Research Monograph Series

Axioms of Generative Topological Ontology
Foundations of Generative Being

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Abstract

The purpose of this paper is to systematize the theoretical foundations of Generative Topological Ontology as an axiomatic system. Conventional ontology has tended to understand being as a fixed object or substance. By contrast, the present study defines being not as a fixed substance but as a topological structure that is continually generated through interactions among self, other, and environment.

The paper first clarifies the basic concepts that constitute the theory and then presents a set of axioms for describing the generation of being. It further examines the coherence and logical consistency of the theory through theorems and corollaries derived from those axioms, and extends its possible applications to art, aesthetics, artificial intelligence, interface theory, and social systems.

Within Generative Topological Ontology, being is not a closed object but an open structure whose essential character lies in connectability. Generation, moreover, is not understood as a mere change of state, but as a process through which relations between different phases give rise to new modes of being. This framework seeks to move beyond the subject-object dualism of modern philosophy and to provide a unified theory for describing being dynamically and relationally.

As a foundational theory crossing philosophy, aesthetics, art theory, and artificial-intelligence research, this study aims to construct a new ontology that explains being, generation, and interface within a single theoretical framework.

Keywords Generative Topological Ontology; Axiomatic System; Ontology; Interface Ontology; Generation; Artificial Intelligence; Topology

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Methodological Statement

Methodological Note

Toward a Minimal Axiomatic System for the Generation of Being

0.1 Methodology of This Paper

The purpose of this paper is not to expand ontology by adding new concepts, but to construct a minimal axiomatic system capable of describing the generation of being.

Since the modern period, philosophy has developed around the question, “What is being?” Being has been understood as substance, or reinterpreted through diverse concepts such as subject, Dasein, body, difference, and event. Yet many such approaches are theories that describe being; they are not theories that systematically derive how being is generated from a minimal set of premises.

This paper introduces a methodological turn at precisely this point. Rather than explaining being by beginning from definitions, it derives the structure of being from axioms.

The method is inspired by the axiomatic method in mathematics, but its purpose is neither to apply mathematics to philosophy nor to reduce philosophy to mathematics. The axiomatic method adopted here makes explicit the minimum premises necessary to explain the generation of being and develops a conceptual system logically from those premises.

Accordingly, the axioms in this paper do not proclaim self-evident truths. They are the minimal ontological premises required for this theoretical system to be constituted.

0.2 Generative Topological Ontology as a Minimal Theory

Generative Topological Ontology understands being not as a fixed substance but as a relational movement that continues to generate.

“Generation,” as used here, does not mean mere change or motion. Generation is the event in which a new phase of being is opened.

Likewise, “topology” does not mean geometric space. It refers to the structure of being determined by the connectability of relations.

For this reason, the theory does not treat being, generation, relation, and topology as mutually independent concepts. Being appears in generation; generation occurs in relation; and relation is structured as topology.

This minimal structure forms the point of departure for the entire paper.

0.3 Primitive Concepts, Definitions, Axioms, and Theorems

The theoretical system of this paper is constructed in the following order.

First, it presents the Primitive Concepts that form the basis of the theory. Primitive concepts are the minimal concepts that remain undefined within the system. They constitute the starting point of the theory and are not reduced to more fundamental concepts.

Second, Definitions are given by means of those primitive concepts. A definition is a logical operation that clarifies a new concept through concepts already introduced.

Third, the paper presents the Axioms that serve as the minimal premises of the theory. Axioms are not proved; they provide the logical basis for every proposition derived thereafter.

Fourth, Theorems are derived from the axioms. A theorem is a proposition logically derived from the axioms and definitions and expresses a fundamental structure of the generation of being within this theory.

Fifth, Corollaries are derived from the theorems. Corollaries are propositions that apply the axiomatic system to concrete domains such as art, artificial intelligence, interfaces, society, and culture.

Accordingly, art and artificial intelligence are not starting points of this paper. They are positioned as ontological consequences derived from the axiomatic system.

0.4 Scope of This Paper

The direct purpose of this paper is not to construct a theory of art. Nor is it to present a theory of artificial intelligence or a social theory.

Its purpose is to construct a more fundamental ontology capable of encompassing those domains.

If the axiomatic system is coherent, subject, other, art, technology, artificial intelligence, society, and culture can be derived not as independent theories but from a single theory of the generation of being.

In this sense, Generative Topological Ontology is not a theory that explains individual domains. It is a foundational theory that explains how such individual domains can themselves be generated.

0.5 Fundamental Proposition of This Paper

The entire paper develops from the following fundamental proposition:

Being is not substance.

Being is the topological structure of relations that continue to generate.

The task of this paper is therefore not to define “what being is.” Its task is to describe, through a minimal axiomatic system, how being is generated.

On the basis of this proposition, the paper systematically constructs Generative Topological Ontology in the order of primitive concepts, definitions, axioms, theorems, and corollaries.

Chapter 1

Primitive Concepts

The Theoretical Point of Departure of Generative Topological Ontology

1.1 Position of Primitive Concepts

This chapter presents the Primitive Concepts that constitute the theoretical system.

A primitive concept is a minimal concept that remains undefined within the theory. Such concepts are not reduced to more fundamental concepts and function as the logical starting points of the axiomatic system as a whole.

Just as “point,” “line,” and “set” may be introduced without definition in mathematics, the primitive concepts of this paper are not explained through other concepts. If one attempted to define the primitive concepts further, the definitions would become circular and the axiomatic system would lose its independence.

