“Do more with less”?

How four organizations translate that into “being more efficient and effective” using cloud computing services.

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Agenda

1. Introductions / Overview
2. Definitions
3. Opportunities / challenges of cloud computing
4. New services enabled by cloud computing
5. Preparing your organization for cloud computing services
6. Case study: A Library Service Platform
7. Conclusion
Campus MAIN STREET and the CROSSROADS

- Serve and engage users where they are
- Provide users with comprehensive and efficient access where they are
- Lead and partner in technology innovation
- Enhance collection storage and delivery for maximum efficiency and access
- UT Libraries serve the flagship campus of the state university system
- 3 branches and a main facility plus an outpost in Nashville and support for Space Institute in Tullahoma (Law School and Preston Medical
Overview - Banking, Cheerleading & the Vision Thing

LONG TERM
- Do what will enhance sustainability and preservation
- Do what will position us best for the future

SHORT TERM
- Don't worry about spending money for the last time--
  - We won't like it in a couple years anyway
  - New tools and technology will inevitably pull us in other directions
- Remember there's a risk in not acting
- Server room on top floor of a thirty year old building
Overview - Banking, Cheerleading & the Vision Thing

OVER ARCHING GOAL
- Invest in search so that serendipity is optimized (burst the campus boundaries)
- Invest in workflows that enhance, optimize, and streamline workflows
- Reach for better data/analytics
In the background photo is Bizzell Library is the largest research library in the state of Oklahoma. It contains almost 6 million volumes, 75,000 serials subscriptions (print and electronic), and 300 databases. OU Libraries has been a depository library for federal government documents since 1893. We maintain over 17,000 linear feet of manuscripts and archives, 1.6 million photographs, and more than 1.5 million maps and we hold more than 70 books printed before 1501, the oldest one of which was published in 1467.

This list outlines what we’ve done in just the last 20+ months. NOTE: Underlined items are being done using...
Cloud computing offers an economic advantage by allowing institutions to focus more resources on differentiating value…” (Oblinger, 2010). Clearly something we need to do better in academia today… Let’s look at what’s happening outside of academia.
Recent survey by Gitgaom Research on cloud computing showed...
The IT functions that have already won their cloud battle are:

- Web Presence: 63%
- Communications: 54%
- Disaster Recovery: 47%

SaaS applications are designed for end-users, delivered over the web.

PaaS is the set of tools and services designed to build - i.e. to make coding and deploying those applications quick and efficient.

IaaS is the hardware and software that powers it all – servers, storage, networks, operating systems.
This slide shows suppliers you likely know in each of these spaces. How to decide which to use?

**Per Rackspace - SaaS Makes Sense**
- Vanilla offerings where the solution is largely undifferentiated - email, web hosting…
- Applications where there is significant interplay between the organization and the outside world, i.e. websites where mobile access is important.
- For short term needs or where demand fluctuates significantly.

**Where SaaS May Not be the Best Option**
- Applications where extremely fast processing of
Type of cloud you select might be affected by your IT department, local regulations/legislation - for instance if research data must be stored on university owned hardware, some public clouds (Google) will not assure you that where your data will be stored (country).

Or, as in OU’s case, IT might have a “community cloud” where OU & OSU have gone together to build a jointly owned cloud.
Opportunities/challenges of cloud services

- Opportunities
  - New services
  - Collaboration / Cooperation
  - Analytics
  - Research support
  - Integration of library w/o University platforms
  - Better scalability

- Challenges
  - Meeting regulations/legislative requirements.
  - Your data in their cloud.
  - Security / Privacy
  - Support
  - Change management
  - Lock-in
  - Network infrastructure
Licenses / Limitations (Who can access the API)? You, your vendors?
Pricing
Who “owns” the data?
What if library data is “enhanced”? Who owns it then?
Extracting library owned data. (What if your cloud vendor goes bankrupt, gets sold, merged?)
Privacy
GROWTH IN WEB APIs SINCE 2005

Source: Programmable Web

Cloud computing solutions move a lot of the “common” to a shared structure. So how do we continue to meet local, unique needs? By open API’s, REST calls and or OSS extensions. But make sure your provider will accommodate this. And make sure the API’s come with training, documentation, are open to who you want them to be open to and allow you to extract your data, when you want, at no additional (or at the very least, a known) cost.
With LSP’s support becomes far more critical. Your vendor is maintaining the back end and you’re entirely dependent upon them.

