

RTRN eagle-I, “to discover invisible resources”

RTRN eagle-i is an informatics system for collecting and publishing information about biomedical research resources. It is composed of a "stack" of software with the following components: 1) *Data Entry Tools*, 2) *Customized Repository*, 3) *Network* and 4) *Search Application*. The design of each of these components has been heavily influenced by Semantic Web standards. Importantly, the use of these standards permits optimal flexibility and interoperability between each component of the system and also with outside systems. To tackle the problem of discovering and publishing such a diverse array of biomedical resources, eagle-i implemented a unique architectural element – an ontology driven architecture. eagle-i employs a common centralized ontology in order to describe each resource type. Thus, the ontology serves as the single source of truth about all resource types, their properties and semantics. This allows RTRN eagle-i to incorporate new resource types simply by modeling them in the ontology.

To address sustainability and scalability, data entry is managed by the Data Tools component via web forms, ETL (Extract Transform and Load data import) processes and APIs (Application Programming Interfaces). All data management forms and data feed processes are dynamically configured by the ontology. The Data Tools process and transform the data to RDF (Resource Description Framework) format and then load it into the Repository. The Repository is a triple store (a data store designed to hold RDF data) that facilitates ontology driven services to ensure data quality, data integrity, access controls, provenance, semantic reasoning and migration/transformation of data to a variety of formats. The Network utilizes a flexible protocol that supports federated queries and can be scaled to national levels. The Search Application offers semantically rich search and browse functionality. The Search Application's user interface and major functions (e.g. search results faceting, filtering and browsing) are also dynamically configured by the ontology. eagle-i not only enables discovery of resources via its own search application but it also publishes resource information on the Internet for Google and other open-i Technical Proposal search engines to find. Use of Semantic Web standards (RDF and the OWL ontology language) and the ontology centric architecture makes eagle-i a truly unique and capable platform for ingesting, curating, storing, publishing and discovering research resource data.

The RTRN eagle-i enables managers of resources to list information about their resources online in a searchable format; eagle-i facilitates conversations between researchers and resource managers regarding sharing of resources. Not only can eagle-i save valuable time and expense in the research process through sharing, but it can also be the starting point for future collaborations.