manns & Rising's PLoP 2012 paper
		Köppe & Nijsten's EuroPLoP 2012 paper "Pattern Language for Teaching in a Foreign Language: Part 1"	"Additional Patterns for Fearless Change, Part IV"
		Köppe & Nijsten's PLoP 2012 paper "A Pattern Language for Teaching in a Foreign Language: Part 2"	
2013	PLoP 20th Anniversary	Köppe's EuroPLoP 2013 paper "Towards a Pattern Language for Lecture Design"	
		Köppe & Schalken-Pinkster's EuroPLoP 2013 paper "Lecture Design Patterns: Laying the Foundation"	
		Köppe & Schalken-Pinkster's PLoP 2013 paper "Lecture Design Patterns: Improv- ing Interactivity"	
		Shibuya, Seshimo, <i>et al</i> .'s PLoP 2013 paper "Educational Patterns for Generative Participants"	
2014		Köppe & Portier's EuroPLoP 2014 paper "Lecture Design Patterns: Improving the Beginning of a Lecture"	
		Harashima, Kubota, & Iba's EuroPLoP 2014 paper "Creative Education Patterns"	
		Köppe & Pruijt's CSERC'14 paper "Improving Students' Learning in Software Engineering Education through Multi-level Assignments"	

Fig. 11. A brief timeline of the beginning of pattern languages of practices [2010-2014].

	Pattern Languages of Programs	Pattern Languages of Practices (Pedagogical Patterns)	Pattern Languages of Practices (Patterns for Professionals & Fearless Change)
2015		The first EduPLoP workshop	Manns & Rising's More Fearless
		Köppe, Niels, <i>et al.</i> 's EuroPLoP 2015 paper "Flipped Classroom Patterns: Designing Valuable In-class Meetings"	Change
		Bergin, Kohls, <i>et al.</i> 's EuroPLoP 2015 paper "Assessment-Driven Course Design Foundational Patterns"	
		Bergin, Kohls, <i>et al.</i> 's PLoP 2015 paper "Assessment-Driven Course Design: Fair Play Patterns"	
		Köppe, Niels, <i>et al.</i> 's PLoP 2015 paper "Flipped Classroom Patterns: Using Student Solutions"	
		Köppe, Portier, <i>et al.</i> 's PLoP 2015 paper "Lecture Design Patterns: More Interactivity Improvement Patterns"	
2016	EuroPLoP 20th Anniversary	Köppe, Niels, <i>et al.</i> 's VikingPLoP 2016 paper "Flipped Classroom Patterns: Controlling the Pace"	
		Bergin, Kohls, et al.'s EuroPLoP 2016 paper "Student's Choice of Assessment"	
		Charão, Neto, <i>et al.</i> 's PLoP 2016 paper "Hall of Shame & Fame"	
		The second EduPLoP workshop	
2017		Fassbinder, Barbosa, & Magoulas' PLoP 2017 paper "Towards an Educational Design Pattern Language for Massive Open Online Courses (MOOCs)"	
		Köppe, Nørgård, & Pedersen's Viking- PLoP 2017 paper "Towards a Pattern Language for Hybrid Education"	
		Kohls, Nørgård, & Warburton's EuroPLoP 2017 paper "Sharing is Caring"	
		Kohls's VikingPLoP '17 paper "Hybrid Learning Spaces"	
2018		Kohls, Köppe, <i>et al.</i> 's EuroPLoP 2018 paper "Outside In and Inside Out: New Hybrid Education Patterns"	
		Köppe, Manns, & Middelkoop's PLoP 2018 paper "The Pattern Language of Incremental Grading"	
		Köppe, Kohls, <i>et al.</i> 's PLoP 2018 paper "Hybrid Collaboration Patterns"	
2019		Köppe, Manns, & Middelkoop's EuroPLoP 2019 paper "Educational Design Patterns for Student-Centered Assessments"	

Fig. 12. A brief timeline of the beginning of pattern languages of programs [2015-2019].

4. TRACING THE EXPANSION OF PATTERN LANGUAGES OF PRACTICES INTO EVERYDAY LIFE AND MORE

As we discussed above, pattern languages originated in the field of architecture for places and subsequently found applications in software engineering for programs, as well as in practices such as education and organizational transformation. From the 2010s onwards, there has been an expansion in the crafting of pattern languages that cover an even broader spectrum of practices. I believe that the Iba Lab at Keio University has played a significant role in this expansion.

Our contributions are not limited to profession and work. They also encompass everyday life that covers areas like living better with dementia, balancing work with parenting, and living naturally and creatively. Furthermore, we craft Pattern Languages of Practices on Journey of Life and Social Formation. In total, we have developed pattern languages for more than 80 types of practices, comprising over 3,000 individual patterns. A conservative estimate suggests that our work has been accessed by over three hundred thousand individuals. We have also developed our own methodology for crafting pattern languages, refining it with each project. This approach has now been adopted by other researchers and authors in the field of pattern languages.

In the second part of this paper, I, Takashi Iba (Figure 13), aim to trace the trajectory of our contributions, focusing particularly on the decade spanning from the mid-2000s to the mid-2020s. This account could be considered an "autoethnography," a form of qualitative research where authors use self-reflection and writing to explore personal experiences and connect them to wider cultural, political, and social meanings (Adams, Jones, and Ellis, 2015, 2021; Hughes and Pennington, 2017), of the development of pattern languages in various practical domains.



Fig. 13. Takashi Iba (a photo taken in 2023).

Here, I am going to start from the PRELIMINARY PERIOD [1995-2003], which was before I started writing patterns. In retrospect, I have come to understand that the following 20 years of my research on crafting pattern languages can be broadly categorized into three distinct phases: the STARTUP PHASE [2004-2012], the EXPANSION PHASE [2013-2019], and the MATURATION PHASE [2020-] (Figure 14).

The first phase, the STARTUP PHASE [2004-2012], was characterized by several key activities. These included attempting to craft pattern languages of practices and developing methods for doing so. We also worked on thoroughly implementing these methods and articulating "Pattern Languages of Practices" as a new genre within the field of pattern languages.

During the second phase, the EXPANSION PHASE [2013-2019], our focus shifted towards initiating collaborative research on crafting pattern languages of practices that addressed social issues. We also worked on crafting pattern languages of practices for everyday life while simultaneously examining and refining our methodology. Additionally, we sought to expand the application domains for pattern languages of practices.

The third and current phase, the MATURATION PHASE [2020-], has been dedicated to establishing a solid methodology and attempting to craft pattern languages that capture the journeys of life. We have also been grounding our methodology in philosophical concepts and exploring new media and forms of expression. It is important to note that at the time of writing this paper, we are in the midst of the MATURATION PHASE. As we move forward, our goal is to establish this area of study as a recognized academic discipline.

Now, let us start by delving into the prehistory, the PRELIMINARY PERIOD, and then progressively examine the STARTUP PHASE, EXPANSION PHASE, and MATURATION PHASE in detail.

1		
1995	PRELIMINARY PERIOD [1995 - 2003]	Engaging with Complex Systems in its Wholeness and Modeling its Essence
		Learning Object-Oriented Design by Reading the <i>Design Patterns</i> Book and Applying It to Modeling
2003		Developing Model Patterns for Designing Agent- Based Social Simulation Models
2004	STARTUP PHASE [2004 - 2012]	Unexpectedly Starting to Develop Pattern Languages of Practices, and then Encountering the Pattern Commu- nity
		Attempting to Craft and Utilize Pattern Languages of Practices in Our Own Way and Style
2012		Articulating and Proposing Pattern Languages of Practic- es as a Genre of Pattern Language
2013	EXPANSION PHASE	Crafting Pattern Languages of Practices in Everyday Life, which Address Social Issues
	[2013 - 2019]	Pioneering the Implementation of Everyday Use Pattern Languages, and Developing a Methodological Pattern Language for Crafting a Pattern Language in Our Way
2019		Expanding Pattern Languages of Practices to Various New Everyday Activities and Sharing Our Methodology with People Globally
2020	MATURATION PHASE [2020 -]	Crafting Pattern Languages to Shape Our Future in Response to Societal Changes, and Conducting Analy- ses Leveraging Our Accumulated Research Results
		Establishing Our Methodology and its Academic Grounding, and Collaboratively Advancing Pattern Lan- guages of Practices to the New Stage
	1	

Fig. 14. Transition of the characteristics of each period of Takashi Iba's research over the past 30 years, including 20 years of pattern language research.

5. PRELIMINARY PERIOD [1995-2003]

In my teenage years, before this period, I was captivated by the world of cinema and aspired to become a film director. Throughout high school, I directed two films for the school festival, and during the first half of my university years, I actively participated in video production projects. However, my interests extended beyond just filming; I was drawn to the broader concept of creation, including storytelling and design. This passion led me to engage in various creative endeavors across different domains.

Also, since my junior high school days, I had been programming as a hobby, creating games. Even in university, I was regularly building practical tools for everyday use, as well as tools for simulations and data analysis in my research. Having started it as a hobby, my programming skills were entirely self-taught, starting with procedural languages like BASIC, C, C shell, and Perl.

Shortly after I entered university in 1993, the Mosaic browser for the World Wide Web (WWW) was released. Within less than a year, I learned about it from my friends and started creating my own homepage (Figure 15). I quickly uploaded two original picture books I had drawn with a mouse in Photoshop and collected feedback using a form I made with CGI. The picture book character is Shiro-kun (Shiro means "white" in Japanese), and the story is about an inhabitant of a white world traveling to worlds of other colors. I also made games and systems for fun using CGI. Back then, very few individuals or organizations in Japan had their own homepages. Once, a research institute created a page called "Sites that can be read in Japanese," and my personal page was included in their list of about 50 sites. In this way, I was creating and publishing various things during the dawn of the WWW world.



Fig. 15. My personal homepage during my university days and the online picture book I published there.

I would like to write a little about the expression in this picture book *The Adventure of White*. This is because it is the source that later leads to the simple expression of our Pattern Illustrations. Until around 1994, when I drew this picture book on a computer, I was interested in video production and actually created experimental videos, event videos, presentation videos, and even started shooting a few original films. In the early 1990s, the world was in the era of video and multimedia, and it was a topic of discussion that, unlike previous expressions, it could convey an overwhelming amount of information and feel realistic. I was also attracted to the strengths of video.

However, in 1994, I encountered a simple expression that was in stark contrast to the transmission of large amounts of information. It was Shel Silverstein's *The Missing Piece*, a picture book that adults also read (Silverstein, 1976). This picture book had a simple expression of a circle with a black eye, with only a part of it missing. The world was also depicted with a single simple line representing the ground, and the main character moved from left to right on that ground. Other characters were also very simple. However, the story told there was a deep story that conveyed important things, and it was universal in content.

I was deeply impressed when I encountered this simple expression. I was amazed that such important, deep, and universal content could be packed into such a simple expression of simple lines! This discovery has stayed with me ever since, and it is connected to the simple expression of Pattern Illustrations with simple lines.

Thus, I wanted to draw a simple and powerful work like Shel Silverstein's *The Missing Piece*. Since *The Missing Piece* was a story about shape, I made mine a story about color. I paid homage to Silverstein with the main character moving from left to right on a single line of ground. This shows that I was significantly influenced by it at the time.

In Episode 1, Shiro (White), from the world of white, embarks on a journey to the world of blue, guided by his friend, Mizuiro (Light Blue) (Figure 16). Mizuiro, who was originally white but has been tinted blue to become light blue, feels out of place in both the white and blue worlds. However, he realizes that he can create his own world of light blue, embracing his unique color. This story resonated deeply with friends and readers who have been influenced by multiple cultures, such as those who have returned from living abroad. Then, I created Episode 2, which depicts further adventures. In this episode, Shiro encounters characters with various colors and gradually absorbs these hues, ultimately creating his own unique color palette as he progresses through the story.

Amazingly, about 10 years later, an editor from a well-known Japanese publishing company discovered *The Adventure of White* and approached me about publishing it as a picture book. However, at that time, I was in the midst of writing my doctoral dissertation and also starting work as a university faculty member, so I couldn't find the time and had to give up on the idea. Looking back now, it's unfortunate that I couldn't publish the picture book at that time. However, I ended up drawing Pattern Illustrations, and I now want to draw a picture book in the near future.



Fig. 16. Characters with simple expressions in my picture book, *The Adventure of White* (The upper and middle parts are from Episode 1, while the bottom part is from Episode 2).

During my third year of university, in 1995, I joined a research laboratory and embarked on my research journey. Before I get into the story of my research during my university days, there's something I'd like to briefly mention. It's about how I ended up writing a book with my friend.

One day, one of my friends got an offer from a famous computer-related publisher in Japan to write a book on how to use Netscape 3.0, the new browser at that time, and he was looking for someone to write it with him. Since we were in the same lab and it was a rare opportunity for a university student to write a book, I decided to join the project. As a result, in 1996, two books we wrote, the *Netscape 3.0 Guide for Macintosh* (Sasaki, Iba, *et al.*, 1996) and *Netscape 3.0 Guide for Windows* (Sasaki, Tanaka, *et al.*, 1996), were published.

In writing these books, I was responsible for the chapter on browser plugins. The fact that plugins can extend the functionality of a browser is isomorphic to the characteristics of my later model framework, where Behaviors can be added to Agents, and the idea that one can become capable of doing something by acquiring patterns of a pattern language. Looking back now, it's quite interesting that I was in charge of the plugin chapter at that time. In this way, while having the experience of writing books about the cutting-edge topics of that era, I joined a research lab and stepped into the world of research.

5.1 Engaging with Complex Systems in its Wholeness and Modeling its Essence [1995-1998]

During my undergraduate and graduate studies, two professors served as my research mentors. One was Prof. Heizo Takenaka, who specialized in economics and economic policy (Takenaka, 1991). The other was Prof. Yoshiyasu Takefuji, an expert in artificial neural networks (Takefuji and Lee, 1989; Takefuji, 1992). I initially conducted research in environmental economics, which led me to explore the economics of self-organization (Krugman, 1996) in Takenaka Lab.

Then, I also worked on solving optimization problems using artificial neural networks (Iba, *et al.*, 1996a, 1996b), and I conducted research using simulations of multi-agent models where multiple agents with learning by neural network and evolution interact with each other (Figure 17; Iba and Takefuji, 1997, 1998; Iwamura, Iba, and Takefuji, 1999) in Takefuji Lab. In those studies, we investigated how diverse and complex behaviors emerge from simple mechanisms. And then, these research areas merged, and during my graduate school years, I began to engage in simulation research of self-organization processes in social phenomena (Iba. Takenaka, Takefuji, 1998, 1999, 2001).



Fig. 17. Our multi-agent simulation study of the behavioral evolution of artificial ants and the emergence of cooperative phenomena, with agents having genes and learning through neural networks (Iwamura, Iba, and Takefuji, 1999).

Complex Systems Science and Writing a Book

During this journey, I encountered the emerging fields of Artificial Life (Levy, 1993) and Complex Systems Science (Waldrop, 1992). These were new scientific approaches addressing mysteries of life, intelligence, and society that had eluded traditional reductionist science. Rather than breaking down complex subjects into components, they sought to understand and grasp complexity as a whole. The methodology involved developing models of complex systems on computers, running simulations, observing the generated phenomena, and gaining insights from the behavior. Inspired to contribute to these pioneering research efforts, I decided to pursue graduate studies and continue this work for my master's degree.

Looking back, I see connections between two things: the desire to capture complex subjects in their entirety and distill their essence into models; and what I later engaged in when crafting pattern languages. My work at the time involved quantitative studies with computational models, whereas pattern languages represent a qualitative approach to identifying core principles and modeling them. Simulation models operate on computer software, while pattern languages function in the "humanware" of the human mind. I sense that the aptitude for
systems thinking and modeling I developed during this period still manifests when I craft pattern languages today.

Of course, these overlaps are not coincidental. Christopher Alexander's ideas, as seen in his books such as *The Nature of Order* (Alexander, 2002a, 2002b), are connected to the concepts and theories of complex systems, complex adaptive systems, and self-organization. In fact, the term "complex system theory" is explicitly used in his book, *The Nature of Order, Book One* (Alexander, 2002a). In other words, the philosophy of pattern language inherently contains overlaps and connections with the complex systems science. In that sense, at this stage, I was not crafting a pattern language and was not even aware of the concept or the book on pattern language. However, it can be said that I was preparing myself for future pattern language research.

Upon starting my master's program, the first thing I did to deepen my understanding of complex systems science was to launch a study group on campus with my friend Yoshihisa Fukuhara. His nickname is Fuku-chan, which is an affectionate way of addressing him.

We put up posters to recruit participants, hoping a few interested people might join us. To our surprise, around 90 people showed up to the first session! The group included undergraduates, graduate students, and covered diverse fields like life sciences, economics, sociology, linguistics, computer science, mathematics, and philosophy.

Our initial vision of an intimate discussion group was no longer feasible with such a large turnout. Instead, Fuku-chan and I took turns researching topics, preparing presentations on the concepts and theories in the complex systems science, and leading free-form discussions afterwards. As we indeed conducted giving presentations every week, we keenly realized how challenging it was to understand the concepts and theories in the complex systems science by reading academic books and papers published at that time. We thought it would be beneficial for future learners to have an introductory book, so we decided to publish one ourselves!

We sent a book proposal to publishers by email, and an editor who expressed interest came to observe our study group and consider the project. However, the idea of students authoring a science introduction was quite unconventional, and it took considerable effort for the editor to get approval within the publishing company. After waiting several months, we finally got the green light to proceed.

The writing process turned out to be extremely demanding. Although we had already investigated many references and compiled presentation materials, transforming that into book form was an arduous struggle. Prior to this book, I had co-authored a book, Netscape 3.0 guide, but this writing was far more in-depth and difficult.

Since we were learning as we wrote, we wanted to verify the accuracy of the content. We sent drafts of each chapter to professors and researchers we had met at symposia and lectures—the chaos chapter to a professor studying chaos, the fractals chapter to a researcher who wrote a book on fractals, and so on. The feedback we received mostly confirmed that the content was correct and well-written, and we incorporated all the detailed comments on phrasing and such.

Furthermore, as an introductory text, we needed to ensure the material was clearly understandable to readers new to the field. We asked study group participants and our friends to read the manuscript and provide feedback on any confusing or incomprehensible parts. We also asked them to point out sections they found interesting or insightful. In total, around 30 people reviewed drafts and shared their thoughts (Figure 18). Using their input as reference, we polished the writing, adding necessary clarifications and footnotes.

The resulting book, *Introduction to Complex Systems: An Adventure to the Frontier of Knowledge*, in Japanese (Iba and Fukuhara, 1998) turned out to be highly accessible, with reviewers praising it as "an understandable explanation that addresses key points" and "a wonderfully engaging and comprehensible introduction." It became an enduring bestseller among popular science books. As of 2024, it is still in print (currently in its 22nd printing) and has sold more than 25,000 copies.

Although seeking expert and peer feedback to revise our work was something we did back then to produce a better book, in retrospect it's intriguing to note the similarities with the practices of "shepherding" and Writers' Workshops in the pattern language community. Moreover, since the publishers had low sales expectations for a book by students, we handled all the layout, figures, and illustrations ourselves. We used LaTeX for the layout with help from a friend. Fuku-chan and I crafted the figures, while another friend drew the illustrations (we treated her to yakiniku dinner twice as thanks) (Figure 19). This hands-on approach to book production also carried over to our later pattern language publication style. Whenever we publish pattern language books, we always craft the illustrations and page layouts ourselves, submitting the Adobe InDesign files to publishers.



Fig. 18. In completing the book *Introduction to Complex Systems*, we asked our friends to read the manuscript, write down good points and points to improve, and we revised the manuscript based on them.



Fig. 19. The cover of the book *Introduction to Complex Systems*, its interior page layout featuring side notes, and an illustration (depicting scientific revolution and paradigm shifts).

Multi-Agent Simulation of Complex Social Phenomena

For my master's research, I conducted multi-agent simulation studies on the winner-take-all phenomenon in video format competition and the generation and collapse of bubbles in stock markets, which are popular topics in social studies of complex systems science (Iba, 1999). At that time, I programmed the simulations myself using the C language. I was able to do this because I happened to enjoy programming as a hobby, but typically, social scientists are often unfamiliar with programming. Recognizing this limitation in social simulation research, I decided to focus my doctoral research on developing a system that would enable computer simulations without the need for programming skills.

5.2 Learning Object-Oriented Design by Reading the *Design Patterns* Book and Applying It to Modeling [1999-2001]

Just as I entered graduate school, the Java language appeared, ushering me into the world of object-oriented programming. I got hold of introductory and technical books on Java and started learning on my own, as usual. However, this is where I encountered a limitation. Because procedural and object-oriented approaches are fundamentally different in the way they conceptualize things, mastering the syntax of the programming language didn't make me proficient in building programs. This was the first time I had hit a wall of this sort in my programming journey. How could I become capable of good design?

Reading GoF's Book, Design Patterns

One day, a graduate student in a software-engineering lab mentioned that everyone in the lab was reading a book that provides valuable insights. That book was *Design Patterns* (Gamma, Helm, *et al.*, 1994). It described what constitutes excellent design and studying it would sharpen one's design intuition. "Ah, this is what I've been looking for!" I thought. So, I immediately began reading it. Though I struggled a bit since I was not yet accustomed to the object-oriented mindset, I felt that I started to get a grasp of how an object-oriented program should be structured. Patterns like **OBSERVER**, **STRATEGY**, and **STATE** were very simple, yet they contained thoughtful innovations that seemed universally applicable. These were the first patterns I had ever read about.

Thus, my first encounter with patterns and pattern languages was not, in fact, through the works of Alexander, but rather through the book *Design Patterns* by Erich Gamma and others. This is similar to Mary Lynn Manns' experience. This was back in 1999 when I was a graduate student in a doctoral program. At that time, five years had passed since *Design Patterns* was published, and four years had passed since its Japanese edition was released.

The research I was conducting at graduate school involved using multi-agent models to represent complex socio-economic phenomena, aiming for a constructive understanding through computer simulation. In my doctoral research, in particular, I shifted to a more meta-perspective, focusing not on simulating specific phenomena but on developing methods and software systems for studying socio-economic phenomena through computer simulation.

During that research, my project members and I delved into UML (Unified Modeling Language), reading newly published books like *UML User Guide* and *UML Reference Manual* (Rumbaugh, Jacobson, and Booch, 1999), in order to develop a way to describe multi-agent models with UML. We also discovered that Martin Fowler's *Analysis Patterns* (Fowler, Beck, *et al.*, 1996) was an important book for our research and studied it thoroughly. This book focused not on program design but on the patterns of the conceptual structure of business processes.

As a result of such studies on object-oriented modeling, I eventually started writing explanatory articles on object-oriented modeling (Iba, 2001a, 2001b, 2003a). I wrote for a general audience outside the software field about using object-oriented approaches to model the world. I didn't remember it at the time, but looking at it now, it's interesting to see that the character (Figure 20) somehow resembles Manabu-kun, the character in Iba Lab's Pattern Illustrations. I realize that I've been drawing these kinds of characters since then.



Fig. 20. Figures in my explanatory articles on object-oriented modeling, in Japanese (Iba, 2001a, 2001b).

Figure 21 is a figure I frequently used in my presentations at the time and is also included in my Ph.D. thesis (since I wrote my Ph.D. thesis in Japan, the figure is in Japanese). Looking back now, I realize that my discussion of the relationship between classes and instances in object-oriented social modeling at that time corresponds to patterns and their implemented instances. From a single class/pattern, diverse instances can be generated. Conversely, modeling means capturing the common essence from diverse concrete objects in the real world and defining it. That is what it means to identify and define a class/pattern. It is understandable that the concept of pattern language, which originated in the field of architecture, was naturally accepted and spread in the field of software, especially in the object-oriented domain.

During this period, I was constantly thinking about how modeling not only allows us to run simulations that bring the models to life but also how models can become tools for thinking and be shared through communication (Figure 22). Looking back from the present, this overlaps with the idea that pattern languages not only support the execution and implementation of models but also serve as tools for thinking and become vocabulary for communication. In that sense, even though the fields and subjects of my research have changed, my fundamental interests remain the same.



Fig. 21. Figures in my explanatory articles on object-oriented modeling, in Japanese (Iba, 2003b).



Fig. 22. Obtaining models from the real world based on the conceptual model framework and how these models become shareable with others. (Iba, 2003b).

A Model Framework where Behaviors were Separated and Linked to Agents

The above discussion was about how object-orientation itself has isomorphism with patterns. However, in fact, there is another level in which the social model we modeled can be seen as having connections to the concept of patterns. At that time, we devised a model framework, based on object orientation, that could describe and simulate complex socio-economic multi-agent models. We named this the "Boxed Economy Foundation Model," which was later renamed to "PlatBox Foundation Model" to reflect that it could describe social phenomena in general beyond economy (Figure 23; Iba, Chubachi, *et al.*, 2001, 2003; Iba, Takabe, *et al.*, 2001; Iba, 2003b).

In this model framework, the relationship between an Agent and its Behavior was structured according to the **STRATEGY** pattern from *Design Patterns* (Gamma, Helm, *et al.*, 1994). In conventional object-oriented agent models, it is standard practice to write the behavior directly into the Agent class. However, in our model, we designed it such that Behavior was not directly embedded within the Agent but was instead externally linked (Figure 24). This allowed for dynamic behavioral changes at runtime (Iba, 2003b, Iba, 2004a). This is a significant feature of our model framework. This feature is important because my definition of a "Complex System" is a system where the rules (functions) of behavior of the elements dynamically change according to the context of the whole (Figure 25; Iba and Fukuhara, 1998; Iba, 2006a). As I later realized when looking back, it actually connects to my subsequent research on facilitating the acquisition of new practices through pattern languages.



Fig. 23. Behavior is defined separately from Agent and is designed to be attached at implementation time in the Boxed Economy Foundation Model, later renamed PlatBox Foundation Model (Iba, Chubachi, *et al.*, 2001, 2003; Iba *et al.*, 2004).



Fig. 24. Behavior Creation and Behavior Switching in *Model Patterns* (Iba, 2003) describes the design of a model that dynamically changes Behavior of Agents (Iba, 2003).



Fig. 25. Complex systems, where the rules (Functions) of behavior of the elements dynamically change according to the context of the whole (Iba, 2006a).

We implemented the tool for modeling based on this framework as a plugin into Eclipse (Figure 26). At that time, Eclipse was a leading Integrated Development Environment (IDE), and its design leader was Erich Gamma, who authored *Design Patterns*. For these reasons, we saw it as the best platform for realizing our ideas and methods. The models we developed with our tool could generate Java source code just by drawing diagrams and setting up the action elements (Figure 27). At that time, Model-Driven Development was a cutting-edge topic. Indeed, we developed a tool that could generate program code when you drew the model diagrams in UML, by specializing in socio-economic multi-agent models (Iba, 2003, 2004b, 2006a; Iba, Matsuzawa, Aoyama, 2004; Aoyama, Takeda, *et al.*, 2004).



Fig. 26. PlatBox Simulator and its Component Builder, the latter running on the Eclipse environment (Iba, 2003b).



Fig. 27. Our Component Builder enables Model-Driven Development of simulations, allowing executable code for simulations to be generated simply by describing model diagrams.

Constructive Understanding

Although it may seem unrelated to my research, a significant personal event during this period was my conversation with the film director Hayao Miyazaki on a television program. As the millennium shifted from 1999 to 2000, the national public broadcaster, NHK, implemented a five-night program where young people visited and listened to the stories of older individuals. The first night featured a project where I, as a complex systems scientist, visited and conversed with the film director Hayao Miyazaki. At the age of 25, when I was Ph.D. student, I visited Studio Ghibli and engaged in a dialogue with Miyazaki for over four hours, which was edited into a 45-minute program and broadcast in December 1999.

During this conversation, I wanted to ask Miyazaki about how he creates stories while drawing storyboards for his films, with the story and its ending revealing themselves during the creative process. In essence, I wanted to ask like Pattern Mining. This is because what we do in complex systems science is also a form of "constructive understanding." We build models and gain understanding through running and modifying them, which I thought had parallels with Miyazaki's creative process. However, Miyazaki abruptly ended the discussion, stating that his process is something he does out of necessity and not something he would recommend to others.

Moreover, the excitement of talking to Miyazaki, whom I admired, combined with the pressure of being in front of cameras and lights, made me extremely nervous, and I was unable to express myself as I had hoped. Although I personally regretted not being able to engage in the dialogue as I had intended, it was still a precious experience that one would not normally have the opportunity to obtain.

5.3 Developing *Model Patterns* for Designing Agent-Based Social Simulation Models [2002-2003]

In addition to this research, during my time in the doctoral program, I had the opportunity to serve as a parttime lecturer in my field at my university since 2002. In a course titled *Corporate and Market Simulation*, I taught the methods and tools we had developed in our research to university students. For this, I created instructional materials to explain the concepts and also developed manuals for the tool.

Model Patterns

During teaching, I realized that it is difficult for many students to construct their own models successfully for the final project, even though they remembered all the concepts and how to operate the tool. After closely observing the situation, I found that, although they understood the model elements, they were not able to assemble them into a model. It was as if they lacked a sense of how to construct a model or couldn't grasp the essence of it.

I had a sense of déjà vu about this issue where students understood the parts but couldn't figure out how to assemble them. "Ah, this is just like when I couldn't fully grasp object-oriented design," I intuitively realized. Once I made this connection, the solution became clear. Just as I had come to understand the sense of object-oriented design through *Design Patterns*, I thought that if there were design patterns for multi-agent model design, then the students could also gain a better grasp of modeling.

And so, in 2002, I wrote patterns for the first time. The name of the patterns is *Model Patterns* (Okabe and Iba, 2003; Iba, Tsuya, and Aoyama, 2005). What I used as a writing example is *Design Patterns*, so the format and

feature of what I wrote was heavily influenced by it. The *Model Patterns* was structured into four categories: "Elementary Model Patterns," "Communication Model Patterns," "Behavioral Change Model Patterns," and "Activation Model Patterns." Each of the 23 patterns was written in a form: Purpose, Motivation, Basic Operations, Design (Class Diagram), and Sample Code. In addition to basic operations, I represented *what* is done and *how* it is done there in a visual diagram, like the progression of frames in a manga strip. The design of the visual diagram derived from the view of our simulator.

I included this *Model Patterns* in my Ph.D. thesis, which I submitted in 2003 (Iba, 2003b). In the chapter on *Model Patterns* in the thesis, quotes from *Design Patterns* were included, along with the following passage from Christopher Alexander's book, *The Timeless Way of Building*.

The same patterns in our minds are dynamic. They have force. They are generative. They tell us what to do; they tell us how we shall, or may, generate them; and they tell us too, that under certain circumstances, we *must* create them (Alexander, 1979, p.182).

So, by the time I was writing, it appears I had already read Alexander's book. The *Model Patterns* were the first patterns I ever wrote in my life.

This period's key events and major publications are summarized in a chronology in Figure 28.

My Life Events		My Studies		Events Related to Pattern Languages
993	Entered Keio University	Participate study Envir	d in a group to ronmental Issues	The Hillside Group was founded First PLoP Conference
994				GoF's <i>Design Patterns</i> book was published
995		Joined the economics network Encountere (artificial life of complex	labs for studying and artificial neural ed to study A-Life e) and the science ity	Ward launched the first wiki site, 'Portland Pattern Repository'
996	Started to study multi-agent simulations of complex social phenomena Published books with friends: <i>Netscape 3.0 Guide</i>		Alexander's Keynote at OOPSLA Fowler's <i>Analysis Patterns</i> book was published	
997	Entered the Master's Program	Hosted a study group on Complex Systems in our campus		Mary Lynn initiated the Pedagogical Patterns Project
998	Published a book: Introduction to Complex Systems			
1999	Entered the Ph.D. Program	Methodology and tools for studying complex social	Master thesis "Agent- Based Simulation Model for Bubbles, Crashes and Winner-Take-All Market"	
	Recording and Broadcast of My Conversation with Hayao Miyazaki	phenomena with multi-agent simulation	Read the GoF's <i>Design</i> Patterns book and Fowler's Analysis Patterns book	
000	Part-time instructor of university courses 'Computer Skills' and 'Programming'			
001		Magazine A the World t Oriented P	Article "Capturing hrough Object- erspectives"	
002	Became an Assistant Professor at Chiba University of Commerce	Model Patterns, my first patterns		Alexander's books, <i>The Nature</i> of Order, Book One & Two, were published
003		Paper at Fo Technology Economic a	orum on Information r: " Model Patterns for and Social Simulations"	PLoP 10th Anniversary
		Journal Art Foundation Agent-base and Societ	icle "Boxed Economy Model: Framework for Modeling of Economics ies"	
		Ph.D. thes Simulating as Evolutio including t	is "A Study on Economies and Societies nary Complex Systems" the Model Patterns"	
		Received I	Ph.D. degree	

Fig.28. Timeline of an overview of my research in the PRELIMINARY PERIOD.

6. STARTUP PHASE [2004-2012]

The STARTUP PHASE from 2004 to 2012 can be divided into three periods: Unexpectedly Starting to Develop Pattern Languages of Practices, and then Encountering the Pattern Community [2004-2007], Attempting to Craft and Utilize Pattern Languages of Practices in Our Own Way and Style [2008-2010], and Articulating and Proposing Pattern Languages of Practices as a Genre of Pattern Language [2011-2012]. In the following sections, we will examine each period in detail.

Note that, from this section onward, we will reflect on each period from five perspectives: (1) Application to New Domains, which focuses on the fields in which pattern languages were created; (2) Methodology of Crafting, which explores the advancements in the creation methods; (3) Ways of Expressing and Utilizing, which examines new ways of expressing and utilizing pattern languages; (4) Pattern Communities, which discusses participation in and contributions to pattern language-related conferences; and (5) Theories and Philosophies, which investigates research on theories and philosophies related to pattern languages and Alexander's work.

6.1 Unexpectedly Starting to Develop Pattern Languages of Practices, and then Encountering the Pattern Community [2004-2007]

In 2004, just after turning 30, I joined Keio University's Faculty of Policy Management as an Assistant Professor and started the Iba Lab. Initially, the lab focused on social simulation research, which I had been working on. Later, we expanded our research areas to include social systems theory and complex networks.

During the initial third of the STARTUP PHASE, from 2004 to 2007, we initiated several key undertakings. (1) First, as an application of pattern language to new domains, we crafted our first Pattern Languages of Practices inspired by *Model Patterns*. (2) In terms of the methodology of crafting, we were crafting pattern languages while drawing upon software development methodologies and creative techniques, which, although quite rudimentary at this juncture, would later serve as the foundation for our crafting process of pattern languages. (3) As for ways of expressing and utilizing, we were depicting each pattern with an illustrative figure where characters implement the solution, which would subsequently evolve into Pattern Illustrations. (4) Concerning pattern communities, we initially published pattern papers in Japanese conferences on information processing, computer science, and communication, and then found the PLoP conference and began to participate. (5) As studies of theories and philosophies, we conducted research on theoretically analyzing pattern languages as communication media from the perspective of social systems theory. Let us now delve into each of these explorations in greater detail.

(1) Application to New Domains in 2004-2007: Our First Pattern Languages of Practices Inspired by *Model Patterns*

As we have seen, I created a collection of patterns for model design called *Model Patterns*. However, my first opportunity to craft a pattern language of practices came about quite accidentally. It may come as a surprise, but I didn't initially intend to apply pattern languages to domains of practice. So, how did it all begin? Let's trace the course of events.

In 2004, one day after class on social simulation, a student approached me and said, "I want to compile facilitation methods for experiential learning in the same way you've compiled your *Model Patterns*." It seemed something struck a chord with the student when they saw the *Model Patterns* I had distributed in my class.

Multi-agent models describe actions and interactions of agents. The student probably thought that if *Model Patterns* could describe such structures, patterns for facilitation could also be written for the actions and interactions of humans.. I responded by saying, "What I wrote is not really about actual human interaction, so I'm not sure what such patterns would look like. But if you're fine with that, I'll guide you." This led us to begin writing the *Facilitation Patterns*.

At that time, we were not aware of papers on *Pedagogical Patterns* and *Fearless Change* patterns workshopped at the PLoP conference, nor were we aware of the existence of the book *Fearless Change*, published that same year. So, we thought of the method ourselves and wrote patterns, using *Design Patterns, Analysis Patterns*, and my own *Model Patterns* as references. We mined patterns by finding commonalities mentioned in two or more publications from a total of 32 books covering experiential learning, facilitation, meeting methods, and education. In the end, we identified 56 patterns. Thus, we crafted the *Facilitation Patterns* (Shimizu and Iba, 2006).

After that, other students who saw this Facilitation Patterns project started two projects to craft pattern languages in their areas of interest: *Project Patterns*, a pattern language for project promotion (Furuichi,

Wakamatsu, *et al.*, 2007; Yumura, Wakamatsu, and Iba, 2008; Naruse, Takada, *et al.*, 2008), and *Research Patterns*, a pattern language for research design (Sasaki, Kobayashi, and Iba, 2008; Kobayashi, Yoshida, *et al.*, 2008). Subsequently, another student, inspired by those studies, expressed his desire to write patterns for concept making and proceeded to do so, resulting in *Concept Making Patterns* (Kato and Iba, 2008).

Our faculties have an event called the Open Research Forum (ORF) where we present research results to the general public. Every year, our laboratory showcases our daily research achievements at this event. In 2004, the titles of the Iba Lab's exhibits were "Methodological Innovation: New Forms of Thinking and Learning" (Iba Lab, 2004) and "Building a Platform for Social and Economic Simulation" (Iba Lab and Boxed Economy Project, 2004), and at this point, we had not yet presented anything on pattern languages. We started presenting about pattern languages in our exhibits from 2005, with the titles "Creating New Tools for Thinking: Social Simulation and Pattern Language" (Iba Lab, 2005a) and "Social Analysis Research at the Meso-level" (Iba Lab, 2005b), where pattern language became part of the title of exhibition. By 2007, pattern language had become the main theme, as seen in the title "Articulating Tacit Knowledge and Know-how through Pattern Language" (Iba Lab, 2007b). Moreover, that year, we also held a session titled "The New Trend in Knowledge Management: Articulating Tacit Knowledge through Pattern Language," where we introduced the *Project Patterns* (Iba Lab, 2007a). The following year in 2008, the title was "Pattern Languages for Educational Support and Community Revitalization" (Iba Lab, 2008), and pattern languages continued to be the central focus of our exhibits in the subsequent years.

(2) Methodology of Crafting in 2004-2007: Crafting Pattern Languages while Drawing on Methods of Creative Thinking and Software Development

For the crafting of *Facilitation Patterns*, we identified patterns that appeared in two or more sources from a collection of 26 books on experiential learning and facilitation. We then employed the "KJ Method," a technique developed by Jiro Kawakita for organizing diverse information and generating ideas, to synthesize (Kawakita, 1967) and articulate 56 patterns. Similarly, when crafting the *Project Patterns*, we extracted key insights from 15 books related to project management and used the KJ Method to structure and describe 47 patterns. In the case of *Research Patterns*, we consulted literature on research activities, identified behaviors and ideas that were consistently observed across 21 books, and utilized the KJ Method to consolidate and craft the patterns.

During this period, as part of a separate research project on social simulation in Iba Lab, we proposed a modeling method called "Pair Modeling" (Figure 29; Iba, 2007e). Drawing inspiration from pair programming in software development, the Pair Modeling approach involves collaborative modeling in pairs rather than working individually. This concept later evolved into "Pair Writing" in our Pattern Writing process. During the Pattern Writing phase, before the meeting where all members review the patterns, it became common practice for pairs to work together and revise the descriptions through pair writing, rather than tackling the task alone. This approach often yielded better results compared to each person working independently. It's worth noting that the *Research Patterns* were crafted by pairs; and the *Project Patterns* were developed by a group of three, making the project itself akin to pair writing.



Fig.29. An understanding of what happens in Pair Modeling, based on Luhmann's Social Systems Theory (Iba, Aoyama, et al., 2006).

Additionally, drawing from our experiences of crafting pattern languages at that time, beginning in 2007, I took on the responsibility of teaching a new course titled *Pattern Language* (Figure 30). To effectively deliver the course to a large number of students, I developed and refined crafting process and methods tailored to this context. In the 2007 class, 60 undergraduate students participated in this course. In this course, 60 students worked in small groups to write patterns, and the entire class compiled them together to craft a single pattern language on creative works (Figure 31). We crafted a pattern language based on the way we did in our projects, as follows.

First, patterns were mined from books that described the author's know-how, mind, and attitude for creative works, including books written by fiction writers, film directors, composers, and researchers. Students formed groups with others who had read the same book, discussed the important parts of the book, and summarized the know-how, mind, and attitude for creative works based on the book and their discussion.

Then, students chose one theme from (1) Patterns of Activity and Methods for Creative Work, (2) Patterns of Environment and Relationship for Creative Work, and (3) Patterns of Self-improvement and Sustainability for Creative Work and wrote 7 problem-solution pairs for creative works from that perspective. Next, students gathered with others who had chosen the same theme, introduced the 7 problem-solution pairs written by each group, and coordinated among the groups to avoid overlaps with other groups. They selected 5 out of the 7 pairs and wrote those 5 patterns. Furthermore, from the 5 patterns written by each group, they coordinated among the groups and selected 3 patterns. Two groups were paired up, and they provided constructive comments to each other on their 3 patterns to improve them. Based on this feedback, each group revised their 3 patterns.



Fig. 30. Scenes from the Pattern Language Class in the first year, 2007 (Iba and Kobayashi, 2008).



Fig. 31. In the class, students were divided into groups, wrote assigned patterns, and collaboratively crafted a single pattern language as a whole class (Iba and Kobayashi, 2008).

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Through this process, we ultimately crafted *Creative Patterns*, a pattern language for creative work, consisting of 48 patterns. From our current perspective, the quality as a pattern language is low, but at that time, we designed the course in the style of "Creative Learning," where students learned by creating. I wrote a paper about this course and presented it at PLoP 2008 (Iba and Kobayashi, 2008).

(3) Ways of Expressing and Utilizing in 2004-2007: Expressing Each Pattern with an Illustrative Figure where Characters Implement the Solution

In the *Facilitation Patterns* we ultimately compiled, we included illustrative figures featuring characters for each pattern (Figure 32), which became the precursor to what we later refined as Pattern Illustrations. However, these initial images were descriptive, inspired by the agent diagrams in the *Model Patterns*, and their expression fell somewhere between pictures and diagrams. We completed these *Facilitation Patterns* in 2005 and presented them at an academic conference in Japan in March 2006 (Shimizu and Iba, 2006). This was our first pattern language of practices.

In other pattern languages crafted during this period, illustrative figures were also attached to the patterns. For example, in *Project Patterns* and *Concept Making Patterns*, illustrative figures using clip art were attached to each pattern (Figure 33), while in the *Research Patterns*, illustrative figures were created using Lego blocks (Figure 34). It is interesting to note that, perhaps influenced by the simple characters consisting of circles and triangles in the illustrative figures of *Facilitation Patterns*, the figures of *Research Patterns* did not have hair parts attached to the human characters. Similar to the later Iba Lab characters Manabu-kun and Bo-Ningen-kun (stick person), the characters were designed in a way that their gender and age were not discernible.

