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ECOLIB, LIBRARY OF NATIONAL R&D INSTITUTE FOR INDUSTRIAL ECOLOGY, AN ON-LINE TOOL FOR ENVIRONMENTAL TOPICS AREA

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Abstract

Digital Repository of National Research and Development Institute for Industrial Ecology ECOIND, library was launched on the end of April 2017. ECOLIB Repository is structured in six communities, as follows: *Ecology and Pollution Control; Environmental Assessment; Environmental Technologies; Environmental Management; Other Topics; SIMI Proceedings* (International Symposium „The Environment and The Industry”: editions 2011, 2013, 2015, 2016).

First four communities, representing the main research areas of ECOIND, contains articles authored by ECOIND researchers published in national and international journals, doctoral theses (abstract), conference papers, short description of the projects developed from 2006 till present, patents. The repository contains more than 800 documents, 850 author names, 1750 keywords.

The research results presented within repository documents are related to development / implementation of the analytical control methods used to assess environmental pollution level (water, soil, sediments, air, waste products); ecotoxicological assessment studies for chemicals / polluted environmental samples regarding their biodegradability, acute and chronic toxicity on different aquatic organisms (fish, green algae, planktonic and benthic crustacean, rotifers, ciliates, plants and bacteria); modern procedures applied for advanced removal of dangerous compounds from water; technologies / biotechnologies applied for water treatment, clean technologies with low energy inputs, innovative biotechnologies presenting unconventional treatment processes; evaluation of the ecological risk determined on the environment (covering water, air, and soil components); industrial waste management– development of advanced methodologies for identification and assessment of the environmental risks caused by waste disposal; methodologies in the fields of quality management, environmental management, and health and occupational safety management.

Keywords: *articles, conference papers, ECOLIB, patents, research results*

Introduction

Research Institutes possess high amount of valuable data that remains hidden in archives, print formats, and personal storage devices. These may be in the form of research materials, presentation, technical reports, which are nearly inaccessible to end users. Various Institutional Repositories or Digital Libraries (DL) are implemented by various institutions as an innovative way to manage institutional

properties more efficiently, to disseminate the research activities and to preserve of digital assets generated by researchers (Chen & Zhang 2014).

DL refers to a collection that constitutes electronic resources, accessible on-line via internet. DL's are distributed software infrastructures that aim to collect, manage, preserve, and use digital objects (or resources) for the long term, and provide specialized services on such resources to its users. Currently, modern digital libraries include a wide range of conventional digital objects: text document, image, audio, video, software, etc.

DL have emerged since the early 1990s, distinguished by their useful content, helpful organization and a range of services that include indexing, searching, browsing. DL is associated with metadata catalogue, services, collection, digital objects (Fox 2005). The concept of DL has therefore evolved (Saracevic 2000), moving from a system for the retrieval of static information (primarily books and digitalized textual documents) to a tool useful for the collaboration and interaction between researchers and users, regarding domain-specific topics.

For implementation, a DL request a proper infrastructure and software in order to build the structure and preserve the added documents.

Open source DL software represents a system for the construction and presentation of information collections. It helps in building collections with searching and metadata-bases browsing facilities. Moreover, these software's are easily maintained and can be rebuild automatically. Commonly open source DL management software used to disseminate information to world audience are DSpace, EPrints and Greenstone. The choice of one of them usually depends on material type / format, distribution, software platform and time frame for setting up a DL (Tramboo et al. 2012). In the comparative studies are presented the performance of the software's, information on metadata format, search options, authentication, statistics, programming language (Tramboo et al 2012, Barbuti et al 2014).

DSpace was elaborated in a joint project of the Massachusetts Institute of Technology Libraries and Hewlett-Packard laboratory (Madalli 2003). It is fully customizable to meet the needs of individual institutes and archives, has been initiated and developed by academic institutions, and is nowadays the most common software used in research (DSpace 2014), with the largest community of users all over the world.

The paper present the implementation of ECOLIB Library from the starting point (building) to the indexing process using DSpace software.

Materials and Methods

Infrastructure

Server Dell, model PowerEdge T130;

CPU: Intel(R) Xeon(R) CPU E3-1230 v5 @ 3.40GHz;

Memory: 8Gb; HDD: 1x1Tb;

SO: VMware vSphere 6 Hypervisor.

