

Scientific Recognition Architecture Operational Specification — Version 1.0

Reference Language Implementation: English

Status: Initial Operational Specification

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Abstract

The Scientific Recognition Architecture provides an operational specification for organising research on complex dynamic empirical objects whose development may precede sufficiently mature scientific explanation. Its purpose is to organise Scientific Recognition rather than to prescribe disciplinary methods or establish a particular explanatory theory. Operational Specification — Version 1.0 establishes a common cognitive architecture within which disciplinary expertise, empirical observations, scientific uncertainty, research navigation, relational organisation, process morphology, and explanatory development can operate as parts of one research process. The Specification is intended to support continuity of investigation while the investigated object, its recognised relationships, and available explanations continue to develop. The document functions as an operational standard rather than as a theoretical exposition. It defines project-entry conditions, common research principles, operational concepts, project organisation, learning requirements, documentation, version control, authorised language implementations, specialised specifications, and operational review. Its numbered structure is intended to support consistent implementation across projects and linguistic environments. Version 1.0 is designed for practical application and subsequent evaluation through research experience. It does not claim finality. Operational difficulties, ambiguities, successful applications, and justified deviations may provide evidence for future versions. The Architecture itself

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remains subordinate to its purpose: supporting Scientific Recognition and improving understanding of the investigated object.

Keywords: Scientific Recognition; Scientific Recognition Architecture; Operational Specification; Complex Dynamic Objects; Scientific Navigation; Persistent Scientific Uncertainty; Process Morphology; Research Organisation; Cognitive Architecture.

Key Points

1. The Scientific Recognition Architecture organises Scientific Recognition; it does not prescribe disciplinary methods.
2. The investigated object remains the primary reference point throughout the research process.
3. Scientific Recognition precedes sufficiently mature Scientific Explanation.
4. Persistent Scientific Uncertainty is an operational condition of investigation, not a methodological failure.
5. Scientific Navigation maintains continuity of investigation while the empirical object and its recognised organisation continue to develop.
6. Disciplinary expertise remains specialised; the cognitive organisation of the project remains common.
7. Explanatory plurality may remain scientifically legitimate while Process Morphology is developing.
8. Administrative completion of a project is not equivalent to completion of Scientific Recognition.
9. Project participation requires acceptance of the common operational architecture.
10. Operational readiness requires reproducible cognitive performance rather than memorisation of terminology.
11. The Specification is version-controlled, auditable, and open to revision through practical research experience.
12. Authorised Language Implementations preserve a common numbered operational architecture across linguistic environments.
13. Specialised Specifications may develop independently while remaining traceable to the general Architecture.
14. The Scientific Recognition Architecture exists to support understanding of the investigated object; preservation of the Architecture itself is not its purpose.

1. Purpose

1.1

This Specification establishes the operational architecture for the scientific investigation of complex dynamic empirical objects.

1.2

The purpose of the Specification is the organisation of Scientific Recognition.

1.3

Scientific Recognition shall remain directed toward the investigated object.

1.4

The Specification shall organise investigation before sufficiently mature Scientific Explanation is available.

1.5

The Specification shall not prescribe disciplinary methods.

1.6

Disciplinary methods shall operate within the common architecture established by this Specification.

1.7

Scientific Explanation shall emerge from Scientific Recognition.

2. Scope

2.1

This Specification applies to empirical objects whose development cannot be adequately organised in advance by a sufficiently mature explanatory theory.

2.2

The Specification is intended primarily for complex, dynamic, long-term, multi-component, and cross-disciplinary empirical objects.

2.3

Long-term military environmental contamination constitutes one class of such objects.

2.4

The Specification may be applied to other empirical objects when its operational conditions are satisfied.

2.5

Application to a new class of objects may require a specialised Specification.

2.6

A specialised Specification shall preserve the general cognitive architecture established by this Specification unless empirical experience demonstrates the need for revision.

3. Fundamental Principles

3.1 Object Priority

3.1.1

The investigated object shall remain the primary reference point of the investigation.

3.1.2

Project organisation shall follow the developing empirical object.

3.1.3

The investigated object shall not be reduced to disciplinary boundaries.

3.1.4

The investigated object shall not be reduced to the initial project design.

3.1.5

The investigated object shall not be reduced to the explanatory theory available at the beginning of investigation.

3.2 Recognition Before Explanation

3.2.1

Scientific Recognition shall precede sufficiently mature Scientific Explanation.

