Open up
Why the open source model is the best model for education

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INTRODUCTION

ICT has changed the world as we know it. Cars can't drive without software, companies can't work without ICT and increasingly, educational insitutes can't function without ICT either. There's basically two kinds of ICT in education, first the ICT people use for administrative purposes like registering students and manage classes. Secondly, the kind of ICT what this paper is about: ICT in the primary process, the actual process of gathering and sharing knowledge and skills.

The use of ICT in the primary educative process is becoming increasingly important. All the serious electronic learning tools are based on the methodology of learning objects, which is an important trend in E-learning.(1) The idea underlying this methodology is that educators can define and create pieces of knowledge and then group them into separate objects. These objects are stored in a database and described with educational metadata. This structure allows educators to share objects and combine them to create lessons or courses.

The learning objects methodology gives schools maximum flexibility and serious opportunities to get E-learning into the learning process. Furthermore, this methodology makes it possible to deliver more student centred education.

So, if ICT becomes part of the primary process, how much influence should a school have on the quality and future of the software? Other question: how should a school spend an innovation budget, on buying software or on the true educative innovation?

You can only answer these two mission critical questions when you understand about open source software. Why? With closed software, you can't influence the roadmap of the software enough; you always depend on the software company and such dependency is not appropriate for a primary educative process. Also, the costs of ICT for educational institutes are already getting way out of hand. Another good reason to have a close look at open source software.

This paper starts with a brief overview of some of the most important open source initiatives in the world of education: Sakai, Dokeos, Moodle and Didactor. The case of Didactor is examined more thoroughly, because it's representative for the phases educational institutes go through when deciding whether or not to use open source software. It provides universities and other knowlegde institutions with a set of arguments to make a good decision about using open source software.

Sakai

Sakai is an initiative by a number of American universities. It's a high-end solution, aimed at cutting costs and creating a worldwide community.

The University of Michigan, Indiana University, MIT, Stanford, and the uPortal consortium are joining forces to integrate and synchronize their considerable educational software into a pre-integrated collection of open source tools. This should end up in three wins for higher education:

1. A framework that builds on the recently ratified JSR 168 portlet standard and the OKI open service interface definitions to create a services-based, enterprise portal for tool delivery;
2. A re-factored set of educational software tools that blends the best of features from the participants' disparate software (e.g., course management systems, assessment tools, workflow, etc.);
3. A synchronization of the institutional clocks of these schools in developing, adopting and using a common set of open source software.

The products of this project will include a portal, course management system, workflow engine and a technology portability profile as a standard for writing future tools that can extend this core set of educational applications.

Sakai was started because of the limited possibilities of existing E-learning tooling, combined with the rising costs of ICT for the participating universities.

Dokeos

Dokeos is free E-learning software translated in many languages that helps organisations worldwide to manage learning and collaboration activities.

It allows teachers/trainers to create content, structure activities along a sequenced path, interact with students/trainees and follow their progress. It allows the trainer to create pedagogical content, to structure activities in learning paths, to interact with students and to follow their evolution through a reporting system.

The free Dokeos software is developed by the users according to their own needs. The Dokeos user community includes many organisations and the Dokeos development community includes about 80 developers.

Moodle

Moodle is a course management system, a software package designed to help educators create quality online courses. Such E-learning systems are sometimes also called Learning Management Systems (LMS) or Virtual Learning Environments (VLE)..

Moodle is open source software, which means you are free to download it, use it, modify it and even distribute it (under the terms of the GNU General Public License). Moodle runs without modification on Unix, Linux, Windows, Mac OS X, Netware and any other system that supports PHP, including most webhost providers. Data is stored in a single database: MySQL and PostgreSQL are best supported, but it can also be used with Oracle, Access, Interbase, ODBC and others.

Because Moodle needs PHP to work, it's not as scalable as typical internet programming languages like Java and .NET. Moodle is good software to start gaining E-learning experience, but when things get bigger and more important, organisations tend to look at other, more scalable, software solutions.

