At the Edge of the World
With a Compass
But No Map

Ted Dodds
CIO and Vice President, Information Technologies
Cornell University
Monday, April 8, 2013
“In theory, there is no difference between theory and practice. In practice, there is.”

...Yogi Berra
Practitioner’s Perspective

WHY?
Vision

WHAT?
Strategy

How?
Tactics/Execution
1. Director of Information Technology

For all the press that teachers and nurses get for their long hours, low pay and thankless tasks, it may be surprising to see the most hated job was that of information technology director, according to CareerBliss. After all, the salary’s pretty good and with information technology such a prevalent part of everyday business, an IT director can hold almost as much sway over the fate of some companies as a chief executive.

Read more
Pressures to change the academy are growing and persistent.
Legacy coping strategies no longer work.
(raise tuition, borrow, wait, deny)
Despite a history of broken promises, IT can make a difference in addressing these challenges. Both institutionally and systemically.
This time, the outcome will be different.
Here’s why.
Cornell ... a case study

Founded 1865
1,587 faculty
1,073 academic non-faculty
7,074 staff
21,424 students

$3.2B operating budget
$5.6B endowment
“I would found an institution where any person can find instruction in any study.”
Cornell ... small town, big city

A new graduate school for entrepreneurial technologists motivated to change the world

A new academic culture and program that fully embraces and furthers today’s world, positioning Cornell Tech alumni, faculty, and students at the center of 21st century economic and societal growth.
• Cash-flow
• Reimagine
• Reduce
• Restructure
• Efficiencies
• Rebalance IT expenditures

REINVENTING THE UNIVERSITY

CORNELL’S STAIRWAY TO THE FUTURE
HIGHER EDUCATION CHALLENGES
Higher Education Challenges

• College affordability and graduate debt

Student loan writeoffs reach $540 million

The federal government is writing off another $231 million in unpaid student loans this year from more than 44,000 cases, meaning taxpayers are on the hook for more than half a billion dollars in uncollected student debt over the past few years. Supplementary spending estimates call for another $231 million in the 2012-13 fiscal year to write off 44,048 Canada Student Loan debts. The new cash for 2012-13 is in addition to nearly $312 million on the books from the 2011-12 fiscal year to cover unpaid loans from 98,448 debts dating back more than a decade. Together, taxpayers are on the hook for more than $540 million to cover uncollected student loan debt. Postmedia News
Higher Education Challenges

- College affordability and graduate debt
- Stagnant or declining revenues, all sources
Negative Outlook for US Higher Education Sector in 2013

Outlook Horizon: 12-18 months

Critical Factors:
1. Limited prospects for tuition revenue growth
2. Non-tuition revenue sources also strained: diversity no longer offers safe haven
3. Rising student loan burden and defaults taint public perception
4. Escalated regulatory and accreditation risk
5. Focus on governance and management to provide long-term sustainability

Baseline Assumptions:
1. Fundamental demand for the product is still high
2. Stronger earnings by educational attainment
3. Global economy creates need for educated workers
Majority of Sector is Tuition Dependent
Median Revenue Contributions, FY 2011

Private Universities:
$42,000+ per year, tuition and fees

Public Universities:

Note: The majority of the rated portfolio does not receive meaningful revenue from patient care or from grants and contracts, therefore the median contribution ratios for those two revenue sources is zero.

Source: Moody's MFRA
Layoffs at Athabasca U

Athabasca University will lay off 44 people due to cuts in provincial funding. The board of governors passed a budget last Friday for the new fiscal year that also eliminates 34 vacant positions and will see an extra 35 employees leaving voluntarily through Athabasca U's Career Transition Program. University officials say the provincial funding cut translates to a revenue shortfall of about $3.7 million and that leaves the institution with no choice but to cut jobs. "We had counted, as had all the post-secondsaries, on a two per cent increase in this year's operating grant as promised in last year's provincial budget," says Athabasca U president Frits Pannekoek. "We were instead surprised with a deep cut and we have been left with no other choice than to eliminate positions."

Edmonton Journal | CBC

Staff cuts on the horizon at UNBC

The University of Northern British Columbia's board has approved a $68.4-million balanced operating budget for the 2013-14 academic year, which will mean another 2% tuition increase, higher monthly parking fees, and staff cuts. UNBC president George Iwama says that while the institution continues to seek other revenue sources, static enrolment numbers and reduced levels of government funding over the past 4 years have left the board with no choice but to download some of the increased operating costs onto students. 3 full-time non-faculty staff will be laid off and one vacant faculty position will be eliminated. Prince George Citizen
Higher Education Challenges

• College affordability and graduate debt
• Declining revenues, all sources
• Growing cost pressures, despite recession cuts
• On-line education both opportunity and threat
• Culture of slow, incremental change
NOW IS THE TIME FOR TECHNOLOGY TO MAKE A DIFFERENCE
REASON FOR SKEPTICISM
Technology 

Broken

WHY ARE WE UPGRAADING?