The purpose of this chapter is therefore not to explain the primitive concepts. Its purpose is to make explicit the minimal conceptual vocabulary on which the theory depends.

The seven concepts presented below do not each possess a complete and independent meaning in isolation. They form the theoretical system only through their relations with one another.

1.2 Primitive Concept 1: Being

The first primitive concept is Being.

Being is the object of inquiry of this theory. At this stage, however, being is defined neither as substance, object, nor subject.

What being is becomes intelligible only through the axiomatic system as a whole. “Being” therefore remains undefined at this stage.

1.3 Primitive Concept 2: Generation

The second primitive concept is Generation.

Within this theory, generation is the most fundamental movement through which being is understood. At this stage, however, generation is not reduced to existing concepts such as change, motion, development, or creation.

What generation is will be determined only through the axioms. “Generation” therefore also remains undefined at this stage.

1.4 Primitive Concept 3: Relation

The third primitive concept is Relation.

This theory understands being not as an isolated substance but in relation. At this stage, however, relation is not restricted to any particular kind of relation, such as causal, social, or logical relation.

Relation is introduced as one of the most fundamental modes of being within the axiomatic system as a whole.

1.5 Primitive Concept 4: Topology

The fourth primitive concept is Topology.

Topology here does not directly mean a topological space in mathematics. Nor does it simply mean spatial structure.

Within this theory, topology refers to the structure of connectability formed by being and relation. Its details are not yet defined at this stage. Topology is a primitive concept that acquires its meaning through the axiomatic system as a whole.

1.6 Primitive Concept 5: Difference

The fifth primitive concept is Difference.

Difference is introduced as one of the conditions that make generation possible. It is not understood as opposition, distinction, negation, or binary opposition.

Difference is introduced as a minimal condition of the generation of being. Its ontological significance will be clarified through the axioms that follow.

1.7 Primitive Concept 6: Reality

The sixth primitive concept is Reality.

Reality in this theory does not mean the empirical world or the physical world. Nor does it designate subjective experience or objective fact.

Reality is introduced as an independent primitive concept. Its ontological position will be determined through the axiomatic system.

1.8 Primitive Concept 7: Interface

The seventh primitive concept is Interface.

In this theory, interface does not mean the operating surface of an information device or a communication technology. Nor is it defined as a medium that connects subject and object.

Interface is introduced as an independent primitive concept and will acquire its ontological significance through the axioms that follow. Its function and role therefore remain unspecified at this stage.

1.9 Irreducibility Among the Primitive Concepts

The seven primitive concepts are introduced independently of one another. None is defined by means of another.

For example:

- Being is not defined by Generation.
- Generation is not defined by Relation.
- Relation is not defined by Topology.

- Topology is not defined by Difference.
- Difference is not defined by Reality.
- Reality is not defined by Interface.

This irreducibility is a methodological requirement for maintaining the logical independence of the axiomatic system.

The theory avoids fixing the meaning of the primitive concepts prior to the axioms; instead, their meanings are mutually determined within the axiomatic system as a whole.

1.10 Conclusion of This Chapter

This chapter has presented the seven primitive concepts constituting Generative Topological Ontology.

They are not concepts to be defined but the logical starting points of the theory as a whole. Consequently, each concept does not yet possess a sufficient meaning when considered only within this chapter.

Their meanings will be systematically determined through the Definitions in the next chapter and the Axioms that follow.

This chapter therefore does not explain being. It presents the minimal conceptual set required to describe the generation of being.

Chapter 2

Definitions

Definitions of the Fundamental Concepts of Generative Topological Ontology

2.1 Purpose of This Chapter

The preceding chapter presented the Primitive Concepts that constitute the theoretical system. They were introduced without definition as the logical starting points of the axiomatic system as a whole.

This chapter uses those primitive concepts to define the fundamental concepts of the theory.

A definition here is not the creation of a new concept. It is a logical operation that clarifies the objects of the theoretical system prior to the introduction of the axioms.

The definitions in this chapter are therefore preparations for the axioms; they are not themselves axioms.

Definition 1: Being

Being is not the object of generation; it is the phase that becomes manifest in generation.

This definition does not adopt the view that being is a fixed substance. Being is not complete in itself; it appears through generation.

Being within this theory is therefore not a static concept but is understood in an inseparable relation to generation.

Definition 2: Generation

Generation is the ontological movement through which a new phase of being is constituted.

Generation is neither mere temporal change nor causal change. It is the constitution of a structure of being that had not previously been established.

Generation is thus a movement, but it cannot be reduced to physical motion.

Definition 3: Relation

Relation is the minimal unit that makes the generation of being possible.

Within this theory, relation is not a subsequent operation that connects already existing entities. Relation precedes being. Being becomes manifest as a result of relation.

Relation is therefore more fundamental than being within this theoretical framework.

Definition 4: Topology

Topology is the structure of connectability generated by relations.

Topology here is neither physical space nor geometric form. It is the structure formed by the totality of relations that can be generated.

Topology is therefore not space; it is a condition of relational generation.

Definition 5: Reality

Reality is the phase in which generated relations become irreducible.

Reality is neither an objective world nor a subjective world. Nor is it physical fact or psychological experience.

Within this theory, reality designates the condition in which the generation of being can no longer be completely reduced to other relations.

Reality is therefore not the cessation of generation but the phase in which the irreversibility of generation becomes manifest.