3.2.2

The absence of sufficiently mature Scientific Explanation shall not prevent investigation.

3.2.3

Scientific Explanation shall not determine in advance what the investigated object is permitted to become.

3.2.4

Explanation shall remain dependent on the continuing development of Scientific Recognition.

3.3 Empirical Openness

3.3.1

Investigation shall remain open to new empirical manifestations.

3.3.2

New empirical manifestations may modify the recognised organisation of the investigated object.

3.3.3

Initial boundaries of the investigated object shall remain provisional when empirical development requires their revision.

3.3.4

Initial research questions may be revised when Scientific Recognition changes the recognised structure of the object.

3.4 Persistent Scientific Uncertainty

3.4.1

Scientific uncertainty shall be treated as a normal operational condition.

3.4.2

Scientific uncertainty shall not be eliminated through premature explanatory closure.

3.4.3

Uncertainty shall be progressively organised through investigation.

3.4.4

Changes in the structure of uncertainty shall be recorded.

3.5 Disciplinary Equality

3.5.1

No discipline shall possess automatic explanatory priority.

3.5.2

Each discipline shall contribute according to its capacity to increase Scientific Recognition of the investigated object.

3.5.3

Disciplinary expertise shall remain specialised.

3.5.4

Organisation of the investigation shall remain common.

3.5.5

Participation in the project requires acceptance of the common operational architecture in addition to disciplinary expertise.

3.6 Cognitive Openness

3.6.1

Multiple scientifically plausible interpretations may coexist.

3.6.2

Explanatory plurality shall not be treated as methodological failure.

3.6.3

Explanatory possibilities shall remain open while the empirical organisation of the object continues to develop.

3.6.4

Explanatory closure shall occur only when supported by sufficient maturity of Scientific Recognition.

4. Operational Definitions

4.1 Pre-Theoretical Domain

4.1.1

The Pre-Theoretical Domain is the operational domain in which investigation proceeds before sufficiently mature explanatory theory is available.

4.1.2

The Pre-Theoretical Domain may contain observations, disciplinary knowledge, hypotheses, preliminary explanations, practical experience, and competing interpretations.

4.1.3

The Pre-Theoretical Domain does not imply the absence of theory.

4.1.4

The Pre-Theoretical Domain ends only to the extent that sufficiently mature Scientific Explanation emerges.

4.2 Scientific Recognition

4.2.1

Scientific Recognition is the progressive increase in the scientific recognisability of the investigated object.

4.2.2

Scientific Recognition shall organise observations, relationships, boundaries, patterns, processes, and uncertainties.

4.2.3

Scientific Recognition shall remain continuous throughout the project.

4.2.4

Accumulation of data shall not be treated as equivalent to Scientific Recognition.

4.3 Persistent Scientific Uncertainty

4.3.1

Persistent Scientific Uncertainty is the continuing presence of scientifically productive uncertainty during investigation.

4.3.2

Persistent Scientific Uncertainty may change in form, location, and significance.

4.3.3

Reduction of one uncertainty may generate or reveal another.

4.3.4

Persistent Scientific Uncertainty shall be documented rather than concealed.

4.4 Scientific Navigation

4.4.1

Scientific Navigation is the continuous organisation of investigation under conditions of Persistent Scientific Uncertainty.

4.4.2

Scientific Navigation shall determine the next operational direction of investigation.

4.4.3

Scientific Navigation shall respond to changes in Scientific Recognition.

4.4.4

Scientific Navigation shall not be replaced by rigid adherence to the initial project design.

4.5 Relational Field

4.5.1

The Relational Field is the developing network of empirically recognised relationships within the investigated object.

4.5.2

Relationships may connect observations across disciplines, locations, environmental systems, scales, and time periods.

4.5.3

The Relational Field shall remain open to revision.

4.5.4

Relationships shall not be treated as causal explanations unless causality has been independently established.

4.6 Process Morphology

4.6.1

Process Morphology is the progressively recognisable organisation of the developing empirical process.

4.6.2

Process Morphology shall emerge from the developing Relational Field.

4.6.3

Process Morphology shall not be imposed by disciplinary boundaries.

4.6.4

Process Morphology shall remain provisional while the investigated object continues to develop.

4.7 Morphological Cognitive Openness

4.7.1

Morphological Cognitive Openness is the preservation of explanatory openness while Process Morphology remains under development.

4.7.2

Morphological Cognitive Openness shall prevent premature reduction of the developing process to a single explanation.

