Top 3 Technology Trends/Issues Affecting Higher Education

How to address these trends as an IT Executive

by

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Agenda

- Part I – Research Sources for Tech Issues/Trends
- Part II – Top Three Tech Issues/Trends
- Part III – Managing the change of the Tech Issues/Trends
- Part IV – Q&A
TOP 3 Tech Issues/Trends for Higher Education

1. Infrastructure
2. Collaborations
3. Mobility
Part I

Research Sources for Tech Issues/Trends
Research Sources for Tech Issues/Trends


The Gartner Group [2]
  ▶ Top Ten Disruptive Technologies for 2008 to 2012;
  ▶ 2008 Top Ten Strategic Technologies for next 3 years

EDUCAUSE CIC – Current Issues Committee (member since 2006)

Other Publications:
  ▶ The Future of the Web, Intelligent Devices and Higher Education; EDUCAUSE; EDUCAUSE Review [7]
  ▶ James M. Dutcher – Binghamton Press – Op Ed pieces.[8]
    • Infrastructure Eco-Systems
    • Fixing SUNY
The Horizon Report – 2008 Edition

Time-to-Adoption: One Year or Less
- Grassroots Video
- Collaboration Webs

Time-to-Adoption: Two to Three Years
- Mobile Broadband
- Data Mash-ups

Time-to-Adoption: Four to Five Years
- Collective Intelligence
- Social Operating Systems
The Gartner Group - Top Ten Disruptive Technologies for 2008 to 2012

- Multi-core and hybrid processors
- Virtualization and fabric computing
- Social networks and social software
- Cloud computing and cloud/Web platforms
- Web mash-ups
- User Interface
- Ubiquitous computing
- Contextual computing
- Augmented reality
- Semantics

Gartner –2008 Top Ten Strategic Technologies for next 3 years

- Green IT
- Unified communications
- Business process modeling
- Metadata management
- Virtualization 2.0
- Mash-up and composite applications
- Web platform and "cloud computing"
- Computing fabric
- Real world web
- Social software
Top-Ten IT Issues, 2008

1. Security
2. Administrative/ERP/Information Systems
3. Funding IT
4. Infrastructure
5. Identity/Access Management
6. Disaster Recovery / Business Continuity
7. Governance, Organization, and Leadership
8. Change Management
9. E-Learning / Distributed Teaching and Learning
10. Staffing / HR Management / Training

(** member since 2006)
Part II

Top Three Tech Issues/Trends
TOP 3 Tech Issues/Trends for Higher Education

1. Infrastructure
2. Collaborations
3. Mobility
TOP 3 Tech Issues/Trends for Higher Education

1. **Infrastructure**
   - **Network**
     - Increasing bandwidth – Wired, Wireless, WiFi, Cellular
     - Beyond Internet2 – CERN, terabyte networking and beyond
   - **Data Center**
     - Server Blades
     - SANs
     - Virtualization
   - **RESULTS:**
     - Quick implementation of applications and web-based services
     - Safe/Secure IT Environments; Efficient IT management of hardware and services
     - Cost savings – HW/SW procurements, maintenance and utilities (Green IT)
     - Highly available data/info accessible data/info from anywhere anytime
     - **Cloud/Grid Computing: “The Internet is the operating system”**
       - Web 2.0; SaaS (software as a service); Mash-ups
       - Multimedia (audio/video)
       - Simulated environments
       - Enabler of On-Line **Collaborations**
TOP 3 Tech Issues/Trends for Higher Education

2. Collaborations

- On-line collaborations
  - Front end – Students (aka Customers)
    - Enhanced educational experience & Participatory research
  - Back end – Employees of the organization – planning, decision making and day-to-day operations.