Definition 6: Interface

An interface is an ontological boundary that forms generative conditions between different phases.

Interfaces are commonly understood as devices of connection. This theory does not define them in that way.

An interface is not connection itself. It is the topological boundary that establishes the conditions under which new generation becomes possible.

In this sense, interface is a condition that precedes the generation of being.

Definition 7: Self

The Self is the phase in which generative relations temporarily acquire local stability.

The self is not a substance, nor is it an invariant subject. It is a local structure in which relational generation has temporarily stabilized.

The self is therefore not fixed being but a phase that remains continuously generative.

Definition 8: Self-Externalization

Self-Externalization is the ontological movement through which the self constitutes itself by generating relations with what is not itself.

The important point is that self-externalization should not be understood as a loss of self. The self is not lost by being projected outside itself. The self becomes itself only through the generation of relations with what is not itself.

Self-externalization is therefore a fundamental movement of the generation of being within this theory.

This definition is a phenomenological description; its necessity will be demonstrated through the axioms and theorems that follow.

2.2 Structure Among the Definitions

The preceding definitions are not a list of independent concepts. Definitions 1 through 8 form a single logical sequence.

Being appears in generation; generation is constituted in relation; relation is structured as topology; topology acquires irreducibility as reality; the condition of transition between phases is interface; the local stabilized condition becomes the self; and the self continues the generation of being through self-externalization.

The definitions in this chapter therefore do not form a circular structure. They are constructed as a minimal conceptual sequence for describing the generation of being.

2.3 Conclusion of This Chapter

This chapter has defined the fundamental concepts constituting Generative Topological Ontology.

These definitions clarify the conceptual domain addressed by the theory; they are not themselves axioms.

The next chapter introduces the Axioms on the basis of the concepts defined here. The axioms are positioned as the minimal premises of the theory and provide the logical basis for the theorems and corollaries that follow.

This chapter gives meaning to the concepts; the next chapter presents the logical structure of the generation of being itself.

Chapter 3

Axioms

The Minimal Axiomatic System of Generative Topological Ontology

3.1 Purpose of This Chapter

The preceding chapter defined the fundamental concepts that constitute the theory. Definitions, however, are not the premises of a theory. A definition is a logical operation that clarifies the meaning of a concept; it does not by itself establish the theory.

A theory is established by its axioms.

This chapter presents the minimal axiomatic system required for Generative Topological Ontology.

The axioms of this theory are neither generalizations from empirical facts nor propositions to be proved. An axiom is a minimal ontological premise supporting the theoretical system as a whole.

The five axioms below each perform an independent logical role while mutually complementing one another to constitute a single ontological system.

Axiom 1

Being is Generative.

Axiom

Being is not a fixed substance; it becomes manifest only as generation.

Interpretation

This axiom rejects the understanding of being as a static substance. Being is neither a completed object nor a self-contained essence. Being always appears as a process of generation, and being itself cannot be posited apart from that generation.

Accordingly, being in this theory is “being that generates,” and a “being prior to generation” is not theoretically posited.

Reason for Adoption

If being were posited as a fixed substance, generation would become a secondary phenomenon attached to being. This theory, by contrast, understands being itself as generation.

This axiom is the most fundamental premise of Generative Topological Ontology as a whole.

Axiom 2

Generation is Relational.

Axiom

No generation is constituted apart from relation.

Interpretation

Generation does not occur within an isolated being. It is always constituted in some form of relation.

“Relation” here does not mean interpersonal or causal relation. Relation is the minimal structure that makes the generation of being possible.

Relation is therefore more fundamental than being within this theory.

Reason for Adoption

Axiom 1 alone cannot explain how generation is constituted. Axiom 2 is necessary in order to introduce relation as the condition of generation.

Axiom 3

Relations are Topological.

Axiom

Relations are structured by connectability rather than by distance.

Interpretation

Topology in this theory is not geometric space. It is the structure of connectability formed by relations.

Generation is therefore determined not by position or distance but by connectability.

Through this axiom, the theory becomes not a theory of space but a topological ontology.

Reason for Adoption

Generation is not merely relation. Generative relations possess structure. This theory introduces topology in order to specify that structure.

Axiom 4

Reality is the Phase in Which Relational Generation Becomes Irreducible.

Axiom

Reality is the phase in which generated relations can no longer be completely reduced to other relations.

Interpretation

Reality is not matter. Reality is not information.

Reality is the condition in which generated being, while maintaining its generation, can no longer be completely reduced to another structure.

Through this irreducibility, being is experienced as reality.

Reality in this theory is therefore not the cessation of the generation of being, but the phase in which the irreversibility of that generation becomes manifest.

Reason for Adoption

This axiom is introduced in order to derive “reality” from the structure of the generation of being without reducing reality to either an objective or a subjective world.

It thereby allows the theory to treat reality ontologically rather than empirically.

Axiom 5

Interfaces Induce Topological Transitions.

Axiom

An interface is the ontological occasion that forms new generative conditions between different phases.

Interpretation

An interface is generally understood as a surface of connection. This theory does not understand it in that way.

An interface is not the result of connection. It is the condition under which new generation begins.

Accordingly, an interface is not itself the topological transition that makes the generation of being possible; it is the condition that induces such a transition.

Reason for Adoption

Generation in this theory is not continuous change. Generation is a transition into a new phase.

Interface is indispensable as the concept that specifies the conditions of that transition.

3.2 Relations Among the Five Axioms

Although the five axioms are independent propositions, they form a single logical sequence.