Software

DSpace software was used for implementation of Institutional Repository because was compatible with various metadata standards and inter-operability protocols, uses only one programming language, complete documentation is available on-line for free and are various communities that can provide technical support (DSpace 2014).

The documents included in the repository created with DSpace software are automatically indexed in Google Scholar which represented a strong advantage. The version of the used DSpace application is 5.5.

Structure of the Institutional Repository

The repository was structured, by the MBM Software IT specialists, in communities and collections according to the main research activities developed by the scientists from National Research and Development Institute for Industrial Ecology.

In Fig. 1 is presented the access scheme to the Institutional Repository via internet, the web address being: <http://dspace.incdecoind.ro>.

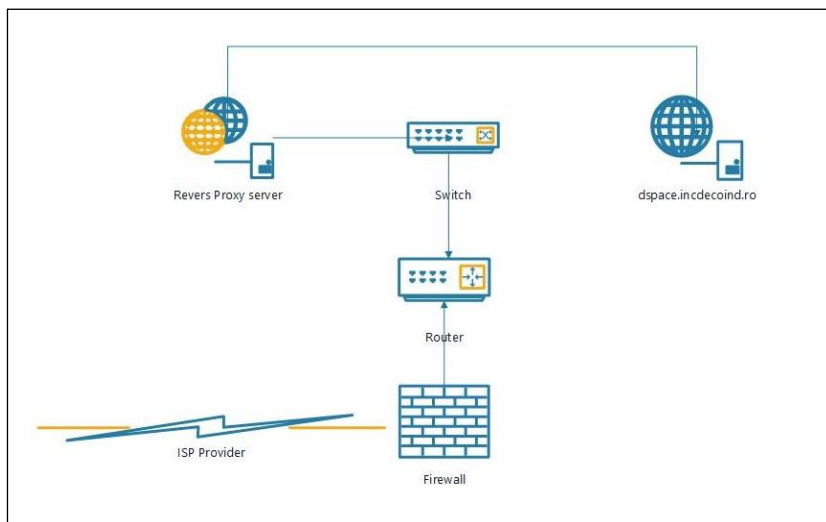


Figure 1. ECOLIB Repository access scheme

The search in the repository is performed using one of the following options: author name, publication year, title of the document, subject (keywords).

Access to the full-text of the resources is either open access or restricted in accordance with the document publication policy.

The repository has been completed in march 2017. It was launch on-line at the end of April 2017 and after that it was used for indexing within Google Scholar database.

Results and Discussion

Communities and collections

The repository is structured in six communities, four of them representing the main research areas of ECOIND. The documents included are: articles published in national and international journals, doctoral theses (abstract), conference papers, short description of the projects developed from 2006 till present, patents, presentations.

Ecology and Pollution Control community include research results on development / implementation of new methods, methodologies, and advanced analytical control

techniques for assessment of environmental pollution level (water, soil, sediments, air, waste products) with inorganic and organic substances and microbiological contaminants. Within this community there are also laboratory and field eco toxicological assessment studies for chemicals / polluted environmental samples regarding their biodegradability, acute and chronic toxicity on different aquatic organisms (fish, green algae, planktonic and benthic crustacean, rotifers, ciliates, plants and bacteria). 60 full-papers, 25 conference articles, 3 book chapters, 5 PhD abstracts and short description of 34 projects are included.

Environmental Assessment community contain research results related to pollution state of various environmental media with establishment of the anthropic impact and various tools and techniques for data processing and analysis, by using mathematical modelling software, in the field of environmental impact and ecological risk assessment.

This community include also research results on mobility of a wide range of hazardous substances in aquatic ecosystems, industrial waste management – development of advanced methodologies for identification and assessment of environmental risks caused by waste disposal (gases emissions, pollutants migration through soil layers and groundwater systems) and studies for the evaluation of the ecological risk upon the environment (covering water, air, and soil components). There are 40 articles, 3 book chapters, 18 conference papers, 4 PhD abstracts and summary of 35 projects.

Third community is called Environmental Management and cover research results regarding methodologies in the fields of quality, environmental, health and occupational safety management; food safety management and audits; research results addressed to methodologies applied to management of environmental quality costs and security. In Environmental Management are summary of 30 projects, 11 conference papers, 3 articles, one book chapter.