- Eco-Systems [8]
  - New knowledge areas/academics [11] [12]

- Collaboratories [9] [10]

RESULTS:
  - Partnerships for success – in 3D (dimensions) – with students, internally among departments, externally with vendors, non-profits, government, other colleges, and internationally
  - Mobility:
    - Collaborations anytime/anywhere with true 24X7X360° (anytime/anywhere) support and services
    - Real time planning decision support
    - True mobile experience (laptops, smart phones)
    - Enhanced research – real-time data gathering/analysis for both academic & business purposes
3. **Mobility**

- Use of iPods, iPhones, Blackberries and (more generically) smart phones

  - **For students**
    - Download educational/course snippets to learn on the go or refresh just before an exam
    - Data collection/analysis for research and academic assignments
    - Real time/ad-hoc experiential and simulations for academics

  - **For employees**
    - Enhanced/improved communications
    - Project collaboration
    - Document sharing
    - Real-time/ad-hoc planning
    - Real-time/ad-hoc support services
    - On demand, day-to-day management & decision making
    - Fast and efficient organizational processes from anywhere at anytime
    - Cost savings to the organizations
Part III

Managing the Change of the Tech Issues/Trends
TOP 3 Tech Issues/Trends for Higher Education

1. Infrastructure
2. Collaborations
3. Mobility
Managing Customer Service

IT Management Customer Service Issues and Challenges

- Issues and challenges for Higher Education IT Managers - managing customer service [13] [14] [15]****

![Figure 1. Challenges to Instructor Support Needs](image_url)

- Securing Adequate Funding to Handle Demand: 80%
- Providing 24 x 7 Support: 71%
- Upgrading Classrooms for Technology Use: 64%
- Responding to Increased Tech Support Demands: 64%
- Maintaining Current Technical Infrastructure: 57%
- Creating Easy-to-Use Tools to Decrease Support Requirements: 57%
- Responding to Increased Pedagogical Support Demands: 43%
- Maintaining a Standard: 30%

Percent of Respondents Rating Factor a Significant Challenge in Faculty Support
Managing Customer Service

People - Mobility

IT Management

Processes-Collaborations

Infrastructure - Technology
Managing Customer Service (ITSM)

Diagram showing the integration of People, Process, Technology, and Organization.
Managing Customer Service

IT Management – Technology Infrastructure

- Maintaining Technological Currency
  - PCs
  - Network
  - Software/Applications
  - Other

- Planning/Budgeting for maintenance & replacement
  - Keeping HW under proper warranty
  - Maintaining software/application licensing
  - Replacement policies for hardware (computer, network, server, etc)
  - Establishing Leasing/turn-over cycle
    - Allows for optimal planning/support
    - Spread costs out – removes big “one-time” hits to the budget.

- Critical Success Factor is proper (operational) planning/budgeting
Managing Customer Service

IT Management – Processes [15]

- ITIL – Information Technology Infrastructure Library

- ITSM – Information Technology Service Management
  - People, Process, Technology, Organization, Integration

- Critical Success Factors are to
  - Stabilize
  - Standardize
  - Establish repeatable IT processes (planning, managing, budgeting)
  - IT Management philosophy of continuous improvement (with assessment and feedback)
    » Define, control & stabilize, measure, improve
ITSM - IT Management Philosophy

IT Management Philosophy: Continual Process Improvement

Define → Measure → Control & Stabilize → Improve → Define

What is not defined cannot be controlled
What is not controlled cannot be measured
What is not measured cannot be improved
Managing Customer Service

IT Management - People

- ITS/Technical personnel
  - Regular/budgeted training for technical competency/currency
    - Software Applications installation/use; Specific hardware installed/used
    - Regular/budgeting training on “softer skills”
    - Customer Service Skills
    - Grant Writing; Project Management; Budgeting/Contracts
    - Vendor partnering/relationship building
    - IT Security
  - ITSM – Information Technology Service Management (see Processes)

- Non-ITS/Technical personnel
  - Regular/budgeted training on
    - LMS/CMS
    - PC/Internet use skills
    - Office productivity software proficiency; Other software/applications use
    - On-line & mobile collaboration tools
    - Engagement of ITS dept personnel (using ITSM)

