# Semantic Infrastructure Concept of Operations Objectives

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## Major Goal

The major goal of the NCI CBIIT Semantics and Operations Group is to enable semantic interoperability in a virtual network or cloud of interconnected organizations, which in turn redefines how research is conducted, care is provided, and how patients and participants interact with the biomedical research and care enterprise. The research community is primarily focused on the development of new knowledge and treatments, while the health care community is focused on clinical care and outcomes; both objectives can be advanced by leveraging the semantic infrastructure investment in CBIIT and caBIG® tools and frameworks.

Due to the fundamental differences of the research and clinical domains they may employ different architectural models (compositional versus derivative for example). The semantic model and infrastructure must support each domain, uniting them semantically. The objectives noted below stem from the desired outcomes of the stakeholders in the NCI, CBIIT and the caBIG® program, both nationally and internationally.

## Objectives

The objectives of the initiative are to identify and evaluate alternative approaches to establish and use semantics, to formally model promising approaches, and to develop reference implementations and operational resources and services to support semantic and syntactic interoperability in biomedical research and healthcare IT systems and information services.

## Scientific Goals

The scientific goals of the initiative are to:

- Improve practical utility of semantics to support translational research and personalized medicine

## Programmatic Goals

The programmatic objectives of the initiative are to:

- Develop implementation independent architecture model(s) which define the semantics backbone components and behavior
  - Architect semantics backbone to support and unite:
    - Domains using different architectural types (e.g. compositional vs derivative)
    - Domains with different business imperatives (regulatory compliance vs. rapid evolution)
  - Design/deploy backbone to:
    - Reduce overhead associated with creation and maintenance of semantics information
    - Provide semantic integration across .NET, Semantic Web as well as CORBA-based Grids
- Participate in the development of national and international semantic interoperability standards to protect caBIG®'s investments in semantic framework, and to meet evolving requirements of caBIG® and the broader biomedical and health community.
- Deploy within caBIG® reference implementations of the semantics backbone components to:
  - Demonstrate their practicality
  - Increase the semantic coherence within caBIG®
- Follow caBIG® dictates for all software development:
  - Allow users to decide on their choice of open or COTS technology platform
  - Maintain an open-source environment
  - Follow rigorous engineering methodology, including automated build/deployment and continuous integration

- Develop, adopt, utilize and promote best practices and methodologies for modeling developing, operating and distributing metadata, terminologies, ontologies and other data semantics artifacts.
- Create and distribute open, free semantic content that supports strong shared semantics and is directly useful to builders and users of health IT systems and biomedical researchers.