



PatternDynamics™
—
thrive in complexity

PatternDynamics One Day Workshop

Learning the principles
of sustainability through
the patterns of nature

Workbook v1.0



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Introduction to PatternDynamics™:

How the patterns of nature show us the principles of sustainability



The Story: How I Created PatternDynamics and Why

by Tim Winton

After completing university studies in Canada in English Literature and Architecture, I moved to Australia. The next year, 1994, I attended a Permaculture Design course. At that point I committed to making 'sustainability' my life's work. After an initial few years learning the fundamentals of ecological design and practical techniques in sustainable agriculture, forestry and land management, I founded a residential centre for sustainability education on a rural property in the hinterland of the north coast of New South Wales, Australia.

This went on to become a ten year experiment in forming an 'educational community for sustainability'. During this period, as well as becoming a sustainability educator, I developed careers in reforestation contracting, organic agriculture, ecological design and sustainability consulting.

The centre was called Permaforest Trust, and it was here, along with experiences from my work in various aspects of the sustainability industry, that I developed the foundation insight that was to form PatternDynamics™ as a sustainability pattern language. The insight was that: ***the patterns of***

nature hold the key to the principles of sustainability of any system, of any type, at any scale.

At the Permaforest Trust we had access to all the technologies and strategies we needed to live sustainably. We had the capacity to generate our own energy using solar panels, grow our own food in restorative agricultural systems, integrate our wastes back into the environment, share resources as a community to lower our environmental footprint, and to restore soils and ecosystems. But, ironically, the centre itself – as a 'system' – struggled to be sustainable. This is true of any intentionally sustainable community I know of. The stresses became so great that there were times when the project almost failed completely. My work outside the centre, in the world at large, demonstrated the same dynamic: the sustainable systems I participated in establishing there also struggled to be sustained. Globally, too, sustainability was struggling. ***Why was sustainability proving to be so unsustainable?*** This became an overriding question for me. I think the answer holds a key for the possibility of human thriving on this planet that has not been properly recognised or addressed to date.

Our problem at the centre was not that we needed more sustainability technologies or strategies – we had more than enough of these. Our challenges had to do with how the people in the project interacted to form a ‘system’ that could support these technologies and strategies. We tended to have different ideas about how the centre should be organised: some people wanted it to be more structured than others, some more creative, some more feminine or more masculine, some more focused on trade and financial sustainability, some on vision and purpose, some on management structures, some on programs and schedules and so on. These different views caused real problems and conflict in the social system of our small community. Often these different perspectives would literally go to war with each other: for example people who advocated creativity and freedom would think of people who believed in structure as wrong or even ethically unsound, and visa versa. Or, folks who believed in developing strong trade systems would be either glorified or reviled. What became clear after a time was that people’s cultural values dictated, to a significant extent, the patterns of organisation they aligned with: that is, people tended to identify with patterns that they found culturally *meaningful*.

Gradually I came to realise that the natural systems around us, which had sustained themselves for many millions of years, exhibited patterns of organisation that resembled all of our various views – never just one or even just a few, but many, many different patterns were always present all the time. Nature demonstrates that integrating multiple patterns of organisation is the key to sustaining its

systems. I call the ability to recognise and understand multiple patterns of organisation ‘systems thinking’. Intuitively at first, I began experimenting with using natural systems to introduce people to balancing and integrating many patterns, not just the limited amount they identified with based on their cultural conditioning. As I developed and formalised this approach into PatternDynamics™, it proved to be a powerful method for making this kind of systems thinking meaningful and therefore useful in organisational settings. In the end it allowed us to overcome many of our challenges at Permaforest Trust and to create a unique and quite special sustainability community.

Systems Thinking that facilitates Organisational Sustainability for creating a Thriving Planetary Civilisation

What became clear to me in this long experiment was that Permaforest Trust was a microcosm of the global sustainability macrocosm. On a planetary scale, we have enough technologies and strategies to create a sustainable world. **What is critical for taking sustainability to the**

next level are tools that make integrating multiple patterns and perspectives meaningful. This is the key to enabling human organisations to participate in and facilitate the spread of the sustainability technologies and strategies we already have. Just as all ecological systems at all levels play their unique roles in the overall sustainability of nature, so each human organisation must play its unique role in global sustainability.

PatternDynamics™ is a tool I developed so you can learn systems thinking and bring it to your organisation as a way of creating the meaning that will allow it to play its role in facilitating the development of a truly thriving planetary civilization.

Introduction

PatternDynamics™ resolves complexity

The challenge of our age is to facilitate global sustainability through the creation of a truly thriving planetary civilization.

The key to this challenge is our capacity to deal with complexity. We have created an increasingly large, fast paced and complex world, but our ability to coordinate ourselves has not kept pace.

PatternDynamics™ is a simple tool that can be learned by anyone to overcome the challenges posed by complex systems – at any scale. Here's how it works:

- The key to complexity is *systems thinking*
- The key to systems thinking is *Patterns*; and
- The key to using Patterns is to form them into a *language*.

PatternDynamics™ is a language of visual Patterns – a 'Sustainability Pattern Language' – that will help you understand, communicate and design solutions at the systems level. By learning PatternDynamics™ you will gain a powerful new capacity as a 'systems thinker' – a skill that is often thought to be unteachable.

With this skill you will learn to create Cultures of Sustainability and to facilitate Deep Sustainability Design: sustainability strategies that help resolve complex challenges at any level of organisation, from the community to the planetary, and in any domain, from business to governance to institutional.

Theory

PatternDynamics™ is based on 3 simple ideas

1. Sustainable Natural Patterns:

Complex natural systems exhibit consistent general patterns of organisation that have allowed them to persist and thrive for many hundreds of millions of years. These 'patterns of organisation' provide us with design templates that illustrate how complex dynamics systems work. Natural patterns are like 'keys' that help us unlock the mysteries of working with whole systems. As such, they provide us with principles we can rely on to guide us in the creation and design of sustainable futures.

2. The Power of Language:

Language – the system of symbols we use to communicate – has a powerful role in shaping what we actually see. In each historical age people have developed symbols that help them to see, communicate about, and act on the things that are important for their collective survival and prosperity. What has become clear with regard to complex sustainability challenges is that we do not have effective languages for seeing the 'whole system'.

3. A Sustainability Pattern Language:

Our current spoken, written and mathematical languages are excellent for analyzing the nature of 'parts', but they are not optimized for helping us see how these parts are connected and organized as 'wholes'. By combining the **patterns of nature** with the **power of language**, PatternDynamics™ creates a **Sustainability Pattern Language** – a language of wholistic symbols designed to help us develop the systems thinking capacity needed to meet the complex challenges of creating a sustainable planetary civilization.

Philosophy**Local structures create planetary culture**

Our basic philosophy is that the biggest lever in human affairs is culture – the understandings, beliefs, values and their expression that provide the shared meaning that glues us together in social systems.

