The Commercialization of Open Source

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As presented at the
Open Source and Sustainability Conference
OSS Watch, University of Oxford
12 April 2006 | Oxford, England

Preface

This presentation explores the possibility of commercial support of open source software being developed by and for higher education. It does not address the question of whether commercial support is desirable or not.

The approach evaluated possible businesses that could emerge for the software products individually or combined into a suite of related products.

To achieve minimal volume for even a small company operating within a country, the business would need a minimum annual revenue of $2-$5 million per year to sustain the set of necessary technical skills (10 to 20 technical staff).

The analysis focuses on the Red Hat "support" model as best meeting the expressed needs of higher education.

This presentation does not address the two models of open source development—cooperative development (Brad Wheeler's "community source") and focused open development (John Norman's suggestion for the specialized tools for research universities)—successful without commercial support.

The presentation begins with excerpts from a recent A-HEC study on open source that may be new to the audience.

The reader should be aware the evaluation "comparables" are from larger companies and, in the case of Plumtree, broader markets. The capital market would discount the values based on size (and liquidity) and the historical difficulty of achieving return from the higher education market. The discount was not estimated or included.

Some slides, including these notes, have been added subsequent to the presentation either to make the presentation more easily understood by someone reading the presentation or to provide information given but not included in the presentation slides.

The A-HEC Open Source Study
3 February 2006
Alliance for Higher Education Competitiveness

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"The business drivers for open source applications in higher education favor proprietary product providers. ... the challenges for open source initiatives is to develop more stability than proprietary providers. That can only happen if there is a very large shift of industry financial resources from proprietary to open source. ... there are no signs that a large shift is occurring at this time."

Rob Abel, "Best Practices in Open Source in Higher Education Study," A-HEC, 3 February 2006.

Higher education open source

Product	Leading	Most Considered	Viable
uPortal+Luminus +Academus	16%	30%	67%
Moodle CMS	5%	23%	19%
Sakai CLE	4%	28%	13%
OSPI ePortfolio	2%	12%	7%

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Rob Abel, "Best Practices in Open Source in Higher Education Study," A-HEC, 3 February 2006.

Survey respondent comments

- Open source strengths
  - Total cost of ownership
  - Integration with the campus infrastructure
  - Functionality
  - Security
- Open source weaknesses
  - People skills required
  - Commercial support
  - Product maturity

Rob Abel, "Best Practices in Open Source in Higher Education Study," A-HEC, 3 February 2006.

Context

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- The goal of open source projects, as used here, is broad adoption and use, including many users not contributing to software development or support.

- Cooperative development and support need not have this broad objective in order to be successful and sustained by the participants.

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- This presentation focuses only on software applications specific to higher education.

- There are many open source products that can be and are used by colleges and universities as well as other organizations and businesses.

The A-HEC survey:

- "Non-higher education specific open source software ... has achieved implementations in a majority of institutions. This study estimates that 57% of all institutions have implemented some form of open source application software (operating systems, web servers, databases, etc)."

Rob Abel, "Best Practices in Open Source in Higher Education Study," A-HEC, 3 February 2006.

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Open source in higher education

Cooperative development

- Wheeler criterion of success

  [If developing and supporting software is the required alternative then] collaborative development and support reduces the unit cost for every cooperating member.

- Norman strategy

  Sharply-focused communities with near-identical needs (e.g. major research universities) can be more effective software developers than larger communities with diverse interests.

Conclusion

Without changes in the behaviour of colleges and universities and their open source development projects, it is unlikely that any current open source "product" will be sustainable in higher education.

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Sustainability

"Adopted to economics, sustainability focuses on constancy, permanence and [preserving] economical resources. The term is associated with long-term goals, long-term planning and long-term success. Economical sustainability is medium- and long-term profit maximization. Sustainable products are products offering medium-and long-term customer-value. They persist over a longer period of time."

Hoppe and Breitner, "Sustainable Business Models for E-Learning," 7 January 2004.

