



Open Source: Risks, Rewards and Realities

Jim Farmer

As presented at the
Computing Services Management Symposium
10 April 2006 | San Diego, California USA



The biggest benefit

The biggest benefit of Open Source may be learning how to collaborate in making the investment in information and education technologies and content to support the transformation of higher education.



Open source defined

A working definition:

Open source software is made available in a form that can be modified and extended, and is available for use without any licensing fees.

More broadly, open source software is developed by a community that shares the costs and the benefits of their work.



Open source is not new

- **Wave 1 – Infrastructure**
Sendmail, Linux operating system, Apache web server, Tomcat application server, uPortal
- **Wave 2 – Learning systems**
CHEF, Bodington, OLAT, Sakai, Moodle
- **Wave 3 – Administration and Library**
Indiana University Open Source Student Services System planning study
CREE portlets



Agenda

- Available open source systems
- The economics of open source software
- Choosing open source software
- The community
- An example – the ESUP Portail Consortium (France)
- Summary

Available open source systems



Examples of open source

Systems	University and Colleges	Commercial
Finance	Kuali	Compiere
Student	Agresso, Informs, AcademicEdge	
Human Resources		Compiere
CRM		SugarCRM
Course Management	Bodington, OLAT, LAMS, Moodle	



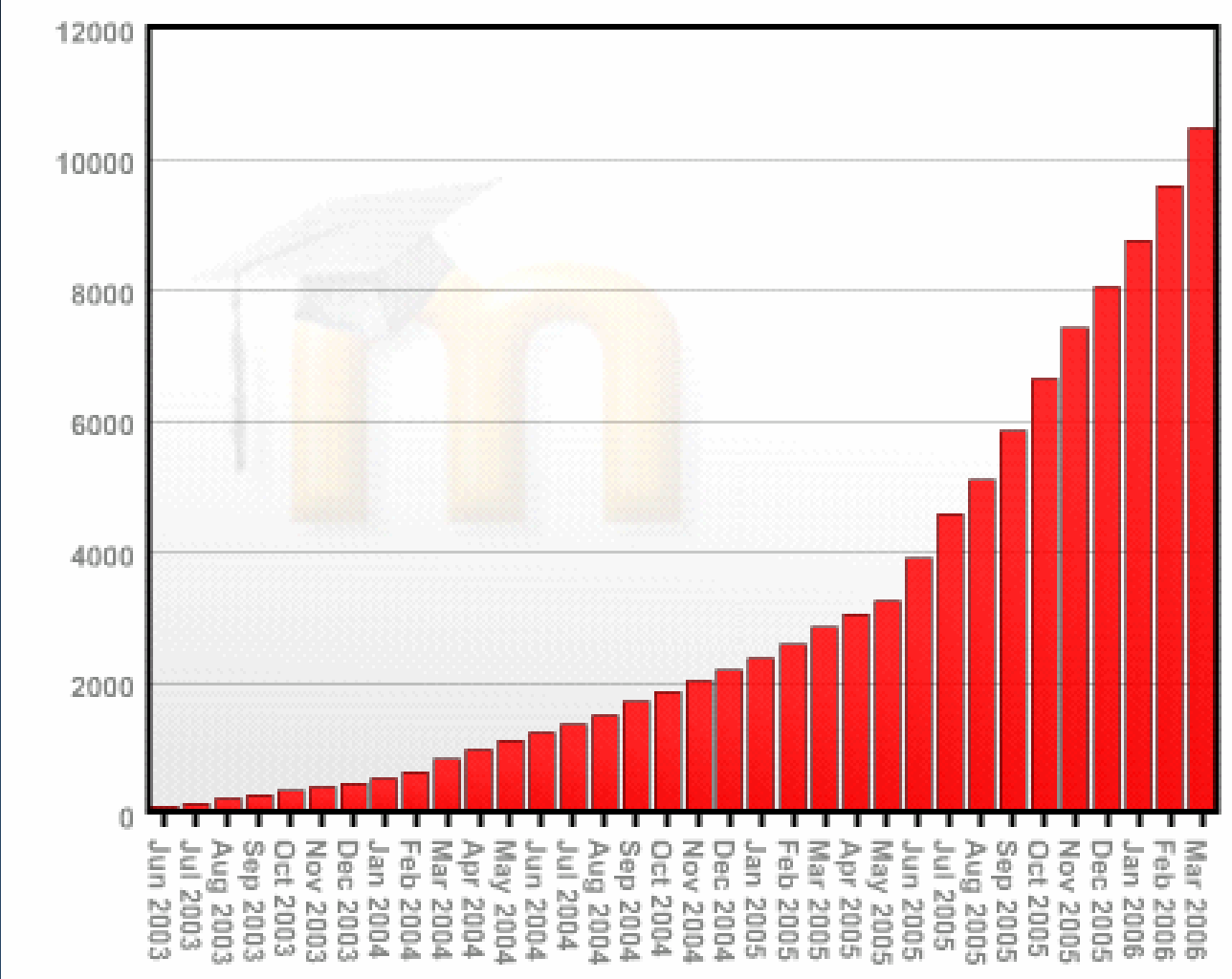
Moodle: “rogue “ enterprise system

- Moodle 1.5 sites: 7,721
(of 10,875)
- Courses: 323,866
- Users: 3,465,857
- Teachers: 598,419
- Enrolments: 5,357,535
- Quiz questions: 2,097,928



Moodle sites 2003-2006

Georgetown University





The survey numbers

<u>All Respondents</u>		<u>Most Knowledgeable</u>	
Sakai	4.4	uPortal	6.3
uPortal	3.3	Sakai	4.6
Moodle	1.6	OSP	1.9
OSP	1.6	Kuali	1.4
Kuali	1.1	Moodle	1.1
OKI	0.6	OKI	0.6
LionShare	0.3	LionShare	0.3

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



On the road to sustainability

- JA-SIG's uPortal with 900+ installations (and the ESUP Portail project)
- Moodle with 10,875 *registered* installation now growing at about 1,000 per month.

BEA paid US\$286,000 for each Plumtree client. This gives uPortal a potential market value of US\$257,000,000; or US\$4.1 million based on Red Hat's US\$1,495 annual support fee.

Based on Blackboard, Moodle has a potential market-value of \$1.2 billion (with a "b"); or, adjusted to an annual maintenance fee of US\$1,495, US\$50 million

*The economics of open source
software*



“Wall Street”-based pricing

The cost of annual maintenance can, and will, be increased to meet the profit goals that supports a desired stock price.

For the past five years, Oracle’s annual increase in annual software maintenance has been 22% per year.

Analysis of the Potential Purchase of PeopleSoft, 2003



The commercial reality

“The Corporation’s legally defined mandate is to pursue, relentlessly and without exception, its own self-interest, regardless of the often harmful consequences it might cause to others.”

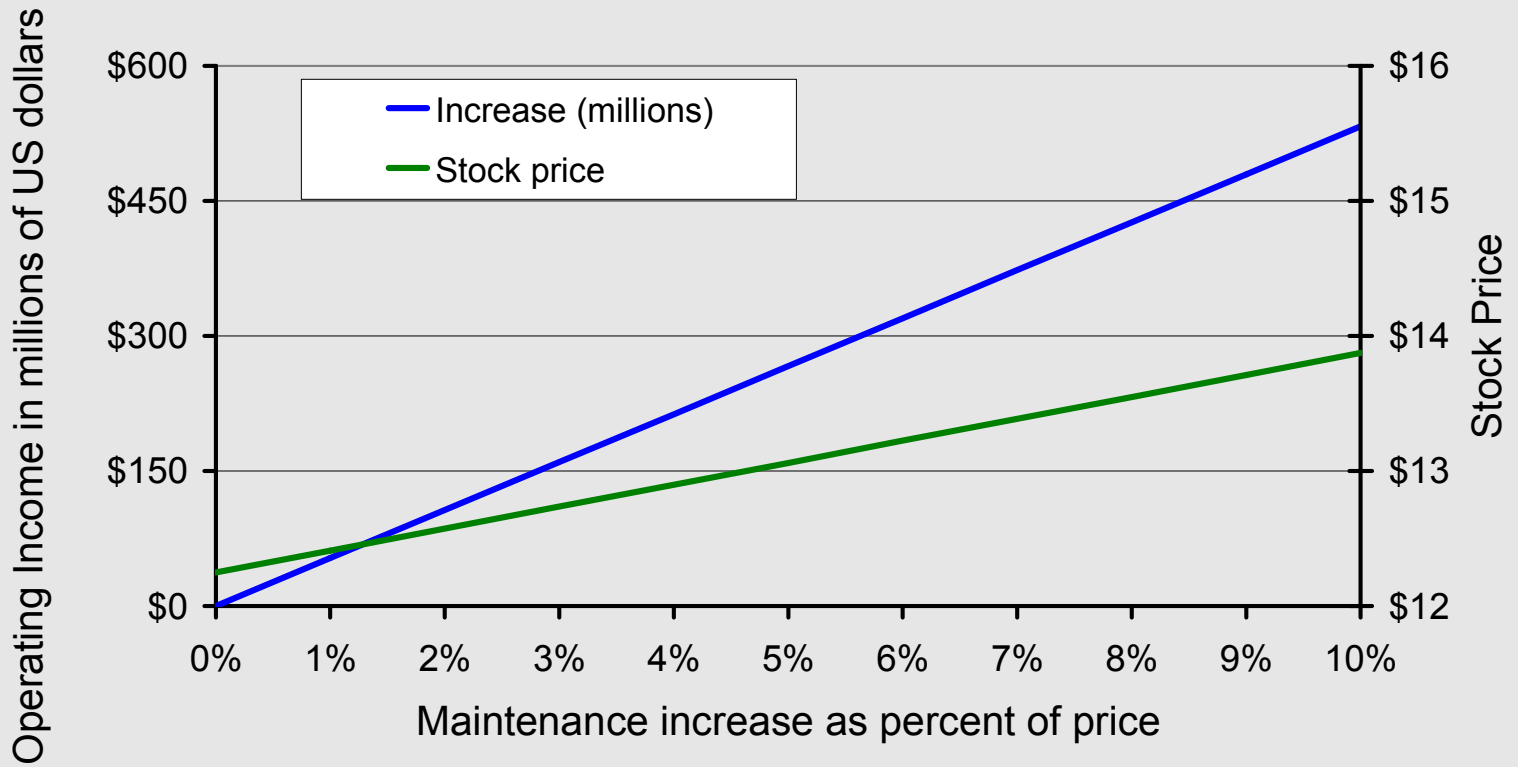
Joel Bakan, “The Corporation,” Free Press, 2004

