ICT Practices in IIT Bombay

Lessons from Education and e-Governance

Education

Student Life Cycle Mgmt.

- Home grown applications by Software Cell
- Applications, Admission, Fees, Course Registration, Classroom Management, Biometric Attendance, Centralised Clocks, Course Conduct, Exam timetabling, Course Feedback/Evaluation, Grades, Transcripts, Degrees, Demat, Alumni Database
- Challenges
  - Autonomous framework of IITs lead to frequently changing rules with more options and flexibility: Coding challenge
  - about 90% integrated

Moodle Course Conduct

- Moodle is an open Learning Management System
- IITB has integrated Moodle with its SLCM
- Mainly used for
  - Lecture Notes
  - Assignments
  - Class Interaction (email, discussion)
- Online Exams with Moodle
  - Question Bank Management
  - Variable numerics questions
  - Automatic Grading
- Challenges: Scaling more than few 100s for exams

Cloud Computing

- Open Source Virtual Machine Management
  - on-demand resources from available pool
  - Cloud storage
  - Trial phase to be expanded
- Virtual Desktop and Applications
  - Linux and Windows Applications
  - Thin clients in labs or BYOD
  - Accessible from anywhere
- Collaborative Research

Distance Education

- Recorded Lectures
- Ask-a-Question sessions
- Teacher Training
  - 10,000 teachers enhance skills from IITB Faculty
  - Video conference lectures in nearby college centers
  - Labs conducted under pre-trained coordinators at IITB
- Spoken Tutorials for Open Software usage
- Textbook Companion
- Virtual Labs

MOOC through edX

- **edX:** Massive Open Online Courses platform developed at MIT and Harvard
- Complete course with assignments, quizzes
- IITB to offer 4 courses in 2014-15 in "Blended Model"
  - Students of colleges get credit locally
  - Labs local
  - Exams proctored locally
  - Online evaluation

Entrance Exam Management

- Large scale application management (19+ lakh registrations)
- Online Application scrutiny
- Massive ORS handling (10 lakh+)
- Scorecard Dematerialisation (Online validation)

- Partial automation of subjective paper correction

e-Governance

Home Grown ERP

- Financial Budgeting, Expenditure, Payroll, Purchases, HR (recruitment), Hospital
- Mobile Registry (Approvals, Alerts, Notifications)
- Research Management (Proposal, Fund Management, Staff Recruitment, Utilisation Reports)
- Campus Security
- Biometric Access Control and Staff Attendance
- IITB Moving to Commercial ERP (like SAP, PeopleSoft)

State of Art Campus Networks

- Fibre Optic and Cable network (All hostels rooms and residences wired)
- Wireless
  - 500+ access points (500+ more underway)
  - eduroam
- Multiple Video conferencing rooms
- FTTx (Fibre to the x=office, home) planned
- 4G and Blanket Wifi planned

Challenges in Education

- Recognition of e-learning as a core activity
  - Steady budget for R&D in new distance education technologies, pedagogy, Office space and staff
- High speed LAN issues
  - Illegal downloads (internet)
  - P2P sharing (intranet)
  - Responsibility matters
  - Sensitisation and Value inculcation
- Social Interaction between Faculty-Students reducing
  - Social Media and other Private Networks partly the reason

Challenges in e-Governance

- Residential Campuses: Mini-municipality; Asset and Estate Management are most difficult
- ICT Management Issues
  - Skilled Manpower and inadequate compensation
  - On-call-duty (but no compensation)
  - Knowledge Updation (3 years by Government norms too long)
  - CTO and reporting to highest level, required
  - Demarcated subunits required (Domain knowledge, Coding, DB, UX/UI, Testing, Deployment, Networks, SysAdmin)

Proposals to MHRD

1. Create a NIC like department for Universities
2. Central cloud for campus ERP (SAP, PeopleSoft, or Other); each univ. has a private space
   a. Use IITs experience to generalise (Codes can be shared)
   b. Minimize expensive first time learning and implementation costs
3. Codify ICT Management Best Practices; Treat as Essential Service; Compensate Staff
4. University Cloud like Amazon EC2
5. Countrywide new Faculty application portal

Credits

- Umesh Bellur, CSE
- Sharat Chandran, ASC and CSE
- Vikram Gadre, CDEEP
- Nirdosh Khosla, MEMS
- D Manjunath, CC and EE
- Kannan Moudgalya, ChE
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- D B Phatak, CSE
- SV Raghavan, CS, IITM
- Asmita Shete, ASC
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- S Sudarshan, CSE
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- Numerous ASC Programmers and CC Staff