4.7.3

Morphological Cognitive Openness shall not prohibit explanation.

4.7.4

Morphological Cognitive Openness shall preserve correspondence between explanation and the developing empirical object.

4.8 Explanatory Possibility

4.8.1

An Explanatory Possibility is an empirically grounded explanatory direction compatible with the current state of Scientific Recognition.

4.8.2

Multiple Explanatory Possibilities may coexist.

4.8.3

Explanatory Possibilities shall remain subject to empirical development.

4.8.4

An Explanatory Possibility shall be revised or rejected when it ceases to correspond to the recognised empirical object.

4.9 Scientific Explanation

4.9.1

Scientific Explanation is an explanatory organisation supported by a sufficiently mature state of Scientific Recognition.

4.9.2

Scientific Explanation shall remain open to subsequent empirical revision.

4.9.3

Scientific Explanation shall not be treated as the termination of Scientific Recognition.

5. Operational Cognitive Architecture

5.1

The operational sequence shall begin with the empirical object.

5.2

Empirical observations shall enter the Pre-Theoretical Domain.

5.3

Scientific Recognition shall organise the developing empirical material.

5.4

Persistent Scientific Uncertainty shall remain explicit.

5.5

Scientific Navigation shall determine successive directions of investigation.

5.6

Recognised relationships shall form the Relational Field.

5.7

The developing Relational Field shall support recognition of Process Morphology.

5.8

Morphological Cognitive Openness shall preserve explanatory plurality while Process Morphology remains under development.

5.9

Explanatory Possibilities shall develop from the recognised empirical organisation.

5.10

Scientific Explanation shall emerge only when supported by sufficient maturity of Scientific Recognition.

5.11

Scientific Explanation shall return to the empirical object for continued verification.

5.12

Scientific Recognition shall continue after Scientific Explanation has emerged.

6. Operational Rules

6.1 Empirical Observation

6.1.1

Every observation shall retain its source.

6.1.2

Every observation shall retain its spatial reference when spatial information exists.

6.1.3

Every observation shall retain its temporal reference when temporal information exists.

6.1.4

Every observation shall retain its disciplinary and methodological context.

6.1.5

Absence of information shall not be converted into evidence of absence.

6.2 Relationship Formation

6.2.1

Relationships shall be recorded independently of explanatory preference.

6.2.2

Relationships shall distinguish empirical association from inferred causality.

6.2.3

Relationships may cross disciplinary boundaries.

6.2.4

Relationships may cross project-defined spatial and temporal boundaries.

6.2.5

Contradictory relationships shall remain visible until resolved.

6.3 Uncertainty

6.3.1

Uncertainty shall be recorded explicitly.

6.3.2

The source of uncertainty shall be identified when possible.

6.3.3

Uncertainty shall not be removed solely to simplify the project.

6.3.4

Changes in uncertainty shall be treated as research information.

6.4 Scientific Navigation

6.4.1

Every major change in research direction shall be linked to a change in Scientific Recognition, uncertainty, or Process Morphology.

6.4.2

Scientific Navigation may modify research priorities.

6.4.3

Scientific Navigation may require additional disciplinary participation.

6.4.4

Scientific Navigation may identify previously planned work as no longer operationally necessary.

6.4.5

Scientific Navigation shall remain documented.

6.5 Explanatory Control

6.5.1

No Explanatory Possibility shall acquire privileged status solely because it was formulated first.

6.5.2

No Explanatory Possibility shall acquire privileged status solely because it is associated with a dominant discipline.

6.5.3

No Explanatory Possibility shall acquire privileged status solely because it is supported by institutional authority.

6.5.4

Explanatory preference shall follow empirical correspondence.

6.5.5

Premature explanatory closure shall be treated as an operational risk.

7. Project Organisation

7.1 Project Entry

7.1.1

Acceptance of the applicable Specification shall precede participation in the project.

7.1.2

Project participants shall understand the distinction between disciplinary expertise and common cognitive organisation.

7.1.3

A participant unwilling to operate within the common cognitive architecture shall not participate in the project under this Specification.

7.1.4

Acceptance of the Specification shall not require agreement with any particular Scientific Explanation.

7.2 Project Object

7.2.1

The project shall define an initial empirical object.

7.2.2

The initial definition shall remain provisional.

7.2.3

The object definition shall be revised when Scientific Recognition requires revision.

7.2.4

The project shall preserve a record of changes in the recognised object.