Software users want

- Required features + ability to add
- Sustainability
    - Reliable software
    - Long-term product support
    - Training and documentation
    - Active user community
    - Enhancements synchronized with needs
    - Reasonable costs
- Integration with other software
- Availability of trained staff
- Freedom to choose suppliers

Open source business models

Open source business models

- Software packaging

- Suite certification

- Support services

- Consulting

- ASP remote hosting

- Supplementary "added value" software

- Dual open/commercial licensing

Justin Tilton, "Open Source Business Models," 17 January 2006

Open source business models

1. "Packagers" such as Red Hat and SuSE.

    - Bundle software developed by a third party and offer a shrink-wrapped or downloadable product.

2. "Professional open source" such as MySQL AB and JBoss, Inc. (Hibernate, Tomcat, BPM)

    - Depends upon dual open/proprietary licensing

    - Paid high-quality, full-time developers

    - "Safe" for the enterprise – competitive enterprise levels of service (e.g. 24/7 technical support)

    Red Hat announced acquisition of JBoss, Inc. on 10 April 2006 during a presentation describing JBoss' strategy.

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Open source business models

3. Tri-level products (such as IBM)

- Open source for developers (e.g. open source Cloudscape)

- Low-cost, limited support for small businesses (Cloudscape)

- High-cost, full service for mission critical large-scale enterprise implementations (DB/2)

4. Integrated product "suites" (SpikeSource)

- Assemble a tested package of multiple products, open source and proprietary (e.g. uPortal, Sakai, Moodle, and Harvest Road's Hive)

Sustainability in higher education

To achieve a viable firm in a small market, a business should combine:

- Suite of integrated products with scheduled releases. (SpikeSource)

- User and technical support (Red Hat)

- Consulting (Optaros, IBM, Unisys)

- Contribution to development – for features and brand identity (Unicon and r*smart group)

The Red Hat model

"We have developed a suite of service offerings that enable large enterprise customers to capture the cost, performance and scalability benefits of our enterprise solutions. We persist in our core belief that the collaborative open source development model is the most effective method to create and deliver high-quality, broadly-used software functionality to enterprise customers."

From the "Red Hat Annual Report 2005," 16 May 2005.

Strategy = Support + suite

Where does the revenue go?

		Red Hat 2005	Blackboard 2004
Revenue			
Subscription revenue		77%	
Product			89%
Services revenue		23%	11%
	Total	100%	100%
Expenses (as a percent of revenue)			
Cost of revenue		19%	30%
Sales and marketing		32%	32%
Research and development		17%	12%
General and administrative		18%	14%
Amortization		1%	3%
	Total	86%	91%
Earnings before interest, taxes, and extraordinary		14%	9%

Open source business analysis

Why commercial partners

- Open source is a services business
  - Geoffrey Moore: "Control culture"
- Access to multiple products and "projects"
- Access to investment capital

Some foundation-funded and user-capitalized consortia may have the same characteristics of commercial firms, including access to capital.

Business strategies (observed)

Firm	Strategy
AcademicEdge	Complementary products
Embanet	Sakai ASP
Harvest Road	Complementary products
IBM Corporation	Consulting
Optaro	Consulting
Ostrakon	Product supplement
Pearson Education	Complementary products
r*smart group	**Supported suite**
remoteLearner	**Supported suite**
Sun Microsystems	Consulting, product supplement
SunGard Higher Education	unknown
Unicon Inc.	**Supported suite**
Unisys	Consulting