Public corporations are beholden to their stockholders—“Wall Street”—not their users, and behave accordingly.



Need money?

Change in Operating Income, Oracle Corporation





Open source changes business model

Enterprise Software Model is Broken

- Enterprise software today
 - Long sales cycles
 - Expensive
 - Inaccessible to SMB
 - Inaccessible to small developers
 - Disconnect between license cost and manufacturing cost
- 76% of New license revenue today goes to sales and marketing¹
- We are charging customers (a lot!) to convince them they need our software!



¹ Source: Goldman Sachs





Cost of sales

- According to recent financial statements, it costs Blackboard Inc. \$281,000 to “sell” a system.
- This cost compares to an estimated cost of \$78,000 per sale for commercially-marketed open source software and \$450 to \$1,000 for community-building for the uPortal product.
- Blackboard’s average annual revenue per client was \$35,000 projected to increase to \$160,000 for a “fully adopted” client.
- Blackboard paid \$108,000 for each WebCT client.



An observation

- Higher education has little “market power”

Except for

- Software firms that earn most of their revenue from higher education

Or when there are

- Open source projects that have an active, large and supporting user base.

Choosing open source software



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 and proprietary

Open source	Proprietary
Developed by a community to meet their needs	Developed by a firm to meet the anticipated needs of procurements
Community “shares”	Firm restricts market use
Success depends upon value to user	Firm depends upon long-term fees for profit



Open source software if

- Functions are not available in commercial products
- or
- Shared development reduces unit cost of operation – the “Wheeler” criterion
- or
- Perpetual access to the source code is required (and the software supplier will not provide it)



Modifying open source

Danger Ahead! Modifying open source software has the same long-term costs of maintenance and integration as proprietary software.



Open source, an alternative but ...

- Most open source software development projects fail.
- Most consortium software development projects in higher education have failed. (CodeX, CAS, Moodle, and uPortal were or may be exceptions).
- Projects with limited scope are more likely to succeed. Components or projects extending existing software, are most likely to succeed.
- Developing software products is always a risky business.



Is higher education different?

- Bright and productive people are “cheap” (as compared to the market)
- Contributing people’s time is less difficult than approval of an equivalent amount of funds spent for supplies or services.
- Research staff can be assigned to “related” projects and remain “billable.”

Education is a distorted market

Commercial firms must monetize services

Higher Education

- Most of these features apply to Higher Education

Aggregated Layout
For distributed layout control

- System Integration & Consistency
- Single Sign-on & Security
- Personalization
- Collaboration
- Component Reuse
- Task Management & Workflow
- Internationalization
- Customer Relationship Management
- Syndicated Content Subscription

- uPortal is bridging the gap between corporate portals and the needs of Higher Education Institutions

The dilemma of “open standards”

Open Standards vs. Open Source

- ÿ Open standards offer
 - Choice
 - Flexibility
 - Standardization
 - Lower cost
- ÿ Open standards are more important to an enterprise than open source

ORACLE



The community



OSS and community

- “OSS is a very complicated phenomenon that is related to technology, human behaviors, economics, culture, and society.”
- “... learning is one of the major driving forces that motivate people to get involved in OSS communities.”
- “An Open Source Software (OSS) project is unlikely to be successful unless there is an accompanied community [and platform] for developers and users to collaborate with each other.”

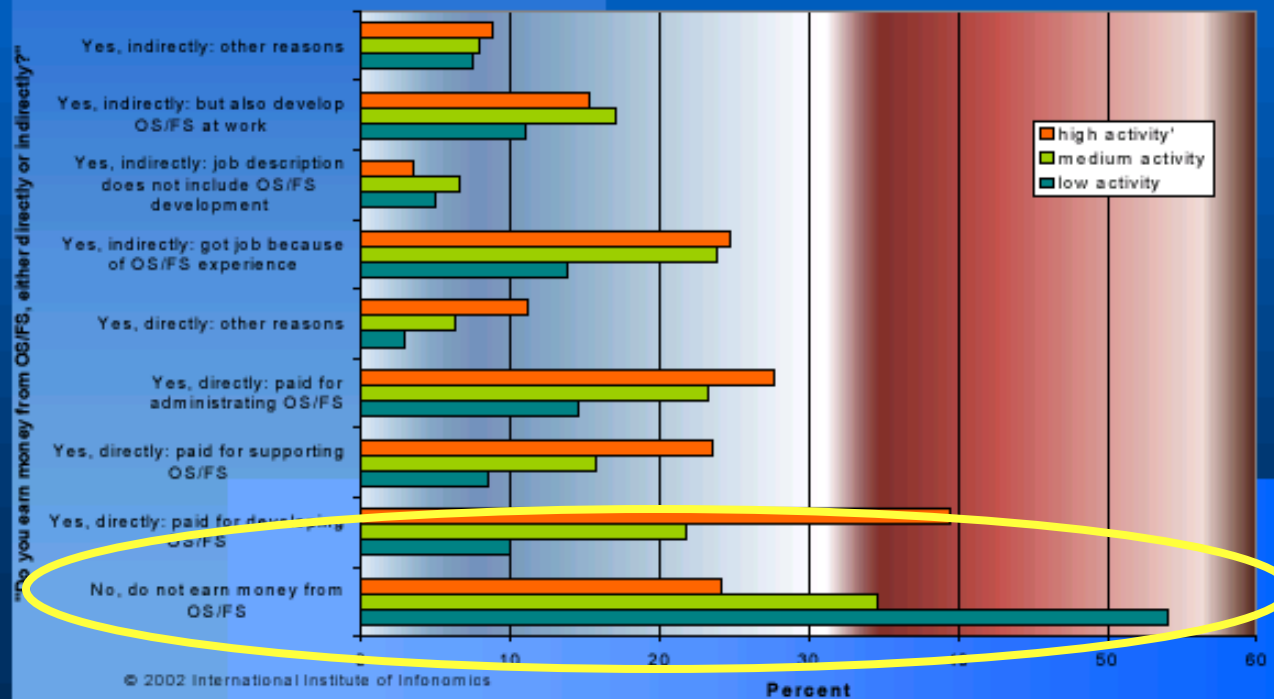
“Toward an Understanding of the Motivation of Open Source Software Developers,” Yunwen Ye and Kouichi Kishida, 10 May 2003.



Who pays for development?

