

Takashi Iba

Ph.D. in Media and Governance

Associate Professor, Faculty of Policy Management, Keio University iba@sfc.keio.ac.jp



A diagram to describe a creative process, which I name "Creative Systems Diagram."

Creative Systems Theory (Iba, 2009)

1. Overview of Creative Systems Theory

Revised version of "An Autopoietic Systems Theory for Creativity" (T. Iba, *COINs2009*, 2009)

2. Creative Systems Diagram (CSD)

3. Case: The origin of "Footprint of Chaos"

Our Project combining philosophy, art, and science. (K. Shimonishi, J. Hirose, and T. Iba, since 2007)







Creative Systems Theory

based on the autopoietic systems theory

- A creative process is defined as an autopoietic system whose elements are *discoveries*.
- Creative process is a (re-) production network of *discoveries*.
- Each *discovery* is emerged only when a synthesis of the following three selection occurs: *idea*, *association*, and *finding*.



Iba, T. (2009) "An Autopoietic Systems Theory for Creativity", COINs2009.

Production Network of Discoveries in Creation

- Each *discovery* is produced based on previous *discovery*, associating to on-going creation.
- What is most important is successive production of *discoveries*.
- *Discovery*, in this context, does not imply it is novel, true, and useful.



Iba, T. (2009) "An Autopoietic Systems Theory for Creativity", COINs2009.

Creation-Centered Viewpoint



What is most important is successive production of *discoveries*. It doesn't matter where and how *discoveries* come from.

- Maybe from deliberation, spark, or merely by accident.
- Maybe by somebody alone or collaboration by more than one person.



Both of human and source of ideas are located in the *environment* of the creative system!

Iba, T. (2009) "An Autopoietic Systems Theory for Creativity", COINs2009.

Emergence of Momentary Elements

- Discovery is emerged from a synthesis of following three selections: *idea*, *association*, and *finding*.
- Discovery happens only when a *finding* is obtained as a result of that an *idea* is *associated* to on-going creation.



Iba, T. (2009) "An Autopoietic Systems Theory for Creativity", COINs2009.

Discovery Media

Ø

There are intrinsically uncertainties for realization of *discovery*.

- Association of idea.
- Far-reaching *finding* from *association* of *idea*.
- Success of the *discovery*

Media is evolutionary achievements for overcoming these uncertainties

- *Media* for description
- *Media* for thinking
- *Media* for success



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Creative Systems Diagram

Ver. 0.10

discovery (system element)



A *discovery* is to obtain a *finding* as a result of that an *idea* is *associated* to on-going creation.



production network of discoveries (system formation)



Creative process is a production network of discoveries.











Creative Systems Diagram

Processes View

Creative Systems Diagram

abstract

Elements View

Creative Systems Diagram

Environments View

Creative Systems Diagram

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Informal Project for "Footprint of Chaos"



Kazeto Shimonishi





Takashi Iba

Junya Hirose





•K. Shimonishi & T. Iba, "Visualizing Footprints of Chaos", *3rd International Nonlinear Sciences Conference (INSC2008)*, 2008

•T. Iba & K. Shimonishi, "Exploring Patterns on Footprints of Chaos", *3rd International Nonlinear Sciences Conference (INSC2008)*, 2008

•K. Shimonishi, J. Hirose & T, Iba, "Understanding Dynamics on Network Structure: Applying New Visualization Method to Coupled Chaotic Systems", *International Workshop and Conference on Network Science* '08 (*NetSci*'08), 2008

•K. Shimonishi, J. Hirose & T. Iba, "The Footprints of Chaos: A Novel Method and Demonstration for Generating Various Patterns from Chaos", *SIGGRAPH2008*, 2008



Creative Process of "Footprint of Chaos"

with Creative Systems Diagram ver. 0.10

"Is it possible that unity and diversity coexist?"

Processes View

Creative Systems Diagram

Inventing the "Footprints of Chaos," an art work with using chaos

Thinking a new way of philosophical exploration











Understanding the radical meaning of Cellular Automata

What is the lessons from the studies of cellular automata?

The resulting pattern generated, on cellular automata depends on the *rule* of the system. Cellular automata can be considered as a system that generates a new "world" for thinking, which enable us to explore "world-as-it-could-be" beyond "world-as-we-know-it." The instance of constructive approach to the coexistance of unity and diversity

cellular automata

What is the lessons from the studies of cellular automata?

Similarity between patterns on cellular automata and patterns in the natural world, for example some seashells.

The instance of constructive The studies on cellular approach to the coexistance automata demonstrate that of unity and diversity both of regular and irregular patterns can be generated cellular automata from a single system. What is the lessons from the What is the lessons from the studies of cellular automata? studies of cellular automata? Cellular automata can be The patterns generated on Similarity between patterns on considered as a scientific cellular automata fascinate cellular automata and patterns model of natural phenomena. many people. in the natural world, for example some seashells. Why is it worth noticin The conception of bea so far, basically relate

What o























How to convert the value of a To convert the value of variable into an angle of vector? a variable, ranging from 0 to 1, into the angle, ranging from 0 In the logistic map, the variable is to 2π. ranging from 0 to 1. suitable for e mechanism. What name best describes the re generated mechanism? mechanism, - It looks like raindrops falling on nteresting! "Footprints of Chaos" the canvas .: - The generated patterns are just traces, not generating systems. - Each plot is drawn at a time step.

Elements View

Creative Systems Diagram

association (self-reference) *idea* (alter-reference)







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Creative Systems Diagram *based on the creative systems theory*

Describing a creative process as a production network of *discoveries*.

Each *discovery* is described with specifying *idea*, *association*, and *finding*.

Three types of view: Processes View, Elements View, Environments View.



"Autopoietic Systems Diagram for Describing Creative Processes" *COINs2010*

Takashi Iba Faculty of Policy Management, Keio University iba@sfc.keio.ac.jp