Developing suitable pedagogical methods for various classes, intellectual calibers and research in e-learning

Report to Domain Expert Committee (e-Content)

2nd May 2016

A Project Under
National Mission On Education Through ICT (NMEICT)

www.ide.iitkgp.ernet.in

Sponsored by
Ministry of Human Resource Development, Govt. of India
Outcome of the project and Achievement so far

1. Outcome-based Curricula for 177 UG level Engineering Courses covering 6 Engineering Disciplines: CE; EE; ME; ECE; CSE; Chem. E and First Year Courses as a model curricula → over all 80% development completed

2. Open Source Web-based Pedagogy Framework tool for designing, reviewing, monitoring and publishing Outcome-based Curricula → Open accesses web based Tools completed

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3. All Universities / Institutions are able to use the above developed web-tool to develop their own Outcome based curricula / adapt / adopt the curricula already being developed nationally → More than 2000 faculty members have already registered for development of their own courses

4. Conduct Training Programmes for more than 5000 Engineering Faculty members of different institutions across the country for Instructional System Design, Pedagogy, outcome based Curriculum Design → Around 4000 faculty members of various institutions have been trained by the Project team
## Major Deliverables of the Project and Status

<table>
<thead>
<tr>
<th>Deliverables</th>
<th>Status as on April 2016</th>
</tr>
</thead>
</table>
| **1**  
Outcome-based Curricula for 177 UG level Engineering Courses covering 6 Engineering Disciplines: CE; EE; ME; ECE; CSE; Chem. E and First Year Courses |  
- 12 courses are completed and released for open access  
- 6 course Review completed pending final modification by developer  
- 78 courses completed in 40 units and domain review is going on.  
- 90% of the development of 81 courses are completed |
| **2**  
Open Source Web-based Pedagogy Framework tool for designing, reviewing, monitoring and publishing Outcome-based Curricula | Completed |
| **3**  
Conduct Training Programmes for more than 5000 Engineering Faculty members of different institutions across the country for Instructional System Design, Pedagogy, Outcome based |  
Around 4000 faculty members of various institutions have been trained in Pedagogy by the Project team of IIT Kharagpur |
Impact of Pedagogy Project

- The developed web-tool is used for faculty development program under TEQIP-II. More than 1000 faculty members are already resistor for development of their own courses.

- All Universities / Institutions are able to use the IIT Kharagpur web-tool to develop their own Outcome based curricula / adapt / adopt the curricula already being developed nationally.

- One of the most encouraging development of this unique project is the very rapid (many folds) growth in the demand for training in Pedagogy by all Institutions and TEQIP’s insistence for such training for every faculty.

- Many Institutions that received training under this project have succeeded in getting NBA accreditations at first attempt.
Open Source Web-based Pedagogy Framework tool for designing, reviewing, monitoring

www.ide.iitkgp.ernet.in
## Administrative Details

<table>
<thead>
<tr>
<th></th>
<th>Executing Agency</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Centre for Educational Technology, IIT Kharagpur (Anchor)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Partner Institute:</strong> (14)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>IIT Delhi, IIT Bombay, IIT Guwahati, IIT Roorkee, NIT Trichi, BIT Mesra, NIT Warangal, NIT Durgapur, NIT Rourkela, SVNIT Surat, Amrita University, SASTRA University, IIIT Hyderabad, IIIT Bangalore,</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Total Cost of the Project as approval by MHRD</th>
<th>Total Rs. 16.0 Crores</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Project Sanction no &amp; Date Project Control No.</th>
<th>F.16-36/2009-DL dated 19th February, 2013 ARE04061212597</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>4</th>
<th>Funds released so far</th>
<th>Rs.3,59,44,500.00; 2) Rs.69,57,000.00; 3) Rs.34,78,500.00 Total=Rs.4,63,80,000.00</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>5</th>
<th>Duration of the Project</th>
<th>3 Years</th>
</tr>
</thead>
</table>

| 6 | Date of starting | April, 2013 |
## Financial

A. Financial Outlay as per DPR

<table>
<thead>
<tr>
<th></th>
<th>Year-1</th>
<th>Year-2</th>
<th>Year-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non Rec. [Rs in Lakhs]</td>
<td>30.00</td>
<td>15.00</td>
<td>15.00</td>
</tr>
<tr>
<td>Rec. [Rs in Lakhs]</td>
<td>770.00</td>
<td>385.00</td>
<td>385.00</td>
</tr>
<tr>
<td>Total</td>
<td>800.00</td>
<td>400.00</td>
<td>400.00</td>
</tr>
</tbody>
</table>

B. Funds released so far: **Rs.463.80** Lakhs

C. Total Expenditure as on Feb. 2016: **Rs.445.30** Lakhs

D. Balance as on Feb. 2016: **Rs.18.50** Lakhs

E. Fund required Immediately

**Rs. 430.00 + Rs.117.60= Rs. 547.60** Lakhs
<table>
<thead>
<tr>
<th>Head</th>
<th>Amount [in Lakhs]</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Fund Required for course Development 430.00</td>
</tr>
<tr>
<td>B</td>
<td>Fund required for Software development, Project Staff Salary, Workshop, TA/DA etc 117.60</td>
</tr>
<tr>
<td></td>
<td><strong>Total Fund requirement by March 2016 (A+B)</strong> 547.60</td>
</tr>
<tr>
<td>Sr. No.</td>
<td>Institute Name</td>
</tr>
<tr>
<td>---------</td>
<td>--------------------</td>
</tr>
<tr>
<td>1</td>
<td>IIT Guwahati</td>
</tr>
<tr>
<td>2</td>
<td>IIT Delhi</td>
</tr>
<tr>
<td>3</td>
<td>IIT Roorkee</td>
</tr>
<tr>
<td>4</td>
<td>NIT Trichi</td>
</tr>
<tr>
<td>5</td>
<td>NIT Warangal</td>
</tr>
<tr>
<td>6</td>
<td>NIT Durgapur</td>
</tr>
<tr>
<td>7</td>
<td>NIT Rourkela</td>
</tr>
<tr>
<td>8</td>
<td>SVNIT Surat</td>
</tr>
<tr>
<td>9</td>
<td>IIIT Hyderabad</td>
</tr>
<tr>
<td>10</td>
<td>Amrita University</td>
</tr>
<tr>
<td>11</td>
<td>Sastra University</td>
</tr>
<tr>
<td>12</td>
<td>BIT Mesra</td>
</tr>
<tr>
<td>13</td>
<td>IIT Kharagpur</td>
</tr>
<tr>
<td>14</td>
<td>MNNIT Allahabad</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td></td>
</tr>
</tbody>
</table>
Summary Of Budget / Expenses

- **Commitment for Course Development** = 1008.95 L
- **Already paid** = 197.065
- **To pay immediately** = 430.00
- **To pay by December, 2016** = 381.8843
- **Budget need for workshop, conference, TA/DA, equipment, software development, salary etc.** = 365.835
- **Already spent** = 229.735
- **Available in hand** = 18.50
- **Immediatly needed** = 117.067

**2016-17 Requirement** = 430.0 + 117.067 + 381.8843 = 928.951 Lakhs
Thank You
MHRD, under NME-ICT, has allocated funds to the UGC for development of e-content in 77 subjects at postgraduate level.

Social Sciences, Arts, Humanities, Natural & Mathematical Sciences, linguistics and languages

E- PG Pathshala
A Brief Overview on Project

- Assigned Work: Development of e-Content for 77 subject
- Project Awarded to UGC on June, 2011.
- Total Project Cost is Rs 84 Crore.
- Funds released to INFLIBNET is Rs. 30 Crore for the disbursement of fund to the PI’s institute
- E-Content Development Charge per subject = 1.12 Crore
  (7 Lakhs per paper. 1 Subject = 16 Papers)
  (Rs 17,500-20,000 per module for all 4 quadrants)
(As compared to Rs 31,000 (includes Rs 2,000 for transcription) approved by PAB in 27th meeting of PAB on 19th March, 2014)
Volume of work

Volume of a subject

1 Subject = 16 Papers*
1 Paper = 30-35 Modules (1 hour each)
Total modules = 16 X 35 = 560

Volume of a module

1 Module = 1 topic comprising of
a) e-text = textual material (8-10 pages)
b) Self-learning = audio / video component (30 mins)
c) Self assessment = Questions
d) Learn More = further reference material

* 4 core paper of each semester (2Yr course)

77(Subject)X16(Paper)X35(Module) = 43120 (Modules) (Approx.)
E-PGPathshala: Status

- No of subjects identified: 77
- No of subjects where content is being developed: 73
- No of Modules received - 5600+ (Four quadrants)
- No of e-Text Modules received - 8600+ (e-Text)
E-PGP & MOOCs

• No of courses ready in four quadrants: 100 (To be ready by July, 2016 – MOOCs compliant)

• No of courses ready (50%) with four quadrant: 100 (To be ready by Dec-16 - MOOCs compliant)

• Workshop of all paper coordinators – Mid May -2016
THANK YOU!
Virtual Labs
An MHRD Govt of India Initiative
Domain Expert Committee Meeting
Agenda

- Introduction
- Update of Virtual Labs Phase-II
- Status of Outreach/Integration activities
- Update of RT Labs Project
- Request for the release of next installments for Phase-II (Rs 27.60 Crores + Rs 20.69 Crores)
Motivation

- Physical Distances
- Limit Doing Experiments
- Sharing of Costly Equipment
- Proliferation of Quality Labs
Objectives of the Virtual Lab Project

- To provide remote-access to labs in various disciplines of Science and Engineering.
- To cater to students at the UG level, PG level as well as to research scholars.
- To enable the students to learn at their own pace, and to arouse their curiosity.
- To provide a complete Learning Management System that includes web-resources, video-lectures, animated demonstrations and self evaluation.
Types of Virtual Labs

- Modeling / Simulation Based
- Measurement Based
- Remote Triggered

Scalability
Closer to Reality
AIM
Intended Users

✓ College students who do not have access to good lab-facilities.