BLACKBOX 8 & 2
SUPPORT AUG 2012
SUPPORT

TRANSFORM IT

TECH REASONS

YOU hold the Key

ERP

IMPROVED FUNCTIONALITY

EFFICIENCY

STAFF

9.1 IS NEAT

STUDENT

FEWER CLICKS

PETE WHITTON 2011
Ok, It Doesn’t Fly...yet
Mobile and Internet Adoption, Record-Breaking

![Technology Adoption Graph](source: Forbes Magazine)
Do Your IT Expenditures Look Like This?

90% Utilities

10% Differentiators

- Academic technologies
- Analytics
- Usability
- Research computing
- Mobility

- Messaging/calendaring
- Most administrative systems
- Voice and most data networking
- Desktop support
Working to a More Equal Balance

50% Differentiators
- Academic technologies
- Analytics
- Usability
- Research computing
- Mobility

50% Utilities
- Messaging/calendaring
- Most administrative systems
- Voice and most data networking
- Desktop support
Our Complexity Challenge

Common Infrastructure

Reallocate investment to academic differentiators

Cost

Complexity

Virtualization
Cloud services
Desktop management
Software consolidation

Scale/Value

Cost
IT Service Delivery

Traditional Resource Strategies
- Built at Cornell
- Buy or Outsource
- Higher-Education Community Source

Emerging Cloud Services
- Cornell Cloud Services
- Public Cloud

Common Foundational Elements
- Data Stewardship and Governance
- Federated Authentication and Authorization Services
- Optimization of local infrastructure versus cloud infrastructure / CPU / storage
- Contracts / Privacy / Use policy / Security
- LifeCycle Management
- System Integration

Communication and Outreach
✔ Technologists
✔ Administration
✔ Service Users
IT Service Delivery

Traditional Resource Strategies

- Built at Cornell
- Buy or Outsource
- Higher Ed Community Source

High cost
Resource limited
Total control
No compromise

Emerging Cloud Services

- Cornell Cloud Services
- Public Cloud

Free
Resource unlimited
Limited control
Requires compromise

Common Foundational Elements

- Data Stewardship and Governance
- Federated Authentication and Authorization Services
- Optimization of local infrastructure versus cloud infrastructure / CPU / storage
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- LifeCycle Management
- System Integration
Office 365

The project has completed nearly all faculty and staff migrations to Office 365.

23,538 moves were complete as of March 15.

From December into March, the Cornell email and calendar system for faculty and staff is being switched from Cornell's locally provided Exchange service to Office 365, Microsoft's cloud-based Exchange service.
Internet2 Value Proposition

Leverage network and federated authentication

Access to cloud services through a trusted network managed to community requirements

Accessing cloud services through the Internet2 Network provides value:
1) Unparalleled performance
2) Can be optimized to support diverse use cases
3) Can be optimized to maximize security and data privacy in transit
4) Uniquely supports collaborations

Utilizing InCommon authentication to access cloud services provides value:
1) Uniquely recognizes individuals without loss of institutional affiliation
2) Allows greater individual autonomy to access services
3) Allows the provisioning and licensing of services directly to individuals while respecting institutional obligations relative to that use
## Net+ Service Development

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<th>Research Incubator</th>
<th>Evaluation</th>
<th>Service Validation</th>
<th>Early Adopter</th>
<th>General Availability</th>
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<tr>
<td>A research driven activity to incubate very early stage solutions &amp; technical concepts towards service creation.</td>
<td>I2, service provider, &amp; 1 university, studies an offering to determine whether suited for a NET+ scale</td>
<td>Sponsor institution and group of universities work with service provider and Internet2 to define and tailor the service for a NET+ offering.</td>
<td>A small number of universities not previously involved begin using the NET+ service and to with I2 and service provider to smooth out any glitches and assist in roadmap</td>
<td>NET+ service open to eligible universities and quarterly Advisory Board meetings continue informing roadmap</td>
</tr>
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</table>

**PLUS:**

**Step 0:** Inquiry / Investigation

**Step 6:** Sunset
Net+ Today: 60 Services, 56 SPs

3 General Availability
Box, Merit, Comodo Certificates

10 Early Adopter
DuraSpace, Eduroam, Duo (BA), Evogh (BA), SIP, Adobe (BA) eText, Safenet, MS (Azure, SHI as Reseller), Instructure (BA), SDG(BA)

10 Service Validation
D2L, Dell (IaaS), Vidyo, ICE Health, AWS, MS (O365), CENIC (AWS, SIP, Virtual DC), rSmart, Code42 (Crashplan)

12 Evaluation
NCSU/IBM-VCL (Research Computing), AT&T (IaaS), CTL/Savvis (IaaS), Fischer (Identity), Splunk, Penguin/IU (HPC), LectureTools/Echo360, MS (Professional Services, Personal Storage), SHI, Starfish, Lynda, eContent (CourseLoad/McGraw-Hill)