Axiom 1 understands being as generation.

Axiom 2 shows that such generation is constituted only in relation.

Axiom 3 shows that relations form topological structures.

Axiom 4 specifies as reality the state in which such topology acquires irreducibility.

Axiom 5 positions interface as the condition through which that topology moves into further generation.

Through this sequence, the theory understands being not as a fixed object but as a topological movement of generation.

3.3 Characteristics of the Axiomatic System

This axiomatic system integrates being, generation, relation, topology, reality, and interface as a minimal set of premises.

What is important is that concepts such as the following do not yet appear in this chapter:

- self,
- other,
- self-externalization,

- art,
- artificial intelligence,
- society.

These are not axioms. They are propositions derived from the axioms.

The theory is therefore not human-centered from the outset. It is constructed as a minimal theory describing the generation of being prior to the human.

3.4 Conclusion of This Chapter

This chapter has presented the five axioms required to constitute Generative Topological Ontology.

These axioms provide the logical foundation of the theory as a whole, and every theorem and corollary that follows depends upon them.

The next chapter presents as Theorems the fundamental propositions logically derived from this axiomatic system.

Only there will core concepts of the theory - including the self, self-externalization, the openness of being, and generation through interfaces - be derived from the axiomatic system.

Chapter 4

Theorems

Logical Consequences of Generative Topological Ontology

4.1 Purpose of This Chapter

The preceding chapter presented the five axioms constituting Generative Topological Ontology.

Axioms are not proved. Yet insofar as they constitute a theoretical system, their logical consequences must be derived.

This chapter presents as Theorems the fundamental propositions derived directly from the axiomatic system.

The theorems presented here are not empirical facts; they are logical consequences of the axiomatic system. This chapter therefore does not present concrete examples of the generation of being. It demonstrates what kind of ontology is constituted by the axioms.

Theorem 1

Being Emerges Locally.

Theorem

Being becomes manifest not as a totality but as a local phase.

Proof

By Axiom 1, being is generation. By Axiom 2, generation is constituted only in relation. Since relation is always constituted within a concrete topology, being becomes manifest not as abstract generality but as local generation.

QED.

Interpretation

Being is not the result of first positing a whole. Being is generated in each locality.

Being in this theory is therefore always particular and concrete.

Theorem 2

Being is Open.

Theorem

Generative being does not form a closed system.

Proof

By Axiom 3, relations are structured as connectability. So long as connectability exists, being retains the possibility of further generation.

Being therefore does not complete itself as a closed system.

QED.

Interpretation

Being is not a completed substance. It is a structure that remains open to further generation.

In this sense, the present theory is not a closed ontology but an open ontology.

Theorem 3

The Self Emerges Relationally.

Theorem

The self is not an independent substance; it is constituted as a local stabilization of relational generation.

Proof

Axiom 2 shows that generation is constituted only in relation. By Definition 7, the self is a state of local stabilization. The self therefore cannot exist independently of relational generation.

QED.

Interpretation

The self is not a fixed subject. It is a phase in which relational generation has temporarily acquired equilibrium.

Theorem 4

Self-Externalization is a Necessary Condition of the Generation of Being.

Theorem

The self is constituted only through relational generation with what is not itself.

Proof

By Theorem 3, the self is generated in relation. Relation cannot be constituted by the self alone. The generation of the self therefore necessarily includes relational generation with what is not itself.

This ontological movement is called Self-Externalization.

QED.

Interpretation

Within this theory, self-externalization is not a psychological phenomenon. It is a logical condition of the generation of the self.

Self-externalization is therefore not self-loss; it is a condition of the generation of being itself.

Theorem 5

Reality Cannot Be Fully Externalized.

Theorem

Reality cannot be completely replaced through self-externalization.

Proof

Axiom 4 defines reality as an irreducible phase. Because it is irreducible, reality cannot be completely transformed into another relation.

No matter how far self-externalization proceeds, it therefore cannot eliminate reality itself.

QED.

Interpretation

Self-externalization does not cause reality to disappear. Rather, it brings the irreducibility of reality into relief.

Here the ontological occasion of confrontation with reality is constituted.

Theorem 6

Interfaces Generate New Phases of Being.

Theorem

An interface is a condition of topological transition in the generation of being.

Proof

Axiom 5 shows that an interface induces topological transition. A topological transition signifies the generation of a new phase of being.

An interface is therefore a condition that makes the generation of being possible.

QED.

Interpretation

An interface is not merely a surface of connection. It is the occasion through which new being is generated.

Theorem 7

Confrontation with Reality Induces the Generation of Being.

Theorem

Being moves into a new phase through confrontation with the irreducibility of reality.

Proof

By Theorem 5, reality cannot be fully externalized. By Theorem 6, topological transition is induced by interface.

Confrontation with reality is the phase in which irreducibility functions as interface. Confrontation with reality therefore induces a new generation of being.

QED.

Interpretation

The generation of being is not produced by the quantity of information. It begins through an encounter with irreducible reality.

This gives the ontological position of the occasion within the present theory.

4.2 Logical Structure of the Theorems

The seven theorems above are not mutually independent propositions.

Theorem 1 shows the locality of being.

Theorem 2 derives the openness of being.

Theorem 3 positions the self as a local structure of the generation of being.

Theorem 4 derives self-externalization as a necessary condition of the generation of being.

Theorem 5 shows the irreducibility of reality.

Theorem 6 specifies interface as a condition of topological transition.