✓ High-school students whose inquisitiveness will be triggered, possibly motivating them to take up higher-studies.

✓ Different engineering colleges who can benefit from the content and related teaching resources.

✓ Researchers in different institutes who can share / collaborate equipment and resources.
Participating Institutes

IIT Delhi
IIT Bombay
IIT Kanpur
IIT Kharagpur
IIT Madras
IIT Roorkee
IIT Guwahati
IIIT Hyderabad
Amrita University
Dayalbagh University
NITK Surathkal
COE Pune
Broad Areas of Virtual Labs

- Electronics and Communication Engineering
- Computer Science and Engineering
- Electrical Engineering
- Mechanical Engineering
- Civil Engineering
- Chemical Engineering
- Biomedical and Biotechnology Engineering
- Chemical Sciences
- Physical Sciences

All areas of Science and Engineering are covered.
One common website to access all Virtual Labs

Website: www.vlab.co.in
Value Add in a Nutshell

On-demand Labs
[learn at own pace]

Self - Evaluation
[pre /post lab quiz]

Integrative Learning
[contents at one place]

Animation/Video Tut
[better insight]

Freedom to make mistakes
[can experiment with experiments]

Virtual Labs - A Complete Learning Management System
Objectives of Phase-II Project

The primary focus of the Second Phase of the Virtual Labs project is to reach out all potential users of Virtual Labs, in order to address the following issues:

• To **maintain and upkeep** the existing operational virtual labs.

• To **port** Virtual Labs to a **common platform** and host it on a **national server**.

• To create a ‘**single package**’ of simulation-based Virtual Labs to be distributed to users.

• To engage **private agencies for outreach** of Virtual Labs: (i) awareness about labs and (ii) usage of labs.
Objective of Phase-II Project (2)

- To identify the gap areas between the typical syllabi of technical universities and the existing labs and to develop additional labs/experiments to fill these gaps.

- To convert labs not based on free and open source technologies to open source.

- To port the existing labs to mobile platforms.

- To identify and work with government, private agencies and professional bodies for granting ‘Certificate to users of Virtual Labs’.
# Funding of the Project

**Name of the Project:** Virtual Labs Phase-II  
**Funding Agency:** MHRD, Govt. of India  
**Duration of the project:** Aug, 2014 – Aug, 2017 (3 Years)  
**Fund sanctioned for the project:** Rs 68.99 Crores (Rs 23.50 + Rs 22.36 + Rs 23.13)  
**Fund received as 1st Installment:** Rs 20.69 Crores (@ 30% of Rs 68.99 Crores)

<table>
<thead>
<tr>
<th>Institute’s Name</th>
<th>Fund Transferred (In Lacs Rs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIT Delhi</td>
<td>62.92</td>
</tr>
<tr>
<td>IIT Bombay</td>
<td>158.87</td>
</tr>
<tr>
<td>IIT Kanpur</td>
<td>47.08</td>
</tr>
<tr>
<td>IIT Kharagpur</td>
<td>145.64</td>
</tr>
<tr>
<td>IIT Roorkee</td>
<td>47.08</td>
</tr>
<tr>
<td>IIT Guwahati</td>
<td>81.05</td>
</tr>
<tr>
<td>IIIT Hyderabad</td>
<td>780.66</td>
</tr>
<tr>
<td>Amrita University</td>
<td>153.03</td>
</tr>
<tr>
<td>Dayalbagh University</td>
<td>62.92</td>
</tr>
<tr>
<td>NITK Surathkal</td>
<td>57.64</td>
</tr>
<tr>
<td>COE Pune</td>
<td>93.72</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1690.61</strong></td>
</tr>
</tbody>
</table>

Funds were disbursed as per given table:
Latest Utilization Certificate of Phase-II has been submitted to MHRD on 25 Feb 2016
FORM GFR-19A

UTILISATION CERTIFICATE

For the Financial Year 2014-15
(From 01.04.2015 To 31.03.2016)

Title of the project: "Virtual Labs (Phase-II)" (RP02923)

<table>
<thead>
<tr>
<th>S.No</th>
<th>Letter No.</th>
<th>Amount</th>
<th>Certified that out of Rs. NIL of grants-in-aid sanctioned in favour of Registrar IIT Delhi under this Ministry/ Department letter/ order No. given in the margin and Rs.4,28,48,007.00 on account of unspent balance of the previous year, a sum of Rs.32,10,459.00 has been utilized for the purpose of research for which it was sanctioned and that the balance of Rs.3,96,37,548.00 will be adjusted towards the grants-in-aid payable during the next year i.e. 2016-17.</th>
</tr>
</thead>
</table>

TOTAL | Nil | Nil |

2. Certified that I have satisfied that the conditions on which the grants-in-aid was sanctioned have been fulfilled/are being fulfilled and that I have exercised the following checks to see that the money was actually utilized for the purpose for which it was sanctioned:

Kinds of checks exercised
1. Cash Book
2. Ledger
3. Bank Reconciliation
4. Payment Voucher

Principal Investigator
(K Tyagarajan)  
Head of the Institute  
A.R. (IRD A/cs)
Outreach Status
Deliverables of Project

The target year wise usage for Phase II shall be as follows:

- **Nodal Centers** using Virtual Labs (end of 1st year) = 300
- **No. of usage** for 1st year = 6,48,000
- **Two reviews** by an expert panel

2nd Year (Aug 2015-July 2016)
- **New Nodal Centers** added to Virtual Labs (during 2nd year) = 22
- **Total number of Nodal Centers** (end of 2nd year) = 300(1st Year) + 22(new) = 322
- **No. of usage** for 2nd year = 6,95,500
- **Cumulative total number** of usage = 13,43,520
- **Two reviews** by an expert panel

3rd Year (Aug 2016-July 2017)
- **New Nodal Centers** added to Virtual Labs (during 3rd year) = 33
- **Total number of Nodal Centers** (end of 3rd year) = 322(2nd Year) + 33(new) = 355
- **No. of usage** for 3rd year = 7,66,800
- **Cumulative total number** of usage = 21,10,320
- **Two reviews** by an expert panel
<table>
<thead>
<tr>
<th>Activity</th>
<th>Nos. Proposed for 1(^{st}) + 2(^{nd}) Year (Half)</th>
<th>Nos. Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Outreach</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nodal Centers</td>
<td>311</td>
<td>329</td>
</tr>
<tr>
<td>Workshops</td>
<td>77</td>
<td>515</td>
</tr>
<tr>
<td>Usages</td>
<td>6,71,760</td>
<td>9,18,611</td>
</tr>
<tr>
<td><strong>Integration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FOSS Migration</td>
<td>60</td>
<td>81</td>
</tr>
<tr>
<td>Labs porting to Mobile Platform / Level 6 integration</td>
<td>60</td>
<td>72</td>
</tr>
<tr>
<td>Single Packages of VLabs</td>
<td>90</td>
<td>35</td>
</tr>
<tr>
<td><strong>VLEAD</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hosting of Labs on Cloud</td>
<td>40</td>
<td>72</td>
</tr>
<tr>
<td>Institute Name</td>
<td>Number of NCs Planned</td>
<td>NCs Authorized till March, 2016</td>
</tr>
<tr>
<td>----------------</td>
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<tr>
<td>IIT-D</td>
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<td>IIT-K</td>
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<td>IIT-B</td>
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<td>DAYALBAGH</td>
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<td>IIIT-H</td>
<td>26</td>
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<td>IIT-KGP</td>
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<td>8</td>
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<tr>
<td>NIT-K</td>
<td>26</td>
<td>14</td>
</tr>
<tr>
<td>COE, Pune</td>
<td>26</td>
<td>27</td>
</tr>
<tr>
<td>Grand Total</td>
<td>311</td>
<td>329</td>
</tr>
</tbody>
</table>
## Mid-term Review

### 1st Review
**21 March 2015, IIT Delhi**
- Prof. Ajay Chakrabarty
  - IIT Kharagpur
- Prof. G. K. Suraishkumar
  - IIT Madras
- Dr M Sasikumar
  - C-DAC Mumbai
- Prof. Arun Kumar
  - IIT Delhi
- Prof. Om Damani
  - IIT Bombay

### 2nd Review
**17 Oct 2015, IIT Delhi**
- Prof. Ajay Chakrabarty
  - IIT Kharagpur
- Dr M Sasikumar
  - C-DAC Mumbai
- Dr. Saurabh Jain
  - IIST Indore
- Dr. Anil Kumar Ahlawat
  - KIET, Ghaziabad
- Dr. K D Verma
  - MHRD

### 3rd Review
**9 April 2016, IIT Delhi**
- Prof. G. K. Suraishkumar
  - IIT Madras
- Prof. Arun Kumar
  - IIT Delhi
- Prof. Om Damani
  - IIT Bombay
- Dr. Pradip Chanda
  - MHRD
Methodology for counting usages
# METHODOLOGY FOR COLLECTING OUTREACH USAGE DATA

The outreach include following activities for collecting outreach usage data on actual basis

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Activity</th>
<th>No. of Usages</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Number of Vlabs experiments performed at Nodal Centers</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Online Lab-wise usage form</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Number of attendees in workshops</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Cloud data usage</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>FDP / CEP / QIP at respective institutes</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Others (Please specify)</td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Total Usages</strong></td>
<td></td>
</tr>
</tbody>
</table>
NODAL CENTERS ACROSS THE COUNTRY

- App. 320 Nodal Centers
- App. 9 Lakh Usages
- App. 550 Workshops
EOI from NITs
National Institute of Technology Meghalaya
National Institute of Technology Durgapur
National Institute of Technology Mizoram
National Institute of Technology Arunachal Pradesh
Malaviya National Institute of Technology Jaipur
National Institute of Technology Jalandhar
National Institute of Technology Raipur
National Institute of Technology Kurukshetra
National Institute of Technology Goa
Decisions/Advice from DEC

- Request for the release of 2\textsuperscript{nd} installment (Aug 2015-July 2016) for Phase-II i.e. Rs 27.60 Crores.