Georgetown University

Degree of Activity in F/LOSS and Monetary Rewards





Open source developers

Major motivations

1. Altruism
2. Anti-Microsoft Passion
3. "Cool hobby"
4. Great personal career development
5. Useful for my job

Cited by Geoffrey Moore, Open Source Business Conference 2005

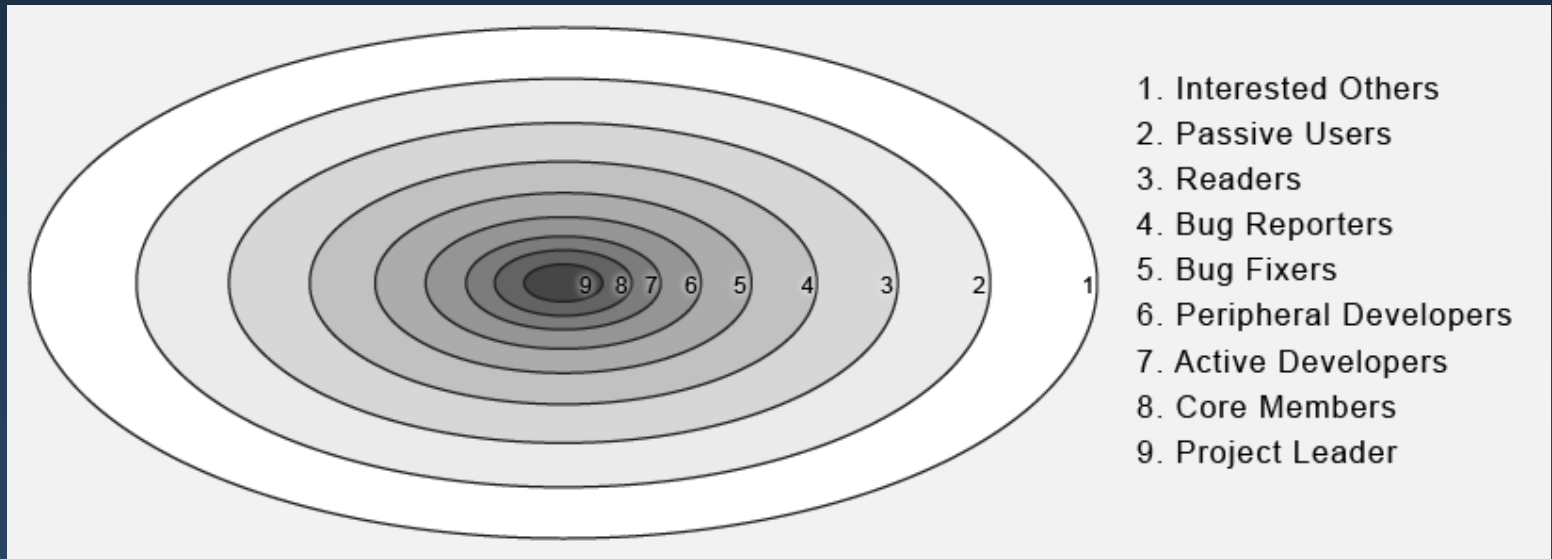
“Developers may be attracted by learning opportunities, but getting them to turn their hobby into a full-time job requires paying them salaries comparable to what they’d be earning in the proprietary software world.”

Marc Fleury, “The Challenges & Opportunities...”, July/August 2005



Users of Software

Georgetown University

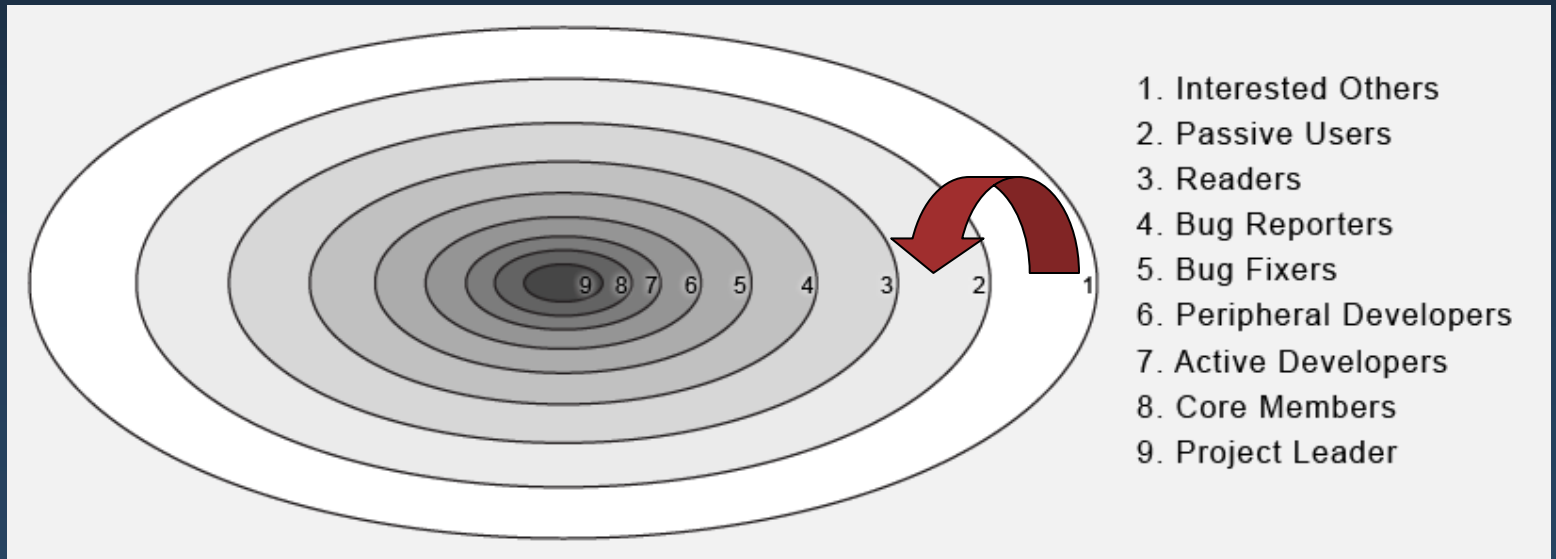


Yuwen Ye and Kouichi Kishida, "Toward an Understanding of the Motivation of Open Source Software Developers," 8 February 2003.



Community conversion ratio

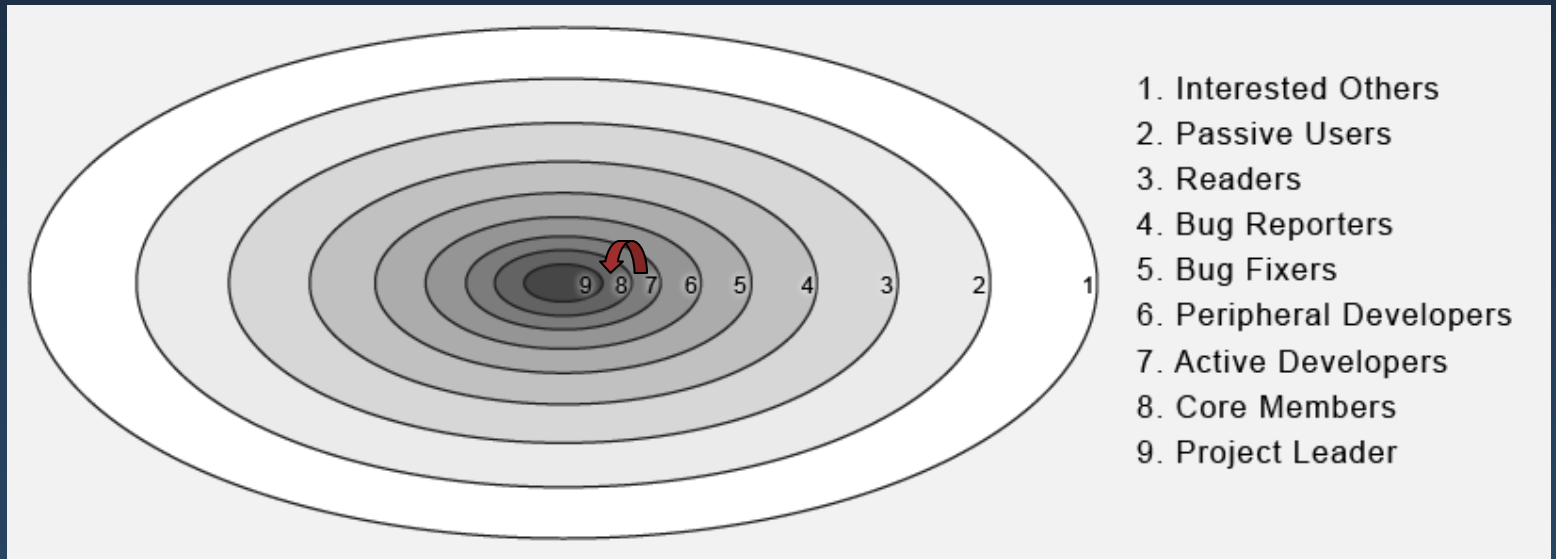
“Interested others to users”





Sustainability ratio

“Bug fixers through core members”





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.

Open source business models

Open source business models

1. “Packagers” such as Red Hat and SuSE.
 - Bundle software developed by a third party and offer a shrink-wrapped 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. 27/7 technical support)



Open source business models

3. Tri-level products (such as IBM)

- Open source for developers (e.g. open source Apache Derby)
- Low-cost, limited service for small businesses (Cloudfscape)
- High-cost, full service for mission critical large-scale enterprise implementations (DB/2)

4. Integrated Product "Suites"

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





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



Why commercial partners

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

Requires "open" license for supported open source products

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



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.



Sustainability in higher education

To achieve a viable firm in a small market:

- Suite of integrated products with scheduled releases. (Spike Source)
- User and technical support (Red Hat)
- Consulting (Optaros)
- Contribution to development – for features and branding (Unicon)



Is uPortal successful?

“There’s another project, which was funded by the Mellon Foundation ... that has been very, very successful—that’s uPortal. It’s in use at scores of institutions now. It is the primary enterprise portal at those institutions.”

Ira Fuchs, Andrew W. Mellon Foundation as quoted in
“Learning Management Systems: Are We There Yet ?,”
Syllabus Magazine, July 1, 2004.



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.

