

***Galapagensis* Technical Specification v1.4**

Method and Data Model for Relational Documentary Research in Galapagos History, Knowledge and Memory

Edgardo Civallero | 0000-0001-8849-3484

Date: 30 August 2026

Project URL: <https://galapagensis.net/>

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DOI: <https://doi.org/10.5281/zenodo.22816706>

Recommended citation: Civallero, Edgardo. 2026. *Galapagensis Technical Specification: Method and Data Model for Relational Documentary Research in Galapagos History, Knowledge and Memory*. Version 1.4. <https://galapagensis.net/>. <https://doi.org/10.5281/zenodo.22816706>

Abstract

Galapagensis is an independent, long-term research programme and digital knowledge infrastructure devoted to the documentary reconstruction and critical study of the Galapagos Islands. Its research domain is Galapagos itself rather than any particular archive, institution, collection, documentary format, or disciplinary tradition. Relevant evidence may therefore be pursued across archives, libraries, museums, scientific collections,

published literature, private and family holdings, oral testimony, digital repositories, material culture, and other documentary environments in Ecuador and internationally.

This specification defines the methodological and informational architecture of *Galapagensis*. It operationalizes a relational approach to documentary research in which historical knowledge is built from evidence-backed assertions connecting people, places, events, activities, organizations, biological entities, material entities, sources, and collections. The model distinguishes documentary evidence from interpretation, preserves uncertainty and contradiction, records documentary mediation and claim transmission, and maintains provenance for both historical sources and *Galapagensis*'s own acts of knowledge production. It further distinguishes normalized research assertions from their particular expressions in sources, and represents the evidentiary links through which those assertions are assessed.

The specification also defines Linked Data as a publication and interoperability layer: public records may be assigned persistent Web identifiers and exposed in machine-readable form without replacing the evidence-centered *Galapagensis* model or flattening its provenance architecture.

The specification grew from the earlier *Galapagueana* project and from the theoretical framework articulated in *Los tejedores de memorias* (Civallero 2023), where archival work was conceived as an active process of recovering, connecting, interpreting, and making visible heterogeneous fragments of scientific and social memory. The present model extends that approach beyond a single institutional collection and applies it to a distributed documentary domain whose sources may be dispersed across institutions, countries, media, and communities.

Three contrasting historical cases were used to test and refine the model: the reconstruction of a *Nourmahal* expedition photograph through heterogeneous records; the attribution and documentary biography of Rosamond Georgina Lloyd Taylor's 1938-1939 *Galapagos Diary*; and the distributed documentary tradition surrounding Patrick Watkins, an early resident of Floreana. These tests produced the current requirements for evidence-backed metadata, source segments, documentary mediation, assertion lineage, identity resolution, contradiction preservation, and knowledge provenance.

Document intended use

The document is intended to serve five functions:

1. provide the formal methodological basis of *Galapagensis*;
2. define the conceptual data model from which software implementation can be derived;
3. establish stable terminology for research, documentation, collaboration, and publication;
4. provide a citable public description of the *Galapagensis* model and its intellectual genealogy; and
5. support later technical mappings, software documentation, grant proposals, scholarly publications, and DOI-bearing releases.

Section 1

Research domain and purpose

Galapagensis studies Galapagos as a documentary, historical, ecological, scientific, social, and cultural domain. It does not treat the holdings of any institution as the natural boundary of inquiry.

Research may begin from a document, object, observation, contradiction, historical claim, person, place, event, or explicit research question. Evidence is then followed wherever documentary relationships lead. A single investigation may therefore move among a family photograph in Puerto Villamil, a ship log in Nantucket, a scientific paper, an Ecuadorian administrative record, an oral-history interview, a museum specimen, and an archival collection in Europe.

The programme has two simultaneous objectives:

- to reconstruct defensible knowledge about Galapagos; and
- to document how that knowledge is produced.

The second objective is essential. *Galapagensis* must expose the evidentiary basis of significant claims, their current assessment, the interpretive interventions involved, competing explanations, documentary gaps, and the contributions through which a conclusion was reached.

The resulting platform is therefore not conceived primarily as a digital archive. It is a research infrastructure in which documentary traces, claims, contexts, and relationships can be investigated, represented, challenged, revised, and reused.

Section 2

Intellectual genealogy

The methodological foundations of *Galapagensis* developed from work carried out by Edgardo Civallero from 2018 onward with the Library, Archive & Museum of the Charles Darwin Foundation in the Galapagos Islands, and through *Galapagueana*, a project he conceived in 2019-2020 and publicly launched in 2021 within that institutional setting.

In his thesis *Los tejedores de memorias*, Civallero described *Galapagueana* as the long-term practical application of an approach that connected library, archive, museum, and oral sources in order to reinterpret the history and discourse of the natural sciences in Galapagos (Civallero 2023). *Galapagensis*, created as an independent programme after that period, preserves the intellectual genealogy while adopting a distinct name, institutional identity, corpus, and namespace.

That framework treated documentary memory as a network rather than a collection of isolated objects. Its broad conception of documentary evidence is consistent with *documentalism* and with work on *information-as-thing* and the expanded concept of the document (Buckland 1991, 1997; Lund and Buckland 2009). Documents were understood as products of specific contexts, processes, intentions, and audiences, while archival work included the recovery and maintenance of relationships among fragments of memory and between those fragments and the communities that produced and used them. It also argued against the fragmentation of memory by documentary format and institutional discipline, and for the use of apparently minor, informal, or unconventional documentary supports. These concerns also intersect with scholarship on archives, memory, scientific

knowledge infrastructures, and archival power (Schwartz and Cook 2002; McKemmish et al. 2005; Bowker 2006; Daston 2017).

The independent *Galapagensis* retains these principles but changes the scale and center of gravity. The earlier project was substantially collection-centered because its research corpus was largely constituted by the holdings available within one institution. The independent project is domain-centered. Galapagos itself defines the research field, while the documentary corpus is assembled relationally from distributed evidence. Its participatory, multimodal, and digital dimensions also place it in conversation with work on rogue archives, embodied and transmitted memory, collective digital archives, and contemporary digital practice in cultural-heritage institutions (Taylor 2003; De Kosnik 2016; Szoniecky and Bouhaï 2017; Lewi et al. 2020).