- Request for the release of 3\textsuperscript{rd} installment (Aug 2016-July 2017) for Phase-II i.e. Rs 20.69 Crores.

- Validity of the project till August, 2017.

- Title to be modified to “Virtual Labs Phase-II (Outreach, Integration and Maintenance of Virtual Labs)”.
Deliverables of Project

The target year wise usage for Phase II shall be as follows:

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## Overall Budget Breakup

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Items</th>
<th>Budget</th>
<th>Total (in Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>First Year (in Lacs)</td>
<td>Second Year (in Lacs)</td>
</tr>
<tr>
<td>1</td>
<td>Deployment and Outreach</td>
<td>264.5</td>
<td>289.03</td>
</tr>
<tr>
<td>2</td>
<td>Integration and Maintenance</td>
<td>861</td>
<td>928</td>
</tr>
<tr>
<td>3</td>
<td>Development of new experiments (300 expt. x 3 Lacs / expt.)*</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>4</td>
<td>Honoraria</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>5</td>
<td>Central platform Engineering</td>
<td>587.5</td>
<td>566.05</td>
</tr>
<tr>
<td>6</td>
<td>Data Centre</td>
<td>34.515</td>
<td>50.43</td>
</tr>
<tr>
<td>7</td>
<td>Software License</td>
<td>200</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>Reviews / Mid-term evaluations/Internal Workshops</td>
<td>62.67</td>
<td>62.67</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>2350.185</strong></td>
<td><strong>2236.18</strong></td>
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</table>
Virtual Labs... A Journey from Concept to Reality

Thank You!
Back up Slides
## Approximate Fund Utilization

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Items</th>
<th>Budget for First Year (in Lacs Rs)</th>
<th>Projected Fund</th>
<th>Actual Disbursement</th>
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<tbody>
<tr>
<td>1</td>
<td>Deployment and Outreach</td>
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<td>2</td>
<td>Integration and Maintenance</td>
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<tr>
<td>3</td>
<td>Central Platform Engineering</td>
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<td>515.17</td>
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<td>4</td>
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<tr>
<td>5</td>
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<td><strong>1690.61</strong></td>
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## Overall Budget Breakup

<table>
<thead>
<tr>
<th>S.No.</th>
<th>Items</th>
<th>Budget</th>
<th>Total (in Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>First Year</td>
<td>Second Year</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(in Lacs)</td>
<td>(in Lacs)</td>
</tr>
<tr>
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<td>Deployment and Outreach</td>
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<tr>
<td>2</td>
<td>Integration and Maintenance</td>
<td>861</td>
<td>928</td>
</tr>
<tr>
<td>3</td>
<td>Development of new experiments (300 expt. x 3 Lacs/</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td>expt.)*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Honoraria</td>
<td>40</td>
<td>40</td>
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<tr>
<td>5</td>
<td>Central platform Engineering</td>
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<td>566.05</td>
</tr>
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<td>Data Centre</td>
<td>34.515</td>
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<td>Software License</td>
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</tr>
<tr>
<td>8</td>
<td>Reviews / Mid-term evaluations/Internal Workshops</td>
<td>62.67</td>
<td>62.67</td>
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<td></td>
<td></td>
<td><strong>Total</strong></td>
<td><strong>Total</strong></td>
</tr>
<tr>
<td></td>
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<td><strong>2350.185</strong></td>
<td><strong>2236.18</strong></td>
</tr>
<tr>
<td>Name of the Institute</td>
<td>First Year</td>
<td>Second Year</td>
<td>Third Year</td>
</tr>
<tr>
<td>-----------------------</td>
<td>------------------------------------------------</td>
<td>-------------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>Number of Usage</td>
<td>W/S</td>
<td>Budget (Lacs)</td>
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<tr>
<td>IIT Delhi</td>
<td>54000 (25 NCs)</td>
<td>2</td>
<td>23.5</td>
</tr>
<tr>
<td>IIT Bombay</td>
<td>54000 (25 NCs)</td>
<td>2</td>
<td>23.5</td>
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<tr>
<td>IIT Kanpur</td>
<td>54000 (25 NCs)</td>
<td>2</td>
<td>23.5</td>
</tr>
<tr>
<td>IIT Kharagpur</td>
<td>54000 (25 NCs)</td>
<td>2</td>
<td>23.5</td>
</tr>
<tr>
<td>IIT Roorkee</td>
<td>54000 (25 NCs)</td>
<td>2</td>
<td>23.5</td>
</tr>
<tr>
<td>IIT Guwahati</td>
<td>32400 (15 NCs)</td>
<td>2</td>
<td>21.1</td>
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<tr>
<td>IIIT Hyderabad</td>
<td>54000 (25 NCs)</td>
<td>2</td>
<td>23.5</td>
</tr>
<tr>
<td>Amrita University</td>
<td>129600 (60 NCs)</td>
<td>2</td>
<td>31.9</td>
</tr>
<tr>
<td>Dayalbagh University</td>
<td>54000 (25 NCs)</td>
<td>2</td>
<td>23.5</td>
</tr>
<tr>
<td>NITK Surathkal</td>
<td>54000 (25 NCs)</td>
<td>2</td>
<td>23.5</td>
</tr>
<tr>
<td>COE Pune</td>
<td>54000 (25 NCs)</td>
<td>2</td>
<td>23.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>648000 (300NCs)</strong></td>
<td><strong>22</strong></td>
<td><strong>264.5</strong></td>
</tr>
</tbody>
</table>
**NOTE:** 25 NCs x 3 Experiments per Lab x 30 Students per lab x 3 years x 4 Branches = 27,000 Usages per Semester (or 54,000 Usages per year)

<table>
<thead>
<tr>
<th>EXPENSE</th>
<th>AMOUNT (Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Manpower:</strong> 3 field engineers per Institute</td>
<td>4 L x 3 (person) = Rs 12 L (Salary Rs 4 Lacs per annum per person)</td>
</tr>
<tr>
<td><strong>Honorarium for Nodal Coordinators</strong></td>
<td>Rs 12* x 1000 x 25 = Rs 3 L</td>
</tr>
<tr>
<td><strong>Workshops</strong></td>
<td>Rs 6 x 2** x 1000 x 25 = Rs 3 L</td>
</tr>
<tr>
<td><strong>Consumables</strong></td>
<td>2.5 L</td>
</tr>
<tr>
<td>(Stationery / Printing / Publicity material / Internet)</td>
<td></td>
</tr>
<tr>
<td><strong>Miscellaneous expenses</strong></td>
<td>2.0 L</td>
</tr>
<tr>
<td><strong>Travel</strong></td>
<td>1 L</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>23.5 L</td>
</tr>
</tbody>
</table>

* Cost for 1 usage=Rs 12/-per students as per AICTE norms.
  
