How a FIRM (Flexibility, Innovation, Robustness, and Maturity) Argument for FOSS (Free and Open Source Software) Can Displace FUD (Fear, Uncertainty, and Doubt).

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This paper discusses how a coalition of Athabasca University (AU) faculty successfully promoted Moodle, an open source learning management system (LMS), as a viable alternative to two major proprietary LMSs: WebCT Vista and Lotus Notes. The evaluation tool a group of core users developed to determine AU's choice of LMS is described and the evaluation results are touched upon. The evaluation process, however, was not a neat, technical exercise, but rather a process of debate, contention, disagreement, and compromise. Because an LMS resides at the confluence of the social and technological, choosing an LMS is not a purely technological act, but rather a communicative process that can be fraught with political, economic, and cultural factors, as well as personas. Advocates of open source software need to remain fully cognizant of this fact and be prepared to calmly provide evidence of flexibility, innovation, robustness, and maturity (FIRM) whenever institutional and/or personal objections appeal to and/or promulgate arguments against open source software based on fear, uncertainty, and doubt (FUD).

Athabasca University (AU) faculty first learned of the decision to adopt WebCT Vista as the University's Learning Management System (LMS) in a University-wide email circulated by Athabasca's Chief Information officer (CIO) on Wednesday, September 17, 2004:

> In order that we can provide stable, sustainable and world class courses and learning experiences for students, I have recommended, after extensive research and review, that AU adopt WebCT Vista as its learning management system (LMS). I have further recommended that we migrate to this platform through a transition process with an objective of completion by the end of 2006.

This seemingly arbitrary decision deeply troubled AU's faculty for a number of reasons; the most significant, however, were: a lack of consultation; the declaration that choosing an LMS was a non-academic matter; and the absence of factual evidence to support the choice of WebCT Vista.

This precipitated a faculty-led intervention that pressured the administration into agreeing to a transparent evaluation of 3 enterprise-level LMSs, at least one of which would be open source. Since there are a number of open source LMSs, those advocating an open source alternative had to carefully assess the most viable open source candidate. The overwhelming choice was Moodle, primarily because of its proven track record, its extensive feature set and modular architecture, and the vibrancy of its development community.

Selection of an Evaluation Team

Before the evaluation could begin, representatives from across the University had to be recruited and constituted into an Evaluation Group. These evaluators were drawn from program administration, student registration and record keeping, system administration, course development and delivery, Web development, help desk and student services, and central computing systems (security, database management, support). The evaluators were then divided into those whose interests were primarily administrative, and those whose interests were primarily hands-on: a Core Evaluation Team of 12, and a hands-on Testing Team of 20-plus. (Of the 20-plus Test Team, 17 would submit comprehensive evaluations).

Evaluation Process

WebCT Vista, Lotus Notes, and Moodle were identified as the three contenders. WebCT Vista was the first LMS to be evaluated, and it was out of the process of inquiry and testing that ensued that an initial listing of evaluation criteria (needs assessment) emerged. The WebCT Vista evaluation also provided evaluators with a much greater knowledge of the complexities involved in the course production, delivery, and administration processes, as well as the centralized computing services infrastructure required to support and maintain those services.

The Evaluation Group met 9 times (not including demonstrations and training sessions) between October 2004 and May 2005. The scope of early meetings

ranged widely, and discussions were often intense, and it was in these initial meetings that fear, uncertainty, and doubt (FUD) about open source software first emerged. Rather than confront these arguments on a philosophical or political-economic basis (democracy vs. corporatism, licensing fees vs. free and open access, etc.,), which could very easily have served to polarize the evaluators into camps of "for" and "against" open source software, efforts were focussed on emphasizing the flexibility, innovation, robustness, and maturity (FIRM) of the open source candidate (Moodle).

Economics, often the single-most important factor in the choice of an LMS, especially when resources are scarce, did not play a major role in this case: the necessary resources were available to implement whichever LMS proved most appropriate for AU's needs.

As the evaluation process continued, there were many opportunities for members of the Evaluation Group to communicate via email and face-to-face regarding the flexibility, innovation, robustness, and maturity of Moodle over WebCT Vista and Lotus Notes. Fortunately, there were several examples of corporations abandoning proprietary software in favour of open source in the media. For example, in June of 2005, a *Business Week Online* article entitled "The Power of Us" explores how mass collaboration is affecting business, and notes:

> Nowhere has that phenomenon happened faster than in software. Collaborative open-source development is rapidly moving beyond basic utility software like Linux to mainstream applications as well. An especially eye-opening example is SugarCRM Inc., which provides an open-source version of customer-relationship management software now dominated by Siebel Systems (**SEBL**) and salesforce.com Inc. (**CRM**)

This article served to substantiate the claims of a June 2004 article published in *Forbes*, entitled "Cheapware," wherein the corporate migration from proprietary to open source software is explored:

Craig Murphy has had enough. As chief technology officer at Sabre Holdings, which runs the world's largest airfare and ticketing network, Murphy has spent millions of dollars on database and other software from companies like Oracle. But last year, when Sabre was building a new computer system for online shoppers, Murphy took a flyer on a database program from a little-known company in Sweden that charges only $495 per server computer, versus a $160,000 list price for Oracle. Guess what? The Swedish stuff works great. Fired up, Murphy is hunting for other places to use the cheaper software, called MySQL. "We're just not going to pay license fees for those databases like we used to. We'll download free stuff off the Internet before we do that," Murphy says. "I believe this is the future of computing."