*An example:
“Perhaps the most productive use
of open source software in
higher education”*



ESUP Portail Project

- 17 French universities informally,
- now 33 other universities, school districts, and government agencies following
- Voluntary, semi-directed collaborative *implementation* and supplementary development
- Formal training program and documentation
- Support network



ESUP Portail Strategy

3. Portlets

Help Desk

JA-SIG CAS

uPortal

Tomcat

Apache

Linux

Moodle

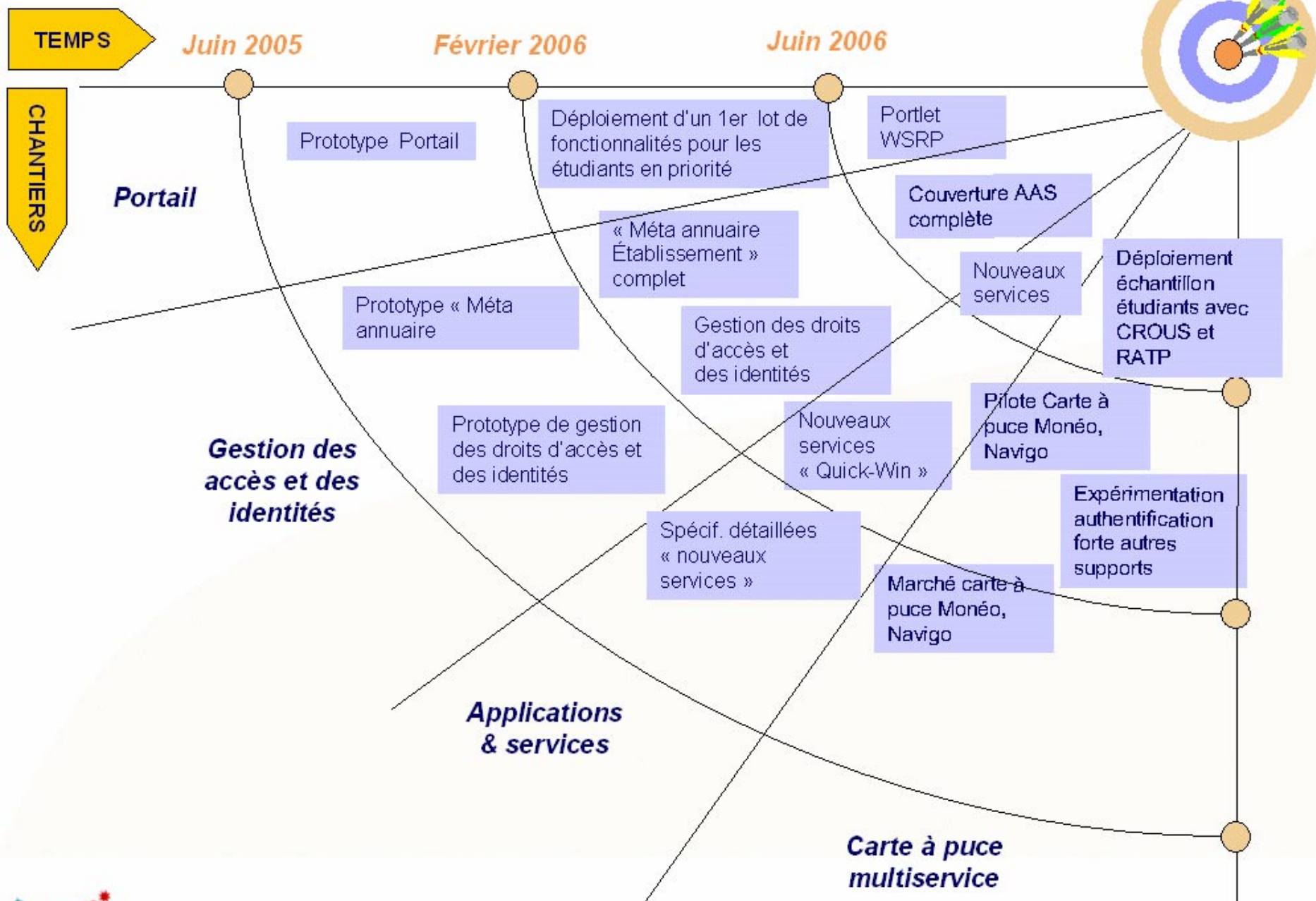
2. Integration

1. Infrastructure



CEVIF : La trajectoire

Cible=Janvier 2007



Portail ENT de l'UBO - Microsoft Internet Explorer fourni par 07/12/04 11:00

Fichier Edition Affichage Favoris Outils ?

http://ent1.univ-bret.fr/Portail/index.asp?rootNode=UP

Espace Numérique de Travail

Accueil Informations Validation de Comptes Aide

Mot de bienvenue

L'Université de Bretagne Occidentale est sur le point d'ouvrir, plus tôt qu'initialement prévu (ce qui est une promesse des acteurs et un réajustement des personnels du CRF), un Espace Numérique de Travail (ENT), véritable portail d'accès aux services numériques disponibles dans l'établissement. Il s'agit d'un service accessible à tous, personnels et étudiants. En bref, d'un formulaire outil administratif de travail destiné à l'ensemble des membres de notre communauté universitaire, y compris aux étudiants. La mise en oeuvre de l'ENT-UBO en cette rentrée de septembre 2005 marque une étape particulièrement importante dans le processus de modernisation de l'établissement.

L'un des axes majeurs du projet Université Numérique en Région Bretagne prévoit le déploiement, dans les établissements d'enseignement supérieur de

Accueil de l'Environnement numérique

L'ENT est un dispositif global, en quelque sorte un bureau virtuel, qui permet à chaque usager de l'établissement d'avoir à disposition quel accès internet où qu'il se trouve et quand il veut, un point d'accès, à travers les réseaux, à l'ensemble des ressources et services numériques en ligne en rapport avec son activité.

Que vous soyez étudiant ou personnel de l'UBO, vous pouvez accéder, à partir de cette page, à votre Environnement Numérique de Travail personnel. Une fois authentifié, vous trouverez les informations et services qui relèvent de votre statut et de votre fonction.

Actualités

Informations générales (3 annonces)

- DEBRECHE SCHEMA** des personnels des universités WA-FI dans les BR-Campes-Est
- Forum Ouest Breizh** - 1er décembre 2005
Vous êtes à la recherche d'un emploi, d'un stage, ou vous avez tout simplement envie de découvrir le monde du travail? Le Forum Ouest Breizh est une opportunité à ne pas manquer sous aucun prétexte! Avec plus de 2000 stagiaires venant de toute la Bretagne et plus de 50 entreprises, le Forum Ouest Breizh, ...
- Présentation des personnels WA-FI dans les BR**
Afin d'apporter un support aux étudiants qui voudraient utiliser le réseau WA-FI, des séances de configuration de leurs machines seront proposées les jours indiqués ci-dessous.
Des membres assureront cette opération sur trois sites différents.
(cliquez sur le titre de l'annonce pour en savoir plus...)

Internet

Portail UR2 - Microsoft Internet Explorer fourni par 07/12/04 11:00

Fichier Edition Affichage Favoris Outils ?

http://portail.ur2.fr/index.html

portailUR2

Bienvenue dans l'environnement numérique de travail de l'université Rennes 2

Accéder au Portail UR2

Accès à l'UR2

Etudiants : La première fois, activez votre compte

Accès en mode anonyme

FAQ (questions & réponses)

Contacts

Depuis le 28 février 2005, l'université Rennes 2 - Haute Bretagne met à la disposition de ses personnels et de ses étudiants un Environnement Numérique de Travail (ENT) proposant un ensemble de services numériques accessibles via un navigateur internet. A Rennes 2, cet ENT, actuellement en construction, propose les services suivants:

Personnels :

- Messagerie électronique
- Annuaire de l'Université
- Listes de diffusion de l'Université
- Annexes concernant l'évaluation du portail
- Visualisation du dossier administratif (Hautpage)

Etudiants :

- Annuaire de l'Université
- Listes de diffusion de l'Université
- Annexes concernant l'évaluation du portail
- Accès au dossier administratif
- Accès aux notes et aux résultats d'examens
- Accès à certains cours en ligne (logiciel d'enseignement à distance)

L'accès à l'ENT/Rennes 2 se fait à partir d'un compte unique, le compte **SESAME UR2**.

- Dans les prochains mois, l'ENT/Rennes 2 offrira de nouveaux services : messagerie pour les étudiants, espace de stockage, accès aux ressources documentaires.
- A plus long terme, d'autres projets sont à l'étude : intégration d'une Web-TV, agenda partagé...

Internet

CUFR Champollion - esup-portail 2.4 - Microsoft Internet Explorer fourni par 07/12/04 11:00

Fichier Edition Affichage Favoris Outils ?

http://esup.univ-bretagne.fr/Portail/index.asp?rootNode=UP

Espace Numérique de Travail JEAN-FRANÇOIS CHAMPOLLION

Accueil Ressources du multimédia Documentation

Service Commun de la Documentation

Maison du Multimédia

CUFR J.F. CHAMPOLLION

Environnement numérique de travail

Pour la rentrée universitaire 2005-2006 le Centre Universitaire de Formation et de Recherche Jean-François Champollion met à votre disposition un Environnement Numérique de Travail ou bureau à distance. Cet ENT est accessible, à partir d'un navigateur, en mode personnalisé dès que vous êtes identifié. Vous pourrez accéder aux services mis à votre disposition et passer de l'un à l'autre sans avoir à fournir à nouveau vos codes d'accès et mot de passe. L'ENT sera accessible depuis n'importe quel lieu et à n'importe quel moment. Il suffit de disposer d'un équipement connecté à l'internet (dep. votre domicile, depuis le réseau de l'université ou depuis tout autre point d'accès).