  Number of usage=1000
  
  Cost for 1 Nodal Coordinator =Rs 12,000*/- per year
  
  **Rs 6/= per student per workshop, two workshops planned in a year.*
## Budget for Integration and Maintenance

<table>
<thead>
<tr>
<th>Name of the Institute</th>
<th>No. of Labs</th>
<th>No. of Engineers</th>
<th>1st Year (in Lacs)</th>
<th>2nd Year (in Lacs)</th>
<th>3rd Year (in Lacs)</th>
<th>Total (in Lacs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IIT Delhi</td>
<td>6</td>
<td>7</td>
<td>48</td>
<td>51.5</td>
<td>55.35</td>
<td>154.85</td>
</tr>
<tr>
<td>IIT Bombay</td>
<td>11</td>
<td>13</td>
<td>83</td>
<td>89.5</td>
<td>96.65</td>
<td>269.15</td>
</tr>
<tr>
<td>IIT Kanpur</td>
<td>3</td>
<td>4</td>
<td>30</td>
<td>32</td>
<td>34.2</td>
<td>96.2</td>
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<tr>
<td>IIT Kharagpur</td>
<td>20</td>
<td>23</td>
<td>142</td>
<td>153.5</td>
<td>166.15</td>
<td>461.65</td>
</tr>
<tr>
<td>IIT Roorkee</td>
<td>3</td>
<td>4</td>
<td>30</td>
<td>32</td>
<td>34.2</td>
<td>96.2</td>
</tr>
<tr>
<td>IIT Guwahati</td>
<td>9</td>
<td>11</td>
<td>71</td>
<td>76.5</td>
<td>82.55</td>
<td>230.05</td>
</tr>
<tr>
<td>IIIT Hyderabad</td>
<td>20</td>
<td>23</td>
<td>142</td>
<td>153.5</td>
<td>166.15</td>
<td>461.65</td>
</tr>
<tr>
<td>Amrita University</td>
<td>20</td>
<td>23</td>
<td>142</td>
<td>153.5</td>
<td>166.15</td>
<td>461.65</td>
</tr>
<tr>
<td>Dayalbagh University</td>
<td>6</td>
<td>7</td>
<td>48</td>
<td>51.5</td>
<td>55.35</td>
<td>154.85</td>
</tr>
<tr>
<td>NITK Surathkal</td>
<td>5</td>
<td>6</td>
<td>42</td>
<td>45</td>
<td>48.3</td>
<td>135.3</td>
</tr>
<tr>
<td>COE Pune</td>
<td>11</td>
<td>13</td>
<td>83</td>
<td>89.5</td>
<td>96.65</td>
<td>269.15</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>114</strong></td>
<td><strong>134</strong></td>
<td><strong>861</strong></td>
<td><strong>928</strong></td>
<td><strong>1001.7</strong></td>
<td><strong>2790.7</strong></td>
</tr>
</tbody>
</table>
Budget for Integration and Maintenance

*1 Engineer per 1 lab for Integration, 1 Engineer per 7 labs for maintenance,

*Maintenance budget includes funds for the New RT Labs, in addition to the existing lab

Manpower Required: 134 Engineers for Integration & Maintenance 1st year
Salary : Rs 5 Lacs per annum per engineer
Internet usage: Rs 5 Lacs per Institute
Travel cost : Rs 2 Lacs per Institute
Consumables : Rs 1 Lac per lab
Total = 5 x 134 + ( 5 + 2 ) x 11 + 1 x 114 = Rs 861 lacs
<table>
<thead>
<tr>
<th>Items</th>
<th>Budget (in Lacs)</th>
<th>First Year</th>
<th>Second Year</th>
<th>Third Year</th>
<th>Total</th>
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<tbody>
<tr>
<td>Salaries and Manpower</td>
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<td>353.8</td>
<td>389.18</td>
<td>321.07</td>
<td>1064.05</td>
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<td>Equipment</td>
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<td>0</td>
<td>63.4</td>
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<td>Consumables</td>
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<td>24</td>
<td>26.40</td>
<td>29.04</td>
<td>79.44</td>
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<td>Collaborations</td>
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<td>25</td>
<td>27.50</td>
<td>22.69</td>
<td>75.19</td>
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<tr>
<td>Travel and Events</td>
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<td>44.67</td>
<td>49.14</td>
<td>54.05</td>
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<td>Sub Total</td>
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<td>510.87</td>
<td>492.22</td>
<td>426.85</td>
<td>1429.94</td>
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<tr>
<td>Contingency @15%</td>
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<td>76.63</td>
<td>73.83</td>
<td>64.03</td>
<td>214.49</td>
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<tr>
<td>Grand Total</td>
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<td>587.50</td>
<td>566.05</td>
<td>490.88</td>
<td>1644.43</td>
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JUSTIFICATION OF BUDGET FOR REVIEWS / MID TERM EVALUATIONS / INTERNAL WORKSHOP

Travel / stay of experts (Rs 23,000 x 5 experts) = Rs 1,15,000
Honoraria of experts (Rs 4,000 x 5 experts) = Rs. 20,000
Total = Rs. 1,35,000 / discipline (for 5 experts)
New Experiments = 1,35,000
Integration = 1,35,000
Outreach = 1,35,000
Total for (New Experiments + Integration + Outreach) =3 x 1,35,000 = 4,05,000
Total for 9 disciplines = 36,45,000 (One review per year)
Travel / stay for Lab developers (Rs.23, 000 x 114) = Rs. 26,22,000 (including old and new labs)
Total (experts for 9 disciplines + All lab developers) = Rs 62,67,000 / year
Region-wise Nodal Centers
<table>
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<tr>
<th>State</th>
<th>Number</th>
<th>North East</th>
<th>Number</th>
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<tr>
<td>Kerala</td>
<td>35</td>
<td>Andhra Pradesh</td>
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<tr>
<td>Telangana</td>
<td>34</td>
<td>Delhi</td>
<td>1</td>
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<tr>
<td>Uttar Pradesh</td>
<td>18</td>
<td>Chhattisgarh</td>
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<tr>
<td>Karnataka</td>
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<td>Himachal Pradesh</td>
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<td>Gujarat</td>
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<td>West Bengal</td>
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<td>Haryana</td>
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<td>Punjab</td>
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<td>Madhya Pradesh</td>
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<td>Uttarakhand</td>
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<td>Goa</td>
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<tr>
<td>Tamil Nadu</td>
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<td>Rajasthan</td>
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Internal Timeline
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<tr>
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<th>Jan – Mar</th>
<th>Apr – Jun</th>
<th>Jul – Sep</th>
<th>Oct - Dec</th>
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<tr>
<td>2014</td>
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<tr>
<td>PICs/DNC meeting</td>
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<td></td>
<td>“Single package” 3\textsuperscript{rd} release in Dec (35 VLabs)</td>
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</tr>
<tr>
<td>“Single package” 1\textsuperscript{st} release in Jul (17 VLabs)</td>
<td></td>
<td></td>
<td>Addition of new Nodal Centers as per commitment</td>
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</tr>
<tr>
<td>“Single package” 2\textsuperscript{nd} release in Sep (30 VLabs)</td>
<td></td>
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<td>Finalization of the Cloud to host VLabs</td>
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<tr>
<td>Addition of new Nodal Centers as per commitment</td>
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<td>Workshop for outreach</td>
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<tr>
<td>Hiring of Maintenance and Integration Engineers</td>
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<td>Sprint sessions for integration</td>
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</tr>
<tr>
<td>Identification of gap areas and development of new experiments</td>
<td></td>
<td></td>
<td>Evaluation of new experiments by subject experts</td>
<td></td>
</tr>
<tr>
<td>Finalize details of timeline for migration to FOSS</td>
<td></td>
<td></td>
<td>Identification of agencies for outreach (CDAC etc)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Initiate migration to FOSS</td>
<td></td>
</tr>
</tbody>
</table>
# Virtual Lab Phase-II Timeline

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1&lt;sup&gt;st&lt;/sup&gt; Review Meeting In Jan (all PICs/DNCs to participate)</td>
<td>“Single package” 5&lt;sup&gt;th&lt;/sup&gt; release in Mar (60 VLabs)</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; Review Meeting In Jul (all PICs/DNCs to participate)</td>
<td>“Single package” 7&lt;sup&gt;th&lt;/sup&gt; release in Mar (80 VLabs)</td>
</tr>
<tr>
<td></td>
<td>“Single package” 4&lt;sup&gt;th&lt;/sup&gt; release in Mar (50 VLabs)</td>
<td>Addition of new Nodal Centers as per commitment</td>
<td>“Single package” 6&lt;sup&gt;th&lt;/sup&gt; release in Mar (70 VLabs)</td>
<td>Addition of new Nodal Centers as per commitment</td>
</tr>
<tr>
<td></td>
<td>Addition of new Nodal Centers as per commitment</td>
<td>Migration to FOSS (30 Labs)</td>
<td>Addition of new Nodal Centers as per commitment</td>
<td>Migration to FOSS (50 Labs)</td>
</tr>
<tr>
<td></td>
<td>Migration to FOSS (25 Labs)</td>
<td>Migration to Mobile platform (30 Labs)</td>
<td>Migration to FOSS (40 Labs)</td>
<td>Migration to Mobile platform (50 Labs)</td>
</tr>
<tr>
<td></td>
<td>Migration to Mobile platform (25 Labs)</td>
<td>Workshop for outreach</td>
<td>Migration to Mobile platform (40 Labs)</td>
<td>Workshop for outreach</td>
</tr>
<tr>
<td></td>
<td>Initiate “VLab Certification”</td>
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# Virtual Lab Phase-II Timeline

<table>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3rd</td>
<td>Review Meeting In Jan (all PICs/DNCs to participate)</td>
<td>“Single package” 8th release in Mar (100 VLabs)</td>
<td>“Single package” 9th release in Mar (110 VLabs)</td>
<td>“Single package” 8th release in Mar (120 VLabs)</td>
</tr>
<tr>
<td>“Single package” 8th release in Mar (90 VLabs)</td>
<td>Addition of new Nodal Centers as per commitment</td>
<td>Addition of new Nodal Centers as per commitment</td>
<td>Addition of new Nodal Centers as per commitment</td>
<td></td>
</tr>
<tr>
<td>Addition of new Nodal Centers as per commitment</td>
<td>Migration to FOSS (70 Labs)</td>
<td>Migration to FOSS (80 Labs)</td>
<td>Migration to FOSS (90 Labs)</td>
<td></td>
</tr>
<tr>
<td>Migration to FOSS (60 Labs)</td>
<td>Migration to Mobile platform (70 Labs)</td>
<td>Migration to Mobile platform (80 Labs)</td>
<td>Migration to Mobile platform (90 Labs)</td>
<td></td>
</tr>
<tr>
<td>Migration to Mobile platform (60 Labs)</td>
<td>Workshop for outreach</td>
<td>Workshop for outreach</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**4th Review Meeting in Jul (all PICs/DNCs to participate)**
# Virtual Lab Phase-II Timeline