3 Research Incubator ...
MS-big Data, Dell BDaaS, HP (HPC)

22 Inquiry Phase
FuzeBox (Video), BlueJeans (Video), Latysis (IaaS), CycleComputing (HPC), Nasuni (StaaS), MCFTech (QuickBase-PaaS), AppDynamics (Performance Monitoring), Vmware, Oracle, Day1Solutions (Storage), DocuSign, Joulex, Brocade, Bracket Systems, SnapLogic, LMC DataEdgeBackup, Mozy, Nuestar (UltraDNS), Troux, VirtuStream, Apptio, Starfish Solutions
SHIFTING RESOURCES TO DIFFERENTIATORS

...ON-LINE EDUCATION
The MOOC Disruption

Clay Cristensen, disruptive innovator's dilemma

3 goals of edX

Faculty driven, bottom up, therefore promising

Board activism will maintain pressure

– UVA story from Jun/2012
Online Learning and the Future of Residential Education

A Summit hosted by MIT and Harvard University
Cambridge, Massachusetts
March 3 and 4, 2013

Program

SUNDAY, MARCH 3

Keynote Program and Overview of Summit Objectives

Venue
Radcliffe Gymnasium, Harvard University

5:30–6:30 PM
Reception and Networking

6:30–9 PM
Discussion and Dinner
This keynote program included an overview of the Summit and an interactive dialogue with the speakers on how online learning is shaping teaching, research, and the student experience both on- and off-campus.

Welcome Remarks
Drew Gilpin Faust, President, Harvard University

Opening Conversation
- Moderator: Lawrence S. Bacow, President Emeritus, Tufts University and President-in-Residence, Harvard University
- Drew Gilpin Faust, President, Harvard University
- L. Rafael Reif, President, MIT
- Gene B. Sperling, Director, National Economic Council and Assistant to the President for Economic Policy
“If we understand the magic of what we do, how many years do we need?”

Rafael Reif, President, MIT
Shifting from Teaching to Helping Students Learn

Eric Mazur says learning interests him far more than teaching, and he encourages a shift from "teaching" to "helping students learn."
EDA sensor module. The device has a modular design and is shown with an optional radio transceiver mounted on top.

Fig. 4. Experimental setup. Measurements were recorded from (I) right fingers with the Flexcomp system, (II) left fingers with the proposed sensor module, (III) right distal forearm with the proposed sensor module using Ag/AgCl electrodes, and (IV) left distal forearm with the proposed sensor module using conductive fabric electrodes.

The device is also inconspicuous, nonstigmatizing, and allows for discrete monitoring of EDA. Furthermore, the electronic module can be easily detached when the user desires to wash the wristband.

To date, there is no generally accepted standardization with respect to electrodermal recording sites [3]. The electrodes are commonly placed on the palmar surface of the hand, the most popular sites being the medial and distal phalanges of the fingers, and the thenar and hypothenar eminences (see Fig. 4). However, since both hands are often needed for manipulation, placement of electrodes on these sites is highly susceptible to motion artifacts and interferes with daily activities. Thus, we decided to use the ventral side of the distal forearms as our recording sites. We chose to use Ag/AgCl disc electrodes with contact areas of 1.0 cm² (Thought Technology, Ltd.) for our recordings, as recommended in the literature [33]. These electrodes are disposable and can be snapped onto or removed from
PRESSURES & ENABLERS
SYSTEMIC CHANGE
The University of Virginia’s first female president, Teresa Sullivan, will step down this summer after just two years on the job because of an apparently abrupt rift between her and the school’s governing board over the direction of one of the nation’s premier public universities.

The announcement Sunday shocked the university community and signaled potential hard times ahead for the flagship university, an institution founded by Thomas Jefferson and unaccustomed to instability. The previous president, John T. Casteen, stayed for 20 years. When she exits on Aug. 15, Sullivan will have served two years and two weeks, the shortest presidential tenure in the school’s history.
Pressure - Faculty Activism

The War in Washington Square
By JEFF GOODWIN
Published: March 20, 2013

LAST week the faculty of arts and science of New York University approved a no-confidence resolution in the university’s president, John Sexton, and in the board of trustees. In December, and in the aftermath of the resolution, the largest campus demonstration in NYU history, was decisive: 298 to 224.

How did Dr. Sexton respond to the vote of no confidence of his colleagues? By conventional standards, he would be the last person to come out of this episode strengthened. One of the things that I have always been known for is my ability to work with faculty members. But I look forward to working with the faculty to maintain NYU's academic trajectory and prepare for the challenges ahead.

Read both statements and the board resolution after the jump.

Statement from John Sexton

Related
‘No Confidence’ Vote for Head of N.Y.U. (March 16, 2013)
N.Y.U.’s Global Leader Is Tested by Faculty at Home (March 10, 2013)
Enabler - Collaboration models have matured
Enabler - Learning Platforms have Matured

- Student Use
- Content

100%
Other Factors

- Never underestimate the power of denial
- Duck and cover, business as usual
- Major SaaS privacy breach
- CIOs ready to lead the conversation?
Think like a Future CIO
YES!

Will it be different this time?
Thanks for listening...
Any questions?

Ted Dodds
CIO and Vice President, Information Technologies
Cornell University
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