Ce projet est destiné à faciliter l'accès à vos informations en lien avec votre formation et votre statut de personnel ou d'étudiant. Vous y trouverez, dans un premier temps, les services suivants :

- Messagerie électronique
- Service d'annonces
- Consultation de résultats
- Consultation de votre dossier administratif
- Consultation de cours en ligne
- Affichage des actualités de l'université
- Gestion des agendas
- Un espace de stockage
- Un accès aux ressources documentaires
- Accès à certaines bases de données documentaires

Et bientôt des services plus évolués de travail de groupes, d'informations sur les emplois du temps, etc. Ce projet est destiné à simplifier votre travail et les accès à vos informations.

Cet outil, issu du projet national ESUP-Portail (consortium de plusieurs

Internet

ESUP - IJFM de Bretagne - Microsoft Internet Explorer fourni par 07/12/04 11:00

Fichier Edition Affichage Favoris Outils ?

http://esup.bretagne.univ-bretagne.fr/index.asp?rootNode=UP

ESUP Espace Numérique de Travail

Actualités Annonces Aide

Actualités IJFM Événements nationaux Séminaires et colloques nationaux

Actualités

ENTRE CIEL ET TERRE
Avant les Champs Libres, l'Espace des sciences présente sa dernière exposition au Colomba du 10 octobre 2005 au 20 janvier 2006 : ENTRE CIEL ET TERRE - une exposition de la cité de l'espace, animée par l'Espace des sciences, S, 4, 2, 2, 1, Coléage !
pour plus de renseignements : www.espace-sciences.org

Expositions

Travaux questionnaires
Raphaël LARRE
du 5 novembre au 2 décembre 2005
Galerie de l'espace arts et culture, SUFR de Bretagne, site de formation de Rennes, 153 rue Saint-Malo.
Contact : Isabelle BERTIN

Cadastre et mailles
VERNISSEAGE mercredi 16 novembre 2005 à 18h30
EXPOSITION du 16 novembre au 16 décembre 2005
SUFR, site de Vannes
32 avenue Roosevelt - 56000 VANNES - TEL 02.97.43.89.27
Contact : André SCHERB

Conférences

Salon du livre de jeunesse de Lorient
du 23 au 27 novembre

"Sur la terre comme au ciel, des paradis..."
Danielle SQUIN
Lundi 14 novembre 2005 de 17h30 à 19h00

La politique documentaire de l'établissement scolaire
Jean-Louis DURFAIRE
le mercredi 16 novembre 2005, de 14h30 à 17h30

"La redécouverte de tous les élèves : un défi pour l'école" - des outils pédagogiques pour engager tous les élèves dans les apprentissages fondamentaux
Sylvie CEBE
le mercredi 23 novembre 2005 - 9h30-12h00 - 13h30-16h30

Internet

In summary



The message

- There are significant risks to both open source—sustainability—and proprietary software—long term availability and costs.
- Open source projects is encouraging innovation.
- Viable commercial support should emerge.
- The reality is caution—thoughtful, researched decisions—and cooperation.

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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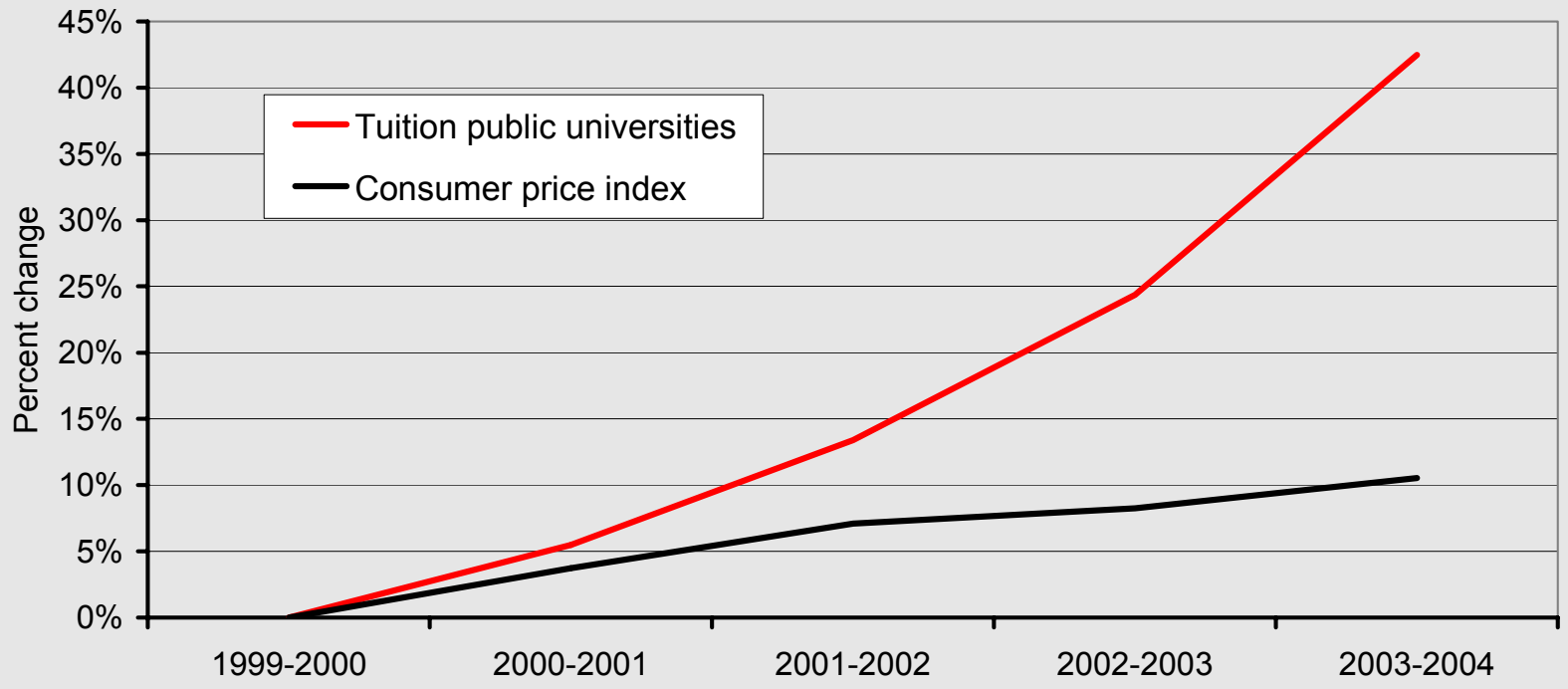
Supplementary material

Context for our dialogue



The public perception

Tuition and Required Fees Public Universities

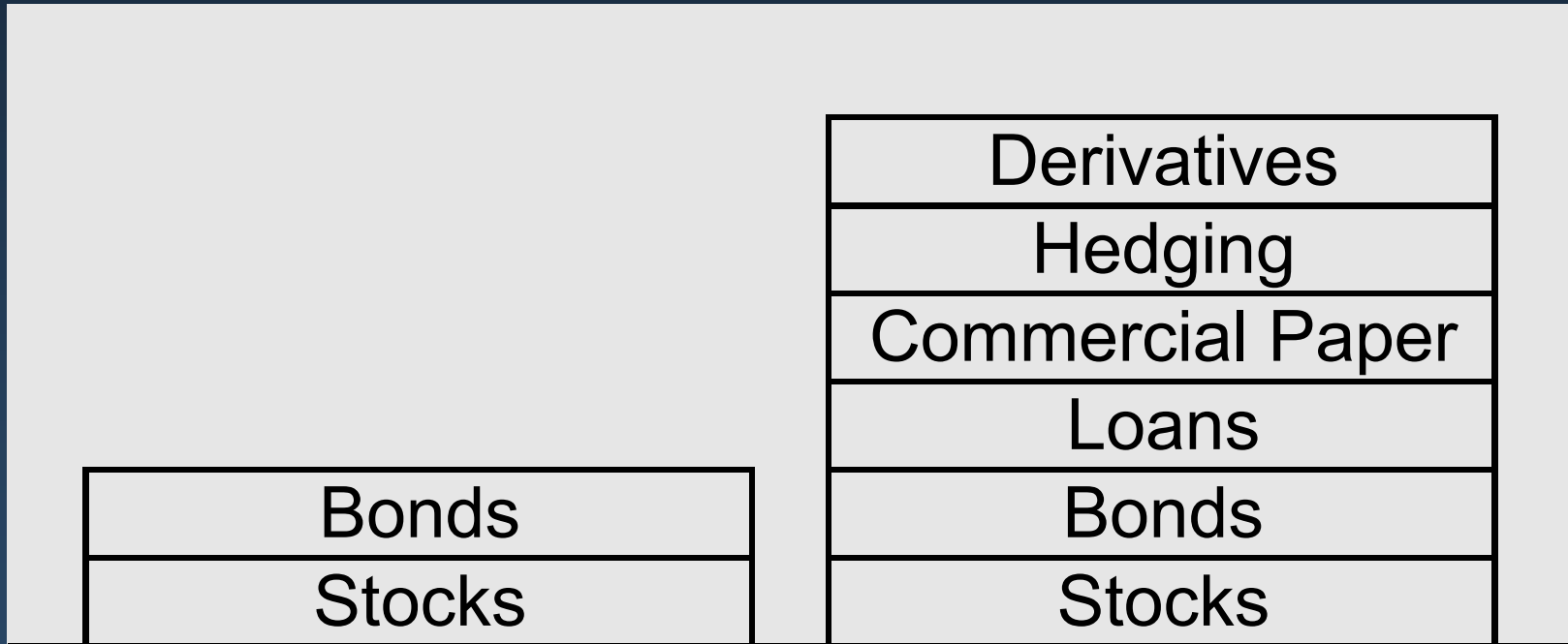


Digest of Education Statistics 2004, NCES



The student's perspective

"The explosion of knowledge"