<table>
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<tr>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5&lt;sup&gt;th&lt;/sup&gt; Review Meeting In Jan (all PICs/DNCs to participate)</td>
<td>“Single package” 13&lt;sup&gt;th&lt;/sup&gt; release in Mar (120+ VLabs)</td>
<td>Addition of new Nodal Centers as per commitment</td>
<td>Migration to FOSS (120 Labs)</td>
<td></td>
</tr>
<tr>
<td>Addition of new Nodal Centers as per commitment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migration to FOSS (100 Labs)</td>
<td>Migration to Mobile platform (120 Labs)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Migration to Mobile platform (100 Labs)</td>
<td>Workshop for outreach</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>6&lt;sup&gt;th&lt;/sup&gt; Review Meeting In Jan (all PICs/DNCs to participate) and Project Closure</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1st PRSG constitution
Fwd: Members of PRSG for Virtual Lab

1 message

Ranjan Bose <rbose.iitd@gmail.com>
To: Sanjeeet Kumar <sanjeetkumar.iitd@gmail.com>

------ Forwarded message ------
From: "KushalDevVerma US" <kdverma.edu@nic.in>
Date: Oct 8, 2015 10:31 AM
Subject: Members of PRSG for Virtual Lab
To: <rbose.iitd@gmail.com>
Cc:

Sir,

Joint Secretary (TEL) and Mission Director (NMEICT) has approved the PRSG for Virtual Lab with following members:-

1. Prof. Ajay Chakrabarty, IIT Kharagpur
2. Dr. M. Sasikumar, Associate Director, C-DAC Mumbai
3. Dr. Anil Kumar Ahlawat, KIET, Ghaziabad
4. Dr. Saurabh Jain, Indore Institute of Science & Technology
5. Shri K. D. Verma, Under Secretary (TEL) – from TEL Bureau, M/o HRD

The formal order will follow in this regard

Thanking You

(K. D. Verma)
Under Secretary (TEL)
M/o HRD
Letter to MHRD for Maintenance Funds of RT Labs
Letter for Maintenance funds for RT Labs has been submitted to MHRD on 18 Feb 2016

Dr. Ranjan Bose
Professor

To
Mission Director,
NMEICT,
MHRD, Shastri Bhawan,
New Delhi

Subject: Release of funds for maintenance of Remote Triggered Labs

Dear Sir,

Kindly refer to the ‘Virtual Labs Remote Triggered Labs’ project, approved by MHRD. As per recommendation of recent PRSG held on 17 October 2015 at IIT Delhi, all the remote triggered labs should be kept in up-and-running condition. The funds required to maintain all the labs is ₹ 7.35 Crores. The minutes of meeting (MoM) is enclosed herewith for your reference.

Therefore, you are requested to kindly sanction ₹ 7.35 Crores to keep in up-and-running condition. Please let me know if you need any other information from me. My contact no. is 9818253072.

Thank you,
Sincerely,

Prof Ranjan Bose, Co-PI, Virtual Labs Project

CC: (1) Deputy Secretary, MHRD, Department of Higher Education (TEL Division)
(2) Under Secretary (TEL), MHRD, Department of Higher Education

Kamal
23/4/16
FOSSEE: Adoption of Free and Open source Software for Education
(www.fossee.in)

PI: Prabhu Ramachandran
Indian Institute of Technology, Bombay

Presentation to the Domain Expert Committee
May 2, 2016
Project Objectives

- Increase use of Free/Open Source Software in education
- Minimise use of proprietary/commercial software in education
Project Investigators

- Prabhu Ramachandran (AE)
- Mani Bhushan, P Sunthar and Kannan Moudgalya (ChE)
- Siddhartha Ghosh (CE)
- Supratik Chakraborty, Varsha Apte, Krishna S (CS)
- Madhu Belur, Maryam Shojaei and Kumar Appaiah (EE)
- Jayendran Venkateswaran and Ashutosh Mahajan (IEOR)
- Shivasubramanian Gopalakrishnan (Mech.)
- N.K. Khosla (MEMS)
save institutional and government money
enable freedom in software usage
use of FOSS makes students and teachers better programmers
GOI Policy on FOSS


- Policy on Adoption of OSS
Problems

- Limited awareness
- Reluctance to shift
- Lack of Support
  - Teaching aids
  - Documentation
  - Answering questions
Software Promoted

Scilab.in

python

COMPUTATIONAL FLUID DYNAMICS
Software Promoted

OR Tools
FOSS Tools for Operations Research

eSim
A Free and Open source EDA tool
Software Promoted

Osdag
Open steel design and graphics

Sandhi
Visual Programming Language and Editor

OS-HARDWARE
Develop and promote opensource hardware
How we promote FOSS
Flow over a flat plate - English

Spoken-Tutorial IIT Bombay

Subscribe 3,992

1,202
## Software Development

![3D Viewer Screenshot](https://via.placeholder.com/150)

### Input Dock
- **Connectivity** *: Column flange-Bear
- **Beam section** *: ISMB 400
- **Column section** *: ISSC 200
- **f_y (MPa)** *: 410
- **f_t (MPa)** *: 250

### Factored Load
- **Shear Force (kN)** *: 240

### Bolt
- **Diameter (mm)** *: 16
- **Type** *: Black Bolt
- **Grade** *: 4.8

### Plate
- **Thickness (mm)** *: 16
- **Height (mm)**: 0
- **Width (mm)**: 0

### Weld
- **Thickness (mm)** *: 8

### Output Dock
- **Bolt**
  - Shear capacity (kN): 28.974
  - Bearing capacity (kN): 58.384
  - Capacity of bolt (kN): 28.974
  - No. of bolts required: 9
  - Bolt group capacity (kN): 260.766
  - No. of rows: 5
  - No. of columns: 2
  - Pitch (mm): 60.0
  - Gauge (mm): 40.0
  - End distance (mm): 40.0
  - Edge distance (mm): 40.0

- **Plate**
  - Height (mm): 320.0
  - Width (mm): 120.0
  - Moment demand (kNm): 21.429
  - Moment capacity (kNm): 74.473

- **Weld**
  - Shear demand (kN/mm): 799.821
  - Weld strength (kN/mm): 1060.477

**Messages**
- Wed, 20 Jan 2016 17:20:25 INFO: Overall finplate connection design is safe
- Wed, 20 Jan 2016 17:20:25 DEBUG: End Of design
- Wed, 20 Jan 2016 17:44:41 INFO: Overall finplate connection design is safe

**Buttons**
- [Reset]
- [Design]
- [Save messages]
- [Create design report]
### FOSSEE Lab Migration

<table>
<thead>
<tr>
<th>No</th>
<th>Institute</th>
<th>Lab</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>National Institute of Science and Technology</td>
<td>Open Source EDA Lab</td>
<td>2014</td>
</tr>
<tr>
<td>2</td>
<td>Gujarat Technological University / Darshan Institute of Engineering &amp; Technology</td>
<td>Simulation &amp; Design Tools</td>
<td>2015</td>
</tr>
<tr>
<td>3</td>
<td>MANGALORE INSTITUTE OF TECHNOLOGY AND ENGG, MOODABIDRI</td>
<td>POWER ELECTRONICS SIMULATION LAB</td>
<td>2016</td>
</tr>
<tr>
<td>4</td>
<td>Dharamsinh Desai University</td>
<td>NETWORK ANALYSIS</td>
<td>2016</td>
</tr>
</tbody>
</table>
Workshops

Statistics
Advertisements

Scilab-Arduino Workshop

July '15
03
July '15
04

Arduino is an open source microcontroller board and an electronic prototyping platform, popular in industry. Scilab is an open source, user friendly, state of the art, computational engine. This workshop is devoted to the control of an Arduino board from Scilab. The workshop kit will include an Arduino Uno board, a shield containing sensors and actuators, and necessary documentation. Participants will learn to perform embedded system experiments on the Arduino board using Scilab code and also through the GUI based simulation environment, Xcos.