- Critical Success Factor(s)
  - Establish working relationships with IT personnel and end user/departments.
  - **TIME/TRAINING ALLOCATIONS FOR FUTURE TECH CHALLENGES/TRENDS**
ITSM Components [16]

SolutionMethod™ - ITSM Methodology

Business End-Users (Customers)

Requirements (Needs)  Services (Provided)

Requirements (Defined)  Technology and Services (Proposed)

IT Service Delivery Processes:
- Service Level Management
- Availability Management
- Capacity Management
- Financial Management

IT Service Support Processes:
- Incident Management
- Problem Management
- Configuration Management
- Service Desk (Function)
- Change Management
- Release Management
- Performance Management
- Service Continuity

Support Services

Requirements Definition Process:
- Business Strategy
- Service Planning
- Organization Planning
- Technology Planning
Implementing ITSM

SolutionMethod™ - ITSM Implementation

Strategy ➔ Business ➔ Service ➔ Operational ➔ Technology
ITSM Methodology - Benefits

- Better able to manage customer service requests
- Better able to manage change
- Ability to be more flexible and responsive to customer needs
- Provide consistent and stable IT services
- Provide highly available, safe/secure IT infrastructure
- Improve communication throughout the organization
- Improved Customer and User satisfaction
- Common language (for both tech and non-tech personnel)
- Deliver efficient and effective IT services in all areas/depts of an organization
- **Able to adapt to and address future IT Trends/Issues**
### ITSM Methodology – Benefits – old vs. new

<table>
<thead>
<tr>
<th>Traditional IT (old)</th>
<th>becomes</th>
<th>ITSM Process (new)</th>
</tr>
</thead>
<tbody>
<tr>
<td>REACTIVE</td>
<td>-&gt;</td>
<td>PROACTIVE</td>
</tr>
<tr>
<td>“fire-fighting”</td>
<td>-&gt;</td>
<td>Preventive</td>
</tr>
<tr>
<td>Technology Focus</td>
<td>-&gt;</td>
<td>People/Process Focus</td>
</tr>
<tr>
<td>Users</td>
<td>-&gt;</td>
<td>Customers</td>
</tr>
<tr>
<td>Centralized (access), done in-house,</td>
<td>-&gt;</td>
<td>Distributed (access), sourced, integrated, enterprise-wide, self service</td>
</tr>
<tr>
<td>silos</td>
<td></td>
<td></td>
</tr>
<tr>
<td>One-offs, ad-hoc, informal processes</td>
<td>-&gt;</td>
<td>Repeatable, accountable, formal best practices</td>
</tr>
<tr>
<td>IT internal perspective</td>
<td>-&gt;</td>
<td>Organization perspective</td>
</tr>
<tr>
<td>Operational specific</td>
<td>-&gt;</td>
<td>Service Orientation</td>
</tr>
</tbody>
</table>
How to address the Tech Issues/Trends

- Aligning IT Strategic/Master Plan with all other organizational strategic/master plans

- Identify specific Tech Trends/Issues that are aligned with and support the advancement of other organizational goals/objectives.

- Articulate the targeted trends/issues in the IT Strategic/master plan goals and objectives
  - Based on priority/ranking, the organization will make the conscious decision to devote people, time and resources

- Example
  - SUNY Orange – Podcasting
    - Useful (addresses goals/objectives) for Academics -
    - Useful Adult continuing education/training
    - Useful for College communications/marketing
      - New students
      - Fund raising
      - Strategic communication needs
The Future…account for new/emerging technologies

1. Infrastructure
2. Collaborations
3. Mobility

RESULTS

- Internet everywhere
- Internet enabled devices
- Migrations
- Integrations, convergences
- IT anywhere at anytime
- IT SERVICES ANYTIME/ANYWHERE
The Future...addressing the IT Trends/Issues

- Starts with planning, especially strategic planning (organization, integration)

(A) Situation

(C) Strategy

(B) Vision

The Change

(A) Where are you today?