Culture is an invisible field of shared consciousness that shapes our behaviours and dictates the acceptance or rejection of social changes. This is what organisational change expert Peter Drucker means when he states: “*culture eats strategy for breakfast.*”

PatternDynamics™ creates ‘Cultures of Sustainability’, cultures that value systems thinking and build the capacity to resolve complex organisational challenges.

Our approach to creating cultures of sustainability is to focus on the organisational level – what we call ‘**local structures**’. Local structures provide human scale environments to develop complex problem solving skills.

We believe that learning to thrive by resolving complex challenges *inside local structures* requires the same culture, competencies and capacities needed to create sustainability outside the organisation, where it must play a role in global sustainability – what we refer to as creating ‘**planetary culture**’.

About**PatternDynamics™: a planetary social enterprise**

Our vision is to provide a real and practical tool for creating the consciousness required to form a planetary civilization and a truly sustainable, thriving global society.

As an enterprise, our defining identity and purpose is to do this by providing a social benefit through the dissemination of PatternDynamics™ (PD), an Integral Sustainability Pattern Language. PD is a way of learning the principles of sustainability through the patterns of nature in order to communicate about ‘whole systems’ and to facilitate the sustainability of complex organisations at all scales.

We think of PD as a **language of human evolution**.

As a Pattern Language, PatternDynamics™ is a technology in the form of Intellectual Property. The Intellectual Property consists of a set of visual Patterns, their Charts, descriptions and usage instructions.

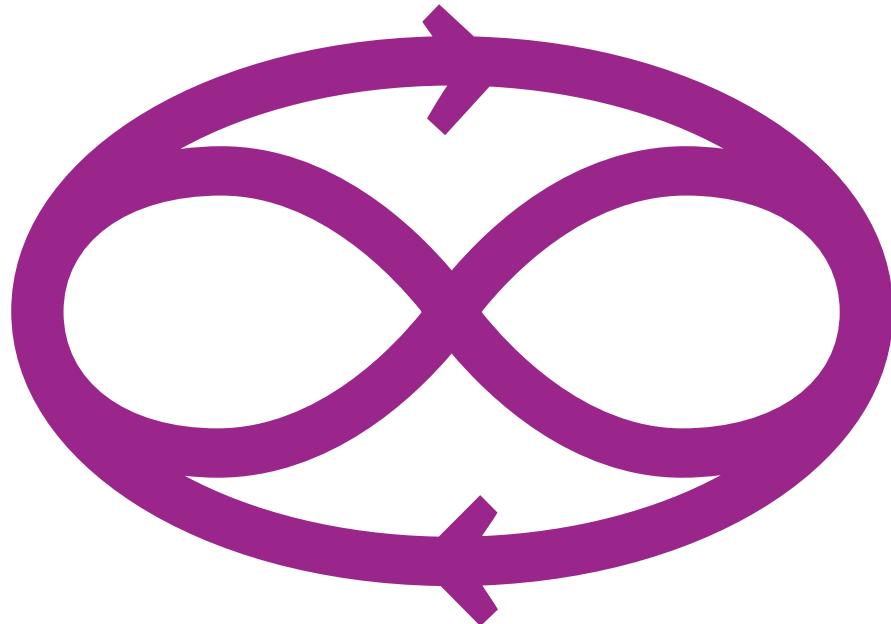
As a social enterprise PatternDynamics™ is foremost a Community of Practice – a community of PD practitioners derived from a wide range of people, invited from all domains and levels of society, who are committed to facilitating the transition to a sustainable world.

PatternDynamics Pty Ltd is a for-profit company charged with supporting the development of the PD community of practice such that:

- Our members are able to meet their needs as social entrepreneurs and to generate viable livelihoods through the use and dissemination of PD.
- The core of PD IP is made freely available as a global community resource in the form of a Sustainability Pattern Language.
- Both the public and private sectors have access to high quality PD resources for learning, communicating and designing sustainable futures.
- PatternDynamics™ IP owner(s) and licensees have the resources to:
 - Continually evolve PD and its offerings
 - To make a portion of these offerings available as free global community resources
 - To facilitate the development of the community of practice
 - To protect the integrity of PD intellectual property, and
 - To grow sustainably as a social enterprise.

PatternDynamics™ Workshop Program

9am	Start and Introduction
9:30am	Rhythm Pattern
	<ol style="list-style-type: none"> 1. Introduction/examples 2. Movement/group exercise 3. Small group discussions 4. Large group workshop 5. Review
10:15am	Polarity Pattern
	<ol style="list-style-type: none"> 1. Introduction/examples 2. Movement/group exercise 3. Small group discussions 4. Large group workshop 5. Review
11:00am	Tea Break
11:30am	Structure Pattern
	<ol style="list-style-type: none"> 1. Introduction/examples 2. Movement/group exercise 3. Small group discussions 4. Large group workshop 5. Review
12:15pm	Exchange Pattern
	<ol style="list-style-type: none"> 1. Introduction/examples 2. Movement/group exercise 3. Small group discussions 4. Large group workshop 5. Review
1:00pm	Lunch
2:30pm	Creativity Pattern
	<ol style="list-style-type: none"> 1. Introduction/examples 2. Movement/group exercise 3. Small group discussions 4. Large group workshop 5. Review
3:15pm	Dynamics Pattern
	<ol style="list-style-type: none"> 1. Introduction/examples 2. Movement/group exercise 3. Small group discussions 4. Large group workshop 5. Review
4:00pm	Source Pattern
	<ol style="list-style-type: none"> 1. Introduction/examples 2. Movement/group exercise 3. Large group workshop 4. Review
4:45pm	Review, Discussion and Feedback
5pm	End



Rhythm Repetitions in Time



'Rhythm' represents the waves and cycles of a system.

All natural systems have regular repetitions and cycles that order events over time. The most important ecological cycle is the annual changing of the seasons caused by the tilt in the earth's axis relative to the plane of its orbit around the sun. The moon causes ocean tides to ebb and flow with a complex monthly rhythm which is in turn overlaid with the pulse of waves caused by the wind. Both the seasons and the tides then coordinate biological activities, fertility cycles, resource pulses and a host of other natural rhythms. What role do

rhythms play within a system? Think about how having holidays at irregular and random times from year to year would affect the organisation of your workplace. What would happen if there was never any variation to the routine? Does your household function better when your family's weekly routine is regular and uninterrupted? How could you balance an existing Rhythm or integrate a new one into a system in your life to improve how it is organised? How do rhythms serve to coordinate systems?

