

Open Education Systems – the challenge of updating when republishing is allowed

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Abstract—Open Access and Open Educational Resources are important issues for the future of education even or especially in Higher Education. This contribution introduces a project on a textbook done collaboratively by more than 200 participants. From a technical background the Open Journal Systems is used to assist and manage the whole scientific publishing process. Furthermore a plugin for the system has been developed to open the access to the content to any other third party application like mobile applications. In spite of a fully Open Education System numerous chapters appeared on different platforms because of the nature of openness and the possibility of republishing. This research study aims to address the problem of unnecessary multiplication of learning objects. The report concluded that much more awareness is needed towards sustainability and reliability.

Index Terms— Internet, Open Education, Information System, Web technologies

I. INTRODUCTION

OPEN education is defined by Meisner [1] as *free and open access to, the usage of and the right to modify and re-use digital open educational resources and digital educational tools, and the free and open access to the related virtual educational communities, in order to learn, teach, exchange or advance knowledge in a collaborative and interactive way*. Therefore Open Educational Resources (OER) are a just a part of the whole movement, but maybe the most important one [2]. The UNESCO by means of their “Free Educational Resources” initiative firstly described OER in 2002 as the *wish to develop together a universal educational resource available for the whole of humanity* [3]. Subsequently the Massachusetts Institute of Technology (MIT) started the “MIT Open Course Ware” and offered a number of courses, videos or other learning content for free [4]. Two further publications, a questionnaire about OER of the OECD in 2007 as well as a first draft about the OER-movement by the William and Flora Hewlett Foundation [5],

helped to gather further attention. Further follow up projects like the OpenLearn project of the Open University UK [6], the Wikieducator [7] or the German ZUM-Wiki help to increase the number of OER.

The big advantage of OER that there is no restriction in exchange, modification and republishing is also its most worst disadvantage. Bearing this in mind the number of similar objects will increase, doubled, tripled and so on. In this publication we would like to address exactly the problem of unnecessary multiplication of learning objects, how it might be avoided or it might be solved in future. We present our thoughts along a research project done in the German speaking area.

II. THE OPEN TEXTBOOK PROJECT “L3T”

L3T is a German acronym for “textbook on learning and teaching assisted by technology” [8]. The project was started in 2010 by the authors with a video call for chapters¹ for an open access textbook on Technology Enhanced Learning. The call found interest by more than 130 people – professors in the field, researchers, and educators. Within ten months 48 chapters were written and reviewed in a highly collaborative way and the book was online available since February 2011² with the assistance of about 200 different people [9]. From a technical point of view the world’s most used open source platform for journal management and publishing the Open Journal Systems (OJS) was used. Legally, the project used the creative commons license “CC BY NC ND” for every single chapter, so it was easy to use, copy and implement them on a single chapter base.

The project got well recognized in the German speaking area and the free available chapters got downloaded more than 100.000 times in the first year. Several small follow-up projects deal with the possibility of different usage of the content. For example iPhone or Android apps were developed or a special print on demand solution. The main website was completely redone³ and chapters also got published on other platforms like Slideshare.com.

In 2013 the book was rewritten during a further research

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¹ http://youtu.be/SM3HJ_Y3rLc?list=PLDE65680727BA9014 (last access July 2014)

² <http://l3t.tugraz.at> (last access July 2014)

³ <http://l3t.eu> (last access July 2014)

project [10]. The authors initiated a so called book sprint and proposed that they would like to write the new version of the book in just seven days collaboratively and online. Therefore eight camps were organized with the idea to synchronize different kind of people during the whole week and to support online workers in an appropriate way. Afterwards different roles were defined from authors of chapters to designers as well as editors. With the help of numerous online available tools the whole process was operated, monitored and realized online. In summary, more than 250 people worked simultaneously on the project within seven hard days. The final result was a lecture book fully available online with 60 chapters on the issue of technology enhanced learning. Additionally the whole content is now licensed with the creative commons license “CC BY SA” and each single picture, too. This makes it now an fully “open educational resource” in the sense of current definitions, as it now allowed to copy, modify, re-publish the texts or single pictures under the same license (“share alike” component).

III. THE OPEN JOURNAL SYSTEMS

In the very first beginning of the project it was decided to use the open source software Open Journal Systems (OJS) as publishing tool [11]. The software has been developed since 1998 following the idea to be able to manage, to publish, and finally to index online journals. OJS is for sure a milestone for the open access movement. Today more than 24.000 known installations are in use⁴ and the map-visualization⁵ displays a dramatically increase all over the world.

Due to the fact that the whole process of doing a scientific journal is highly complex the system assists the major steps – submission of a proposal, review of the proposal, decision of acceptance, compilation of the issue and finally the publication.

The software is written in the object-oriented language PHP using Smarty template framework for the user interface abstraction. The backend supports the free SQL database management system. OJS offers a huge variety of features due to its extendable architecture and the possibility of additional plugins. Consequently, different plugins has been programmed for example to integrate social media, to print the journal via a Print on Demand Service [12] or to recommend articles to the readers [13].

IV. OPEN UP THE OJS WITH AN API

Our research interest was not only to provide the textbook as Open Educational Resource but also to offer each chapter in as many as possible different ways. So from a technical point of view it should not matter which devices are used or which browser or software.

