The Cloud or Bust

Cloud computing: promises and challenges

http://z.umn.edu/elichimein
Introductions

- Ed Clark, Vice President for Technology & CIO, Minnesota State University, Mankato
- Jude Higdon, Ed.D., Director of Innovative Learning and Academic Technology, College of Pharmacy, University of Minnesota
- Chad Topaz, Ph.D., Associate Professor, Department of Mathematics, Statistics, and Computer Science, Macalester College
Goals for the Session

By the end of this session, we hope you will be able to:

- **identify** various **legal, ethical, and technical challenges** to faculty and student uses of cloud-computing tools and mobile devices on campus,
- **articulate** several **strategies** for **helping faculty and students** make smart decisions about their use of cloud-computing and mobile devices for University-related activities,
- begin to **evaluate** the practicability of **implementing a collaborative, shared support structure** at their own institutions, and
- **utilize the strategies** presented as a starting point for **modeling support activities around cloud-computing** and mobile devices at their own institutions.
Session Outline

Three perspectives, with input from each other (and you) as we go:

- Faculty perspective: Inverting a math class at a liberal arts institution (Chad)
- Support challenges: Structuring a technology ecosystem to leverage the cloud, enterprise and personal (Ed)
- Faculty dreams: Helping faculty to power pedagogical dreams (Jude)
- Q & A (from ChimeIn and live)
Housekeeping

Some web addresses that may be of interest:

Presentation online at:

http://z.umn.edu/eli2012

Response questions online at:

http://z.umn.edu/elichimein
Case Study 1: Inverted Math Class at a Liberal Arts College

- Motivate instructional design via learning science framework
- Describe instructional design for Applied Calc at Macalester
- Introduce LiveScribe, GoogleModerator

xkcd
• Designed in conjunction with biologists, economists, and others
• Required for biology major, economics major, and others
• Assumes solid knowledge of high school algebra
• Unexpected gateway to applied math/stat major
• Envisioned as part of a sequence with Statistical Modeling
• Approx. 120 students in 5 sections per year
• Approx. 30% of graduating seniors leave having taken
Pedagogical Framework

Successful learning environments

- Community Centered
- Knowledge Centered
- Learner Centered
- Assessment Centered
Traditional Math Class Structure

Knowledge Centered
What Actually Happens

Lectures occur in a pre-class format.

Students pose and answer each others’ questions online.

Face-to-face time is freed up not only for assessment, but much more.
Pre-Class Lectures [Knowledge-centered]

http://z.umn.edu/livescribe
Pros and Cons of LiveScribe

PROS

- Cloud-based, non-college tool
- Pause button (for students)
- Cheap (~$100), no fee for students
- Easy to use
- Low “activation energy” for recording
- "Free" publishing mechanism (cloud-based)
- One good recorded lecture can last a long time
Pros and Cons of LiveScribe

CONS

• Cloud-based, non-college tool
• Editing is impossible
• The medium is limited
• First term recording is labor-intensive (payoff comes later)
• One or two students complain that I am not teaching them
Peer Interaction [Knowledge-, Learner-, and Community-centered]

http://z.umn.edu/googlemoderator
Pros and Cons of Google Moderator

PROS
- Free
- Automatic prioritization of questions
- Intuitive Google interface for posing/responding
- Robust back end

CONS
- Not part of institutional CMS
- Students sometimes resistant
What Actually Happens

Lectures occur in a pre-class format.

Students pose and answer each others’ questions online.

Face-to-face time is freed up not only for assessment, but much more.
Case Study 2: Support Model

BASICS

- GUIDELINES FOR CLOUD USAGE (OSU)
- http://ocio.osu.edu/policy/standards/cloud/
- Covers items such as:
  - Intellectual Property and Copyright
  - Terms of Service
    - A provider’s TOS can change at any time
  - Privacy and Data Security
  - Data Availability, Accessibility and Records Retention
Case Study 2: Support Model

BASICS (Cont.)