Theorem 7 logically derives confrontation with reality as the occasion that initiates a new generation of being.

Within this theory, self-externalization, reality, interface, and occasion are therefore not independent concepts. They describe, from different phases, a single structure of the generation of being necessarily derived from the axiomatic system.

4.3 Conclusion of This Chapter

This chapter has presented seven fundamental theorems derived from the axiomatic system of Generative Topological Ontology.

Through these theorems, the theory understands being as a continuous structure of generation, relation, topology, reality, and interface.

Here, for the first time, “self-externalization” is positioned not as a hypothesis or premise but as a logical consequence derived from the axiomatic system.

The next chapter presents Corollaries derived from these theorems and logically develops their possible applications to art, Web Installation, Reverse-Problem Art, Derivative Space, artificial intelligence, and other domains.

Chapter 5

Corollaries

Applied Consequences of Generative Topological Ontology

5.1 Purpose of This Chapter

The preceding chapter presented the fundamental theorems logically derived from the axiomatic system.

Theorems are universal propositions constituting the theory. Yet if an axiomatic system is to function as a theory, its logical consequences must also remain coherent within concrete domains of being.

This chapter presents such consequences as Corollaries.

A corollary here is neither a new axiom nor a new theorem. It is an applied proposition that follows naturally from the axioms and theorems.

This chapter therefore does not develop an independent theory of art or artificial intelligence. It shows what explanatory possibilities Generative Topological Ontology possesses in relation to concrete domains.

Corollary 1

Art is the Practice of Designing Interfaces.

Corollary

Art is not merely the production of works. Art is the practice of designing interfaces that make a new generation of being possible.

Derivation

By Theorem 6, an interface is a condition for the generation of a new phase of being. Art can therefore be understood not as the production of an object but as the design of conditions for the generation of being.

Implication

The artwork is not the end. The work is positioned as a condition that makes the generation of being possible.

Corollary 2

Web Installation Implements the Generation of Being.

Corollary

Web Installation is not art that merely uses the Internet. It is an interface that implements the conditions of the generation of being in reality.

Derivation

By Corollary 1, art designs interfaces. Web Installation becomes a methodology for realizing such design in both informational space and embodied space.

Implication

Web Installation is not a format of artwork. It is an ontological method for implementing the generation of being.

Corollary 3

Reverse-Problem Art Designs Conditions for Generation.

Corollary

Reverse-Problem Art is not art that presents completed meaning. It is art that designs the conditions under which meaning is generated.

Derivation

By Theorem 7, the generation of being begins through an occasion. Art therefore participates in the generation of being by designing not meaning itself but the conditions under which meaning is generated.

Implication

Art is not an answer. Art is the practice of designing the phase in which an answer is generated.

Corollary 4

Derivative Space is the Social Phase of Self-Externalization.

Corollary

Derivative Space is the phase in which self-externalization develops as a social, cultural, and technological structure.

Derivation

By Theorem 4, self-externalization is a necessary condition of the generation of being. When self-externalization extends beyond the individual into institutions, markets, and informational space, Derivative Space is formed.

Implication

Derivative Space is not a virtual world. It is a social structure of the generation of being.

Corollary 5

Artificial Intelligence Accelerates Self-Externalization.

Corollary

Artificial intelligence is not an entity that substitutes for human intelligence. It is an interface that accelerates self-externalization and makes its limits visible.

Derivation

Theorem 4 positions self-externalization as a condition of the generation of being. Theorem 6 positions interface as a condition of topological transition. Artificial intelligence can be understood as an ontological environment in which both are simultaneously constituted.

Implication

The ontological significance of AI does not lie in intelligence itself. It lies in the expansion of the occasions through which the generation of being becomes possible.

Corollary 6

Osamari is the Generation of Local Stability.

Corollary

Osamari is not completion. It is the phase in which relational generation acquires local stability.

Derivation

Theorem 1 shows the locality of being, and Theorem 3 derives the self as local stability. Osamari is the condition in which such local stability becomes manifest in society, body, space, and technology.

Implication

Osamari is not cessation. It is a temporary equilibrium oriented toward a further generation of being.

Corollary 7

Bonsai Designs the Temporality of Generation.

Corollary

Bonsai is not a technique for miniaturizing a plant. It is an interface that temporally designs the relational generation between human beings and nature.

Derivation

Theorem 6 positions interface as a condition of topological transition. Because bonsai continuously generates relations through time, it can be understood as a sustained interface of the generation of being.

Implication

Bonsai is not a representation of nature. It is a method through which nature and human beings participate together in the generation of being.

5.2 Unified Structure of the Corollaries

The seven corollaries above appear to concern different objects. Yet they share the same logical structure.

Art designs interfaces.

Web Installation implements that design.

Reverse-Problem Art designs generative conditions.

Derivative Space structures self-externalization socially.

Artificial intelligence accelerates self-externalization.

Osamari forms local stability.

Bonsai designs the temporality of generation.

Each is a manifestation, in a different domain, of the same principle: the generation of being.

The propositions presented in this chapter are therefore not separate theories. They are applied consequences derived from the axiomatic system.

5.3 Conclusion of This Chapter

This chapter has presented seven corollaries derived from the axiomatic system and theorems.

These corollaries show that Generative Topological Ontology can be applied to diverse domains such as art, information technology, society, culture, and nature.

What is important is that these domains are not starting points of the theory. Art, artificial intelligence, Web Installation, Reverse-Problem Art, Derivative Space, osamari, and bonsai are all ontological consequences derived from the principle of the generation of being.