Pattern	The arrows represent regular cyclical processes through time. The two inner shapes denote 'parts' that are encompassed by the larger oval into a 'whole' system.
Description	The Rhythm Pattern is closely related to and serves as an aspect of the Source Pattern, the most foundational organising principle within PatternDynamics™.
Definition	The temporal aspects of systems.
Principle	<u>The principle of good timing:</u> the enduring health of any system depends on the appropriate balance and integration of the temporal capacity for both regularity and variation, <i>for a given context</i> .
Composition	The Rhythm Pattern is a major aspect of Source, the most foundational organising pattern of all systems.
Examples	<p>Nature</p> <p><u>Organism:</u> All life forms have rhythms of activity that vary in order to support the health of that organism. Respiration in animals is a good example of a rhythmic activity that serves to coordinate the activity of the entire organism in order to keep it healthy. If the rhythm of respiration is too slow the animal will not have enough oxygen to drive metabolic processes, but if it is too fast it may cause hyperventilation – the loss of too much carbon dioxide from the blood and resultant loss of blood pressure.</p> <p><u>Ecosystem:</u> Humans have intervened in natural forest fire cycles by introducing smaller, but more frequent fires. This keeps the fuel load from building up to the point where there are large, hot fires that may destroy property. Changing the Rhythm of fire frequency has other wider effects on the ecosystem, including changing species composition of both plants and animals, altering soil conditions and changing predator/prey relationships.</p>
Culture	<p><u>Organisation:</u> Businesses have financial reporting cycles that influence rhythms within the business like capital expenditures, investment strategies and wage level adjustments. In most cases annual reporting is sufficient, but if a business is undergoing a period of rapid growth or change it may be necessary to do more frequent financial analysis in order to keep the business healthy.</p> <p><u>Economy:</u> All scales of economies throughout history have displayed extremities and irregularities in their levels of activity which has posed challenges for the sustainability of those economies. This is referred to as a 'boom and bust' dynamic. Governments and financial institutions regularly intervene to try to moderate extreme swings in financial activities and to introduce more reliability into the rhythms of financial markets.</p>



Rhythm



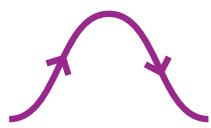
Resonance



Enantiodromia



Synchronisation



Pulse



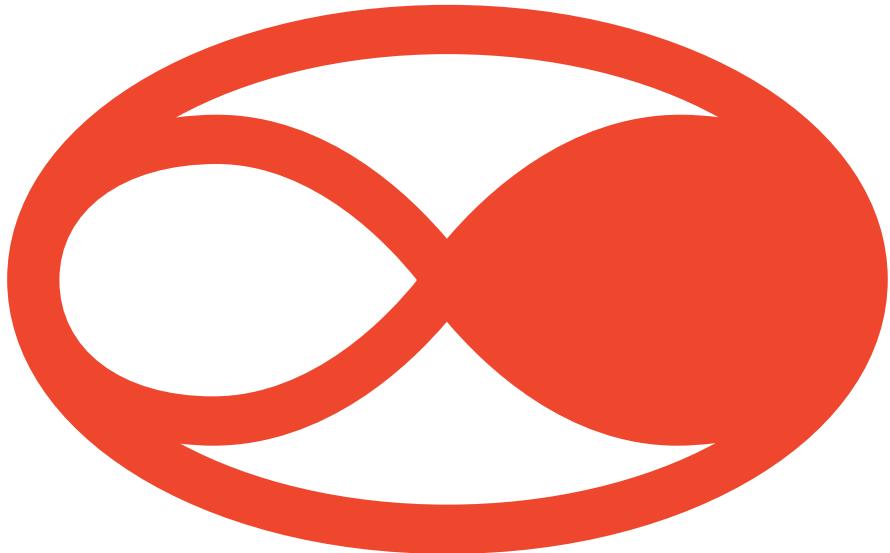
Cadence



Swing



Repetition



Polarity Integration of Opposites



'Polarity' represents the relationship between opposites.

All natural systems have opposing elements and dynamics that are really just two sides of one thing. Growth and decay in biological systems are two aspects of the cycle of life – although they seem like opposing processes, one cannot exist without the other. They are necessary compliments. What role do polarities play within systems? Think about what your workplace would be like if everyone spent all their time communicating and no time actually acting to get things done. Think also about the opposite scenario where only action

was prioritized and no one communicated to anyone else. How does the more masculine drive to get things done interact with the more feminine tendency to discuss how that should happen? Does an organisation that needs to make a big decision about its future direction need to prioritize a more masculine or a more feminine approach? How could you balance an existing Polarity or integrate a new one into a system in your life to improve how it is organised? How do polarities serve to coordinate systems?

Pattern The dark coloured shape on the right, joined to the light coloured shape on the left, demonstrates a relationship between seeming opposing elements. The two inner shapes represent 'parts' which are encompassed by the larger oval into a 'whole' system.

The Polarity Pattern is closely related to and serves as an aspect of the Source Pattern, the most foundational organising principle within PatternDynamics™.

Definition The interplay of opposites within a system.

Description The Polarity Pattern represents opposing forces as two ends of a continuum in dynamic interplay. The relationship between polarities stores potential and their integration liberates energies that drive the activity of systems. Polarities must be integrated to take advantage of both approaches, but they must also be maintained to build potential. The role of Polarity is to maintain the potential within systems.

Principle The principle of paradox: the enduring health of any system depends on the appropriate balance and integration of the interplay of opposing dynamics, *for a given context*.

Composition The Polarity Pattern is a major aspect of Source, the most foundational organising pattern of all systems.

Examples
Nature Organism: All organisms must balance the relationship between inputs to their system and the outputs from their system. If an organism is growing then its inputs of nutrients need to exceed its output of wastes. If conditions change in the environment and nutrients for that organism become scarce it must then adjust so that outputs exceed inputs, allowing it to shrink and survive.

Ecosystem: The interplay between periods of orderly growth and the chaotic bush fires in northern boreal forests is a major planetary regulator of oxygen levels, and by extension the maintenance of atmospheric conditions favorable to life. If the forests do not burn when oxygen levels become high then less fire adapted ecosystems will ignite. If boreal forests were to continue to burn when oxygen levels are low some organisms would struggle to respire.

Culture Organisation: The interplay between the more *feminine* capacity for connection and relationship and the more *masculine* capacity for individual achievement provides a potential within an organisation for outcomes not able to be attained by either polarity alone. A relational approach is necessary for good communications and good decision making, but a capacity for achievement is necessary to enact the decisions made through those good communications.

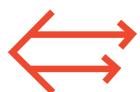
Economy: The economy is potentized by the dynamic relationship between *cooperation* within enterprises and *competition* with outside rivals. Competition leads to productivity and efficiency gains, but unless it is integrated with cooperation it becomes a negative force creating hyper-individualism which causes social disintegration. Cooperation creates synergies, but unless it is integrated with competition it leads to a loss of drive by high performing individuals necessary for a strong economy.