Additionally, in the *Project Patterns*, the related patterns were not only listed by their pattern names but also illustrated through a relationship diagram.

In the pattern languages crafted during the *Pattern Language* course, each pattern was accompanied by an illustrative figure designed by the group responsible for that particular pattern. Some of these illustrative figures were created by combining clip art objects, while others were hand-drawn illustrations (Figure 35). Because we used our own pattern languages as examples at the time, a variety of illustrative figure styles emerged. Notably, the hand-drawn illustrations bore a resemblance to our later Pattern Illustrations of Bo-Ningen-kun. This highlights that the efforts and outcomes of this course were an indispensable step in shaping the distinctive characteristics of our pattern languages.



Fig. 32. Illustrative figures in the *Facilitation Patterns*, examples from **Guide for Newcomers** pattern (left) and **All-Inclusive place** pattern (right), which is written in Japanese (Shimizu and Iba, 2006).



Fig. 33. Illustrative figures in the *Project Patterns*, examples from **Outside of Work** pattern (left) and **Snowball Theory** pattern (right) (Naruse, Takada, *et al.*, 2008).



Fig. 34. Illustrative figures in the *Research Patterns*, examples from **"I've Finished!" is Halfway** pattern (left) and **Edison's Notes** pattern (right) (Kobayashi, Yoshida, *et al.*, 2008).

No.10 Proto-Thinking

Problem

The discussion concerning the idea took parallel courses.

Solution

Brush up the idea with making a prototype. It promotes your understanding, and you can share the image with team members.



Problem

The project cannot proceed any more, because there are no diversity in the roles, for instance, only leaders, idea men, or critics in the team.



Consider and understand the role of you in the team, and commit the project at your position.



Problem

The feature of environment influences whether you can settle down to your work or not.

Solution

Prepare your own base for creation, where there are lots of items that are familiar to you.

No.39 Users in My Immediate Circle

Problem

The image that looks good on your brain sometimes misleads the direction.

Solution

Clarify the target for whom you make a product, and talk with them frequently.



Fig. 35. In the *Pattern Language* class, each group drew illustrative figures in their preferred style, and among them were drawings that resembled later Pattern Illustrations (Iba and Kobayashi, 2008).

In the *Facilitation Patterns*, we presented an overview that visualized the connections between related patterns (Figure 36). Similarly, in the *Project Patterns*, we provided a "Pattern Map" that visualized which stage each pattern is used in: Planning, Practice, or Turning Around, alongside the pattern network (Figure 37), and the relationship with other patterns as a diagram in each pattern description (Figure 38). On the other hand, the *Research Patterns* took a different approach. In the *Research Patterns*, instead of focusing on network-like relationships, the entire collection was divided into three categories: Motivation, Creativity, and Relationship

(Figure 39). A "Category Map" was presented, indicating which category each pattern belonged to base on its content, offering a unique perspective on the organization of the patterns.



Fig. 36. Related patterns network in the Facilitation Patterns, in Japanese (Shimizu and Iba, 2006).



Fig. 37. Related patterns network (left) and Pattern Map (right) in the Project Patterns (Naruse, Takada, et al., 2008).



Fig. 38. Expression of related patterns in the Project Patterns (Naruse, Takada, et al., 2008).



Fig. 39. Category Map of the Research Patterns (Kobayashi, Yoshida, et al., 2008).

(4) Pattern Communities in 2004-2007: Initially Publishing Pattern Papers in Japanese conference, and then Finding the PLoP Conference and Starting to Participate

Regarding our involvement in pattern communities, before 2007, we were unaware of any conferences specifically dedicated to pattern languages. As a result, we continued to present our work at the Information Processing Society of Japan's research group on modeling, where I had been presenting since my student days. In that sense, I suppose I was perceiving the crafting of pattern languages as a kind of modeling. But in truth, this research group was named "Mathematical Modeling and Problem Solving," and pattern languages weren't considered "mathematical" models. However, since they were still "models" and related to "problem solving," the group accepted our papers on pattern language. Nevertheless, I knew we couldn't keep presenting there for much longer.

In 2007, I found and attended the PLoP (Pattern Language of Programs) conference for the first time. It was the 14th PLoP conference held at Allerton House (Figure 40). That year, I did not submit any papers but participated just to observe, watching what kinds of topics were being discussed at the conference.

At the conference, I participated in a bootcamp led by Linda Rising and Bob Hanmer, which was a tutorial for beginners. Also, I got to listen to invited talks by Ralph Johnson, Richard Gabriel, and Linda Rising. For the Writers' Workshop, I chose a group that seemed interesting and understandable for me. At that time, I didn't know anything, but it turned out later that the group was moderated by Richard Gabriel who started Writers' Workshop in the pattern community. Christian Kohls was also in that group, and we, as young researchers, talked to each other, who would become later play a key role in the European pattern community and become one of my important international academic colleagues, contributing to pattern languages in education and creativity.

The conference greatly surprised me, as it was completely different from any other computer science or social science conferences I had previously attended. The format and atmosphere were quite unique. "Writers' Workshop? What is this weird workshop?" I thought. But I also felt, "The community is very nice, comfortable, and creative." I decided on the spot that I would write a paper in English and present it at this conference the following year.



Fig. 40. Scenes from PLoP 2007 at the Allerton House, Illinois, USA, the first PLoP I attended.

(5) Theories and Philosophies in 2004-2007: Theoretically Analyzing Pattern Languages as Communication Media from the Perspective of Social Systems Theory

Around this time, some of my students were working on crafting pattern languages. The *Facilitation Patterns* led to a flow of influence and succession from seniors to juniors, and the crafting of pattern languages of practices in the Iba Lab continued, albeit on a small scale, but with a continuous lineage. However, I wasn't heavily involved in the actual crafting process because these projects were conducted as student projects during the semester or for graduation theses.

Instead, I was more interested in understanding the nature and function of pattern languages. At the time, I primarily focused on sociological research (Iba, 2006b, 2007b; Iba Lab, 2007c) based on Niklas Luhmann's social systems theory (Luhmann, 1984). I also conducted social data analysis from the perspective of complex networks (Figure 41). In this context, I focused on examining how pattern languages function as a communication medium and wrote papers on the subject (Figure 42; Iba, 2007a, 2007c, 2007d). During this period, we perceived pattern languages as "tools for thought" and "communication media." Additionally, I wrote a paper that positioned Friedrich Hayek, Niklas Luhmann, and Christopher Alexander as thinkers who tackled the theory of spontaneous order formation and knowledge, and discussed the relationships between their ideas (Iba, 2008).

The events of this period are summarized in the timeline shown in Figures 43 through 46.



Fig. 41. Studying open collaboration of open-source development of Linux OS, with using network analysis and the Social Systems Theory.







Fig. 43. Timeline of our pattern language research in 2004, in the first period of the STARTUP PHASE.



Fig. 44. Timeline of our pattern language research in 2005, in the first period of the STARTUP PHASE.



Fig. 45. Timeline of our pattern language research in 2006, in the first period of the STARTUP PHASE.



Fig. 46. Timeline of our pattern language research in 2007, in the first period of the STARTUP PHASE.

6.2 Attempting to Craft and Utilize Pattern Languages of Practices in Our Own Way and Style [2008-2010]

During the second third of the STARTUP PHASE, spanning from 2008 to 2010, we continued our work across several fronts. (1) First, as an application of pattern language to new domains, we crafted a pattern language to support students in their daily learning activities. This marked the first pattern language of practices that I invested a considerable amount of time and effort to develop. (2) During its creation, in terms of the methodology of crafting, we conceived and commenced the practice of Mining Dialogue, Clustering, and Pattern Illustrating. (3) As for ways of expressing and utilizing, we developed our concise style with a pattern per two-page spread and Dialogue Workshops using a pattern language. (4) Regarding pattern communities, we encountered an unexpected debate that emerged from our initial PLoP papers on human actions, but the following year, our paper was accepted without issue. (5) In the realm of theories and philosophies, we concentrated on developing creative systems theory and theoretically discussing the creative functions of pattern language. Let us now delve into the details of each of these explorations, tracing their progression.

(1) Application to New Domains in 2008-2010: A Pattern Language to Support Students in Their Daily Learning Activities

In 2008, we started working on the *Learning Patterns* from the summer. It was a practical task I carried out as a faculty member within the university, rather than research. At that time, we had finished re-designing the undergraduate curriculum, and we needed to create new ways to support students' learning design. I intuitively thought, "If it's about supporting design, then it has to be a pattern language." I hadn't heard of a pattern language

specifically for learning design, but since we'd already crafted one for facilitation, projects, and research design, I felt confident that it would be possible. I only had a hunch that it would work, but I felt strongly that it could.

However, during faculty meetings, the concept was not easily understood. There were no opposing opinions, but there was a question about why something used in the fields of architecture and software would be useful for supporting learning. If I had known about pedagogical patterns at the time, the conversation would have been quicker, but I struggled to provide a rational explanation.

Eventually, it was decided that "If Iba-san says it's worthwhile, why not give it a try?" Given that we were an experimental department, we were granted permission to try it. Thus, we went ahead and started crafting the Learning Patterns, a pattern language for active learners. Later, we changed the subtitle to "a pattern language for creative learning" to better fit the contents. Seven students from the Iba Lab joined the project. This was in the summer of 2008.

The *Learning Patterns* booklet was completed in February 2009, and it was distributed to all 4,000 students of the Faculty of Policy Management and the Faculty of Environment and Information studies in April 2009 (SFC, 2009). From February of that year, I took a sabbatical year and became a Visiting Scholar at MIT Center for Collective Intelligence, residing in Cambridge, Massachusetts. In the spring of 2009, I received the SFC Dean Award for my work on *Learning Patterns*, but by the time I received the news of the award, I had already moved to the American continent.

After completing the *Learning Patterns*, we distributed them to students. We also launched a website and shared it on Twitter, which received a great response from software engineers in Japan. Reflecting on this, it made sense to me. While students in school have classes and engage in relatively passive learning on a daily basis, professionals who need to acquire knowledge and refine their skills within their work feel a greater need to actively design their own learning. Moreover, just as *Design Patterns* have been widely accepted in the software field, it seems that the thinking of engineers and the form of patterns are indeed compatible. For this reason, I was invited to speak about *Learning Patterns* at several software-related events (Miyake, Kato, and Iba, 2009; Iba and Learning Patterns Project, 2010; Iba, 2012a).

However, at our faculty's Open Research Forum (ORF), an event for presenting research to the general public, the reaction was totally different (Iba Lab, 2009, 2010). This event is attended by businesspeople from various occupations, researchers, educators, and others. Upon seeing the *Learning Patterns*, many people harshly criticized them, saying things like "These things should be naturally acquired, not explicitly stated" or "The idea of taking shortcuts with such manual-like things is not good." This took both my students and me by surprise. It seemed that "learning" was somewhat sanctified, considered a natural human activity, and putting it into writing like this was deemed unacceptable. Today, such reactions are hard to believe, but it shows just how novel the idea of a pattern language of practices for non-professional people was at the time.

As for academic presentations, we presented the *Learning Patterns* at several conferences (Iba, Miyake, *et al.*, 2009; Iba, Kato, *et al.*, 2009; Iba Lab, 2009, 2010; Iba and Miyake, 2010; Iba and Sakamoto, 2011; Iba and Learning Patterns Project, 2011). Additionally, we provided the booklet at events for the general public, delivered oral presentations at several academic conferences, and gave talks at various gatherings. Subsequently, English-language on-demand books and Japanese booklets and cards were made available for purchase. Although a publisher has plans to publish the Learning Patterns as a regular book in Japanese, we haven't been able to dedicate sufficient time to that publication project. As a result, it remains unpublished in Japanese. Nevertheless, there is no doubt that this work constituted a significant leap forward in our journey of pattern language research, propelling us onward in our exploration of this fascinating field.

One of the unique pattern languages I created during this period was a pattern language for realizing public policies, called *Policy Language*. Prof. Heizo Takenaka, one of my mentors during my student days, had experience in implementing public policies such as postal privatization and non-performing loan disposal as a minister. I conducted a Mining Interview with him about his practical experience and extracted patterns regarding the realization of policies. These interviews were conducted as part of my *Pattern Language* course and also served as a demonstration of Mining Interviews. This pattern language was first introduced in a Japanese book (Iba, Nakano, *et al.*, 2013) and later published as an English paper (Iba and Takenaka, 2017). After seeing this pattern language included in the book, a local government staff created a pattern language for their own domain and presented it at a conference.

(2) Methodology of Crafting in 2008-2010: Conceiving and Beginning to Practice Mining Dialogue, Clustering, and Pattern Illustrating

In the Learning Patterns Project, we aimed to craft a pattern language with a group of about eight students who were new to the process, working on it during our weekly project activities. Therefore, we needed to explicitly define and execute the steps to follow. Additionally, we had a fixed deadline for submission six months later, so we had to work backward to determine how we could create a high-quality product within that time frame. Thus, we devised our initial pattern language crafting process and put it into practice.

The process for crafting the *Learning Patterns* consists of five phases: Pattern Mining, Pattern Prototyping, Pattern Writing, Language Organizing, and Catalogue Editing (Figure 47; Iba, Sakamoto, and Miyake, 2010; Iba Lab, 2011a). This process is not strictly sequential, so allowing back and forth if necessary.

In crafting the *Learning Patterns*, we reflected on our own experiences and collectively identified what was important for creative learning (Figure 48). We were developing these *Learning Patterns* to distribute to students at our university, so it was a natural idea to draw from our own experiences and highlight what we felt was crucial. In the previous pattern languages crafted by the Iba Lab, such as the *Facilitation Patterns*, *Project Patterns*, *Research Patterns*, we extensively read books in the respective fields and extracted points we considered important. As non-experts, we believed such research was necessary. However, this time was different.

We wanted to articulate what was essential for better learning in our own faculties, and we believed that the answers lay within our own experiences rather than in some literature. Therefore, we employed a brainstorming approach, thoroughly listing things we thought were important. Through discussions, we unearthed our own experiences, a method I now call "Mining Dialogue."



Fig. 47. Process of crafting the Learning Patterns, as described in the terminology of the time (Iba, Sakamoto, and Miyake, 2010).



Fig. 48. Scenes of Mining Dialogue and Clustering for crafting the Learning Patterns.

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One crucial phase in our pattern language crafting process was "Clustering," which involved compiling mined rules of thumb as materials for crafting a pattern language. This idea of Clustering was inspired by Jiro Kawakita's KJ Method (Kawakita, 1967). The KJ Method was originally conceived to organize disparate data fragments to make new discoveries. Since my student days, I had been using brainstorming and the KJ Method to generate ideas, and this continued even after becoming a faculty member. I taught these methods in my *Collaboration Skills* class and conducted ideation workshops outside the university to provide hands-on experience (Iba, 2009a). I thought this method would be suitable for crafting pattern languages. While we had been using the KJ Method in our previous pattern language creation efforts, we had been doing so in a rather rough and broad manner. However, this time, with my involvement, we thoroughly followed the spirit of the KJ Method and applied it more rigorously. When we tried it, it worked well and became our standard method.

It was also around this time that we began the process of refining pattern descriptions by having everyone read the draft of pattern descriptions written by each member, discussing potential improvements, having one person revise them, and then having everyone review the revisions again in the next meeting. This cycle was repeated many times (Figure 49). Each pattern took approximately one to one and a half hours to review, and with 40 patterns, most of the time spent creating the pattern language was devoted to these discussions (Figure 50, 51). We currently refer to this process of multiple people reviewing the patterns as a Pattern Review. Additionally, since we were mining from our own experiences during this period, the project members were also practitioners, which means that this process also served as what we now call a Practitioner Review.



Fig. 49. Scenes of Pattern Reviews for the Learning Patterns.



Fig. 50. Improvement process of the Learning by Teaching pattern.



Fig.51. Diagram showing the process of Pattern Reviews for the *Learning Patterns*.

Language Organizing is the process of understanding the relationships between patterns and considering their positioning and order. This is similar to what we currently call Systemization, but the current Systemization creates a system through differentiation from the whole to the parts before entering the Pattern Writing phase. In contrast, Language Organizing at that time was done when the patterns were mostly completed, considering the relationships between individual patterns and building those relationships bottom-up from the parts (Figure 52).



Fig. 52. Language organizing for the Learning Patterns.

In addition, for the crafting of the Policy Language in 2010, we conducted Pattern Mining in a different way than before (Figure 53). Previously, we had been mining patterns from literature and uncovering them through Mining Dialogues while reflecting on our own experiences. However, from this point forward, we began conducting "Mining Interviews" where we extracted patterns by interviewing practitioners. This method is particularly effective when we are not practitioners of the practice we are targeting. Mining interviews later became our primary mining method and led to research on how to conduct them.



Fig. 53. Mining Interview to Prof. Takenaka for crafting Policy Language.

In 2010, a dialogue between a network science researcher, a media artist, a contemporary philosopher, and myself about pattern languages was featured in a philosophy magazine (Iba, Eto, *et al.*, 2010). During the discussion, the organizers posed a question: with the ability to collect vast amounts of data of human behaviors from the real world, could we capture patterns and create pattern languages using methods like network science? I (along with the media artist) argued that patterns are not objective or quantifiable entities. To create a good pattern language, one must capture the world as seen through the eyes of practitioners. This is precisely why we create pattern languages by interviewing practitioners and reflecting on our own experiences. Analyzing behaviors and results from a behaviorist perspective only leads to grasping external "patterns" outside of human beings, which is a different meaning from patterns in a pattern language. Instead, I believe that Pattern Languages of Practices should describe how practitioners perceive the world and engage with it from their own perspective. I expressed this view during the dialogue. Today, I could explain it better with the help of phenomenology, but I still hold the same beliefs I asserted in that discussion. This idea has remained important and has been reiterated throughout my subsequent projects.

(3) Ways of Expressing and Utilizing in 2008-2010: Developing Our Concise Style with a Pattern per Twopage Spread and Dialogue Workshops Using a Pattern Language

The *Learning Patterns*, as a pattern language, has two significant features in its expression as patterns (Figure 54). First, the text is concise and written in a simple style. Second, each pattern includes a Pattern Illustration that symbolizes its content. We will first delve into the details of the first one.

When crafting the *Learning Patterns*, what we crafted focused not on practices of professionals or working, but practices of everyday life. And its targets were ordinary students. Therefore, we also needed to ensure that our descriptions were simple, readable, and intuitive. As a result, the text of our patterns is very brief, differing significantly from Alexander's *A Pattern Language* or software patterns, aiming for simplicity, readability, and intuitiveness. For readers who are experts or highly motivated, exhaustive documentation and detailed examples are not negative, however, for a general audience that might not have high motivation, simplicity, readability, and intuitiveness can be effective. We chose the latter approach.

In the early days such as this period, we used to write forces and actions in a bullet-point style, which I rarely use anymore. At that time, we thought that writing forces in bullet points made it easy to see at a glance that there were several forces at play, as each force was written as a single item (and it was also clear to the creator whether the forces were sufficiently understood). For actions, the bullet-point notation emphasized the steps to be taken and could be used as a guide for execution. In this way, we felt that bullet points were suitable for quickly grasping the content of patterns, and this feeling was probably influenced by the pattern form of Software Patterns, which we were referring to at the time. However, I later recognized the limitations of using bullet points and started writing in paragraphs, which I will discuss later.

Moreover, before people read the text, it's important to embed motivations to make them want to read it. So we placed an introduction sentence, like a catchphrase, under the pattern name and further included a Pattern

Illustration that could quickly give an idea of the content and appeal of the pattern. We consciously drew and included Pattern Illustrations, a single picture symbolizing the essence of the pattern.



Fig. 54. An example of the original pattern form of the Learning Patterns (Iba and Learning Patterns Project, 2011).

The second feature of the *Learning Patterns* is that each pattern includes a Pattern Illustration. In terms of visual representation in pattern descriptions, Alexander's *A Pattern Language* used photos and spatial design sketches. Software patterns used class diagrams and other diagrams. However, we felt none of these were appropriate for depicting everyday practices like learning. When trying to represent the design of learning through photographs, the scenes ended up looking too similar—always someone sitting at a desk, writing, or reading. We didn't think this captured the essence of the practice of learning. Sketches and diagrams also seemed unsuitable for portraying the practice of learning.

Instead, we thought that illustrations could be a more suitable alternative. With illustrations, not only can you show characters doing something, but you can also add speech bubbles to indicate what they are thinking or saying. Furthermore, you can selectively draw only the necessary backgrounds and tools, omitting the rest. Deformations for emphasis are also possible. And what we realized in practice was that unlike photos, illustrations could capture not just a moment in time, but the context before and after that moment. For example, in a scene where one character is surprising another, both can be captured in a single image.

Thus, "Manabu-kun" (Figure 55) was born as the character for our *Learning Patterns*' illustrations. The character is simple, with no discernable gender, age, race, or attire. However, because the shape is human-like, it allows readers to empathize and see themselves in the character. The character's name, "Manabu," means "to learn" in Japanese, and it was given this name because the character was created for the *Learning Patterns*. At this point, we never imagined that this character would become a regular feature in many of our pattern languages, starting with the *Presentation Patterns* and the *Collaboration Patterns*, and would eventually become a symbol of the Iba Lab's pattern languages (If we had known, we probably wouldn't have given it a name tied specifically to Learning).

Note that Pattern Illustrations are not mere ornaments or supplementary images. We consider them to be symbolic essential expressions of the pattern, equal to the pattern name. If the pattern name serves as a "left-brained," language-based symbolic expression succinctly indicating the essence of the pattern, then the Pattern Illustration is its "right-brained," image-based counterpart.



Fig. 55. Drawing Pattern Illustrations (left), and examples of Pattern Illustrations of Language Shower pattern (center) and Community of Learning pattern (right) (Iba and Iba Lab., 2014a).

The overall structure of the pattern language, with groups of three patterns with similar content and the entire language divided into three categories, was born during the crafting of *Learning Patterns* (Figure 56). Since then, it will become our standard design policy for organizing the system of patterns. We have often been asked, "Why three?" when people notice that our patterns are structured based on the number three. The reason is that the number three is cognitively easy to remember and handle, and semantically, it can convey simplicity while also accommodating diversity of elements. If you look around the world, you will find various instances where the number three serves as a key organizing number. Having two items can lead to a binary opposition, while having four items already introduces the complexity of classifying into four types along two axes. For these reasons, as our rules of thumb, we strive to weave the structure of our patterns using the number three.



Fig. 56. Overall system of the Learning Patterns.

During this period, in the *Collaboration Skills* course I was teaching, I conducted an experiment in 2008 where students reflected on their group work using the *Project Patterns* and *Concept Making Patterns* (Kato and Iba, 2009). They discussed and reflected on their group activities with their team members using these pattern languages. This is the first instance where we used pattern languages to reflect on activities. This approach later led to various applications, such as using the *Presentation Patterns* to reflect on presentations and the *Collaboration Patterns* to reflect on team activities.

In 2010, we also made a significant invention in utilizing a pattern language. This invention was the "Dialogue Workshop" with utilizing a pattern language, where participants share their experiences related to the patterns. We arrived at this invention as we sought to address the challenges we faced at the time.

After completing my year-long sabbatical in the United States and returning to Japan in the spring, 2010, I found that the *Learning Patterns* booklet had not been as widely read by students as I had hoped. It seemed that

the booklet was distributed along with timetables and other academic materials at the start of the new academic year and had ended up unread on bookshelves. It even appeared to have been forgotten altogether. I acutely realized at this point that delivering pattern language to the general public differed fundamentally from the professionals who are eager to learn in the case of architectural or software patterns; it required instigating the motivation to read.

This led me to consider how I could encourage students to read the booklet. Since merely asking them to read it would not suffice, some kind of innovation was needed. The first idea that came to mind was to frame reading the booklet as preparation for some subsequent event. If there was something compelling to look forward to, the students would likely read it. The next thought was that this subsequent event should be enjoyable and festive. If the reading led to an uninteresting event, it could tarnish the overall impression of the pattern language. Ideally, something should follow the reading that would make them think, "Wow, that was fun!"

With this in mind, I conceived of a Dialogue Workshop where classmates could share their experiences related to the patterns. Since patterns themselves are intriguing and valuable, the experiences linked to them would likely also be engaging and worth sharing. Listening to these experiences would undoubtedly be a rewarding experience. Thus, the concept of the Dialogue Workshop, an exchange of experiential narratives, was born.

To implement the Dialogue Workshop, I decided on a specific approach. Participants would read the *Learning Patterns* booklet in advance and mark patterns that resonated with their experiences. Not limited to academic learnings, experiences could span from childhood to present and include extracurricular activities, hobbies, social work, and everyday life. Participants would mark the patterns they felt they had practiced. Furthermore, among the patterns they hadn't yet experienced, they would select five they would like to try and mark them with a star.

During the workshop, attendees would seek out someone who had experience with one of these five selected patterns and listen to their story. Participants would roam around the venue, pair up, introduce themselves, and ask each other if they had experiences related to the "would like to try" patterns. They would then share their episodes of experience, while listeners took notes. After about an hour of mingling, most participants could talk to roughly ten to thirteen people. They would gather insights from several people regarding each of the patterns they were interested in, enabling them to visualize how to implement these patterns themselves.

In the Fall semester of 2010, I tried this workshop in the *Pattern Language* course for undergraduate (Figure 57). Although I was anxious, I had a premonition it would work well. At worst, students would still be exposed to pattern language, mitigating the risk of total failure. So, how did it turn out? The workshop was an overwhelming success, far beyond my expectations. The room was charged with excitement, and students engaged in lively, joyful conversations. The post-workshop survey was highly favorable, and most importantly, students were utilizing the *Learning Patterns* as a common language. It was an emotionally impactful moment.



Fig. 57. First Dialogue Workshop with using the Learning Patterns at Keio University in 2012 (Iba, 2012b).

After witnessing this success, I considered why the workshop was so effective. Firstly, while participants are practitioners of learning, they are not experts. Without the 40 patterns from the *Learning Patterns*, they might struggle to articulate their successful learning experiences. These patterns legitimize their experiences as "good practices," providing them with the confidence to share, even illuminating experiences they'd taken for granted.

Secondly, the dialogue format of the workshop invites people to talk with those who haven't yet experienced a particular pattern they're interested in trying. This not only encourages enthusiastic narration but also engages the listener, who will eventually share their experiences. Given the diversity of experiences, mutual dialogue becomes possible, inherently making the workshop enjoyable. This enjoyable atmosphere explains the elevated

levels of engagement during the workshop, a realization that dawned on me only after witnessing the vibrant interactions.

Following the success of the initial implementation, we decided to extend the Dialogue Workshops based on the *Learning Patterns* to incoming freshmen in our department starting the following year. At that time, the dean of our faculty was Prof. Jun Murai. Upon consulting him, we received an enthusiastic endorsement to proceed, which led to immediate implementation the next year, as I will mention later.

(4) Pattern Communities in 2008-2010: Unexpected Debate Arose from Our First PLoP Papers on Human Actions, but the Next Paper was Accepted Smoothly

During crafting the *Learning Patterns*, in 2008, my students and I submitted papers on *Project Patterns* (Naruse, Takada, *et al.*, 2008) and *Research Patterns* (Kobayashi, Yoshida, *et al.*, 2008) to PLoP and attended the conference with the students. I don't remember much about that year's conference, but I do recall heated discussions during the Writers' Workshop about whether human actions can be written as patterns. Opinions were divided; some thought, "human behavior can be described in patterns," while others argued that because humans have free will, which is different from software design, such behavior could not and should not be described. We were not assigned to the group where Linda and others brought in additional patterns for *Fearless Change*, the 'Software & People' group, led by Linda Rising and Joshua Kerievsky, but to a group mainly consisting of people from software backgrounds. Hence, it was a quite tough conference experience for us.

One of the most memorable papers from this year's Writers' Workshop was Christian Kohls' "The Relation between Design Patterns and Schema Theory" (Kohls and Scheiter, 2008). It was a paper that explored the understanding of patterns from the perspective of psychological concepts. As someone who enjoys interdisciplinary research, I was excited by this work. I remember thinking that the ideas discussed in the paper were effective for comprehending and explaining pattern languages.

At the time, we were in the midst of crafting the *Learning Patterns*. I remember hearing at the Bootcamp that "Forces are important in pattern descriptions." After returning to Japan, I shared this insight with the project members, and we added a section for Forces to our pattern descriptions. This incident reflects how, at that time, we only understood the importance of the three-point set of context, problem, and solution (our pattern descriptions from that period lacked not only the Forces section but also the Consequences section).

Next year, In August of that year, I submitted a paper on the *Learning Patterns* (Iba, Miyake, *et al.*, 2009) and attended PLoP 2009 held in Chicago. My participation was a bit nerve-wracking, as it followed a debate from the previous year about whether human actions can be described in patterns. In our view, human actions can indeed be written in patterns, and we had successfully done so. However, it was a different question whether other participants at the conference would agree with our perspective, a realization we had acutely felt the previous year. Hence the anxiety.

At the conference, our paper was assigned to 'People' group of Writers' Workshop, moderated by Linda Rising (Figure 58). In that group, Mary Lynn and Linda's paper on additional patterns for *Fearless Change* and Christian Kohls' paper on the epistemology of patterns (Kohls and Panke, 2009), among others, were workshopped. Therefore, in that group, not only were patterns of practices not a problem, but such topics also appeared in other papers. Unlike the previous year, we received many constructive suggestions regarding the content, making the workshop an extremely valuable experience.



Fig. 58. 'People' group at PLoP 2009, in which the Learning Patterns paper was workshopped.

Also, it seems that during this time, we discussed Linda and Karl's paper on Patterns for Sustainable Development (Rising and Rehmer, 2009) in our Writers' Workshop. Although I have no recollection of this, it appears that I had already been exposed to pattern languages based on social issues at this point. Linda's pioneering work on these topics during this time highlights her innovative mindset, which I have come to appreciate once more.

(5) Theories and Philosophies in 2008-2010: Developing Creative Systems Theory and Discussing the Creative Functions of Pattern Language Theoretically

In 2009, during my sabbatical year, my family and I lived in Cambridge, Massachusetts, USA, where I became a Visiting Scholar at the MIT Center for Collective Intelligence. There, I was researching collaboration on Wikipedia using network analysis with colleagues of the center (Iba, Nemoto, *et al.*, 2009). However, around this time, I had two major realizations that led me to significantly shift the new direction of my research.

The first realization was that I was still fascinated by systems theories, such as complex systems. After all, I had originally been captivated by complex systems science during my undergraduate years, which led me to pursue graduate studies, so it was only natural. However, I had stopped directly thinking about or discussing complex systems for some time. I had already shifted my research to social systems theory and complex networks, which were related to complex systems but not the same.

But when I became a Visiting Scholar at MIT and picked up the original English versions of books, I had previously read in Japanese translation at the MIT Bookstore, I found myself unable to contain my excitement. I spent days buying and reading those books. Perhaps the sabbatical period, my first time living abroad, had freed my mind. In any case, my enthusiasm for complex systems science, which I had forgotten during the days of steadily conducting research in my doctoral program and guiding students as a faculty member, was reignited.

Thus, I was engaged in a novel study of chaos from a fresh perspective. I immersed myself in the research, programming diligently, running a tremendous number of simulations daily, and analyzing the results (Figure 59). My passion was focused on the study of the attractive shapes generated by chaotic functions (Figure 60; Iba and Shimonishi, 2011) and the analysis of state transition networks drawn by rounding and discretizing chaotic values (Figure 61; Iba, 2011a). In retrospect, it may not have been as remarkable as I believed, but at the time, I was in the midst of the excitement of discovery and took great pride in what I considered to be quite groundbreaking research. During this research, I read the Refactoring book (Fowler, Beck, *et al.*, 1999), actually refactored my own program, and strongly felt the effectiveness of patterns firsthand.



Fig. 59. Chaotic Walker: A research simulator thoroughly built from scratch to study the complex order hidden in chaotic functions (Left), and the machines that were constantly running those simulations day and night (Center and Right).



Fig. 60. Chaotic Walk: Generating diverse shapes from a single simple chaotic function.



Fig. 61. Study of the state transition network of the discretized values of a chaotic function (Iba, 2011a).

The second realization was that, although I had been researching "creative collaboration" for the past few years, I had been focusing solely on its social aspects and had not been able to approach creativity itself. I noticed that I had been treating "creative" as something additional, like a flavor added to coffee. I wondered if there was a way to study "creation" more directly. I had always loved creating things, and my interest in life and complex systems stemmed from their creative aspects. Although there was no academic field that directly studied "creation" at the time, I wanted to tackle this subject. If there wasn't one, I thought, I would have to create it myself.

With this in mind, I worked on developing a systems theory of creativity, which I called "Creative Systems Theory" (Iba, 2009b, 2009c). This theory formulated what creation is using the systems theory of autopoiesis. Autopoiesis was originally conceived as a concept of living systems in the field of biology, but the sociologist Niklas Luhmann applied it to society and discussed social systems. I applied it to creation and proposed creative systems. The elements of social systems are communications, and their generation and concatenation give rise

to social phenomena. The elements of creative systems are discoveries, and their generation and concatenation give rise to creative phenomena (Figure 62).

From the perspective of these social systems and creative systems, we can see that pattern languages are not only media of communication but also media of discovery (Figure 63). Thus, I became able to understand pattern languages not only from a social aspect but also from a creative aspect, and I began to consider centering my research on pattern languages that function as media in this dual sense, exploring their possibilities. In a sense, this was my "systems theoretical turn."



Fig. 62. Psychic, social, and creative systems.



Fig. 63. Pattern language as media for structural coupling between systems.

In 2009, when I was on sabbatical at MIT, my collaborators there, including Peter Gloor, were planning to launch a conference called COINs (Collaborative Innovation Networks). I joined them, helped organize the conference, and also presented the paper on the Creative Systems Theory at the conference (Iba, 2009c). And, in 2010, the first AsianPLoP was held. I also helped organize it as a Program Committee member. During this period, I served on the Program Committee for AsianPLoP 2010 and the Steering Committee for COINs 2009 and COINs 2010. In the spring of 2010, I was promoted to Associate Professor.

The events of this period are summarized in the timeline shown in Figures 64 through 66.







Fig. 65. Timeline of our pattern language research in 2009, in the second period of the STARTUP PHASE.



Fig. 66. Timeline of our pattern language research in 2010, in the second period of the STARTUP PHASE.

6.3 Articulating and Proposing Pattern Languages of Practices as a Genre of Pattern Language [2011-2012] The final third of the STARTUP PHASE, encompassing the years 2011-2012, was a period marked by critical events that would determine our future trajectory. The occurrences during this time were so pivotal that, had we taken a different path at the crossroads, our current research and progress would not exist. Even during this period, we persevered in our endeavors across multiple fronts. (1) First, as an application of pattern language to new domains, we crafted pattern languages for daily creative activities, such as presentations and collaborations, and for living vibrantly and beautifully. (2) In terms of the methodology of crafting, we began presenting our methodology on Mining Dialogue, Clustering, and Pattern Illustrating at several conferences. (3) As for ways of expressing and utilizing, we conducted Dialogue Workshops in various communities and explored visual representations of patterns, conducted Dialogue Workshops in various communities, and weekly introduced patterns on a TV program in Japan. (4) Within the pattern communities, a momentous event occurred that would shape our destiny. I was asked to provide an invited talk amidst a crisis of near paper withdrawal and potential abandonment of further research, and I accepted the invitation. (5) In our theories and philosophies research, by reexamining pattern languages from the architectural era, I proposed a new genre called pattern languages for human actions, which we referred to as Pattern Language 3.0. Let us now delve into each of these explorations in greater detail.

(1) Application to New Domains in 2011-2012: Pattern Languages for Daily Creative Activities, such as Presentations and Collaborations, and for Living Vibrantly and Beautifully

In 2011 and 2012, I launched several projects to craft different pattern languages following the pattern language crafting process developed with the *Learning Patterns*. One of these was the *Presentation Patterns* (Iba Lab, 2011b; Iba, Matsumoto, and Harasawa, 2012; Iba and Iba Lab, 2013), and another was the *Collaboration Patterns* (Iba Lab, 2012b; Iba and Isaku, 2013). At the time, I believed that the three basic skills for the 21st century were creative learning, creative collaboration, and creative presentation, and I wanted to create these three pattern

languages as sister works. We called the *Learning Patterns, Presentation Patterns*, and *Collaboration Patterns* "the Iba Lab Trilogy."

When we presented the *Learning Patterns* at the SFC Open Research Forum (ORF), they received a negative response. However, in 2011, when we presented the *Presentation Patterns* at the next year's ORF (Figure 67), the reaction was completely different. There was a significant response, and it was very well-received. I was quite surprised by the difference in reaction compared to the *Learning Patterns*, but it seems that presentations are widely recognized as a skill, and the fact that they were compiled as patterns was quite acceptable.

At the ORF, we distributed booklets of the *Presentation Patterns* (Iba Lab, 2011a) to interested visitors at the Iba Lab exhibition booth (Iba Lab, 2011b). Despite the two-day event, all 800 copies we had prepared were gone by early afternoon on the first day. That's how well-received they were. Some people had seen the advance notice and came to get them right away. However, we ran out of copies for those who were looking forward to getting them in the afternoon of the first day or on the second day, which was unfortunate. From that moment until the next day, we explored ways to print more copies by express, but it was quite expensive and not a viable option for booklets we were distributing for free.



Fig. 67. Iba Lab booth at ORF 2011, where the highly popular Presentation Patterns were presented.

So, we changed our approach and decided to put the PDF file of the *Presentation Patterns* booklet that we had planned to distribute on the web and make it publicly available. This way, even though people who were looking forward to the booklet couldn't get a physical copy, they could still read the content. That night, I worked on it, and by the next morning, we had the PDF available online. We then handed out papers with the address to visitors at the exhibition booth.

As a result, the *Presentation Patterns* released online became a hot topic on Twitter, and GIGAZINE, a web magazine, quickly picked it up, further explosively spreading the existence of the *Presentation Patterns*. It was an astonishing development. That week, it ranked in the weekly rankings of Hatena Bookmark, a Japanese bookmark service, and even more people learned about the *Presentation Patterns* and visited the site. The response to the situation where all the prepared booklets were gone led to a social phenomenon that we had not anticipated. This shows how much media like the *Presentation Patterns* was potentially in demand. This was the moment when something like the Pattern Language of Practices gained wide recognition in Japan.

Then, the *Presentation Patterns* were later published as a book in Japanese, and their innovative approach to organizing and conveying presentation skills was honored with a Good Design Award. The *Learning Patterns*, the *Presentation Patterns*, and the *Collaboration Patterns* have been made available as Japanese booklets and cards (CreativeShift, 2014a, 2014b, 2014c), as well as English print-on-demand books (Iba and Iba Lab, 2014a, 2014b, 2014c). These pattern languages have become our classics and continue to be widely utilized to this day.

Figures 68 and 69 show the Cover Design and Overall System of the *Presentation Patterns* and the *Collaboration Patterns*. The Overall System was designed to convey the dynamic momentum of the creative process. We had used this type of circular design for the Overall System representation in the *Learning Patterns*, *Presentation Patterns*, and the *Collaboration Patterns*, but after them, we rarely used it. This is because the pattern names inevitably become small. When placing a circular design with pattern names inside a square page, the text size must be relatively small. As a result, although the overall impression can be felt, the pattern names become too small to read.

Therefore, since the *Collaboration Patterns*, we have shifted to an Overall System representation that fits well within a square and allows the text to be large and easily readable, rather than using a circular overall image. As we will see later, *Words for a Journey* was a period of exploring new designs, and through this process, the current Overall System representation that we commonly use was born at the *Words for a Dialogue* stage.



Fig. 69. Cover design and overall system of the Collaboration Patterns.

In 2011, in parallel with these, we also created *Pedagogical Patterns for Creative Learning* (Iba, Ichikawa, *et al.*, 2011) and *Generative Beauty Patterns* Arao, Tamefusa, *et al.*, 2012; Iba Lab, 2012c; Generative Beauty Project, 2012b), which I will discuss in more detail later, *Change-Making Patterns* (Shimomukai, Nakamura, and Iba, 2012a, 2012b, 2015; Nakamura and Iba, 2015b), and *Personal Culture Patterns* (Nakada, Kamada, and Iba, 2013). Additionally, in their undergraduate and master's theses, students wrote patterns on child raising (Chujo and Iba, 2009, 2011; Chujo, 2011) and collective intelligence (Shimizu and Iba, 2011).

From the latter half of 2011 to 2012, we engaged in collaborative research with Kanebo Cosmetics, Inc., aimed at supporting women in living vibrant and beautiful lives. Researchers from Kanebo's Innovative Beauty Science Laboratory approached me with the idea of exploring alternative ways to promote beauty from within, beyond conventional cosmetics.

When initially confronted with this proposition, I was somewhat surprised but also intrigued. I thought, "Up until now, our work has revolved around intellectual activities like learning and presentations. This new project focuses on more everyday aspects of life, something we haven't tackled before but could theoretically accomplish." As for the subject of "beauty," I reasoned that since Christopher Alexander, the originator of the pattern language concept, had discussed the aesthetic qualities of "places," it was not a far stretch to apply the same principles to this domain. Consequently, we agreed to jointly take on this new challenge, giving rise to the Generative Beauty Patterns project.

(2) Methodology of Crafting in 2011-2012: Presenting Our Methodology on Mining Dialogue, Clustering, and Pattern Illustrating

In the crafting of the *Presentation Patterns*, we based our process on the one we had developed during the crafting of the *Learning Patterns*, making appropriate adjustments along the way as we progressed with the pattern language development (Figure 70, 71). During this process, we consciously sought better methods for Pattern Illustrating and gained practical insights. When crafting the *Collaboration Patterns*, we inherited the process from the *Presentation Patterns* but added various refinements at key points (for example, the format for describing what to write after Clustering and how to connect to the next step).



Fig. 70. Scenes of Mining Dialogue and Clustering in the crafting of the Presentation Patterns.



Fig. 71. Scenes of structure building in the crafting of the Presentation Patterns.

By this time, people at conferences were asking for more details about how we were crafting the patterns, so we not only took photos but also recorded videos of the early stages of the crafting process of the *Collaboration Patterns*¹ (Figure 72). We edited these videos and made them available on the internet. These explorations into the crafting methods were compiled into pattern languages for Pattern Mining (Iba and Isaku, 2012), which was presented as papers at PLoP.

¹ YouTube "Holistic Pattern Mining (Collaboration Patterns Project)": <u>https://www.youtube.com/watch?v=plpwld6dIms</u>


Fig. 72. Video of Holistic Pattern Mining in the Collaboration Patterns Project, including the part condensing 20 hours of Clustering work into a 1000x speed playback.

Additionally, when mining the *Generative Beauty Patterns*, we introduced a small twist to the process by conducting a Mining Dialogue. As this pattern language focused on women living vibrantly and beautifully every day, we wanted to capture the essence of that beauty. To achieve this, we brought photos of each member's room and personal belongings, and we engaged in a Mining Dialogue while examining these images together. The photos were spread out on tables for discussion (Figure 73), and we wrote down what we considered important on sticky notes, which we then attached to the relevant photos. Furthermore, we conducted multiple Mining Dialogues, each centered on a specific theme such as clothing, small items like bags and scarves, meals, and activities at school or work. When it came to Clustering, we began by partially consolidating the results of the theme-specific mining sessions using only the sticky notes attached to the photos. We then integrated these partial clusters, adopting a stepwise Clustering approach. The subsequent crafting process was essentially identical to the one we employed for crafting the *Collaboration Patterns*, which we were working on concurrently that year.