Generative Topological Ontology is thereby positioned not as a theory of a particular domain but as a foundational theory capable of explaining diverse domains of being within a unified framework.

The next chapter examines whether this axiomatic system possesses sufficient coherence and independence as a theory, and considers the relations among the axioms, the minimality of the axiomatic system, and the logical consistency of the theoretical system as a whole.

Chapter 6

Consistency and Independence

Logical Examination of Generative Topological Ontology

6.1 Purpose of This Chapter

Chapter 3 presented the five axioms constituting Generative Topological Ontology. Chapter 4 presented the fundamental theorems derived from those axioms, and Chapter 5 derived applied consequences for art, Web Installation, Reverse-Problem Art, Derivative Space, artificial intelligence, and other domains.

An axiomatic system, however, does not become a theory merely by listing axioms.

For a theoretical system to be constituted, it must be shown that its axioms are logically coherent, that each axiom performs a distinct role, and that the system as a whole does not contain unnecessary premises.

This chapter examines Generative Topological Ontology from four perspectives:

First, it confirms the Consistency of the axiomatic system.

Second, it examines the Independence of the axioms from one another.

Third, it considers the Minimality of the axiomatic system.

Fourth, it clarifies the scope and limits of the theory.

6.2 Consistency of the Axiomatic System

Consistency in an axiomatic system means that the axioms do not produce logical contradiction among themselves.

Within Generative Topological Ontology, the following are not identical concepts:

- Being
- Generation
- Relation
- Topology
- Reality
- Interface

Yet neither are they concepts that contradict one another.

Axiom 1 understands being as generation.

Axiom 2 locates the condition of generation in relation.

Axiom 3 understands relation as topological structure.

Axiom 4 defines reality as an irreducible phase.

Axiom 5 introduces interface as a condition of topological transition.

No axiom negates a preceding axiom. Each presents an ontological condition at a different level.

At least internally, the theory therefore does not contain circular reasoning and forms a coherent logical structure.

6.3 Independence of the Axioms

A crucial requirement of an axiomatic system is that its axioms be mutually independent. If one axiom can be derived from the others, that axiom is unnecessary.

The five axioms of this theory can be examined as follows.

Axiom 1: Being is Generative.

This proposition cannot be derived from the other four axioms. Since the other axioms all presuppose “generation,” Axiom 1 functions as the most fundamental premise of the entire theory.

Axiom 2: Generation Occurs Only in Relation.

Axiom 1 only states the relation between being and generation; it does not determine how generation is constituted. Axiom 2 is therefore independent.

Axiom 3: Relations are Topological.

Even if relation is assumed, the proposition that its structure is topological cannot be derived from Axioms 1 and 2. Axiom 3 is therefore also independent.

Axiom 4: Reality is the Phase in Which Relational Generation Becomes Irreducible.

The concept of reality cannot be constituted from being, generation, relation, and topology alone. Understanding reality as irreducibility is a premise specific to this theory. Axiom 4 is therefore independent.

Axiom 5: Interfaces Induce Topological Transitions.

Even if topology exists, the conditions of its transition cannot be derived from the preceding four axioms. Axiom 5 therefore also performs an independent role.

The five axioms of the theory thus retain logical independence from one another.

6.4 Minimality of the Axiomatic System

The theory aims to be constructed with as few axioms as possible. The reason is that the fewer axioms required, the simpler the theory becomes and the greater its explanatory economy.

At present, the theory consists of five axioms.

It cannot be ruled out that an equivalent explanatory power might someday be maintained with fewer than five axioms. At the present stage, however, five axioms are regarded as the minimum configuration necessary to treat within a single framework the six conceptual domains of being, generation, relation, topology, reality, and interface.

The theory therefore does not claim completeness. It remains open to the possibility that its axioms may in the future be compressed or reorganized.

6.5 Openness of the Theory

The theory does not aim to form a closed system.

The reason is that Axiom 1 understands being itself as generation. Generation presupposes new possibilities of being. The axiomatic system itself must therefore continue to retain the possibility of future extension.

In this sense, the theory is not a completed system. It is not completion, but a system that itself generates.

This is an important difference from conventional formal systems.

Consistency within this theory does not mean closure. It means open consistency.

6.6 Limits of the Theory

This theory is a foundational theory that explains the generation of being.

It is therefore not intended, by itself, to explain the totality of art, aesthetics, sociology, artificial intelligence, or cultural theory.

Rather, it presents minimal principles for understanding such domains within a unified framework.

Concrete analysis of phenomena requires empirical research and domain-specific theories appropriate to each field. The present theory is therefore not a replacement for empirical science, nor does it deny empirical facts.

It is a foundational theory that presents ontological conditions prior to empirical inquiry.

6.7 Conclusion of This Chapter

This chapter has examined the axiomatic system of Generative Topological Ontology in terms of consistency, independence, minimality, and theoretical limits.

The examination yields four points.

First, the axioms maintain logical consistency with one another.

Second, each axiom performs an independent ontological role.

Third, the five axioms are positioned, at the present stage, as a minimal configuration.

Fourth, the theory is not a closed system but an open system that, like generation itself, retains the possibility of future extension.

Through these considerations, Generative Topological Ontology has been shown to possess a degree of logical coherence as a foundational theory based on a minimal axiomatic system rather than as a mere philosophical assertion.