Polarity



Masculine/
Feminine



Competition/
Cooperation



Order/
Chaos



Flows/
Stores



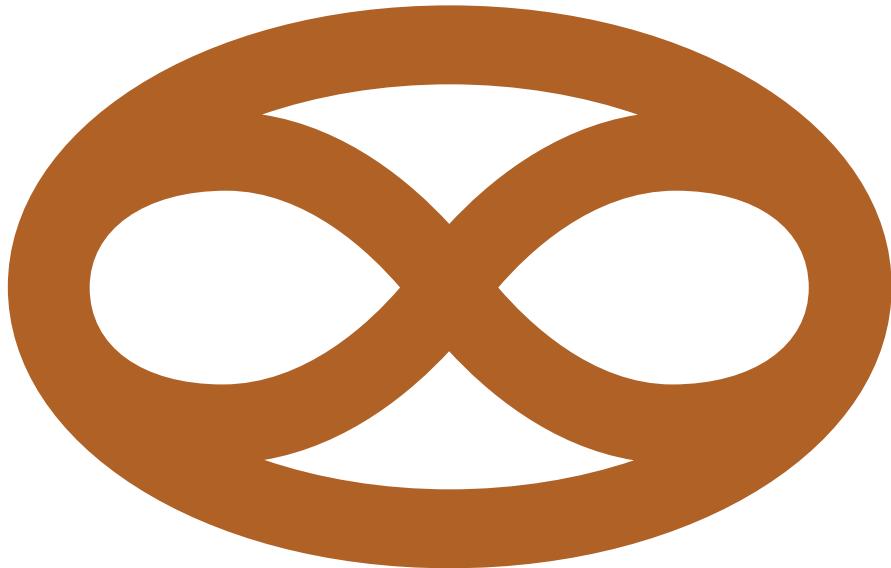
Input/
Output



Concentration/
Diffusion



Expand/
Contract



Structure Enduring Frameworks



'Structure' represents the bones of a system.

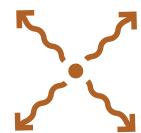
All natural systems have frameworks that provide relatively fixed and unchanging support structures for more dynamic aspects of the system. Forests are based on the tall, enduring biological structure of trees. Higher animals have strong bone skeletons and lower animals like insects have rigid exoskeletons. Even relatively soft biological cells have cytoskeletons that maintain their structural integrity. What role do structures play within a system? Think about what an organisation would be like if its legal frameworks changed frequently

or were removed altogether. Think also about what it would be like if these legal frameworks never changed and remained the same now as they were hundreds of years ago. How do unwritten, but well understood, codes of behaviour provide stability within families? When do these sorts of structures start to cause problems? How could you balance an existing Structure or integrate a new one into a system in your life to improve how it is organised? How do structures serve to coordinate systems?

Pattern	The thick amber colored lines represent the solid and relatively fixed nature of structures and frameworks. The two inner shapes represent 'parts' that are encompassed by the larger oval into a 'whole' system.
Description	The Structure Pattern is closely related to and serves as an aspect of the Source Pattern, the most foundational organising principle within PatternDynamics™.
Definition	The enduring frameworks of systems.
Principle	<u>The principle of effective frameworks:</u> the enduring health of any system depends on the appropriate balance and integration of the structural capacities for both rigidity and flexibility, <i>for a given context</i> .
Composition	The Structure Pattern is a major aspect of Source, the most foundational organising pattern of all systems.
Examples	<p>Nature</p> <p><u>Organism:</u> All higher animals have interior structural frameworks called a skeleton who's job is to provide support for the rest of the body. If the bones of a creature's skeleton become too brittle and lose their flexibility, they may break. If bones are too flexible and soft they cannot support the weight of the other elements of the body.</p> <p><u>Ecosystem:</u> Mangrove trees are the central living structural element in tidal wetlands. They hold the shifting sands in place with their multi-stalked aerial root systems. Mangrove trees have evolved to provide enough structure to hold the shifting sands in place, but they are not so rigid that they cannot flex in high winds or tidal currents.</p> <p>Culture</p> <p><u>Organisation:</u> Companies are governed by legal structures called constitutions. These documents provide the enduring framework of rules and regulations that shareholders, directors and executives must follow in participating in the dynamic operation of the business. If the corporate constitution changes too frequently it undermines the integrity of the agreements that allow people to work together effectively. If it is too rigid and does not change at all over time, the business will not be able to adapt to changing circumstances.</p> <p><u>Economy:</u> All modern economies measure the level and success of their activities through financial frameworks called accounting systems. If accounting structures are changed without good reason, it can lead to inaccurate financial reporting, misallocation of resources and fraud. If accounting frameworks are too static and they are not changed at all over time, they may become irrelevant in an evolving economy.</p>



Structure



Field



Holarchy



Complexity



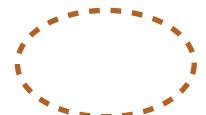
Network



Hierarchy



Holon



Boundary



Exchange

Specialization and Trade



'Exchange' signifies the productive capacity of systems.

All natural systems have productive processes driven by specialized elements exchanging energy and materials with each other. Flowers distribute nectar as a natural energy product in an exchange with insects and animals that do the work of distributing the plant's pollen. This is a more efficient and therefore more productive outcome than if the flower had to organize its own pollination and the insects and animals had to photosynthesize their own sugars from sunlight energy. What role do exchanges play within a system? Think about what an organisation would be like if it did not have a unique role within the

economy that allowed it to trade its goods or services with other organisations and individuals. What would a business be like that tried to be an extreme generalist and work in a multitude of unrelated industries? Alternatively, what would it be like to be so highly specialized that your role was not often required within an organisation? How do you choose the appropriate level of specialization? How does trade amongst specialists make everybody better off? How could you balance an existing Exchange or integrate a new one into a system in your life to improve how it is organised? How do exchanges serve to coordinate systems?

Pattern

The opposing arrows represent the trade or exchange of resources between elements of a system. The two inner shapes represent 'parts' that are encompassed by the larger oval into a 'whole' system.

The Exchange Pattern is closely related to and serves as an aspect of the Source Pattern, the most foundational organising principle within PatternDynamics™.

Definition

The productive capacity of systems.

Description

The Exchange Pattern represents the material, energetic and informational trades made between elements with unique capacities that enable the productivity of systems to be greater than any group of non specialized, non trading elements. The role of Exchange is to provide the production and efficiency gains of systems.

Principle

The principle of productivity: the enduring health of a system depends on the appropriate balance and integration of the degree of specialization and the scale of trade, *for a given context*.

Composition

The Exchange Pattern is a major aspect of Source, the most foundational organising pattern of all systems.

Examples**Nature**

Organism: The major organs, which act as sub systems within animals, specialize in unique capacities: hormone regulation by the endocrine system, filtration by the kidneys, pumping blood by the heart, and gaseous interchange by the lungs, to name but a few. The organs have evolved specializations which allow them to enter into relational exchange as part of a greater system, but many are not so highly specialized that some of their functions are not replicated by other organs. For instance the kidneys and heart have secondary endocrine functions supporting hormone regulation in the body.

Ecosystem: Specialized fungi translocate mineral elements through the soil and deliver them to the roots of plants where they are exchanged for sugars produced in the plant's leaves. If a fungus specializes to the degree where it can exchange with only one species of plant it may become very efficient, but if its plant partner disappears so will the fungus. If the fungus is less specialized and has a generalized capacity to trade with many species it may not be maximally efficient, but it will be more resilient to changes in plant distributions.