Fig. 73. Scenes of mining and Clustering in the Generative Beauty Patterns project.

In the crafting of the *Presentation Patterns*, two people were in charge of the Pattern Illustrations, engaging in "Pair Illustrating." During the crafting of the *Learning Patterns*, we were starting from scratch, considering the fundamental idea of including illustrations with the patterns and feeling our way through what kind of illustrations would be good. However, this time, we were able to focus on crafting better Pattern Illustrations while inheriting the Manabu-kun character. We were also able to discuss the composition and presentation of the Pattern Illustrations with the team members and talk about how to craft better illustrations (Figure 74). As initial sketches tend to easily become flat, we flipped through Hayao Miyazaki's storyboard collection books to gain inspiration from the depth and movement in his compositions. We also used three-dimensional objects like erasers to grasp the spatial relationships between objects while drawing. To ensure consistency, one person drew all the final touches for the illustrations.

In the crafting of the *Collaboration Patterns*, four people were responsible for the Pattern Illustrations, but this did not work well. With a larger number of people, the roles eventually divided into one person being the main illustrator while the other three contributed ideas. From this experience, our subsequent approach evolved to have one main illustrator working with either one other person of nearly equal involvement for pair illustrating or a few supporting members.

Based on our experiences, we wrote and presented first paper on Pattern Illustrating (Harasawa, Arao, and Iba, 2012).



Fig. 74. Scenes of Pattern Illustrating for the Presentation Patterns.

In 2012, I was invited to serve as an instructor for a training session on creating pattern languages at Dai Nippon Printing (DNP), a Japanese company (Figure 75). Sumio Iwanami, who planned this training, learned about our pattern languages at the Open Research Forum (ORF) in 2011, and he described his thoughts at that time as follows (Iwanami, 2015):

Pattern languages were very unique, and I was convinced that they could be 'absolutely useful' and 'create something.' It was truly an inspiration. At that time, the Iba lab had created '*Learning Patterns*,' '*Presentation Patterns*,' and '*Collaboration Patterns*,' which I was allowed to take back with me. They were met with great excitement within the company, with everyone saying, 'This is it!' We then started thinking about how we could utilize pattern languages in our company (Iwanami, 2015).

My role is in human resource development, so I have always emphasized how to 'teach' within the organization. We needed training content and teaching methods. Although it is common for superiors to teach their juniors, I thought there might be different ways of teaching and learning. Since I encountered pattern languages at that timing, I rushed to Professor Iba, and the introduction of pattern languages at DNP began (Iwanami, 2015).

When we interviewed a few new employees, we found that despite their anxieties, they had a particularly strong sense of unease about interacting with 'customers,' whom they had never dealt with before. Based on this, we decided to create a pattern language on the theme of 'creating lively relationships with customers' during the training (Iwanami, 2015).

Thus, we conducted a total of 11 training sessions, each lasting about 3 hours, over a period of about 4 months. In the first year, we created '*Live Relation Patterns*' for creating lively relationships with customers. We also held

a Dialogue Workshop using the patterns we had created. Regarding the results, Mr. Iwanami shared the following:

Creating 'Live Relation Patterns' and conducting 'Dialogue Workshops' have become a mechanism for intentionally carrying out on-the-job training. Since the 'context,' 'problems,' and 'solutions' that form the basis of building relationships with customers are patterned, senior employees can use them as triggers to dig up their own experiences and pass them on to their juniors. New employees have told us that by hearing their seniors' actual experiences in an organized manner, 'customers, whom they had never interacted with before, feel more familiar to them.' Even without experience, they can gain wisdom from the stories. Moreover, they can connect their seniors' ways of interacting with customers to their own past experiences of human relationships, which lowers the hurdles they try to overcome. The fact that this led to deep insights about customers not only for new employees but also for both parties was an effect beyond our expectations (Iwanami, 2015).

The company's training department subsequently conducted similar pattern language creation training sessions for several years. Based on our experiences during this time, Mr. Sumio Iwanami and others from DNP and I launched the Pattern Language 3.0 Study Group for business professionals two years later. In addition, for me, the instructor's fee from this experience later became the funding to start a pattern language company.



Fig. 75. Scenes of the training session at DNP where new employees interviewed mid-level senior employees and craft a pattern language for customer relations.

(3) Ways of Expressing and Utilizing in 2011-2012: Exploring Visual Representations of Patterns, Dialogue Workshops in Various Communities, Patterns on a TV Program

In the *Generative Beauty Patterns*, we used photographs instead of Pattern Illustrations for the visual representation (Figure 76). We felt that the simple Manabu-kun character did not suit the theme of women living vibrantly and beautifully. Moreover, since we conducted the Mining Dialogue while examining various attractive and beautiful photographs, it was natural for us to arrive at the idea of using colorful photographs, as they were more appealing and exciting.

Incorporating photographs to convey the lively texture of the patterns was something Alexander had done in his architectural pattern language. In that sense, we can say that we were following in his footsteps. While this is fundamentally true, if there was a difference, it would be that we used color photographs in the *Generative Beauty Patterns*. When the photographs are in color, having the rest of the page in black and white feels incongruous. This led us to realize that the entire pattern page should be presented in color. Ultimately, we defined colors for each group of patterns and incorporated those colors into the page design and overall expression.

All the photographs used were taken by members of the Iba Lab, and most of the people featured in the photographs were also members of this project. We took great care to ensure that there was no infringement of design rights for the objects photographed. When we distributed this booklet at our faculty's Open Research Forum (ORF), a research presentation event for the general public, it was immensely popular and very well-received.



Fig. 76. Page design of the booklet of the Generative Beauty Patterns.

One of the major events during this period, in terms of how pattern languages were utilized, was the introduction of Dialogue Workshops using the *Learning Patterns* as a program for our faculty's new students (Figure 77). All of the approximately 900 incoming students each year began participating in Dialogue Workshops that utilized our *Learning Patterns*. This eventually became a regular event that continued for nine years.

The Dialogue Workshop for new students is conducted as follows: About two weeks after enrollment, during a required course for new students, the *Learning Patterns* booklet and a Preparation Sheet listing the pattern names are distributed, and the homework for the following week is explained. The homework involves reading the booklet and reflecting on whether they have experienced each pattern in their lives so far. If they can think of a specific instance when they did something related to a pattern, they circle the pattern name on the sheet. After checking their experience with all 40 patterns, they select five patterns from among those they have not circled (i.e., patterns they think they have not experienced) that they would like to try in the future, and they mark those patterns with a star. This is the preparatory homework for the Dialogue Workshop.



Fig. 77. Dialogue Workshop with using the Learning Patterns for all freshmen at Keio University.

The following week, students bring the *Learning Patterns* booklet and their Preparation Sheet to class (Figure 78). During the Dialogue Workshop, they seek out people who have experienced the patterns they marked with a star (i.e., patterns they think they have not experienced), listen to their experiences, and take notes. Since they are all new students and don't know each other, they randomly approach people, introduce themselves briefly, and ask if the person has experienced any of the patterns they marked with a star. If the person has experienced one of those patterns, they ask them to share their experience. Conversely, if the other person has starred a pattern that they have experienced, they share their own experience. Once they have finished talking, they part ways and start a conversation with someone else. They continue this process for an hour, talking to as many people as possible and collecting experiences.



Fig. 78. The Preparation Sheet for Dialogue Workshop.

As part of the day's homework, they are also required to write about the conversations they had during the Dialogue Workshop. This means that the dialogue is not just about listening to experiences but also involves taking notes on the key points of those experiences on the sheet. This Dialogue Workshop is incredibly engaging, even for people meeting for the first time. This is because when they find someone who has experienced a pattern they want to try, and they hear about that experience, they become excited and say, "That's amazing!" Sharing

one's experience with an enthusiastic listener who reacts in this way is a fun and rewarding experience, and the atmosphere quickly warms up and continues in this manner. Since people have experienced different patterns, it's not a one-sided conversation; they share their experiences with each other, and exclamations of "That's amazing!" "I see!" and "I want to try that too!" fly back and forth.

I conducted surveys of the participants for a few years, and what I found was that a certain proportion of students wrote things like, "I'm shy, so I find it difficult to have to talk to people I don't know, and this workshop seems challenging for me," or "I'm shy, so I didn't really want to participate in this workshop where I have to talk to other people." However, many of these students also reported that they were surprised to find themselves quickly initiating conversations with others. The workshop is well-designed to ensure that conversations flow smoothly and become lively.

The homework assigned after this Dialogue Workshop involves creating a plan for how they will implement the patterns they starred as ones they want to try in the future, based on what they learned from other students during the workshop. They identify the activities and situations in which they will apply these patterns during the semester. In this way, they expand their vision of their own future practices based on the specific examples they heard from practitioners during the Dialogue Workshop and the feelings they experienced at that time. This is the Dialogue Workshop using the *Learning Patterns* that we have been conducting for new students in our faculty.

Building on the success of the Dialogue Workshop for students, I expanded the program to include workshops for adults in 2011. The first attempt was with a group of elementary to high school teachers, which was organized by a colleague of mine at the university (Figure 79). I was confident that the Dialogue Workshop would be successful and engaging for participants other than students, and it turned out to be true. Based on this experience, we then went on to conduct workshops at international conferences such as COINs 2011 (Figure 80; Iba, Shimomukai, *et al.*, 2011), AsianPLoP 2011 (Iba, Shimomukai, and Sakamoto, 2011), PLoP 2012 (Figure 81; Iba, Shimomukai, *et al.*, 2012), and the SFC Open Research Forum (ORF) (Iba, Kumasaka, *et al.*, 2011).

What we are doing in the Dialogue Workshops is not learning from the content of the patterns by reading them, but rather learning from the experiences of others through the use of patterns (Figure 82). In this process, the pattern language functions as a medium for peer learning. During this period, we compiled our methods for Dialogue Workshop, into pattern languages and submitted the papers to the EuroPLoP conference (Iba, 2012b) and gave a talk about dialogue with using a pattern language (Iba, 2011d).

During this period, we worked on developing a web system that utilizes patterns, the *Generative Beauty Patterns*. The first was a diagnosis system that helps users understand their current practices using patterns and suggests patterns to incorporate from those they are not currently practicing. This system was inspired by the concept of 'diagnosis and repair' discussed in Alexander's *The Oregon Experiment*, and it aimed to encourage overall improvement. This system was actually operated and utilized at the exhibition booth of ORF 2012 (Figure 83; Generative Beauty Project, 2012a). Later, the concept of diagnosis system was also applied to the *Learning Patterns* (Isaku, Yamazaki, and Iba, 2013).



Fig. 79. Dialogue Workshop with using the Learning Patterns for teachers.



Fig. 80. Dialogue Workshop with using the Learning Patterns at COINs 2011 conferences.



Fig. 81. Dialogue Workshop with using the *Learning Patterns* at PLoP 2012 conferences.



Fig. 82. "Communication vocabulary" function of a pattern language, which can be used for peer learning.



Fig. 83. Exhibition booth for the Generative Beauty Patterns and its diagnosis system (Generative Beauty Project, 2012a).

Furthermore, in 2011, I conducted an interactive workshop that mixed patterns from *Learning Patterns* and *Presentation Patterns* (Iba, 2011e). This workshop was held in response to a request to give a lecture and workshop for Japanese students who were planning to study abroad. To support their learning for studying

abroad and to help them shift of communication style from Japanese to foreign countries, I selected important patterns from the two pattern languages and used them in the Dialogue Workshop. Both pattern languages were written in the same style and the Pattern Illustrations of the same character, Manabu-kun, so there was no sense of incongruity when mixing them. This became my own pioneering practice of what would later be called "Pattern Language Remix" (Schuler, 2014; Grundschober, Ghoneim, *et al.*, 2017), a method that we also adopted, even before the term was coined.

Other notable events during this period include my introduction of the *Presentation Patterns* on an educational television program called "Super Presentation," broadcasted by NHK, the national public broadcaster in Japan (Figure 84). One day, I received an offer from a major television network to become a regular presenter on a program about presentations, where I would use the *Presentation Patterns* to provide explanations. The program featured and introduced TED talks, and I used the *Presentation Patterns* to analyze the effectiveness of the selected talks. My role was to bridge the gap and enable viewers to learn from the talks and apply the lessons to their own practices.



Fig. 84. Scenes from the recording of a TV program.

Following this television program, I developed and conducted a new workshop that uses pattern languages as "Glasses of Recognition" (Figure 85). In this analysis workshop, after watching a short TED talk video, participants use the *Presentation Patterns* to discuss in groups which patterns can be found within the talk (Figure 86). This workshop has been conducted in schools and other settings. Before this "Analysis Workshop," a Dialogue Workshop is first conducted using the same patterns, so that participants can learn about cases of people practicing the patterns they have experienced at a higher level. This is designed to help participants feel a sense of continuity rather than a disconnection between themselves and amazing people.

In this Analysis Workshop, I often use Derek Sivers's TED Talk "How to start a movement." This talk is an excellent material for analysis because it compactly contains many patterns of the *Presentation Patterns* within a short duration of just under 3 minutes. First, participants listen to the content while enjoying it. After listening once, during the second and third playbacks, they glance at the video while discussing which of the Pattern Cards spread out on the table can be found and rearrange them near the "practicing" work cards. In this way, the workshop involves practicing interpreting the talk using the patterns.



Fig. 85. "Glasses of recognition" function of a pattern language.



Fig. 86. Scenes of the Analysis Workshop with using the Presentation Patterns.

(4) Pattern Communities in 2011-2012: Invited to Talk Amidst a Crisis of Near Paper Withdrawal and Potential Abandonment of Further Research

Looking at it this way, it might seem like both my research and practice were in top form during this period. However, in reality, a significant event occurred in 2012 that could have caused the pattern language for practices to fizzle out. Next, I'd like to talk about that incident.

In 2012, we submitted a paper on *Generative Beauty Patterns* to PLoP 2012 conference, titled "Generative Beauty Patterns: A Pattern Language for Living Lively and Beautiful." However, we later received an email from the chair of the conference indicating some concerns. Within the organizing committee, there was debate over whether the content of the paper was appropriate for the Pattern Language of Programs (PLoP) conference. Some even pointed out that the paper's content could potentially be offensive from a gender perspective. The committee wanted to understand our intentions behind the submission.

I could understand the concerns and criticism raised. This pattern language about daily living is not directly related to software programming. Additionally, the focus on "women" could raise concerns from a feminist perspective. In response, I acknowledged that while *Generative Beauty Patterns* might not fully align with the original scope envisaged for PLoP, the conference had already started to expand its scope by including patterns on *Fearless Change* and education. Writers' Workshops under the "people" banner were also being conducted. This suggests that the conference's scope is broadening to include "designing our daily life," potentially encompassing topics like clothing, food, and shelter. In my reply, I wrote the following:

Alexander and his colleagues wrote the patterns about "houses," we wrote the patterns about "clothes" (and makeup), and, I think, someone will write about "cooking" in the future.

At the time, I had no way of knowing that we would later craft our own pattern language for cooking (conducted and presented in collaborative research with a recipe website company). I continued my reply as follows:

I understand that some of committees might think that this language is not suitable to pattern language in the viewpoint of software pattens, but, in my understanding, being lively and generating beauty is the center theme of Christopher Alexander, so our patterns fit well to the method of pattern language (see *The Timeless Way of Buildings*, for the relations between pattern language and being lively, and also S. Grabow's book for the idea of generating beauty).

Note that the books I mentioned here is Alexander (1979) and Grabow (1983), which shows Alexander's thought an struggles on beauty.

Furthermore, I stated, "While I understand that PLoP is not a conference for pattern languages in general, it is also true that there are no other conferences related to pattern language in the world. Given this context, we felt that submitting our paper to PLoP was the appropriate course of action." In response to the concern that our pattern language could be "offensive to some cultures," I replied as follows:

It was difficult for us to imagine that our patterns are offensive for some cultures. The concept of our project is the patterns for designing lively life 'of the women, by the women, for the women'.

Indeed, the crafting of *Generative Beauty Patterns* was motivated by the desire of our female students to provide supportive structures for themselves, and people like them. As a male, my role was to support these activities, encouraging the team's efforts. The project originated from a cosmetics company that wanted to provide support through an approach different than makeup. Given that context, the focus on women was somewhat natural—especially since, at that time, cosmetics were primarily targeted at women.

However, I do understand the concerns raised by some members of the organizing committee. "If it's problematic to focus only on women, we can modify the pattern language to be gender-inclusive, as most of the patterns can be applicable to men as well," I offered as a concession.

In closing, I wrote, "If the consensus is that this paper is not suitable for PLoP, then I believe it would be appropriate to withdraw it." I did not want to write this last sentence; causing disruption or inconvenience to the conference was not my intent. The conference chair had reached out personally, and I didn't want to make things difficult for him either. Yet, the team that had worked with me on crafting the pattern language had invested a significant amount of time over a year. They had simultaneously written an academic paper in English and made great strides. It was I who had invited them to contribute, telling them, "PLoP is a great conference. Let's write a paper and go together!" If we had to withdraw the paper, it would be a disservice to their hard work, and the guilt would be immense. It was with such torn feelings that I sent this email.

After some back-and-forth, something astonishing happened. I was invited to give a talk at PLoP 2012 conference! Invited Talk!!!

When one thinks of invited talks at PLoP, the names that come to mind are luminary figures like Ralph Johnson, Richard Gabriel, and Linda Rising. While I had delivered invited talks in Japan in Japanese, I had never had the experience of delivering one at an international conference in English. It felt like a monumental moment for me. However, this talk provided an invaluable opportunity to articulate and share what we have been working on. I enthusiastically accepted the invitation.

As a result, I was set to deliver an invited talk with the title "Pattern Language 3.0: Making Pattern Languages for Human Actions" (Iba, 2012c) at PLoP 2012 conference, held in Tucson, Arizona, and collocated with the SPLASH 2012 conference. What follows is the abstract of that invited talk.

The original idea of pattern languages for writing out the design knowledge was proposed by an architect Christopher Alexander. His intention was to have people get involved in the process of designing their own houses and community where they live in. Ten years later, the idea of pattern languages was adopted in the field of software design. And, recently, the fields where pattern languages are applied are expanding little by little.

With these events in the background, I have been writing pattern languages in a whole new area of knowledge: human actions, like learning, presentation, collaboration, education, business, social innovation, policymaking, and even beauty in daily life. Through these experiences, I have faced such a fundamental question as "what are pattern languages?" Such thoughts allowed me the opportunity to organize and refine my views on pattern languages.

Human actions appear to be much different from architecture and software, however they need to be designed with tacit design knowledge, which consists mainly of context, problem, and solution. In that sense, without losing the essence of design knowledge, pattern languages have gone through, and are still experiencing, a tremendous evolution. In this talk, I will present a new framework for pattern languages based on these thoughts and show our examples of patterns and applications (Iba, 2012c).

Thus, at PLoP 2012, I was given the opportunity to deliver an invited talk (Figure 87). It allowed me to introduce our pattern language for everyday practices not only to the usual participants in the Education and People groups, with whom I regularly participate in Writers' Workshops, but also to attendees from more software-oriented backgrounds. During this invited talk, I presented a comprehensive overview of the evolution of pattern languages and pattern languages of practices (human actions) as a new genre. As I will mention later in this section, I labeled architectural pattern languages as "Pattern Language 1.0," software patterns as "2.0," and patterns for daily practices as "3.0" for explaining the progression.



Fig. 87. Invited talk I provided at PLoP 2012.

In addition, I highlighted the unique characteristics of each type of pattern language, explicitly demonstrating how patterns for everyday practices differ from those in the realm of software. For instance, we often hear comments like "You should include more details" or "Add examples" during Shepherding and Writers' Workshops. However, our descriptions are deliberately simplified because the intended audience is the general public, not just experts. Moreover, we aim for intuitive understanding, employing metaphors instead of technical explanations. As a result, I showed that our patterns are considerably shorter in length compared to those in architecture or software: The **Adventure Playground** pattern in Alexander's *A Pattern Language* comprises 670 words, including 2 photos and 1 sketch, and **Abstract Factory** from *Design Patterns* consists of 2,159 words, accompanied by 2 diagrams and 83 lines of code; In contrast, the word count for **Jump In** from *Learning Patterns* is a mere 182 words with an illustration.

Furthermore, I talked about our emphasis on orality (Figure 88). Instead of detailing examples in written form, we believe that they can be better understood through dialogue in workshops. This approach to examples is integrated into our pattern development process, and I introduced this during my talk. I also provided an overview of the methodology and processes we use for crafting pattern languages, generating interest among the attendees.



Fig. 88. Slide on orality for invited talk at PLoP 2012.

Thanks to this invited talk, the position of our Pattern Languages of Practices was clarified within the PLoP community. Giving this talk also empowered us to confidently engage in crafting pattern languages aimed at improving lives and potentially saving the world. For this opportunity, I am deeply grateful to Richard Gabriel and Joe Yoder, who thought of inviting me to give a talk there.

Without this chance to present an invited talk at the conference, we might not have continued to submit our pattern papers to PLoP-related conferences and may have even ceased our work on pattern languages altogether. In that sense, this was a pivotal moment for us. I think that without it, not only would people who could have

been helped by the pattern languages we subsequently crafted have gone unaided, but others inspired by our methodology to craft their pattern languages might never have emerged. Socially and academically, the present would likely be a bit different.

As for what happened to the *Generative Beauty Patterns* paper, Jenny Quillien was invited from outside the software-focused community to shepherd the paper. She had participated on the editing of Christopher Alexander's magnum opus from his later years, *The Nature of Order* (Alexander, 2002a, 2002b, 2004, 2005), and thus understood the deeper aspects of our paper and offered valuable advice for improvement (such as pointing out that superficial elements from the younger generation were included in the patterns). It subsequently went through the Writers' Workshop process.

In this talk, not only did I explicitly position pattern languages of practices as a new genre, but I also made a declaration, almost a prophecy, about the direction we would take in the future. At the end of the talk, I stated, "Pattern Languages Potentially Save the World" and "Pattern Languages are Hopes for the Future" (Figure 89).

Indeed, over the next decade, we would go on to address social issues such as earthquake disaster prevention and emergency actions, living well with dementia, overcoming mental difficulties, elderly care, and the independence of youth in impoverished areas, as we will show below. At this point, we could only foresee crafting the first one, a pattern language for disaster prevention. However, for us, considering the potential power of pattern languages of practices, the ideas of "Pattern Languages Potentially Save the World" and "Pattern Languages are Hopes for the Future" felt like a natural direction to pursue.

Thus, the situation took a drastic turn from the potential withdrawal of our paper and the possible end of our pattern language of practices research. Instead, we conveyed our ideas firmly to other members of the pattern community and declared our direction of addressing social issues. This event marked a turning point in our research in 2012, ten years after I first wrote the *Model Patterns* and three years after crafting the *Learning Patterns*. In the following decade, our research accelerated further, leading to a future we couldn't have imagined at the time, something we were still unaware of in that moment.



Fig. 89. Slides of the last part of my talk at PLoP 2012 (Photos of the right slide: Courtesy of Masaru "JUMBO" Kadotani).

In 2012, at the PLoP conference held in Tucson, Arizona, I had the opportunity to interview Richard Gabriel and Jenny Quillien and capture their conversations on video. The quote from Richard about Writers' Workshops in this paper is from that interview.

In fact, it was from this point that I finally started to be able to communicate a little with Richard. He was a large man who spoke in a low voice, and I knew he was one of the key figures who had established PLoP. Sometimes he would say things that I couldn't understand (later, I realized that he was just making jokes with a straight face, but at the time, I found his conversations quite puzzling).

However, in connection with his Invited Talk, I realized that he had a good understanding of our research, and as I interviewed him, I gradually became able to talk with him more easily (Figure 90). Over time, I discovered that he was an interesting and charming person. From this point on, Richard would help me in various ways at conferences and provide me with a great deal of inspiration. But at the time, I had no idea that I would later invite him to Japan or have meals with him outside of conferences.



Fig. 90. Since the PLoP in Tucson, Arizona, I have also been able to talk a bit with Richard Gabriel.

During this period, Christian Köppe, who was creating and presenting Pedagogical Patterns, took a liking to our Learning Patterns. I heard that he had posted a poster of our *Learning Patterns'* **Talking Thinker** pattern in his university classroom. In 2012 and 2013, he also created and presented a pattern language from the students' perspective, not just the teachers' side, called *Learning Patterns for Group Assignments* (Köppe, 2012, 2013). Besides, Additionally, Christian Kohls began developing *The Magic 5 of Innovation*, which he sometimes also called *Patterns for Creative Thinking* or *Creativity Patterns*. He presented his initial paper on this subject at the PLoP conference in 2012 (Kohls, 2012b). Furthermore, Christian Kohls came up with a way to explain what patterns are using the metaphor of paths on a map. He also published papers on this topic from 2010 to 2012 (Kohls, 2011, 2012a). This research was characteristic of his creative and innovative approach.

Throughout this time I served as the Publication Co-Chair for AsianPLoP 2011, on the Program Committee for PLoP 2012, and on the Steering Committee for COINs 2011 and COINs 2012. In 2012, I participated in EuroPLoP, which is held in Europe, for the first time. In 2011, a student I supervised wrote a master's thesis on pattern languages for the first time. In 2012, *The Battle for the Life and Beauty of the Earth* (Alexander, Neis, and Alexander, 2012) was published. Also, Joe (Bergin) and co-authors' book *Pedagogical Patterns* (Pedagogical Patterns Editorial Board, 2012) was published.

(5) Theories and Philosophies in 2011-2012: Proposing a New Genre, Pattern Languages for Human Actions, which is Called Pattern Language 3.0

In my talks at conferences and articles in academic journals, I started saying that what we were crafting was "a pattern language for human actions," succeeding pattern languages in architecture and software, which could be called "Pattern Language 3.0" (Figure 91, 92; Iba, 2011b, 2011c). This phrasing was inspired by the term "Web 2.0," and we drew an overall map of the evolution of pattern languages from 1.0 in architecture, 2.0 in software, and 3.0 in human actions, and explained it.

Note that I currently use the term "Pattern Language of Practices" and the word "practice," but for a while from this period, I used the term "Human Actions." This was because, in contrast to the design of physical objects like architecture and the design of non-physical objects like software, what we were creating was the design of the actions of the people using the pattern language themselves, which was a significantly different type, so I included the word "human" to emphasize "human actions." When I named the term "human action," I had in mind the title of the book, *Human Action: A Treatise on Economics* (Mises, 1949), by Ludwig von Mises, the Austrian school economist (When thinking about what to call it, recalling the title of this book, which is not directly related, would feel natural if one remembers that I studied complexity economics and evolutionary economics, which are closely related to the Austrian School, during my graduate school years).

Previously, we struggled to position our work outside of specific academic categories, often relying on comparisons to architecture and software while emphasizing 'human' actions. Now, I prefer using terms that are more accessible to the general public across various academic fields. With our accumulated examples now able to stand on their own, I've shifted to using the more general term 'practice' instead of 'human action,' which was initially emphasized to draw comparisons with architecture and software.

After that, for a while, I used to refer to the progression of pattern languages as Pattern Language 1.0, 2.0, and 3.0. However, I have abandoned this terminology after receiving feedback from architects who engaged on pattern languages. They pointed out that this phrasing might suggest an obsolescence of earlier versions, implying that they have been overwritten or updated. Indeed, it unintentionally turned out that way. In addition, while the terminology might have been actually useful in 2012 to highlight the novelty of the next iteration, it is no longer necessary today. Given the substantial growth in the types and examples of practice-based pattern languages, they have gained a strong presence, eliminating the need for such emphasized distinctions. Therefore,

I believe it is now appropriate to simply refer to them as "pattern languages of practices" without additional qualifiers.

The events of this period are summarized in the timeline shown in Figures 93 and 94.



Fig. 92. Differences among three types of pattern language (Iba, 2012c).



Fig.93. Timeline of our pattern language research in 2011, in the third period of the STARTUP PHASE.



Fig. 94. Timeline of our pattern language research in 2012, in the third period of the STARTUP PHASE.

7. EXPANSION PHASE [2013-2019]

The EXPANSION PHASE from 2013 to 2019 can be divided into three periods: Crafting Pattern Languages of Practices in Everyday Life, which Address Social Issues [2013-2014], Pioneering the Implementation of Everyday Use Pattern Languages, and Developing a Methodological Pattern Language for Crafting a Pattern Language in Our Way [2015-2016], and Expanding Pattern Languages of Practices to Various New Everyday Activities and Sharing Our Methodology with People Globally [2017-2019]. In the following sections, we will examine each period in detail.

7.1 Crafting Pattern Languages of Practices in Everyday Life, which Address Social Issues [2013-2014]

The initial third of the EXPANSION PHASE, spanning the years 2013-2014, was a period when we ventured into uncharted territories in our research and significantly expanded our frontiers of exploration. (1) First, as an

application of pattern language to new domains, we engaged in crafting pattern languages of practices in everyday life, which addressed social issues such as disaster prevention and elderly welfare. (2) In terms of the methodology of crafting, driven by the practical necessities of each research project, we conceived and began to practice mining interviews, Mining Workshops, and Pattern Writing Sheets. (3) As for ways of expressing and utilizing, we focused on developing Pattern Cards, experience charts, and systems for utilizing a pattern language. (4) During this period, within the pattern communities, we increasingly felt that our style of pattern language was gradually gaining recognition. (5) In the realm of theories and philosophies, we started discussing the meaning and significant role of pattern language in the emerging creative society through papers and talks. Let us now reflect on the activities and events of this period for each of these explorations in more detail.

Before delving into those stories, I would like to first note something very important happening during this period in my pattern language research and activities. It is that I launched a company to help implement pattern languages in society. With the aim of shifting people and organizations in a creative direction, I named the company "CreativeShift" (initially, the company was named "Institute for Creative Society Research," but I changed it shortly after).

Later on, this company would go on to sell various Pattern Cards, collaboratively develop pattern languages with different companies, and provide consulting services for people who wanted to craft pattern languages. We also set up an office space where we held small seminars and workshops as well as activities for crafting pattern languages. From then on, my research and activities would progress with the Iba Lab and CreativeShift, Inc. as the two driving forces.

(1) Application to New Domains in 2013-2014: Pattern Languages of Practices in Everyday Life, which Address Social Issues such as Disaster Prevention and Elderly Welfare

After the Invited Talk at PLoP 2012, we worked on two pattern languages: *Survival Language*, a pattern language for surviving a major earthquake, and *Words for a Journey*, a pattern language for living well with dementia. These pattern languages were related to social issues, and *Words for a Journey* was the world's first pattern language in the welfare domain.

Although I worked hard to craft these pattern languages, the idea for them did not actually come from me. Someone else approached me and asked if we could craft something like this. I just responded to their request. This marked the beginning of crafting pattern languages that tackle social issues, which is not something that would typically be conceived. Let's first look at the *Survival Language*.

The idea for a pattern language for disaster prevention was born and the request was made in October 2012, just before the PLoP 2012 conference. My university colleague and the dean, Prof. Jun Murai, after seeing my work on *Generative Beauty Patterns* at the classroom for a Dialogue Workshop for first-year students, asked,

Couldn't this be adapted for disaster prevention?

I was intrigued that he could link a booklet of lavish photos to disaster management, but his point was spoton. In 2011, Japan experienced the Great East Japan Earthquake, resulting in a large number of casualties. Prof. Murai, the "father of the Internet" in Japan, later became the leader of Japan's disaster information system within the government and believed that "even with a system in place, it's ineffective unless people take the right actions." He suggested that pattern language could be an effective way to internally guide people in taking appropriate actions. I responded,

Preparing for disasters and emergency responses require situational judgment, which is a design issue. Therefore, it's appropriate to support this with pattern languages. We will do it.

Thus, the next year, I collaborated with Satoko Oki, a seismologist who joined our department, to craft the *Survival Language* (Furukawazono, Seshimo, *et al.*, 2013a, 2013b; Iba Lab, 2013b; Furukawazono, Motoi, *et al.*, 2014; Furukawazono, Iba, and Survival Language Project, 2015; CreativeShift, 2015b).

Survival Language, a pattern language for surviving earthquakes, consists of 21 patterns classified into three categories: Designing Preparation, Designing Emergency Action, and Designing Life After Quake (Figure 95). Daily preparations need to be seamlessly integrated into everyday life. For example, the **Extrastock** pattern recommends, "Buy food with longer expiration dates such as canned and retort food" (Furukawazono and Iba, 2015). Building on this, the **Daily Use of Reserves** pattern addresses the problem that "stock food and water

you have prepared for emergency can expire before an emergency actually arises" and suggests the following solution:

Use **Extrastock** just as you use normal supplies. If you buy what you want or what you like, it is easy to consume it appropriately and still maintain your emergency supplies. For example, if you have three cases of water on hand and consume one case, you still have two cases left. The next time you go shopping, buy just one case of water so you will always have at least two cases of water available at any time (Furukawazono, Iba, and Survival Language Project, 2015).

They are patterns for preparing earthquakes, but there are also patterns for emergency actions when an earthquake occurs. I considered emergency actions to be a design issue for appropriate behaviors based on situational judgment. Moreover, since it is a matter of design and practice, we believed that a pattern language could provide suitable support. However, unlike regular patterns, these patterns needed to be easily recalled and quickly put into action during emergencies. Therefore, we thought that pattern names and Pattern Illustrations were crucial.

A symbolic example is the **Life Over Furniture** pattern (Figure 96). This pattern advises that when an earthquake occurs, even if dishes or books are about to fall from shaking shelves or bookcases, one should move away from them instead of trying to hold them steady. People tend to instinctively think, "Oh, the wine glass is going to break," and rush to hold the shaking shelf. While this is not a problem in everyday situations, during a major earthquake, shelves can sway significantly and potentially topple over. In such cases, there is a risk of being trapped under the fallen shelf. In fact, during the Great Hanshin-Awaji Earthquake in 1995, many people lost their lives in this manner.

Therefore, this pattern emphasizes that life is more important than furniture, and one should move away from it at all costs, which is reflected in the pattern name and Pattern Illustration. This pattern is one that we strongly hope will be widely practiced by everyone, from children to the elderly. This pattern language can be considered one of the most serious and life-threatening themes among the pattern languages created up to that point. The *Survival Language* was presented as a paper at conferences, such as COINs (Furukawazono, Seshimo, *et al.*, 2013a), PLoP (Furukawazono, Seshimo, *et al.*, 2013b), AsianPLoP (Furukawazono, Motoi, *et al.*, 2014), and was also published as an on-demand book (Furukawazono, Iba, and Survival Language Project, 2015) and Pattern Cards (CreativeShift, 2015b).



Fig. 95. Overall system of the Survival Language.



Fig. 96. Life over Furniture pattern from the Survival Language (Furukawazono, Iba, and Survival Language Project, 2015).

Another pattern language we crafted related to social issues during this period was a pattern language for living well with dementia. This pattern language summarized the practices that those with dementia, their families, and the surrounding community can implement to realize a good quality of life while living with dementia. I believe this is the world's first pattern language in the welfare sector.

Like the previous pattern language for surviving earthquakes, this pattern language was not my own idea. I am always interested in creative activities that involve making something, so when I come up with ideas myself, they tend to relate to such themes. In contrast, pattern languages related to social issues are usually brought to me by people involved in those problems, and we craft them through collaborative research (Okada, Igarashi, *et al.*, 2016). People who are concerned about an issue encounter pattern languages as a means to solve problems in their field and then reach out to me. This was also the case with *Words for a Journey*, a pattern language for living well with dementia (Iba and Okada, *et al.*, 2015a, 2015b, 2015c; Iba, Kaneko, *et al.*, 2015; CreativeShift, 2015a; Iba, Matsumoto, *et al.*, 2016; Iba, Okada, and Kaneko, 2017).

In early 2014, I conducted a workshop lecture aimed at Japanese businessmen, introducing them to pattern languages and giving them a slight taste of Pattern Mining and Writing. The lecture workshop was titled "Pattern Language Open Seminar: Pattern Language 3.0 for Business Creation" (Iba, 2014a). After the lecture, one of the participants, Makoto Okada, who would later become my co-author of *Words for a Journey*, approached me for a business card exchange. Makoto, who was working at Fujitsu Laboratories at the time, asked,

Are there any pattern languages for the welfare sector?

I responded, "I've never heard of that. I guess no one in the world has created that yet." Then he continued: "Right now, various companies and NPOs are coming together to think about how we can support the lives of people with dementia. Do you think pattern languages could also help people with dementia and their families live more positively?" I thought for a moment and then answered:

Since no one has crafted a pattern language for the welfare sector, it's hard to say for sure. However, in principle, I believe it can be done. Manuals can't cover situations that require design adjustments, but pattern languages are well-suited for that. Knowledge about what to do in certain situations could certainly serve as good support for people with dementia and their families in crafting their lives. Please go ahead and try it and let me know how it goes. This exchange marked a potentially groundbreaking idea. Pattern languages, with their inherent flexibility and adaptability, could serve as crucial tools for solving complex social issues, such as improving the lives of people with dementia and their families. As pattern languages have been primarily associated with fields like architecture and software design, expanding their use to welfare and social issues may well be an innovative step toward more holistic problem-solving approaches.

Thus, the conversation at hand concluded. After exchanging pleasantries and business cards with Okada-san, whom I had just met, I moved on to engage in conversation with another person. A week later, I received an email from Okada-san. He mentioned that he and another collaborator, who happened to be an acquaintance of mine, had discussed the idea of articulating "living better even with dementia" through pattern language, and wanted to meet to explore the idea further. After listening to his insights about the societal context of dementia in Japan, I decided to join the effort despite my initial reservations.

Could you please craft it with us?

I had no prior knowledge about dementia and my daily life was already quite hectic. I was fully aware that constructing a comprehensive pattern language consisting of dozens of patterns would be an enormous undertaking. Nevertheless, Okada-san explained the gravity of the dementia situation in Japan, where, including mild cognitive impairment, it is estimated that over 8 million people aged 65 and above are affected—roughly one in four seniors or one in 15 of the total population. This wasn't an abstract issue happening in some distant place; it was occurring right in the communities we inhabit.

Many people diagnosed with dementia continue to live at home with their families, often in a state of anxiety and fear. However, it is also true that some continue to live positive, cheerful lives post-diagnosis. The aim was to study these outliers, understand their thought processes and lifestyle choices, and encapsulate these into a pattern language to help many others. After hearing all this, I felt compelled to contribute, and so I agreed to collaborate on crafting a pattern language for living well with dementia.

This would likely be the first pattern language in the realm of social welfare. It may very well throw a significant stone into the pond of pattern language research, broadening its applicability. Another challenge that occurred to me was to design the pattern language to address the needs and perspectives of different stakeholders involved—namely, those with dementia, their family, and the broader community members.

Usually, pattern languages assume that the same reader will apply all the patterns, each categorized in a system of dozens. However, in this particular pattern language for living well with dementia, I thought of incorporating patterns directed at different stakeholders within the same system of language. This is because "living well with dementia" cannot be realized solely by the efforts of the individual, their family, or the community; rather, it would require the synergy of all these elements.

If this is the case, it would be crucial for family members to understand the practices of those with dementia, and for the community to recognize the efforts made by families. Pattern languages serve to articulate problems and recommended practices, thereby generating a shared language and mutual understanding. In light of this, I posited that it would be beneficial for this pattern language to integrate various practice patterns aimed at multiple stakeholders into a single, cohesive framework. Consequently, the pattern language for living better with dementia, titled *Words for a Journey*, was developed as a tripartite system, segmented into sections targeting those living with dementia, their caring families, and everyone around them (Figure 97).

In *Words for a Journey*, at the end of each pattern, three related patterns are presented. While some of these related patterns fall under the same category, others belong to different categories. When visualizing the interconnections between these patterns, a complex network emerges (Figure 98). This holistic view is not included in the book, as it's not particularly essential for the general reader. Observing such a complex diagram might lead one to believe that the practice of these patterns is challenging. What readers need to understand is how a particular pattern relates to others, not the complexity of the entire network. I believe the brilliance of the pattern language lies in the fact that, without being consciously aware of this intricacy, one can practice the patterns and achieve this intricate synergy.

Subsequently, in the fall of 2014, we simultaneously released the Japanese and English versions and showcased them at various events, towards a follow-up meeting for the G8. *Words for a Journey* and our project were featured and introduced in several newspaper articles. This led to numerous inquiries from individuals across Japan expressing a desire to obtain the booklet. We shared this situation with the publisher, and it was decided that the book could be published with the same layout, illustrations, and cover design as the original

booklet (Iba and Okada, 2015a, 2015b). The English-language version of the on-demand book has been featured in British newspapers, leading to it being read more widely than expected in the UK and EU (Mccann, 2016).



Fig. 97. Tripartite structure in Words for a Journey patterns (Iba and Okada, et al, 2015b).



Fig. 98. Related patterns network hidden in the pattern language, Words for a Journey (Iba, Matsumoto, et al., 2016).

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Furthermore, especially in 2013, the student members of the Iba Lab created various pattern languages in diverse fields based on what they wanted to make. These included *Personal Culture Patterns* aimed to help users cultivate their unique identity (Iba Lab, 2013; Nakada, Kamada, and Iba, 2013), "good old future" attempted to capture the cultural qualities of Japan in pattern form (Iba Lab, 2013c; Kadotani, Ishibashi, et al., 2014), Global Life Patterns for designing each way of life in the global era (Matsuzuka, Isaku, et al., 2013; Iba Lab, 2013d), Omotenashi Patterns for Generating Comfortableness, Tsukkomi Patterns for delivering punchlines like Japanese comedy in communication, a pattern language for creating wedding parties, and a pattern language for designing T-shirts. As a wide variety of creations emerged all at once, I liken this period to the "Cambrian Explosion" in the history of biological evolution.

In 2014, after this, we began in earnest the crafting of pattern languages for cooking, which would eventually result in the development of several types of culinary pattern languages (Isaku and Iba, 2014; Iba Lab, 2014b). We also carried out projects to create further pattern languages in the field of education. We craft *Creative Education Patterns*, related to Creative Learning and 'generator' (Iba Lab, 2013f; Shibuya, Seshimo, *et al.*, 2013; Shibuya, Harashima, *et al.*, 2014; Harashima, Kubota, *et al.*, 2014a), and self-directed learning (Harashima, Kubota, *et al.*, 2014b). The last one, *Learning Patterns for Self-Directed Learning with Notebooks*, was crafted by elementary school students (12 years old) who reflected on their own experiences and developed their own pattern language with the support of the Iba Laboratory members (Figure 99). This is a valuable pioneering case, as it represents a genuine pattern language crafting by children.



Fig. 99. Scenes of crafting Learning Patterns for Self-Directed Learning with Notebooks (Harashima, Kubota, et al., 2014b).