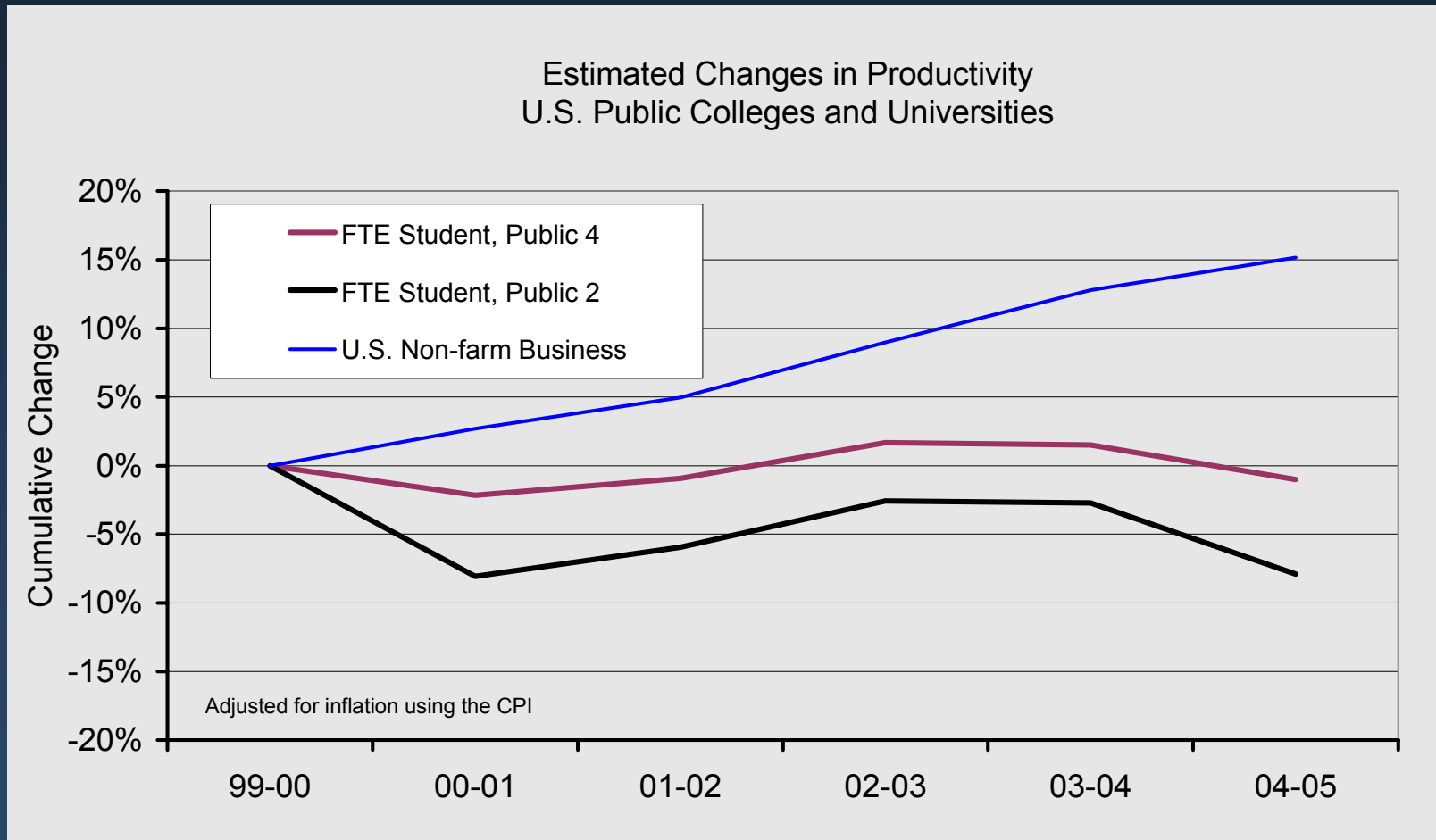
1962

2002

Finance Course, UCLA Anderson School of Management



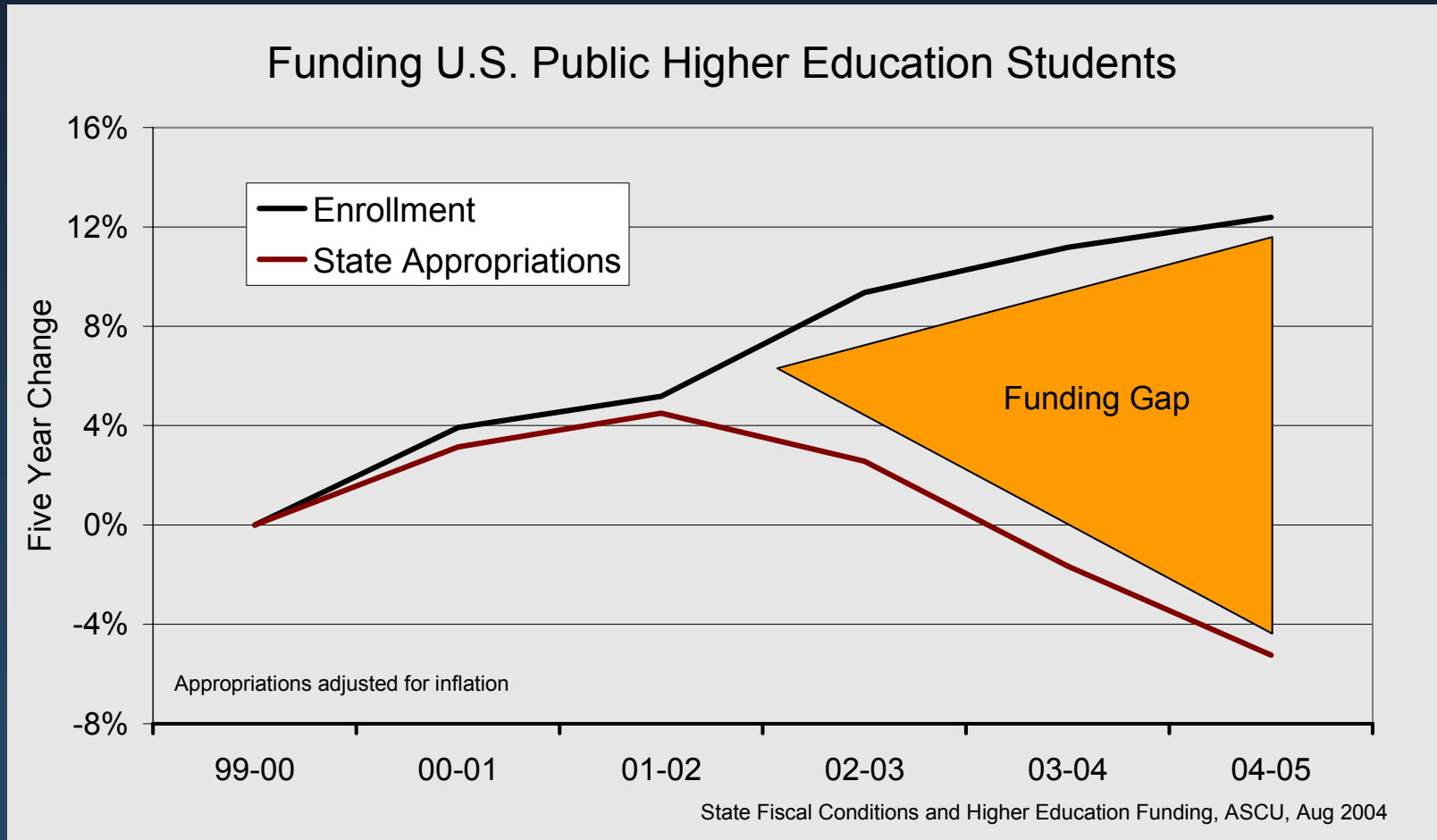
The government's view





The universities' reality

Georgetown University





Government response

- Redirection of students to lower cost colleges and universities
- Leverage bright students in high school
- Force increased productivity – “starve them into effectiveness”
- Budget-enforced restructuring of the curriculum, course offering, and support services.



“Accelerated learning”

- Dual enrollment
- Early admissions
- International Baccalaureate
- Credit for Advanced Placement examinations
- Distance Learning - Requires BIG investment!
- Credit by examination (CLEP: College Level Examination Program)
- Improved articulation and advising

Expenditures per FTE student



	Public	Private not-for-profit	Private for-profit
Doctoral, extensive	\$37,738	\$73,462	
Doctoral, intensive	21,290	26,426	\$12,915
Master's	13,886	16,234	8,231
Baccalaureate	12,309	21,672	10,418
Specialized	101,090	34,675	11,652
Two-year	9,183	14,494	11,048
Average	20,606	33,069	10,781

For 2001, Digest of Education Statistics 2003, Dec 2004



Institutional responses

- Reduced class offerings and larger class sizes
- Reduced adjunct faculty
- Narrowed curriculum
- Administrative and program reductions
- An emphasis on eLearning and eBusiness

"You just don't understand university education"

Role of education technology



Presidents on e-Learning

- “Based on his work with the University of South Australia and his conversations with presidents and financial officers, [Bill Becker] said **there is a general belief that eLearning increases the cost of education.** He said the cost of the distance learning courses at the University of South Australia exceed those offered in the classroom because of the amount of time that faculty spend responding to students.”