The present specification consequently converts the earlier metaphor of "weaving memories" into an explicit research and data architecture. Relationships are represented directly. Claims retain their evidentiary basis. Documentary transformations are modeled. Uncertainty is preserved. And the history of a claim can itself become an object of research.

Section 3

Normative conventions

In this specification, the following terms indicate requirement strength:

- MUST identifies a requirement necessary for an implementation to conform to the *Galapagensis* model.
- SHOULD identifies a strongly recommended feature that may be omitted only for a documented reason.
- MAY identifies an optional capability.

These terms are used in their ordinary technical sense. They are not intended to impose a software standard beyond the conceptual requirements defined here.

Section 4

Foundational methodological principles

4.1 Documentary plurality

No documentary format possesses automatic epistemic priority. A scientific article, photograph, handwritten note, map, oral recollection, specimen label, material object, field diary, database record, or family album may each provide evidence unavailable through the others.

The evidentiary value of a trace depends upon its provenance, context, relevance to the research question, relationship to the phenomenon under study, and comparison with other evidence.

A conformant *Galapagensis* implementation MUST therefore permit heterogeneous documentary forms to participate in the same research network without forcing them into separate epistemic silos.

4.2 Relationality

A documentary trace MUST be capable of being connected to the people, places, organizations, events, activities, biological entities, material entities, collections, and other sources with which it is associated.

Relationships are not merely navigational links. They are research objects whose own provenance may need to be recorded.

4.3 Separation of evidence and interpretation

Galapagensis MUST distinguish between what a source directly establishes and what a researcher infers from it.

The system MUST permit several propositions derived from the same source to carry different evidentiary assessments. An inference MUST NOT automatically inherit the certainty of the evidence from which it was developed.

4.4 Provisional knowledge

Historical reconstruction is corrigible. Assertions MUST be revisable when new evidence appears. Superseded interpretations SHOULD remain available through version history or equivalent provenance mechanisms.

The system MUST be capable of preserving uncertainty rather than forcing every field into a single definitive value.

4.5 Critical inquiry without predetermined conclusions

Galapagensis recognizes that archives, scientific practices, classifications, institutions, and historical narratives are shaped by selection, omission, and relations of power. Critical analysis is therefore legitimate and expected.

However, analytical categories such as "hegemonic", "marginalized", "colonial", or "extractive" MUST NOT be silently encoded as inherent properties of people or institutions. Where such characterizations are used, they SHOULD appear as explicit interpretive propositions supported by evidence and argument.

4.6 Resistance to documentary fragmentation

Documentary relationships frequently disappear when materials are divided among libraries, archives, museums, scientific collections, and administrative systems. *Galapagensis* MUST allow relationships to be reconstructed across documentary formats, institutional domains, and repositories.

4.7 Distributed research

No repository has methodological privilege merely because an investigation begins there. Research SHOULD be capable of following evidence across institutional, national, disciplinary, and media boundaries.

Section 5

Research workflow

The *Galapagensis* research workflow is iterative rather than strictly linear. Researchers may return to earlier stages whenever new evidence changes the context, identity, or interpretation of a trace.

5.1 Entry point: trace or question

Research may begin in either of two ways.

- *Trace-led research* begins when a document, object, observation, anomaly, or unidentified element generates a question.
- *Question-led research* begins with a defined historical or documentary problem and proceeds through a deliberate search for relevant evidence.

Both routes SHOULD be supported within Research Dossiers.

5.2 Stage 1: documentary identification

The researcher establishes what the trace is and records, where applicable, its creator, title, date, place, language, documentary form, extent, repository, collection, identifier, condition, provenance, rights, access conditions, and original/copy/transcription status.

Important descriptive properties **MUST** be capable of being represented as assertions when their values are uncertain or historically reconstructed. Authorship, date, title, and provenance are not assumed to be intrinsically authoritative metadata.

5.3 Stage 2: documentary biography

A source **SHOULD** support a history of its own creation, use, custody, transfer, alteration, loss, rediscovery, description, digitization, publication, translation, and reinterpretation.

Documentary biography is methodologically significant when later interventions affect what can be known about the source or how it has been understood.

5.4 Stage 3: contextualization

The researcher reconstructs the source's historical environment. Relevant questions include who produced it, for whom, for what purpose, during which activity, under what institutional or social circumstances, and with what relationship to the people or events described.

Genre, intended audience, communicative function, and degree of retrospection **SHOULD** be recorded where they materially affect interpretation.

5.5 Stage 4: entity and relationship extraction

People, organizations, groups, places, events, activities, biological entities, material entities, collections, and related sources are identified from the evidence.

Each relationship discovered MAY generate another research path. The system SHOULD support iterative expansion of this network without requiring that all relationships belong to one predeclared disciplinary hierarchy.

5.6 Stage 5: documentary-network expansion

Research follows relevant relationships to additional sources and repositories. Search pathways MAY include institutional catalogues, scholarly literature, archival finding aids, newspapers, private collections, oral testimony, scientific databases, museum records, government records, and other documentary systems.

Research may stop when the question is adequately answered, available avenues are exhausted, access restrictions prevent continuation, the marginal value of further searching becomes low, or the issue remains explicitly unresolved.

5.7 Stage 6: source-level analysis

Evidence SHOULD be linked to the smallest practical addressable unit of a source.

Examples include a page, folio, paragraph, diary entry, photograph detail, audio timestamp, video timestamp, database record, map feature, or object inscription. This addressable unit is represented as a source segment.

5.8 Stage 7: documentary mediation

The system MUST support relationships by which one source or source segment quotes, paraphrases, summarizes, translates, reports, refers to, or fictionalizes another source or claim.