Didactor

'Didactor' is a low-threshold platform that frees organizations to spend their innovation budgets on truly educative innovation. The Mediator Group, a Dutch educational institute and innovator in the field of education originally initiated it.

The platform is developed from a didactic perspective, which is considered to be "One of the most crucial prerequisites for successful implementation of E-learning." (2) Furthermore, it's based on the methodology of learning objects, which is an important trend in E-learning.(1)

The Didactor's architecture meets international standards like the IEEE's standard Learning Object Metadata (LOM). (3) Developers are now in the process of integrating the flexible generic language IMS Learning Design.(4) The system is highly platform independent and has adopted standards like JavaTM, XML, J2EETM and JDBCTM.

Didactor is based on the learning objects methodology and fulfills open and didactic standards. Educators can define and create pieces of knowledge and group them into separate objects. These objects are stored in a database and described with educational metadata. This structure allows educators to share objects and combine them to create lessons or courses. Didactor consists of 23 didactic components, like e-portfolio, assessment, competence management, group discussion, chat etc.

Why did The Mediator Group, together with their partners, create a new platform? Because the others didn't fit their didactic, technical or commercial perspectives.

OPEN SOURCE

The Mediator Group faced a challenge: which development platform to choose for Didactor? The Mediator Group soon recognized open source as a promising route, as this would reduce commercial licensing costs for clients and also, with ICT in education becoming more and more part of the primary process and thus mission critical, we expected the lock-ups of traditional vendors to become more and more painful. Third, it would be a good way to share development costs for the initiators.

The Mediator Group approached a number of organizations and asked them to write proposals for a new platform. They defined four criteria, namely the platform should be open source, it should be based on the learning objects methodology, it should fulfill open and didactic standards and if possible, there should be the possibility to bond with existing open source communities.

The Mediator Group soon found out that they themselves needed to become the principal architect to be able to give direction to the roadmap of Didactor for the coming years, unfortunately also in a technical manner. This was sometimes pretty hard, because open source software is not always properly documented and The Mediator Group focuses on didactics, not on technical development. Be aware of miscommunication between

technicians and educational specialists. This is a rule for all ICT projects, but in the open source model even more, because all parties are equal, so every ICT-company can start working on the project. For example: what an educational technologist calls a functional design, are the requirements for a programmer. The solution to this problem was setting up multi-functional teams and The Mediator Group itself giving lead to the process.

In the end, the project group chose the existing open source MMbase community as the development platform and approached several parties to co-develop Didactor.

MMBase is an architectural tool, based on Java, with enterprise content management (ECM) and portal functionality.

First, let's look on the reasons to choose for open source. Later on, we'll get in to why we wanted to use the existing MMbase tooling.

OPEN SOURCE AND EDUCATION
So, why did the project group choose for open source? I'll take you through some of the most important issues and talk about the lessons I've learned in implementing the open source model.

Independency of vendors
Try answering these questions first:

- Are you the sole owner of the content in your LCMS?
- How do you want to spend your budget, on innovation or mainly on licenses?
- Can you decide when new functionality is delivered or do you depend on an ICT-company?

open source isn't of course a magic word that will solve all of these problems, but it sure can help.

Social model
Open source enables organizations to participate more actively in the future of their mission critical ICT. People in the open source community have some kind of a bond because they've made the strategic decision to take things in their own hands. The Internet, and e-mail, are such huge successes because nobody 'owns' them. Of course money is being made with them, but that doesn't harm their primary purpose. The same goes for open

source E-learning: as soon as there's one owner, commercial and social principles tend to clash. And with ICT in education becoming more and more important, it's important not to be dependent of just one vendor.

Open Standards

Standards are, in my opinion, the critical factor for a worldwide breakthrough of E-learning software. Open source software is almost automatically based on open standards, but closed software isn't. Even if closed software is using worldwide standards, you're still dependent on the vendor if the standards change. You'll have to wait for them to implement a standard, whereas with open source software, you can take things into your own hands.