- PRIVATE/HYBRID CLOUD + VIRTUALIZATION
- Companies/organizations must consider:
  - business criticality of the applications
  - regulatory issues,
  - required service levels,
  - usage patterns for the workloads, and
  - integration
- Is your IT shop even capable of creating private cloud?
BASICS (Cont.)

● HYBRID

● PLATFORM-INDEPENDENT DEVELOPMENT
  (INFOWORLD’S 9 gotchas)
  ○ Gotcha 3: Developers often dislike the unfamiliar cloud territory
  ○ Gotcha 4: Lack of documentation hinders cloud developers
  ○ Gotcha 7: Cloud licenses can contain surprising deployment restrictions
  ○ Gotcha 9: The cloud's fast pace of change can be hard to keep up with
Case Study 2: Support Model

BASICS (Cont.)

- SUPPORT FLEXIBILITY
- “Rapid change” kills standardization,
- “multiple devices” means byod,
- “connect anywhere” means support anywhere

goals of the talk:
  - begin to evaluate the practicability of implementing a collaborative, shared support structure at their own institutions, and
  - utilize the strategies presented as a starting point for modeling support activities around cloud-computing and mobile devices at their own institutions.
Case Study 2: Support Model

Let's build a model:
IT Support: The Three Layer Model

Layer 1: Consultation

Layer 2: Translation

Layer 3: Infrastructure
IT Support: The Three Layer Model

Consultation

Translation

Infrastructur

Data

Translating
IT Support: The Three Layer Model

- **LOCAL**
  - Consultation

- **CENTRAL**
  - Translation
  - Infrastructure

Data flow:
- Data flows from LOCAL to CENTRAL.
- Translation is an intermediate step between LOCAL and CENTRAL.

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IT Support: The Three Layer Model

Layer 1: Consultation
- Technology Management & Strategy
- Professional Consulting
- Course Design

Layer 2: Translation
- Desktop & Classroom Support
- Application Development
- Web Design and Content Management

Layer 3: Infrastructure
- Servers & Storage
- Media and Network Services
IT Support: The Three Layer Model

Layer 1
- Consultation
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  - Professional Consulting
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Layer 2
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IT Support: The Three Layer Model

Consultation
- Technology Management & Strategy
- Professional Consulting
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Translation
- Desktop & Classroom Support
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Infrastructure
- Servers & Storage
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IT Support: The Three Layer Model

- **Consultation**
  - Technology Management & Strategy
  - Professional Consulting
  - Course Design

- **Translation**
  - Desktop & Classroom Support
  - Application Development
  - Web Design and Content Management

- **Infrastructure**
  - Servers & Storage
  - Media and Network Services

**EFFICIENCY**
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IT Support: The Three Layer Model

**Efficiency**

**Insourced Services**

**Outsourced Services**

**Consultation**
- Technology Management & Strategy
- Professional Consulting
- Course Design

**Translation**
- Desktop & Classroom Support
- Application Development
- Web Design and Content Management

**Infrastructure**
- Servers & Storage
- Media and Network Services
IT Support: The Three Layer Model

INNOVATION

Consultation
- Technology Management & Strategy
- Professional Consulting
- Course Design

Translation
- Desktop & Classroom Support
- Application Development
- Web Design and Content Management

Infrastructure
- Servers & Storage
- Media and Network Services
IT Support: The Three Layer Model

**Core Competencies**
- Consultation
  - Technology Management & Strategy
  - Professional Consulting
  - Course Design
- Translation
  - Desktop & Classroom Support
  - Application Development
  - Web Design and Content Management
- Infrastructure
  - Servers & Storage
  - Media and Network Services

**Innovation**

**Shared Competencies**
IT Support: The Three Layer Model

STARTUP COSTS

Consultation
- Technology Management & Strategy
- Professional Consulting
- Course Design

Translation
- Desktop & Classroom Support
- Application Development
- Web Design and Content Management

Infrastructure
- Servers & Storage
- Media and Network Services

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IT Support: The Three Layer Model

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Innovation Lifecycle

NO MORE ADOPTION!