The OJS itself just allow publishing different file formats. Therefore till the second version of the book each chapter is available as PDF format, HMTL format or even EPUB format

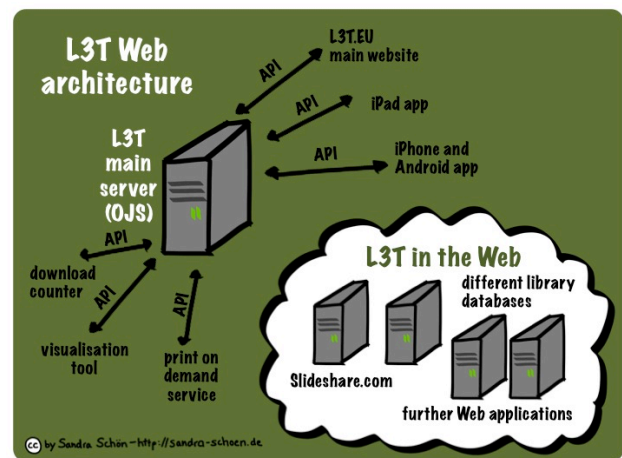


Fig. 1. The architecture of the textbook L3T in the World Wide Web

for e-readers. For that purpose a special edition was developed to export different file formats from just one source.

To allow mobile access a further plugin has been programmed. This plugin provides an API (Application Programming Interface) allowing other applications to download the chapters directly or even to get more detailed information (such as title, authors, number of downloads). This follows the main idea to allow third party applications to use the original documents without duplicating them on the World Wide Web. Fig. 1 points out the architecture of the textbook. All chapters (files) are physically on the L3T web server within the OJS and are used from different applications:

- L3T main website: The official main website of the book is completely separated from the OJS due to mainly design reasons.
- Three mobile applications for the iPhone, for the iPad as well as for numerous Android devices are available in the corresponding Stores. Each of them is downloading the chapters via the API [14].
- There are a further special site⁶, which acts as download counter and displays in real time how often different chapters got downloaded.
- A visualization tool⁷ points out how often each chapter got downloaded with the help of a bar chart and from where readers are coming from using additionally the Google map API.
- With the help of a developed Print on Demand Plugin chapters can freely chosen and sent to a print service [12].

At this point it can be stated that the OJS combined with the API- plugin greatly opened up the system to allow third party application dealing with the content.

V. EXTERNAL COPIES AND MODIFICATIONS

After running the system for some time interesting aspects popped up. Despite our idea to deal with central stored files,

⁴ <https://pkp.sfu.ca/ojs/ojs-usage/> (last access July 2014)

⁵ <https://pkp.sfu.ca/ojs/ojs-usage/ojs-map/> (last access July 2014)

⁶ <http://l3t.tugraz.at/analytics/> (last access July 2014)

⁷ <http://l3t.eu/visualization/> (last access July 2014)

which may be used via an API for several services, we were more or less forced to use external copies as well.

- In the very first time authors and experts wanted to embed articles in their personal websites, blogs or e-portfolios. Therefore all chapters have been uploaded to slideshare.com (see Fig. 1). We did this with a special L3T account and for every single chapter. The aim was to be at least able to up-date these files and to be able to monitor the usage.
- Additionally, we asked the German archive service within our domain, the “FIS bildung” database, to archive our chapters from issue 2 (2013). Technically, as archive service, they deal with copies that cannot be updated by us.
- Furthermore, the Austria Wiki, the Austrian open-access platform for Austria-related content with diverse content, asked to integrate the L3T chapter within their system. Again, their system allows smart scrolling through the pages, but is not able to deal with our API.

Additionally, open educational resources respectively liberally creative commons licensed content means that others cannot only download the content, but also modify and upload it to different websites:

- Several libraries of universities archives L3T chapters. Of course, not all of them also archived the newer issue by now or brings the archived issues together.
- Additionally, several contributors, but also other users, upload chapters on their website, in their learning management systems, as part of the online literature of a seminar and so on.
- Certainly, there are materials (for example slides, videos, podcasts, single Weblog postings, course materials) where L3T material is (modified and) re-published.
- Last, but not least, the copies of L3T make it obligatory, that our main server still is at the top rank of search machines. If big and important (other) university servers have a higher page rank, this would additionally limit the visibility and usage of the central and current chapters.

Legally, this is a wished and welcomed usage. Nevertheless, practice shows the challenges of this practice.

- Citations of the L3T projects shows, that a lot of current citations use the first issue (2011) and not the current one (2013). This might not only a problem for a lack of literature research literacy, but also a consequence of several L3T copies from 2011 in the Web.
- Even worse, there are already citations existing, that do not link the central L3T system or URL, but to a copy.
- Following these observations, we are sure that a lot of people use and deal with L3T articles from the first issue and do not get aware of the newer

version or current version.

Last, but not least, finally we wanted to provide our authors the compensation of the German copyright collector VG Wort. We thought that it might be able that they use our API to get directly the correct number of downloads. But the collecting society treated us to provide a website with a hidden pixel to count the numbers. We refused it due to the fact that each chapter is not available through only one webpage (especially if we think about the two versions) and therefore the number of downloads are to low to get considered.

VI. DISCUSSION

In our particular case the OJS turns into an Open Education System due to the fact that the content itself is intended for lecturing as well as learning. The advantages of this technical solution are:

- The content is stored once and no further resources are wasted.
- The content can be updated easily – it will be automatically appear in the third party application.
- From a user perspective it means that he/she get for sure the latest version.

Nevertheless, L3T chapters and figures are licensed and developed as fully open educational resources. They are meant to get copied, modified, re-used. As we pointed out, the goal to centralize the data and make it accessible from just one point, which make sense concerning currency and quality issues, is not possible due to many practical reasons.

VII. CONCLUSION

Our practical example points out that Open Education System does not only mean to offer the content for free but also to offer APIs to allow the usage by different third party applications. On the other site openness means also that any user can republish the content him/herself on any other website ignoring aspects of sustainability, reliability and version control. In times of information abundance the idea of Open Education Systems needs awareness of how technology is working in the background otherwise an information dilemma can be predicted.

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