Markets for software

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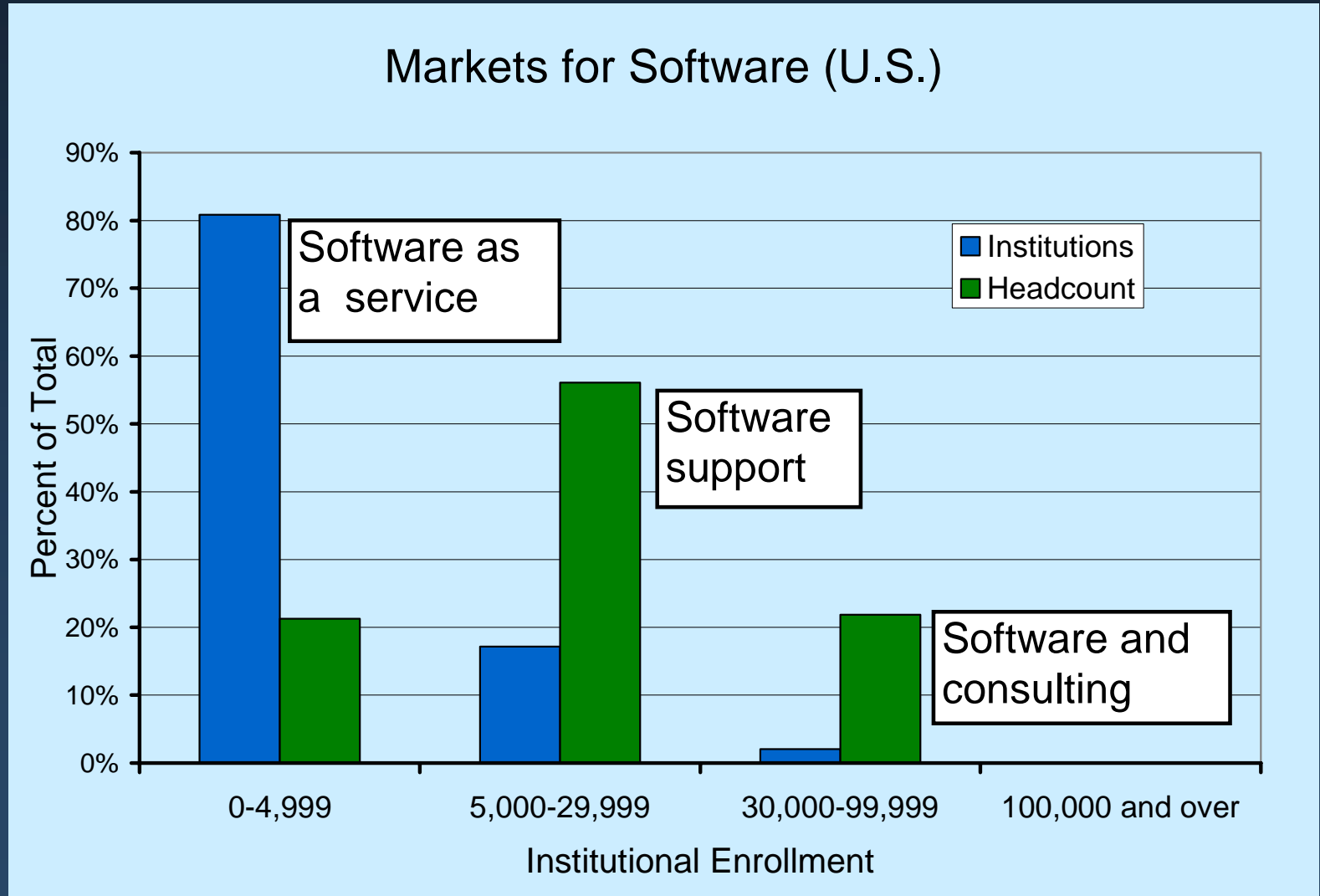
Notes

This classification was intended to represent skills that are typical for a college or university in the enrollment range. The lower enrollment colleges and universities typically have a Webmaster and few or none with programming skills. The middle tier may have programming skills, but not sufficient to maintain a modified product. This tier implements systems as they are provided. The largest universities have hundred of programmers and extensive modify and extend systems, or build and maintain their own.

For purposes of estimating the market for software as a service—often known as an ASP (application service provider), enrollment from only the lower tier was used for estimating the market.

The market value was assumed to be 4.01 times the revenue since once implemented, it is very difficult to change providers.

$7 per student is typical for Moodle partners; $50 represents a typical incremental value for on-line courses, and $300 represents a fraction of what some on-line services are charging to deliver on-line courses for a college or university.