Culture

Organisation: Specialist employees exchange skills like accounting, management, trade skills, and IT expertise in order to create productive business systems. If the employees are so highly specialized that they do not understand enough about other roles within the business to relate to them, then specialization has gone too far. If employees and managers are too generalist in their approach tasks may be covered off by a number of people, but they will not be done with same level of expertise or productivity.

Economy: Economies are composed of individuals, businesses and whole industries that develop unique capacities and then trade to form a multi-scaled system of exchange. Highly specialized businesses and institutions are needed as economies grow more complex, but high specialization makes business vulnerable to market changes that marginalize the demand for their unique goods or services. All businesses in an economic system must find the balance between high specialization that brings productivity gains and more general capacities that allow them to adapt to changing circumstances.



Exchange



Flow



Process



Uniqueness



Trade



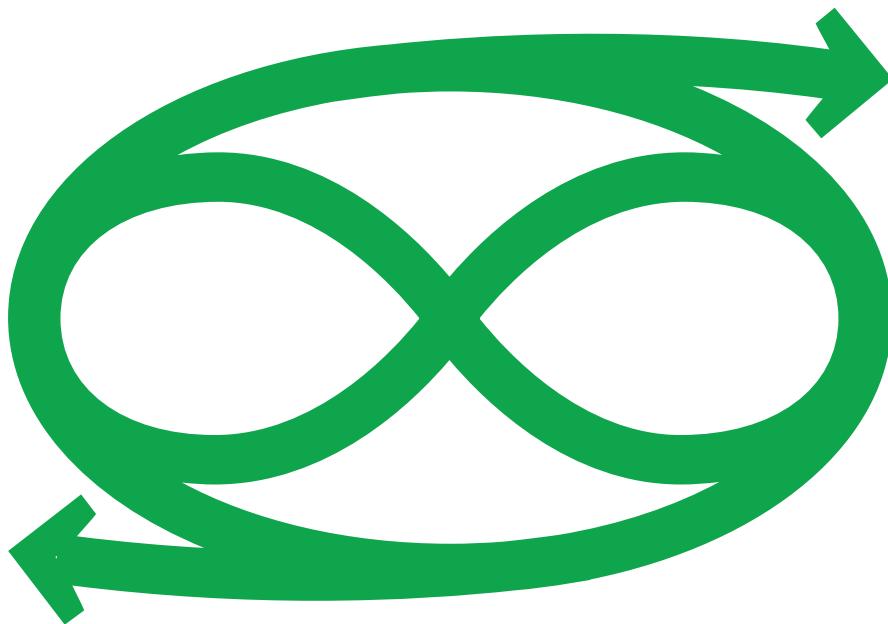
Capture



Balance



Cycle



Creativity

Innovative Adaptations



'Creativity' represents the emergence of new forms within a system.

All natural systems display the capacity for creative evolution in response to changes in the conditions around them. Animals that camouflage themselves to mimic their environment must evolve their strategies as the landscape around them changes. Plant species will continually evolve new forms of protection as their predators evolve to overcome previous protective strategies. What role does creativity play within a system? Think about what it would be like if an organisation was constantly

reinventing itself. Would it have enough periods of stable activity to be productive? Alternatively, what if an organisation never changed any aspect of how it was organised? How much energy does it take to create a new recipe versus using one you already know well? How could you balance an existing Creativity dynamic or integrate a new one into a system in your life to improve how it is organised? How does Creativity serve to coordinate systems?

Pattern	The arrow-tipped lines extending from the outer oval demonstrate the expansive emergence into new territory required to bring forth a creative act. The two inner shapes signify ‘parts’ that are encompassed by the larger oval into a ‘whole’ system.
	The Creativity Pattern is closely related to and serves as an aspect of the Source Pattern, the foundational organising principle within PatternDynamics™.
Definition	The emergence of novel adaptations within systems.
Description	The Creativity Pattern represents the emergence of new forms and processes that help systems adapt to changes in the ever changing environments around them. The generation of new forms and processes is a risky, energy and resource intensive act that must be balanced by the successful operation of the system to support its ongoing function.
Principle	<u>The principle of adaptive emergence:</u> the enduring health of a system depends on the appropriate balance and integration of creative experimentation on the one hand and the ongoing successful operation of the system on the other, <i>for a given context</i> .
Composition	The Creativity Pattern is a major aspect of Source, the most foundational organising pattern of all systems.
Examples	
<i>Nature</i>	<u>Organism:</u> Organisms as diverse as viruses and mammals show both minor adaptations to temporary changes in things like moisture availability and major evolutionary leaps to accommodate permanently changed circumstances, such as climate change. Any organism that places too much emphasis on experimental adaptations risks using too much energy innovating, thereby compromising existing productivity. On the other hand, organisms that do not adapt at all or too slowly will be out-competed by organisms that adapt to fit the changing circumstances better.
<i>Ecosystem:</i>	Forest ecosystems display adaptive responses that allow them to recover from disturbances as diverse as wind throw, land slip, human harvesting, pest infestation and fire. If conditions like human harvesting place a greater imperative to adapt to disturbance than the forest can manage, it may be replaced by another vegetation type more suited to that type of disturbance. Alternatively, if forest ecosystems are protected by humans from the cycles of disturbance to which they have adapted, like fire, they may lose their natural vigour and become prone to attack by things they are not adapted to, like pests and disease held in check by normal disturbance events.
<i>Culture</i>	<u>Organisation:</u> All organisations must balance the rate of creative change to their systems of operation. If changes are made too frequently and speculatively the energy spent by members adapting to the new changes and the energy required to repair failures may compromise the health of the organisation. If changes are not made frequently enough the organisation may become dysfunctional by virtue of being out of step with the world around it.
<i>Economy:</i>	If governments make large or frequent changes to tax law without consulting industry and without giving enough notice of changes, business may find it difficult and resource intensive to adapt to the new fiscal conditions. If government regulators are slow to change tax law to fit with changed economic conditions then it may have an equally disruptive effect because tax revenue may not be being collected effectively enough to support the institutions required for a robust economy.