Check the support ratings they get (Marshall Breeding’s reports are good for this). If they’re not good with the existing ILS products, it’s probably only going to get worse with the CC products. Ask yourself if that’s where you want to be?

Because the other thing I’ll share with you, is the vendors really can’t afford to tweak those CC service agreements much. Everyone is using the same thing. The vendors, in order to keep costs down, need everyone to agree to the same support agreements. So, we need to shop carefully on the
The ability to better predict what a community user will need when, to be ahead of them instead of behind them.
Powerful indicators, but new technology and much more to be done here. Can’t yet accurately predict human behavior, just gives trends
With all that in mind, bottom line....

Using cloud computing, libraries will go from being reactive and generic service organizations to proactive and highly personalized service organizations.
One last observation about technology change. Don’t let slow growth fool you.
1. Read Dornbusch’s quote>
2. This is known as an S-Curve. We see it throughout nature, economics, technology. Starts slow, then goes exponential. I think we’re just getting started with education technology - real change. ✪
CAVEAT: We’re creating an approaching divide in the provision of library services...
ill-informed legislation (about cloud computing in libraries) will result in ill-informed citizens...
Preparing your organization for cloud computing services

- Explain and educate team about reasons for move to cloud computing.
- Involve team in business process improvement planning and job re-definition that will result.
- Inform team about training to ensure they’re successful in new jobs.
- Provide lots of forums for discussion, Q & A.
- Do test runs, analyze results, modify and re-run.
- Only then do you implement…. 
Preparing your organization for cloud computing services

- Systems / I.T.
  - Change varies - depends on degree of control and flexibility you wish to maintain locally
  - New skills that may be needed:
    - Contract management (Service Level Agreements - SLA's)
    - Partner management (people skills)
    - API's
    - Authentication/authorization with C.C. systems.
    - Data analysis / analytics
    - Knowledge of privacy legislation/regulations (national/state/local/campus)
    - Mobile deployment
    - Survey development/compilation/interpretation
New services enabled by cloud computing

- Analytic driven services
  - Improving student retention & matriculation rates
  - Researcher support (winning grants)
  - Faculty on tenure track
- Making Library use data and collections more accessible
  - Ensuring library services are included in analysis of university services on goals achievement
- Special collections
  - Accessible, shareable scans
  - Sharing open access resources, metadata, exhibitions
- Collaboration / Cooperation
  - Repository services
  - Research data / open data / big data
  - Metadata
  - Functions
Case study: A Library Service Platform
About Boston College

• Private, Jesuit Catholic University
• Chestnut Hill, Massachusetts
• 9,500 Undergraduates
• 4,500 Graduate/Professional
• 900 Faculty
• 8 Libraries; 3+ million volumes; 745 online databases
• ARL Library
• Carnegie Classification: Comprehensive Doctoral/Research Institution
BC’s Move to the Cloud

- Enterprise library applications @ BC (pre-Alma):
  - Aleph ILS (1999)
  - Metalib; SFX; Digitool; Primo Discovery (2000-2007)
- Mid 2008: Began shifting local library servers to BC cloud
- Early 2009: Became an Alma/URM development partner with Ex Libris
- July 2012: Went live with Alma & Primo in the cloud
Outcomes of BC’s Move to the Cloud

We went from focusing on...

- Aleph Support / Server Admin
- Oracle Database Admin
- OPAC Customization
- Building SQL Reports
- Extracting Data for External Systems (Financial / ILL, etc...)
- KB Updates / Maintenance
- Building and supporting ERMdb
- Building Library Web Site & Tools for End Users / Staff
- Talking about new technologies

To focusing on...