Lost or currently unavailable sources MAY be represented when their former existence is itself supported by evidence. Such sources MUST be clearly distinguished from surviving materials.

5.9 Stage 8: triangulation

Researchers compare evidence rather than count citations. Multiple later sources derived from one earlier account MUST NOT be treated as independent confirmations merely because they are separately published.

Triangulation SHOULD consider source independence, temporal position, relationship to the event, documentary mediation, internal consistency, external corroboration, and relevant contradictions.

5.10 Stage 9: contradiction and gap analysis

Contradictions, absences, silences, and unresolved identities are legitimate research results.

Researchers SHOULD ask which sources disagree, which voices are absent, which forms of labor or participation disappear from later accounts, which materials were systematically discarded, and whether widely repeated claims derive from circular or dependent citation.

5.11 Stage 10: interpretation

Interpretive propositions are developed only after the evidentiary structure is sufficiently established for the research question.

Interpretation MAY address scientific practice, environmental change, conservation, labor, gender, race, class, migration, tourism, institutional power, local knowledge, material culture, representation, or other historically relevant dimensions.

Interpretive propositions MUST remain distinguishable from factual and identification assertions.

5.12 Stage 11: reconstruction and output

Research may result in a structured record, research note, open dossier, historical narrative, critical edition, dataset, map, timeline, exhibition, peer-reviewed article, book, or other output.

The scale of the output SHOULD reflect the strength and extent of the evidence rather than an external expectation that every discovery become a major publication.

5.13 Stage 12: reintegration

Findings are returned to the knowledge system as new or revised assertions, relationships, entity records, bibliography, source descriptions, and research questions.

Outputs MAY themselves become secondary sources for later investigations, provided that the system preserves their relationship to the evidence and interpretations from which they were produced.

Section 6

Evidentiary architecture

6.1 The evidence-backed assertion

The central analytical unit of *Galapagensis* is the evidence-backed assertion. At minimum, an assertion connects:

Subject -> Predicate -> Object or Value

An assertion MAY additionally include time, place, evidentiary assessment, disposition and contestation, researcher, reasoning note, related assertions, Dossier membership, creation date, review date, and version information.

Research-significant relationships among historical entities SHOULD normally be represented as assertions, or by an equivalent mechanism that preserves evidence and provenance. Bare structural links MAY be used for administrative relationships whose historical truth is not at issue, such as "Source segment is part of source."

The purpose of this architecture is to prevent the source from disappearing behind the narrative fact.

6.2 Assertion types

A conformant system MUST distinguish at least the following assertion types:

- Factual assertion. A proposition that an event, state, observation, or condition occurred or existed.
- Identification or attribution assertion. A proposition establishing the identity, authorship, attribution, or equivalence of an entity.
- Relational assertion. A proposition connecting two entities through participation, membership, custody, creation, location, derivation, or another relationship.
- Negative finding. A statement about the current absence of supporting evidence, such as "no formal scientific education has yet been documented." A negative finding **MUST NOT** be represented as proof that the underlying phenomenon did not exist. It **MUST** record the research scope within which the absence was established, including relevant repositories, corpora, dates, search limits, or access constraints where material. A significant negative finding **SHOULD** be supported by one or more research actions documenting the search or inspection on which it rests.
- Interpretive proposition. A researcher's analytical conclusion about the meaning or significance of evidence.
- Historiographical proposition. A proposition concerning the construction, transmission, repetition, alteration, or reception of a historical claim or narrative.

These types are not necessarily mutually exclusive. For example, a proposition may be both factual and relational. Implementations **MAY** permit multiple assertion types where this preserves meaning more accurately.

Additional assertion types **MAY** be added when real research requirements justify them.

6.3 Evidentiary assessment

The original test cases used convenient summary labels such as "directly documented", "corroborated", "strong inference", "tentative inference", "disputed", "unresolved", and

"rejected". These remain useful for human-readable research notes, but they do not form a single clean ordinal scale. A proposition may, for example, be both directly documented and independently corroborated, while "rejected" describes a research disposition rather than evidentiary strength.

A conformant implementation **MUST** therefore keep the principal dimensions of evidentiary assessment separate.

Attestation mode describes how the proposition relates to the evidence:

- *Directly documented*: one or more sources explicitly state, depict, or materially demonstrate the proposition.
- *Inferential*: the proposition is derived from evidence but is not itself directly stated or demonstrated.
- *Insufficiently assessed*: the relation between evidence and proposition has not yet been adequately evaluated.

For inferential assertions, an *inference strength* **MAY** be recorded:

- *Strong inference*: the available evidence makes the interpretation considerably more plausible than alternatives.
- *Tentative inference*: the interpretation is plausible but rests on limited, indirect, or incomplete evidence.

Corroboration state **SHOULD** be separately recordable:

- independently corroborated;
- not independently corroborated;

- independence unknown.

Direct documentation MUST NOT be treated as an automatic guarantee of historical truth. A source can directly document that a person made a statement without establishing that the statement itself was accurate.

The system MAY derive concise public labels such as "Directly documented", "Corroborated", "Strong inference", or "Tentative inference" from these underlying dimensions.

6.4 Assertion disposition and contestation

The current treatment of an assertion is separate from its evidentiary basis. An assertion SHOULD record a *disposition*:

- *Active*. The proposition remains part of the current research state.
- *Rejected*. The proposition has been evaluated and is inconsistent with stronger evidence.
- *Superseded*. The proposition has been replaced by a later formulation while remaining part of the research history.

Contestation SHOULD be represented separately as *contested*, *not currently contested*, or *unknown*. This avoids forcing a contested assertion to cease being an active proposition.

A Dossier or public record MAY designate one active assertion as the current *preferred interpretation* among competitors. Preference is not an evidentiary assessment and MUST be accompanied by a rationale when materially contested.

An assertion for which evidence is inadequate but which remains a live research possibility stays active while its attestation mode or evidence links indicate the insufficiency. "Unresolved" is therefore normally a Dossier or research-state description rather than a truth value.