Creativity



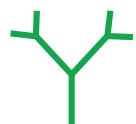
Elegance



Evolution



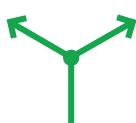
Emergence



Growth



Adaptation



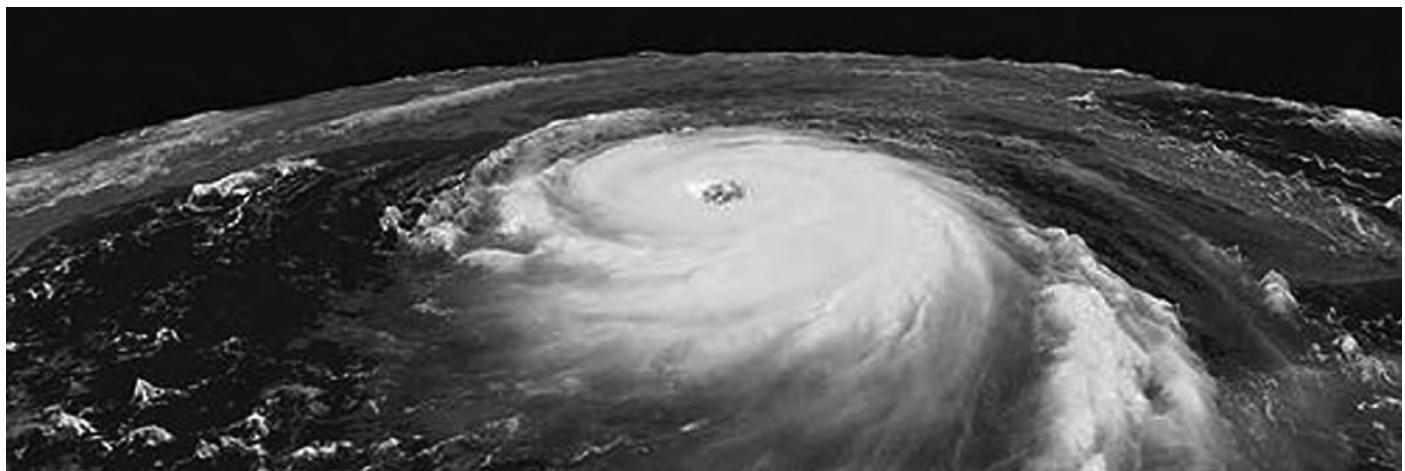
Bifurcation



Seed



Dynamics Integrated Systems



'Dynamics' signifies the coordination of processes at the systems level.

All natural systems have processes that integrate dynamics at the systems level. In terrestrial ecosystems fire events can cause changes in species composition that favour more future fire events, starting a positive feedback loop that amplifies fire frequency. Small adjustments over many iterative cycles can lead systems to adapt considerably over time to events like climate change or soil fertility decreases. What role do systems dynamics play within systems? Think about what it would be like within an organisation if there

was no way for feedback to be given or received by anyone. How would this affect the ability to adjust operations to suit new conditions? How does feedback operate to either enhance or diminish a process within a system? What effect does making small changes over many cycles have versus making a dramatic change over a relatively short period of time? How could you balance existing Dynamics or integrate new ones into a system in your life to improve how it is organised? How do Dynamics serve to coordinate systems?

Pattern

The arrows leading around a coordinated circuit illustrate the integration and coordination of processes at the systems level. The two inner shapes represent 'parts' which are encompassed by the larger oval into a 'whole' system.

The Dynamics Pattern is closely related to and serves as an aspect of the Source Pattern, the most foundational organising principle within PatternDynamics™.

Definition

Any process that coordinates dynamics at the systems level.

Description

The Dynamics Pattern represents integrated and coordinated systemic functioning. Systemic dynamics work to refine and adjust the coordination of elements and processes and their relationships through feedback mechanisms, iterative refinements, synergies and spontaneous adaptations. Small changes to systemic dynamics can have great effect and overuse may throw systems out of balance.

Principle

The principle of systemic refinement: the enduring health of a system depends on the appropriate balance and integration of the use of refinements to adjust the coordination and integration of system processes, *for a given context*.

Composition

The Dynamics Pattern is a major aspect of Source, the most foundational organising pattern of all systems.

Examples**Nature**

Organism: The human nervous system is constantly taking measurements of ambient temperature which then feeds back to adjust activity levels and the body's metabolic rate. If the iteration period of cycles of adjustment is left too long the system will swing wildly from extreme to extreme. If the cycles are too frequent the system will become stressed from the constant activity of adjustment.

Ecosystem: Coral Reefs are formed by a symbiotic relationship between a calcium carbonate secreting polyp and a photosynthetic algae which lives within its tissues. This dynamic synergy allows these tiny creatures to build vast reef systems. If the individual organisms give up too much autonomy the reef system will lose adaptability. If the different organisms do not cooperate fully enough a reef system will not be possible.

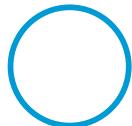
Culture

Organisation: Adjustments to business systems over many cycles helps improve organisational performance. If the cycles of adjustment are too frequent, too much energy is used up in making adjustments and not enough is available for productive activity. If the cycles are too infrequent, the organisation may drift off course and lose market share.

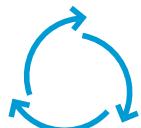
Economy: Central banking institutions provide feedback that adjusts the rate of growth in the economy through the manipulation of interest rates. If the central bank cuts prime lending rates too much the economy will overheat as businesses borrow money and expand their operations. If the bank is too slow to cut rates during a slowdown the economy may go into recession.



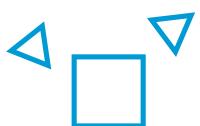
Dynamics



Harmony



System



Spontaneity



Feedback



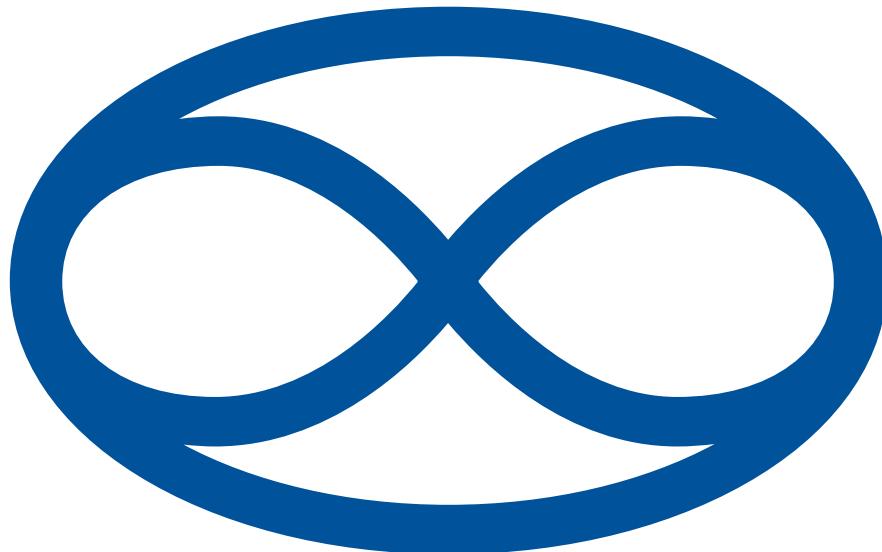
Synergy



Agency/
Communion



Iterate



Source

The Origin of Order



'Source' represents the primordial pattern of organisation at the heart of all systems.

Source signifies the collective consciousness of a system's essential nature – the awareness of its fundamental 'pattern of organisation'. More specifically it relates to the origin of identity and purpose, how this evolves over time, and how it affects a system's self-organising capacity. All systems in nature have clear patterns that form the same atoms, molecules and cells into different self-organising entities. For instance, different trees, animals, and ecosystems all have distinct identities and roles that evolve over time to adapt to changing circumstances. How does a system's evolution affect the parts of that system? Think about what it means when an organisation changes its core identity and purpose. How does

this affect the awareness of what the organisation is, who it attracts, and their level of commitment? If it is a radical change, will members still identify strongly enough with the organisation to participate fully and effectively? If an organisation does not change at all, will it remain relevant as things change around it? Have you been part of a group response to an emergency? How strong was the collective consciousness of the identity and purpose of that group? How did it affect self-organising capacity? How could you balance Source or integrate it more fully into a system in your life to improve how it is organised? How does Source serve to coordinate systems?

