Open Encyclopedia System

Open Source Software for Open Access Encyclopedias

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Abstract

The main objective of the project "Open Encyclopedia System (OES)" is to develop a standardized web-based open source platform for building and maintaining scientific online encyclopedias, which will be publicly available, free of charge on the internet and accessible worldwide. The project consortium is carried out of four partners: Center for Digital Systems (CeDiS), Friedrich-Meinecke-Institut (FMI), Center for Modern Greece (CeMoG) all based at the Freie Universität Berlin, as well as the Bavarian State Library (BSB) in Munich.

Keywords: open access; e-publishing; online encyclopedia; versions; crowd sourcing; digital humanities; digital history

1   Designing open source software for open access encyclopedias

Between the years of 2011 and 2015, an English language online encyclopedia on the First World War "1914-1918-online" has been created, published and is freely accessible worldwide. The multi-perspective, open access encyclopedia is a collaborative project by the largest network of World War One

researchers worldwide, spanning more than 50 countries. "1914-1918-online" features innovative navigation and search functions based on semantic wiki technology and will eventually contain around 1,600 articles. The well-known framework Semantic MediaWiki (SMW)[1] is used as an editorial system.

The follow-up project Open Encyclopedia System (OES) started in 2016 and will – by the end of the project in 2019 – offer a generic modular open source software system with which editors and users are able to build an online encyclopedia on their own. Our claim is to create a system for the users, in which collaboration is easy and web-based. The OES software should be customizable, flexible and adaptable to context applications and simple to operate. Ultimately, the OES software should set a standard in saving time and in being a sustainable framework.

After almost one year of analyzing the requirements for an Open Encyclopedia System and conceptualizing the software architecture and its components, we stand in between the design and the implementation phase. The core components will be ready for release by the end of spring 2017.

1.1 The necessity of an *Open Encyclopedia System*

Hitherto existing online encyclopedias however, prevalently stick to a linear and static content structure like a reversed image of print publications. There are to date no satisfying solutions that are able to meet the challenges of the digitized era nowadays: e.g. the dynamic sampling of electronic publications will need solutions for displaying various versions of articles alongside with reliable referencing and collation. Furthermore, the potential of crowd sourcing with reference to identifying updatable content, contributing (external) links or collaboratively extending bibliographies is not completely and consequently utilized as it is already being done in other web-based projects in the humanities.

In addition, most online encyclopedias are mere publication systems that do not make use of the internet's possibilities of designing interactive working environments neither for editors nor for authors. Options for personalized settings, e.g. individualized search and navigation history, personal article lists or annotations, are usually missing. This may be considered as a huge deficit referring to online encyclopedias as these are mostly consisting of a

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1 https://www.semantic-mediawiki.org/wiki/Semantic_MediaWiki

huge quantity of data that is worked on long-term. Academic encyclopedias might benefit if they are able to connect high-quality, peer-reviewed knowledge with the advantages of publishing electronically in a persuasive way.

Until now, academic online encyclopedias are implemented as proprietary and singular versions. Most software components are tailored models for specific requirements of a use case. New projects aiming at publishing reference works online may therefore benefit from foremost developed concepts of digital publication (e.g. web presentation, search, navigation, etc.). When using aforesaid software for own projects, a client has two options: adopting specific project-related decisions or adapting the software in a costly way. Consequently, just using the same software would be either expensive or of less quality. Taking this into consideration, it is desirable to develop a standardized information architecture for the creation, publication and maintenance of open access online encyclopedias comparable to software solutions for other forms of publications like e.g. online journals (with the software OJS) or online monographs (with the software OMP). There is a necessity for an open and modular solution that can provide all functions that are adaptable and essential for designing a specific online reference work in a cost and time effective way.

1.2   Guiding principles of the software design

Our main concepts and visions are predominantly led by four principles – and are the key advantages over a wiki software extension (e.g. SMW) – in order to ensure the sustainability, adaptability, longevity and usability of such a software system: modularity, openness, integrity of data and interconnection. Our aim is to build a generic software system that is web-based and features a modular plug-in architecture. Furthermore, a key asset of the OES will be its availability as open source software. This will make the software easily modifiable and thus optimizable and might be kept up-to-date. Beyond that, one of the main challenges of the software development of OES will be to guarantee the interoperability between the software modules, components and interfaces.

2   Modules, publication and interfaces

The online platform of the Open Encyclopedia System will be built with a set of modules that are adaptable to specific application contexts. Each module will be (de-)selectable and composed by configurable components. The flexibility of modules and components ensures the adaptability to the requirements of specific needs of the digital publication of an encyclopedia. Additionally, the online platform will need to stay open source itself, therefore we will need to find a way of providing each technological component and feature without any financial obstacles. However, it should be possible for users to add proprietary software if it is advisable in a particular context.

The customizable modules of the OES platform will amongst others consist of components for workflow and project management, services for administering multimedia content, flexible assignment and management of user rights.

Individual and project-related workflows will be guaranteed with configurable tools and plug-ins. With providing various types of (open) peer review, automatic DOI registration and collation tools, academic standards will be held up on a high level. Numerous functionalities of community engagement and participation such as an integrated "call for papers", blogs and comments that will be implemented within OES will strengthen the networks of scientists and authors and increase an encyclopedia's impact.

2.1   Typical workflow of publication

The only existing typical workflow of publication so far is the one of the online encyclopedia "1914-1918-online. International Encyclopedia of the First World War"; in the course of the functional upgrade, the workflow will be modified. Below, a typical workflow scheme is sketched:

First of all, conceptualizing the articles and its structures will take place in a wiki environment, where only editors and the editorial office communicate. Applications to paper calls can be made with the integrated web form, while a list of open calls will be updated daily on the website of the encyclopedia. The authoring and reviewing process will be organized with the help of a project management tool that will be offered as a module and can be adapted to a context application. The process of editing and indexing will occur in the editorial system, which is part of the core components of the OES. Articles,

enrichment of metadata and versions of articles can be managed here. Each article will be connected to a specific bibliography that might be linked to Zotero[2] via a bidirectional interface. The publication platform will technically be separated from the other level(s) of data processing. In addition to the provision of encyclopedic articles, the publication system will include a personalized environment with reading lists, annotations, comments and shareable bibliographies.

2.2 Networking and interfaces

With reference to interconnection and networking, OES will provide interfaces to library catalogues such as OAI-PMH[3], SWORD[4], SRU[5] et cetera in order to increase the visibility and impact of reference works created within the platform. Bibliographies that are created with the online reference tool Zotero may be edited via a bidirectional interface from and to a specific project.

In terms of availability, the Bavarian State Library (BSB) will offer professional services and strategies for the long-term preservation of digital objects documents tailored to particular encyclopedia projects.

3   Prospects

Currently, there are two use cases that will make use of the OES platform: a) "1914-1918-online. International Encyclopedia of the First World War"[6], which was launched in October 2014 and is planned to be functionally upgraded with OES until 2018, b) the work-in-progress "Online Encyclopedia on German-Greek entanglements", which should functionally be a scholarly publication platform for case study research and working papers on the history of cultural and scientific exchange between the German and Greek

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2 https://www.zotero.org/

3 https://www.openarchives.org/pmh/

4 http://swordapp.org/about/

5 http://www.loc.gov/standards/sru/

6 http://encyclopedia.1914-1918-online.net/home.html

spaces from the 18th century to the present day (and is mainly planned by the Center for Modern Greece).

References

Ute Daniel et al. (Eds.) (2014): 1914-1918-online. International Encyclopedia of the First World War, issued by Freie Universität Berlin.