“Access and Persistence Symposium,” September 8, 2005, Washington, DC

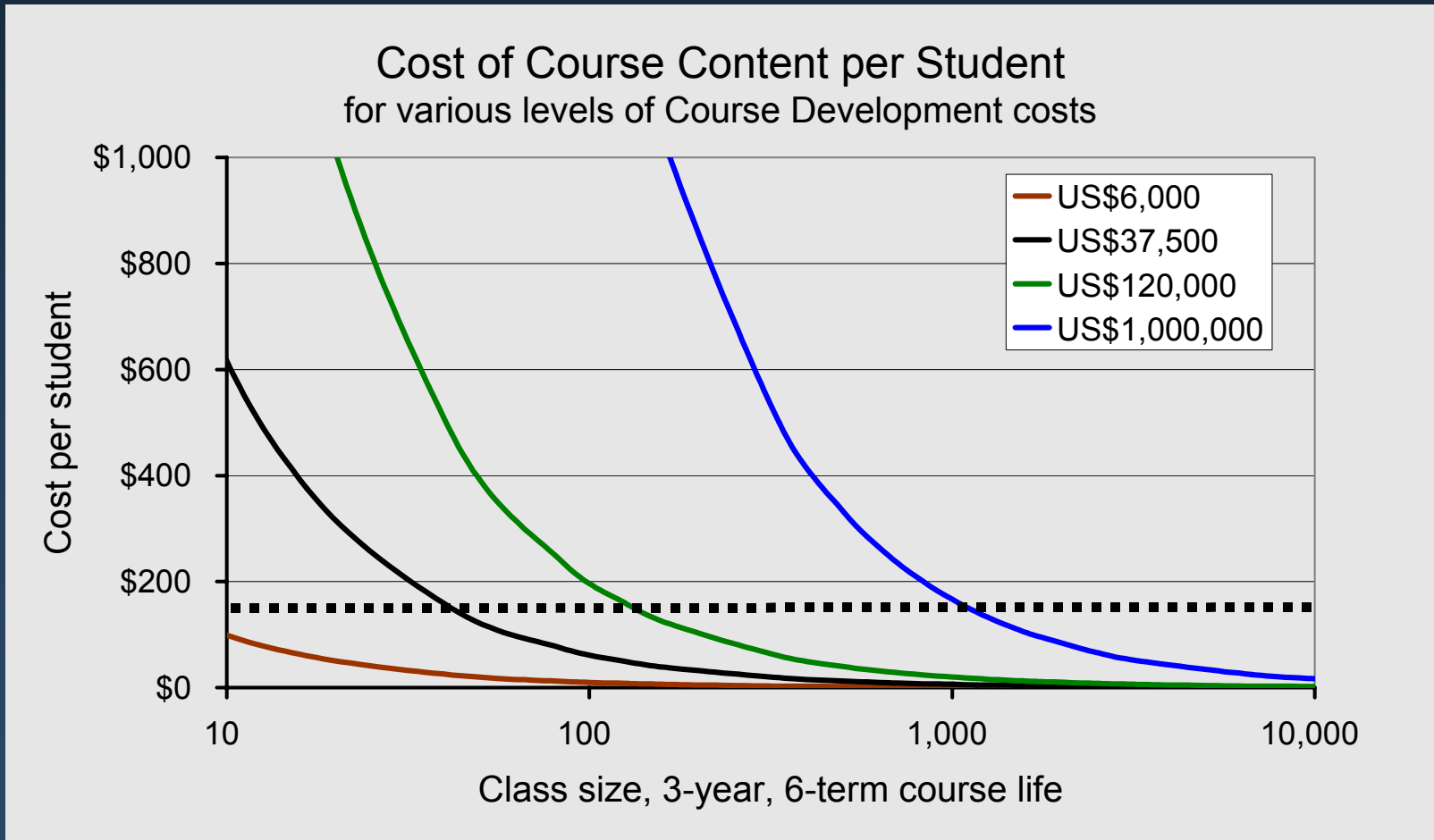


Current reengineering.

“Most information technology applications in higher education have been of the first two kinds. Enrichment add-ins improve educational quality, but they do not save either time or money. Productivity aids release faculty and student time for other tasks. Faculty time savings usually are reinvested in research (Massy and Wilger, 1992). Student time savings enhance learning or leisure but they rarely reduce the time and tuition required for the degree. Hence the individual productivity aids do not save money; indeed, they usually add to the institution’s cost base. **No wonder, then, that so many pundits question whether information technology can ever save money.**”



Investing in courseware





IT burden

- Increased student records support
 - Articulation
 - Historical record (portfolio?)
 - Real-time data exchanges with other colleges and universities and government agencies
- Increased load on student contact centers
 - Complexity increases interactions and shifts from self-service to in-person and telephone communications
 - Complexity increases the scope of information that must be made available to contact center staff
- Depending upon university strategy, increased eLearning and eLibrary support



Where do IT funds go?

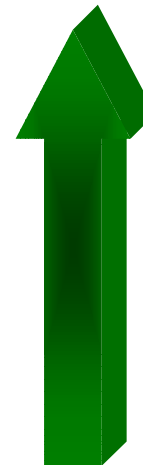
Demand for Reducing Costs

As business executives have become more appreciative of how IT and systems impact their bottom line and relationships with customers, they have become understandably more demanding.

Linking Business And It Strategies Together: Four Factors For Success, Marianne Broadbent and Ellen S. Kitzis, Jan 2005

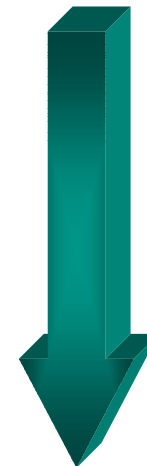
“On average, IT maintenance eats up more than **\$6 out of every \$10** in the IT budget.”

CIO Challenge: Maintenance Costs Jim Middlemiss, Wall Street & Technology, Jun 2004



Institution Demands

IT Budget Constrained by Maintenance





Where the IT dollars go

Georgetown University

Economic Realities



Information Technology



Why open standards?

- Preserves future options; choices of software tools
- Sharply reduces software maintenance
- Leads to commodity pricing
- Facilitates data exchanges with others
- Lowers training costs



Components architecture

“Software has become so big that no company can do everything alone anymore.” “... the industry must adopt standards that would enable a variety of different software vendors to provide the parts needed to quickly build a sophisticated software system.”

Hasso Plattner, CEO SAP AG at the JavaOne Conference in San Francisco, March 2002, as reported by Reuters, “Software's future is in components, SAP chief says,” March 27, 2002



Types of e-Learning

Portion of Content Delivered Online	Type of Course	Typical Description
0%	Traditional	Course with no online technology used - content is delivered in writing or orally.
1 to 29%	Web Facilitated	Course which uses web-based technology to facilitate what is essentially a face-to-face course. Uses a course management system (CMS) or web pages to post the syllabus and assignments, for example.
30-69%	Blended./Hybrid	Course that blends online and face-to-face delivery. Substantial proportion of the content is delivered online, typically uses online discussions, typically has some fact-to-face meetings.
80+%	Online	A course where most of the content is delivered online. Typically has no face-to-face meetings.



