Open Source Integrations: How Fred Hutchinson Cancer Research Center connected their Drupal Resource Collection to the eagle-i Network

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Abstract
Recently, the Fred Hutchinson Cancer Research Center decided to share the contents of its Shared Resources website with the eagle-i Network. A joint FHCRC/Harvard/Freelock team successfully developed a reusable open source solution to connect the two systems.

Introduction and Background
eagle-i (www.eagle-i.net) is a biomedical resource sharing network that currently counts 26 institutions sharing more than 54000 resources. The eagle-i platform gives investigators the ability to easily discover resources that can enhance and accelerate their research. Developing or sourcing such resources in each individual laboratory would otherwise be inefficient, costly, or in many cases impossible. In 2012, the Arnold Library at the Fred Hutchinson Cancer Research Center in Seattle, WA contacted the eagle-i team to explore technical options for joining the network. This world-class cancer research center recognized the benefits of visibility on the eagle-i Network, but faced the challenge of connecting their existing Drupal-based resource information to eagle-i without introducing inefficiency or duplication of labor.

Methods
It was clear that the only way to manage the cost and efforts involved in maintaining content in both the Shared Resources website and eagle-i would be to connect the two systems in an automated fashion. The team (FHCRC, Harvard and Freelock) devised a solution that leverages eagle-i's distributed architecture: an FHCRC eagle-i node was installed locally and through a custom Drupal module, automatically populated with content from the Shared Resources website; after this, joining the eagle-i network was transparent, as it simply required eagle-i's central search application to index the FHCRC eagle-i node in the same manner it indexes all other nodes. The team developed the custom Drupal module to handle the data flow from FHCRC to the eagle-i local node. Designed to reside alongside the existing Shared Resources website, the new module maps the site's content to the eagle-i ontology and creates resource descriptions in the local eagle-i node. The team also developed a new eagle-i web service that accepts resource descriptions generated by third party applications, and that is contacted by the Drupal module when new content is created or when existing content is updated. The system allows the content to be created or edited in only one location (the Drupal site) and once published, key elements of that same material are instantly available in the eagle-i network.

Results and Discussion
This open source solution allows seamless propagation of descriptions and metadata from the Fred Hutchinson Shared Resources website to the eagle-i Network without duplication of data entry or manual data integration. The resulting Drupal module code base has been shared as open source in the Drupal.org community site, and the new web service is now part of the standard eagle-i open source software stack. This Drupal module can be a useful option for other Core Labs and Shared Resources groups that are looking to partner with the eagle-i network. Future enhancement opportunities include the development of a schema-mapping user interface, as the module currently relies on a static XML map that translates the Drupal site data model to the eagle-i ontology. A more detailed technical description of the project is available on Freelock's website. (Lamb 2013)

References
1. Lamb, Aaron. *Drupal and the Semantic Web - Introducing the eagle-i Drupal module.* July 29, 2013. http://www.freelock.com/blog/aaron-lamb/2013-07/drupal-and-semantic-web-introducing-eagle-i-drupal-module (accessed October 2, 2013).