7.3 Project Questions

7.3.1

Initial research questions shall guide investigation.

7.3.2

Initial research questions shall not define the final boundaries of Scientific Recognition.

7.3.3

Research questions may be added, modified, divided, combined, or discontinued.

7.3.4

Changes in research questions shall remain traceable.

7.4 Disciplinary Contributions

7.4.1

Each disciplinary contribution shall identify what it adds to Scientific Recognition.

7.4.2

A disciplinary result shall not be treated as an independent representation of the entire empirical object.

7.4.3

Disciplinary outputs shall enter the common Relational Field.

7.4.4

Project integration shall occur continuously rather than only at the end of disciplinary work.

7.5 Project Decisions

7.5.1

Major project decisions shall be evaluated against the investigated object.

7.5.2

Administrative convenience shall not redefine the empirical object.

7.5.3

Funding structure shall not determine explanatory priority.

7.5.4

Institutional status shall not determine explanatory priority.

7.5.5

Project completion shall not be equated automatically with completion of Scientific Recognition.

8. Learning Requirements

8.1

Training shall precede operational participation when participants have not previously worked under the applicable Specification.

8.2

Training shall focus on reproducible cognitive operations rather than memorisation of terminology.

8.3

Participants shall demonstrate the ability to distinguish observation, relationship, uncertainty, Process Morphology, Explanatory Possibility, and Scientific Explanation.

8.4

Participants shall demonstrate the ability to operate beyond the boundaries of their own disciplinary perspective without abandoning disciplinary competence.

8.5

Participants shall demonstrate the ability to preserve uncertainty without converting it prematurely into explanation.

8.6

Participants shall demonstrate the ability to revise an interpretation when the empirical object changes.

8.7

Successful completion of training shall not be defined solely by verbal reproduction of the Specification.

8.8

Operational reproduction shall be the primary criterion of readiness.

9. Project Record

9.1

The project shall maintain a traceable record of the development of Scientific Recognition.

9.2

The record shall include major changes in:

9.2.1

the recognised empirical object;

9.2.2

the Relational Field;

9.2.3

Process Morphology;

9.2.4

Persistent Scientific Uncertainty;

9.2.5

research questions;

9.2.6

Scientific Navigation;

9.2.7

Explanatory Possibilities;

9.2.8

Scientific Explanation.

9.3

The project record shall preserve unsuccessful and abandoned explanatory directions when they contributed to Scientific Recognition.

9.4

Negative and inconclusive results shall remain part of the project record.

9.5

The project record shall support subsequent analysis of the research process.

10. Project Completion

10.1

Administrative completion and scientific completion shall be distinguished.

10.2

A project may be administratively completed while Scientific Recognition remains incomplete.

10.3

Project completion shall include a statement of the current state of Scientific Recognition.

10.4

Project completion shall include unresolved Persistent Scientific Uncertainty.

10.5

Project completion shall identify the current Process Morphology when sufficiently recognised.

10.6

Project completion shall identify remaining Explanatory Possibilities.

10.7

Project completion shall identify the current Scientific Explanation when sufficiently mature.

10.8

The final project output shall identify what became scientifically recognisable as a result of the project.

11. Version Policy

11.1

Every operational use of this Specification shall identify the applicable version.

11.2

A project shall operate under the version accepted at project entry.

11.3

A Specification version shall not be modified during a project.

11.4

Operational difficulties shall be recorded during the project.

11.5

Recorded project experience may support development of a subsequent version.

11.6

A subsequent version shall not invalidate the historical operation of an earlier version.

11.7

A new version is different from an earlier version; it is not automatically superior.

11.8

Earlier versions shall remain permanently identifiable.

11.9

Version history shall remain traceable.

12. Authorised Language Implementations

12.1

English Version 1.0 is the initial reference language implementation of this Specification.

12.2

Additional language implementations may be prepared when required by an operational project.

12.3

An official language implementation shall be designated an Authorised Language Implementation.

12.4

An Authorised Language Implementation shall preserve the operational meaning of every numbered provision.

12.5

An Authorised Language Implementation is not required to preserve literal wording or sentence structure.

12.6

Hierarchical numbering shall remain identical across all Authorised Language Implementations of the same Specification version.

12.7

Operational discussion across languages shall reference numbered provisions.

12.8

Unauthorised translations shall not constitute operational implementations of this Specification.

12.9

An Authorised Language Implementation shall be identified by language, Specification version, and implementation status.

12.10

Authorised Language Implementations of the same Specification version shall remain operationally equivalent.