The following experiments will be performed:

- LED Blink
- RGB LEDs
- Light intensity measurement
- DC motor control
- Pushbutton
- Relay
- Potentiometer
- Temperature sensor
- Using different sensors
- Receive data through any modbus compatible device
- Demos on some industrial applications
... and more

Register here:

LH 101
Postal Campaigns
Partner Institutes

- IIT Kharagpur: documentation for several important open source software engineering tools
- Thiagaraja College of Engineering, Madurai - organizing and disseminating information about FOSS
- To add more partners with Committee’s approval
Our Projects
Scilab Textbook Companions

Completed Books

- Fluid Mechanics
- Control Theory & Control Systems
- Chemical Engineering
- Thermodynamics
- Mechanical Engineering
- Signal Processing
- Digital Communications
- Electrical Technology
- Mathematics & Pure Science
- Analog Electronics
- Digital Electronics
- Computer Programming
- Others

Total number of completed books: 533

Fluid Mechanics:
Contributors are students from across the nation

Honorarium and certificates to contributors
Scilab: Lab Migration

- Migrate labs using proprietary software
- Migrated 40 Matlab based labs to Scilab
- Another 19 labs are under progress
- Scilab Lab Migration Weblink
Scilab on Cloud
Scilab on Cloud

- User can modify codes & parameters and check the results
- Accessible on multiple browsers
- Such free service is not available for Matlab
- Accessible on mobile devices
--- Forwarded msg. From: Dr. Ashish Panchal <akp@eed.svnit.ac.in>  
Date: Wed, 4 Dec 2013 23:54:14 +0530  
To: belur@iitb.ac.in

Dear Sir,  
In the year 2009-2010, S V National Institute of Technology had initiated the procedure for procuring MATLAB. In the mean time, Prof. M Belur and his team came to SVNIT Surat and introduced about similar freeware Scilab. They conducted introductory workshops/tutorials for the faculty and students. Thereon, the work was successfully transferred to Scilab instead of MATLAB. Hence the procurement of MATLAB tool boxes etc. were drastically reduced and we could save lot money because of introduction of such a freeware.

With regards.  
Panchal Ashish K., Assoc. Prof.  
Electrical Engineering Department, SVNIT  
Ichchanath, Surat-395007  
Gujarat, India.
Scilab: Other Achievements

- AICTE project evaluation committee saved about Rs. two crores in FDPs by promoting FOSS
- Trained hundreds of students, faculty
- First Scilab India Conference in 2014
Scale up Lab Migration activity
Complete additional Textbook Companions
Version control for Textbook Companions (like wikipedia)
Organize Scilab conferences
```python
import numpy as np
import matplotlib.pyplot as plt

# Define the range for x and y
x = np.linspace(x0, x1, 100)
y = np.linspace(y0, y1, 100)

# Create a grid of points
x, y = np.meshgrid(x, y)

Ex, Ey = E_total(x, y, charges)
streamplot(x, y, Ex, Ey, color='g')
draw()

print("Positive charge is indicated by blue circle. Negative charge is indicated by red circle\n")
print("Change the magnitudes of the charges using the sliders")

interact(plot_field_lines, q1_value=(-20, 20, 0.1), q2_value=(-20, 20, 0.1))
```

Positive charge is indicated by blue circle. Negative charge is indicated by red circle

Change the magnitudes of the charges using the sliders
Python: Textbook Companions

- Make it easy for users of textbooks to start using Python
- To improve the documentation available for Python
Ch-2 Optical Fibers & Fiber Cables

Example 2.1 Page no 31

```python
from __future__ import division
from math import sqrt, pi
# Calculation of core diameter
# Given data
n1=1.5# # Refractive index of core
n2=1.48# # Refractive index of cladding
N=1000# # No of modes
lambda=1.3# # Light wavelength
V=sqrt(2*N)# # Mode parameter

#core diameter
d=(lambda*V)/(2*pi*sqrt(n1**2-n2**2))#

print"Mode parameter = %0.2f "%(V)#
print"Core diameter = %0.0f micrometer "%(d)"

# Answer is wrong in the book.
Mode parameter = 44.72
Core diameter = 38 micrometer
```
Python: Other Achievements

- 51 Spoken Tutorials in Python created
- More than 40,000 trained using these
- 378 Textbook Companions, 219 under progress
- 7 SciPy India conferences (2009 – 2015)
- SDES: Software Development Techniques for Engineers and Scientists
Scale up Python Textbook Companion
Improve Yaksh and support its use in ST project
Create advanced/updated Spoken Tutorials
Python for Schools and Colleges
Flow Inside a Orifice Meter with streamlines.
OpenFOAM: Achievements

- CFD toolbox, equivalent to Ansys Fluent, Star CCM
- 19 Spoken Tutorials for self study
- First User Symposium held on 27 February 2016
OpenFOAM: Work Planned

- Develop GUI for OpenFOAM
- Scale up Lab Migration activities
- Create Advanced level tutorials for OpenFOAM
- Write a book on OpenFOAM through Spoken Tutorials
eSim
eSim: Achievements

- Used for schematic creation, PCB design and simulation
- 2 Lab Migrations
- 8 Textbook Companions
eSim: Work Planned

- Thorough testing of the GUI to make it a more stable and powerful EDA Tool
- Create basic, intermediate and advanced Spoken Tutorials
- Conduct several live workshops
- Conduct a massive campaign to train engineering students
OR-Tools

The OR Tools project, a part of the FOSSEE project, promotes the use of Free and Open Source Software (FOSS) tools for a wide range of problems seen in Operations Research (OR): mathematical optimization, simulation, queueing theory, and their applications in

Scipy India 2014

Prof. Jayendran Venkateswaran, PI of OR Tools gave a presentation on "Solving Optimization Problems using Python/PuLP".
OR-Tools: Achievements

- 5 Textbook Companions
- 2 Spoken Tutorials
- Scilab optimization toolbox
Open Hardware
Open Hardware

- The cost of building and testing new hardware is significant
- An open hardware builds on already trusted design
- Saves money, ideal for institutions and startups
- Scilab-Arduino and OpenPLC are open hardware
Scilab-Arduino Workshop
Scilab-Arduino: Achievements

- 10 experiments
- 2-Day workshop conducted
- Trained more than 150 participants
Microcontroller experiments through Arduino, Scilab & Xcos

The make-in India drive cannot succeed with software alone: a good mastery of hardware is equally important. Research and Development in both software and hardware have to go hand in hand to establish a world standard manufacturing industry. To excel in manufacturing, industrial automation is indispensable. Microcontrollers form the basis of industrial automation.

This book explains how to interface the popular open source microcontroller Arduino Uno board with a computer, running MS Windows or Linux. It explains how one can do this through open source software Arduino Integrated Development Environment (IDE). It also explains how one can effectively use the state of the art open source computational engine Scilab. The ease of the graphical programming environment Xcos of Scilab is illustrated. Using the code that comes with this book, one can learn to work with LEDs, LDRs, DC Motors, Push Buttons, Threading, and stepper motors. Easily available low cost hardware, such as an Arduino Uno board and a Shield containing sensors, actuators, and servo motors have been used in all demonstrations.

This book is the result of the work done by the FOSSEE (free and open source software for education) team, IIT Bombay. FOSSEE has been promoting open source software through collaborative activities, such as Textbook Comparisons, Lab Migration, and Spoken Tutorials. The Arduino experiments of this book have been validated on the affordable, but versatile, FOSSEE Laptop. The FOSSEE project is supported by the National Mission on Education through ICT (MHRD), Government of India.
Scilab-Arduino Book

- Microcontroller experiments using Arduino and Scilab
- Published by Shroff Publishers, Mumbai
- Used for conducting workshops, self learning
OpenPLC
OpenPLC

- Developed for educational purposes
- Useful to teach the concepts of Ladder Logic
Open Hardware: Work Planned

- Support for more experiments in digital domain
- Interfacing Arduino with Python & Julia
- IOT with Arduino and raspberry pi
- Interfacing with real time simulator using OpenModelica
- Designing modular PLC board to create a generic platform
SC/PAB suggests other FOSS

- SC Meeting on 4 December 2010 recommended promotion of other FOSS equivalents
- PAB, January 2011 directed FOSSEE to identify commercial software for which open source equivalents need to be developed
- PRSG meeting held on 7 Sept. 2012 suggested that FOSSEE should also work on other FOSS systems
Sandhi

Visual Programming Language and Editor
Sandhi - New Software Developed

- Open Source alternative to LabVIEW
- Programmers from all the partner institutions of the Virtual Labs project trained by Sandhi team
Sandhi: Work Done

- Completed lab: 1, under progress: 6
- Xcos on web
  - User interface built using Javascript, as a proof of concept
  - A few Xcos palettes made available
- Xcos on desktop
  - Able to build and edit backend of Xcos through Eclipse IDE
Sandhi: Work Planned

- Make the Xcos web interface fully functional and usable
- Make Xcos desktop more user friendly and add more blocks
Python count number of vowels with Dict (Code)

Define a function called `CountVowels(s)` which takes one string argument. Your function should count the number of vowels in the string passed as argument and return a dictionary which has the vowel as its key & the count of that vowel as associated value. Assume that string passed as argument will always be in lower case.

For Example `CountVowels("aeiou")` should return `{\'a\':1, \'e\':1, \'i\':1, \'o\':1, \'u\':1}` For Example `CountVowels("aaeeiioouu")` should return `{\'a\':2, \'e\':2, \'i\':2, \'o\':2, \'u\':2}`

Note: You do not have to print anything, neither you have to make the function call. Just define the function to perform the required operation & click on check answer. Also, note that the function name should exactly be as mentioned above.