The next chapter compares the axiomatic system with existing ontology, phenomenology, topological space theory, category theory, and Buddhist thought in order to clarify its theoretical position and distinctiveness.

Chapter 7

Discussion

Theoretical Position of Generative Topological Ontology

7.1 Purpose of This Chapter

The preceding chapters have presented Generative Topological Ontology as a minimal axiomatic system.

This chapter compares that axiomatic system with existing philosophical, mathematical, and intellectual frameworks in order to clarify the theoretical position of the present theory.

The purpose is not to judge the superiority or inferiority of existing theories. It is to show what the present theory inherits and where it introduces a theoretical turn.

Generative Topological Ontology does not reject conventional ontology. Rather, it seeks to reconstruct existing ontological problems from the perspective of the generation of being.

7.2 Comparison with Descartes

Modern philosophy has taken the subject as a point of departure.

The proposition “I think, therefore I am” established the modern subject by placing the self at the foundation of certainty.

In the present theory, however, the subject is not the point of departure.

Identity is neither a definition nor an axiom; it is derived in Chapter 4 as a theorem. Identity becomes manifest as a local stabilization of relational generation.

The theory therefore does not explain being from the subject. It derives the subject from the generation of being.

In this respect, its methodology differs from modern theories of the subject.

7.3 Comparison with Heidegger

Martin Heidegger returned philosophy from beings to the question of Being itself and made ontology a central problem of twentieth-century philosophy.

The present theory shares with Heidegger the refusal to understand being as a fixed substance. Yet there is an important difference between them.

Dasein occupies a central position in Heidegger. In the present theory, by contrast, Dasein is not the point of departure. The generation of being itself precedes it.

Human existence is therefore understood as one local phase of the generation of being.

Furthermore, interface in the present theory is not a site at which being is disclosed; it is a condition under which a new phase of being is generated.

The theoretical center of gravity thereby moves from the disclosure of being to the generation of being.

7.4 Comparison with Merleau-Ponty

Maurice Merleau-Ponty understood the body as the very relation between self and world and sought to move beyond the dualism of subject and object.

The present theory shares with this approach an understanding of being in terms of relation.

Yet the body is not treated here as the ultimate foundation. The body itself is understood as one local structure of the generation of being.

The theory is therefore not a bodily ontology but an ontology of the generation of being that includes embodiment.

7.5 Comparison with Structuralism and Post-Structuralism

Structuralism privileged structure over subject, while post-structuralism demonstrated the fluidity of structure itself.

The present theory shares with these approaches the view that structure is not a fixed system.

However, within the present theory, structure itself is generated.

Structure is not a framework that determines being. It is a result of generation and, in turn, becomes a condition of further generation.

The theory is therefore not a theory of structure but a theory of the generation of structure.

7.6 Comparison with Topological Space Theory

In mathematics, topology describes space through open sets and continuity rather than through distance.

The present theory receives an important suggestion from this mode of thought. Yet it does not directly apply mathematical topological spaces to being.

Topology in this theory is an ontological concept describing the connectability of relational generation.

The theory is therefore not an attempt to philosophize mathematical topology. It is an attempt to extend the idea of topology toward the generation of being.

7.7 Comparison with Category Theory

Category theory treats morphisms, rather than objects, as fundamental. Objects are understood within networks of morphisms.

This orientation has a strong affinity with the relational precedence of the present theory.

Yet Generative Topological Ontology is not category theory itself.

What the present theory addresses is not the morphism but generation. A morphism describes a relation; the present theory asks how such relations generate being.

In this sense, the theory may be understood as an ontological extension of the relational intuition found in category theory.

7.8 Comparison with Buddhist Thought

Buddhist thought, particularly the doctrine of dependent origination, does not understand being as an independent substance but as something constituted through relation.

This point has a deep affinity with the present theory.

The present theory, however, does not aim at religious salvation. Nor does it treat impermanence or emptiness as objects of faith.

Its purpose is to describe the generation of being as a logical structure.

It therefore shares a problem-consciousness with Buddhist thought while differing from it methodologically.

7.9 Distinctiveness of the Theory

The distinctiveness of the theory can be organized into four points.

First, it understands being not as a fixed substance but as generation itself.

Second, it integrates being, generation, relation, topology, reality, and interface within a minimal axiomatic system.

Third, it positions self-externalization not as a premise of the theory but as a theorem derived from the axiomatic system.

Fourth, it understands art, artificial intelligence, informational space, society, and culture not as separate theories but as corollaries derived from the same axiomatic system.

Through these four points, the theory is positioned as a unified framework crossing ontology, theory of art, and theory of artificial intelligence.

7.10 Conclusion of This Chapter

This chapter has positioned Generative Topological Ontology through comparison with existing philosophical and mathematical theories.

Although the theory has many points of contact with modern theories of the subject, phenomenology, structuralism, topological space theory, category theory, and Buddhist thought, it is not a simple synthesis of those approaches.

Its center lies in understanding being as generation.

Being is not substance; it is generation. Generation is constituted in relation, and relation is structured as topology.

The phase in which that generation becomes irreducible is called reality, and the condition of topological transition is called interface.

From this structure, self, self-externalization, art, artificial intelligence, and culture are logically derived.

Generative Topological Ontology is therefore not an eclectic combination of existing theories. It is a new foundational theory that describes the generation of being through a minimal axiomatic system.

Conclusion

Generative Topological Ontology as a Foundational Theory of the Generation of Being

This paper has presented Generative Topological Ontology as a minimal axiomatic system and has constructed a foundational theory for understanding being not as a fixed substance but as generation.