Supported products

Supported Product Suites

Firm	Student	Kuali	OS Portfolio	Sakai CLE	Moodle	Fedora	uPortal	Portlets
AdvantageEdge	√						√	
r*smart		√	√	√				
remote.learner					√		√	√
Unicon				√			√	√

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Business evaluations (in GBP)

Comparable	Clients	Basis	Value GBP
Moodle			
Blackboard	*10,875*	*59,727*	*649,531,419*
Red Hat - £858	10,875	3,441	37,425,865
5% with support	544	3,441	1,871,293
uPortal (excluding Luminus and Academus)			
Plumtree	*450*	*158,452*	*71,303,383*
Red Hat - £858	450	3,441	1,548,656
10% with support	45	3,441	154,866

Suites			
uPortal, Moodle, CREE	589	6,883	16,251,483
uPortal, Moodle, CREE, Sakai, Hypercontent	634	13,766	34,987,269

Notes

The estimate of market value for Moodle was based on values from Blackboard's acquisition of WebCT and for uPortal on values from BEA's acquisition of Plumtree. Of course this assumes that the open source products could produce the same revenue as proprietary products—conversion from open source to proprietary would be straight-forward for both. The detailed computations are available in the companion spreadsheet. These value are much higher than the market would currently support, but can be used to suggest some substantial market value is being achieved by the broad acceptance of these two open source applications by higher education.

The second estimate was based on the number of clients and the revenue that IBM and Red Hat receive for product support of IBM's Cloudscape and Red Hat's enterprise linux—both currently $1,495 per year. Blackboard paid 4.01 time revenue for WebCT; this value was used to estimate the value from support revenue.

The revenue from suites of products were based on the proportionate selection of products from the suite. Not all clients would use all products. No revenue was attributed to the CREE library portlets; their availability would increase the number of clients, but no estimate was made.

Business evaluations (in US$)

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	Comparable	Clients	Basis	Value USD
Moodle				
	Blackboard	*10,875*	*104,054*	*1,131,587,838*
	Red Hat - US$1,495	10,875	5,996	65,201,855
	5% with support	544	5,996	3,260,093
uPortal (excluding Luminus and Academus)				
	Plumtree	*450*	*276,049*	*124,221,922*
	Red Hat - US$1,495	450	5,996	2,698,008
	10% with support	45	5,996	269,801
Suites				
	uPortal, Moodle, CREE	589	11,991	28,312,688
	uPortal, Moodle, CREE, Sakai, Hypercontent	634	23,982	60,953,430