Language: python

```python
1 def CountVowels(s):
2     a_no = 0
3     e_no = 0
4     i_no = 0
5     o_no = 0
6     u_no = 0
7     if \'a\' in s:
8         a_no = a_no + 1
9     if \'e\' in s:
10        e_no = e_no + 1
11     if \'i\' in s:
12        i_no = i_no + 1
13     if \'o\' in s:
14        o_no = o_no + 1
15     if \'u\' in s:
16        u_no = u_no + 1
17     return {\'a\':a_no, \'e\':e_no, \'i\':i_no, \'o\':o_no, \'u\':u_no}
```
Yaksh (Online Test) - New Software Developed

- Currently supports Python, C, C++, Java, Scilab and Bash
- Used for SDES, T10KT
- Useful tool for recruitment of programmers
Osdag is a cross-platform free and open-source software for the design (and detailing) of steel structures, following the
Cross-platform GUI, for design of steel structures

Follows the Indian Standard IS:800(2007)

Interactive GUI, provides 3D visualisation of the designed component
Redefining the user interface for multiple projects
Reformatting the design report
Organising a pre-launch workshop
Creating Spoken Tutorial videos for installation and basic usage
Launching a few modules for the general public use
Scilab-Toolboxes - New Software

- PAB: raise the level of Scilab to Matlab
- Ongoing improvement of toolboxes
  - Image processing
  - Signal processing
  - Communication systems
  - Optimisation
  - System identification
  - Control Systems
  - Scilab2C
- Use existing industry standard open source libraries for development
Scilab-Toolboxes: Work Planned

- Future toolbox development in DSP, Computer Vision, Wavelets, Symbolic Math
- Current and future toolbox development aims at UG academic and research requirements
## Summary of Activities (Phase II)

<table>
<thead>
<tr>
<th>Item</th>
<th>Committed (1st Year)</th>
<th>Achieved (1st Year)</th>
<th>Committed (2nd Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Textbook Companions + Lab Migrations</td>
<td>300</td>
<td>400</td>
<td>350</td>
</tr>
<tr>
<td>New FOSS</td>
<td>0</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Conferences + Live Workshops</td>
<td>4</td>
<td>11 (2 C + 9 W)</td>
<td>5</td>
</tr>
<tr>
<td>Postal Campaigns</td>
<td>10</td>
<td>11</td>
<td>15</td>
</tr>
<tr>
<td>Partner Institutes</td>
<td>5</td>
<td>2</td>
<td>5</td>
</tr>
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</table>
## Budget for three years

<table>
<thead>
<tr>
<th>Head</th>
<th>I yr</th>
<th>II yr</th>
<th>III yr</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Salaries</td>
<td>1.05</td>
<td>1.40</td>
<td>1.80</td>
<td>4.25</td>
</tr>
<tr>
<td>Honorarium for textbook companion creators</td>
<td>0.60</td>
<td>0.88</td>
<td>1.05</td>
<td>2.53</td>
</tr>
<tr>
<td>Collaborating partner institutions</td>
<td>0.50</td>
<td>1.00</td>
<td>1.50</td>
<td>3.00</td>
</tr>
<tr>
<td>Travel</td>
<td>0.20</td>
<td>0.25</td>
<td>0.30</td>
<td>0.75</td>
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<td>Postal campaign expenses</td>
<td>0.10</td>
<td>0.15</td>
<td>0.20</td>
<td>0.45</td>
</tr>
<tr>
<td>Other promotional expenses (stalls, media)</td>
<td>0.15</td>
<td>0.20</td>
<td>0.25</td>
<td>0.60</td>
</tr>
<tr>
<td>Conferences and workshops</td>
<td>0.20</td>
<td>0.25</td>
<td>0.30</td>
<td>0.75</td>
</tr>
<tr>
<td>Equipment</td>
<td>0.15</td>
<td>0.20</td>
<td>0.25</td>
<td>0.60</td>
</tr>
<tr>
<td>Web hosting expenses</td>
<td>0.05</td>
<td>0.10</td>
<td>0.15</td>
<td>0.30</td>
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<tr>
<td>Consumables</td>
<td>0.13</td>
<td>0.15</td>
<td>0.20</td>
<td>0.48</td>
</tr>
<tr>
<td>Other FOSS systems to be taken up for promotion</td>
<td>0.00</td>
<td>0.50</td>
<td>1.00</td>
<td>1.50</td>
</tr>
<tr>
<td>Contingency</td>
<td>0.10</td>
<td>0.15</td>
<td>0.20</td>
<td>0.45</td>
</tr>
<tr>
<td>Coordinator’s honorarium</td>
<td>0.08</td>
<td>0.10</td>
<td>0.15</td>
<td>0.33</td>
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<tr>
<td><strong>Total</strong></td>
<td>3.31</td>
<td>5.33</td>
<td>7.35</td>
<td>15.99</td>
</tr>
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</table>
## Current Financial Status

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<thead>
<tr>
<th>Details</th>
<th>Amount (Cr)</th>
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</thead>
<tbody>
<tr>
<td>Amount received on 09-06-2014</td>
<td>4.45</td>
</tr>
<tr>
<td>Amount spent and committed</td>
<td>4.436</td>
</tr>
<tr>
<td>Cash in hand</td>
<td>0.014</td>
</tr>
</tbody>
</table>

- 45 people employed by FOSSEE

---

FOSSEE (IIT Bombay)
FOSSEE Vision

- Facilitate independence from proprietary monopolies
- Spread FOSS in a much bigger way
  - Government organizations
  - Schools
  - More curricular changes
Thank you!
Talk to a Teacher
Teachers empowerment, students empowerment, and integration of tools for empowerment (synchronous delivery)

IIT Bombay:
Kannan M. Moudgalya, D. B. Phatak

IIT Kharagpur:
Raja Datta

Domain Experts Committee Meeting
23 November 2015
Outline

- Budget and project components
- Plan vs. delivery
- Requests to this committee
- Brief description of T10KT and Spoken Tutorials
Components

1. 10,000 Teacher Training Programme (T10KT)
2. Spoken Tutorials
10,000 Teacher Training Programme: Deliverables

1. Conduct 15 courses
   - 9 at IIT Bombay
   - 6 at IIT Kharagpur

2. Train 1,50,000 teachers

3. Establish 10 Nodal Centres

4. Establish 500 Remote Centres
1. Create 5,000 Spoken Tutorials of 10 minute duration each
2. Train 1,50,000 students and faculty
## T10KT Training Alone: Planned vs. Delivered

<table>
<thead>
<tr>
<th>Year</th>
<th>No. workshops</th>
<th>Planned</th>
<th>Delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td>13-14</td>
<td></td>
<td>3+1</td>
<td>4+2</td>
</tr>
<tr>
<td></td>
<td>No. trained</td>
<td>40,000</td>
<td>56,377</td>
</tr>
<tr>
<td>14-15</td>
<td></td>
<td>3+2</td>
<td>5+2</td>
</tr>
<tr>
<td></td>
<td>No. trained</td>
<td>50,000</td>
<td>49,407</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>90,000</td>
<td>1,05,784</td>
</tr>
</tbody>
</table>

IIT Bombay, IIT Kharagpur

Talk to a Teacher 6/16
# T10KT Overall: Planned vs. Delivered

<table>
<thead>
<tr>
<th></th>
<th>Planned (3 years)</th>
<th>Delivered (&lt; 2 years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>People trained</td>
<td>1,50,000</td>
<td>1,05,784</td>
</tr>
<tr>
<td>Nodal Centres</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Remote Centres</td>
<td>500</td>
<td>350</td>
</tr>
</tbody>
</table>

We are at about the midpoint of this project!
<table>
<thead>
<tr>
<th>Year</th>
<th>Planned</th>
<th>Delivered</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. trained</td>
<td></td>
</tr>
<tr>
<td>13-14</td>
<td>50,000</td>
<td>2,44,215</td>
</tr>
<tr>
<td></td>
<td>ST creation</td>
<td>1,140</td>
</tr>
<tr>
<td></td>
<td>1,100</td>
<td>1,960</td>
</tr>
<tr>
<td>14-15</td>
<td>No. trained</td>
<td>50,000</td>
</tr>
<tr>
<td></td>
<td>50,000</td>
<td>4,52,199</td>
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<tr>
<td></td>
<td>ST creation</td>
<td>2,200</td>
</tr>
<tr>
<td></td>
<td>1,960</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>No. trained</td>
<td>1,00,000</td>
</tr>
<tr>
<td></td>
<td>1,00,000</td>
<td>6,96,414</td>
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<td></td>
<td>ST creation</td>
<td>3,300</td>
</tr>
<tr>
<td></td>
<td>3,130</td>
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</table>
## Overall Budget (in lakh)

<table>
<thead>
<tr>
<th></th>
<th>I Year</th>
<th>II Year</th>
<th>III Year</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>IITB</td>
<td>5557</td>
<td>3879</td>
<td>3937</td>
<td>13373</td>
</tr>
<tr>
<td>IITKgp</td>
<td>1299</td>
<td>1893</td>
<td>2637</td>
<td>5829</td>
</tr>
<tr>
<td>Total</td>
<td>6856</td>
<td>5772</td>
<td>6574</td>
<td>19202</td>
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</table>
### Details of funds received

<table>
<thead>
<tr>
<th>Year</th>
<th>Date of receipt</th>
<th>Amount recommended by SC (Rs. crore)</th>
<th>Amount Released (Rs. crore)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>6 Feb. 2013</td>
<td>30%</td>
<td>57.60</td>
</tr>
<tr>
<td>2</td>
<td>18 Sept. 2014</td>
<td>57.60</td>
<td>20.00</td>
</tr>
</tbody>
</table>

- The SC (27-28 May 2014) recommended the release of Rs. 57.60
- Rs. 20 crore was released in Sept. 14
- Rs. 10 crore was released in January 2016
- We are waiting for funds
Current proposal