In 2013, at the Open Research Forum (ORF) exhibition, we at the Iba Laboratory decided to showcase the diversity of the pattern languages we had crafted across various domains. The entire exhibition of this year's ORF was divided into five areas: "Trustworthy Information Society," "Healthy Aging Society," "International Strategy Design," "Social Innovation," and "Symbiosis with the Environment." Each laboratory had its exhibition booth arranged accordingly. However, the Iba Laboratory set up exhibition booths in all five areas and independently organized a stamp rally that guided visitors through each of them (Figure 100, 101). This allowed visitors to experience the diverse range of pattern languages being developed at the Iba Laboratory.

創造社会へのパスポート 井庭研スタンプラリー@ORF, 11/22・23/2013



フラ・通信・技術

·地域·教育



B:身体知・ヘルスケ ア・ライフサイエンス



D:社会・グローバル D:社会・グローバル ·地域·教育

E:デザイン・環境 デザイン

C:政策・文化・

ガヴァナンス

Fig. 100. At ORF 2013, to demonstrate the diverse range of applications for pattern languages, the Iba Laboratory set up booths in all the themed areas and organized a stamp rally that guided visitors through each of these booths.



Fig. 101. Iba Lab booths dispersed throughout the ORF 2013 venue.

Visitors who toured the Iba Laboratory booths, which were dispersed throughout the large venue, were given a "Creative Society Passport" to serve as a stamp rally log (Figure 102; Iba Lab, 2013a). This passport included spaces for the stamps and also served as a booklet containing information about the vision of a Creative Society, an explanation of pattern languages, an overview of the pattern languages being exhibited, and URLs to access more detailed information about them. The color of the passport cover was designed to resemble that of a Japanese passport.

For the stamp rally, we used Manabu-kun stamps that we had created ourselves using FAB (Figure 103). Visitors who completed the rally by visiting all the Iba Laboratory booths received an original pattern sticker featuring the pattern names and illustrations from our patterns as a prize (Figure 104).



Fig. 102. Creative Society Passport, featuring explanatory text and pages for collecting stamps.



Fig. 103. We made the stamps used for the stamp rally with using a laser cutter in the FAB space.



Fig. 104. Stickers printed with pattern names and Pattern Illustrations from Iba Lab's pattern languages.

Additionally, I also wrote *Mining Interview Patterns* (Iba and Yoder, 2014) and we crafted *Pattern Illustrating Patterns*, a pattern language for Pattern Illustrating (Harasawa, Miyazaki, *et al.*, 2014).

In addition, we published on-demand books in English for the previously crafted pattern languages, including *Learning Patterns, Presentation Patterns*, and *Collaboration Patterns* (Iba and Iba Lab, 2014a, 2014b, 2014c). I also rewrote the *Presentation Patterns* in simple language for elementary school students and serialized them in a children's newspaper (Iba, 2014g).

(2) Methodology of Crafting in 2013-2014: Conceiving and Beginning to Practice Mining Interviews, Mining Workshops, and Pattern Writing Sheets

During this period, a new approach was incorporated into our Pattern Mining methodology. I conducted one-onone Mining Interviews with practitioners for the creation of the *Policy Language* in 2010. However, during this period, various projects began to involve multiple team members conducting Mining Interviews together. In this context, I reflected on my experience, mined patterns on the way of conducting Mining Interviews, compiled them into a pattern language, *Mining Interview Patterns*. I initially wrote this pattern language in Japanese and used it in projects and lectures in Japan (Iba, 2014c). Then, it was translated into English and submitted as a paper to SugarLoafPLoP (Iba and Yoder, 2014). Furthermore, we also conducted a Pattern Mining Workshop at EuroPLoP (Kubota, Harashima, *et al.* 2014).

Mining Interviews became the primary method employed in crafting the pattern language for living well with dementia, *Words for a Journey*. As we are neither people with dementia nor their family members, we cannot uncover patterns solely from our own experiences. Consequently, it is reasonable to conduct Mining Interviews with those with dementia and their families while also combining this approach with mining from literature, such as memoirs written by people with dementia from both Japan and abroad. Thus, we conducted Mining Interviews with individuals suffering from dementia, their families, and those supporting them in family associations (Figure 105).



Fig. 105. Scenes of Mining Interview for Words for a Journey.

During this period, in line with the previous research on *Generative Beauty Patterns*, we developed and conducted workshops where participants shared what they cherished to live vibrant and beautiful lives, further uncovering patterns through these conversations. In these workshops, we designed methods for facilitating the discussions and added thoughtful touches, such as using attractive designs for the props used in the sessions. At the time, we held workshops in Japan, South Korea, and the United States.

In the United States, we organized a workshop at Mary Lynn's University of North Carolina Asheville, where students and faculty members participated (Figure 106; Iba and Iba Lab, 2014d). In addition, during that visit, we also conducted a Dialogue Workshop with using the *Learning Patterns* for new students (Figure 107; Iba and Iba Lab, 2014e).



Fig. 106. Generative Beauty Mining Workshop, at the University of North Carolina, Asheville.



Fig. 107. Dialogue Workshop with the Learning Patterns, at the University of North Carolina, Asheville.

In 2014, at the Open Research Forum (ORF), we tried several new things. First, in addition to having exhibits and sessions at the Roppongi venue for two days as usual, we held events related to pattern languages every day at various satellite venues throughout Tokyo as part of "Pattern Language Week" (Figure 108). This included a Generative Beauty Mining Workshop related to the *Generative Beauty Patterns*, a Self Travel Cafe using the *Personal Culture Patterns*, and a session on "Future Language," which I newly developed that year.



Fig. 108. Pattern language week in 2014.

Moreover, as an executive committee member of ORF that year, I established a new category of exhibits called "Creating × Exhibiting," which were Workshop Exhibition rather than mere explanatory exhibit. In an interview at the time, I spoke about this attempt as follows:

I had been questioning the ORF, which was only for 'viewing.' As stated in the curriculum since 2007, SFC emphasizes the keywords 'creation' and 'cutting-edge.' I think the cutting-edge, or frontier, part could be fully presented in the conventional ORF. However, the 'creation' part was not visible. Because it was limited to exhibiting the results of research, the process of 'how it was created' was not visible. Therefore, I had been wondering how we could make the 'creation' part open. In the past year or two, my research group (Iba Laboratory, hereafter referred to as Iba Lab) had been thinking about how to answer that question. As a result, we arrived at the idea that workshops might be able to realize it. And since I became an ORF executive committee member this year, I tried to incorporate workshops into the exhibition format to share the experience of creating. (Takashi Iba, in SFC CLIP, 2014).

The workshops that we, the ORF executive committee, are aiming for are close to the original meaning of the word. Originally, a workshop referred to a place where a studio for making shoes, bags, etc., and a store for displaying and selling products were integrated. The place where things are sold is the studio itself. The Workshop Exhibition are similar in that they not only exhibit the results but also show the 'creation of knowledge' there. If you go there, you can not only have the experience of viewing but also the experience of creating. We call such a place a 'future laboratory.' To make it clear that this is an interactive and experiential attempt, we have added the subtitle 'Creating × Exhibiting' (Takashi Iba, in SFC CLIP, 2014).

I believe that the essence of a university is to 'create together.' Nowadays, SFC classes are open to the public on the SFC Global Campus (SFC-GC), and you can take lectures on the Internet using iTunes U. However, the experience of creating, such as group work, cannot be done without actually being there... I believe that 'creating together' is the essence of a university. And in the future laboratory, I believe that 'creating' will become more advanced and will remain (Takashi Iba, in SFC CLIP, 2014).

In this way, I created a new form of ORF, and Iba Lab also conducted this Workshop Exhibition. We made the Iba Lab exhibition booth a project where we crafted pattern languages together with visitors, rather than a place to introduce the research results of pattern languages as before, and through this process, we let them know various things (Iba Lab, 2014a). In the above interview, I also introduced the Iba Lab project as an example of a Workshop Exhibition. It was like this:

Iba Lab will conduct a workshop to collaboratively craft a pattern language. We will condense what is normally done over six months into two days. Participants can join and leave at any time they like in an open format, and those who participate will be asked to reflect on their experience using the learning pattern language that Iba Lab usually uses. Rather than conducting several one- or two-hour experiences, the concept is to make Iba Lab appear in Roppongi's Tokyo Midtown for the two days of the main event (Iba Lab, 2014a).

This was like a pattern language creation version of "Deep Dive," an ABC News program that followed the design firm IDEO's attempt to design a new shopping cart in just five days, which this endeavor has also been featured in a book (Kelley, 2001). However, what was significantly different from that program was that visitors could not only glimpse the process but also participate in the work, experience it, and feel and understand the crafting process as an insider, rather than just being a mere observer. At that time, we did not perform a simplified "pretend play" for the visitors as a demonstration. Instead, we carried out our serious exhibition right there.

Toward the Workshop Exhibition, we thoroughly discussed the spatial design of the booth and the movement and coordination of people from the preparation stage (Figure 109). We also practiced the actual-size activities in the classroom to confirm the design, which is called "full-scale design," which we learned from Christopher Alexander. Of course, we did not examine or prepare the content of the pattern language to be created in advance. There was no "cheating" in that regard. The creation was strictly limited to the two days of the event.

The theme of the pattern language we created over the two days was "creative life." This was a theme that many people would be interested in, and they could think about it together based on their own experiences. Moreover, it was an attractive theme for such a challenge.

The project progressed over the two days. In other words, what the participants were doing differed depending on when they visited the booth. Conversely, if they participated in the time slot they wanted to see, they could experience the part they wanted to experience. They could stay at the booth the whole time, or they could go and see other exhibits and then come back to see the progress made. We were fully engaged in activities at that booth for two days, but the visitors had the freedom to participate according to their interests.

On the morning of the first day, we invited acquaintances who practice creative life to come and conducted Mining Interviews with them (Figure 110). Based on the information obtained from these interviews, we performed Clustering around noon to derive pattern seeds. We then wrote CPS sentences, which are sets of one sentence each for Context, Problem, and Solution. As evening approached, the first day of the event came to an

end. Members were assigned homework (just like in our usual projects) to write the description for each pattern on their own and bring it in by the following morning. They wrote at cafes or after returning home.



Fig. 109. Preparation for our Workshop Exhibition on crafting a pattern language for living creatively.



Fig. 110. The first day of our Workshop Exhibition on crafting a pattern language for living creatively.

On the second day, we conducted Pattern Reviews where everyone reviewed and discussed points for improvement (Figure 111). In the latter half of the day, a team worked on crafting Pattern Illustrations, and eventually, we created a booklet in our standard layout, printed and bound the prototype booklet, and completed it by the evening of the second day. Towards the end, we were cutting it close, and even after the official end time of the entire event had passed, activities continued at a tremendous pace at our exhibition booth. The visitors stayed, and we were able to share the moment of completion together. This is how the *Creative Life Patterns* were born (Iba Lab, 2014d).

The background for attempting this was that by this year, more people had got the Iba Lab's pattern language booklets, and there was a growing desire to know how they were created. Additionally, there was an increase in people who wanted to try creating one themselves. We thought that if we could set up a pop-up research lab at the ORF, like an open lab, where people could participate in the actual creation process, they would be able to experience it firsthand. Our big challenge was whether we could condense the process and methodology that usually takes half a year to a year to complete into two days. In the end, the student members who had accumulated experience in the Iba Lab worked at full capacity to achieve this. As a result, this year's ORF became an even more memorable and impressive event than ever before.



Fig. 111. The second day of our Workshop Exhibition on crafting a pattern language for living creatively.

Another creation from this period is the Pattern Writing Sheets (Figure 112: Iba, 2014d). I felt it was necessary when giving lectures and workshops on pattern languages in various places both in Japan and abroad. We realized that when participants actually write patterns themselves, their understanding of what pattern languages are trying to achieve deepens. However, the full-fledged process we undertake at the Iba Lab, starting from mining, cannot be done in a few hours. So, I thought about how we could enable participants to try writing just one pattern and came up with this sheet.

On the Pattern Writing Sheets (Iba, 2014d), participants first write what is important to do in a certain area of practice, then write what happens or what problems occur if they don't do it, and then write when it happens. By thinking and writing in this order, the necessary information for the Solution, Problem, and Context can be written out in sequence. The Pattern Writing Sheets have such navigation written on it, and by following it, participants can write one pattern.

When we actually tried conducting workshops and classes using this sheet, we found that participants could write one pattern even without specialized knowledge. Moreover, it was interesting, and they could get a sense of what it's like to write patterns. We don't use this sheet in our own full-fledged projects, but since then, we have been using this sheet quite often in workshops and classes.

The Pattern Writing Sheets have been well-received and is referenced in several publications. Notable mentions include the O'Reilly's book previously mentioned, *Cloud Native Transformation* (Reznik, Dobson, and Gienow, 2019), as well as the Economist's book, *Designing Organisations* (Stanford, 2022), *Pattern Language for Game Design* (Barney, 2020), and other papers (Teramura, Ando, *et al.*, 2019). I frequently utilize this sheet in workshops, and I've found it invaluable as it enables even first-timers to experience Pattern Writing, thereby deepening their understanding of pattern languages.



Fig. 112. Pattern Writing Sheet (Iba, 2014d).

In 2013, we conducted a Pattern Mining Workshop at the COINs conference held in Chile (Figure 113). This was my first visit to the South American continent. We conducted a Pattern Mining Workshop which is similar to what we typically do in our projects, allowing participants to better understand Pattern Mining and our methods (Iba, 2013d). Since the theme of the conference was Collaborative Innovation Networks (COINs), we focused on crafting a pattern language for collaboration. Participants who were unfamiliar with pattern languages seemed to deepen their understanding of pattern languages through the process of crafting them.



Fig. 113. Pattern Mining Workshop at COINs 2013 in Chile.

Furthermore, from this period, I began giving lectures (Iba, 2014a, 2015b) and conducting a series of seminars on pattern languages for business professionals (Figure 114; Iba, 2014b; Iba, 2015c). In the six-part seminar series, participants gained a deeper understanding of pattern languages and their creation process by experiencing the development of a pattern language using our methodology. Following the seminars, several participants expressed interest in creating pattern languages related to their own fields. This led to many cases where we collaborated with these individuals as partners to craft pattern languages or provided support for their pattern language development efforts.



Fig. 114. Pattern Language 3.0 Study Group for Business Professionals (Top row: First year, 2014; Bottom row: Second year, 2015).

Furthermore, in 2014, a training session was held at the Ministry of Economy, Trade and Industry where participants created a pattern language for policy design based on their own practical experiences, and I served as an advisor for this session (Figure 115). This came about when someone from the ministry who had learned about the *Policy Language*, which was included in our published book (Iba, Nakano, *et al.*, 2013). I had previously created contacted me, expressing their desire to conduct a training session to create their own pattern language for policy design. In the first session, I provided an explanation of pattern languages and the process of creating them, and we conducted a Mining Dialogue Workshop where participants mined from their own experiences. After that, during the training period, a team of volunteer members from among the participants worked on Pattern Writing, and along the way, everyone gathered for review sessions to reflect on their work. Several participants mentioned that although they work diligently every day to create policies, they rarely have the

opportunity to reflect on their practices and discuss the important aspects with their colleagues, so they found the experience to be meaningful.



Fig. 115. Scene from a training session at the Ministry of Economy, Trade and Industry, (METI) where participants craft a pattern language for policy design based on their own practical experiences.

Around this period, we created a picture book that summarized the pattern language and fundamental approach of Pattern Illustrating (Figure 116). We took on this project because the students who had been in charge of illustrating *Presentation Patterns* and *Collaboration Patterns* were about to graduate. The younger members of the Iba Laboratory wanted to learn and acquire the way of thinking and the methods from their senior, so a project was launched to compile this knowledge. The outcomes of this project were published as a book and a research paper (Figure 117; Iba Lab, 2014c; Iba and Iba Lab, 2015; Harasawa, Miyazaki, *et al.*, 2014, 2015; Miyazaki, *Sakuraba*, *et al.*, 2015).



Fig. 116. The picture book from which readers can learn the fundamental approach to Pattern Illustrating (Harasawa, Miyazaki, *et al.*, 2015).



Fig. 117. Book on the Pattern Illustrating Patterns (Iba and Iba Lab, 2015).

(3) Ways of Expressing and Utilizing in 2013-2014: Developing Pattern Cards, Experience Chart, and Systems for Utilizing a Pattern Language

As we conducted Dialogue Workshops, one challenge became apparent. Before entering into dialogue, we had to introduce the patterns. With 30 patterns, it inevitably took 30 minutes to an hour to explain them, and it was quite challenging for participants to listen to information about many patterns all at once. While the dialogue time was lively and exciting, the explanation time before it felt like dead time. However, without knowing the patterns, participants couldn't engage in dialogue about them. When we conducted workshops at the university, we distributed booklets the week before and assigned reading them as homework, so participants could read them outside of class. However, this wasn't possible for one-time workshops. As a result, we had no choice but to allocate explanation time in the first half and dialogue time in the second half, which made the overall workshop longer and the first half quite taxing.

So, I thought carefully about the factors causing this problem and realized that it was because we were introducing the patterns sequentially, which took so much time. It seemed promising if we could make this parallel instead of sequential. If each person reads and understands a few patterns, they can grasp the content of the patterns in a very short time. When sharing experiences during the dialogue time, participants would choose and talk about one pattern at a time anyway. Thus, to enable the participants to read their share of the patterns in parallel, I came up with the idea of turning the patterns into cards and distributing them. This was the birth of the Pattern Cards (CreativeShift, 2014a. 2014b, 2014c).

Initially, we included detailed information such as forces and actions on the Pattern Cards, but when there was too much information on the cards, everyone would read them carefully, and it took a considerable amount of time before they started talking. So, we boldly decided to include only the pattern name, introduction, illustration, context, problem, and solution on the cards. This way, participants could quickly read through a few cards and immediately enter into dialogue mode. Since participants only know the content of the patterns on the cards they have, when sharing their experiences, they first introduce the outline of the pattern and then share their personal experiences. As the dialogue time progresses, members can learn about patterns other than the ones they read. This is the key to the approach of reading and learning in parallel.

I have created several designs for our Pattern Cards. The first cards we made for *Learning Patterns*, *Presentation Patterns*, and *Collaboration Patterns* follow the double-sided design shown in Figure 118. The front of the card includes the Pattern Name, Introduction, Pattern Illustration, and Solution. On the back, the Context and Problem of the pattern are written, along with supplementary information such as the Pattern Number, Category, and the name of the pattern language. We included the pattern language name because we were creating cards for three different pattern languages simultaneously using the same design, and we thought this information would be necessary to easily sort the cards back into their original card sets when mixed together. The card size is 63mm × 88mm, which is the same as the standard size for trading cards. The size of this cards is the smallest, allowing many cards to be laid out on a table, but the downside is that the text is also small due to the card size.



Fig. 118. Design of a Pattern Card of the Presentation Patterns.

The second design for our Pattern Cards was used for *Words for a Journey*, which is a pattern language for living with dementia (Figure 119). To make the cards easier to read for elderly people and to improve the ease of handling, we increased both the font size and the card size (B6 size, which is 128mm × 182mm). Additionally,

all the information, including the Context and Problem, is presented on one side of the card, while the back features a colorful visual design that matches the cover design of the book for this pattern language.



Fig. 119. Design of a Pattern Card of Words for a Journey.

The third type of Pattern Card design is shown in Figure 120, which is currently adopted for many of our pattern language card sets. The Pattern Name, Pattern Illustration, and Solution are highlighted in white, making them stand out. By reading these sections first, one can grasp the most essential content of the pattern. If needed, the Context and Problem, written on the gray background, can be read to deepen understanding. Like the second design, all the content is written on one side of the card, while the back features a visual that matches the cover design of the pattern language book. The size of this card is between the first and second designs (B7 size, which is 91mm × 128mm), which we believe is a well-balanced and easy-to-handle size, making it our current standard.



Fig. 120. Design of a Pattern Card of the Project Design Patterns (in Japanese).

Pattern Cards are shuffled like a deck of playing cards, distributed in small stacks to each participant. Individuals then examine their respective cards, identify those with which they have personal experience, and place them on the table while sharing their relevant experiences (Figure 121, 122). As the exercise continues, participants may be left with cards that do not reflect their experiences. In such cases, these cards can be placed on the table, prompting others to share their related experiences.

The presence of Pattern Cards facilitates inquiries, even about unfamiliar topics. An alternative method involves laying all the cards out on the table. Participants can then select cards they resonate with or deem significant, and subsequently discuss their thoughts and experiences related to those cards. This approach is commonly used for self-introduction or as an icebreaker. With Pattern Cards, even in the absence of a skilled facilitator, individuals can initiate and successfully maintain discussions by merely following the instructions.

Currently, in Japan, 17 types of pattern language cards are available for purchase and are being utilized in various settings nationwide.



Fig. 121. Workshops with using Pattern Cards in Japan.



Fig. 122. Workshops with using Pattern Cards in USA, Austria, Congo, Portugal.

I developed the Pattern Cards during this period for these reasons, but I later learned that there were already people in the world who had turned patterns into cards. Note that the inception of the Pattern Card concept is

not entirely clear, but interestingly, it seems to have been independently developed at multiple locations at around the similar time. Douglas Schuler in Washington State has created Pattern Cards based on his book *Liberating Voices: A Pattern Language for Communication Revolution* (Schuler, 2008) and employs them in his workshops. In 2009, Douglas Schuler created Pattern Cards, according to his reflection:

In late 2008 or early 2009, Greg Steltenpohl, one of the founders of Odwalla, the natural juice company, looked over my book and suggested that I needed to create a card for each pattern in the book. Although I was wary of the amount of work that this entailed—distilling a card-sized description from a 2–4-page essay—I realized that this was absolutely the next step. As far as I know the first use of the Pattern Cards was at Peter Day's Community Media class at the University of Brighton, UK, on March 24, 2009. The other card project that happened soon after was the Groupworks project. From a July 21, 2010, message from one of the group's leaders: "Other ideas for sharing this project include a card deck, learning game, larger event, iPhone application, teaching workshops, and more." (as stated by Doug)

In Japan, we also developed cards for the *Learning Patterns Card Game* and presented them at a conference in 2011 (Okazaki, Takaoka, *et al.*, 2011), which is shown in Figure 123. In the same year, *Fearless Journey game* was collaboratively developed at Play4Agile in Germany, which is "an annual Open Space unconference focused on games and playful approaches to change teams and organizations"². Also in 2011, *The Group Works Card Deck* (Group Pattern Language Project, 2011) was developed by The Group Pattern Language Project in Eugene, Oregon. By 2013, we had produced Pattern Cards based on three different Pattern Languages, the *Learning Patterns*, the *Presentation Patterns*, and the *Collaboration Patterns*, and began selling them via amazon.co.jp in 2014. Also, Wise Democracy Project created Pattern Cards, *Wise Democracy Card Deck* (Wise Democracy Project, 2016, 2019). The simultaneous development of Pattern Cards at various locations suggests that converting unitized sets of patterns into card form was a natural evolution for Pattern Language.



Fig. 123. Cards of the Learning Patterns Card Game (Okazaki, Takaoka, et al., 2011).

Pattern Cards of *Words for a Journey*, a pattern language for living well with dementia, is the most widely used across various age groups in Japan (Figure 124). It has been incorporated into daily practices at certain day-care centers. Moreover, it is employed in settings such as gatherings for the elderly and "Orange Cafés," where those with dementia and their families come together for dialogue and consultation. The pattern language is also utilized in planning by community staffs and supporters. Additionally, it is adopted in university-level nursing

² <u>https://play4agilenorthamerica.com/about/</u>
education and discussions on community welfare at elementary, middle and high schools. The language can also be found in waiting rooms of forgetfulness outpatient clinic and has been integrated into guidebooks aimed at those with dementia, published by local municipalities (Kawasaki City, 2017a). It is note that *Words for a Journey* received the Good Design Award and the Orange Act's Dementia-Friendly Award in Japan.



Fig. 124. Scenes of utilizing *Words for a Journey* Pattern Cards.

During this period, I also developed the "Experience Chart," which visualizes what types of patterns from a systematic pattern language an individual is practicing and to what extent using a radar chart, allowing them to grasp the overall picture (Figure 125; Iba, 2014j, 2014e; Iba and Yoshikawa, 2016a). This is particularly suitable for graphing when the patterns are organized into groups of three, as we do in the Iba Lab. By looking at the shape of this Experience Chart, individuals can become aware of biases or deficiencies in their practice or engage in dialogue with others using the chart. Moreover, by drawing the Experience Chart again after some time has passed and overlaying it, individuals can understand changes in their experience. The figure shows an actual case of the change in a university student's area of experience at the time of enrollment (dark green) and one year later (light green).



Fig. 125. Experience Chart (Iba, 2014f).

Applying Pattern Language from Places to Programs and Practices: Page - 109

The 2013 book edition of *Presentation Patterns* marked a departure from the conventional pattern catalog format. We crafted original content designed to be more narrative and accessible, using this as the primary text To accommodate distinctive layout features, such as footnotes, we undertook the task of designing page layouts using InDesign, submitting the completed InDesign files for publication. This comprehensive approach to book production became our signature style, first established with our work on *Introduction to Complex Systems*. Although this level of involvement in book design significantly increases our workload as authors, we persist with this method. The ability to tailor the final product precisely to our vision outweighs the additional effort required, allowing us to create a book that aligns perfectly with our conceptual ideals.

This *Presentation Patterns* book follows the standard vertical writing style of Japanese general books (although academic books or engineering books that include mathematical formulas or program codes often use horizontal writing, most books in the humanities, social sciences, philosophy, general business, and practical guides are written vertically in Japan). This book is mainly vertically written, but some pages, such as the cover pages, incorporate a horizontal writing design.

The main part of this book is three chapters, each focusing on a specific category of the *Presentation Patterns*. At the beginning of each category chapter, there is a category cover page, followed by a page that provides an overview of the patterns included in that category (Figure 126).

Each pattern is then introduced over four pages: pattern cover page, pattern contents pages, and last page (Figure 127). The cover page for each pattern employs a horizontal layout, with text reading from left to right. The horizontal orientation was necessitated by the illustration, which is designed to be interpreted from left to right. This design drew inspiration from Christopher Alexander's *A Pattern Language*, where each pattern begins with a cover page solely comprising the pattern name and a symbolic photograph. I adapted this concept to suit our specific needs while maintaining the essence of Alexander's approach.

In the pattern contents pages that follow the pattern cover page, to make it easier to read as a reading material, no sections such as Context or Problem are created, and the standard pattern description style used by Iba Lab, such as " \checkmark In this context" is not used. Instead, design elements are incorporated to indicate which part is the Context or which part is the Problem. The Solution text and the pattern names within the body are emphasized by changing the color of the text (the publisher allowed the use of one color in addition to black for this book's publication).



Fig. 126. Page layout design for each category in the Presentation Patterns book (Iba and Iba Lab, 2013).

Then, on the last page, the pattern name and Solution are presented again for emphasis. The reason for doing this is that the next page (visible on the left side of this page when open) features a prominent pattern cover page with the next pattern name and Pattern Illustration. By re-stating the pattern name and solution on this last page as a summary, it prevents readers from mistakenly associating the content they have just read with the next pattern name. I believe this approach has successfully prevented such misunderstandings from occurring.

In this way, I designed the page layout of the *Presentation Patterns* book using Adobe InDesign. I paid meticulous attention not only to the content but also to the visual appearance, crafting it thoroughly before it was published as a book.



Fig. 127. Page layout design for each pattern in the Presentation Patterns book (Iba and Iba Lab, 2013).

I'm pleased to share that after its publication, the *Presentation Patterns* book received the Good Design Award in 2013 (Figure 128), which is the only comprehensive design evaluation and promotion award in Japan with a history spanning more than 60 years. The jury's evaluation comments were as follows:

In modern society, where communication is highly valued, the opportunities for giving presentations have increased. Recently, even young people have many occasions to present, and there may be things that are difficult to convey to those who lived in the previous generation. This book has been organized in an easy-to-understand manner, providing tips (perspectives and ways of thinking) to promote a fundamental understanding of presentations. It has been finished in a way that is easy to read, even for students, using witty illustrations and copy. We evaluated it from the perspective of editorial design. We also hope that it will serve as a guide to design awareness, which requires an understanding of the existence of others (Japan Institute of Design Promotion, 2013).



Fig. 128. The Presentation Patterns book received the Good Design Award 2013.

Words for a Journey, which was created as a booklet in 2014 and published as a book in 2015, was also meticulously crafted by us, including the page layout, using Adobe InDesign files for submission. The feature of the *Words for a Journey* book is that it maintains the same form and layout as our original booklet (Figure 129). Unlike the *Presentation Patterns* book, where all the text was rewritten like a normal book to make it more readable for distribution, we did not do that for the publication of *Words for a Journey*.

In fact, after the publication of the *Presentation Patterns* book, I began to question whether rewriting the content to make it more readable truly aligned with our goals. Indeed, the *Presentation Patterns* book turned out to be a good book and was well-received by readers. However, when creating the pattern language booklet, we put so much effort into writing it in that specific pattern form, and I wondered if it was really impossible to publish it in that form as a book, even though we could create it as a booklet for distribution as part of our research. In our perception, the booklet felt like a purer description of the pattern language, while the rewritten version in the *Presentation Patterns* book seemed more like an "explanation" of the pattern language.

If possible, we wanted to deliver the pure form of the pattern language that we found fascinating and had crafted with great care. With that in mind, we designed the *Words for a Journey* book using Iba Lab's pattern description style. There was also a background that made this possible. When we brought the publication project to the publisher, feedback had been collected from the distribution of 500 booklets at events such as the SFC Open Research Forum (ORF) and G8 follow-up event in the previous year (2014), and the feedback highly praised the pattern description style as well. Based on those comments, we discussed with the publisher and decided to proceed with the same description style as the booklet. Thus, for the first time, a book with Iba Lab's simple description style was set to be published.

Moreover, the cover design and page layout of the booklet and book were created by Iba Lab students and me. We went through multiple versions, reviewing and revising together as a team (Figure 130, 131). Starting with this *Words for a Journey* book, the subsequent three pattern language books to be published by Maruzen Publishing also had their covers and layouts entirely designed by us.



Fig. 129. An example of the standard description style composed of paragraphs, a pattern from the *Words for a Journey* (Iba and Okada, et al., 2015b).



Fig. 130. Designing and prototyping of the page layout for the Words for a Journey.



Fig. 131. Designing and prototyping of the book cover for the Words for a Journey.

Here, let me note that the style of pattern description has undergone some changes over time. As mentioned earlier, we used to write forces and actions in bullet points. However, around this time, I began to feel the limitations of bullet-point descriptions and started writing in paragraphs. We decided to use a bold Problem sentence as the key sentence, followed by a paragraph about forces, and a bold Solution sentence as the key sentence, followed by a paragraph about actions. The reason for this change was that although bullet points are indeed easy to understand at a glance, they do not allow for writing about the relationships between items.

For example, it was not possible to write about how one force opposed another, and it was also difficult to express the strength or weakness of forces in bullet points. With paragraph writing, these aspects could be freely incorporated. Similarly, for actions, we primarily wrote execution steps in bullet points, but when we needed to

list multiple methods or provide examples, we could only write them as bullet-point items, leading to semantic confusion. With paragraph writing, content could be freely included.

Furthermore, while bullet points were suitable for organizing information when compiling pattern catalogs as booklets, when our created pattern language reached the stage of being published as a book, bullet-point descriptions were considered too functional for reading material. We believed that prose that readers could immerse themselves in was more suitable, especially for books.

Thus, we gradually stopped using bullet points and began writing in paragraphs containing Problem and forces, and Solution and actions. This approach resulted in a simple and cohesive overall structure, with three blocks: a Context sentence, a Problem+Forces paragraph, a Solution+Actions paragraph, and a Consequence paragraph. Currently, unless there is a specific reason, I use this paragraph-based description.

During this period, a new character emerged in our Pattern Illustrations for the pattern languages we crafted. In the pattern language of *Words for a Journey*, we decided to use a character different from Manabu-kun, who has been the character in previous Iba Lab pattern languages, to illustrate the patterns (Figure 132). There are two reasons for this. Firstly, the setting of Manabu-kun living with dementia is significantly different from the worldviews of other pattern languages. Secondly, we wanted readers to discover important aspects of living well with dementia and to try their hand at writing and illustrating based on what they learned. In fact, when we actually tried to draw Manabu-kun, we found it difficult to depict him well.

Therefore, in this pattern language, we used a relatively easy-to-draw stick figure character. Although it is still challenging to depict empathetic expressions and gestures with this character, it is certainly true that anyone can easily draw a rough sketch of this type of character. This character has become our standard character for welfare-related patterns, also appearing in *Words for Caring*, a sister publication to *Words for a Journey*, which is a pattern language for elder care practices and place-making. Incidentally, we call this character "Bo-Ningen-kun" (*Stick Figure*-kun) alongside Manabu-kun.



Fig. 132. The character in the Pattern Illustrations of Words for a Journey, stick-figure-kun (Iba, Matsumoto, et al., 2016).

Furthermore, while the standard style of pattern description became established during this period, several entirely new styles also emerged. As previously mentioned, 2013 was a year in which the student members of the lba Lab created pattern languages based on their individual interests, resulting in the emergence of a diverse array of creations, reminiscent of the "Cambrian Explosion." During this time, not only did the domains of practice targeted by the pattern languages become more diverse, but a variety of expressions also emerged in the booklets presenting the pattern languages. The first of these was the *Personal Culture Patterns* (Nakada, Kamada, and Iba, 2013). The booklet for this pattern language had a distinctive style where the pattern descriptions were written as poems rather than explanatory text, and the Pattern Illustrations were created as colorful, fantastical images (Figure 133).

The next one was *Omotenashi Patterns: A Pattern Language for Generating Comfortableness*. The booklet for this pattern language was designed as a picture book with watercolor illustrations (Figure 134).

Additionally, in *Tsukkomi Patterns*, which compiled tips for delivering punchlines in Japanese comedy, the pattern booklet included a story unfolding in comic-like frames (Figure 135). Instead of illustrations, the booklet featured photographs of Iba Lab members acting out the scenes, making it a truly unique creation.

Furthermore, even for the pattern languages that had already been created, there were instances of producing new types of booklets (Figure 136). For the *Change Making Patterns*, we created a workbook that users could write in and use, rather than just a booklet with patterns listed (Nakamura, Shimomukai, *et al.*, 2014).

Dream Tiles

You are searching for a goal but don't exactly know what you want to do.

you are already blinded from your own feelings. But your true desires are in your heart

So go ahead. Start exploring your inner heart.

that you think you want to do. Now then add to the list the things you've failed in the past.

These failures are actually your desire disguised in ugly form. When your wishes have been listed.

then start laying dream tiles. All your small teelings should lead you to a single goal.

Fun Along the Way

sent to the full fun it giv



The Power of Words

When headed towards your goals you hold everything to yourself. Worries, froubles, problems. No one would understand your bitter situation. So speak out loud, of your goals and your dreams. Declare to your friends what you are going to achieve

power so anong not as you speak, ou will be convinced that your goal was no joke. Then people who support you may start to appear and unexpected hints may bring you good cheers

The power to push your back. The power to help you start moving to your goal





Fig. 133. Personal Culture Patterns with colorful, fantastical illustrations and poetic writing.



Fig. 134. Booklet in picture book style with watercolor illustration, Omotenashi Patterns.



Fig. 135. Tsukkomi Patterns, a booklet presenting a story through comic-like frames with photographs.



Fig. 136. Layout of the *Change Making Patterns Workbook*, where the pattern description is on the left page and the right page contains the actual workbook activity, which gives the readers a real-life story on the pattern (Nakamura, Shimomukai, *et al.*, 2014).

As already mentioned in the section on *Collaboration Patterns*, the circular overall system used since the *Learning Patterns* had the drawback of making the text too small to read. Even with *Words for a Journey*, we struggled considerably with the representation of the overall system and tried various approaches, but all of them resulted in the text becoming too small, just like before. Therefore, we had to rethink the idea of arranging the patterns within some kind of shape. Especially for *Words for a Journey*, considering the age range of the target audience, the small text size used previously would be too small to read. If so, couldn't we convey the information more simply and straightforwardly?

Thus, the overall system representation that emerged during *Words for a Journey* is shown in Figure 97, which has already been presented. In this representation, the pattern names are listed hanging under their respective categories. The constraint on the text size becomes the width, so the text can be larger compared to the circular representation. It may not have much design innovation and can be said to be close to a list format. This representation is included on the very last page of the booklet or book. In fact, even in *Learning Patterns* and other booklets, we had included a list of all pattern names at the end. Therefore, Figure 97 can be said to be a fusion of the overall system and the pattern name list, somewhere in between the two.

In *Words for a Journey*, there is another page that provides an overview of all the patterns, separate from this one. That is the illustrated pattern table of contents (Figure 137). This is a three-page list of pattern names and their corresponding Pattern Illustrations. With the inclusion of illustrations, it becomes easier to get an overview of what patterns are available and to find the desired pattern. This illustrated pattern table of contents has since been created for various pattern languages that we have developed.



Fig. 137. A list of pattern names and Pattern Illustrations by category, featured at the beginning of the Words for a Journey book.

During this period, we also worked on developing a web system to make pattern languages more accessible and familiar in everyday life. The system we developed during this period is a system for sharing and enriching 'feeling of life' of individual patterns (Figure 138; Kanazashi, Yamazaki, *et al.*, 2014; Iba, Kimura, and Sakai, 2014). The goal was to help users connect with others' experiences through patterns. In the system, users can write about their experiences along with photos, linked to specific patterns, and others can view them. While it has similarities to Instagram in being photo-based, this system is not a social networking service where users can follow each other. Instead, it is a system that allows users to connect with others' experiences through patterns. We named it "4th Place," which refers to a space beyond the "third place" where people interact. This system was demonstrated at the exhibition booth of ORF 2013 (Figure 139; Generative Beauty Project, 2013).



Fig. 138. The 4th Place system (Generative Beauty Project, 2013).



Fig. 139. Exhibition booth for the Generative Beauty Patterns and the 4th Place system (Generative Beauty Project, 2013).

(4) Pattern Communities in 2013-2014: Our Style of Pattern Language Gradually Gained Recognition in Pattern Language Communities

There were also various developments and changes in pattern language conferences. First, PLoP celebrated its 20th anniversary in 2013. For several years, it had been held in conjunction with conferences like SPLASH in various parts of North America, but for the 20th anniversary, it returned to the Allerton House in Illinois after several years. During the conference, Ward and Jenny gave invited talks; Joe (Yoder) and Richard organized a 20th-anniversary panel discussion.

An unexpected and delightful thing for us was being asked to design the official conference T-shirts! Joe (Yoder) requested that we include Manabu-kun in the design. We collaborated on the design, drawing a sheep and a shepherd. Personally, I was excited that the software pattern community members who founded this community, such as Ward and Ralph, wore the Manabu-kun T-shirts and that everyone took a 20th-anniversary commemorative photo wearing these shirts (Figure 140). This happened the year after the invited talk in 2012, following our disappointment that we might not be able to submit papers to this conference anymore. It was a symbolic event that made us feel welcomed by the software community and this community, along with our pattern languages.



Fig. 140. Our character "Manabu-kun" was used for T-Shirts design in PLoP 2013.

At the PLoP 2013 Bootcamp, Joe and others asked me to speak about Pattern Mining and other topics on short notice. I also introduced a Dialogue Workshop using patterns and a web system under development that utilizes patterns (Figure 141).



Fig. 141. Bootcamp at PLoP 2013.

Speaking of conferences, a very important development for us began in 2014. It was the launch of a workshop called Pursuit of Pattern Languages for Societal Change, which is PURPLSOC for short. The first workshop was held in Krems, Austria, in 2014, and was attended by social scientists, educators, practitioners, systems theorists, artists, architects, computer scientists, and others (Figure 142). What made PURPLSOC significant was that it prominently featured the theme of "Societal Change." It was a conference centered around pattern languages, rather than a subfield such as architecture or software. Since we had started crafting pattern languages related to social issues, the theme of this conference was right up our alley. The conference was subsequently held in 2015 and 2017 (unfortunately, it hasn't been held since 2017 due to the health problem of one of the key organizers), and we presented many papers there during this period. In the 2014 workshop, I presented on the study of Alexander's 15 Fundamental Geometrical Properties (Iba and Sakai, 2014) and the qualitative research on the responses of Dialogue Workshop participants (Iba, 2014i).

Actually, the day before the 2014 PURPLSOC workshop, I was in South America. I attended SugarLoafPLoP conference, 10th Latin American Conference on Pattern Languages of Programs, held on a beautiful island, Ilha Bela, São Paulo, Brazil, and gave an invited talk there (Iba, 2014h). To commemorate the 10th anniversary of SugarLoafPLoP, Joe, Ralph, and I gave invited talks (Figure 143), along with Rossana M. C. Andrade from Brazil. In addition to the invited talk, we also submitted papers to Writers' Workshop (Iba and Yoder, 2014; Kamada, Nakamura, *et al.*, 2014) and conducted a workshop called "Self Travel Café" (Figure 144; Kamada and Iba, 2014; Kamada, Nakamura, *et al.*, 2014) using the *Personal Culture Patterns* (Nakada, Kamada, and Iba, 2013) to help participants understand and express their unique identities.



Fig. 142. First PURPLSOC Workshop in 2014.



Fig. 143. My invited talk at SugarLoafPLoP 2014.



Fig. 144. Self Travel Café at SugarLoafPLoP 2014.

The experience of that trip for SugarLoafPLoP and PURPLSOC was very memorable. In the middle of the Brazilian summer, a group conducted Writers' Workshop in the shallow pool, and we jumped into the pool during breaks (Figure 145). From the midsummer of Brazil in November, I hopped to conferences in the winter of Austria, where I bought and drank hot wine at the market (Figure 146). This became an unforgettable experience.

That year, I participated in AsianPLoP in Japan in March, PLoP in the USA in September, and SugarLoafPLoP in Brazil and PURPLSOC in Austria in November, presenting papers, giving talks, and holding workshops. I strongly felt that pattern languages were being crafted and researched all over the world.



Fig. 145. Writers' Workshop at SugarLoafPLoP amidst the sweltering heat of the Brazilian summer.



Fig. 146. From the middle of Summer in Brazil to Winter in Austria, where hot mulled wine brings warmth and joy, for PURPLSOC conference the following day.

Also, in 2013, I also attended the Portland Urban Architecture Research Lab (PUARL) conference at the University of Oregon for the first time (Figure 147). It is a conference where people involved in pattern languages in the field of architecture, including Alexander's students and collaborators, gather. Starting from 2009, the PUARL Conference has been organized every few years by Prof. Hajo Neis, a disciple and co-author of Christopher Alexander. Prof. Neis is the director of the Portland Urban Architecture Research Laboratory (PUARL) at the University of Oregon. There, some co-authors and associates of Alexander provided talks and panel discussion, sharing attempts to apply pattern language to architecture.



Fig. 147. My talk at PUARL 2013 Conference.

Until then, I had hardly met anyone related to pattern languages in the architectural field other than Hiroshi Nakano, so I was nervous about attending. The organizer, Hajo Neis, asked me to give a short talk since I was there, so I spoke about the development of pattern languages in fields beyond architecture (Iba, 2013e). While some people knew that pattern languages had been applied to software (as Alexander had also given lectures at OOPSLA), many seemed to be hearing for the first time that they had further expanded into the domains of practice. This became the first step in my interaction with the architectural pattern community. Although I was nervous, in the end, I was glad that I was given the opportunity to give this short talk.