Gather Requirements

Enterprise Adoption

MAINTAIN

NE

RETIRE

SHARED

ATEMPT TO STANDARDIZE

CENTRAL
Innovation Lifecycle

- **NEW**
- **SHARED**
- **CENTRAL**
- **MAINTAIN**

**Must define steps for hand-off**
Innovation Lifecycle

- **NEW**
- **SHARE**
- **CENTRAL**
- **MAINTAIN**
- **RETIRE**

**Must define steps for hand-off**
Tying It All Together

CONSULTATION

MAINTENANCE

TRANSLATION

INFR A.

RETI RE

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Tying It All Together

- LOCAL CONTROL
- CAN COORDINATE LAYERS 2 & 3
- PART OF SHARED IT STRUCTURE
Case Study 3: Helping faculty to power pedagogical dreams

Among many, many other things, applied thoughtfully, technology can help faculty to power their pedagogical dreams.
When in Doubt...

...look to Medieval times for answers to modern technological questions.
Her Vision
The Reality
Diagnosis: Motivation

**Prescription:**

Improve choice, persistence, and effort (Clark and Estes, 2008)

Clarify and/or activate expectancy and valence (Van Eerde and Thierry, 1996)

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Take Tweets from 70 Students...

...and use them to dialogue after the movie.
Dialogic Tweets

umnhist3611: I always thought gargoyles were there to protect the building from evil
Thu Mar 11 12:13:45 2010 via web

umnhist3611_4: Gargoyles gave messages/warnings of hell and the consequences of peoples' sin. #umnhist
1:11 PM Mar 11th via web

umnhist3611_7: the gargoyles are a visual symbol to the illiterate of the terrors of hell, a reminder of why they go to church #umnhist
1:11 PM Mar 11th via web

umnhist3611: the Gargoyles were to show what might happen to you if you didn't believe in god #umnhist
1:10 PM Mar 11th via web

umnhist3611_8: What was the purpose of the gargoyle decorations? If the cathedral is a house of God, why did they use Hellish decorations #umnhist
1:08 PM Mar 11th via web
Wordle Cloud
The Complex Issues

LEGAL
CYBERBULLYING
STUDENTS’ RIGHTS
TERMS OF SERVICE
DIGITAL DIVIDE
INVIGILATION
WIRELESS
ETHICAL
FERPA
OPT OUT
Phase 2: The Private Cloud

Question #1594

What if this patient was a 52 year old woman with Type 1 diabetes who had been off of her insulin for 3 months due to a loss of insurance coverage? What would you need to consider in restarting her insulin therapy?

Results

[View Results Table] [Results Spreadsheet]
Takeaways

- Faculty, academic technologists, and CIO admins think of the cloud in very different ways
  - Vertical conversations are needed to power innovation
  - Faculty -- what can this do for me and my students?
  - Academic tech -- how can I use this to help faculty?
    What are the legal, technical and ethical issues?
  - CIO/admins -- how can I structure these environments to reduce costs and still meet needs?

- Check your tech
  - Do students have the tools?
  - If not, can/will they democratize the sharing of tools?
  - Can your wireless stand up?
Takeaways (cont.)

- Consider legal and ethical issues
  - The "I Agree" button for students
  - Opt outs
  - FERPA, HIPPA or Copyrighted materials
  - IP agreements, "free" publishing, and the implications for faculty-produced materials

- Be "learner-centered"
  - "You're not teaching me"
  - Take student responses seriously, but with a grain of salt
  - Don't assume "tech savvy" capacity
Takeaways (cont.)

● Invigilation and Digital Citizenship
  ○ Is your use of a tool going to encourage cyberbullying?
  ○ How do you ensure that students understand and practice digital citizenship?

● Lines are blurring
  ○ Older private cloud model: Google, Apple, etc.
  ○ New private/public cloud model: Pearson LMS, Yammer/Chatter
  ○ Private cloud is getting easier to develop for internally (consider Purdue's HotSeat or ChimeIn)
Takeaways (cont.)

BE INTREPID!

DREAM BIG!
Thank you!

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