6.5 Claim Expression

An assertion is a normalized proposition used by *Galapagensis* for research and comparison. A *claim expression* is a particular occurrence or formulation of a proposition in a source, source segment, oral contribution, or research intervention.

For example, several nineteenth-century publications may contain differently worded claim expressions corresponding to the same normalized assertion. Conversely, one passage may express several distinct assertions.

A claim expression SHOULD record:

- the assertion or assertions to which it has been mapped;
- the source or source segment in which it occurs;
- the actor responsible for the expression where identifiable;
- the date of the expression where relevant;
- whether it quotes, paraphrases, summarizes, translates, or otherwise renders an earlier expression;
- wording or a precise locator where rights permit;
- the researcher responsible for the mapping.

Claim expressions make it possible to reconstruct the history of a proposition without treating every repetition as independent evidence.

6.6 Evidence Link

An *evidence link* connects an assertion to an evidentiary basis and records how that basis bears on the proposition. The evidentiary basis will normally be a source or source segment, but it MAY be a research action when the proposition concerns the documented outcome of research itself, especially a negative finding.

An evidence link SHOULD be capable of recording:

- source, source segment, or research action;
- assertion;
- claim expression where the evidentiary contribution is a specific statement or formulation;
- evidentiary role;
- evidential function, where useful;
- evidence position;
- independence or dependence from other evidence where known;
- researcher or contributor who established the link;
- date of assessment;
- explanatory note.

Evidence links are provenance-bearing research objects. They MUST NOT be reduced to unqualified citation lists when the relationship between evidence and claim materially affects interpretation.

6.7 Evidence Position

The historical position of a source in relation to the phenomenon under study **SHOULD** be represented through facets rather than one mutually exclusive label, because categories such as "participant", "eyewitness", "retrospective", and "oral" may overlap.

An evidence position **MAY** record:

Temporal relation

- contemporary;
- near-contemporary;
- retrospective;
- unknown.

Relation to the phenomenon

- direct witness or observer;
- participant without direct observation of the specific event;
- non-participant reporter;
- later analyst or scholar;
- cataloguer or metadata creator;
- creator of a literary or artistic transformation;
- unknown.

Transmission basis

- direct observation;
- direct recollection;
- second-hand report or hearsay;
- transmitted or family memory;

- community narrative;
- document-based analysis;
- institutional description;
- unspecified.

These facets SHOULD remain extensible. Their purpose is analytical transparency, not automatic scoring of source reliability.

6.8 Evidence role and evidential function

The primary evidentiary role describes how a source or source segment bears on an assertion. Initial values are:

- supports;
- corroborates;
- contradicts;
- contextualizes.

Where greater precision is useful, a separate evidential-function vocabulary MAY record that a source:

- identifies;
- attributes;
- dates;
- locates;
- describes;
- quantifies;
- establishes provenance.

A source SHOULD be labeled "corroborates" only when its relevant evidentiary contribution is substantially independent of the evidence already supporting the assertion.

6.9 Assertion Lineage

Claims have histories. *Galapagensis* MUST be able to represent the transmission of propositions and claim expressions through time.

Assertion lineage SHOULD normally connect claim expressions, or equivalent source-specific claim occurrences, while the normalized assertion provides the proposition against which those expressions can be compared. It SHOULD support relations such as:

- originates;
- repeats;
- quotes;
- paraphrases;
- summarizes;
- translates;
- modifies;
- combines;
- omits;
- fictionalizes.

These are lineage relations, not evidentiary roles. A later source may repeat or fictionalize an earlier claim while providing little or no independent support for its historical truth.

Assertion lineage is distinct from ordinary bibliographic citation. It represents the genealogy of information itself.

6.10 Research Action

A research action records a methodologically significant act undertaken in the course of *Galapagensis* research when the act itself contributes to evidentiary or audit provenance.

Research actions MAY include:

- repository or catalogue search;
- bibliographic search;
- archival inspection;
- comparison of candidate identities;
- verification of a date, place, or attribution;
- consultation of an authority system;
- structured source comparison;
- examination undertaken to support a negative finding.

A Research Action SHOULD record, where applicable:

- actor;
- action type;
- date;
- Research Dossier;
- repository, corpus, database, authority system, or material examined;
- search strategy, query, procedure, or comparison performed when methodologically important;
- result or outcome;
- limits, exclusions, access constraints, or uncertainties;
- related sources, assertions, and contributions.

Research action does not require *Galapagensis* to preserve every click, failed query, or incidental search. It exists for actions whose provenance is necessary to understand, reproduce, or qualify a research conclusion.

Section 7

Source architecture

7.1 Source

A *source* is any documentary trace from which information may be derived. Source type does not imply evidentiary quality.

Sources MAY include manuscripts, publications, photographs, maps, audio, film, administrative records, scientific data, specimen documentation, objects used as evidence, oral-history recordings, websites, inscriptions, digital reproductions, and other forms.

A source SHOULD support, where applicable, creator or attribution, title, date, place, language, documentary type, extent, repository, collection, identifier, condition, provenance, access, rights, genre, communicative function, and related assertions. Important descriptive properties MUST themselves be capable of carrying evidence when uncertain.

For mutable networked sources, the record SHOULD preserve the URL or network locator, date of access, version or capture date where available, and an archived or persistent snapshot reference when feasible.

7.2 Source Segment

A *source segment* is an addressable portion of a source used as evidence or as the object of analysis.

Examples include a page of a diary, a folio, a single diary entry, a paragraph of a letter, a timestamp in an interview, one image within an album, a labeled region of a photograph, one database record, or an inscription on an object.

Segments **MUST** retain their parent source relationship. Where a locator belongs to a particular representation, such as page numbers in an edition or line numbers in a transcription, that dependency **SHOULD** be explicit.

7.3 Source Representation

A *source representation* is a source that represents or derives from another source, such as a scan, photograph, facsimile, transcription, edited transcription, translation, or critical edition.

Source representation is therefore a documentary role or subtype, not a parallel ontological category outside source.