In addition, during this period, I was also invited to give a talk at architectural symposiums in Japan (Iba, 2013b). Also, I was requested to write a paper on pattern languages for a journal published by the Japan Science and Technology Agency (Iba and Furukawazono, 2013). Additionally, a long interview about pattern languages was featured as an article in a magazine by an advertising agency (Iba, 2013a). Moreover, at ORF, multiple sessions were held to discuss the applicability of pattern languages to businesses and management, which were attended by many businesspeople (Iba, Iwanami, *et al.*, 2013; Iba, Kameda, *et al.*, 2014; Nakano, Horikiri, *et al.*, 2013, 2014).

During this period, I served as the Program Co-Chair for AsianPLoP 2013, on the Program Committee for PLoP 2014 and SugarLoafPLoP 2014, and on the Steering Committee for COINs 2013. In 2014, I participated in SugarLoafPLoP, which is held in South America, for the first time.

(5) Theories and Philosophies in 2013-2014: Discussing the Meaning and Significant Role of Pattern Language in the Emerging Creative Society

We reflected on the history of pattern languages and considered the positioning and characteristics of the pattern languages of practices that we are working on. In the published book, *[Reality+] Pattern Language*, we provided an overview of Alexander's ideas and included interviews with Hiroshi Nakano, a Japanese disciple of

Alexander, media artist Koichiro Eto, and software expert Eichi Hanyuda (Iba, Nakano, *et al.*, 2013). This book is a rare resource for learning about pattern languages and has been being used as a supplementary textbook in my university courses.

From around this time, I began to position pattern language as a medium in a Creative Society and discuss its role (Iba Lab, 2012a, 2013a; Iba, 2013c). In an era where people live creatively, pattern language plays an important role as a medium that supports creative practices. This idea has been my consistent explanation for why pattern language is needed in our times, and I have been describing it as such ever since.

In a journal article on pattern language, I defined pattern languages as a method for mining experiences (Iba, 2014f). I discussed the function of extracting patterns from practitioners' experiences and the function of using patterns to help individuals recall their own experiences and bring them into dialogue related to the patterns (Figure 148).

Moreover, while experiences are qualitative and holistic, once we become able to capture them in the unit of patterns, we can quantify them by counting. This allows us to quantitatively grasp an individual's experiences and the experiences of people belonging to their community from the perspective of patterns (Figure 149, 150). I also discussed this point in the paper.



Fig. 148. Pattern languages as a method for mining experiences (Iba, 2014f).



Fig. 149. Percentage of people who have experience of each pattern, aggregated by year (Iba, 2017h).



Fig. 150. Percentage of people who aspire to embody each pattern in the near future, aggregated by year (Iba, 2017h).

During this period, in 2013, I carried out a project related to pattern languages. The idea was to interview and record key people in the history of pattern languages. I hoped that in the future, this material could be used to create a documentary movie about pattern languages. The narratives of the people involved that I have discussed in this paper are transcripts from these interviews. Some of the people I already knew from conferences, while others I contacted and visited specifically for the interviews.

The interviews were conducted during breaks at PLoP and EuroPLoP, or I visited their cities before or after conference trips and interviewed them at their offices or homes. When talking in a conversation, it's difficult to record everything, but by setting up an interview and recording it with a video camera, the interviewees speak with the understanding that it will be made public, and I can explicitly state what I want to ask and have them answer those questions.

In those interviews, I also asked people who had been involved in pattern languages in the fields of architecture and software what they thought about new attempts like pattern languages of practices. In addition to learning about the history, this was a question I really wanted to ask. I wanted to know how people who had been involved in pattern languages up to that point viewed what we were doing, whether it would be accepted, and use that as a reference for the future.

One day in October 2013, we visited an architectural firm in Berkeley, California, to interview Murray Silverstein and Max Jacobson (Figure 151), who were co-authors with Christopher Alexander of *A Pattern Language*. I wondered what they would think of pattern languages of practice. It was my first time meeting them in that interview, and I conducted the interview with some nervousness.



Fig. 151. Max Jacobson (left) and Murray Silverstein (right) (2013).

In their subsequent book, *Patterns of Home* (Jacobson, Silverstein, and Winslow, 2002), they mention that there are "patterns for cooking, patterns for living." During the interview, I brought this up and introduced the notion that pattern languages are now being crafted for the realm of human practices. In response, Murray shared an anecdote about encountering architects who are working on new versions of pattern languages and expressed his enthusiasm, stating, "That's exciting, we think it's great." He then went on to elaborate further.

Since we did that book, published in 1977, I think individual buildings had got better, but cities have gotten worse. So, anything you can, do that. Help turn it around. Incorporated in such a thing (as stated by Murray).

Murray, who is an architect with his own design firm, has also published a book of poems (Silverstein, 2006, 2014, 2024). Like Richard Gabriel, who is both a computer scientist and a poet, encountering individuals who write poetry in the field of pattern language may not be coincidental, in my opinion. I feel that this may relate to the idea that pattern language constitutes a "new literature," as described by Richard Gabriel as is already taken above.

When asked about his thoughts on the pattern language of human practices, Max provided the following response.

I think it's such a fundamental way, that people do anything. That I agree with you. So if I want to learn how drive a car, I have certain patterns that I use, that I have to apply to a specific situation, and which are context sensitive (as stated by Max).

I had frequent discussions with Hajo Neis, a disciple and co-author of Alexander, and a professor at the University of Oregon (I served as a researcher under Hajo during my second sabbatical at the University of Oregon from 2018 to 2019). What I came to re-recognize in these exchanges was that Alexander originally conceived of pattern language as means to improve the quality of people's lives (Alexander, 1979; Alexander, Davis, *et al.*, 1985). Our own efforts in developing a pattern language for human practices share that aim; we are not merely applying these concepts in irrelevant domains. Furthermore, the concept of patterns is not confined to architecture but is more universal, applicable in both software and human practices.

That year, during the breaks at the PLoP conference, I also had the opportunity to interview Ward and Ralph, and I cautiously asked questions related to the concept of pattern languages of practices. Ward Cunningham, when posed with this query, offered the following remarks:

We were suspicious, I would say. Originally because we felt there is in a sense implicit process in the patterns themselves. The pattern said, this is what you build, it said what you order to build it so all you have to do is think about what you want to choose the pattern and build it. I think people looked at what people are struggling with at any given moment. They were less struggling with building. Software is figuring out how they're going to organize team to develop, therefore, they're all matters of human activity. So, my suspicion softened when I thought if there is the thing, it could be the physical thing, software thing, or could be a meeting that you're hold and activity that people would recognize as a thing that deserved a name. That naming of things and then people learning those names and deciding to make those things real was important. It was not an abuse of form in any sense. If those things would be other things, you have generative property, if they resolve forces, then all the pieces make the pattern form, pattern language structure applicable and operative so why would you not apply it if it works? Use it (as stated by Ward).

Ralph Johnson provided further insight, incorporating easily understandable examples in his explanation:

You can apply the same idea, of breaking down this complicated design problem into lots of individual pieces, for anything. I think it's really more about the nature of how humans design things. It's not really about buildings, it's not about software, it's more about people, this is the way people work. The way anybody learns to be a good designer is by designing, is by working with something.

If you are doing music for example, you start off by playing other people's music. And then you start trying to write your own music, and you get together with other people who write music, and you're constantly sharing things, and you play in different bands and do something.

There are theory courses you can take, there are various courses you can learn to make music. There's a lot of people write music who don't take those courses, and even if you take the courses, that's not going to make you a good music writer. You have to practice a lot.

As you do that, you will learn the patterns. There's a lot of patterns in music that you will learn. It's the human way of learning things and when you're learning music, they'll have names for a lot of different things, you'll learn different patterns. As you are working, somebody will teach you something, you can ask "What is that?" He may not have a name. He may be showing you how to do something you can copy. Or maybe there'll be a name. Usually when the first time somebody does something, there's no name to it. They'll just say, "Like so and so, do this in one piece," and you copy that. After that's been spread around a lot and people have it, they'll now have a name, and they can be shared even more. To me it applies everywhere (as stated by Ralph).

The conversations with Ward and Ralph greatly encouraged us. Rather than viewing our work as merely forcing practical issues into a pattern language format, they recognized and articulated that the method of pattern language can be meaningfully applied in the realm of human practices on a more general level. Of course, this is precisely the perspective from which we had been approaching our work, but I had concerns that others might not share this view and might even perceive our efforts as strange or misplaced. Hence, their affirmation was a source of significant relief for us.

Also, when I visited Linda's home for an interview, I asked her, "Do you have any words for future creators of pattern languages?" She responded with the following:

The patterns changed my life. I think it's a little bit like a virus. You can be infected and what you have the patterns virus, you see the patterns everywhere. It changes your viewpoint in the world, and you begin to look for the same ideas that might have a name. And you wonder what the name might be and how useful would be and think about it. That's what I do all the time. I think it changes your brain. You begin to look for patterns everywhere. I think it's been a good thing. So, that's the danger if you start writing the patterns you begin to the see them everywhere and it will change your life (as stated by Linda).

Patterns are embedded in every facet of the world, so we can find them everywhere. Therefore, we find patterns everywhere we look. Once we craft several pattern languages, our sensitivity to them increases. Gradually, we become more aware of patterns all around the world. Indeed, this has led us to identify patterns even in welfare and daily living.

Note that, in 2013, the Japanese translation of The Nature of Order, Book One was published. Then, in 2014, the Japanese translation of *Fearless Change* was published. I wrote the preface for the Japanese version. Around this time, Hajo Neis of the University of Oregon, inspired by our *Survival Language*, created and presented a pattern language for sign planning to guide people to evacuate during an earthquake (PUARL, 2014). They adopted the category structure of our pattern language and incorporated the term *Survival Language* into the name. This pattern language was released by The Oregon Office of Emergency Management.

The events of this period are summarized in the timeline shown in Figures 152 and 153.



Fig. 152. Timeline of our pattern language research in 2013, in the first period of the EXPANSION PHASE.



Fig. 153. Timeline of our pattern language research in 2014, in the first period of the EXPANSION PHASE.

7.2 Pioneering the Implementation of Everyday Use Pattern Languages, and Developing a Methodological Pattern Language for Crafting a Pattern Language in Our Way [2015-2016]

During the middle third of the EXPANSION PHASE, spanning the years 2015-2016, we continued to conduct our research productively. (1) First, as an application of pattern language to new domains, we crafted many pattern languages of practices in everyday life, such as parenting and cooking. (2) Additionally, intertwined with the methodology of crafting, we crafted *A Pattern Language for Creating Pattern Languages* by mining patterns from our own experiences. (3) In terms of ways of expressing and utilizing, we conceived and implemented new ideas that differed from typical approaches in the pattern communities, such as Pattern Objects, Pattern Songs, Pattern Concierge, and Idea-Generation Workshops. (4) Regarding pattern communities, we became involved in the establishment of a new community focused on pattern languages for societal change, which directly aligned with our research themes. Also, I initiated interactions with key figures in architecture who had collaborated and co-authored with Christopher Alexander. (5) In the realm of theories and philosophies, we studied Alexander's seminal work, *The Nature of Order*, and embarked on a unique challenge of exploring the nature of order in practices, not in space, and proposing the fundamental behavioral properties. Let us now examine each of these explorations during this productive period in greater detail.

(1) Application to New Domains in 2015-2016: Pattern Languages of Practices in Everyday Life such as Parenting and Cooking

First and foremost, they were pattern languages of practices in everyday life. We had already ventured into this domain with the *Generative Beauty Patterns* for living beautifully and lively, and *Words for a Journey* (crafted in 2014 and published as a book in 2015) for living well with dementia. Prior to that, the *Pedagogical Patterns* and *Fearless Change* patterns were practical patterns in the school and workplace, and even the ones we crafted, such as the *Presentation Patterns* and the *Collaboration Patterns*, were pattern languages of practices in activities in the school and workplace.

Pattern languages of everyday life focused on practices in private life at home. They included the *Ways of Everyday World-Making*, a pattern language for raising children while working (Iba Lab and Kao Corp., 2016; Sekine, Komura, *et al.*, 2016; Ogo, Iba, *et al.*, 2017), *Parenting Patterns* on child raising (Sasabe, Isaku, *et al.*, 2016), *Ethical Lifestyle Patterns*, aka *Natural Living Patterns*, for an ethical life (Kamada, Kato, *et al.*, 2016; Iba Lab, 2016a; Kamada, 2017), and *Life Transition Patterns*, a pattern language for thinking about the place where one will act in the future (CreativeShift and Kawaijuku, 2017; Iba and Kubo, 2017). Others were the *Cooking Patterns* that summarized good practices for everyday cooking (Akado, Shibata, *et al.*, 2016), the *CoCooking Patterns* for collaborative cooking (Isaku and Iba, 2015; Isaku and Iba, 2018), and the *Cooking Life Patterns* for an everyday life with cooking (Yoshikawa, Akado, *et al.*, 2016), all crafted in 2015 and 2016.

Each of these aims to enhance the quality of life (QoL) in the respective directions of its theme. Considering that Christopher Alexander's pattern language aimed to make daily life alive and imbued with the *quality without a name* (Alexander, 1979), it can be said that we have finally returned to this point in the sense that we have verbalized the practical patterns on the "events" side in contrast to the "space" he tackled.

As an interesting aside, there is also a pattern for making delicious tacos (Figure 154; Yoshikawa, Shimizu, and Iba, 2017a). The Pattern Cards are laminated and waterproofed using pouches to ensure they can withstand getting wet when used in the kitchen. This pattern language is particularly useful when cooking collaboratively with multiple people. In fact, we've used it during co-cooking parties with our lab members and students taking the course (Figure 155).



Fig. 154. Cook-That-Dish Patterns for Tacos (Yoshikawa, Shimizu, and Iba, 2017a).



Fig. 155. Collaborative cooking with the Cook-That-Dish Patterns for Tacos.

The second characteristic of the pattern languages we worked on crafting during this period is that, in contrast to the everyday life mentioned above, they are about highly professional work. Examples include the *Project Design Patterns* that summarize patterns for innovative project (Iba and Kajiwara, 2016; CreativeShift, 2016; Kubota, Harashima, *et al.*, 2016; Mori, Harashima, *et al.*, 2016; Iba and Kajiwara, 2019; Iba, Mori, *et al.*, 2019), *Design Patterns for Creative Education Program* (Kimura, Shimizu, *et al.*, 2016), the *Active Learning Patterns for Teachers*, a pattern language for teachers conducting active learning-style education (CreativeShift

and Benesse, 2017; Iba and Utsunomiya, 2017; Iba, 2017f; Utsunomiya, Yoneda, *et al.*, 2017), *Generator Patterns* on collaborative inquiry (Nagai, Isaku, *et al.*, 2016; Akado, Nagai, *et al.*, 2016; Isaku and Iba, 2016; Akado and Iba, 2017), *Cross-Border Leadership Patterns* for social intrapreneurs (Miura, Shimomukai, and Iba, 2016), and *Words for a Dialogue*, a pattern language of dialogue practices learned from the practical research of "Open Dialogue," which heals mental illnesses such as schizophrenia through dialogue (Iba, Nagai, *et al.*, 2017; Iba, Nagai, and Ishida, 2017; Nagai, Asano, *et al.*, 2017; Saito, Iba, and Nagai, 2017; Nagai, 2018; Iba and Nagai, 2018; Iba, 2019b). Although the source of mining for *Words for a Dialogue* is highly professional practice, the pattern language aims to resolve problems through dialogue in everyday life, so it can also be said to support everyday life as mentioned above.

In addition to these, in 2015, we collaboratively crafted a pattern language at the request of Toyota Motor Corporation's Future Project Office. For this project, we developed a pattern language to capture the values of target customers during qualitative research (customer insight) when considering new products and services. This innovative method aimed to understand what makes the subjects feel energized and engaged. The resulting pattern language encapsulated the "energized state" of customers (the intended users of products and services), which was subsequently utilized within the company (Suzuki, Otsuka, and Yoshida, 2015). This represented a novel application in a corporate setting: creating a pattern language to grasp customer values.

During this period, we also conceived and developed several creative languages that, while inspired by the concept of pattern languages, were distinct entities in their own right. One such novel approach is "Future Language" (Iba Lab, 2014e; Iba and Nakagawa, 2014; Iba, 2016c). This methodology involves capturing elements that constitute a vision of the future in discrete units akin to patterns, describing them, and assigning them unique names, Future Word (Figure 156). We frequently implemented this approach through participatory workshops, which we call "Future Mining Workshop," involving residents or users, applying it to various contexts such as placemaking, community development, and educational program design. We conducted Future Language workshops and applied the outcomes to a diverse range of real-world scenarios, including office (Honda, Nakagawa, and Iba, 2015) and cafe-restaurant designs (Suzuki, Honda, *et al.*, 2015), after-school program development, and local agricultural initiatives (Fujioka, Honda, *et al.*, 2015). Additionally, we employed this approach in discussions centered on community centers in underprivileged areas of Southeast Asia (Nakamura and Iba, 2015a). Furthermore, we conducted a Future Mining Workshop at the PLoP conference to create a Future Language about the future of the Pattern Community (Figure 157; Iba, 2014e).



Fig. 156. Future Language: Creating and naming elements that do not yet exist but constitute a vision of the future.



Fig. 157. Future Mining Workshop for co-creating the Future Language of the pattern community at PLoP 2014 conference (Iba, 2014e).

The second creative language we developed is the "Concept Language." While it adheres to the same structural format as patterns in a pattern language (Context, Problem, and Solution, accompanied by Name and Illustration), its content diverges significantly. Rather than documenting established empirical rules with existing examples, Concept Language articulates forward-thinking ideas or desired behaviors for future implementation. A prime example of our Concept Language application was in developing an area disaster prevention strategy for central Tokyo (Figure 158; Iba, 2016d). This project was commissioned by a local city planning council, aiming to communicate optimal actions and behaviors to businesspeople in the area during a major earthquake. Each concept word (analogous to a pattern name) succinctly conveys crucial actions individuals should take during a seismic event, while also serving as a common lexicon for broader discussions.

The key distinction lies in the nature of the content: while pattern languages describe empirical rules derived from actual examples, Concept Language outlines expected behaviors in response to specific environmental conditions. This fundamental difference led us to classify it separately from pattern languages, coining the term "Concept Language" to emphasize its unique characteristics and applications. The development of this Concept Language was initiated in response to requests from people who had been exposed to our previously crafted and published *Survival Language*. These stakeholders expressed a keen interest in developing a similar linguistic framework for their own purposes. This Concept Language was displayed as an interactive system at the Ecozzeria site in Tokyo and was used for communication among businesspeople and members involved in area management (Figure 159).



Fig. 158. Examples of Concept Words in the Concept Language for Area Prevention of Disasters for The Case of The Otemachi-Marunouchi-Yurakucho (OMY) District (Iba, 2016d).



Fig. 159. The Concept Language for Area Disaster Prevention in the Otemachi-Marunouchi-Yurakucho (OMY) District was displayed as an interactive system at ECOZZERIA, Tokyo.

The third language we developed is what we term "Culture Language" or "Community Language" (Figure 160; Ogo, Oi, et al., 2016). This approach encapsulates the essence of a specific community's culture, particularly focusing on their core values and principles, articulated in discrete units akin to patterns. A prime example of this was our initiative coinciding with the 25th anniversary of our university faculty and campus (SFC). Recognizing the milestone as an opportunity for introspection, we embarked on a project to verbalize the

fundamental ideals that have shaped our academic community. Through interviews with 50 stakeholders, we synthesized their insights to create the *SFC Culture Language*. This comprehensive cultural lexicon not only served as a reflection of our collective ethos but also as a forward-looking guide. It was formally introduced and distributed to attendees during the 25th anniversary ceremony, serving as both a celebration of our past and a compass for our future endeavors (Iba Lab, 2016b).



Fig. 160. Culture/Community Language: method of encapsulating and expressing the values of a specific community through concise description.

The fourth creative language we developed, distinct from pattern languages, is "Cooking Language," which emerged from our culinary research endeavors. Our inaugural Cooking Language was an *Egg Language*, which articulates the multifaceted functions of eggs as an ingredient and elucidates their contributions to various culinary creations (Isaku, Kubonaga, and Iba, 2015; Isaku and Iba, 2017). We further expanded this concept by developing *Washoku Language*, a comprehensive cooking language for Japanese cuisine (Isaku, 2017). While these Cooking Languages share some linguistic similarities with pattern languages in their application, they diverge significantly in structure. While these Cooking Languages can be used linguistically similar to pattern languages, they are not described in the Context, Problem, and Solution format. Therefore, we distinguish them as entities that, while similar to pattern languages, are fundamentally different.

(2) Methodology of Crafting in 2015-2016: Mining Patterns from Our Experiences and Crafting a Pattern Language for Crafting Pattern Languages

The characteristic of this period in the research on methods for crafting pattern languages is that we reflected on and analyzed what we do in our pattern language crafting process and worked on verbalizing the essences of practice at each phase as patterns. We started working on the *Pattern Illustrating Patterns* slightly ahead of the previous year, and in 2015, we ran three projects on *Pattern Mining Patterns* (Sasabe, Kaneko, *et al.*, 2016), *Pattern Writing Patterns*, and *Pattern Symbolizing Patterns* including pattern naming (Shibata, Kogure, *et al.*, 2016), in parallel to elucidate and verbalize our practices.

These patterns were eventually compiled into a pattern language consisting of 364 patterns (Iba and Isaku, 2016). In this pattern language for creating a pattern language, the entire collection is divided into three main categories: Pattern Mining, Pattern Writing, and Pattern Symbolizing, each consisting of 121 patterns. Each of these categories is further divided into three subcategories, resulting in a six-level hierarchy as shown in Figure 161.

In this pattern language, not only the elements at the lowest level (level 6) but also all the categories at every level are written as patterns. Similar to Alexander's A Pattern Language, there are patterns ranging from large-scale to small-scale. In the Solution and associated Actions of each higher-level pattern, lower-level patterns are mentioned, so when attempting to practice a higher-level pattern, one naturally becomes aware of and practices the lower-level patterns as well (Figure 162). Figure163 presents an alternative visualization of this hierarchy, which may give a slightly different impression than the neat hierarchical structure.

Now, when presenting such a hierarchical structure, one question that inevitably arises is: Didn't Alexander argue in his essay "A City is Not a Tree" (Alexander, 1965) that semi-lattice structures, rather than tree structures, are important? So, isn't it problematic that these pattern languages have such a tree-like structure? It is well-known that Alexander advocated for pattern languages to generate semi-lattice structures in spatial design. And indeed, it is understandable that the system structure we present appears to be a neat tree structure, giving the impression that the pattern language itself has become a tree structure.



Fig. 161. Overview structure of patterns in A Pattern Language for Creating a Pattern Language (Iba and Isaku, 2016).



Fig. 162. Connections between upper patterns and sub-patterns in the pyramid structure of patterns in A Pattern Language for Creating a Pattern Language (Iba and Isaku, 2016).

However, one should not be deceived by appearances. Semantically, as shown in Figure 164, there are links between elements of different categories, rather than a pure tree structure. We could even call it a semi-lattice. The creation of categories and groupings is intended to make it easier for users of the pattern language to grasp the overall picture and remember the patterns. When handed a complex network, people can only stand in bewilderment. Instead, we craft pattern languages in such a way that, based on an easy-to-understand map, as one walks through each pattern, they discover a semantically more complex and richer world. I would like to reemphasize that the neat and easy-to-understand overview does not represent everything; it is merely a "map" that visualizes the structure in an easy-to-understand way from a certain perspective.



Fig. 163. Categorical structure of patterns in A Pattern Language for Creating a Pattern Language (Iba and Isaku, 2016).



Fig. 164. Semantic relations between patterns in A Pattern Language for Creating a Pattern Language (Iba and Isaku, 2016).

Additionally, we proposed a method for systematizing languages into a cohesive system (Ishida, Nagai, and Iba, 2017), patterns for conducting Mining Workshops (Kogure, Akado, *et al.*, 2015; Akado, Kogure, *et al.*, 2015), and a new approach to comparative cultural studies through this mining (Sasabe, Hong, *et al.*, 2015; Hong, Akado, *et al.*, 2015).

In addition, we undertook a method of agile pattern creation, which differs from our usual deliberate and heavyweight process for crafting pattern languages (Iba, Kimura, *et al.*, 2015b). Around this time, our university decided to expand the campus and build a new educational facility with accommodation. As part of the architectural education program, faculty and staff were tasked with designing the facility. During this design process, we practiced agile development of patterns by capturing good design ideas that emerged during our weekly discussions and immediately describing them as patterns. These patterns were then utilized in the following week's discussions. This approach was greatly inspired by Alexander's attempts to capture the voices of campus users as patterns, which is well-known as *The Oregon Experiment* (Alexander, Silverstein, *et al.*, 1975) and the Eishin Campus projects (Alexander, Neis, and Alexander, 2012; Guttmann, Kaiser, and Mazanek, 2019). Rather than focusing on universal patterns to be shared widely, this endeavor aimed to articulate and share design ideas tailored to the specific location, making them more manageable and accessible.

I'm delighted to share that in 2015, our methodology was adopted in the process of crafting pattern languages. This was highlighted by Yishay Mor, who tweeted "pattern mining Takashi Style" during the EduPLoP workshop. (Figure 165). The results of these endeavors have been presented at conferences like PLoP, EuroPLoP, and VikingPLoP (Warburton, Bergin, *et al.*, 2016a. 2016b; Bergin, Kohls, *et al.*, 2015a, 2015b, 2016; Kohls, Nørgård, and Warburton. 2017).



Fig. 165. Scene of EduPLoP (Courtesy of Yishay Mor).

(3) Ways of Expressing and Utilizing in 2015-2016: Conceiving and Implementing Pattern Object, Pattern Song, Pattern Concierge, and Idea Generation Workshops

In 2015-2016, we also made new attempts regarding media for delivering pattern languages. We proposed and demonstrated Pattern Objects, which embed patterns in places where they can be seen on a daily basis (Figure 166; Iba, Yoshikawa, *et al.*, 2016c). A symbolic example is a cutting board engraved with one of the *Cooking Patterns*, **Uniform Bites**. There is also the "Survival Basket," which, when used according to the **Daily Use of Reserves** from the *Survival Language*, gives instructions to do **Extrastock**. These Pattern Objects were created by us using FAB machines (Figure 167), and the FAB data was also made publicly available on the web. The digital data for these are publicly available, allowing people to engrave the patterns on their own cutting boards using a FAB laser cutter or embroider the basket cover using a FAB sewing machine.



Fig. 166. Pattern Objects embedded in everyday life environment (Iba, Yoshikawa, et al., 2016c).



Fig. 167. Prototypes of Pattern Objects presented in our paper (Iba, Yoshikawa, et al., 2016c) were self-made using FAB machines.

Furthermore, we proposed and demonstrated a "Pattern Song" with lyrics that incorporate the patterns of a pattern language (Figure 168; Iba, Ueno, and Yoshikawa, 2017). The one we created was based on the patterns of *Ways of Everyday World-Making*, and it is available for listening on music streaming platforms such as Spotify and Amazon Music under the title *Everyday World*³. The lyrics were written by Mayu Ueno, who was a student in the Iba Lab at the time, and me, while the composition was done by Mayu. It features professional band performance with Mayu on vocals. The lyrics include the Problem, Solution, Pattern Name, and other elements of the patterns, so listening to the song allows one to encounter the key messages of the pattern language. We created it as a song of support for busy people who are raising children while working, so that they can grasp the essence of the patterns by listening to the song instead of reading the text of pattern description.

日々の世界』	Everyday World	No.0 Everyday World (N)
あのこはどんどん変わっていくのに わたしはどうかしら? はあ 仕事も家事も君とのことも 大切なのだけど 時間が足んない	Everyone seems to do it so well but me? I can't say the same. Work, home, and you: I care about them all but I just don't have the time.	No.2 Palette Mixing (P) No.1 Natural Balance (P) No.5 Compose the Day (P) No.9 Focus and Simplify (P)
<u>急ぐ帰り道</u> 赤い信号 いつまで待つのかな <u>もう</u> ため息飲んで 見上げた空の先 早く行かなく5ゃ	Rushing home but a red light caught me. Seems like I'm always waiting. Suppress a sigh and stare into the sky. Time to go again.	No.5 Compose the Day (P)
<u>おかえり ただいま</u> に涙が溢れた おつかれ ありがとう 特別な日じゃなくても	When I get home, you're at the door. Just that brings tears to my eyes. "My pleasure" and "Thank you" maybe aren't just for special days.	No.24 Take-off Chance (P) [Thoughtful Gift] (No.28-30) No.33 Precious Memories (S)
世界をつくろう わたしたちなりの 日々の世界をつくって らしくやっていこうよ wow 悩めるのも わたしたちだからこそのチャンス それでも悲しい夜は君に 愛を伝えよう	We can make our world together. Lefs do some tEveryday World-Making" and be ourselves. Times of trouble might be our hidden chance. Even knowing that, the night can still be blue. So I'll give to you my 'l love you".	[Own World-Making](No.0) No.0 Everyday world (S) [Original Color](No.1-3) No.1 Natural Balance (S) No.3 Search for Style (S) No.0 Everyday World (N) No.0 Everyday world (S) No.2 Palette Mixing (S) No.25 Journey of Parenting (S) No.28 Reflection Check (P)
		No.30 Gesture of Love (N)

Fig. 168. Pattern Song, which is auditory expression for pattern languages (Iba, Ueno, and Yoshikawa, 2017).

Additionally, we introduced the concept of a "Pattern Concierge" and put it into practice at the SFC Open Research Forum (ORF) (Iba Lab, 2015). A Pattern Concierge is a specialist who listens to a person's current projects and challenges, and then recommends a pattern that is well-suited to their needs (Mori, Kimura, *et al.*, 2016). In our example, we chose relevant patterns from the vast collection of pattern languages developed by the Iba Lab over the years, which include hundreds of patterns (Figure 169). We presented the selected patterns

³ <u>https://open.spotify.com/intl-ja/track/4soJPMUcXaTxOEUm9ZrR22</u>. The demo version of the music (Gene and Iba, 2016), which features programmed performances and was released at ORF 2016 before the official release, can be listened to at <u>https://www.youtube.com/watch?v=IPZMIAe6TjM</u>.

to each individual as cards. Some participants found the cards so valuable that they continued to keep them in their notebooks long after the event.



Fig. 169. Pattern Concierge at the SFC Open Research Forum (ORF) in 2015 (Iba Lab, 2015; Mori, Kimura, et al., 2016).

In the following year, 2016, at the ORF, we conducted the "Lightning Workshops: 100 Ways of Utilizing Pattern Languages" (Iba Lab, 2016c). This event was held over two days at the Iba Lab booth, where we conducted a variety of mini workshops using various pattern languages. We named it "Lightning Workshops" because, much like Lightning Talks, where talks are given in rapid succession, these workshops were conducted one after another in a short format. During these two days, we held over 100 mini-workshops that utilized pattern languages, ranging from standard styles to unique workshops conceived by the Iba Lab members (Figure 170). Through this event, we aimed to give visitors a sense of the appeal and possibilities of pattern languages.



Fig. 170. Lightning Workshops with utilizing pattern languages (Iba Lab, 2016c).

And in terms of how to conduct workshops using pattern languages, we developed and implemented new types of workshops. It is the Idea Generation Workshop, where participants come up with products, services, or mechanisms that make it easier to implement the Solution of a pattern or that prevent the Problem of a pattern from occurring (Figure 171). The workshops we conducted at several international conferences, in Japan, Italy, and USA, and university classes used the Pattern Cards of *Words for a Journey* to generate ideas that would improve the lives of people with dementia and their families (Figure 172; DFJI, 2014; Iba, Okada, and Yoshikawa, 2016; Yoshikawa, Kaneko, *et al.*, 2016; Iba, Yoshikawa, *et al.*, 2016b; Kaneko, Yoshikawa, and Iba, 2016), while also utilizing the *Project Design Patterns* to support idea generation.



Fig. 171. Idea Generation with patterns.



Fig. 172. Idea Generation Workshop with utilizing Words for a Journey cards towards dementia-friendly society in Japan, Italy, and USA.

We also held talk sessions showcasing applications of pattern languages in education (Suzuki, Itoh, *et al.*, 2016) and business (Ikeda, Iwanami, *et al.*, 2016). Additionally, I invited Joe to give a lecture and workshop on "What is Pattern Language?" (Yoder and Iba, 2016).

In addition to the qualitative research we have conducted so far (Iba, 2014i, 2014j), we also study it by conducting quantitative surveys and found that participants felt the benefits and effectiveness of sharing experiences beyond simply reading the patterns, based on 710 valid responses (Iba, 2017g). In response to the question, "Do you think it was important for you to listen to the learning experiences of others, in order to help you think about your own way of learning?" 95.7% of respondents agreed that it was important, with 60.6% indicating 'Strongly Agree' and 35.1% selecting 'Agree.' Additionally, when asked, "Did you feel that the *Learning Patterns* helped you to articulate your own stories of learning during the dialogue?" 90.3% of respondents felt that they did, with 38.6% choosing 'Strongly Agree' and 51.7% opting for 'Agree.' Lastly, in response to the question, "All in all, was it enjoyable for you to read the *Learning Patterns* and engage in dialogue with others?" 96.5% of respondents found the experience enjoyable, with 59.2% indicating 'Strongly Agree' and 37.3% selecting 'Agree.'

During this period, there were also developments in the editorial design of pattern language books. When creating the book *Project Design Patterns*, we also put consideration into the structure of the book. Since this book was intended to be published as a business book, we kept that in mind throughout the creation process. For each group of patterns, we began by writing a case study of mining in a readable format, enabling readers to have a concrete image while exploring the patterns. During the development of *Presentation Patterns* book, we faced challenges with the constraint of allocating four pages to each pattern. To avoid this, we decided not to

write a case study for every single pattern in this book. Some patterns have engaging and powerful case studies, while others, though important, may not have particularly captivating episodes. Uniformly deciding on a specific number of pages per pattern can make the writing process arduous and might not be optimal for the readers. Taking this reflection into account, in the *Project Design Patterns* book, we opted to start with a two-page episode introduction for each group, covering all the patterns within the group but allowing flexibility in the amount of text dedicated to each one. I still consider this to be an effective approach.

From the outset, Project Design Patterns was intended to be published as a book, and the pattern language was crafted toward it. Consequently, there is no booklet version of this work. The layout of the pattern pages in the book was designed by a designer from UDS Ltd., the company with which we collaborated on crafting this pattern language. The visual design is intriguing and showcases ideas that we wouldn't have conceived on our own. The designer's comment that the Context should be emphasized in the pattern description was particularly interesting and insightful. After all, readers decide whether to read a page based on the relevance of the context to their own situation. As a result, the Context sentence was emphasized by increasing the font size and underlining it.

During the crafting of *Words for a Dialogue*, I developed a new form of representing the overall system, which would be used thereafter (Figure 173). Basically, it is close to the format of a list of patterns by category, but the categories are enclosed in (rounded) rectangles, and the groups are indicated by placing three patterns close together, with spaces between groups. If there is a label or pattern that bundles categories or groups, that name is placed above the enclosure (rectangle). From this pattern language onward, the overall system is basically represented using this design, sometimes with minor arrangements.



Fig. 173. A new form of representing the overall system of a pattern language, introduced in Words for a Dialogue.

Additionally, in the book *Words for a Dialogue*, similar to the *Presentation Patterns* book, we included a page after each category cover page that discusses the essential points for practicing the patterns in that category, using the pattern names, as follows:

Feel the Experienced World

In Open Dialogue, the manner in which a person dealing with a problem views the world and perceives things is understood through dialogues. The experiences that led to their perspectives can also be understood by listening to their story.

To properly understand their **Experienced World**, you should break free from your role and approach the other **As a Living Person**. **Deep Listening** is important when considering their words so that you can use the **Exact Same Words** to respond.

Instead of 'Yes or No' questions, **Open Questions** must be asked so that they can freely express their thoughts and feelings. It is important to give them a **Pause for Thinking** especially when discussing things that they have not yet been able to put into words. When they share their thoughts with you, ensure to provide a **Response to What is Said**.

To truly understand their **Experienced World** rather than just knowing their situation, it is necessary to see it from their **Inner Viewpoint**. Their pent-up emotions may overflow, but you should understand that it is a **Tunnel of Emotion** that helps them express their deeper

feelings that they have been unable to express in words. In such a case, you should show your **Respectful Mind** for the fact that they have endured difficult situations and help them to express their feelings in words.

Accordingly, you can gradually deepen your understanding of the other person's **Experienced World**.

This approach in *Words for a Dialogue* became a standard for our subsequent booklets and books. While presenting the overall picture through a list of pattern names or diagrams is an easy-to-understand method, expressing it through prose also effectively conveys the essence, coherence, and quality generated by the patterns.

Besides, we proposed a new presentation method that involves transcribing Mining Interviews and talks, and then linking the patterns we finally got back to the transcribed text (Figure 174; Oi, Kubota, *et al.*, 2015). As a case of this idea, we later created and published a diagram in our paper (Iba, Mori, and Yoshikawa, 2019) on *Project Design Patterns*, where we applied this concept to real data (Figure 175).



Fig. 174. Patterns indicated to the location of the interview transcription (Oi, Kubota, et al., 2015).



Fig. 175. A Diagram linking each pattern to the corresponding transcriptions from Mining Interviews (Iba, Mori, and Yoshikawa, 2019).

(4) Pattern Communities in 2015-2016: New Community on Pattern Languages for Societal Change and Interactions with Key Figures in Architecture

At the 2015 PURPLSOC conference (Figure 176), I was invited to give a keynote speech (Figure 177; Iba, 2015d). In it, I introduced pattern languages of practices, Dialogue Workshops, Pattern Cards, and the 24 Fundamental Behavioral Properties. For me, it was my first keynote speech at an international conference other than the invited talks at PLoP and SugarLoafPLoP.



Fig. 176. PURPLSOC Conference in 2015, with wearing purple socks.



Fig. 177. My keynote at PURPLSOC Conference in 2015 (Iba, 2015d).

And in 2016, following the 20th anniversary in 2013, Iba Lab was again in charge of designing the PLoP Tshirts. This time, the illustration depicted Manabu-kun and friends engaged in a Writers' Workshop (Figure 178). The bearded character is Richard Gabriel, the moderator. I particularly like the "Gush!" Joe and I participated in brainstorming ideas, composition, and expressions, and Yuma Akado, from the Iba Lab, drew the illustration. Thanks in part to the 2013 T-shirts, I felt that the recognition of the Iba Lab's Pattern Illustration characters had increased among many of the participants.

Around this time, our pattern language style and crafting methods started to be accepted and introduced in the pattern community. One symbolic event was when our style began to be introduced in the Bootcamp (tutorial session) at PLoP conference. I remember being deeply moved when our style was introduced in the Bootcamp by Joe Yoder and Rebecca Wirfs-Brock (Figure 179).

It has been presented alongside Alexandrian Form from *A Pattern Language*, the GoF (Gang of Four) Form from *Design Patterns*, and the *Fearless Change* Form, often referred to as "Pattern 3.0 Format" or "Iba-Style" (Figure 180). In our initial stages, we formatted our pattern form with Forces and Actions in bullet points, aiming for quick and immediate comprehension, but as demonstrated later in this paper, we eventually transitioned away from this bullet-point approach for Forces and Actions, opting instead for a more conventional prose style in subsequent years.



Fig. 178. Our character "Manabu-kun" was used for T-Shirts design of PLoP 2016.



Fig. 179. Bootcamp led by Joe Yoder and Rebecca Wirfs-Brock.



Fig. 180. PLoP Bootcamp slides on pattern styles and forms (Courtesy of Joe Yoder).

In 2015, EuroPLoP celebrated its 20th anniversary (Figure 181). By this time, we were regularly participating in PLoP, EuroPLoP, and AsianPLoP, presenting papers, conducting workshops, and interacting with participants from each region.

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Fig. 181. 20th EuroPLoP conference in 2015.

Regarding societal change through pattern languages, the PURPLSOC conference emerged as a new platform, held in Krems, Austria in 2014, 2015, and 2017. PURPLSOC stands for "Pursuit of Pattern Languages for Societal Change," distinctly emphasizing societal change. As well as PLoP conference, we also presented papers of pattern language of practice especially for Everyday Life and Journey of Life at this conference. It became a crucial venue for our presentations and interactions.

I also had various interactions with people in the architecture. I gave a lecture on our pattern language researches in Prof. Hajo Neis' class at the Portland Urban Architecture Research Laboratory (PUARL) at the University of Oregon (Figure 182; Iba, 2015). The following year, at the PUARL 2016 conference held in San Francisco, I gave a talk at the Plenary Session titled "Evidence-based Patterns and Research Foundations." Peter Bosselmann gave an introduction, and Peter Baumgartner and Dorit Fromm provided commentary. In the session, Max Jacobson gave a talk on "Research Foundation in the Original Pattern Language" (Iba, 2016b). After that, I presented "Creating Pattern Languages for Human Actions" (Figure 183). Sharing the same session with Max Jacobson, one of the co-authors of Christopher Alexander's A Pattern Language, to give a talk about Pattern Languages of Practices was a wonderful experience.

Furthermore, I was honored to be invited to join the Panel Discussion at the conclusion of the PUARL 2016 conference, where I had the privilege of sharing the stage with Hajo Neis and Artemis Anninou, who studied under Christopher Alexander, Howard Davis, who collaborated with him, and Christian Kohls and Peter Baumgartner, who engaged in pattern language of practices, especially in education (Figure 184). Although Chris, Peter, and I come from disciplines outside of architecture, being able to engage in thought-provoking conversations about pattern language was an incredibly rewarding experience that I could not have envisioned just a few years prior. Also, in Japan, I engaged in discussions with architects related to pattern languages (Fujimura, Iba, and Namba, 2015).



Fig. 182. I Gave a lecture at the Portland Urban Architecture Research Laboratory (PUARL) in 2015.


Fig. 183. I Gave a talk at the Plenary Session at the PUARL 2016 conference.



Fig. 184. I Gave a talk at the Plenary Session at the PUARL 2016 conference.

In 2015, I took a role of the Conference Chair of the COINs conference, which was held in Tokyo (Figure 185). At that time, in addition to the usual members of the COINs conference, such as Peter Gloor, I also called for members from the pattern community to participate. I thought it would be great if the COINs community members, who study creativity and collaboration, could learn more about pattern languages and engage in intellectual exchange and interaction. I invited Mary Lynn providing an opening keynote at COINs conference (Manns, 2015). Joe and I conducted a workshop (Yoder and Iba, 2015), and Chris gave a presentation on his *Patterns for Creative Thinking* (Kohls, 2015a). It is a fond memory that Joe, Chris, and Mary Lynn participated, and we had a wonderful time in a Japanese-style atmosphere in Tokyo.



Fig. 185. Memories of Interacting with the pattern community members in Tokyo during the COINs Conference.