Interestingly, MySQL's incursion into the database domain is mirrored by that of other open source software in the Web server, operating system domains: Apache and Linux. In a paper entitled "Will Open Source Software Become An Important Institutional Strategy in Higher Education?," an executive briefing paper delivered to the Alliance for Higher Education Competitiveness in May of 2005, Rob Abel notes Apache's growing popularity Web-wide, and the increasing popularity of open source software targeted at the educational market:

Apache has over three times the market share of its nearest competitor (Microsoft) according to a poll by Netcraft of publicly available web sites – and Apache's share appears to be growing. As for specific higher education focused products, there is one, uPortal, which appears to have made a significant penetration in the higher education enterprise. On its web site uPortal notes 79 institutions that have deployed uPortal and 68 in the process of implementation.

Gavin Clark, in "Developers Mad for It," published in *The Register*, in October of 2005, notes:

MySQL is fast approaching majority market share among software developers, with 44 per cent using the open source database to meet their needs. Use of MySQL has surged 25 per cent during the last six months according to EDC.

And according to an August, 2005 world-wide survey of the server market conducted by IDC:

Linux servers posted their 12th consecutive quarter of double-digit growth, with year-over-year revenue growth of 45.1% and unit shipments up 32.1%. Customers continue to expand the role of Linux servers into an ever increasing array of workloads in both the commercial and technical segments of the market.

Another example of the growing acceptance and popularity of open source software offered in the *Forbes* article is that of E-Trade:

E-Trade, the online brokerage firm, has slashed its IT budget by 50% through measures that include replacing Sun Microsystems hardware and software with Intel-based computers running Linux and the open-source Apache Web software. Now E-Trade is considering dumping Web programs made by BEA Systems and replacing them with an open-source alternative. Though E-Trade still uses commercial database programs from IBM, Oracle and Sybase, "We would look at alternatives," says Joshua Levine, chief technology officer at E-Trade, in New York.

It was by circulating and discussing evidence such as this that the Evaluation Group was alerted to the advantages/strengths of open source software. Such discussions served to dispel the fear, uncertainty, and doubt regarding the viability of open source software, which cleared the way for the Testing Team to focus on evaluating the strength's and advantages of proven open source software—flexibility, innovation, robustness, and maturity, and control:

Fundamentally, the difference between open source and proprietary software has to do with control. Where the open source license imparts freedoms to use, modify, and redistribute the software, the proprietary license restricts use, modification, distribution, and more. Vendors of proprietary software restrict access to and use of the source code because the source is knowledge—and knowledge is power. (Coppola & Neeley, p. 3, 2004).

Eventually, after much discussion and debate, the Evaluation Group's focus narrowed and consensus began to emerge as the testing sessions progressed. Between meetings, exchanges continued via email, and a Wiki was eventually implemented to facilitate dialogue and track progress.

Once the Moodle evaluation was undertaken in earnest, evaluators soon discovered its modular structure renders it exceedingly flexible; it's freely

available source code supports pedagogical innovation and creativity; and it's ongoing development by an international coterie of users, and support of cohorts of up to 91, 000 learners,[1] were clear evidence of its maturity and robustness.

The Rating System

The LMS evaluation tool evolved throughout the testing phase and the debates that ensued, and was finalized in May, 2005. Evaluation criteria were grouped under 5 main headings: mandate, systems administration, cost, instructional design, and teaching and learning. The first (mandate) identifies concerns directly related to the University's unique mission and mandate as an open, distance-education university: monthly course registrations and extendable completion dates, individualized and cohort-based learning, affordability, accessibility (for visually, physically impaired), and connectivity (for those located in remote geographic locations). The second (systems administration) identifies concerns related to integration with existing systems (registration, authentication, library, etc.), security, and standards compliance (SCORM, XML, etc.). The third (cost) identifies concerns related to licensing fees, hardware/software, integration with existing systems, and support and in-house training. The fourth (instructional design) identifies concerns related to learning objects, the separation of content from delivery, and user friendliness. The fifth (teaching and learning) and final heading identifies a number of concerns related to the teaching and learning experience.

Methodology

Data was collected in the form an Excel spreadsheet that assigned a weight and priority rating to each criterion and automatically tabulated the result. Each evaluator's weighting and priority score was averaged to ensure consistency. The weighted scores were then totaled to provide a score for each LMS. The scope of this paper precludes the possibility of discussing the

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[1] The Open Polytechnic of New Zealand <http://campus.openpolytechnic.ac.nz/moodle/>

evaluation tool and process in detail, but both will be presented in greater detail when the paper is delivered at the conference.

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