Quality first

One of the indicators of a successful open source model is a proper functioning community that can meet your demands in terms of hosting, helpdesk and implementations. Because Didactor is mission-critical for organizations, service delivery has become increasingly important. The main parties supporting the product have thus created a shared competence center where hosting, bug fixing and helpdesk can be provided 24/7.

Free riding

I've been active in various web related businesses for about ten years now. Until recently, it wouldn't have passed my mind to invest in something, build it and then give it away for free… However, because open source is in my opinion the only serious model for education (and other purposes), I simply had to convince my fellow entrepreneurs to come along. Since the day we started to invest in open source, our business went up. But, it takes time to realize that the open source model is changing the way the software industry works. The return on investment model for the initiators is not in investing a couple of years and then sit back and make license money. ROI is in the services and the added value for your customers. 'Free riders' will probably always exist. Focus on what you want to do with the software, not on what others might do with it. Also, most of the time a small group of enthousiasts is more effective in getting an open source model started then a large group representing all possible users and developers.

Giving and taking

Nothing's changed, only that vendor's can't hide any longer behind complex license structures and other lock-ups. It's about quality and services: if you don't deliver, you're out. The customer rules.

Programmers

In the Didactor model over 10 companies (Didactor Service Partners) provide services, like software, hardware, hosting, training and content. At a management level, you definitely need to know what you're talking about, but on the programming level, it's not necessary.

Hype

Open source is hot and hyped, don't let this trick you

Always argue from a didactic perspective: do a proper platform study, compare platforms and make decisions based on functionality and commercial implications. Never choose anything just because it's open source.

Understanding

Not everybody understands open source. Open source is a relatively new model for doing business and organizing ICT-processes. It's sometimes a threat for commercial vendors who depend on license fees. You'll sometimes end up in interesting discussions and you will meet resistance when you want to connect your open source tool with existing ICT.

People with other agendas tend to minimalise the powers of open source by saying that it's amateuristic and can never get big. Tell them that several open source companies are now listed on stock exchanges, and that ICT-companies like IBM and Novell have made open source one of their main strategic lines of business for the future.

Open source is and is not free

It's free in the way that you can download and start using it. It's not free in the way that there aren't any costs involved. The big difference is that with open source E-learning, you'll spend your innovation budgets on truly educative innovation, instead of buying licenses.

WHY MMBASE

Now the arguments for choosing open source are made clear, let's examine the reasons for choosing the existing MMbase software to base the Learning Platform on, instead of creating a whole new platform.

1. MMbase is one of the most important open source communities in the Netherlands, with over 100 active developers.
2. Several educational institutes are member of the MMbase community.
3. Several components that the project group needed for Didactor were already present, like forum, chat, e-mail and agenda;
4. MMbase is platform and database independent (5);

5. It's particularly suited for multi-media environments;

6. The technical architecture underlying MMbase, with the object orientation and focus on structured content, matched our educational object philosophy wonderly well.

CONCLUSION

Open source software has become a serious alternative for closed software solutions. The community principles match the academic tradition of sharing knowledge in a democratic manner. Didactics come first, but open source software has to be taken into account seriously when you want to influence your own educative future.

REFERENCES

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About the author

Joost Becking, *(jb@joostbecking.nl)*, is co-founder and principal educational architect of the open source E-learning platform Didactor. Joost is responsible for the open source strategy. Joost co-authored the book *Internet Method* on integrating web applications in primary business processes. His interests are in the areas of open source business modeling, standardization and learning object technology. He strongly believes that ICT can do a lot of good in educational settings, but only if it becomes part of the educational strategy for primary processes. Therefore, Joost strongly believes in the power of blended learning. Furthermore, as an experienced entrepreneur, Joost works as an (international) business consultant to help speed up other initiatives.

More info

http://www.didactor.nl/demo/demo.html

www.mediatorgroup.com

www.mmbase.org

www.sakaiproject.org

www.moodle.org

www.dokeos.com