Archival Research Theory:
Putting Smart Technology to Work for Researchers

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- Archival Theory: the conceptual foundation for the definition of archival functions and methods and techniques that support their execution.

- Archival Science: the enrichment of archival theory through the application of scientific method.

- Archival Engineering: the use of archival science in the development and implementation of techniques and tools that support archival functions.

Archival Research Theory (ART)

- Current archival theory be accurately described as archival management theory (AMT) because it focuses on creation, organization, disposition, preservation and access to current and historical archives.
- ART extends the domain of archival theory to enable support for inquirers conducting research in archives, especially digital archives.

Archives

- In AMT: ordered sets of persistent information objects

- ART looks at archives as complexes of objects that have informative potential, the capacity to provide information responsive to inquirers' questions

- Informative potential lies in the intersection of the information archives can convey and the questions an inquirer poses, mediated by the approach the inquirer uses.

An Archive

- The ensemble of records formed by their relationships with an agent's (actual or expected) use of them in its activity.
- These relationships are empirical, prior to, and independent of whether the records are subjected to a records management regime.
- The totality of these relationships in an archive is called the archival bond, a generic, qualitative, undifferentiated concept.
    - Giorgio Cencetti: "*Sull'archivio come "Universitas rerum"* (1937)
- In ART an archive is, in mathematical terms, a complete, non-uniform hypergraph.

Supporting Research In Archives

- Facilitate the realization of informative potential
  - Accommodate the widest possible variety of researcher interests and approaches
- Optimize use of smart technologies
  - Ensure high-quality results from their use

- Facilitate collaboration and cumulative benefits for researchers and archival programs.

Smart Support for Research in Archives

- Help find things of interest in an archive
  - Identify informative potential of things besides the records and ensembles the inquirer examines
- Support collection and organization of data about those things & their relationships
  - Combine data
    - from different sources used in a research project
    - related to the same things from different projects
- Enable use of various tools for data analysis
  - Including discovery of relationships not evident in the records

Realizing Informative Potential

- Requires discerning and appropriately respecting differences in
  - what something in an archive means to a researcher and
  - what it meant to those involved in the activities that generated the archive.

ART's Multidisciplinary Foundations

- Semiotics
- Constructed Past Theory
- Type Theory

Semiotics

- The discipline that studies how meaning is determined and interpreted.
- Focuses on ‘sign’ as a triadic relation in which something stands for something else in a meaningful relation for an agent capable of meaning making)
    - Substantially advanced in this century by specialization in bio-, cognitive and computational semiotics

Constructed Past Theory

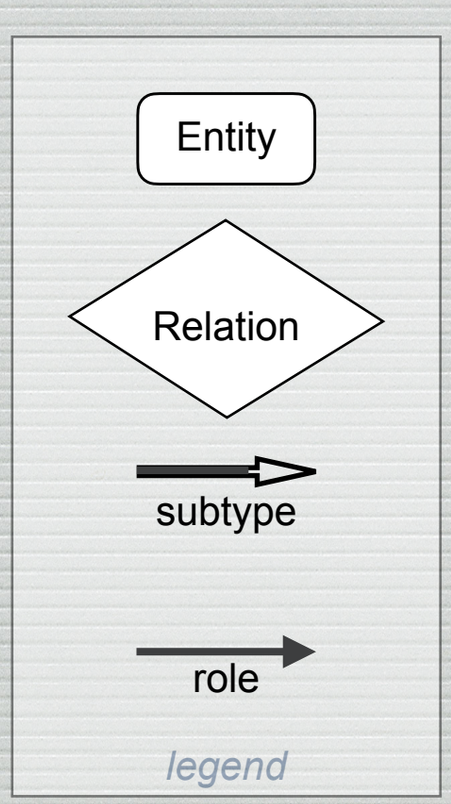
- Applies insights from semiotics as well as cognitive neurology and psychology to the challenge of developing knowledge about things in the past