- Using Data/APIs to power new, public-facing services
- Building library service integration tools for LMS and admin systems
- Assessment: data / usage analysis; systematic issue tracking
- Stronger collaboration w/faculty & students
- Configuring, maintaining Alma & Primo
- Service-level agreements; cloud technologies
Cloud vs. Local Applications @ BC

**Cloud Applications...**
- Alma / UResolver LSP
- Primo / Primo Central Index
- LibApps CMS (Library Web)
- LibGuides
- Canvas LMS
- WorldCat Services
- Digital Measures (faculty productivity database)

**Local Applications...**
- Metálib (federated DB search)
- Digitool (Digital Asset Mgt. App)
- LOCKSS Public + Private Nodes

**Local BC Cloud Applications...**
- EZProxy
- Islandora IR
- ILLiad ILL
- Archives Space / Toolkit
- OJS (BC Open Journals)
- 15+ Web App / Indexing VMs
- Confluence / Jira
We are talking about moving from environment of multiple system (material-based siloes) with duplicate data and duplicate workflows to a unified system in the Cloud. Managing all resource types: P, E and D.
The Goal

- **CONsolidate**
  Consolidate the frameworks

- **Optimize**
  Optimize through collaboration

- **Extend**
  Extend the range of services
'Must-Have’s of Cloud-Based SaaS

- Multi-tenancy
- Security
- Low TCO
- Reliability
- Openness
- Scalability

Cloud Based SaaS
The Cloud Computing SaaS Model: Multi-tenant, Subscription

- Faster time to value
- Automatic upgrades
- Economies of scale
- Scalability
- ‘Native’ sharing & Collaboration

“Without multi-tenancy, a SaaS offering can’t cultivate a Web 2.0-like community of developers who add functionality that all can share.”

Eric Knorr (InfoWorld)
New Models of Collaborations

- Group of institutions with relationships/collaboration in a specific library business area

- Each institution can be part of many networks in multiple business areas

- E.g. Collection Development, Cataloging and Resource Sharing
New Models of Collaborations

Collaboration should undergird all strategic developments of the university, especially at the service function level.

-No Brief Candle

- Shared: Network and Community Catalogs
- Beyond MARC
- Joint licensing
- Demand Driven
- Comparative analytics
- Peer-to-Peer
- ILL via broker, directly between partners
- Much quicker value to users
- Opportunities for direct interaction

- Cataloging
- Acquisitions
- Resource Sharing
- Fulfillment
Actionable Analytics – Driving Business Decisions
Integration with campus stakeholders & systems

- User Spaces
  - Learning Management Systems (LMS)
- Suppliers
  - Metadata Providers
  - Material Vendors
  - Resource Usage
- Partners
  - University Press
  - Open Access Repositories
  - Research Management
  - Scholarly Community
- Parent Institution
  - Student Information System (SIS)
  - Finance & ERP
  - Identity Management

ExLibris
API Platform – Secure & Scalable API Infrastructure

DEVELOPER PORTAL
- Documentation
- Tech Blog
- Code & Apps
- API Console
- Forum

API PROXY
- Access Control
- Threat Protection
- Routing
- Caching
- Throttling

API CONTROL & ANALYTICS
- Policy
- Management
- Versioning
- API Analytics
- API Monitoring

DEVELOPERS

MOBILE APPS

THIRD PARTY APPS

INTEGRATIONS
Concluding Thoughts

- Cloud-based solutions and SaaS are not just passing fads...
- Understand choices and needs & pick appropriately while limiting your risks
- Libraries/University can benefit from cloud solutions for current and future problems
- Opportunities for collaboration, analytics, new services
- Challenges: security/privacy, SLA, change management
- Prepare your organization:
  - education
  - business process improvement
  - refocus and change...
- Immediate benefits: time-to-value, scaleability, upgrades
- Cloud does not have to mean one-size-fits-all
  - Meeting local/unique needs through configurations and open interfaces, APIs, etc (AaaS)
Questions/Thoughts?

Cloud Computing