The represented source and its representation **MUST NOT** be collapsed into one record when editorial, linguistic, or technical intervention may affect evidentiary interpretation.

A representation **SHOULD** record, where relevant:

- represented source;

- representation type;
- creator or editor;
- date;
- method or editorial intervention;
- language;
- completeness;
- relationship to other representations;
- rights and access conditions.

A critical edition, translation, or other scholarly output MAY simultaneously be an output and a source representation.

7.4 Lost and unavailable sources

A source whose existence is supported but whose current location is unknown MAY be represented with an explicit availability status such as "lost", "unlocated", "reported but not examined", or "known but inaccessible".

Assertions about the content of such a source MUST point to the surviving source, source segment, or claim expression through which that content is known.

7.5 Documentary biography

A source MAY be linked to events describing its creation, custody, transfer, loss, annotation, cataloguing, digitization, publication, translation, or reinterpretation.

Documentary biography SHOULD be used whenever later interventions materially affect what can be established about a source or how it has been understood.

7.6 Genre and communicative function

Sources SHOULD permit descriptive values for documentary genre and communicative function when these materially affect interpretation. Examples include operational log, private diary, scientific report, administrative record, memoir, newspaper article, tourist publication, oral testimony, and literary work.

Genre and communicative function MUST NOT be converted mechanically into a reliability score.

7.7 Temporal expression

Uncertain chronology is a substantive research problem and MUST be representable directly rather than forced into false precision.

Dates and temporal relationships SHOULD support, as applicable:

- exact date or datetime;
- approximate date;
- date range;
- before or after a specified date;
- open interval;
- uncertain year, month, or day;
- textual historical date where normalization is uncertain;
- unknown date;
- calendar or normalization note where relevant;
- evidentiary basis for historically reconstructed dates.

A normalized machine-readable value MAY coexist with the original textual date expression. Future technical mappings MAY use standards such as Extended Date/Time Format (EDTF), provided that the original uncertainty is preserved.

Section 8

Core entity model

The *Galapagensis* conceptual model contains fourteen core domain classes plus six cross-cutting knowledge/provenance classes.

Class	Function
Source	Documentary object or trace, including derivative representations
Source segment	Addressable part of a source
Person	Human actor
Group / Organization	Institutional, familial, professional, or collective actor
Place	Spatial entity, including historical place names and hierarchical location
Event	Bounded occurrence
Activity / Project	Sustained process containing or relating multiple events
Biological entity	Taxon, population/group, individual organism, or specimen
Material entity	Ship, building, infrastructure, artifact, instrument, or other physical entity
Collection	Intellectual, administrative, or historical grouping of sources
Repository	Physical, institutional, or custodial location/agent holding sources or collections

Concept / Theme	Controlled thematic access point
Research Dossier	Operational <i>Galapagensis</i> investigation
Output	Research, publication, exhibition, dataset, edition, or other result

Source representation is modeled as a source role or subtype and is therefore not counted as a separate core domain class.

The cross-cutting classes are:

Class	Function
Assertion	Normalized evidence-backed proposition about one or more entities
Claim expression	Particular expression or occurrence of a proposition in a source or contribution
Evidence link	Provenance-bearing relation between evidence and an assertion
Contribution	Provenance record for a meaningful act of knowledge production
Assertion lineage	Transmission and transformation history of a claim
Research action	Provenance-bearing record of a methodologically significant search, inspection, comparison, or verification

The exact storage architecture MAY implement these classes as tables, graph nodes, documents, association objects, or another structure, provided that their distinctions and relationships remain representable.

Section 9

Core entity requirements

9.1 Person

A person record SHOULD support:

- persistent identifier;
- preferred name;
- alternative names and historical forms;
- birth and death information, with uncertainty where required;
- roles and occupations expressed as contextual relationships where possible;
- biographical summary;
- places, organizations, activities, events, and sources associated with the person;
- external authority identifiers where useful;
- images or representations;
- bibliography;
- unresolved identifications and related assertions.

Roles SHOULD be contextual rather than treated as timeless labels. A person may be an expedition participant in one context, author in another, employee in another, and witness in another.

9.2 Group / Organization

A group / organization record SHOULD support preferred and alternative names, organization type, dates of existence, locations, parent, predecessor, or successor relationships, members where appropriate, associated activities and events, sources, external identifiers, and relevant assertions.

Families and informal groups MAY be represented when they function as meaningful historical actors.

9.3 Place

A place record SHOULD support preferred name, historical names, alternative spellings, place type, parent place, coordinates or geometry where appropriate, spatial uncertainty where relevant, temporal validity of names, external identifiers, sources, events, activities, people, and related assertions.

Historical and contemporary names MUST be capable of coexisting without one overwriting the other. Hierarchical containment and jurisdictional relationships SHOULD support temporal qualification when boundaries or administrative contexts change.

9.4 Event

An event is a temporally bounded occurrence. It SHOULD support title, event type, temporal expression, place or places, participants, organizations, related activities, sources, assertions, and related events.

9.5 Activity / Project

An activity / project is an extended process that may contain multiple events. Examples include an expedition, research programme, conservation campaign, settlement project, construction programme, or sustained scientific study.

Activity and event **MUST** remain distinct concepts.

9.6 Biological Entity

A biological entity **MUST** distinguish, where required:

- taxon;
- population or group;
- individual organism;
- specimen.

Taxonomic identification **MAY** itself be represented as an assertion with evidence and uncertainty. This structure prevents a living organism and a later museum specimen derived from it from being represented as the same conceptual state.

9.7 Material Entity

A material entity represents a historically significant physical thing such as a ship, building, road, instrument, archaeological object, vehicle, or piece of infrastructure.

An object **MAY** simultaneously function as a material entity and a source when its physical existence provides evidence.

9.8 Collection

A collection is an intellectual, administrative, historical, or intentionally assembled grouping of sources.

A collection **SHOULD** support title or designation, creator or assembling agent where applicable, dates, scope, custodial history, constituent sources or subcollections, related repositories, access conditions, and relevant assertions.