12.11

A difference in wording between Authorised Language Implementations shall not constitute a difference in operational meaning.

12.12

When an operational difference between Authorised Language Implementations is identified, the affected provision shall be reviewed.

12.13

Until the identified difference is resolved, the Reference Language Implementation shall determine the applicable operational meaning.

12.14

Correction of a language implementation that does not alter operational meaning shall not require a new Specification version.

12.15

A change that alters operational meaning shall require formal version control.

12.16

Authorised Language Implementations shall be developed in response to actual or anticipated operational project requirements.

12.17

The number of Authorised Language Implementations shall not be expanded without operational need.

13. Specialised Specifications

13.1

A specialised Specification may be developed for a defined class of empirical objects, research environment, or operational project.

13.2

A specialised Specification shall identify the general Specification version from which it derives.

13.3

A specialised Specification shall preserve all applicable provisions of the general Specification.

13.4

Specialisation may add operational provisions required by the empirical object.

13.5

Specialisation may refine general provisions when required for operational use.

13.6

Specialisation shall not silently modify the general cognitive architecture.

13.7

Any departure from the general Specification shall be explicit, numbered, and justified by operational experience or empirical necessity.

13.8

Different specialised Specifications may develop at different rates.

13.9

Development of one specialised Specification shall not require equivalent development of other specialised Specifications.

13.10

A newer specialised Specification shall not be treated as inherently superior to another specialised Specification.

13.11

Specialised Specifications may possess their own version histories.

13.12

Each specialised Specification may possess its own Authorised Language Implementations.

13.13

The language requirements of a specialised Specification shall follow the operational requirements of the corresponding research environment.

13.14

Experience obtained through specialised Specifications may support revision of the general Specification.

13.15

Revision of the general Specification shall occur only when the identified experience concerns the general cognitive architecture rather than a subject-specific condition.

14. Operational Review

14.1

Application of this Specification shall be subject to operational review.

14.2

Operational review shall evaluate the implementation of the Specification rather than the status of participating researchers or institutions.

14.3

Operational review shall determine whether project practice corresponds to the applicable numbered provisions.

14.4

Operational review shall distinguish:

14.4.1

demonstrated implementation;

14.4.2

partial implementation;

14.4.3

contradiction with the applicable provision;

14.4.4

insufficient evidence;

14.4.5

non-applicability.

14.5

Operational review shall not substitute compliance with the Specification for scientific truth.

14.6

Operational review shall identify deviations without assuming that every deviation constitutes an error.

14.7

A justified deviation may provide evidence for subsequent development of the Specification.

14.8

Projects operating under this Specification should preserve sufficient records to permit subsequent operational review.

14.9

Operational review may be conducted during or after a project.

14.10

The results of operational review should contribute to cumulative experience with the Scientific Recognition Architecture.

15. Status and Development

15.1

Version 1.0 establishes the initial operational form of the Scientific Recognition Architecture.

15.2

Version 1.0 is intended for practical application.

15.3

Version 1.0 shall be treated as operational rather than final.

15.4

Practical application shall constitute the principal source of evidence for subsequent development.

15.5

Operational difficulties, ambiguities, contradictions, and unsuccessful provisions shall be recorded.

15.6

Successful operation shall also be recorded.

15.7

No provision shall be preserved solely because it belongs to an earlier version.

15.8

No provision shall be changed solely because an alternative formulation appears preferable.

15.9

Revision shall respond to operational or empirical need.

15.10

The Scientific Recognition Architecture shall remain open to revision while preserving traceability of its development.

15.11

Development of the Architecture shall remain subordinate to its purpose: the organisation of Scientific Recognition of the investigated object.

16. Final Operational Principle

16.1

The investigated object shall remain the primary reference point throughout the research process.

16.2

Methods, disciplines, project structures, explanations, and versions of this Specification shall remain subordinate to Scientific Recognition of the investigated object.

16.3

The effectiveness of this Specification shall be evaluated through its capacity to support Scientific Recognition in practice.

16.4

Where practice demonstrates that this Specification obstructs Scientific Recognition, the Specification shall be revised.

16.5

Where the investigated object changes, investigation shall remain capable of changing with it.

16.6

The purpose of the Scientific Recognition Architecture is not preservation of the Architecture.

16.7

Its purpose is understanding the object.

Conflict of Interest

The author declares no conflict of interest.

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Data Availability Statement

No new data were created or analyzed in this study.