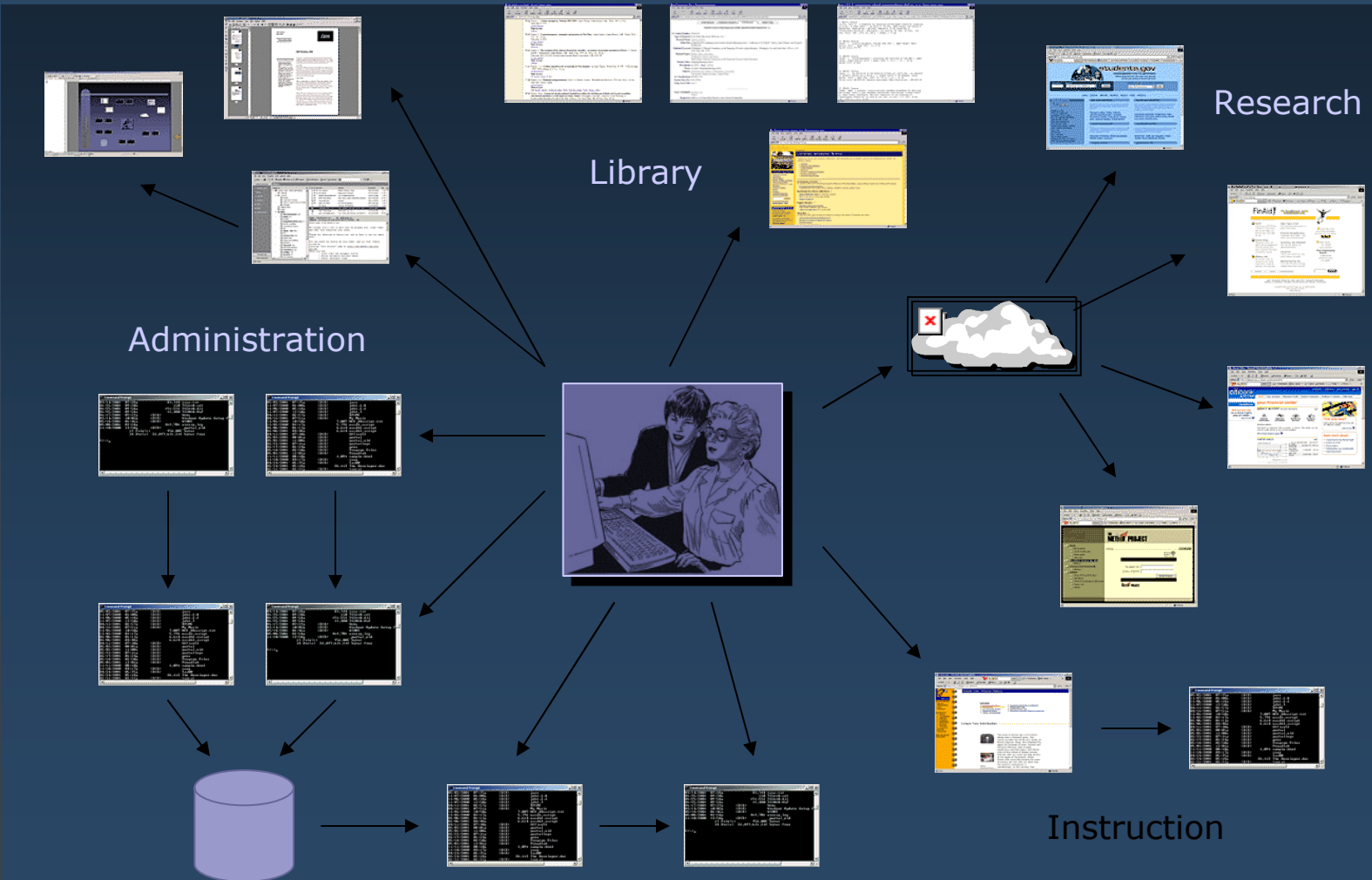
Use of eLearning

- “We did not hear that colleges looked to distance learning as a common strategy to help accommodate students and minimize loss of access. We do want to point out that one college that serves a large portion of its students through distance learning did find it economical to increase this portion. ... with the infrastructures already in place, they could accommodate additional students in these programs more easily than in classrooms.”



The higher education web world

Georgetown University



Actual screen shots of production applications,
Justin E. Tilton, 2003



Students expectations shaped by...

- [In the U.S.] Their experience applying for admissions and financial aid
- Their use of financial services portals
- Their use of the Internet
- Their life in a “real-time, information rich” environment.

Be prepared:

94% of Internet-using (78%) youths age 12-17 use the Internet for school research, 71% say it is the major source for their school projects and reports, 58% use a school or class Website, 17% have created a Webpage for school, 74% use Instant Messaging.



Students now expect...

- Customer service 24 hours a day, 7 days a week
- Complete information from a single source
- Information by Web, e-mail, telephone, facsimile, and wireless devices
 - response time of 15 seconds for telephone, 10 seconds for Web, and 2 hours for e-mail and facsimile
 - access to a complete customer history



Students prefer

- A portal
- Single sign-on even if that means revealing personal logons and passwords [aggregation/credential caching]
- Selection of content [portlets] and layout [user profile]
- Common portlet navigation and icons [consistent look & feel]



Serving students

Mode of Service	Per interaction
Web chat	\$7.50
Telephone chat	4.50
E-mail	2.50
Telephone self-service	1.85
Web self-service	0.65

*Context of eLearning
some results*



Rio Salado College and Plato Math

- Using commercially developed Interactive Mathematics Rio Salado offered four courses with one instructor.
- The number of students in a section increased from 35 to 100.
- A course assistant was added to help with course management, freeing the instructor to focus on student learning.

Academic Systems Inc. Profile, October 2002



Northern Oklahoma College

- Using Interactive Mathematics, the pass rate for Elementary Algebra increased from 45% to more than 70%.
- Sixty percent of the incoming students at Northern Oklahoma College are deficient in mathematics.
- “Students are passing math and staying in school,” Debbie Quirey said. “75 percent of our students who take one or more developmental math classes go on to pass college algebra.”

Plato Implementation Story, April 2004

Student motivation to learn

- “Quirey and others in the department attribute the success to students being able to review the Interactive Mathematics instructional module over and over again until they understand it.”
- Plato Implementation Story, April 2004
- “According to instructors, students using Interactive Mathematics reported that they tended to go back and review the software’s instruction more often than ask questions of the instructor or ask for help from tutors.”

Thomas Coe, Mathematics Department Chair, Rio Salado College
Academic Systems Profile, October 2002





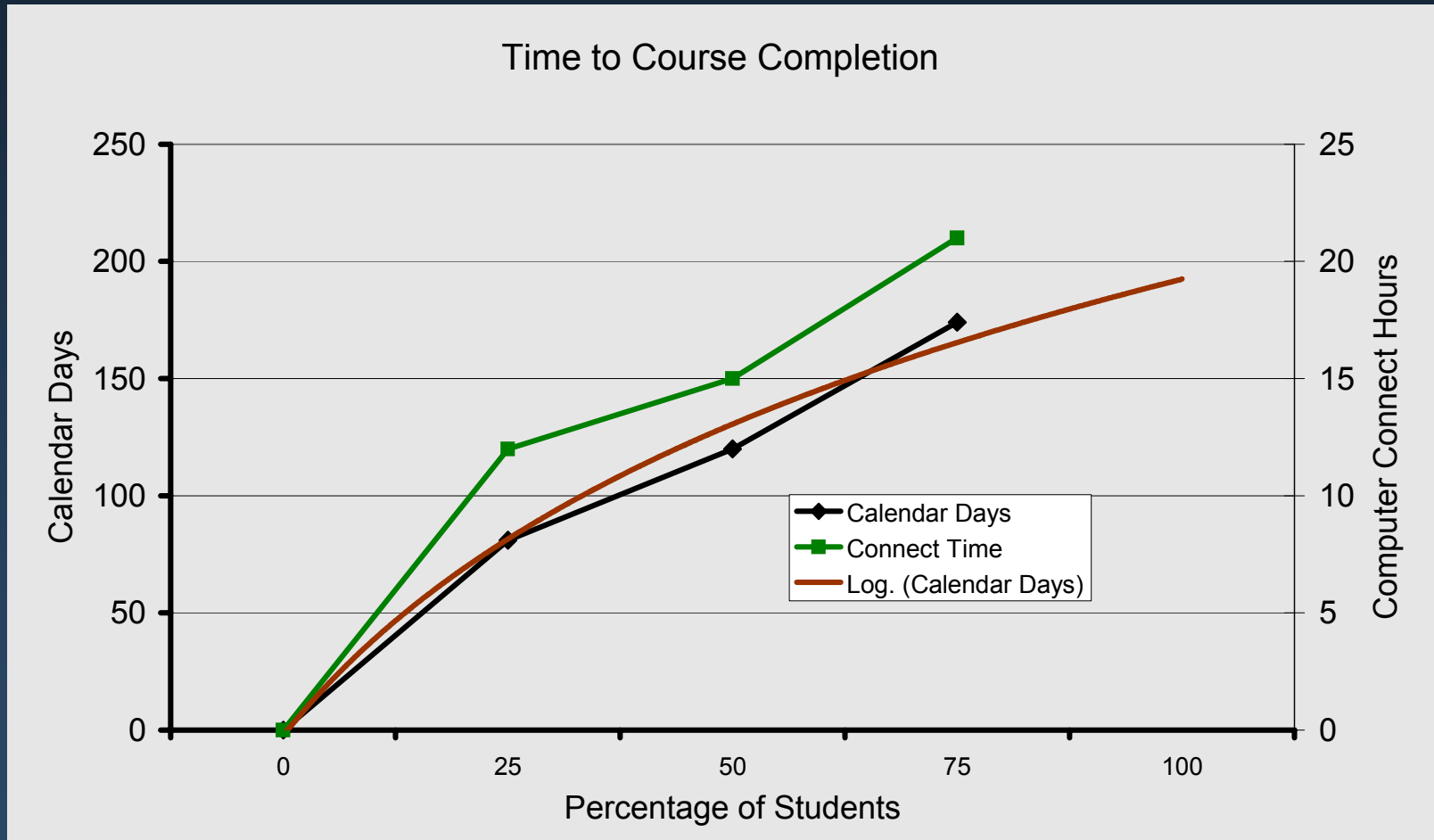
Student willingness to learn

- Students can accelerate their learning and finish more than one course level per term.
- “I have had up to 10 percent of my students complete two courses in a single semester. A few have even completed three courses.”

Kim Brown, Mathematics Department Chair, Tarrant County College
Plato Implementation Story, April 2004



Students learn at different rates





Students work differently

Georgetown University

Distribution of Time of a Session
Algebra 2