A collection **MAY** be distributed across more than one repository.

9.9 Repository

A repository is a custodial context for sources or collections. It may correspond to an institution, organization, physical location, private holder, or another custody-bearing entity.

A repository **SHOULD** support preferred and alternative names, location, organizational relationships, custody periods, access information, external identifiers, and collections or sources held.

Repository and collection **MUST** remain conceptually distinct even when one organization uses the same name for both. An implementation **MAY** model repository as a role played by a group / organization, person, or place, provided that the custodial relationship remains explicit and does not duplicate the underlying actor unnecessarily.

9.10 Concept / Theme

Concept / theme provides controlled thematic access. Themes SHOULD facilitate discovery without being used to encode unargued analytical conclusions. Where useful, concepts MAY carry broader, narrower, related, preferred-label, alternative-label, and external-mapping relationships.

9.11 Research Dossier

Research Dossiers are defined in Section 13.

9.12 Output

An output record SHOULD support title, output type, creator(s), date, publication or presentation context, language, persistent identifier where available, relationship to Dossiers, supporting sources and assertions, and rights or licensing information.

An output MAY also function as a source in subsequent research. Implementations SHOULD permit dual typing or an explicit relationship rather than duplicating the intellectual object unnecessarily.

Section 10

Relationship vocabulary

The relationship vocabulary SHOULD begin conservatively and expand only when research requires additional precision. It SHOULD NOT be maintained as one undifferentiated list: domain relationships, structural relationships, documentary mediation, and claim-lineage relationships perform different functions.

Research-significant historical relationships SHOULD carry evidentiary provenance through an assertion. Structural relationships MAY be stored directly where their provenance is administrative or intrinsic rather than historically contested.

10.1 Domain predicates

Initial evidence-bearing predicates MAY include:

- authored by;
- created by;
- depicts;
- mentions;
- participated in;
- member of;
- employed by;
- occurred at;
- occurred during;

- collected at;
- collected by;
- transported aboard;
- resulted in;
- funded by;
- published by;
- translated by;
- contributed by;
- possibly identical to.

10.2 Structural and custodial predicates

Structural predicates MAY include:

- part of;
- represents;
- held by;
- belongs to collection;
- located in;
- has segment;
- has representation.

These relationships MAY still carry provenance where custody, collection membership, or structure is historically uncertain.

10.3 Documentary-mediation predicates

Relationships among sources, source segments, and claim expressions MAY include:

- reports;
- quotes;
- paraphrases;
- summarizes;
- translates;
- derives from.

Where these relationships describe the transmission of a proposition, they SHOULD also participate in assertion lineage as defined in Section 6.9.

10.4 Relations among Assertions

Assertions MAY be related through predicates such as:

- contradicts;
- refines;
- equivalent to;
- broader than;
- narrower than;
- supersedes.

A relation among assertions MUST NOT be treated as evidence by itself. Its research basis SHOULD be recorded where the relation is interpretive or contested.

All predicates SHOULD have clear definitions before use in production data. Synonymous predicates SHOULD be avoided unless they encode a meaningful distinction. Directionality and inverse relations SHOULD be documented where relevant.

Section 11

Identity resolution

Unknown or partially identified entities are valid records.

The system **MUST** permit records such as "Unknown ship's carpenter, *Nourmahal*" or "Irish resident of Floreana described by Paul West" without forcing premature identity resolution.

A later identification **MUST** be represented through an assertion or equivalent provenance-bearing mechanism. The history of the earlier unidentified record **SHOULD** remain recoverable.

Identity resolution **MAY** have its own evidentiary assessment, disposition and contestation, and supporting evidence.

Section 12

Contradiction and competing interpretations

Contradictory assertions **MUST** be capable of coexisting.

A system **MUST NOT** resolve two incompatible historical claims merely because a single display value is easier to manage. Where a public interface requires a preferred statement, the current best-supported interpretation may be displayed while the competing assertions remain accessible.

The rationale for preferring one interpretation **SHOULD** be documented.

Section 13

Research Dossiers

The Research Dossier is *Galapagensis*'s principal operational research container.

A Dossier SHOULD contain:

- persistent identifier;
- title;
- principal research question;
- secondary questions;
- significance;
- initiating trace or problem;
- status;
- lead researcher(s);
- collaborators and contributors;
- relevant entities;
- sources and source segments consulted;
- assertions generated or evaluated;
- claim expressions mapped;
- evidence links assessed;
- assertion lineages;
- contradictions;
- hypotheses;
- unresolved questions;

- repositories investigated;
- repositories or collections still to investigate;
- people or organizations to contact;
- bibliography;
- research log, including significant discovery pathways where useful;
- research actions supporting negative findings or other audit-significant conclusions;
- resolution or closure note where applicable;
- outputs;
- creation, update, and review dates.

Initial status vocabulary:

- Scoping;
- Active;
- Awaiting evidence;
- Provisionally resolved;
- Resolved;
- Disputed;
- Dormant.

An unresolved Dossier is a legitimate research outcome. Lack of closure **MUST NOT** be treated as methodological failure. When a Dossier is marked Provisionally resolved, Resolved, Disputed, or Dormant, the reason for that status **SHOULD** be recorded.

Section 14

Contribution and collaborative knowledge production

A contribution records a meaningful act through which knowledge in *Galapagensis* is created, corrected, contextualized, or transformed. Contribution types MAY include:

- identification;
- oral testimony;
- source contribution;
- source discovery or research lead;
- correction;
- transcription;
- translation;
- metadata creation;
- photography;
- research;
- local knowledge;
- technical work;
- peer review.

A contribution SHOULD record contributor, contribution type, related entity or Dossier, date, description, resulting assertion or evidence where relevant, and the contributor's preferred form of credit. Meaningful local and community contributions SHOULD receive explicit attribution rather than being absorbed into generic acknowledgements.