Environmental Technologies contains research results addressed to: substantiation of modern procedures applied for advanced removal of hazardous compounds from wastewater/water (setting up techniques, processes, mechanisms, kinetics); technologies/biotechnologies applied for wastewater/water treatment (removal of nutrients, xenobiotics / hazardous substances); solar-based environmental technologies – clean technologies with low energy inputs, and innovative biotechnologies presenting unconventional treatment processes; applied research for restructuring, revamping, and modernization of wastewater treatment plants for sustaining of legislative regulations, treatment costs reduction, and sustainable development approach. This community contain 65 articles, 35 conference papers, 56 patents, short description of 55 projects, 8 PhD abstracts and one book chapter. Another community (Other Topics) belongs to Researcher's Portfolio (articles, book, conference papers and theses), results of PhD, Postdoc studies performed with other institutional affiliation than R&D Institute for Industrial Ecology and contain more than 50 documents.

The last community is assigned to the International Symposium "The Environment and the Industry", *SIMI Proceedings*, and include archives from 2011, 2013, 2015 and 2016 years, approximately 240 full-papers. This publication is edited by the National Research and Development Institute for Industrial Ecology ECOIND, has on-line ISSN (2457-8371) ISSN-L (1843-5831) and DOI for each article published in 2015 and 2016 (10.21896/simi. 2015; 10.21698/simi.2016). The papers

published in the last two years are indexed in Crossref, Google Scholar, Scilit, Scipers International Databases, and can be also found on Mendeley and CiteUlike Platforms.

In the repository are included more than 800 documents, are listed 850 author names and 1750 subjects.

The metadata recorded for each document are: document title, authors, keywords, publisher, abstract, publication title, year, volume, number, other identification data for publication (e.g. ISSN, ISBN), article DOI.

These resources are available without login and access to the full-text is either open access or only abstract with the possibility to send an e-mail to administer and request an author copy.

Indexing

Starting with June 2017, ECOLIB Library is indexed in Google Scholar. Thus, the digital documents submitted in ECOLIB are indexed in Google Scholar, and as result, the citations can be counted.

In June 2017 the application for indexing in Directory of Open Access Repository (OpenDOAR), a platform containing more than 3300 repositories, it was submitted. Until now, no answer received, the rate of acceptance is around one repository per month. In this platform are only three repository from Romania, none belongs to a research institute.

In July 2017 was applied for indexing in Registry of Open Access Repositories (ROAR), the application was admitted and so, ECOLIB is indexed in ROAR. ROAR is hosted at the University of Southampton, UK, being part of the Eprints.org network. In this platform are indexed twelve repositories from Romania belonging to some university, institutes or publications with topics in the field of administrative studies, aquaculture, business administration, economics, theology, but not regarding environmental topics.

Statistics

In Fig. 2 are presented usage statistics starting with March 2017 till July 2017.

In March and April months the repository was under construction, in the process of adding documents, so the viewers were ECOIND scientists.

Starting with end of April, ECOLIB was launched on-line. The number of visitors was low (around 100), until July 2017 when the number increased four times, mainly do to the indexation in Google Scholar on the end of June.

The visitors come from Romania, Hungary, EU and China, the top cities are Bucharest, Cluj, Iasi, Szeged, Hangzhou, Fuzhou, Nanjing.

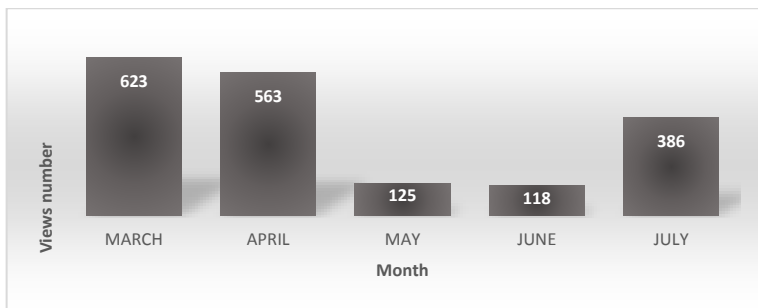


Figure 2. Resource usage statistics

Conclusions

ECOLIB represent the first Institutional Repository in the field of environmental topics from Romania and contain the research results of the scientists from National Research and Development Institute for Industrial Ecology ECOIND.

The repository contain more than 550 documents (articles, conference papers, patents, book chapters) and 240 SIMI conference papers.

ECOLIB Repository is indexed in Google Scholar and ROAR, this fact should lead to a long-term increase of the submitted documents visibility on international level.

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