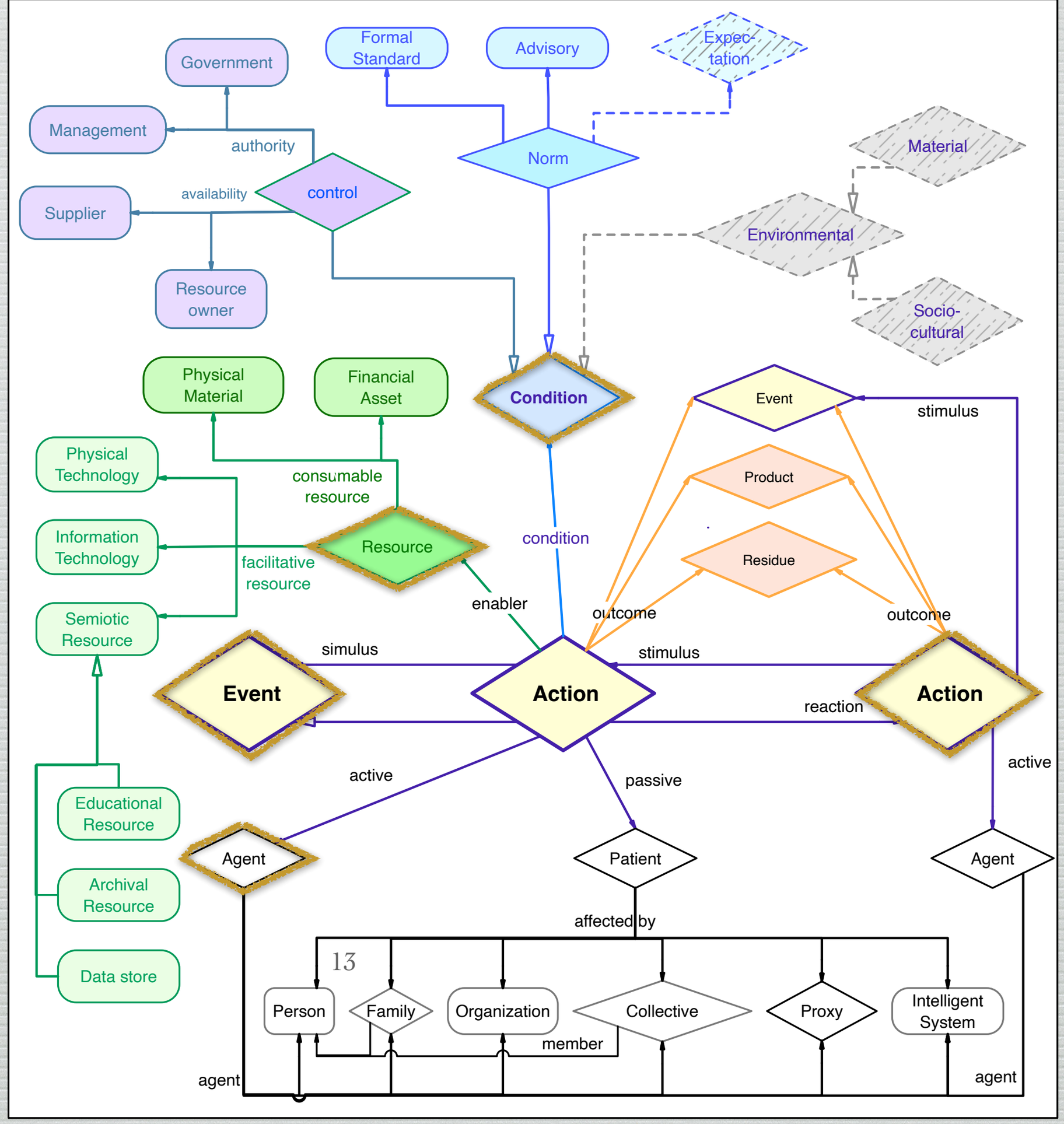
- Enables discernment of and respect for differences in meanings both between researchers and those who contributed to the production of archives and even for the same persons in different situations in the activities that produced an archive.

Type Theory

- Type Theory: a fundamental brach of mathematics with unrivaled expressiveness and logical cogency for modeling complex domains through its ability to encode both data and logic within a single coherent framework.
    - Combined with the logic of the lambda calculus generates the typed lambda calculus that serves as the foundation for functional programming languages
- ART uses TypeDB: an open-source DBMS grounded in type theory
    - TypeDB uses an enriched polymorphic entity, relation, attribute data model
    - Designed to facilitate articulation of schemas that are closely aligned with domain models as formulated by experts.

ART Action Schema





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