Pattern

The two enclosed shapes inside the larger oval represent systems that are part of a larger scale system enveloping them, illustrating the fundamental part/whole nature of reality which is composed of systems within systems within systems, ad infinitum. The enveloping oval also signifies that systems have inner, subjective consciousness and outer, objective form. Where the two inner shapes meet in the center symbolizes the origin of the form of that type of system.

Definition

The most foundational pattern of organisation: the consciousness of the origin and evolution of identity and purpose.

Description

The Source Pattern signifies the origin of order – a system's conscious identity and purpose. When awareness of the primary pattern of any system is clear and its purpose or function is clear, the parts have clear roles within the larger pattern of that system. It is the conscious field of identity and purpose that defines a system's type, or pattern, that in turn enacts the foundational self-organising capacity of its parts.

Principle

The principle of Unity: the enduring health of any system depends on the appropriate balance and integration of changes to a system's unifying consciousness of identity and purpose, *for a given context*.

Composition

The Source Pattern signifies the primordial foundation and origin of order. All other Patterns represent different aspects of Source.

Examples*Nature*

Organism: The first complex (eukaryotic) cells evolved as a new pattern of organisation of already existing simpler (prokaryotic) cells and bacteria. The purpose of this new symbiosis was to create a system in which each of the elements does better as part of the system than as a lone individual. Within the identity of the eukaryotic cell some of the bacteria adapted to become the power plants (mitochondria) and some adapted to become organelles that capture sunlight and convert it into chemical energy (chloroplasts).

Ecosystem: Lichen colonies are formed through a symbiotic relationship between fungi and green algae. Both a fungus and an alga have different patterns of organisation as independent organisms. When in relationship their joint form is distinct and identifiable as a lichen. Through the symbiotic organisation of the lichen form they are able to colonize harsh environments like desert where they exude compounds that stabilize the shifting sands so seeds of higher plants can germinate. If conditions are suitable the 'parts' of the lichen system may revert to their original identities as fungi and algae respectively.

Culture

Organisation: The clear identity and purpose of an organic farming operation is to farm without harmful chemicals so that it may provide healthy food, nurture healthy soils and sustain ecosystems. Its clear identity and purpose and its suitability for repairing degraded environmental conditions has assisted organics to become one of the fastest growing industries on the planet.

Economy: A community credit union lends money to and takes deposits from local people and businesses only, clearly contrasting it with the identity and purpose of commercial banks which operate a much wider range of financial services over much larger geographical areas. The dilution of larger banking institutions' identities and purposes as they diversified into insurance and the brokering of financial derivatives has undermined their ongoing viability.



Source



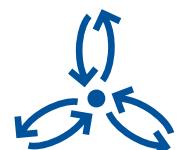
Void



Pattern



Autopoiesis



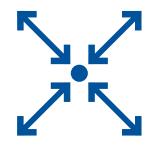
Power



Transformity



Resource



Energy

PatternDynamics Glossary

PatternDynamics™ (also PD)	An Integral Sustainability Pattern Language for understanding, communicating and designing solutions for the sustainability of any system at any scale.
Pattern (also PD Pattern or Pattern Diagram)	A simple diagram created in PatternDynamics™ that signifies a natural pattern of organisation.
Systems Thinking	Systems thinking can best be explained as a capacity for understanding both the characteristics and behaviour of 'parts' and the patterns of organisation that form those parts into 'wholes' – complex dynamic self-organising systems.
What is a 'Culture of Sustainability?'	A culture of sustainability is a set of understandings that gives shared meaning to what a group thinks will make a particular system healthier and more enduring. In PatternDynamics™ we create that meaning by using Patterns. The Pattern diagrams are a tool for learning to understand the principles of how whole systems work and for having discussions about how to improve them using systems thinking.
What is 'Deep Sustainability Design?'	Deep Sustainability Design is a design process that is supported by a Culture of Sustainability. Any sustainability design strategy that is not supported by the culture that has to live with it will not be supported, and it will stand a high risk of failure. By building a Culture of Sustainability with the people who must use or implement the design solution, it will be meaningful to them and therefore get their support, giving it a much higher chance of success.
How does 'Understanding the Principles of Sustainability through the Patterns of Nature' work?	Natural systems are organised in a way that has allowed them to persist for hundreds of millions of years. By looking for the patterns that are followed in organising individual elements into those whole systems, we can deduce principles that help us understand the basis of sustainable design. This is one approach to learning systems thinking.
What is an 'Integral Sustainability Pattern Language?'	A Pattern Language is a set of symbols that represent principles of good design. This concept was first developed by architect Christopher Alexander. In the case of PatternDynamics™ the symbols relate to the principles informing the design of sustainable natural systems. The word 'Integral' signifies that PatternDynamics™ is related to 'comprehensiveness', 'wholistic' approaches and the synthesizing activity of thinking about how things are put together rather than relying exclusively on the activity of analysis, which is used to pull things apart. PatternDynamics™ is based in, but not limited to, Integral Theory developed by Ken Wilber. The use of the word Sustainability indicates a relationship to configuring the human world so that it may support the natural world on which it is dependent on an ongoing basis.
Principles Of Sustainability	Understandings, ideas, concepts, meaning and values, relating to the enduring health of a system.
PatternDynamics™ First Order Chart	The diagram of Source with the First Order Patterns arranged in a circle around it.
PatternDynamics™ Hierarchy Chart	The diagram of the 56 Patterns arranged in a circular manner showing the hierarchical relationships between the Patterns. In this diagram, Source is shown in the center surrounded by its 6 First Order Patterns that are in turn surrounded by their respective 7 Second Order Patterns.