Software as a service

Software as a Service (US)
(enrollment 5,000 headcount or less)
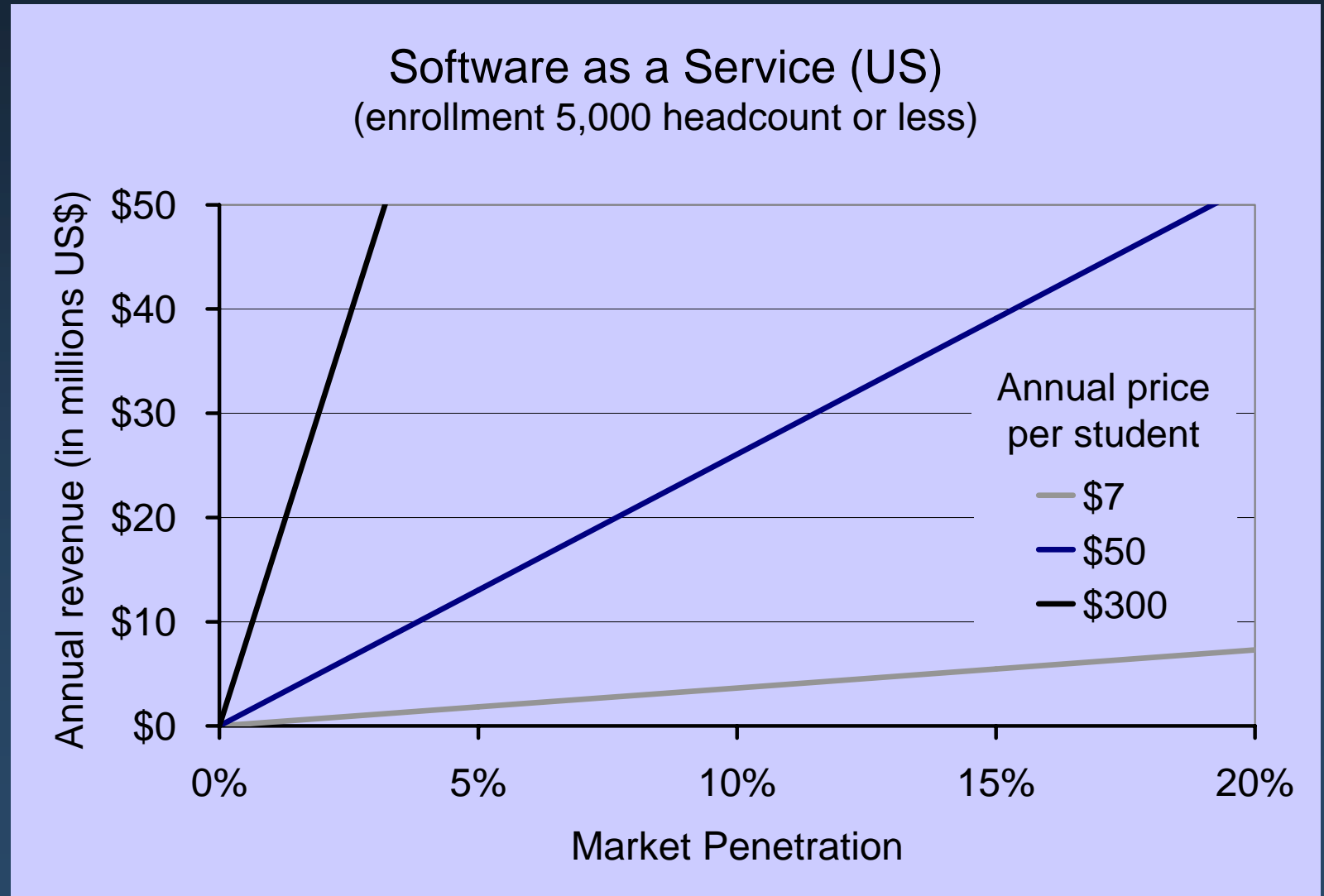
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The potential business value is based on:

- The number of "early adopters" that emerge from the development project.

- A suite of complementary products that increase value to the users and to the supporting business (in the form of revenue).

- Providing application services (SaaS) may be a complementary to support.

In summary

Open source development projects seeking commercial support should:

- Aim for a significant number of early users.

- Coordinate among projects to achieve "practical" interoperability—the "suite."

- Realize most colleges and universities potentially using the product will NOT have sufficient skills to modify, extend or maintain a complex, changing, and poorly documented application.

- Focus design and community development on the ultimate end-user—faculty, staff, students, and public—who will be making the implementation decisions.