Christian Kohls continued to publish a series of papers on the patterns of Creative Thinking and Innovation (Kohls. 2015b, 2015c, 2016a, 2016b, 2016c, 2017b, 2019). During this time, Christian Köppe, together with Anne Bartilla, worked on crafting a pattern language for an important yet unique theme in this area that had not been

addressed before: *A Pattern Language for Increasing Gender Diversity in Computer Science Education*. They published several papers on this topic (Köppe and Bartilla, 2014, 2017; Bartilla and Köppe, 2015, 2016). Additionally, Christopher Preschern, who would later become one of the organizers of the European pattern community, presented a paper titled "A Pattern Language on how to provide Feedback on Scientific Papers."

In 2015, it was a great honor to be invited to become a board member of The Hillside Group, which runs PLoP, AsianPLoP, SugarLoafPLoP, and other conferences. I have been hoping to contribute to the development and dissemination of pattern language research. During this period, I also became CIEC (Community for Innovation of Education and learning through Computers and communication networks), and served on the Program Committee for AsianPLoP 2015, AsianPLOP 2016, EuroPLoP 2016, PLoP 2015, PLoP 2016, and PUARL 2016, and on the Steering Committee for COINs 2016.

During this period, I collaborated with international researchers to plan and conduct workshops at the PURPLSOC conference, where we mutually inspired each other (Iba, Neis, and Finidori. 2015; Morris, Iba, and Leitner, 2015; Finidori, Borghini, *et al.*, 2015). And, in 2015, Mary Lynn and Linda's *More Fearless Change* was published. I provided a recommendation quote. Also, Mary Lynn and I conducted a *Fearless Change* Workshop in Tokyo (Figure 186; Manns and Iba, 2015).



Fig. 186. Mary Lynn's Fearless Change Workshop (Manns and Iba, 2015) and keynote at the COINs conference (Manns, 2015) in Tokyo.

(5) Theories and Philosophies in 2015-2016: Exploring the Nature of Order in Practices and Proposing the Fundamental Behavioral Properties

An interesting attempt we made during this period is the "Fundamental Behavioral Properties." After proposing pattern languages, Christopher Alexander explored the properties latent in living structure of spaces, identified 15 Fundamental Geometrical Properties, and discussed them in detail in his book, *The Nature of Order, Book One* (Alexander, 2002a). These properties are what give life to spaces, and the patterns in a pattern language support the incorporation of such properties into the spatial design being created.

When I read this, I thought that such fundamental properties might also be latent in good practices. This is because, while crafting pattern languages, I had repeatedly felt that there were common characteristics behind good practices across different fields. So, we decided to explore them as well. We worked on this together with the students in the Iba Lab. However, if we approached it in the same way as Alexander, it would likely take us 30 years, just like him. Moreover, unlike spaces, practices disappear instantly, making them difficult to study as they are just by observation. Therefore, we thought we needed to devise a strategy, and we actually came up with a clever one.

The strategy is as follows. In *The Nature of Order, Book One*, Alexander mentioned many patterns from *A Pattern Language* in the footnotes of the chapters explaining each property. These patterns are there to embody this property. If we think of this in reverse, we might be able to glimpse the properties by looking for commonalities among similar patterns. So, we decided to adopt the strategy of collecting patterns from the pattern languages of practices we had crafted so far that have similar essences and exploring the properties behind these groupings (Figure 187). This way, we indeed obtained 24 Fundamental Behavioral Properties (Figure 188; Iba, Kimura, *et al.*, 2015a; Iba, Kamada, *et al.*, 2015; Harashima, Kaneko, *et al.*, 2015; Akado, Kimura, *et al.*, 2016). For example, the behavior of constantly involving the surroundings strengthens that practice, or the behavior of gently accompanying brings a quiet but deep reinforcement, and so on.

These 24 Fundamental Behavioral Properties are characteristics that enhance the life of a practice, so they can be used directly to think about things. For example, at the PLoP and EuroPLoP conferences, we conducted workshops using Fundamental Behavioral Properties cards to make pattern language conferences more vibrant in EuroPLoP (Figure 189; Iba and Akado, 2015) and PLoP (Figure 190; Iba, Yoder, and Wirfs-Brock, 2015).



Fig. 187. Process of identifying Fundamental Behavioral Properties (Iba, Kimura, et al., 2015a).



Fig. 188. Fundamental Behavioral Properties (Iba, Kimura, et al., 2015a).



Fig. 189. EuroPLoP 2015 focus group "Thinking Patterns for Human Actions with the Fundamental Behavioral Properties" (Iba and Akado, 2015).



Fig. 190. PLoP 2015 focus group "Generative Processes of Community with the Fundamental Properties" (Iba, Yoder, and Wirfs-Brock, 2015).

Moreover, since these properties are important for making patterns stronger, by occasionally checking against the Fundamental Behavioral Properties during the crafting of a pattern language, we can use it as an opportunity to make the patterns deeper rather than just describing superficial ways of doing things (Figure 191). We also performed such reinforcement during the process of the crafting *Words for Caring* (Kaneko and Iba, 2022a), a pattern language for care practices and place-making that would later be published.

In 2015, management scholar Prof. Ikujiro Nonaka, together with economic and management journalist Akira Katsumi, published a book titled *All Employees in Company Management: The Essence of Success in Autonomous, Decentralized Innovative Enterprises* (Nonaka and Katsumi, 2015). In this book, pattern language is mentioned, and the following sentence is included:

Pattern language was subsequently applied to the field of computer software development, and now it is beginning to be applied to various fields such as organizational design, educational design, human behavior design, and policy design (Nonaka and Katsumi, 2015, p.10).

And my book *[Reality+]* Pattern Language was listed in the references. As a long-time admirer and devoted reader of Professor Nonaka's works, seeing my own contribution acknowledged in his publication was an immensely rewarding and deeply humbling experience.



Fig. 191. Utilizing Fundamental Behavioral Properties cards in the crafting of the Words for Caring for improvement.

The following year, through a connection with Okada-san, a co-author of *Words for a Journey*, I was introduced to and had the opportunity to meet and talk with Prof. Nonaka (Figure 192). I confirmed that he saw significance in pattern language from the perspective of the SECI model, which includes the conversion of tacit knowledge to explicit knowledge in knowledge creation.



Fig. 192. Dialogue on pattern languages and knowledge creation with Prof. Ikujiro Nonaka in 2016.

In the software field, it's known that when Jeff Sutherland and others developed the "Scrum" software development method, they were inspired by the "scrum approach" described in a Harvard Business Review article by Prof. Ikujiro Nonaka and others (Takeuchi and Nonaka, 1986; Hiranabe, Nonaka, and Oyobe, 2021). While a pattern language for Scrum was created, connecting Scrum and pattern language, I believe it's important that at their source, knowledge creation and pattern language are fundamentally connected. I haven't been able to deeply consider and write this topic yet, so I'm hoping to explore it in the near future.

Furthermore, it's truly interesting that subsequently, both Prof. Nonaka and I independently came to believe in the importance of phenomenological essence intuition and began thorough explorations (Nonaka and Yamaguchi, 2022). Though our fields may appear different on the surface, our philosophies are connected by underground streams of thought.

Furthermore, I emphasized on positioning pattern languages in relation to the near-future vision of a creative society (Iba, 2016a; Kimura, Akado, *et al.*, 2016; Kimura, Akado, and Iba, 2016). Also, to gain a deeper understanding of the creation and functions of pattern languages, we examined them from the perspective of Psychology, based on the work of Lev Vygotsky (Iba and Yoshikawa, 2016a); and philosophically from the perspective of Pragmatism, drawing from the works of C.S. Peirce and John Dewey (Iba and Yoshikawa, 2015; Iba and Yoshikawa, 2016b).

The events of this period are summarized in the timeline shown in Figures 193 and 194.

Languages and Methods	rn Conferences and Publications	Our Papers, Books, Talks, and Workshops
(Pattern Illustrating Patterns)	Program Conference Co-Chair of Chair of AsianPLoP COINs	Application to New Domains: Pattern Languages of Practices in Everyday Life such as Parenting and Cooking
Fundamental Behavioral Properties Project Design Patterns Pattern Language 3.0	Creative City Consortium AsianPLoP 2015 March 5-7, Japan The book	Words for a Journey (Book in Japanese) Words for a Journey (Book in English) "Words for a Journey" (PURPLSOC paper) Survival Language (Book in English) "Creative CoCooking Patterns" (EuroPLoP paper) Change Making Patterns (Book in English) "Fostering Changemakers with Change Making Patterns" (PURPLSOC paper)
Cooking Patterns & Cooking Life Patterns Natural Living Patterns	COINS 2015 Mar 12-15, Japan More Fearless Change	Methodology of Crafting: Mining Patterns from Our Experiences and Crafting a Pattern Language for Crafting Pattern Languages
	book was published The book was published Program Committee of PLoP	Pattern Illustrating Patterns (Book in English) A Tale of Pattern Illustrating (Picture Book in English) "Pattern Illustrating Patterns" (PLoP paper) "Five Patterns for Designing Pattern Mining Workshops" (EuroPLoP paper) "Five Key Points in the Design of a Pattern Mining Workshop" (AsianPLoP paper) "A Method for Cultural Understanding through Pattern Mining" (AsianPLoP paper) "Understanding Cultural Similarities and Differences by Mining Patterns of Thinking and Doing in Daily Lives" (COINs paper) "The Method of Agile Pattern Creation for Campus Building" (PLoP paper)
	The books were published lizing s PURPLSOC 2015 July 3-5, Austria	Ways of Expressing and Utilizing: Conceiving and Implementing Pattern Object, Pattern Song, Pattern Concierge, and Idea Generation Workshops "Pattern Concierge" (ORF exhibition) Words for a Journey Cards, Survival Language Cards (Pattern card deck) "Pattern Cards Workshop" (PURPLSOC workshop) "Touching Patterns to Interview Transcriptions"
	The pattern cards for sale	(EuroPLoP paper) Pattern Communities: New Community on Pattern Languages for Societal Change and Interactions with Key Figures in Architecture "Pattern Language 3.0 and Fundamental Behavioral Properties" (PURPLSOC Keynote) Creating Pattern Languages for Good Quality of Life"
	of The Hillside Aroup The article was published	(PUARL lecture) "Bridging Pattern Languages for Social Innovation via Systemic Patterns" (PURPLSOC workshop) "Pattern Language 1.0, 2.0, 3.0 and 4.0" (PURPLSOC workshop) "Pattern Language 3.0 for New Business Development and Organizational Revitalization" (CCC seminar)
	PLoP 2015 Oct 24-26, USA Lecture at the University of Oregon	"The Contemporary Significance of Pattern Language" (10+1 roundtable discussion article) Theories and Philosophies: Exploring the Nature of Order in Practices and Proposing the Fundamenta Behavioral Properties "The Fundamental Behavioral Properties" (PURPLSO papers)
	ORF 2015 Nov 19-21, Japan	"Fundamental Behavioral Properties, part I" (EuroPLoP paper) "Fundamental Behavioral Properties, part 2"(PLoP paper "Thinking Patterns for Human Actions with the Fundamental Behavioral Properties" (EuroPLoP worksho "Generative Processes of Community with the Fundamental Properties" (PLoP workshop)

Fig. 193. Timeline of our pattern language research in 2015, in the second period of the EXPANSION PASE.



Fig. 194. Timeline of our pattern language research in 2016, in the second period of the EXPANSION PHASE.

7.3 Expanding Pattern Languages of Practices to Various New Everyday Activities and Sharing Our Methodology with People Globally [2017-2019]

During the final third of the EXPANSION PHASE, spanning the years 2017-2019, despite being extremely busy and facing personal challenges such as falling gravely ill and undergoing recovery, our team and I produced numerous accomplishments. (1) First, in terms of the application of pattern language to new domains, we engaged in crafting pattern languages that infuse humanity and creativity into practices across diverse fields. (2) Regarding the methodology of crafting, we conducted workshops to offer experiential learning of our methodology. (3) Furthermore, in terms of ways of expressing and utilizing, we developed and utilized information systems to facilitate daily engagement with pattern languages. (4) In the realm of pattern communities, we participated in conferences held in various locations worldwide, experiencing the global spread of pattern languages of practices on Earth. (5) As for theories and philosophies, based on Alexander's ideas, we conceived and proposed research on egoless creation, the wholeness egg, and pattern language as a medium for creative learning. Let us now examine the explorations during this period in greater detail.

(1) Application to New Domains in 2017-2019: Pattern Languages that Infuse Humanity and Creativity into Practices in Diverse Fields

During this period, we crafted an even wider range of pattern languages of practices than before, covering areas such as learning, well-being, elderly care, childcare, nature, music, and more. First, in the field of learning, we crafted the *Inquiry-based Learning Patterns* (Iba, Tamura, *et al.*, 2018; CreativeShift and Benesse, 2019), which are used in a textbook for high school, since the Ministry of Education, Culture, Sports, Science and Technology of Japan had decided that inquiry-based learning would become a subject in high schools. This pattern language led to a situation where over 300,000 students in more than 100 schools nationwide that adopted this textbook would have the Pattern Cards in their hands for past few years. We also crafted *Life with Reading*, a pattern language for reading (Iba and Watanabe, 2017; Iba Lab and Yurindo, 2018; Ogo, Kimura, *et al.*, 2018; Iba, Burgoyne, *et al.*, 2018; Nitta, Murakami, *et al.*, 2018), and a pattern language for improving foreign language skills when studying abroad (Iba and Iba, 2019, 2020).

We also crafted pattern languages such as *Patterns for Well-being in Life* (Iwata, Ando, *et al.*, 2018; Iwata, Ando, and Iba, 2019; Ando, Iwata, *et al.*, 2019; Iwata, 2021), *Words for Caring* for better elderly care (Kaneko, 2020; Kaneko and Iba, 2022a; Kaneko, Iba, and Munakata, 2022), and *Words for Nurturing a Community* for middle leaders in nursery schools (Nozawa, Iba, *et al.*, 2018; Amano, Nozawa, *et al.*, 2018; Iba, Akita, *et al.*, 2019). Additionally, we crafted *Value-Creation Marketing Patterns* for businesses to convey value to customers and deepen bonds in stores (Oraculum, 2019; Iba, Masai, *et al.*, 2020a, 2020b, 2020c, 2023), *Omotenashi Design Patterns* for hospitality that is welcomed by the community (Iba and Nakagawa, 2019; Umewaka, Suzuki, *et al.*, 2020), and patterns for community innovation by empowering indifferent people for the participation of local residents (Kimura, Wakashin, and Iba, 2017; Makino, Ogawa, *et al.*, 2017; Kimura, 2019). Furthermore, we crafted *A Pattern Language for Biodiversity Conservation Activities* (Kamada, Iba, *et al.*, 2018; Kamada, Munakata, *et al.*, 2019), *Patterns for Motivating Self-Improvement* (Burgoyne and Iba, 2017), and *Patterns for Japanese Soup Stock* (Sano, Kawabe, *et al.*, 2020). And, although not crafted by us, it is worth noting that during this period, Hajo *et al.* crafted and presented a pattern language for refugee reception (Neis, Meier, and Furukawazono, 2017).

Also, unusually for us, we crafted a pattern language for urban design like Alexander, *A Pattern Language for Creating a City with Natural, Local and Creative Elements* (Yamakage, Namiki, *et al.*, 2020). As I will explain later, this is a compilation in the form of a pattern language of the good aspects of urban development in Portland, Oregon, USA, where I lived during my sabbatical.

During this period, books that we had previously published in Japanese were translated into foreign languages and published overseas. The first was *Words for a Journey*, a pattern language for living well with dementia, which was translated into Traditional Chinese and published in Hong Kong and Taiwan (Iba, Okada, *et al.*, 2017), and I was invited to provide a keynote (Figure 195) and have an exhibition (Figure 196) at a symposium on aging societies, *Gerontech and Innovation Expo cum Summit*, hosted by the Hong Kong government (Iba, 2017b).



Fig. 195. My keynote speech at the Gerontech and Innovation Expo cum Summit in Hong Kong, where I introduced the *Words for a Journey* pattern language and its use cases to a large audience (Iba. 2017b).



Fig. 196. Invited exhibition booth at the Gerontech and Innovation Expo cum Summit in Hong Kong, where I introduced the *Words for a Journey* patterns and its translation into Traditional Chinese.

The second was *Project Design Patterns*, which was translated into Korean and published in South Korea (Figure 197; Iba and Kajiwara, 2018). For the Korean translation book, it was determined that the original pattern illustrations were too cute for a business book in South Korea. As a result, while maintaining the same composition, the characters were changed to adult figures and redrawn by a Korean illustrator.

Additionally, Reinhard Bauer and his colleagues at the University College of Teacher Education Vienna in Austria took a liking to the English version of *Learning Patterns* and translated it into German and published it as an on-demand book (Iba and Iba Lab, 2018), just like the English version.



Fig. 197. The Korean translation of the *Project Design Patterns* book, in which the pattern illustrations were adapted to fit Korean culture (Iba and Kajiwara, 2018).

It's important to highlight that, although we are not the primary authors but rather serve as consultants, there has been a notable emergence of pattern languages developed by municipalities and shared with their citizens. Kawasaki City (Takiguchi, Kitamura, *et al.*, 2017), for instance, has introduced pattern languages for various purposes: *Employment of the Disabled Patterns*, aimed at empowering individuals with disabilities (Kawasaki City, 2018); *Welfare Innovation Patterns*, focusing on the creation of new products and services (Kawasaki City. 2017b); *A Pattern Language for Building Community Bonds* (Kawasaki City. 2020); and *Patterns for Social Work Practice to Enliven the Lives of the Elderly* (Kawasaki City, 2023). These initiatives showcase the diverse applications of pattern languages at the municipal level. My company, CreativeShift, provided support in the crafting of these pattern languages.

In 2018, at the Open Research Forum (ORF), we conducted a Workshop Exhibition titled "Future Idea Mining: Call for New Themes of Pattern Languages to Support Creative Practices!" (Figure 198; Iba Lab, 2018). The concept was based on a future bookstore in a creative society. We explained to the visitors what a pattern language is and then asked them to generate ideas for pattern languages they would like to see in the future. The Iba Lab members designed book covers with titles and cover illustrations for these ideas, which were then displayed one after another. As time went on, the exhibition space was filled with these fictitious pattern language books based on the visitors' ideas.

The aim of this project was to mine future ideas and bring about a future where these ideas are realized on the spot. We believed that it was important not only to use existing resources but also to increase the number of people who desire specific pattern languages. Moreover, we considered it crucial to understand what kind of pattern languages people wanted. Thus, over the course of two days, a future bookstore emerged in Tokyo, created together with the visitors. The future bookstore is not merely a place to sell completed books after they have been written; instead, it becomes a space where people can be involved in the creation of books. This concept also reflects my vision of a creative society.

Furthermore, we did not simply ask the visitors to contribute ideas; we also presented them with a specially designed notebook used for this exhibition. The notebook had spaces for writing, but it also contained explanations about pattern languages and other information, making it a booklet that visitors could read and learn from.



Fig. 198. "Future Idea Mining" Workshop Exhibition at ORF 2018.

During this period, we expanded our language variation by developing two new types of languages: "Fun Language" and "Style Language," which we applied across various domains. As previously noted, we had already developed new language types such as Future Language, Concept Language, and Culture/Community Language in previous period. Based on the experience, we continued to conceptualize and create novel language types inspired by the pattern language paradigm.

The first of these new creations is "Fun Language" (Iba, Yoshikawa, and Shimizu, 2017). Unlike pattern languages that focus on achieving objectives effectively, Fun Language articulates ways to derive enjoyment from activities. While not prescriptive, it aims to verbalize and share diverse methods of having fun, thereby infusing the practice process with enjoyment. We developed Fun Language prototypes across several domains (Iba, Yoshikawa, and Shimizu, 2017), with a particular focus on crafting *A Cooking Fun Language* (Figure 199; Shimizu, Yoshikawa, and Iba, 2017).



Fig. 199. Examples of Cooking Fun Cards (Shimizu, Yoshikawa, and Iba, 2017).

The second innovation is "Style Language" (Iba, Toba, *et al.*, 2018; Iba, Nozaki, *et al.*, 2018). This approach describes and verbalizes diverse styles within domains that accommodate various approaches. It operates at a more granular level than pattern languages, capturing implementation variations rather than universal rules (Figure 200). We applied Style Language to several areas, including everyday family lifestyles, *A Style Language for a Family Lifestyle* (Figure 201; Suzuki, Toba, *et al.*, 2018; Suzuki, Ozaki, *et al.*, 2018), ways for foreign tourists to experience Japan, *A Style Language for Enjoying Japan* (Murasawa, Yamakage, *et al.*, 2019), and diverse cooking class formats (Iba, Toba, *et al.*, 2018). These were all developed through collaborative research with corporate partners.

Unlike pattern languages that describe universal rules, Style Languages, which describe variations of specific practice styles one level below, inherently have numerous styles that exist and can be discovered. In fact, in *A Style Language for a Family Lifestyle*, 390 style words were described (Figure 202). While this is a significant number, there are likely many more in the world. The entirety of diverse styles cannot be captured, and they will continue to increase in the future. Even so, Style Languages aim to stimulate creative thinking, practice, and communication by verbalizing and sharing such diverse styles.

To showcase these Style Languages, we conducted workshops at the SFC Open Research Forums (Figure 203; Miyakawa, Iba, *et al.*, 2017; Iba, Mori, *et al.*, 2018), an event (Iba Lab, 2019), and conferences such as PLoP and AsianPLoP (Figure 204-206; Kaneko, Shimoda, *et al.*, 2018; Toba, Ando, *et al.*, 2018; Shimoda, Burgoyne, *et al.*, 2019).



Fig. 200. Style Languages present various ways of approach as actions of patterns in a pattern language of practices (Iba, Toba, et al., 2018).



World Domination Map

"On the big world map we have in our living room, we put different color pins on the places that we visited as a family or someone in the family visited. My dad often went abroad for business frips, but I didn't feel sad when I thought that he was busy expanding our world domination map."

8 P.M. Assembly

"We made sure to eat dinner every night at 8 P.M. with everyone in the family together. Because everyone made plans carefully to make sure they would be home at that time, we were able to see each other everyday."



My Family Awards

"My family gives each other awards at the end of the year. There's not usually an opportunity to express our appreciation for each other, so it's a good chance to say "Thank you." The event is vey exciting and it makes me happy to see that everyone is actually paying close attention to mo."



PaPa Pancake

"Every Sunday Morning, my dad made us pancakes. Even though he's not usually much of a cook, he would try his best to make them into cute shapes. Every Sunday morning was somehow special for me."



A Journey to Collect Memories

"During long breaks, I take myself to places that I used to live or memorable places, such as France and Hakone. When I go to these places, I'm able to reflect back on the time when I lived at those places with my family."

A Great Adventure with Grandpa

"My grandfather loves the outdoors and used to take me fishing on his boat and teach me how to handle fish. Thinking back on it now, we did some quite dangerous things, but I learned how to have fun while eliminating danger."



Fig. 201. Examples of Style Cards in A Style Language for a Family Lifestyle (Iba, Toba, et al., 2018).



Fig. 202. Examples of Style Cards in A Style Language for a Family Lifestyle (Suzuki, Toba, et al., 2018).



Fig. 203. Chatting Workshop with using A Style Language for Family Lifestyle at the SFC Open Research Forum (ORF) (Miyakawa, Iba, et al., 2017).



Fig. 204. Chatting Workshop with using A Style Language for Family Lifestyle at AsianPLoP 2018 (Kaneko, Shimoda, et al., 2018).



Fig. 205. Style Writing Workshop at PLoP 2018 conference, where participants worked on adding their own family styles to A Style Language for a Family Lifestyle.



Fig. 206. Idea Mining Workshop using A Style Language for Enjoying Japan at AsianPLoP 2019 conference (Shimoda, Burgoyne, et al., 2019).

Around this time, I was conceptualizing the idea of "Creative Language," which includes Pattern Language. I viewed Style Language, Future Language, and Concept Language as sister concepts to Pattern Language (Figure 207). While strictly speaking, they are different from each other, I envisioned an overall picture where each of these is a type of Creative Language that supports creative thinking and communication (Figure 208).



Fig. 207. Overview of various creative languages (Iba, Toba, et al., 2018).



Fig. 208. Overview of various creative languages (Iba, Toba, et al., 2018).

(2) Methodology of Crafting in 2017-2019: Conducting Workshops for Offering Experiential Learning of Our Methodology

During this period, we conducted workshops at several conferences to teach our method for crafting a pattern language at conferences, such as AsianPLoP 2017 in Tokyo, Japan (Figure 209; Yoder and Iba, 2017a); at MiniPLoP in Brussels, Belgium (Figure 210; Yoder and Iba, 2017b); at the Symposium on the Future of Learning in Vienna and at PURPLSOC conference in Krems, Austria (Figure 211, 212; Yoshikawa, Munakata, *et al.*, 2017; Munakata, Yoshikawa, *et al.*, 2017); and at EuroPLoP 2018 in Bavaria, Germany (Figure 213; Iba, Isaku, and Burgoyne, 2018). Also, in 2018, we also conducted a Dialogue Workshop using the *Collaboration Patterns* and a Pattern Mining Workshop at the Strascheg Center for Entrepreneurship at the University of Applied Sciences Munich (Figure 214).

Additionally, we published papers that translated and quoted the work of Jiro Kawakita on the KJ Method, which is a major methodological source for our Clustering approach (Iba, Yoshikawa, and Munakata, 2017). While there are many Japanese publications by Jiro Kawakita, his work is generally not available in English. Therefore, we selected passages that we considered important, translated and quoted them, and demonstrated the underlying ideas behind our Clustering process.



Fig. 209. Joe and my Pattern Mining Workshop at AsianPLoP in 2017 in Tokyo.



Fig. 210. My keynote and Pattern Mining Workshop with Joe and Richard at MiniPLoP, Part of Programming 2017 Held in Brussels in 2017.



Fig. 211. Pattern Mining Workshops at the Symposium on the Future of Learning in Vienna in 2017.



Fig. 212. Pattern Mining Workshop in PURPLSOC conference in 2017.



Fig. 213. Holistic Pattern Mining Workshop in EuroPLoP conference in 2018 (Iba, Isaku, and Burgoyne, 2018).

Amazingly, based on these steady efforts and the information from the papers we had presented, journal articles started appearing written by people who crafted pattern languages based on our crafting process. The most surprising was a book published by O'Reilly titled *Cloud Native Transformation: Practical Patterns for Innovation*, which stated that the patterns included in the book were crafted based on our process. The time had come when our method was adopted in a published book! We were both surprised and overjoyed. For example, In the section titled "Our Approach," the following is stated:

The authors of this book followed largely in Iba's footsteps. Some patterns were mined during whiteboard sessions with Container Solutions engineers, others during collaborative brainstorming and epic patterns-writing sessions in London, Amsterdam, and Baltimore. Early versions of six patterns were produced as part of a paper presented at the 2018 PLoP conference. That paper, titled "A Cloud Native Transformation Pattern Language," inspired the creation of many more patterns and eventually grew into this book. (Reznik, Dobson, and Gienow, 2019, p.40).



Fig. 214. Dialogue Workshop using the *Collaboration Patterns* and Pattern Mining Workshop at the Strascheg Center for Entrepreneurship at the University of Applied Sciences Munich.

And there were citations of my PURPLSOC paper. It was my first experience having my name listed in the table of contents and index. However, what made me happiest was that patterns could be crafted using our crafting process and published as a book. As someone who develops methods, there is nothing more gratifying than this.

Moreover, during this period, we conducted research on a new approach to Pattern Illustrations. To address this, we conducted a study to identify the design patterns of Pattern Illustrations by examining the characteristics of the Pattern Illustrations created by the Iba Lab (Figure 215). This research was made possible for the first time by the significant increase in the number of pattern languages we have crafted over the years. As a result, 15 design patterns were obtained (Figure 216; Munakata, Nitta, *et al.*, 2018).



Fig. 215. Scenes of the project to identify the hidden design patterns in our Pattern Illustrations (Munakata, Nitta, et al., 2018).



Fig. 216. Design principles in Pattern Illustrations (Munakata, Nitta, et al., 2018).

The research team, aiming to verify the effectiveness of these design patterns in their own practice, took on the task of crafting Pattern Illustrations for the *Words for Nurturing a Community* patterns (Iba, Akita, *et al.*, 2019), and those illustrations were actually included in the published book (Figure 217). The results confirmed that the 15 design patterns were indeed helpful when drawing illustrations. However, as I joined the team as a generator, we realized that I was using many rules of thumb beyond those 15 patterns. This research was then passed on to subsequent, more detailed design pattern studies.

We then utilized these findings in a workshop at the EuroPLoP conference, where participants crafted Pattern Illustrations based on the identified principles (Figure 218; Munakata, Kaneko, and Iba, 2019).



Fig. 217. The team verified the effectiveness of the *Design Patterns for Pattern Illustrations* by applying them while drawing the Pattern Illustrations for *Words for Nurturing a Community*.



Fig. 218. Pattern Illustrating Workshop using *Design Patterns of Pattern Illustration*, conducted at EuroPLoP in 2019 (Munakata, Kaneko, and Iba, 2019).

In Value-Creation Marketing Patterns, we conceived and created a form called "Action Patterns," which are embedded in the actions that describe the concrete implementation of each pattern's Solution (Figure 219). These Action Patterns are defined within the description of the Actions to execute each pattern's Solution, serving as small patterns to carry out those Actions. As patterns, Action Patterns can be written in the form of Context, Problem, Solution, and Consequence, and illustrations can be added. However, here, we deliberately chose to include only a summary centered on the Solution for each Action Pattern (with content related to Context or Problem added if necessary for understanding). This is because the Context, Problem, and other elements of these Action Patterns largely overlap with those of the parent pattern containing these Actions.

As previously introduced, in A Pattern Language for Creating a Pattern Language (Iba and Isaku, 2016), patterns at all levels were fully described in the same manner, with illustrations. As a result, it became a vast amount of content with 364 patterns, making it complex and difficult to grasp and remember. Learning from this experience, we concluded that rather than treating all levels of patterns equally and applying the same description rules, it is better to adjust the descriptions for each level to achieve a good balance for users. Therefore, in Value-Creation Marketing Patterns, we decided to provide full descriptions only for the 36 core

patterns and the four higher-level category patterns, while limiting the description of Action Patterns hanging from the Actions of the core patterns to a summary centered on the Solution. Based on feedback from users and our own experience as creators, we feel that this was a quite good decision. Going forward, when creating multi-level pattern languages like this, we intend to take this approach.



Fig. 219. Action Patterns in the Value Creation Marketing Patterns (Iba, Masai, et al., 2020a, 2020b, 2020c, 2023).

(3) Ways of Expressing and Utilizing in 2017-2019: Developing and Utilizing Information Systems for Facilitating Daily Engagement with Pattern Languages

During this time, we also worked on developing systems to make patterns more accessible and easier to integrate into daily life. One of the systems we developed and extensively used was the Pattern App, called "Patterns We Live By" (Figure 220; Mori, Kawabe, and Iba, 2018). This web application allows users to view pattern descriptions from various pattern languages such as *Learning Patterns, Presentation Patterns*, and *Collaboration Patterns*. It also enables users to complete an experience check and displays their Experience Chart (Kawabe, Mori, *et al.*, 2018). The Experience Chart can overlay results from different time periods, making it possible to observe changes over time. By utilizing the spreadsheet graph function, the app simplifies the process of visualizing Experience Charts on smartphones, which was previously done through traditional means. At EuroPLoP, we also held an Ideathon about the features of this Pattern App (Kawabe, Burgoyne, *et al.*, 2018).



Fig. 220. Function of Pattern App, Pattern We Live By (Kawabe, Mori, et al., 2018).

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In addition, we developed web application for clipping the information related to the *Presentation Patterns* (Kawabe and Iba, 2019), and explored ways to share patterns and episodes of them using Instagram (Kamada, 2017; Kamada, Kuroda, and Iba, 2018).

Moreover, we conducted trials where participants engaged in discussions using Pattern Cards after immersive Virtual Reality (VR) experiences (Figure 221; Kaneko, Shimogawara, *et al.*, 2018a, 2018b). Additionally, we conducted sessions introducing various ways to utilize pattern languages (Iba, Abe, *et al.*, 2019), and presented patterns for utilizing patterns (Kaneko and Iba, 2017).



Fig. 221. Sharing the reality of living with dementia through Virtual Reality (VR) and dialogue, using *Words for a Journey*, a pattern language for living well with dementia (Kaneko, Shimogawara, *et al.*, 2018a, 2018b).

In 2017, we attempted something we had never done before: translating a single pattern language into many languages (Figure 222). The pattern language we translated was *Words for a Journey*, a pattern language for living well with dementia. Believing that these patterns were needed in countries and regions worldwide, we wanted to make them more accessible to people around the globe (Figure 223). As I declared in 2012, pattern languages will save the world!

Thus, we initiated a project to create a multilingual version by translating the patterns into 25 languages. We translated pattern name list and three patterns from *Words for a Journey*: **Can-Do List**, **Special Day**, and **Job-Specific Contributions** into each language. In addition to the original Japanese and English, the 25 languages included Bulgarian, Chinese (Cantonese), Chinese (Simplified), Chinese (Traditional), Czech, Danish, Dutch, Filipino, Finnish, French, German, Indonesian, Korean, Malay, Myanmar, Nepali, Polish, Portuguese, Russian, Sinhala, Spanish, Thai, and Turkish.

The translations were done with the help of people we met through the pattern language community and international students studying in Japan. This was before the era of generative AI, and translation was a daunting task. Therefore, we decided to start with just three patterns to create an opportunity for readers to encounter the patterns from *Words for a Journey* in their native languages and make the patterns more relatable to them. We presented and distributed the booklet containing these 25 languages at ADI2017, The 32nd International Conference of Alzheimer's Disease International (Figure 224; Iba, Okada, and Kaneko, 2017) The impression was that being able to read the patterns in their own languages made people feel that the message had truly "reached" them.



Fig. 222. Examples In Cantonese Chinese and Myanmar from the multilingual version of Words for a Journey.



Fig. 223. Some of the people who helped translate Words for a Journey into various languages.

(4) Pattern Communities in 2017-2019: Experiencing the Worldwide Spread of Pattern Languages of Practices on the Earth

During this period, I traveled to various countries, delivering presentations and lectures at conferences and conducting numerous workshops. I witnessed firsthand that pattern language was spreading globally, with researchers and enthusiasts present in many different locations. I participated in VikingPLoP for the first time and attended many conferences such as AsianPLoP, EuroPLoP, PLoP, MiniPLoP, COINs, PURPLSOC, and the PUARL conference, where we presented papers on pattern languages.

During this period, I was invited to give keynote speeches and invited talks related to pattern languages, not only at pattern language conferences and workshops like MiniPLoP in Brussels, Belgium (Iba, 2017a) but also at educational in Vienna, Austria (Iba, 2017h), and Kanagawa, Japan (Iba, 2017e), welfare in Hong Kong and Fukuoka, Japan (Iba, 2017b, 2018b), and business-related conferences in Lisbon, Portugal (Iba, 2019a). As the Pattern Mining Workshops have already been discussed, I would like to touch on some points that have not yet been mentioned.



Fig. 224. At the ADI2017 conference, I interacted with people from various countries and presented them with the multilingual version of *Words for a Journey*.

An unforgettable experience for me in 2017 was serving as the Program Chair of PLoP for the first time (Figure 225). I realized that running PLoP is much harder than a typical academic conference, as it involves shepherding, Writers' Workshops, post-proceedings, and more. However, I managed to fulfill my duties with Joe (Yoder)'s significant support. That year, PLoP was held in Vancouver.

As the PURPLSOC conference was held around the same time, I ended up attending both conferences in succession. Moreover, I traveled westward from Japan to Austria, then crossed the Atlantic Ocean to the American continent, and finally returned to Japan by crossing the Pacific Ocean, completing a round-the-world trip. It was my first time doing such a trip. This round-the-world trip of the globe was not just about airplane travel; it was a highly symbolic and impressive experience, representing how our research activities encompass the entire planet.

In 2017, I invited Richard and Joe (Yoder) to Japan, had them give lectures (Figure 226) and Iba Lab (Figure 227) at our university, and held a talk event about Writers' Workshops in Tokyo (Figure 228; Gabriel, Yoder, and Iba, 2017).



Fig. 225. Program chair of PLoP 2017 in Vancouver, Canada.

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Fig. 226. Richard and Joe's invited lecture in the Pattern Language Course at Our Campus in 2017.



Fig. 227. Richard's invited lecture in the Iba Lab in 2017.



Fig. 228. Richard and Joe's seminar on Writers' Workshop in Tokyo (Gabriel, Yoder, and Iba, 2017).

During this period, I served as a board member of The Hillside Group, the Conference Chair for CIEC's PC Conference 2017 and PLIS (Pattern Language Innovators Summit Japan) 2017, the Program Co-Chair for AsianPLoP 2018, and on the Program Committee for AsianPLoP 2017, AsianPLoP 2019, EuroPLoP 2017, EuroPLoP 2018, EuroPLoP 2019, SugarLoafPLoP 2017, SugarLoafPLoP 2018, PLoP 2018, PLOP 2019, PURPLSOC 2017, and PUARL 2018, and on the Steering Committee for COINs 2017, COINs 2018, and COINs 2019.

In 2019, the English version of Project Design Patterns was published as an on-demand book (Iba and Kajiwara, 2019). At that time, many people sent praise to be included at the beginning and end of the book. Ward Cunningham, Mary Lynn Manns, Richard P. Gabriel, Linda Rising, Christian Kohls, Joseph Yoder, Y C Cheng, and from Alexander's circle of architects, Howard Davis and Michael Mehaffy, as well as Peter Gloor, Jenny Quillien, Reinhard Bauer, and Helmut Leitner, all contributed their praise. It was a heartwarming and deeply appreciated gesture to receive this outpouring of support from colleagues and friends I had met and engaged with across the globe.

(5) Theories and Philosophies in 2017-2019: Conceiving and Proposing Egoless Creation, Wholeness Egg, and Pattern Language as Media for Creative Learning

During this time, I developed the concept of "egoless creation" (Figure 229-231; Iba and Yoshikawa, 2017; Iba, 2018a) by connecting my research on creation with Alexander's ideas in *The Timeless Way of Building*. Using this concept, I researched various creative activities and published papers. Additionally, based on the concept of wholeness in Alexander's *The Timeless Way of Building* and *The Nature of Order*, I devised a design method called "Wholeness Egg" (Figure 232; Iba and Munakata, 2018a, 2018b; Munakata and Iba, 2018; Iba and Munakata, 2020), which differentiates parts from the whole. I compiled this into papers and conducted workshops at several conferences (Figure 233, 234; Munakata and Iba, 2018: Munakata, Kawabe, *et al.*, 2018).



Fig. 229. Psychic system and creative system (Iba and Yoshikawa, 2017).



Fig. 230. Egoless creation and intentional creation (Iba and Yoshikawa, 2017).



Fig. 231. Pattern language supporting a chain of discoveries in egoless creation (Iba and Yoshikawa, 2017).



Fig. 232. Wholeness Egg for designing anything on the approach of differentiation from the whole.



Fig. 233. Workshop for Designing a Workshop using the Wholeness Egg Approach at EuroPLoP 2018 (Munakata, Kawabe, et al., 2018).



Fig. 234. Workshop for designing a living workshop with Wholeness Egg approach at PUARL 2018 (Munakata and Iba, 2018).

In 2017, I delivered a keynote speech at the Symposium on the Future of Learning held in Vienna (Figure 235). There, I spoke about Creative Learning and pattern languages, and also created an opportunity for participants to experience a brief Dialogue Workshop. After the keynote, I participated in an "Open Fishbowl with keynote speakers and all participants" along with other keynote speakers, where we discussed the future of education. Additionally, I conducted a Pattern Mining Workshop with members of the Iba Lab, as already shown in Figure 211.

Notably, Reinhard Bauer and others from the University College of Teacher Education Vienna, who hosted this symposium, were very fond of the Learning Patterns and undertook the translation of Learning Patterns into German (Figure 236). They explained their motivation in the "Foreword by the Translators" included at the beginning of the German edition, which reads as follows:

As staff members of the Center for Learning Technology and Innovation, newly established in September 2014 at the University College of Teacher Education Vienna (Austria), we are intensively engaged with the potential applications of digital technologies, media, and tools for contemporary and innovative (higher education) didactics. Taking into account international developments and current research findings, we test and develop models, good practice examples, and materials for efficient communication and cooperation in learning groups and networks. We are open-minded and receptive to new ideas, but always critically and constructively reflect on the possibilities of digital technologies for designing educational spaces, in order to develop sustainable concepts and solutions for schools and universities. We are aware that digital technologies alone are merely tools for designing learning environments and learning processes. An examination of (general) didactic approaches is urgently needed.

Against this background, the pattern approach and working with the *Learning Patterns* by Takashi Iba et al. appear particularly valuable for exploring personal learning biographies. Since the Learning Patterns have not yet been available in German, we decided to translate or adapt them to make them accessible to potential users in German-speaking countries. (Reinhard Bauer, Petra Szucsich, and Martin Sankofi, translated from German Edition, Iba and Iba Lab 2018).

They are utilizing this German version by conducting Dialogue Workshops and other activities at the University College of Teacher Education Vienna.



Fig. 235. My keynote speech and open fishbowl at the Symposium on the Future of Learning at the University College of Teacher Education Vienna (Iba. 2017h).



Fig. 236. The German translation of the Learning Patterns book (Iba and Iba Lab 2018) and the professors at the University College of Teacher Education Vienna who translated it.

From 2018 to 2019, I was working every day to write an academic book on pattern languages, but it was difficult to finish due to the vast amount of content. At that time, *Creative Learning* (Iba, Suzuki, *et al.*, 2019), which I was also writing, was completed first. Although this book is basically a dialogue book, the introductory chapter I wrote from scratch ended up being over 200 pages. It's strange to have such a long introductory chapter, but this part includes quite important content and became the most well-received part after publication. In that chapter, I introduced Constructivist learning theories, specifically explaining the theories and ideas of Jean Piaget, Lev Vygotsky, John Dewey, and Seymour Papert in an easy-to-understand way. The content of this chapter was

extracted and published as a series of four papers at EuroPLoP and PLoP in 2019 (Iba and Munakata, 2019; Iba and Burgoyne, 2019a, 2019b; Iba and Iwata, 2019).

Here is a summary of the most crucial points related to pattern languages that we discussed in these papers: in light of the constructivist learning theory proposed by Jean Piaget, knowledge is never just imparted from the external world, but knowledge is always constructed within individuals through the processes called "assimilation" and "accommodation" (Figure 237). In one's memory, there are cognitive structures to organize similar experiences. Piaget named a structure a *schéma*. A *schéma* contains an abstract representation of things which are "repeatable and generalizable in action" (Evans, 1981, p. xlviii). In his own words, it is "a generalization instrument enabling the subject to isolate and utilize the elements common to similar successive behaviours" (Piaget & Inhelder, 1966).

From this theory, it becomes clear that the physical written patterns are not effective if they are just read through, and it is important that readers take actions and learn from their own experiences. Therefore, pattern languages can support people in the following way, shown in Figure 238: (1) To read patterns (2) To induce and execute appropriate patterns in accordance with the given situation (3) To reflect back on what was experienced. By repeating this process over and over again, cognitive structures, *schéma*, are gradually formed and updated, and eventually, people will learn from the patterns.