PatternDynamics Glossary continued

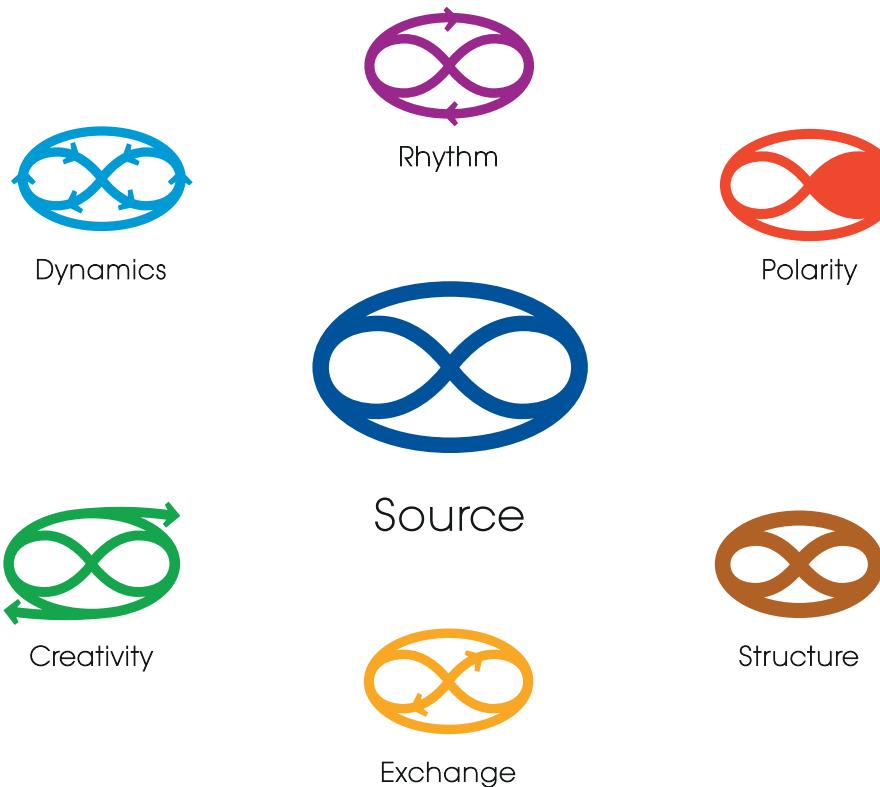
PatternDynamics™ Matrix Chart (also The Chart)	The First Order Patterns are shown across the top and along the left hand side. The Second Order Patterns are color coded and arranged in columns of 7 under their respective First Order Pattern as Aspects of those First Order Patterns. Each Second Order Patterns is a composite of a major component of the First Order Pattern above it and a minor component of the First Order Pattern to the left of it.
Source	Source represents the most primordial and foundational Pattern at work in the Universe. The Source Pattern signifies the origin of order – a system’s conscious identity and purpose. When awareness of the primary pattern of any system is clear and its purpose or function is clear, the parts have clear roles within the larger pattern of that system.
Aspects	Aspects are different facets of a Pattern; they could also be seen as different properties of a Pattern enacted by taking different perspectives on the features of that Pattern. For example, Source has multiple Aspects represented by the 6 First Order Patterns. In turn, the 6 First Order Patterns each have multiple Aspects represented by their seven Second Order Aspects. (See the First Order Chart and the PatternDynamics™ Hierarchy Chart.)
First Order Patterns	The 6 First Order Aspects of Source.
Second Order Patterns	The 49 Second Order Aspects of Source, groups of seven which are also Aspects of each First Order Pattern. (See the PatternDynamics™ Hierarchy Chart.)
Holon	In PatternDynamics the term Holon signifies a perspective on the nature of systems, where systems have the property of parts organized into wholes, but also the property of having both interior, subjective dimensions and exterior, material dimensions. A Holon refers to a system seen as fundamentally composed of four perspectives: parts, wholes, interiors and exteriors.



PatternDynamics™

deep sustainability design

PatternDynamics™ First Order Chart

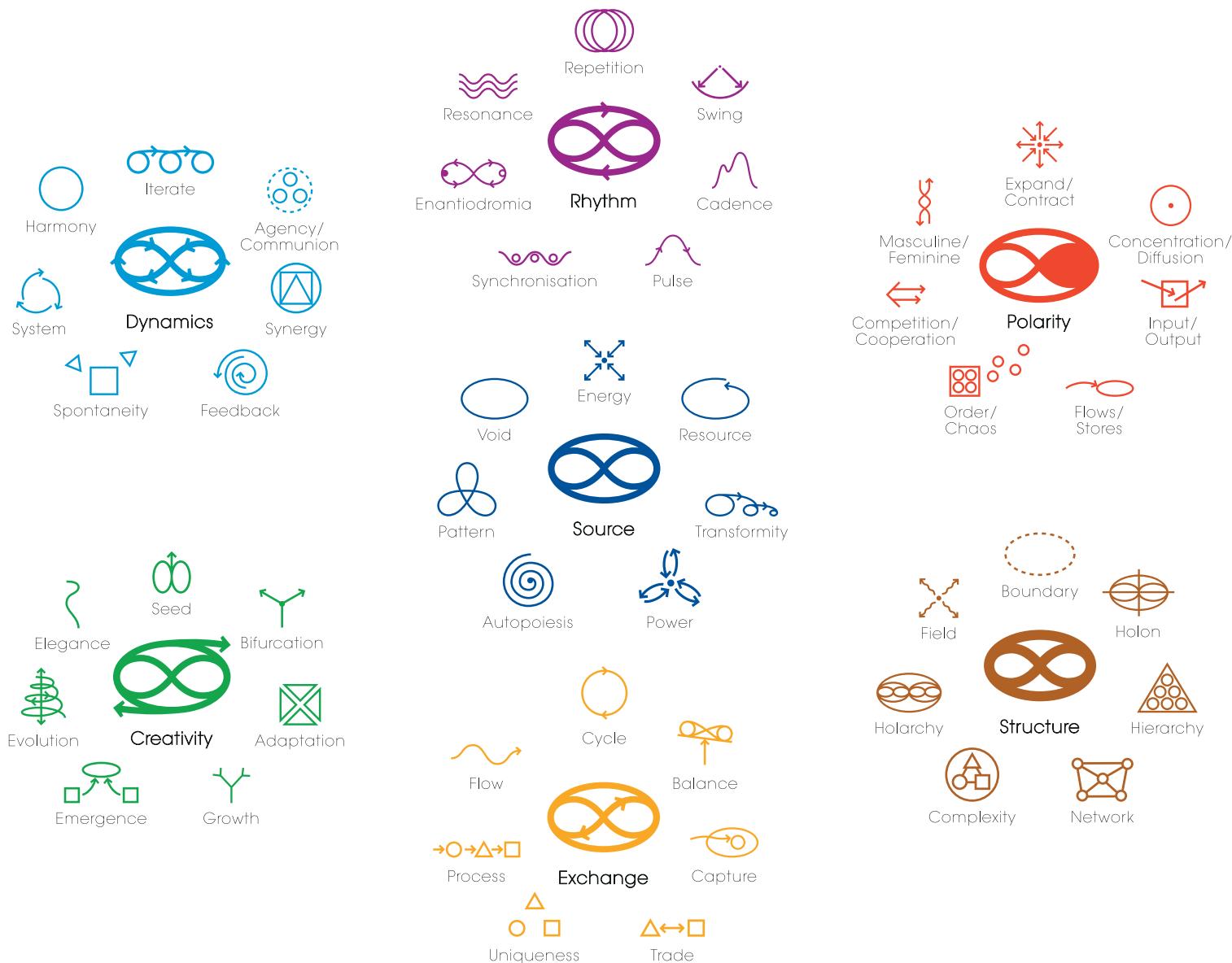




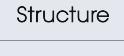
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PatternDynamics™ Hierarchy Chart



PatternDynamics™ Matrix Chart

	Source	Dynamics	Creativity	Exchange	Structure	Polarity	Rhythm
							
							
							
							
							
							
							

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