Thriving communities

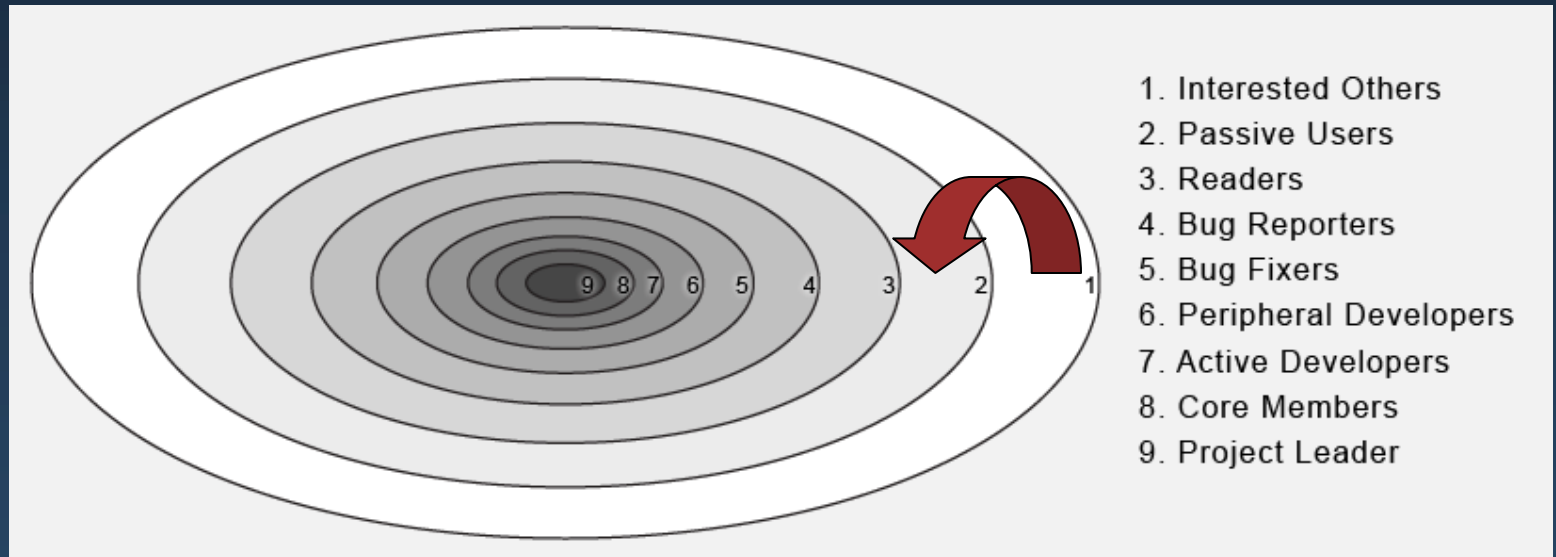Keys to social epidemics [thriving communities of interest]

- "connectors" - Certain influential people in touch with different groups of people;

- "mavens" - experts in one area;

- "salesmen" - who can win customers over.

Malcolm Gladwell as interpreted by Rachel Donadio, "The Gladwell Effect," New York Times, 5 February 2006.

Community conversion ratio

"Interested others to users"

1. Interested Others
2. Passive Users
3. Readers
4. Bug Reporters
5. Bug Fixers
6. Peripheral Developers
7. Active Developers
8. Core Members
9. Project Leader

An estimated 5 new "interested others" leads to an institutional implementation of Moodle

Notes

The concept of community participants moving from one level to another was adapted from Yunwen Ye and Kouichi Kishida's "Toward an Understanding of the Motivation of Open Source Software Developers," from a draft to appear in the " Proceedings of 2003 International Conference on Software Engineering (ICSE2003), Portland, OR, May 3-10, 2003." They say "For an OSS project to have a sustainable development, the system and the community must co-evolve. A large base of voluntarily contributing members is one of the most important success factors of OSS."

The role of "Interested others" was added to represent the large number of teachers, faculty, and education technologists who participate in the Moodle community and become Moodle users and contribute to the community by documenting practices, training other users, and even"marketing" Moodle. Only a very few become code contributors.