Fig. 237. Understanding is constructed through assimilation and accommodation of cognitive structures (Iba and Munakata, 2019).



Fig. 238. How pattern languages support the process of learning (Iba and Munakata, 2019).

Another individual I would like to highlight here is the psychologist Lev Semenovich Vygotsky (1896-1934). He studied the relationship between individual development and proximate people or communities, deeming cognitive development as cultural and historical. He recognized that signs, especially language, are psychological instruments that prompt people's actions. Vygotsky also conducted detailed studies on the role of words in communication and cognition.

Vygotsky expresses the area between the independent problem-solving stage (the current developmental level) and the level of difficulty that can be resolved with the help of others (the maturing level) as the Zone of Proximal Development (ZPD). Thus, the zone of proximal development is the area of development that is closest

to the current developmental level. In this zone, it may be too easy to solve a problem with the help of others. The ZPD differs from person to person even when two people are at the same age, and even if their current developmental level is the same. Even if the current level of development is the same, the ZPD that can be solved through imitation with the help of others has the potential to grow from the present moment.

We pointed out, in our paper, that pattern language works by instructing in the ZPD (Figure 239). It is a medium that supports behavior that cannot be thought or practiced on one's own. Since the pattern is abstract, it is different from step-by-step instruction, even if it supports the idea of action. In other words, pattern language is unlike a manual, through which one can execute a task by merely following the outlined procedure. Instead, it is an instruction/learning support medium that can be used to imitate only that which can be imitated. It is a form of support that can be used to help people perform in their ZPD.



Fig. 239. A pattern language is a medium that supports development in the Zone of Proximal Development (Iba and Burgoyne, 2019a).

Furthermore, Vygotsky's discussion on the relationship between everyday implicit concepts and formal concepts, such as those in science, is helpful in understanding pattern languages. Everyday concepts are spontaneous, lack a system and are unaware, but as scientific concepts are acquired, everyday concepts are positioned within the system as generalization. They are indispensable in the sense that they continue to grow. Scientific concepts reconstruct (reorganize) everyday concepts because the systematic nature of a scientific concept influences the meaning of a spontaneous concept.

The relationships between patterns are in depth, organized, and expressed in a pattern language. In my view, it can be said that pattern language exerts the same effect as Vygotsky's scientific concept. A pattern language with a system becomes involved in its reconstruction on the assumption of an implicit rule of thumb and on the basis of the practical knowledge that a person has spontaneously gained from personal experiences (Figure 240). In other words, written pattern languages (scientific concepts) are significant because they support and help people in reconstructing their implicit practical knowledge (everyday concepts or tacit rules of thumb) into explicit and systematic concepts.



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Fig. 240. As a systematic concept pattern language reconstructs implicit practical knowledge (Iba and Burgoyne, 2019a).

Alexander's statements, "The language is able to awaken you to your own inner-most feelings, and to what is true" (Alexander, 1979, p.544) and "The language, and the processes which stem from it, merely release the fundamental order which is native to us. They do not teach us, they only remind us of what we know already, and of what we shall discover time and time again, when we give up our ideas and opinions, and do exactly what emerges from ourselves" (Alexander, 1979, p.531), should be understood in the above sense.

I also discuss the role of pattern languages as tools for creative learning (Iba, 2017e, 2017h) and as "soft social infrastructure" to allow freedom of creation in the creative society (Figure 241; Iba, 2018c). In addition, from a different perspective, we discussed the overlap between creating pattern languages and functional analysis in sociology (Kimura and Iba, 2018). Besides, the sociological ideas that we were researching for a while often appear in our studies. In a different context, we also discussed the idea of making parts of the whole pattern language interchangeable (Banno, Kaneko, and Iba, 2019). It can be said that this idea stems from the sense of functional equivalence in functional analysis.



Fig. 241. My vision of numerous pattern languages as soft social infrastructure.

Another interesting and unusual event that year was having an entry published in an encyclopedia. The encyclopedia was the Encyclopedia of Artificial Intelligence in Japanese, and I wrote the entry on "Pattern Language" (Iba, 2017c). I never imagined the day would come when I would write an explanation of "Pattern Language" for an encyclopedia!

In April 2018, I was promoted to professor. For the review process, I submitted an 800-page thesis titled "Pattern Language 3.0: Sharing the Art of Living Well through Everyday Creativity," which summarized my pattern language research from my years as an associate professor (Iba, 2017d). At the promotion party, alumni and current students who had crafted pattern languages with me celebrated.

Life Crisis: Suddenly Collapsed due to a Cerebral Hemorrhage, and I Realized that I Had to Write, or It Would Be Lost

In 2017, when I was in top form, I may have overworked myself due to the intense pace. At the end of that year, I suffered a cerebral hemorrhage. On the afternoon of December 21, while I was finishing a paper on egoless creation in my room at home, I started to feel a bit unwell, so I decided to lie down and rest for a while. For the past few weeks, I hadn't been getting much sleep due to finishing the paper, so I thought that was the cause. I had a seminar of Iba Lab that day, so I planned to leave the house after resting for a bit. However, I ended up sleeping until it got dark. A student contacted my wife, saying, "We're worried because the professor didn't come to the seminar," so my wife came back home. I thought I was conversing normally, saying, "Oops, I overslept." But to others, my speech was slurred, and I seemed quite strange. I was taken to the hospital by ambulance, diagnosed with a cerebral hemorrhage, and admitted.

I wasn't particularly aware that anything was wrong with me, and I felt bad about not being able to attend a dialogue event I was scheduled to speak at that evening. I was also disappointed that I couldn't attend the yearend parties planned for that week. I had no idea of the severity of the situation. It wasn't until a few days later that I learned I could have died from the cerebral hemorrhage or that I might not be able to work anymore due to paralysis. Later, I heard from my wife that, based on my condition, she had resigned herself to the likelihood that I would never be able to stand at the lectern again. I had paralysis on the left side of my body and cognitive impairments such as hemispatial neglect. At first, I had difficulty speaking and became a very quiet person. Fortunately, right after the New Year holidays, it was the end of the semester, so other professors substituted for my university classes, and I took a leave of absence from meetings. I then underwent rehabilitation at the hospital five days a week for about four months.

I couldn't believe how much I forgot what I had said or done just before, I boarded the wrong train, and my messages had many typos and omissions. One time, my family and I realized that it was similar to dementia, and we thought that the *Words for a Journey* we had crafted might be useful. Thus, the patterns from *Words for a Journey* started to play a role in our home. My family and I were quite comforted by **Make it Funny**, we thought of a **Can-Do List** with the mindset of **A New Journey**, created a **Chance to Shine** for me, and carried out the **Daily Chore**. We didn't forget the **Gift of Words** to family and those around us. We experienced firsthand how the patterns in *Words for a Journey*, including these, kept us positive.

Later, the paralysis in my body significantly weakened, and my cognitive functions recovered considerably. Although my speech is more sluggish than before, I can now talk. However, due to a hemorrhage, some parts of the brain cells have necrosed, some paralysis remains in parts of the left side of my body, and I get severe headaches if I concentrate on reading a book or listening to a conversation for 20 minutes (These aftereffects still remain at the time of writing this thesis, and I am living and working within these limitations).

Still, I am deeply grateful that I can lead an almost normal daily life and return to work (thanks to the cooperation of my colleagues). It could have been a life that had already ended. Thinking that way, I decided to do the best what I can with the rest of my life. At the same time, I keenly felt that if I had died then, the things I was thinking about in my head and the experiences I had gained would have been lost from this world. And that no matter how important or interesting those things were! I realized I had a lot of such thoughts and ideas in my head. In any case, I had to write! With that in mind, I have since tried to write down my thoughts in books and papers as much as possible.

And, fortunately, starting from the summer of 2018, I was scheduled to enter a one-year sabbatical period. I planned to conduct pattern language research at the Portland Urban Architecture Research Laboratory (PUARL) at the University of Oregon's College of Design under Prof. Hajo Neis. During the sabbatical, I could work at my own pace, unlike the usual busy days in Japan. Thinking this would be helpful, my entire family moved to Portland, Oregon, USA. Setting up our life in a different country was still challenging, but it was less stressful compared to the work-filled days. My study was quickly set up, and my writing environment was ready. After a while, about 3,000 books I had shipped from Japan by ship also arrived.

While I was away from Japan on sabbatical, the Iba Lab continued in Japan, and I supervised remotely using Zoom and Slack (this was before the pandemic. This experience was the reason we could quickly start moving when university classes went fully online in 2020 and craft a pattern language for online education).

The events of this period are summarized in the timeline shown in Figures 242 through 244.

Langua	and Motho		
	ges and metho	ds and Publications	Talks, and Workshops
2017 Life wit Reading	ve Learning rms for hers) Japan Comm Ministr Trade a	toard f The Program f The Committee of aroup The master's thesis was submitted Reconsideration ittee in the y of Economy, and Industry	Application to New Domains: Pattern Languages that Infuse Humanity and Creativity into Practices in Diverse Fields "Ways of Everyday World-Making" (PURPLSOC paper) "Open Dialogue Patterns" (VikingPLoP paper) "A Dialogue on Open Dialogue" (ORF talk and workshop) <i>Life Transition Patterns</i> (Booklet and pattern cards) "Life Transition Patterns" (PURPLSOC paper) Active Learning Patterns for Teachers" (PURPL SOC paner)
	, nader		- Life with Boading (Pattern cards)
(C Pa fo	open Dialogue atterns / Words r a Dialogue)	AsianPLoP 2017 March 12-13, Japan Program Committee of EuroPLoP	Life with Reading (Pattern Cards) "Policy Language" (AsianPLoP paper) Project Design Pattern Cards (Pattern cards) "Project Design Patterns" (AsianPLoP paper) "Cook-That-Dish Patterns for Tacos" (PURPLSOC paper) Words for a Journey (in Traditional Chinese)
	Transition	VikingPLoP 2017	"Words for a Journey" (GIES keynote)
	Patterns)	Mar 30-Apr 2, Germany MiniPLoP in Programming Apr 3, Belgium Conference Program Chair of	"Wolds to a Sourney (GLS Replace) "Welfare Pattern Languages by a Local Government" (PURPLSOC paper) "Patterns for Community Innovation by Empowering Indifferent People" (PURPLSOC paper) "Innovation in Loose Community Development" (ORF talk and workshop)
Words fo Nurturin a Comm	Words for Nurturing a Community	CIEC PC PLoP Steering Committee of COINs The book was Program published Committee of	"The Creation of Style in Generator" (AsianPLoP paper) "Class Design and Communication Evolving and Deepening with Active Learning Patterns for Teachers" (ORF talk and workshop) "Motivating Self-Improvement Methods to Stay Motivated" (PLoP paper)
Valu Mar Pat	e-Creation keting erns	GEIS 2017 Jun 16-18, Hong Kong	Methodology of Crafting: Conducting Workshops for Offering Experiential Learning of Our Methodology
		The encyclopedia was published The thesis was submitted EuroPLoP 2017 July 12-16, Germany The booklet and pattern	"Pattern Mining Workshops" (AsianPLOP Workshop) "Pattern Mining Workshops" (MiniPLOP workshop) "Pattern Mining Workshops" (Symposium workshop) "Pattern Mining Workshops" (PURPLSOC workshop) "Structure Building in Creating a Pattern Language" (PLOP paper) "Philosophy and methodology of clustering in pattern mining" (PLoP paper)
		Cards were published The booklet and pattern cards started to distribute CIEC PC Aug 5-7, Japan The distribution of the	Ways of Expressing and Utilizing: Developing and Utilizing Information Systems for Facilitating Daily Engagement with Pattern Languages "Everyday World" (Pattern song) "Pattern Song" (PURPLSOC paper) "Pattern Language as a Medium for Self-Discovery" (Matteria Herric)
		COINs 2017 Sep 14-17, USA LEAGUE Ginza	"Peer Learning via Dialogue with a Pattern Language" (COINs paper) "Patterns for Utilizing Patterns towards Dementia-Friendly
	PatternApp	The pattern cards for sale	Pattern Communities: Experiencing the Worldwide Spread of Pattern Languages of Practices on the
		Symposium on the Future of Learning Oct 16-17, Austria	Earth "Writers' Workshop" (LEAGUE talk and workshop)
		PURPLSOC 2017 Oct 19-21, Austria	Theories and Philosophies: Conceiving and Proposing Egoless Creation, Wholeness Egg, and Pattern Language as Media for Creative Learning
		PLoP 2017 Oct 22-25, Canada	Systems" (PURPLSOC paper) "Pattern Language" (Encyclopedia entry)
		Library Fair	 "A Pattern Language for Fostering Creative Learning" (CIEC PC keynote)
		ORF 2017 Nov 22-23, Japan	"Generations of Pattern Language: Architecture, Software, and Human Actions" (Programming keynote) "Pattern Languages as New Tools for Learning in the Creative Society" (Symposium keynote)
		Suffered a brain hemorrhage	"Pattern Language 3.0: Sharing the Art of Living Well with Everyday Creativity" (Professor promotion thesis)

Fig. 242. Timeline of our pattern language research in 2017, in the third period of the EXPANSION PHASE.



Fig. 243. Timeline of our pattern language research in 2018, in the third period of the EXPANSION PHASE.



Fig. 244. Timeline of our pattern language research in 2019, in the third period of the EXPANSION PHASE.

8. MATURATION PHASE [2020-]

The MATURATION PHASE from 2020 can be divided into three periods: Crafting Pattern Languages to Shape Our Future in Response to Societal Changes, and Conducting Analyses Leveraging Our Accumulated Research Results [2020-2022], Establishing Our Methodology and its Academic Grounding, and Collaboratively Advancing Pattern Languages of Practices to the New Stage [2023-2024], and the yet-to-emerge period in the near future that follows (which can be included in the MATURATION PHASE, assuming such a period is anticipated). In the following sections, we will examine each period in detail.

8.1 Crafting Pattern Languages to Shape Our Future in Response to Societal Changes, and Conducting Analyses Leveraging Our Accumulated Research Results [2020-2022]

The initial third of the MATURATION PHASE, spanning the years 2020-2022, was primarily characterized by the global COVID-19 pandemic. The impact on society, daily life, research, and educational environments was, without a doubt, the most significant event of this period. As the risk of infection increased, people extremely minimized face-to-face interactions and transitioned to online communication for all aspects of life. Classes and research activities were conducted entirely through online platforms (Figure 245). As a result, the content and methods of research underwent significant changes to adapt to this new reality.

Our initiatives during this period were distinctively tailored to address the social circumstances. (1) First, in terms of the application of pattern language to new domains, we focused on crafting pattern languages of practices for everyday life during the pandemic and for social formation, such as online classes and telework. (2) Regarding the methodology of crafting, while adapting our previously face-to-face methods using craft papers and sticky notes to an online format, we made significant strides in refining and completing our methodology for crafting pattern languages. (3) As for ways of expressing and utilizing, we conducted several pattern language remixes and worked on a study assessing the impacts of introducing a pattern language. (4) Despite the pandemic, the pattern communities managed to continue gathering online. Additionally, following Christopher Alexander's passing in 2022, we engaged in retracing his footsteps. (5) In the realm of theories and philosophies, as part of our research on pattern language and creativity, we studied pattern language in light of Eastern philosophy and phenomenology and conceived the concept of "Natural Deep Creation." From here, let us delve into these explorations in greater detail.

Note that, in 2020, I was selected for Good Practice for Online Education in the Faculty, in 2021, I received the "SFC Faculty Award to recognize outstanding achievements" in research and education in an online environment, and in 2022, I received the "SFC Faculty Award for Award to recognize particularly outstanding achievements."



Fig. 245. The logo I created to share our challenge of that year to go fully online after the declaration of a state of emergency, and scenes of subsequent online activities and interactions (The Bottom-Right image shows an online Halloween party with Iba Lab members).

(1) Application to New Domains in 2020-2022: Pattern Languages of Practices for Everyday Life during the Pandemic and for Social Formation

In 2020, the COVID-19 pandemic significantly impacted our lives and work, forcing university classes to be conducted entirely online. Immediately after the state of emergency was declared, I took on three initiatives.

First, I started sharing useful patterns on the blog from the hundreds of patterns we had written so far, introducing ways of living in the new situation of the pandemic. As people worldwide could no longer simply repeat their previous lives, they were forced to reconsider each aspect of their lives and work. So, I decided to introduce patterns that might be helpful for thinking about these things. I actually tried the patterns I introduced in my own home and shared the cases along with photos. This was very well-received, and in the fall of 2020, it was published as a book in Japanese (Iba, 2020b). I also presented a paper at PLoP conference that year (Iba, 2020c) and gave an invited talk at AsianPLoP conference (Iba, 2020a), which was postponed to the fall and held online.

In 2020, we conducted practical research on online classes, and we crafted a pattern language for online education. Having become accustomed to using Zoom for meetings and research guidance during my sabbatical the previous year, I was well-prepared when the switch to online classes was decided. I immediately started experimenting and trying various ideas in my own classes and Iba Lab seminars. I also frequently gathered feedback from participating students through surveys to accumulate experience in designing and practicing better online classes (Iba, *et al.*, 2021c).

Also, from late summer 2020, we started mining in interviews with other professors and teachers, and over the next six months, we crafted a pattern language for online education, *Online Education Patterns* (Hayashi, Shibata, *et al.*, 2021; Adachi, Shibata, *et al.*, 2021; Inoue, Adachi, *et al.*, 2023). Then, we conducted free online seminars for Japanese educators using that pattern language, with hundreds of participants (Iba and Iba Lab, 2021), and the archived video footage uploaded to YouTube has already surpassed 10,000 views. After that, I was invited to give lectures at faculty development (FD) programs at various universities to support the promotion of better online classes. Additionally, as work shifted to teleworking online, at CreativeShift, we crafted the *Telework Style Patterns* and published them online (CreativeShift, 2020). We received requests for lectures on this topic and gave online presentations at organizations such as the Financial Services Agency of Japan (Iba, 2020d).

In addition to the topics related to online communication mentioned above, we started developing a new kind of pattern language during this period: Pattern Languages of Practices for Journey of Life (Iba, 2023d). The pattern languages we had crafted up until this point were for specific activities, such as the *Presentation Patterns*, or for daily life. Looking back, these can be said to be practices with relatively short durations for a single activity. In contrast, the pattern languages we started working since this period are about ways of living that are practiced over the course of decades. The first and most symbolic of the Pattern Languages of Practices for Journey of Life is *a Pattern Language for Realizing an Exciting Life* (Nitta, 2022). Another study from the same period, *a Pattern Language for Mastering the Way Learned from the World of Noh* (Umewaka, 2022), is also a pattern language on a life scale. Additionally, the subsequent *Self-Reliant Life Patterns for Empowering Filipino Youth* (Kanai, Ota, and Iba, 2023b, 2023c; Kanai and Iba, 2023; Kanai, 2024) are also Pattern Languages of Practices for Journey of Life. Also, on a shorter timescale, we also created *Natural & Creative Living Patterns*, which focus on living in harmony with nature (Yamakage, Minami, *et al.*, 2021; Hatori and Iba, 2021).

The second new type of pattern language we worked on aims to promote social formation. The Digital Agency of Japan commissioned us to develop a pattern language that would enable everyone to collaborate in creating a better digital society. This resulted in a pattern language titled *Leveraging Digital Technology to Build a Better Future* (Digital Agency, 2022). This language comprises patterns aimed at achieving an inclusive digital society and covers how to educate individuals who have been left behind in ICT adoption, how to effectively manage communities through ICT, and good practices for individual participation in society via ICT. We were commissioned to develop this pattern language, and it implicitly integrates patterns for multiple stakeholders, similar to our pattern language for living better with dementia, *Words for a Journey*. Note that it marks the first time a central government agency has employed this pattern language form to communicate essential principles to its citizens.

Delving into a more artistic realm, we also developed pattern languages for both the design of film music compositions (Figure 246, 247) and the practice of composing itself, *Music Composition Patterns* (Suzuki, Watanabe, and Iba, 2022; Suzuki, 2022). Furthermore, we also developed a number of pattern languages related to work and business. These include *Start-Up Patterns*, a pattern language for startups (Kawabe, Iba, *et al.*, 2021), and a pattern language that guides employees in embodying corporate values through their work practices
(Shibata, Inoue, *et al.*, 2023; Aoki, Inoue, *et al.*, 2023), and a pattern language focused on achieving well-being in the workplace, *Work Well-Being Patterns* (Inoue, Hioki, *et al.*, 2023).



Fig. 246. Overview of Music Composition Patterns (Suzuki, Watanabe, and Iba, 2022).



Fig. 247. The patterns in the music "Sonata for Horn, Trumpet and Trombone" scores (Suzuki, Watanabe, and Iba, 2022).

In 2022, *Cards for Enjoying Reading Books for Fostering Creativity*, a set of Pattern Cards designed for children, was released (Figure 248; Iba Lab, CreativeShift, and Yurindo, 2022). These cards were made by selecting 10 patterns from the 27 patterns in the previously created Life with Reading that were particularly important for children. The descriptions were rewritten in simple, child-friendly language and redesigned. By targeting a specific audience, the content and writing style of the same patterns can be adjusted, which can be considered a kind of translation within the same natural language of a pattern language. This is similar to what we did when we serialized a children's version of the *Presentation Patterns* in a newspaper for children, but this is the first time that such a version has been sold as a separate product.



Fig. 248. The set of the Cards for Enjoying Reading Books for Fostering Creativity.

(2) Methodology of Crafting in 2020-2022: Refining and Completing Our Methodology for Crafting Pattern Languages

In response to the social conditions brought about by the pandemic, I adapted our pattern language development process to be entirely online. Our previous pattern language crafting process involved Clustering by spreading large sheets of paper on a table and moving sticky notes while talking in a face-to-face setting. However, due to the pandemic, we could no longer gather, so we needed to arrange that method. Although there were tools that allowed sticky note-like operations online, I believed that rather than just replacing the process online, it was important to create a different way that was more suited to online use. So, instead of Clustering as we had done before, I devised a new method called the Key Element Method, where we extract "key elements" from the narratives of Mining Interviews and move into writing, and we actually worked on crafting pattern languages using this method (Iba, Oka, *et al.*, 2021; Iba, Kawabe, *et al.*, 2021).

We used this method for about two years and submitted a paper to PLoP 2021. However, we felt that while experienced members could do it well, it was difficult for those who were not. Also, participants in the Writers' Workshop at PLoP suggested that our previous Clustering method might be more appropriate. So, when face-to-face activities could resume in 2022, we incorporated the strengths of the Key Element Method and sublimated it into a further new method. In this new method, we transcribe the narratives from Mining Interviews, extract and write down important elements (pattern materials), create Material Cards from those elements, and use them for Clustering. In this way, rather than replacing Clustering, we strengthened the method by utilizing the experience of key element extraction to make the connection from Mining Interviews to Clustering more reliable (this new method is introduced in the appendix of a later paper (Iba and Nitta, 2024), so please refer to it).

During the special research project at the Iba Lab during the spring break of 2021, we divided into groups to investigate previously unexplored aspects of crafting pattern languages. Among the findings, the most significant discovery was that the Solutions of well-written patterns include both what is important to do [*What*] and how to do it [*How*]. The group studying the Solution sentences noticed this tendency after comparing multiple cases. Upon hearing their report that day, I immediately recalled what I had written in the introduction of [*Reality+*] *Pattern Language* (Figure 249; Iba, Nakano, *et al.*, 2013):

A pattern language is a verbalization of *What, Why,* and *How* to create something well in a particular domain. It does not limit *When, Where,* or *Who* creates it, leaving those possibilities widely open. In this sense, it must have a universality that can accommodate diverse situations. In my view, there is currently only one such method of support that is indispensable in a creative society. That is Pattern Language (Takashi Iba in Iba, Nakano, *et al.,* 2013).

In a pattern language, each pattern abstractly presents *What* should be created. It also explicitly states *Why* it is described to solve what kind of 'problem' that arises in a certain 'context.' Furthermore, it presents *How* the solution can be carried out. Therefore, a pattern language supports thinking about *What*, *Why*, and *How* for creation or practice. On the other hand, patterns do not describe *When*, *Where*, or *Who* should use them. In other words, *When*, *Where*, and *Who* creates them is not limited. Each pattern can be referenced only when one

wants to solve the 'problem' in a situation similar to the 'context' described there. What matters is that the reason *Why* to create matches, and *When*, *Where*, and *Who* creates is not an essential issue (Takashi Iba in Iba, Nakano, *et al.*, 2013).

"In other words, *What, How,* and *Why* are the most important contents conveyed by a pattern. In a pattern language, they are written in the form of Context, Problem, Solution, and Consequence to make them executable (Takashi Iba in Iba, Nakano, *et al.*, 2013).

For me, the group's discovery that time was that both *What* and *How* are packed into a Solution sentence (Figure 250). Considering this, it is a very important discovery. This is because, in many projects so far, although it was possible to distinguish between well-written and poorly-written Solution sentences by actually looking at them, it was not possible to generally teach how to write good Solution sentences. With this discovery, we can now say that a Solution sentence should include both *What* and *How*. A Solution sentence is a sentence that says, "Do [*What*], by [*How*]." From this, it became clear that other sentences constituting a pattern also have "Content Forms," which are now used as important points in the current guidance for creating pattern languages (Iba, 2021c).



Fig. 249. The pattern triangle: when crafting a pattern language, for each pattern, *What, How*, and *Why* are focused on, rather than Who, When, and Where (Iba, Nakano, *et al.*, 2013; Iba, 2021c).



Fig. 250. In the Pattern Writing phase, the *What, How,* and *Why* components are transformed into a description written in the pattern form (Iba, 2021c).

During this time, since I was trying to write a book about crafting pattern languages, and due to the pandemic situation, it was a period of staying indoors to reflecting back on our practices so far. So, I took the opportunity to work on compiling the methods thoroughly as a methodology. I clarified the "Systematization" process (Figure 251; Iba, 2021d), which lacked some clarity in the previous explanations of the crafting process. I also explicitly discussed the sense of contrast that we employ when writing patterns (Iba, 2021e) and identified what we focus on when completing pattern descriptions (Shimokawa, Yamakage, *et al.*, 2020).



Fig. 251. The overview of the process of Systematization (Iba, 2021d).

In addition, I conducted research to uncover the implicit principles hidden in the design of Pattern Illustrations. This started from the feeling that the previously crafted the *Pattern Illustrating Patterns* supported the practice of drawing illustrations, but not the content of the drawings themselves, yet there seemed to be commonalities among several Pattern Illustration. To address this, we conducted a study to identify the design patterns of Pattern Illustrations by examining the characteristics of the Pattern Illustrations created by the Iba Lab. As a result, 15 design patterns were obtained. The research team, aiming to verify the effectiveness of these design patterns in their own practice, took on the task of crafting Pattern Illustrations for the *Words for Nurturing a Community* patterns (Iba, Akita, *et al.*, 2019). The results confirmed that the 15 design patterns were indeed helpful when drawing illustrations. However, as I joined the team as a generator, we realized that I was using many more heuristics beyond those 15 patterns. This research was then passed on to subsequent, more detailed design pattern studies.

Furthermore, building on the research that had been conducted in the Iba Lab in 2018 (Munakata, Nitta, *et al.*, 2018), I analyzed 600 Pattern Illustrations, which are in 19 pattern languages, that we had drawn so far and uncovered what I had been unconsciously considering, revealing the Principles of Pattern Illustration Design (Iba, Banno, and Ando, 2021). Thus, I found design principles of Pattern Illustration, 121 potential patterns, are grouped into the following 12 principles: (1) Space that has Depth; (2) Characters with a Mind and Body; (3) Interactions on the Spot; (4) Time Flow from Left to Right; (5) Symbolic Object for Abstract Things; (6) Visible Lines for Clusters and Connection; (7) The Effect Given by Things Created; (8) Object-like Speech Bubbles; (9) Visual Expressions in Comics; (10) Abbreviation for Simplicity; (11) Evolving Stories from Patterns; and (12) A Magical Touch for Charms.

Figure 252 illustrates an example of the fourth principle, "Time Flow from Left to Right," specifically the "From Left to Right" pattern. This pattern suggests that by placing a character's action or statement on the right side of another character's action or statement, it naturally conveys that the action or statement on the right is in response to the one on the left. This design principle was initially applied unconsciously by our team. At some point, we became aware of it and started applying it consciously. As a result, some of our older Pattern

Illustrations do not follow this principle, and we now feel the strong desire to revise them. This design principle helps readers naturally understand the meaning of the illustrations without confusion.

Figure 253 presents another example, which belongs to the category "Symbolic Object for Abstract Things" and is called the "Block of Construction" design pattern. It suggests that to show that something invisible is being built, one should draw a scene of blocks being built. We had been unknowingly applying this pattern, but at one point, we realized that we could only draw certain Pattern Illustrations in this way. We were concerned that the illustrations might look too similar to past Pattern Illustrations, but then we realized that this was not the case and that it was a recurring design pattern.

Figure 254 showcases an interesting example of a design pattern. I believe we can say that this is our invention, as we often use it in our Pattern Illustrations. It is the "Holdable Speech Bubbles" pattern, which falls under the "Object-like Speech Bubbles" category. This pattern suggests that when reacting to other voices, one should draw the speech bubbles like holdable objects to illustrate connections between each speech. Initially, we used this as a makeshift solution, but at some point, we realized that it was quite a versatile and expressive design, and we started using it consciously. This design is rarely, if ever, used in comics, and we can say that it is unique to our Pattern Illustrations.

We have identified 12 types of design principles for Pattern Illustrations and 121 specific design patterns. This exploration is not over yet, and we believe it will continue.



Fig.252. Example illustrations of **From Left to Right** in the category "Time Flow from Left to Right" in the principles of Pattern Illustration design (Iba, Banno, and Ando, 2021).



Fig. 253. Example illustrations of **Block of Construction** in the category "Symbolic Object for Abstract Things" in the principles of Pattern Illustration design (Iba, Banno, and Ando, 2021).



Fig. 254. Example illustrations of **Holdable Speech Bubbles** in the category "Object-like Speech Bubbles" in the principles of Pattern Illustration design (Iba, Banno, and Ando, 2021).

After experiencing the discovery of hidden principles in Pattern Illustrations, we thought that there might also be hidden principles in the text of patterns. So, I thoroughly analyzed the patterns we had crafted so far, focusing on the text, and clarified the content form of the sentences for each element in the patterns (Iba, 2021c).

Besides, we developed "PL Online," an integrated environment to support the crafting of pattern languages along our crafting process (Figure 255; Kawabe and Iba, 2021; Kawabe, 2022). During this period, all Iba Lab projects used this online platform for crafting pattern languages.



Fig. 255. Functions of the PL Online system and the data generated in the pattern language crafting process (Kawabe and Iba, 2021).

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Furthermore, in Japan, pattern languages developed following our methodology have also been published in academic journals (Akasaka and Nakatani, 2020; Akasaka, Yasuoka, *et al.*, 2020, Osada, 2021). I am confident that the publication of my upcoming book on crafting pattern languages will empower more researchers and authors to develop practical pattern languages. This, in turn, will foster the broader growth and spread of pattern languages across various fields and disciplines.

(3) Ways of Expressing and Utilizing in 2020-2022: Conducting Pattern Language Remixes and Working on a Study of Assessing Impacts of Introducing a Pattern Language

In the pattern language for *Leveraging Digital Technology to Build a Better Future* (Digital Agency, 2022; CreativeShift, 2023a), we adopted a different format than our usual style, which followed the order of Context, Problem, Solution, and Consequence, considering that it would be read by a wide range of citizens. We decided to emphasize and present the Context and Solution first, followed by Problem + Forces, Solution + Actions, and Consequence (Figure 256, 257). By doing so, we aimed to convey the essential main points first and then provide details for those who wish to learn more. When considering that the government would be presenting this to the public for the first time, we thought that it would need to be accessible to a wide range of people, and that it might be necessary to convey the Context and Solution concisely first. Also, we thought that people might not feel inclined to read if the pages were in black and white. Therefore, we designed a layout that incorporated colors and graphical elements. Additionally, we created the cards with a different design than before.



Fig. 256. Page Layout of the pattern language for Leveraging Digital Technology to Build a Better Future (Digital Agency, 2022).



Fig. 257. Pattern Card design of the pattern language for Leveraging Digital Technology to Build a Better Future (Digital Agency, 2022).

In recent years, we have been sometimes engaging in the practice of "Pattern Language Remix," which involves selecting patterns from previously crafted pattern languages, reorganizing them for new purposes, and making a set for specific use (Figure 258). Pattern Language Remix has been practiced in workshops by Douglas Schuler (Schuler, 2014) and in a paper by Isabell Grundschober and colleagues (Grundschober, Ghoneim, *et al.*, 2017). In my own practice, the book and paper I introduced earlier, Hints for Living during the COVID-19 Pandemic, are composed by Pattern Language Remix.



Fig. 258. Pattern Language Remix (Iba, 2020c).

Since this publication, we have continued the practice of Pattern Language Remix. In support of students in junior high schools (Kanai, Ota, *et al.*, 2022; Kanai, Ota, and Iba, 2023a) and youth at vocational training schools in the Philippines (Kanai, Ota, and Iba, 2023a; Kanai, 2024), we collaborated with local teachers to select patterns that are most important for those individuals from the pattern languages we have crafted so far, and conducted workshops with using the patterns (Figure 259). The possibility of such Pattern Language Remixes is attributed to the substantial number of pattern languages of practices that have been crafted. In the future, we can expect not only the crafting of new pattern languages but also the combination of patterns from existing pattern languages to achieve specific goals by Pattern Language Remix.



Fig. 259. Cases utilizing Pattern Language Remix in Japan (Kanai, Ota, et al., 2022) and in Philippine (Kanai, et al., 2023a).

In 2022, the Open Research Forum (ORF) was held in-person for the first time in a long while after the COVID-19 pandemic. At the Iba Lab exhibition booth, we displayed patterns remixed from the pattern languages we had crafted over the years, under the theme "Towards a Future of Living Naturally and Creatively" (Iba Lab, 2022). We also provided the original Pattern Cards designed specifically for this event, which visitors could take home with them (Figure 260). This is our latest example of a Pattern Language Remix.



Fig. 260. Iba Lab exhibition booth presenting patterns, remixed for ORF 2022 (Iba Lab, 2022).

During this period, I further developed a new form of representing the overall system of a pattern language, arranging the form I had created for *Words for a Dialogue*. In this design, the overall system is presented in color, with each category enclosed and filled with a different color. The colors are also adjusted to make the groupings more easily recognizable. This design was first used in the pattern language *A Pattern Language for Creating a City with Natural, Local and Creative Elements*, as shown in Figure 261. In most cases, each category is assigned a different color, but this is not always the case. Previously, the design was often created using only one color (black) for monochrome printing. However, this colorization corresponds to the increasing use of slides and PDFs for sharing. Furthermore, due to the pandemic, the overall system is more often presented on screens rather than on physical paper media, and this design aims to add appropriate visual appeal to the overall system representation. The overview of the *Online Education Patterns* that we created later also follows this color-coded form for its overall structure (Figure 262; Hayashi, Shibata, *et al.*, 2021; Adachi, Shibata, *et al.*, 2021; Inoue, Adachi, *et al.*, 2023).

(4) Pattern Communities in 2020-2022: Managing to Continue the Gathering Online during the Pandemic and Then Retracing Christopher Alexander's Footsteps

It is with great sadness that Christopher Alexander, the originator of pattern languages, passed away in March 2022. In the end, I never had the opportunity to meet and talk with him directly. In retrospect, I regret not trying to meet him earlier, but I lacked the courage to do so at the time. I was in the midst of learning from his books, putting them into practice, and deepening my own exploration. By the time I had finally established connections with his colleagues and disciples in the architectural field and felt ready to talk with Alexander himself, his health had deteriorated. Although I reached out to arrange visiting him in UK, it was not realized, and I ultimately never had the chance to talk with him.



0. NATURAL × LOCAL × CREATIVE

Fig. 261. A new form of presenting the overall system in color, starting from A Pattern Language for Creating a City with Natural, Local and Creative Elements (Yamakage, Namiki, et al., 2020).

0. Redesigning for Online Learning



Fig. 262. Overall system of the Online Education Patterns (Hayashi, Shibata, et al., 2021; Adachi, Shibata, et al., 2021; Inoue, Adachi, et al., 2023).

In the summer of 2022, an intimate gathering of those close to Alexander was held. The event took place at the Faculty Club of the University of California, Berkeley, where he had taught. I thought it was wonderful that the concept was to celebrate Alexander's life rather than mourn his passing. In attendance were Alexander's disciples and colleagues, including Hajo Neis. Alexander's daughters were also present. From the software field, Richard Gabriel participated. Through my connection with Hajo, I was invited to attend as well.

Those close to Alexander took turns at the microphone, sharing stories and memories with Chris, gradually bringing his character into vivid relief. Until then, I had known Christopher Alexander as the author of books and the proponent and the pioneer of concepts such as pattern languages. However, at that gathering, I sensed a person, Christopher Alexander. I caught a glimpse of his will, his life, his relationships—I felt his presence as a person. In particular, when his daughters spoke about Chris as a father, as a father myself, I listened with a sense of identification and was deeply moved.

Naturally, many of the people gathered there were elderly. As expected, given their age, many of Alexander's direct disciples had already retired from their original positions. As I participated in that gathering, somehow, I spontaneously felt as though a baton had been passed to me. Of course, it was not about inheriting Alexander's architectural legacy. It was the baton of the will to improve people's lives and communities through pattern languages. The baton there was not a singular one; surely, each person must have taken one home with them. At the very least, I firmly grasped my own baton.

In December 2022, I was invited to give a keynote speech at SPLASH2022 held in New Zealand, titled "Improving the Quality of Creative Practices with Pattern Languages" (Figure 263; Iba, 2022d). SPLASH stands for Systems, Programming, Languages, and Applications: Software for Humanity. The inclusion of the word 'Humanity' at the end is rather unique. Although I am not a researcher or engineer in software, I study everyday practices, way of living, and well-being of life. In that sense, one could say that speaking at this conference is somewhat fitting for me. I was told that Richard Gabriel, who is involved with the Onward! track at SPLASH, had recommended me as a potential keynote speaker for this event. In the keynote speech, I introduced examples of pattern languages for practice and crafting methods and processes. Note that this SPLASH is an amalgamation of several conferences, including OOPSLA. Considering that Christopher Alexander delivered a keynote speech at OOPLSA in 1996 (Alexander, 1996) and that software patterns and educational patterns grew at OOPSLA, it was truly profound for me to give a keynote on pattern languages of practices at that venue.

It's worth noting that over the past few years, I have established connections with the board members and teachers of Eishin Gakuen Higashino High School. Christopher Alexander was involved in the campus design of this school (Alexander, 2002, 2003b; Alexander, *et al.*, 2012). I have visited the campus with students and given lectures for high school teachers (Iba, 2022a). It is a deeply moving experience to have the opportunity to talk about pattern languages of practices at a place associated with Alexander.



Fig. 263. SPLASH 2022 keynote.

We also made our presentations on our pattern languages related to architectural and urban development at this PUARL conference (Mori, *et al.*, 2016; Yamakage, Namiki, *et al.*, 2020). Note that PLoP 2018 was held in collocation with PUARL 2018 in Portland, Oregon. At that time, I was a researcher at the College of Design at the University of Oregon during my sabbatical year.

During this period, I served as a board member of The Hillside Group, the conference chair for AsianPLoP 2020, and a member of the Program Committees for EuroPLoP 2020, EuroPLoP 2021, EuroPLoP 2022, PLoP 2021, and PLoP 2022.

(5) Theories and Philosophies in 2020-2022: Studying Pattern Language in Light of Eastern Philosophy and Phenomenology, and Conceiving Natural Deep Creation

In his writings, Christopher Alexander occasionally refers to Zen and Taoist philosophy. In *The Timeless Way of Building*, a book that summarizes the philosophy of pattern languages, he uses keywords from Eastern philosophy such as 'way,' 'gate,' and 'egoless.' In *The Nature of Order*, he also employs concepts like 'void' and frequently examples from Eastern architecture and places. Furthermore, he references the folk craft, *Mingei*, philosophy of religious philosopher Soetsu Yanagi and has visited The Japan Folk Crafts Museum himself. Considering the zeitgeist of the American West Coast in the 1970s, these Eastern influences can be considered natural. However, I believe there are deeper philosophical connections beyond such superficial links.

As one of the Eastern Japanese scholars, I consider it a duty to nurture the Eastern philosophical aspects of Alexander's thought thoroughly. Therefore, I have discussed the connections with Taoist philosophy, such as *Laozi* and *Zhuangzi*, and the concept of egolessness (Iba and Learning Patterns Project, 2010; Iba and Yoshikawa, 2017; Iba and Munakata, 2018c; Iba, 2021a, 2021b). Recently, I have also discovered significant overlaps between what Soetsu Yanagi and Alexander are saying and have discussed these points (Iba, 2021f).

Over the past few years, I have been exploring the principles of creation. This led me to the concepts of "Deep Creation" and "Natural Deep Creation" (Iba and Adachi, 2021). These are extensions of the concept of "egoless creation." Instead of "creating" through conscious manipulation, we discussed deep creation, which involves creating egolessly by exercising the unconscious sense. This paper was discussed at Plopourri session of PLoP 2021 (Iba, Yoder, and Gabriel, 2022a). This exploration is still a work in progress, and I intend to deepen it further in the future.

Recently, I have been increasingly involved in concept-making for urban development as a member of the city's expert council and also invited to give talks at urban development meetings from the perspective of creation and practice (Iba, 2022c; Iba and Nakajima, 2023; Fujisawa City, 2023). My ideas about creative society and the research perspective on creation and practice are sought after in the context of creating a creative city. Pattern languages originally emerged in the field of architecture (Alexander, Ishikawa, *et al.*, 1977; Alexander, Davis, *et al.*, 1985; Alexander, Neis, *et al.*, 1987), but it is interesting to note that we are now reconnecting with the origins of urban development from the perspective of pattern languages of practices. In the future, I would like to explore thinking about cities from the perspective of creation and practice, incorporating pattern languages of practices, and linking them to Alexander's architectural pattern languages.

The events of this period are summarized in the timeline shown in Figures 264 through 266.



Fig. 264. Timeline of our pattern language research in 2020, in the first period of the MATURATION PHASE.



Fig. 265. Timeline of our pattern language research in 2021, in the first period of the MATURATION PHASE.