Section 15

Oral history and transmitted memory

Oral evidence SHOULD record, where applicable:

- interviewee or contributor;
- interviewer;
- date and place;
- language;
- recording conditions;
- relationship of speaker to the events discussed;
- consent and use restrictions;
- transcription;
- translation;
- entities and events mentioned.

Galapagensis SHOULD distinguish among:

- direct recollection;
- transmitted or family memory;
- community narrative;
- interpretation or opinion.

These categories identify different evidentiary situations rather than levels of intrinsic worth.

Section 16

Knowledge provenance and versioning

Galapagensis MUST record its own research interventions.

Whenever a researcher or contributor identifies a person, creates a relationship, rejects an attribution, changes an evidentiary assessment, assertion disposition, or contestation state, adds a translation, or otherwise alters substantive knowledge, the system SHOULD retain:

- actor;
- action;
- date;
- object affected;
- evidentiary basis or reason;
- previous state where relevant.

Substantive interpretations MUST NOT simply disappear when superseded.

The public interface MAY display only the current preferred state while preserving previous states for research audit and historiographical analysis.

16.1 Research auditability and discovery provenance

Galapagensis SHOULD preserve enough information for another researcher to reconstruct the principal evidentiary path of a Dossier.

This does not require logging every unsuccessful search or every interface interaction. It does require recording significant discovery pathways when they affect reproducibility or provenance, for example:

- source discovered through a cited bibliography;
- source located through a catalogue or finding aid;
- source identified by following a relationship from another source;
- source suggested or supplied by a collaborator;
- private source provided by a holder;
- known source not examined because access was unavailable;
- search of a relevant repository that materially supports a negative finding.

Where practical, the research log SHOULD retain repository or database consulted, date of consultation, search strategy or citation chain where methodologically important, and access limitations.

Audit-significant searches or inspections MAY be promoted from narrative log entries to structured research actions. When a negative finding materially affects an interpretation, the supporting search scope SHOULD be represented through research actions rather than left solely in free-text notes.

Section 17

Rights, access, and ethics

The system **MUST** distinguish at least the following concepts:

- physical ownership;
- custody;
- copyright;
- reproduction rights;
- license;
- permission for *Galapagensis* use;
- access restriction.

The existence of a digital copy **MUST NOT** be interpreted as permission for republication.

Ethical review is required where research involves living persons, private family information, culturally restricted knowledge, sensitive correspondence, vulnerable archaeological sites, locations of vulnerable biological resources, or materials shared under conditions of trust.

Legal permission does not automatically establish ethical appropriateness.

For oral histories and contributed private materials, consent and agreed restrictions **SHOULD** be recorded explicitly.

The system MUST distinguish between the existence of evidence and permission to expose the evidence itself. A restricted source may support a public assertion while remaining inaccessible, provided that the public record does not disclose restricted content and clearly indicates the evidentiary and access limitations.

Section 18

Multilingual architecture

Galapagensis is conceived as one knowledge system with multilingual interfaces rather than separate language-specific databases.

Language-independent data SHOULD include identifiers, dates, coordinates, entity relationships, bibliographic identifiers, and other non-linguistic values.

Language-dependent data MAY include preferred labels, descriptions, interpretive notes, research questions, summaries, and public narratives.

Spanish, English, French, and Portuguese are primary interface languages. Source languages remain whatever they historically were. The data model SHOULD permit additional languages without structural redesign.

Translations MUST remain identifiable as translations rather than replacing the source-language content.

Section 19

Identifier policy

Every persistent record SHOULD receive a stable, opaque identifier that does not encode changeable semantics such as island, date, classification, or current name.

A provisional namespace may include:

- GNS-SRC for source, including source representations;
- GNS-SEG for source segment;
- GNS-PER for person;
- GNS-ORG for group / organization;
- GNS-PLA for place;
- GNS-EVT for event;
- GNS-ACT for activity / project;
- GNS-BIO for biological entity;
- GNS-MAT for material entity;
- GNS-COL for collection;
- GNS-RPO for repository;
- GNS-THM for concept / theme;
- GNS-DOS for research dossier;
- GNS-OUT for output;
- GNS-AST for assertion;
- GNS-CLM for claim expression;
- GNS-EVL for evidence link;

- GNS-CTR for contribution;
- GNS-LIN for assertion lineage;
- GNS-RAC for research action.

The exact syntax MAY change before public release. Once public identifiers are issued, they SHOULD remain stable.

External identifiers such as DOI, ORCID, archival identifiers, geographic authority identifiers, taxonomic identifiers, or other durable authority references MAY be associated with *Galapagensis* records without replacing the project's own persistent identifiers.

19.1 Public Web identifiers

For Linked Data publication, every public persistent *Galapagensis* record SHOULD have a canonical HTTP(S) URI derived from its stable *Galapagensis* identifier. The human-readable URI and the internal identifier are distinct but permanently associated.

A recommended pattern is: <https://galapagensis.net/id/GNS-PER-000001/>

Canonical public URIs SHOULD remain stable even if page titles, labels, navigation paths, or technical implementation change. Redirects SHOULD be maintained when a public URI must exceptionally be replaced.

Controlled vocabulary terms and predicates intended for public reuse SHOULD likewise receive stable URIs in a dedicated namespace, for example: https://galapagensis.net/vocab/resided_at/

The exact URI pattern is an implementation decision, but the persistence requirement is part of the publication model.

Section 20

Controlled vocabularies

Galapagensis SHOULD maintain controlled vocabularies for at least:

- source type;
- source representation type;
- event type;
- activity type;
- organization type;
- place type;
- biological entity subtype;
- material entity type;
- relationship predicate;
- assertion type;
- attestation mode;
- inference strength;
- corroboration state;
- assertion disposition;
- assertion contestation state;
- evidence position facets;
- evidence role;
- evidential function;
- assertion lineage relation;
- contribution type;

- Dossier status;
- rights and access status;
- research theme;
- research action type;
- temporal qualifier where structured values are used.

Controlled vocabularies SHOULD be versioned and documented. They SHOULD remain extensible and SHOULD NOT be enlarged speculatively before real research demonstrates the need for additional terms.