Conventional ontology has developed around the question, “What is being?” Being has been explained through such diverse concepts as substance, subject, Dasein, body, structure, difference, and event. Yet these approaches have primarily described being; they have not systematically derived how being is generated from a minimal set of premises.

The present paper sought to transform this methodological situation.

For that purpose, ontology was presented not as a descriptive theory but as a constructive theory organized through an axiomatic method.

The theory takes as its primitive concepts:

- Being
- Generation
- Relation
- Topology
- Reality
- Interface

and systematizes them through the logical structure of definitions, axioms, theorems, and corollaries.

Through this method, being is described not as a static object but as a relational structure that continues to generate.

The five axioms presented in this paper are each positioned as independent ontological premises.

Axiom 1 understands being itself as generation.

Axiom 2 states that generation is constituted only in relation.

Axiom 3 states that such relations form topological structures.

Axiom 4 introduces reality as irreducibility.

Axiom 5 positions interface as the condition through which the generation of being is led into a new phase.

Through these axioms, the generation of being becomes describable as a single logical system.

The paper further derived a number of theorems from the axioms. As a result, concepts such as self, self-externalization, confrontation with reality, the openness of being, and interface are positioned not as premises of the theory but as logical consequences derived from the axiomatic system.

Particularly important is the derivation of self-externalization not as a theoretical starting point but as a theorem.

Self-externalization can thereby be understood neither as a psychological nor a sociological concept, but as a structural necessity belonging to the generation of being itself. This constitutes a central achievement of the paper.

The paper also derived a number of corollaries from the axiomatic system.

Art, Web Installation, Reverse-Problem Art, Derivative Space, artificial intelligence, osamari, and bonsai are not independent theories. Each is an applied consequence of the generation of being logically derived from the same axiomatic system.

The theory can therefore be positioned as a more foundational ontology capable of encompassing theories of art and artificial intelligence.

The paper further clarified its theoretical position through comparison with existing philosophy.

The theory differs from modern philosophy that begins from the subject. It also differs from ontology centered on Dasein. Nor does it treat structure itself as the final foundation in the manner of structuralism or post-structuralism.

Within this theory:

Being is generation.

Generation is relational.

Relation is structured as topology.

Its irreducibility becomes reality.

Interface initiates a new generation of being.

This structure consistently supports the theory as a whole.

The theory is therefore neither a theory of the subject, a theory of structure, nor a theory of the body. It is a theory of the generation of being itself.

The paper adopts an axiomatic method. Its purpose, however, is neither to reduce philosophy to mathematics nor to imitate mathematical rigor formally.

The axiomatic method adopted here makes explicit the minimal premises necessary to describe the generation of being and constructs a theoretical system from those premises.

For this reason, the theory is not a closed system. If being is generation, then theory itself must also continue to generate.

The axiomatic system therefore does not declare completion. It is positioned as an open foundational theory that permits future revision, extension, and reconstruction.

The aim of this paper was not to add a new concept. Its aim was to construct a theory capable of describing the generation of being in a unified manner through a minimal conceptual framework.

As a result, the paper transforms the question:

What is being?

into the question:

How is being generated?

This transformation constitutes the most important theoretical contribution of the paper.

Finally, the theory as a whole converges on the following proposition:

Being is not substance. Being is the movement through which relations continue to generate topologically.

Human beings, art, artificial intelligence, society, and culture can therefore be understood as diverse phases of this generation of being.

Generative Topological Ontology is an axiomatic system for describing those phases within a unified framework and is a foundational theory of the generation of being.

As a first step, this paper has presented the possibility of describing the generation of being through a minimal axiomatic system.

The task ahead is to further refine this axiomatic system and systematically develop it in such fields as art, aesthetics, artificial intelligence, information technology, social theory, and Japanese culture.

In that development, the axiomatic system presented here may function not as a premise belonging to any one particular theory, but as a common ontological foundation running through them.

In this sense, Generative Topological Ontology is not one philosophical position among others. It is a foundational theory for describing the generation of being.

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Methodological Statement

On the Publication of Research Memoranda

This text is published as a Research Memorandum within the continuing research process of Generative Topological Ontology.

The concepts, definitions, hypotheses, and arguments presented here record the theoretical point reached at the time of writing and publication. They do not signify a finally fixed theory. Through future research, artistic practice, interaction with reality, academic dialogue, and peer review, they may be expanded, revised, redefined, or reconstructed.

This research does not regard only completed theories as research outcomes. It also positions as an important object of research the process through which concepts arise, become connected to one another, undergo transformation, and are integrated into theory. Accordingly, this text should be understood not simply as an unfinished draft, but as one phase recording a particular moment in the generation of theory.

The publication of a Research Memorandum is not intended to present an unfinished theory prematurely as a finished one. It is a method for recording the generative process of thought and practice, making later verification and reconstruction possible, and opening the research to academic and artistic dialogue with different positions.

If the contents of this text are later published as a peer-reviewed article, scholarly book, or other formal research output, that completed version will be explicitly identified as a fixed document distinct from this Research Memorandum.

When citing or referring to this memorandum, the version number and last-updated date should be included together with the title and author. Differences in concepts, definitions, and argumentation may exist between versions.

This Research Memorandum is not a final conclusion. It is one point reached in the continuing formation of Generative Topological Ontology and, at the same time, an interface open to further generation.