(D) Drivers & Restraints

(C) How do you plan to get to where you want to be?

(B) Where do you want to be?

(D) What will help & hinder you getting to where you want to be?

(E) Key Goal Indicators – Key Performance Indicators

(E) How will you know when you get to where you want to be?
The Future – Planning for areas of the organization

Inputs:
- Current Situation (KPI – PPV/OCL): NCHEMS/CHESS
- Federal/State/Local Requirements
- Gen Ed Requirements
- Middle States Requirements
- External Accreditation
- Mission Review

Outputs:
- Strategic Plan (Mission, Vision, Values, Goals)
- Academic Master Plan
  - Facilities Master Plan
  - Enrollment Master Plan
  - Student Development Master Plan
  - Adult Ed/Training Master Plan
  - IT Master Plan (each plan contains)

Goals:
- 1 or more objectives per goal
- Are measurable
- Relate to previously developed Key Performance Indicators
  - GCI
  - PPI
  - NCHEMS/CHESS

Project Plans/Proposals:
- In support of 1 or more goals/objectives (PTBS™)
- Each has measurable KPIs
  - Schedule
  - Budget
  - Student Retention
  - Student Satisfaction
  - Relate to previously developed KPI; NCHEMS/CHESS
    - QCI
    - PPI

Project Implementation/Management/Coordination
- Initiation
- Planning
- Execution
- Control
- Closing

Assessment-Outcomes
- Decision to keep/continue/adjust plans
- Sunset/redeploy resources
- Output here is input into the next planning cycle

Assessment-Outcomes (RTBO™)
- KPIs
  - Schedule
  - Budget
  - Student Retention
  - Student Satisfaction
  - Relate to previously developed KPI; NCHEMS/CHESS
    - QCI
    - PPI

NOTE:
- PTBS – Problem to be Solved
- RTBO – Results to be Obtained

QCI - Qualitative Criteria Instrument
PPI – Program Prioritization Instrument
Issues/Trends Effecting Higher Education

- Aging Population
- Work Age Population Decline
- Rise of Asia – Population & Economic
- Need to Close the Education/Skills Gap
- Time Pressures
- New Industries Requiring New Academic Programs/Training & Partnerships [8]
- Increased Higher Education Competition
- Increased Legal/Regulatory Requirements

**IT Trends/Challenges – points to the possible solution(s)**

- Richard Garrett: Online higher ed clearly has moved from rhetoric to reality, from periphery to mainstream. If you look at people taking individual courses online, we now have 3.5 million at the last count, 20 percent of all students in U.S. higher education. If you segment people over 25, we think it is about 20 percent of people taking their whole higher education online. [19]
Issues and Trends – UPDATE #1

Other sources

Biz-Tech 3.0 – Top 10 Disruptive IT Trends

1. New Media
2. Augmented Reality
3. Social Networks
4. Information Transparency
5. Web Waves
6. 3D Printing
7. Molecular Computing
8. Cloud Computing
9. Semantics
10. Web as Reasoning Engine

Reference:
http://blogs.cioinsight.com/biztech30/content/future_of_it/top_10_disruptive_it_trends.html
How Web 2.0 Can Reinvent Government - By Paula Klein - 2008-04-01

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http://www.cioinsight.com/index2.php?option=content&task=view&id=882092&pop=1&hide_ads=1&page=0&hide_js=1

Baseline Magazine – IT Trends for 2009
http://www.baselinemag.com/c/a/Infrastructure/IT-Trends-for-2009/


Q&A
THANK YOU

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Notes and References


[10] “Science 2.0 -- Is Open Access Science the Future? Is posting raw results online, for all to see, a great tool or a great risk?”; by M. Mitchell Waldrop Scientific American Magazine - April 21, 2008;


[14] "Bats, Owls, Vampires and Other Creatures of the Night"; by Graham Spanier – President Penn. State University; "Leadership" section of EDUCAUSE Review magazine; May/June 2003