Section 21

Minimum implementation requirements

A software implementation claiming conformance with this specification MUST support:

1. persistent entity identifiers;
2. heterogeneous sources;
3. source segments;
4. source representations as distinct source records linked to what they represent;
5. uncertain, approximate, and ranged temporal information;
6. explicit relationships among entities;
7. evidence-backed assertions;
8. multiple competing assertions concerning the same property or relationship;
9. separate attestation mode, inference strength where applicable, and corroboration state;
10. separate assertion disposition and contestation state;
11. evidence links carrying evidentiary role and evidence position;
12. claim expressions, or an equivalent mechanism for source-specific occurrences of propositions;
13. scoped negative findings and contradiction between assertions;
14. identity-resolution assertions;
15. documentary mediation;
16. assertion lineage or an equivalent mechanism for claim transmission;
17. distinct collection and repository records or roles;
18. Research Dossiers;

19. contribution provenance;
20. version history for substantive research changes;
21. multilingual labels and descriptions;
22. rights and access metadata;
23. a means of representing evidence that exists but cannot be publicly exposed;
24. research actions sufficient to ground significant negative findings and other audit-critical research outcomes.

A conformant implementation SHOULD additionally support:

- geographic coordinates, geometry, and spatial uncertainty;
- full-text transcription and translation;
- facsimile or media linking;
- advanced search and filtering;
- public citation of individual records;
- export in structured formats;
- stable public URIs;
- interoperability mappings to relevant external standards and authority systems;
- machine-readable provenance;
- structured research logs and discovery provenance.

Section 22

Interoperability and Linked Data principles

Galapagensis should remain conceptually independent of any single external metadata or ontology standard while retaining the ability to interoperate with established systems.

Future implementation SHOULD consider mappings, where useful, to standards and infrastructures such as:

- Dublin Core for general descriptive metadata;
- SKOS for controlled vocabularies;
- W3C PROV-O for provenance concepts;
- CIDOC CRM for cultural-heritage relationships;
- Darwin Core for biodiversity-related records;
- IIIF for interoperable image presentation;
- W3C Web Annotation concepts where useful for addressable segments and annotations;
- Extended Date/Time Format (EDTF) where useful for uncertain or approximate dates;
- JSON-LD 1.1 for Web publication of Linked Data;
- RDF concepts for graph interoperability where useful;
- persistent scholarly identifiers such as DOI and ORCID;
- appropriate geographic and biological authority systems.

Such mappings SHOULD be treated as interoperability layers rather than as unquestioned replacements for the *Galapagensis* conceptual model. External standards may contain

assumptions that do not fit the research domain or the project's epistemological commitments.

22.1 Linked Data publication profile

Galapagensis's relational architecture is suitable for publication as Linked Data, but Linked Data serialization MUST remain subordinate to the evidentiary distinctions of the research model.

A conformant Linked Data publication layer SHOULD:

1. assign canonical HTTP(S) URIs to public persistent records;
2. make those URIs resolvable to useful human-readable representations;
3. provide machine-readable JSON-LD for public records, either embedded in the human-readable page, linked as an alternate representation, or both;
4. assign stable URIs to public predicates and controlled-vocabulary concepts;
5. express links to external identifiers using semantically appropriate relationships, avoiding automatic use of strict identity where equivalence has not been established;
6. preserve multilingual labels and language tags;
7. preserve the distinction between source, source segment, claim expression, assertion, evidence link, assertion lineage, research action, and contribution where those objects are present;
8. preserve rights, visibility, and suppression rules so that Linked Data export cannot expose restricted content; and
9. allow the Linked Data representation to be regenerated from canonical *Galapagensis* records.

The minimum public graph MUST NOT reduce a research-significant assertion to a naked domain triple if doing so would erase its evidentiary provenance. For example, the public graph may expose a convenience relationship such as Patrick Watkins -> resided at -> Floreana, but the corresponding assertion resource SHOULD remain available so that evidence, attestation, contestation, research provenance, and revision history can be recovered.

Galapagensis does not require a live SPARQL endpoint for Linked Data conformance. Static, dereferenceable HTML and JSON-LD representations are sufficient for the initial publication architecture. Query services MAY be added later without changing the canonical research corpus.

22.2 External linking

External identifiers SHOULD be used to connect *Galapagensis* records with established authority and research infrastructures where the match is defensible. The type of connection SHOULD be explicit. Strict identity links SHOULD be reserved for cases in which *Galapagensis* has established identity; broader, narrower, close, or merely referential mappings SHOULD use weaker relationships.

External reconciliation is an extension of identity resolution, not a substitute for it.

Section 23

Public-interface principles

The complexity of the research architecture **SHOULD NOT** be reproduced mechanically in the public interface.

The underlying system may contain assertions, source segments, evidence positions, version histories, and lineage records while the public interface presents accessible pathways through people, places, sources, research dossiers, maps, timelines, and narratives.

However, significant public research claims **MUST** provide a route back to their evidentiary assessment, disposition, and contestation state. Where the underlying source cannot be exposed for legal, ethical, or access reasons, the interface **SHOULD** provide the fullest permissible citation or description and indicate the restriction without revealing protected content.

The interface **SHOULD** permit exploratory movement through relationships. A place page, for example, may expose related people, events, sources, photographs, biological observations, research dossiers, and publications without forcing users to know the underlying database structure.

Section 24

Research and publication outputs

Galapagensis evaluates success through research value rather than page count. Legitimate outputs include:

- newly identified documentary traces;
- corrected or expanded metadata;
- biographical or chronological reconstruction;
- bibliographic discoveries;
- open Research Dossiers;
- critical editions and translations;
- structured datasets;
- maps and timelines;
- oral-history corpora;
- public-history essays;
- peer-reviewed research articles;
- books and exhibitions;
- new research questions.

A small correction to an established historical claim may be more valuable than a large narrative output if it improves the evidentiary structure of the field.

Section 25

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Section 26

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