

Invenio, or the TIND ILS

A new open source integrated library system (ILS) was launched in 2015 based on software that was developed at the CERN research facility in Switzerland for its own library services. CERN is a major research institution in the area of high-energy physics, which has also gained notoriety as the birthplace of the web by Tim Berners-Lee. TIND was launched in 2013 as a spin-off to provide commercial services for the software outside the organizations directly affiliated with CERN. The software is known by the name Invenio within CERN but is branded as the TIND ILS for other contexts.

General Background

Invenio was initially created as an institutional repository platform to manage the technical documents in the field of high-energy physics. Although it has been thoroughly re-engineered at different times, the software that became Invenio has been in development since the 1990s. The software originated to provide a web-based interface to the organization's Aleph ILS. The software was extended by about 2000 to function as a document repository for documents and multimedia materials and was known as the CERN Document Server. CDSware, as the software was originally known, was released as open source in 2002 and was renamed CDS Invenio in 2006. In 2011, Invenio was further extended to incorporate circulation and related functionality, enabling CERN to eventually retire its Aleph ILS. The development of Invenio was performed by the IT department of CERN.

Invenio takes a different approach to library resource management. Its heritage as a repository platform expanded to also address circulation and other library functions gives it a tenor different from other ILS products. In addition to traditional ILS

functionality, the platform can also serve as a publishing platform for an institutional repository.

Invenio has been used widely, especially in the scientific research community, as a document repository platform. Some of the installations include

- CERN Document Server (the original installation of Invenio)
- CERN Open Data: research data sets made available
- Durham High Energy Physics Database (HEPData)
- The INSPIRE repository: a collaboration of CERN, DESY, Fermilab, IHEP, and SLAC
- Psifiothiki, a repository of the Aristotle University of Thessaloniki
- Bibliothèque Virtuelle de l'Enseignement Supérieur et de la Recherche Scientifique de Côte d'Ivoire
- DESY's accelerator center, which operates a publication database
- Edudoc: electronic documents in the fields of education policy, educational administration, educational planning, and educational research and development in Switzerland
- Himalayan Document Centre
- African Institute for Economic Development and Planning
- iMPULSE: publication and documents from the Heinz Maier-Leibnitz Zentrum
- National Repository of Grey Literature of the Czech Republic
- RERO DOC repository of e-theses, dissertations, e-prints of this library network in western Switzerland

TIND: An Official CERN Spin-Off

Other institutions affiliated with CERN that gained an interest in Invenio implemented the software with

some informal support from the CERN IT department and library. Interest in the software also extended beyond CERN. Because CERN recognized this interest and was not necessarily interested in devoting resources to supporting Invenio outside of CERN, TIND Technologies AS was formed in 2013. TIND was founded by Alexander Nietzold and Kenneth Hole to provide hosting and support services for Invenio, which it markets as the TIND.

Most development for the software continues to be performed by the CERN IT department, though TIND has an increasing role. TIND has assembled a hosting platform and provides services such as installation, data conversion, configuration, customization, and ongoing support for libraries.

TIND's early customers included libraries affiliated with multiple offices of the United Nations, The Institute of Applied Mechanics of the Czech Academy of Science, and the University of Applied Sciences in Western Switzerland.

The California Institute of Technology, usually known as Caltech, migrated from its Millennium ILS from Innovative Interfaces to the TIND ILS in September 2015. This implementation greatly increased the profile of TIND and has sparked interest in other academic libraries. The Olin College of Engineering selected the TIND ILS in August 2016. Other institutions in the United States have opted for TIND to support their institutional repositories, including Millersville University and the University of Minnesota. Caltech recently expanded its involvement with TIND to use the software to support its Research Data Repository.

Technical Characteristics

Invenio is a web-based application based on Python that's able to integrate with relational databases including MySQL. Support for PostgreSQL is planned to provide additional scalability. Invenio also uses noSQL databases such as MongoDB. Invenio is distributed under the GPLv2 open source license.

Bibliographic data was managed in MARC21 format. Beginning with version 2, Invenio relies on JSON syntax for its data stores. Full-text indexing and retrieval can be supported with an optional Elasticsearch configuration.

The application is comprised of around forty different modules, each addressing a finite set of functionality. Each installation of Invenio would assemble the appropriate modules for the functionality required. Invenio is not a multitenant platform, but individual instances of the software support each repository. TIND offers several different versions of Invenio to meet specific needs:

- TIND ILS: a complete integrated library system
- TIND IR: institutional repository

- TIND RDM: research data management
- TIND DA: digital archive, including digitized images and video

Invenio Development Community

Invenio has a somewhat different character compared to the other open source ILS products discussed in this report. The development community is a bit more concentrated in the CERN organization. Most, but not all, developers involved with Invenio are affiliated with CERN or related institutions. The development community is very active, communicating on a channel in Gitter. The Invenio Developer Forum holds weekly events, each addressing a selected topic of current interest.

TIND Resources

TIND website
<https://tind.io>

Documentation
<http://invenio.readthedocs.io/en/latest>

Forecast

The Invenio software, as marketed by TIND, has sparked interest in mid-sized academic libraries, especially following its adoption by Caltech. It appeals especially to organizations like CERN and Caltech, which specialize in science, technology, and engineering. The TIND institutional repository offers solid functionality and has already been implemented in a variety of important scientific and cultural institutions. The TIND ILS has not been adopted in the larger tier of libraries. Its use as a platform for research data management addresses a new area that many research libraries have become interested in entering in recent years. As a new startup, TIND is in a relatively early stage of expanding the position of this open source product and for its services, but its prospects seem promising, especially within specialized niches.

Chapter Resources

- Breeding, Marshall. "Caltech Sets Tech Strategy Based on Invenio." *Smart Libraries Newsletter* 35, no. 8 (August 2015), 5–6.
- . "TIND Technologies and Invenio: A New Model of Automation for Research Libraries." *Smart Libraries Newsletter* 35, no. 8 (August 2015): 2–5.