	Projects for Cra Languages a	afting Patter nd Methods	rn Conferences and Publications	Our Papers, Books, Talks, and Workshops			
2022	(Rakuten Shugi Practice Patterns (Academic Writing	s) Boa of T Hills Gro	ard The book was The published side	Application to New Domains: Pattern Languages of Practices for Everyday Life during the Pandemic and for Social Formation			
	Patterns)	(A Patte Langua	ern was submitted	Leveraging Digital Technology to Build a Better Future (Digital Agency of Japan online booklet and pattern cards)			
	Digital Technol	ogy for Mas	tering y) Program	"A Pattern Language for Nurturing an Exciting Life" (Master's thesis)			
	a Better Future)		Committee of EuroPLoP	"A Pattern Language for Mastering the Way: An Exploration of the Teachings Passed Down in the Traditional Japanese Culture of Noh" (Master's thesis)			
	Generator	(A Pattern Language fo	r The book	Words for Caring (Book in Japanese and pattern cards)			
	Patterns Work	Nurturing an Exciting Life	was published Christopher Alexander has passed away	Dementia Care Service in Japan" (Alzheimer Disease International Asia-Pacific Regional Conference presentation)			
	Patter	ns l	The booklet and pattern	"A Pattern Language for Music Creation" (Master's			
			cards were published online	"Music Composition Patterns" (EuroPLoP paper)			
			Award - Award to recognize particularly outstanding	Methodology of Crafting: Refining and Completing Our Methodology for Crafting Pattern Languages			
			achievements	"A Cloud System for Pattern Language Creation" (Master's thesis)			
			Program Committee				
			of PLoP	Pattern Language Remixes and Working on a			
				Study of Assessing Impacts of Introducing A Pattern Language			
				"Class Design for Junior High School Students Using Pattern Language" (EuroPLoP paper)			
	Se Lil	lf-Reliant e Patterns	EuroPLoP 2022	"Effects of Using Pattern Language in Assessment Preparation and Teaching for a Housing Design Exercise" (ET journal article)			
	fo	Filipino	The journal was	"Developing and Assessing a Training Program Utilizing a Pattern Language for Care and Placemaking" (JABCW)			
	yo	um	published	paper)			
			10th Anniversary	"Dialogue workshop for using Pattern Languages for supporting everyday life" (PLoP PLoPourri workshop)			
			The invited talk at the high school	"Latest Cases of Pattern Language Applications for			
			The web journal				
		Membe	r for Expert Meeting on	Pattern Communities: Managing to Continue the Gathering Online during the Pandemic and Then			
	Mura		a Shin Station Area Urban	Retracing Christopher Alexander's Footsteps			
		Develo	Chris Alexander	"Improving the Quality of Creative Practices with Pattern Languages" (SPLASH 2022 keynote)			
			Celebration of Life Sep 23, USA	"Future of School" (Eishin Gakuen Higashino High School invited talk)			
			JARCW 2022 Oct 9, Japan	"Creative Society Vision" ("Envisioning Society, Towns, and Lifestyles in 2050" Study Group invited talk)			
			PLoP 2022 Oct 17-24, online	Theories and Philosophies: Studying Pattern Language in Light of Eastern Philosophy and Phenomenology, and Conceiving Natural Deep			
			at the study group	Creation "Abduction and Qualitative Induction in Essence			
			ORF 2022 Nov 20-21, Japan	Intuition: Connecting Husserl's Phenomenology and Peirce's Logic" (Wesenswissenschaft Paper) <i>Generator</i> (Book in Japanese)			
			ADI-APRC 2022 Dec 8 - 11, Taiwan				
			SPLASH 2022 Dec 5-10, New Zealand				
1	/						

Fig. 266. Timeline of our pattern language research in 2022, in the first period of the MATURATION PHASE.

8.2 Establishing Our Methodology and its Academic Grounding, and Collaboratively Advancing Pattern Languages of Practices to the New Stage [2023-2024]

The subsequent third of the MATURATION PHASE, encompassing the very recent years of 2023-2024, has been filled with various anniversaries. PLoP celebrated its 30th event (30th year), and AsianPLoP held its 10th conference. It has been 30 years since I joined Keio University, as an undergraduate, graduate student, and a professor, and 20 years since I first wrote patterns. The Iba Lab marked its 20th anniversary, and CreativeShift celebrated its 10th year since its establishment. Moreover, I turned 50 years old in February 2024. It is because of these milestones that I decided to write this paper. Precisely because these years have been marked by so many milestones, I have been engaging in daily research and practice with a renewed mindset, contemplating the future.

And the number of people advancing to graduate school and working adult students at the Iba Lab has been increasing. As of 2023, the Iba Lab has 10 doctoral students and 8 master's students, with plans to further increase next year. This can be seen as a reflection of the establishment of the methodology for pattern language research. It has become possible to conduct research based on our methodology. Each student has their own research theme, crafting pattern languages in new fields while also pioneering new ways of crafting and utilizing pattern languages.

In 2023-2024, we focused on establishing our methodology and working on its academic positioning. (1) First, in terms of the application of pattern language to new domains, we are engaged in supporting those in challenging circumstances and exploring ethical ways of living and working. (2) Regarding the methodology of crafting, we are establishing our methodology as an academic approach, but, on the contrary, starting the challenge of mining from narrative works such as manga. (3) As for ways of expressing and utilizing, we have been experimenting with various approaches and have conceived and implemented new ideas such as pattern coin, pattern manga, evolution visualization with patterns, and Future Play Workshops. (4) In the realm of pattern communities, thirty years after the launch of the PLoP conference, 'Practice' is officially being added to the conference name, alongside 'Program'. As researchers of pattern languages of practices, this development brings us genuine delight. (5) In terms of theories and philosophies, we are working on establishing pattern language as an academic research method for studying creation and practices. Let us now explore each of these explorations in greater depth.

(1) Application to New Domains in 2023-2024: Supporting Those in Challenging Circumstances and Ethical Ways of Living and Working

The pattern languages we developed during this period have a strong ethical focus. These include a Pattern Languages of Practices for Journey of Life designed to help young people in impoverished regions of the Philippines lead independent lives (Kanai, Ota, and Iba, 2023b, 2023c; Kanai and Iba, 2023; Kanai, 2024). So, during this period, I started to describe my research as "Supporting People's Lives with Pattern Languages that Capture the Essence of Folk Knowledge of Practices" (Iba, 2023g).

In addition, we developed a wide range of pattern languages that highlight innovative and inspiring practices and ideas from various domains. These include pattern languages for becoming a 'generator' (Iba, Ichikawa, *et al.*, 2011; Ichikawa and Iba, 2022) who energizes and engages others (Shiota, Hayashi, *et al.*, 2023; Shiota, 2024), organizing workshops that encourage cherishing and sharing favorite things (Shibata, Takamura, *et al.*, 2023; Shibata, 2024), exploring creative applications of generative AI (Iba, Hayashi, *et al.*, 2024), incorporating manga expression in communication (Iba, Ota, and Tajima, 2024), cultivating thinking patterns through mathematical learning (Ishiguro and Iba, 2024), effective sports coaching (Hioki, Tajima, and Iba, 2024), living in harmony with nature, and engaging in philosophical dialogues. And the *Academic Writing Patterns* (Adachi, Hayashi, *et al.*, 2023; Adachi and Iba, 2023, 2024) for thesis writing were used to conduct Focus Groups at PLoP and AsianPLoP to improve papers (Adachi and Iba, 2023; Adachi and Iba, 2024). Moreover, I continue to be invited to give talks about pattern languages on various occasions (Iba, 2023g).

In 2023, *Collaboration Patterns for Team Building*, a version of the *Collaboration Patterns* cards specifically tailored for business, was released (Figure 267; CreativeShift, 2023b). These cards were made by selecting 24 patterns from the previous 34-Pattern Card set that are particularly important in business settings and slightly modifying the descriptions to suit a business context. On the back of each card, some business-related examples are provided. This makes it easier for businesspeople using the cards to imagine how the patterns can be applied in their business practices. While the original 34 patterns of the Collaboration Patterns remain effective for all types of collaboration, including business, the goal of creating a business-specific version was to reach the necessary audience and make the patterns more understandable for those readers. This can be considered a new

example of reorganizing and translating a pattern language within the same natural language to better suit a specific audience (although children's versions had been created before, this was the first time a version was made for an older audience and specifically focused on business).



Fig. 267. Collaboration Patterns for Team Building cards, specifically tailored for business.

(2) Methodology of Crafting in 2023-2024: Establishing Our Methodology as an Academic Approach and Starting the Challenge of Mining from Narrative Works

First, our pattern language crafting process and the methods we use have been established in a standardized form. The latest version of the process is illustrated in the Figure 268. I am currently in the process of writing a book on the process and methods of Crafting a Pattern Language; first in Japanese, and later I intend to write it in English. Additionally, I plan to introduce and explain these processes and methods at various conferences in the near future. The latest version of this process was implemented in 2023 during the creation of the *Essence Intuition Patterns*, a project led by me at the Iba Lab. The interim report of this project is summarized in a paper for AsianPLoP 2024 (Iba and Nitta, 2024).



Fig. 268. Our latest process for crafting a pattern language.

Throughout this development process, we frequently engage in "grasping the essence" at various stages. For instance, during the Pattern Mining phase, we strive to capture the core insights shared by practitioners. In the Clustering phase, we aim to understand the fundamental message conveyed by sentences written in the materials. When writing patterns, we reflect on the essential solution each pattern offers and articulate it clearly. During the Pattern Symbolizing phase, we encapsulate the core meaning of each pattern in a concise pattern name or Pattern Illustration.

I have a strong conviction that "grasping the essence" is a crucial aspect of our work across different phases, and I consistently guide students to focus on this. However, for many years, I struggled to articulate precisely what it means to "grasp the essence." Now that we have clarified the development process and methods, I believed that the final frontier was to effectively explain and guide others on how to truly "grasp the essence."

Amidst these reflections, I discovered a significant overlap between this concept and the fundamental principles we often emphasize when crafting pattern languages (Iba and Munakata, 2021; Iba, 2023f). In phenomenology, as advocated and explored by Edmund Husserl, the aim is to elucidate the essence of things and describe it (Husserl, 1929. 1948, 1950a, 1950b, 1952, 1954, 1958). Within this, I discovered five years ago that the method of Essence Intuition, discussed as a central method of phenomenology, is isomorphic to what we do when crafting pattern languages. Husserl had already discussed philosophically, about 100 years ago, what we had been struggling to explain. It took me several years to decipher his highly complex philosophical works, but I finally grasped the core and became able to discuss it in a paper (Iba and Munakata, 2021; Iba, 2022b, 2023b).

Husserl's phenomenology was particularly relevant to our objectives for another reason: he envisioned and explored phenomenology as a fundamental philosophy capable of providing a foundation for various disciplines. Pattern languages, as a methodology, lack a rigorous academic discipline. The method originally emerged in the field of architecture through Christopher Alexander's remarkable intuition, but his ideas were not rooted in architectural studies. Instead, they suddenly materialized within him, integrating concepts from various disciplines and philosophies. In essence, pattern languages were not built upon a solid academic foundation but rather born from the intuition of a genius.

Consequently, when attempting to consider pattern languages as an academic method, their inherent weakness and fragility become evident. This is especially true when applied to the field of software development and subsequently to practical domains, where pattern languages become entirely rootless as a practical discipline. Therefore, there is a pressing need to establish a foundation for pattern languages as a method of practical science in some form. This has been a central focus of my contemplation for the past decade. Initially, I explored pragmatism as a philosophical perspective to approach this challenge, but while it aligned philosophically, it did not lead to a discussion of establishing a disciplinary foundation.

Eventually, I discovered phenomenology. Phenomenology examines the recognition and judgment of things from the perspective of human consciousness, starting from the very foundation. As such, it can serve as a basis that can be considered the foundation of all disciplines. Currently, I have begun to discuss our pattern language methodology from the perspective of phenomenology and am in the process of writing comprehensive books and papers on the subject.

While conducting rigorous academic methodological examinations, we have also been exploring highly unique methodological approaches. One such endeavor involves mining patterns from the thoughts and actions of fictional characters in stories. Within a story, characters think and act in response to certain situations, and we mine patterns from these thoughts and actions.

Specifically, we have been mining patterns from the stories in Shonen Manga (boys' comics). In the slightly exaggerated world settings of Shonen Manga, the protagonists exhibit exceptionally positive thinking and take powerful actions (Ota and Iba, 2023; Ota, Kuwataka, Iba, 2024). Even in extreme situations, they maintain an indomitable spirit, pushing forward, achieving their goals, helping their comrades, and striving to save the world. Readers engage with these stories, aspiring to be as strong as the characters and admiring their way of life. Through this reading experience, readers receive courage and energy to do their best in their daily lives. In these Shonen Manga, how do the protagonists think, and what actions do they take? If we can identify, describe, and craft a pattern language from these elements, it could potentially become a set of patterns that support people in acting in their daily lives.

Certainly, the patterns obtained through this approach would differ from the usual "patterns" derived from practitioners in the real world. However, if we do not perceive these patterns as mere fantasies or falsehoods, it suggests that we find some form of reality within them. Recently, we have been working on extracting and articulating such patterns from stories, despite their different origins and purposes. Husserl argues that in the essence intuition of phenomenology, it is possible to grasp the essence of things even from fiction, and we have

experienced this firsthand in our research. A pattern language crafted in this manner would not be one that "supports the practices of actual people who exist," but rather one that encourages "living courageously and energetically like characters in Shonen Manga" in our daily lives, akin to the manga we read.

(3) Ways of Expressing and Utilizing in 2023-2024: Conceiving and Implementing Pattern Coin, Pattern Manga, Evolution Visualization with Patterns, and Future Play Workshop

In recent years, we have explored innovative ways to express pattern languages beyond traditional books and papers, such as creating Pattern Objects and Pattern Songs. More recently, we have invented and experimented with even newer media (Iba, 2023e).

The innovative medium we have developed is "Pattern Manga," which conveys the essence of patterns through the style of manga (Figure 269; Iba, Tanaka, *et al.*, 2023). The prototype Pattern Manga we created included various types such as 4-panel manga and story manga, expressing pattern languages such as *Learning Patterns, Words for a Dialogue, Words for a Journey, Fearless Change*, and *Collaboration Patterns* in manga form.

By expressing patterns in this way, we can expand the range of readers even further beyond those who would read the serious text in which they have been expressed so far, to those who would read manga rather than text. Moreover, since Pattern Manga are depicted as a specific story, readers can receive the abstract essence of the patterns along with a concrete episode, just like listening to someone else's story in a Dialogue Workshop. At the Iba Lab, we are currently continuing the challenge of drawing new Pattern Manga.

Another is "Pattern Coins," which are wooden circular chips printed with the name, illustration, and Solution of a pattern (Figure 270; Iba, Shimamura, and Aoki, 2023). Although we call them coins, these Pattern Coins are not a medium of exchange like ordinary currency but a medium for gift-giving to others. When someone possesses a Pattern Coin, the practice written on it is regularly reminded to the owner, encouraging them to practice it.

The owner can only give the coin to someone who seems to need the practice on it after he/she have practiced it him/herself. When handing over the Pattern Coin, they share their own experience along with it (Figure 271). This is a one-way giving, not an exchange, but a gift. For the recipient, such a Pattern Coin as a medium of gift-giving is not just information about the pattern's content but also a feeling of support from the person who gave it to them. This further encourages the practice. In this way, Pattern Coins circulate within a community and stimulate practice (Figure 272). In addition to experiments within the Iba Lab (Iba, Shimamura, and Aoki, 2023), we also conducted a trial at the EuroPLoP conference (Shimamura, Aoki, and Iba, 2023), which was well-received. Note that I designed the pattern coins, which we then produced by laser-engraving the designs onto wooden chips (Figure 273).



Fig. 269. Pattern Manga, which is attractive expression of pattern languages (lba, *et al.*, 2023): *Learning Patterns* (top left), *Collaboration Patterns* (top right), *Fearless Change* (Bottom left), and *Words for a Journey* (Bottom right) (lba, Tanaka, *et al.*, 2023).



Fig. 270. Fundamental design of a Pattern Coin (Iba, Shimamura, and Aoki, 2023).



Fig. 271. Pattern Coins, which are gift-economic media for promoting the chain of practice (Iba, Shimamura, and Aoki, 2023).



Fig. 272. Gifting network at Iba Lab experiment of Pattern Coins.

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Fig. 273. I designed the pattern coins, which we then produced by laser-engraving the designs onto wooden chips.

We also conducted workshops where we used the pattern language as a common language to put it into practice on the spot. At PLoP 2023, we utilized Academic Writing Patterns to discuss how to enhance our own papers (Figure 274; Adachi and Iba, 2023). Academic Writing Patterns articulates the fundamentals of academic writing, such as crafting abstracts and introductions. By employing these patterns as "lenses of recognition" to review their own work, areas for improvement became evident. During the workshop, the participants engaged in this process collaboratively, discussing with other attendees. At the PLoP conference, we were able to support each other by discussing paper revisions in a different format than the traditional Writers' Workshop.



Fig. 274. Workshop for Improving Your Papers with Academic Writing Patterns (Adachi and Iba, 2023).

Moreover, we developed and conducted a workshop called the "Future Play Workshop," where participants embody their future selves after practicing the patterns from a pattern language (Figure 275; Nitta, Kanai, *et al.*, 2023). In this workshop, participants roleplay as their future selves, answer interviews from other participants, and share imaginary episodes of how they applied the patterns. Not only does this workshop generate a lot of excitement, but it also allows participants to experience the outcomes of using a pattern language and connect the value of each pattern to their own future.



Fig. 275. Future Play Workshops at PLoP 2023 (Nitta, Kanai, et al., 2023).

In 2023, at the Open Research Forum (ORF), we held an exhibition with the theme "Living in a Creative Society: Creation and Practice Utilizing Pattern Languages" (Iba Lab, 2023). What made this exhibition unique was that there were no text-based explanation panels; instead, the research was totally introduced through manga (Figure 276). This manga was an original story that provided an overview of "Creative Society," "Generators," and "Pattern Language," and was crafted by a team of Iba Lab students and me (Figure 277-279).

During the manga creation process, we held feedback sessions similar to Writers' Workshops, where Iba Lab members who were not part of the manga crafting team read the manga and provided feedback for improvement, which was then incorporated into the final product (Figure 280). The manga exhibition was very well-received, and based on that experience, we have submitted a pattern paper on "Exhibition by Manga" for AsianPLoP 2024 (Iba, Ota, and Tajima, 2024).



Fig. 276. Iba Lab Exhibition Showcasing 'Exhibition by Manga' at ORF 2023 (Iba Lab, 2023; Iba, Ota, and Tajima, 2024).



Fig. 277. Iba Lab Exhibition Manga at ORF2023, page 1-2 (Iba Lab, 2023; Iba, Ota, and Tajima, 2024).

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Fig. 278. Iba Lab Exhibition Manga at ORF2023, page 3-4 (Iba Lab, 2023; Iba, Ota, and Tajima, 2024).



Fig. 279. Iba Lab Exhibition Manga at ORF2023, page 5-6 (Iba Lab, 2023; Iba, Ota, and Tajima, 2024).



Fig. 280. Scenes of discussing improvements for the exhibition manga like a Writers' Workshop (Iba Lab, 2023; Iba, Ota, and Tajima, 2024).

Additionally, at this exhibition booth, we also had a display that conveyed the vision of a "Creative Society" using images generated by generative AI, to help people better imagine what kind of society a "Creative Society" could be. We will also present a paper on "Visualizing Future Visions" using generative AI at AsianPLoP 2024(Iba, Hayashi, et al., 2024).

Moreover, at this exhibition booth, we wanted visitors to experience some our challenge of Pattern Manga that year. We conducted hands-on workshops where participants selected their favorite patterns and drew a 4-panel Pattern Manga (Figure 281). We created a special sheet for this purpose. The sheet had the content of the pattern described on the left side, and four empty panels for the manga on the right side. Participants engaged in conversations with "Generators" from the Iba Lab members, to flesh out the content and draw the manga. The manga drawn by the participants were continuously posted on the booth's bulletin board, and the collection of Pattern Manga grew. By drawing manga, participants had the opportunity to think deeply about the chosen pattern and engage in conversations with others about it.



Fig. 281. A corner where visitors to the booth craft four-panel manga based on Iba Lab's patterns.

During this period, we developed a method to analyze the degree to which patterns are woven into practices (Kimura and Iba, 2023, 2024). Also, in the research of workshop development, a method has been invented to express workshop designs using patterns and then demonstrate the trajectory of workshop design evolution through pattern changes (Figure 282; Shibata and Iba, 2024).



Fig. 282. Visualization of design evolution through pattern changes (Shibata and Iba, 2024).

(4) Pattern Communities in 2023-2024: Thirty Years after the Launch of the PLoP, 'Practice' is Officially being Added to the Conference Name!

In 2023, the 30th PLoP conference was held. Since it started in 1994 and has been held annually, 2023 marked the 30th event. Due to the pandemic's impact, PLoP had been held online for three years, but the 30th conference took place again at the traditional venue, Allerton House. I was delighted to have PLoP back in person and at Allerton House after such a long time. Here, we presented several papers, including Pattern Manga and this paper.

Once again, the Iba Lab was asked to design this year's T-shirts. Just like the 20th anniversary conference, it was a great honor. This time, the illustration was drawn by Sawami Shibata from the Iba Lab, who had drawn illustrations for *Online Education Patterns* and *Rakuten-shugi Practice Patterns*. Joe and I contributed ideas and participated in the final design.

On this T-shirts, many small Manabu-kun characters are drawn, arranged to form the letters "PLoP" as a whole. The small Manabu-kun characters depict the main events during the PLoP conference from left to right. From the left, there are scenes of rain games and shepherding, Zumba, games, a night of live music, welcome pizza, Writers' Workshops, the traditional yarn network, and finally, everyone dispersing with a "see you again." To commemorate the 30th anniversary, the number of Manabu-kun characters is exactly 30. This T-shirts became one of the official T-shirts for the 30th PLoP (Figure 283). The other one was designed by Richard Gabriel.

This year marks several milestones: the 30th anniversary of PLoP, the 20th anniversary of the Iba Laboratory, 20 years since I first created a pattern language, the 10th anniversary of my pattern language company,

CreativeShift, and the last year of my 40s as I approach my 50th birthday. To commemorate these occasions, I wrote a paper reflecting on my pattern language research to date. Drawing upon past interviews, literature, and information, I compiled an oral history, and I described my pattern language research as an autoethnography. This paper is the result of that endeavor (Iba, 2023c).



Fig. 283. T-Shirts design in PLoP 2023.

As we have seen in this paper, the concept of pattern languages was originally proposed in the field of architecture. It was later applied to the software field, and the first conference on Pattern Languages of Programs was held in 1994. Over the past 30 years, starting with pedagogical patterns and *Fearless Change*, we have crafted many pattern languages of practices. Currently, at the PLoP conference, not only software patterns but also pattern languages of practices are widely presented and discussed. At a board meeting of The Hillside Group in 2023, it was discussed and decided to add "People and Practices" to the last "P" of PLoP, which originally stood for "Programs," making it "Pattern Languages of Programs, People, and Practices."

The first conference with this name change will be AsianPLoP2024, and its name will be the Asian Conference on Pattern Languages of Programs, People, and Practices (Figure 284). The AsianPLoP conference is celebrating its 10th anniversary, and it is also the first time I will serve as the Conference Chair, making it a symbolic occasion. Furthermore, a decision is expected to be made soon regarding PLoP held in North America, and it is said that EuroPLoP held in Europe is also considering moving in this direction. As an active researcher on the pattern languages of practices, this is a delightful development and an event that motivates me to continue working hard and contribute to the community in the future.

During this period, I served as a board member of The Hillside Group, the Conference Co-Chair for AsianPLoP 2024, and a member of the Program Committees for EuroPLoP 2023, EuroPLoP 2024, PLoP 2023, and PLoP 2024.



Fig. 284. Starting from AsianPLoP 2024, the conference will be renamed to "Conference on Pattern Languages of Programs, People, and Practices."

(5) Theories and Philosophies in 2023-2024: Working on Establishing Pattern Language as an Academic Research Method on Creation and Practices

As discussed in the Methodology of Crafting section, I have been dedicating my efforts to studying the philosophy of phenomenology and utilizing it as a foundation to establish pattern languages as a rigorous academic discipline (Iba, 2023b, 2023f). Husserl considered phenomenology to be a philosophy that provides a foundation for all other academic disciplines. This is because, following Descartes' method and thoroughly pursuing it, it

provides a basis for thought that builds up from the fundamentals of consciousness. He envisioned providing a foundation for existing academic disciplines, but this naturally applies to new academic fields that are emerging as well. The foundation for the new academic discipline I am attempting to establish—which I call "Studies on Creation and Practices" (Iba, 2023a)—with pattern languages as the research method, can also be considered from phenomenology.

Furthermore, Husserl distinguished between ordinary empirical sciences, which he called "science of matters of fact," and phenomenology, which he called "science of essence" (Husserl, 1950b). Science of matters of fact clarify how the real world actually is, while science of essence clarifies the meaning of the concept. I believe this perspective is crucial in considering what pattern languages are. Pattern languages are a science of essence that elucidates the essence of design and practice. For example, *Words for a Dialogue* elucidates the essential meaning of what constitutes a "good dialogue" in the sense of Open Dialogue. Of course, it is not created in a vacuum but is based on facts, so in the sense that it is grounded in facts, it is a "Science of essence grounded in facts" (Iba, 2023b).

In this way, phenomenology is indispensable for a new academic discipline that uses pattern languages as its main method. With this as a foundation, I have been focusing on envisioning the form of Studies on Creation and Practices as I conceive it, and I intend to establish it over the next few years.

In addition, I have been teaching the undergraduate course "Creative Systems Theory" at the Faculty of Policy Management and the Faculty of Environment and Information Studies at Keio University, primarily focusing on the systems theory of autopoiesis. However, I have now started teaching about phenomenology in this course as well. Furthermore, I have proposed a new graduate course, "Methodology for Studies on Creation and Practices," at the Graduate School of Media and Governance, Keio University, to discuss research methods for Studies on Creation and Practices. This course will be offered starting from the 2024 academic year.

At this point, I want to highlight a significant recent development: the emergence of several Ph.D. students who have started researching the effects of introducing pattern languages, employing both quantitative and qualitative methods to validate their impact. These results are considered valuable in this field in the sense that they reveal the previously unmeasured and unverified effects of introducing pattern languages.

For example, one utilizes the pattern language method in architectural professional education (Iba, Yamano, *et al.*, 2022; Yamano and Iba, 2024). In the research, a pattern language of housing design by bioclimatic design was crafted and introduced it into architectural education at a vocational school (Yamano, Kobayashi, and Iba, 2022). He compared the performance task evaluations of a class taught bioclimatic design as usual and a class that introduced the pattern language. He demonstrated that the class that shared the knowledge as a pattern language received higher evaluations in both teachers' assessments of the work using rubrics and students' self-evaluations, proving the effectiveness of teaching with pattern languages.

Furthermore, he crafted a pattern language for learning architecture for students in architectural professional education. He used it in workshops for new students and demonstrated its effectiveness in reducing anxiety about "participation" and "acquisition" in new learning (Yamano, Kobayashi, *et al.*, 2023). Additionally, he used the same pattern language at the time of advancement to the second year. He verified that it supports students in seriously facing "learning" to acquire the skills necessary to become a professional and "career path" to become a professional, reflecting on "learning" and "career path" as concretely and detailed as possible, and discussing them with others (Yamano, Kobayashi, *et al.*, 2024).

Moreover, another Ph.D. student member in the Iba Lab crafted *Words for Caring* (Kaneko and Iba, 2022a) for elderly care and held workshops for caregivers. He demonstrated that a pattern language and workshops utilizing it are valuable for caregivers by triggering the sharing of experiences and learning. It was found that sharing experiences with each other is possible using a pattern language, regardless of differences in years of experience (Kaneko and Iba, 2023a).

He also conducted a detailed survey of what kind of learning occurs in the Dialogue Workshop for caregivers. He revealed that there are many realizations and learnings in both the values behind the practice of "*what* is important to do" and the concrete methods of "*how* to do it" in the content of the pattern Solutions (Kaneko and Iba, 2024b). It was also suggested that listening to the experiences of others contributes to team building.

In this way, one of the latest trends at the frontier of our research is that studies investigating and verifying the actual effects in each field are being accepted and published as peer-reviewed journal papers in several academic societies.

Furthermore, he was invited to give keynote speeches at welfare field conferences (Kaneko and Iba, 2023b, 2024a) and presented at conferences focused on elderly care (Kaneko and Iba, 2022b; Kaneko, Iba, Munakata, 2022, 2023; Kaneko *et al.*, 2023). We found that writing patterns as a way of enhancing the quality of reflection

(Kimura, Hikino, *et al.*, 2024). Additionally, as developing new ways, we are developing pattern language research in conjunction with other qualitative research methods (Nitta and Iba, 2023).

As we progress in establishing pattern languages as a practical research methodology and advancing academic research in this field, I am reminded of a significant insight shared by Ralph Johnson. In 2013, during an interview with Ralph, I asked him, "What are your thoughts on pattern languages of practice?" His response has stayed with me ever since:

It's sort of nice that PLoP brings in people who aren't computer people. It makes it a little bit harder when you're running the conference, trying to keep everybody with papers they can understand. At the Writers' Workshop, when you've got a paper on some topic that nobody else understands, it's hard to get good criticism from it. One of the things about PLoP is that it tended not to really focus on "Are the patterns correct? Is this good advice to tell somebody?" Rather, "Is the advice clear? When you read it, are there things that you want to know that it's not talking about? How well does it communicate?" We tend to focus more on how well it communicates. The thought is that probably the writer of the paper knows more about this topic than anybody else does, so we can't really tell him about the mistake in the content, but we can certainly tell him that he's not communicating very well.

Nevertheless, patterns need to have people who criticize their content. People need to read the patterns and say, "but you're missing this really important thing," "this is not right in this situation, that'll be the wrong thing to do," or "What you said works here, but it doesn't work over here." PLoP is not good for that. We don't provide that kind of feedback. We don't have the right people. You need to have a real expert in the domain.

One of the things I thought is that we really ought to have a way to get review. If you have something on security, get a bunch of security experts who don't know anything about patterns. Have them be reviewing the paper and giving the feedback. That would be sort of the next step, maybe beyond PLoP. Or PLoP give you feedback on how well you're communicating, then you'll going to have other people who can give you feedback on is this pattern really the best pattern than other things (as stated by Ralph).

Considering this crucial insight, we have expanded our approach beyond seeking feedback on our writing through the Writers' Workshops at PLoP and EuroPLoP. We now also have the content of our patterns reviewed by the individuals we interview during the mining process and by practitioners in the relevant fields. This enables us to refine both the expression and substance of our patterns. I agree that creating opportunities to have practitioners and experts in the field review the content of the patterns and provide feedback is crucial. To that end, I am considering establishing a new type of academic society in Japan that facilitates this process. Although it is still in the conceptual stage, I believe that this endeavor may be one of my important missions in the coming period.

The events of this period are summarized in the timeline shown in Figures 285 and 286.



Fig. 285. Timeline of our pattern language research in 2023, in the second period of the MATURATION PHASE.





9. CONCLUSION

In this paper, we have traced the history of how the concept of pattern language has been applied from its original field of architecture to the domains of software and practice, albeit limited to the aspects and parts that could be covered within the scope of this paper. The first part uncovers what had been done through interviews with people who were already researching and working in the world of pattern language before I encountered it. The

second part unravels and demonstrates the trajectory based on my own experiences. My 20 years journey of pattern language research is summarized in the overview timeline shown in Figure 287.

		Application to New Domains	Methodology of Crafting	Ways of Expressing and Utilizing	Pattern Communities	Theories and Philosophies			
2004	STARTUP	Unexpectedly Starting	ing to Develop Pattern I anguages of Practices and then Encountering the Pattern Community						
2004	PHASE [2004 - 2012]	Our First Pattern Languages of Practices Inspired by <i>Model Patterns</i>	Crafting Pattern Languages while Drawing on Methods of Creative Thinking and Software Development	Expressing Each Pattern with an Illustrative Figure where Characters Implement the Solution	Initially Publishing Pattern Papers in Japanese conference, and then Finding the PLoP Conference and Starting to Participate	Theoretically Analyzing Pattern Languages as Communication Media from the Perspective of Social Systems Theory			
2008		Attempting to Craft and Utilize Pattern Languages of Practices in Our Own Way and Style							
		A Pattern Language to Support Students in Their Daily Learning Activities	Conceiving and Beginning to Practice Mining Dialogue, Clustering, and Pattern Illustrating	Developing Our Concise Style with a Pattern per Two-page Spread and Dialogue Workshops Using a Pattern Language	Unexpected Debate Arose from Our First PLoP Papers on Human Actions, but the Next Paper was Accepted Smoothly	Developing Creative Systems Theory and Discussing the Creative Functions of Pattern Language Theoretically			
2011		Articulating and Proposing Pattern Languages of Practices as a Genre of Pattern Language							
		Pattern Languages for Daily Creative Activities, such as Presentations and Collaborations, and for Living Vibrantly and Beautifully	Presenting Our Methodology on Mining Dialogue, Clustering, and Pattern Illustrating	Exploring Visual Representations of Patterns, Dialogue Workshops in Various Communities, Patterns on a TV Program	Invited to Talk Amidst a Crisis of Near Paper Withdrawal and Potential Abandonment of Further Research	Proposing a New Genre, Pattern Languages for Human Actions, which is Called Pattern Language 3.0			
2013	EXPANSION	Crafting Pattern Languages of Practices in Everyday Life, which Address Social Issues							
	[2013 - 2019]	Pattern Languages of Practices in Everyday Life, which Address Social Issues such as Disaster Prevention and Elderly Welfare	Conceiving and Beginning to Practice Mining Interviews, Mining Workshops, and Pattern Writing Sheets	Developing Pattern Cards, Experience Chart, and Systems for Utilizing a Pattern Language	Our Style of Pattern Language Gradually Gained Recognition in Pattern Language Communities	Discussing the Meaning and Significant Role of Pattern Language in the Emerging Creative Society			
2015		Pioneering the Implementation of Everyday Use Pattern Languages, and Developing a Methodological Pattern Language for Crafting a Pattern Language in Our Way							
		Pattern Languages of Practices in Everyday Life such as Parenting and Cooking	Mining Patterns from Our Experiences and Crafting a Pattern Language for Crafting Pattern Languages	Conceiving and Implementing Pattern Object, Pattern Song, Pattern Concierge, and Idea Generation Workshops	New Community on Pattern Languages for Societal Change and Interactions with Key Figures in Architecture	Exploring the Nature of Order in Practices and Proposing the Fundamental Behavioral Properties			
2017		Expanding Pattern Languages of Practices to Various New Everyday Activities and Sharing Our Methodology with People Globally							
		Pattern Languages that Infuse Humanity and Creativity into Practices in Diverse Fields	Conducting Workshops for Offering Experiential Learning of Our Methodology	Developing and Utilizing Information Systems for Facilitating Daily Engagement with Pattern Languages	Experiencing the Worldwide Spread of Pattern Languages of Practices on the Earth	Conceiving and Proposing Egoless Creation, Wholeness Egg, and Pattern Language as Media for Creative Learning			
2020		Crafting Pattern Languages to Shape Our Future in Response to Societal Changes, and Conducting Analyses Leveraging Our Accumulated Research Results							
	[2020 -]	Pattern Languages of Practices for Everyday Life during the Pandemic and for Social Formation	Refining and Completing Our Methodology for Crafting Pattern Languages	Conducting Pattern Language Remixes and Working on a Study of Assessing Impacts of Introducing a Pattern Language	Managing to Continue the Gathering Online during the Pandemic and Then Retracing Christopher Alexander's Footsteps	Studying Pattern Language in Light of Eastern Philosophy and Phenomenology, and Conceiving Natural Deep Creation			
2023	023 Establishing Our Methodology and its Academic Grounding, and Collaboratively Advancir								
		or Practices to the New Supporting Those in Challenging Circumstances and Ethical Ways of Living and Working	Establishing Our Methodology as an Academic Approach and Starting the Challenge of Mining from Narrative Works	Conceiving and Implementing Pattern Coin, Pattern Manga, Evolution Visualization with Patterns, and Future Play Workshop	Thirty Years after the Launch of PLoP, 'Practice' will Officially be Added to the Conference Name!	Working on Establishing Pattern Language as an Academic Research Method on Creation and Practices			
		ā							

Fig. 287. Summary of my journey in our pattern language research over the past 20 years.

When I entered the world of pattern language, it had already been applied to the field of software, and its application to the realm of practice had also begun in some areas. I joined the saga of this application's history midway through. In a way, this is akin to Luke Skywalker in the movie *Star Wars*. While it may be slightly presumptuous to equate myself with the main character of the film, considering that each person is the protagonist of their own life, it is permissible to do so. Without a doubt, I feel that I was in a position similar to Luke in *Star Wars*. Before I began my journey, the saga had been unfolding for a long time, and by joining it, becoming involved, and pioneering new paths with the people I met along the way, I became part of the saga. I feel that such a narrative has unfolded.

In the saga of pattern language application, there were Jedi Masters of the generation above me, such as Obi-Wan Kenobi and Yoda, from whom we learned and were guided. Richard Gabriel is my Obi-Wan Kenobi. And in the pattern community, there is indeed Yoda (Joe Yoder), who taught us many things. While I don't know anyone who fell to the dark side and joined the Imperial Army, we were still a "resistance" fighting against the typical modern systems of the world from the beginning of Alexander's work.

Recall that *Star Wars* was initially produced and released as episodes 4 through 6, with the young Jedi warrior Luke Skywalker as the main character; Later, episodes 1 through 3 were created and released, depicting the prehistory leading up to episode 4; Much later, episodes 7 through 9 were produced and released, with Luke becoming an elderly master and the next generation taking on the role of main characters. In retrospect, this structure is well-crafted and has a universal quality, reflecting how everyone lives their life as their own protagonist, with a prehistory and a subsequent era in their world.

Considering this, my 20 years of pattern language research can be said to correspond to episodes 4 through 6 of the original *Star Wars* trilogy. The prehistory, the story of our masters in this world, can be said to encompass Alexander's conception, creation, and development of the pattern language concept (episode 1), its application to the field of software (episode 2: the first half, section 2, of the first part of this paper), and its application to the fields of education and work practice (episode 3: the second half, section 3, of the first part of this paper).

Episodes 7 through 9, which will follow, are likely to be the story of the next generation after me. Currently, there are many doctoral and master's students in the Iba Lab, and I am working on nurturing the next generation daily. The story after this will be one in which they are the main characters, and while I will play an important role, I will eventually recede into the background and depart. The next generation will emerge not only from my direct disciples but also from other places.

Considering this, what we should do from now on becomes clear. As of 2024, we are in the second stage of the middle third of the MATURATION PHASE. If this phase is going to end in 2024, the last third of the MATURATION PHASE will start from 2025 to create an environment for the next generation to grow. In fact, as PLoP celebrates its 30th anniversary and AsianPLoP its 10th, officially adopting Practice in their names, we are at a turning point where the next development is beginning. I would like to establish an academic society in Japan for research using pattern language as a primary method. This will likely take several years, so it will be the final stage of the MATURATION PHASE.

In this paper, we have examined one aspect of the saga of pattern language research. If written by someone else, this story would likely highlight different events and include varying interpretations and meanings. There are also many more stories that could be made into compelling spin-offs. This paper weaves a single narrative based on my own experiences and the stories of the people I met and interviewed. Nevertheless, one important aspect that was not covered in this paper is the interaction and collaboration with Christian Kohls, which can be likened to the relationship between Luke and Han Solo (if we follow the storyline where I am Luke, Chris would be Han Solo, but from his perspective, I might be the one making Han Solo-like unexpected moves). But that is a tale for another time.

Rather than aiming to record an 'official history,' this paper recounts what I discovered from the stories I heard and the world as I perceived it. I believe that communities that have accumulated a certain amount of time should have many such stories told. By doing so, the actual situation will become more multifaceted.

In this conclusion, I have been drawing parallels with the *Star Wars* story, so I would like to conclude with that parallel once more. In the world of *Star Wars*, there is a "Force" that the Jedi follow and from which they derive their power. In the world of pattern language, the solution of a pattern is to resolve the conflict of forces embedded in the situation. In this process, the forces do not disappear; by following and utilizing their power, they become part of creating a favorable outcome while resolving the conflict between them.

Christopher Alexander said, "The patterns in the world merely exist. But the same patterns in our minds are dynamic. They have force. They are generative. They tell us what to do; they tell us how we shall, or may, generate them; and they tell us too, that under certain circumstances, we *must* create them" (Alexander, 1979, p.182). In

this context, let me conclude with a famous quote about that Force: *May the Force be with you*, in the same sense, *May the Patterns be with you*.

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- Takashi Iba. 2013e. "Evolution of Pattern Languages: Designing Human Actions, Dialogue, & Films," Talk, in *the PUARL 2013 Conference*, Oregon, USA.
- Takashi Iba. 2014a. "Pattern Language Open Seminar: Pattern Language 3.0 for Business Creation," Creative City Consortium, Tokyo, Japan.
- Takashi Iba. 2014b. "Pattern Language 3.0 Study Group for Business Professionals," Seminar Series, CreativeShift, Tokyo, Japan.
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- Takashi Iba. 2016d. "Concept Language for Area Prevention of Disasters: The Case of The Otemachi-Marunouchi-Yurakucho (OMY) District," Poster, in *the PUARL 2016 Conference*.
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- Takashi Iba. 2017b. "Words for a Journey: A Pattern Language for Living Well with Dementia," Keynote, in the Gerontech and Innovation Expo cum Summit, The Hong Kong Council of Social Service, Hong Kong.
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- Takashi Iba. 2021a. "Forum "Creative Society in the Age of Symbiosis: Emergence through Non-Self, Chaos, Ku," Invited talk, in

the Ecological Memes Forum 2021, online.

- Takashi Iba. 2021b. "Shaman in Creation: based on remarks by writers, poets, and composers; the thought of Christopher Alexander; and Toshihiko Izutsu's Interpretation of Taoism," Invited talk, in *the Ecological Memes 2021 AWAI gathering*, online.
- Takashi Iba. 2021c. "A Practical Guide on Pattern Writing for Pattern Languages of Practices," in the 28th Conference on Pattern Languages of Programs (PLoP 2021).
- Takashi Iba. 2021d. "Systematization of Patterns: How to Craft a Pattern Language as a Whole," in the 28th Conference on Pattern Languages of Programs (PLoP 2021).
- Takashi Iba. 2021e. "Contrast within a Pattern: Capturing a Gap between Problematic and Good Consequences," in the 28th Conference on Pattern Languages of Programs (PLoP 2021).
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- Takashi Iba. 2022d. "Improving the Quality of Creative Practices with Pattern Languages," Keynote, in the International Conference on Systems, Programming, Languages, and Applications: Software for Humanity (SPLASH 2022), Auckland, New Zealand, published in the SPLASH Companion 2022, ACM, p.4.
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- Takashi Iba. 2023d. "New Frontiers in Pattern Languages of Practices," Lightning talk, in the 30th Conference on Pattern Languages of Programs (PLoP 2023), Illinois, USA.
- Takashi Iba. 2023e. "Exploring New Ways of Expressing and Delivering Pattern Languages: Endeavors of Pattern Card, Object, Coin, Song, and Manga," Lightning talk, in the 30th Conference on Pattern Languages of Programs (PLoP 2023), Illinois, USA.
- Takashi Iba. 2023f. "Philosophical Foundations of Pattern Language Creation: Rooted in the 'Science of Essence' in Husserl's Phenomenology," Lightning talk, in the 30th Conference on Pattern Languages of Programs (PLoP 2023), Illinois, USA.
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