Moodle sites 2003-2006
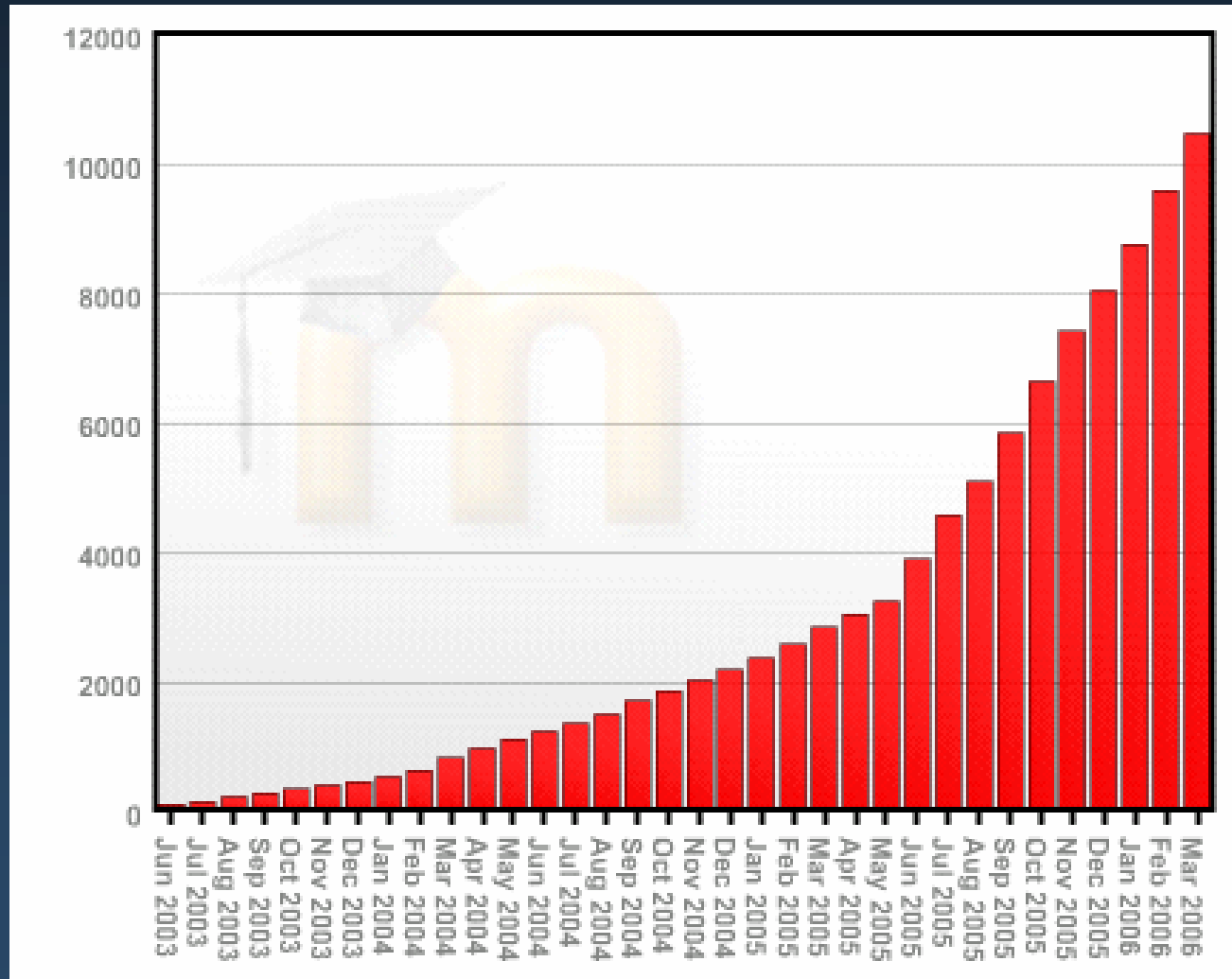
Path to sustainability

- Cooperation among development projects to ensure compliance with open standards.

- Cooperation between development projects and commercial firms.

  - Technology transfer

  - Access to community

- Community building within each development project focusing on their end-users.

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While the evaluations suggest an investment by businesses in open source higher education software projects, there are significant risks in higher education.

- The potential market is small compared to other sectors.

- Historically higher education has rarely actively supported commercial efforts focused on education.

Is uPortal sustainable?

- The open source portal/portal framework uPortal was also highly recognized and expected to succeed in the marketplace. uPortal came out on top from those respondents that rated their knowledge as excellent or expert.

- The open source course management system (CMS) Sakai emerged as the most recognized ... over 75% of the respondents had heard of Sakai.

Ron Abel, "Preliminary Analysis of the Open Source in Higher Education Survey," Alliance for Higher Education Competitiveness, May 3, 2005.

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Without changes in the behaviour of colleges and universities and their open source development projects, it is unlikely that any current open source "product" will be sustainable in higher education.

The end

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Credits

This presentation is based on a presentation made by Justin Tilton at the "Open Source in Government Conference," March 16, 2004, at George Washington University and his subsequent research at the University of Maryland's Robert H. Smith School of Business. He is now education program manger at AOL.

im+m's Jon Allen provided graphical design and graphics, and suggestions on presentation.

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