- Deliver one synchronous course in each of IIT Bombay and IIT Kharagpur for T10KT - as against $3+2=5$ in DPR
- Deliver Spoken Tutorials as proposed earlier
- Shift to MOOCs
# Modified budget for T10KT

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td></td>
<td>IITB</td>
<td>IITKgp</td>
<td>IITB</td>
<td>IITKgp</td>
</tr>
<tr>
<td>No. of Courses</td>
<td>Three</td>
<td>Two</td>
<td>One</td>
<td>One</td>
</tr>
<tr>
<td>Equipment</td>
<td>50</td>
<td>100</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Salary</td>
<td>300</td>
<td>200</td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td>Consumables</td>
<td>100</td>
<td>100</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Nodal centres</td>
<td>250</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Remote centres</td>
<td>600</td>
<td>0</td>
<td>50</td>
<td>0</td>
</tr>
<tr>
<td>10K workshops</td>
<td>1887</td>
<td>1258</td>
<td>629</td>
<td>629</td>
</tr>
<tr>
<td>Coordinator W/S</td>
<td>75</td>
<td>50</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Publicity/sponsor</td>
<td>50</td>
<td>50</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Travel</td>
<td>60</td>
<td>50</td>
<td>20</td>
<td>15</td>
</tr>
<tr>
<td>Contingency</td>
<td>100</td>
<td>100</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>MOOCs effort</td>
<td>0</td>
<td>0</td>
<td>94</td>
<td>94</td>
</tr>
<tr>
<td>Coord. honorarium</td>
<td>25</td>
<td>25</td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>Total</td>
<td>5237</td>
<td>1299</td>
<td>1003</td>
<td>908</td>
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</table>

IIT Bombay, IIT Kharagpur  
Talk to a Teacher  
12/16
### MOOCs Calculation for T10KT

<table>
<thead>
<tr>
<th>Description</th>
<th>IITB</th>
<th>IITKgp</th>
<th>Additional Details</th>
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</thead>
<tbody>
<tr>
<td>Creation of 4 new MOOCs at each IIT</td>
<td>44</td>
<td>44</td>
<td>9 lakh for creation and 2 lakh honorarium</td>
</tr>
<tr>
<td>Repurposing to create 2 MOOCs</td>
<td>16</td>
<td>16</td>
<td>6 lakh for creation and 2 lakh honorarium</td>
</tr>
<tr>
<td>Running 6 courses first time</td>
<td>24</td>
<td>24</td>
<td>Honorarium (1), TA (1.5), staff (1.5) = 3.5 lakh for each course</td>
</tr>
<tr>
<td>MOOCs workshops</td>
<td>10</td>
<td>10</td>
<td>2 workshops at each IIT</td>
</tr>
<tr>
<td>Total</td>
<td>94</td>
<td>94</td>
<td></td>
</tr>
</tbody>
</table>

IIT Bombay, IIT Kharagpur  
Talk to a Teacher  
13/16
<table>
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<th>Head</th>
<th>Approved</th>
<th>New</th>
<th>Comments</th>
</tr>
</thead>
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<tr>
<td>Deliverables as in the second year of DPR</td>
<td>382</td>
<td>382</td>
<td></td>
</tr>
<tr>
<td>Efficacy studies for backward states/districts</td>
<td>0</td>
<td>10</td>
<td>2 Ph.Ds and an assistant</td>
</tr>
<tr>
<td>Repurposing to create MOOCs</td>
<td>0</td>
<td>48</td>
<td>6 courses at the rate of Rs. 8 lakh per course</td>
</tr>
<tr>
<td>Running MOOCs, first time</td>
<td>0</td>
<td>24</td>
<td>6 courses at the rate of Rs. 4 lakh per course</td>
</tr>
<tr>
<td>Conducting one workshop</td>
<td>0</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>382</td>
<td>469</td>
<td></td>
</tr>
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</table>
## Overall budget - requested now

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<th>Approved</th>
<th>New</th>
</tr>
</thead>
<tbody>
<tr>
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<td>IITB</td>
<td>IITKgp</td>
</tr>
<tr>
<td>T10KT</td>
<td>5237</td>
<td>1299</td>
</tr>
<tr>
<td>Spoken Tutorial</td>
<td>382</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>5619</td>
<td>1299</td>
</tr>
</tbody>
</table>

**Total funds requested now**

= Rs. 2377 lakh = 23.77 crore
Thanks
Purpose

● To develop various software systems (usually web based applications) to support academic and administrative processes in academic institutes.
• Started in 2009 as pilot - IITK, DEI, IITR, NITH, AVV
• 2010 - main phase started - AMU, SMVDU, IGNOU, JMI - new partners added.
• Partners added at NMEICT meetings.
Development Philosophy - Agile methodology

- **Development**
  - Personal feedback,
  - Specification doc,
  - Discussion meeting,
  - User experience.

- **Testing**
  - Bug Report, Feature request or identification, Code review
  - Commit to repository

- **Release on Sourceforge.net**
  - SVN Repository
  - If code is stable (No bug fix commit for last few weeks)

- **Installation update**
Development process

- Bug Report
- Code Review
- Feature requests
- Working draft update
- Modify the existing code
- Replace a code Block with redesigned code
- Development of new feature
Current Status

● The project work is stalled. Most of partners withdrawn from project after depositing the code in repository.
● Through other minimal resources - Brihaspati-3 running as service at http://brihaspati.nmeict.in/
● Financial Management System - BGAS - in use at about 35 institutions
Systems currently operational

Brihaspati-3
○ Learning management system
○ Multilingual (हिंदी / urdu / English and 23 other languages)
○ Includes
  ■ online examination
  ■ course content sharing
  ■ collaborative content authoring
  ■ marks upload/view
  ■ Assignment submission
  ■ Group based learning support
- Management interface for main admin, institute admin
- disk quota management
- User information

Institute_course_program
Email_id (alternate)
User_id (Email Id)
Password Hash
Institute_program_rollno
- Remote authentication interface for other application

![Diagram]

- BGAS
- Brihaspati-3
- User
- Handover
- Application access
- Authentication
● Since April 2013, effort started based on the received requirements.
● Double entry, fund based accrual accounting

Example Entries

Credit - liability towards taxiwala
Debit - paid to taxiwala
Credit - paid from cash
Debit - traveled from IITK to Kanpur Central

BGAS - Brihaspati General Accounting System
### Balance Sheet MHRD Format

#### Previous Years' data does not exist

**Entry Date From:** 01/04/2013  
**To Entry Date:** 02/03/2014

<table>
<thead>
<tr>
<th>Sources Of Funds</th>
<th>Schedule</th>
<th>Current Year</th>
<th>Previous Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own Fund</td>
<td>1</td>
<td>Cr 4004570.21</td>
<td>0</td>
</tr>
<tr>
<td>Reserve and Surplus</td>
<td>2</td>
<td>Cr 1258392.02</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1771799.23</td>
<td>0.00</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Application Of Funds</th>
<th>Schedule</th>
<th>Current Year</th>
<th>Previous Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fixed Assets</td>
<td>2</td>
<td>Dr 1999543.00</td>
<td>0</td>
</tr>
<tr>
<td>Investment</td>
<td>4</td>
<td>Dr 13000.00</td>
<td>0</td>
</tr>
<tr>
<td>Current Assets</td>
<td>5</td>
<td>Dr 1750095.23</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1771799.23</td>
<td>0.00</td>
</tr>
</tbody>
</table>

**Notes On Accounts:**

- 5
Open-source ‘Webzash’ taken as base.
modified and enhanced.
New features
- New balance sheet format
- New schedule formats
- Three format for chart of accounts - Standard, bare minimum, detailed as per standard.
Concept of transaction between two entities

Transaction

Conventional design: Accounting unit code and ledger codes are mixed up.
Clean separation - leads to easier processing of data.
For a/c unit code, ledger code specification - committee chaired by CCA constituted.

- includes Finance persons from various organizations.
- Secondary accounting unit code - structure left to individual user organizations. Uniformity in them not needed.
- Currently supported in BGAS
Secondary Accounting Unit

• code (e.g., employee code, vendor code, student roll no.)
• PAN No., Bank Details.
• Depending on type of entity - more information.
• Code decided by user institutes
- Start and end dates for report - flexible.
- Depreciation of assets - automatic calculation
- Year end closing
  - Automatic transfer of (income-expenditure) to General Reserve.
  - Opening of next year assets and liabilities - automatic based on closing balances.
Other systems

- LibMS - was in use in AMU before AMU team stopped functioning due to lack of resources.
- PMS - financial part - subsumed in BGAS. Activity management part in Brihaspati3.
- MGMS - a kind of financial management system, now subsumed in BGAS.
- Data visualization - subsumed in Brihaspati3 as integrated analytics component.
Ongoing work

Basically three aggregates

- Academic Management System - build around Brihaspati
- Financial Management System - build around BGAS
- LibMS - it is available as functional module in opensource. But institutes can also opt for other Lib Mgt Systems also e.g., Koha.
Ongoing Work

- Integration of PayrollSys, PICO, StuFeeMgtSys with BGAS.
- Integration of remote handovers and seamless transfers.
- Secure data sharing APIs.
Installations*

- IIT Kanpur - Shiksha Sopan
- NITIE Mumbai
- CU Gujarat
- DEI Agra
- SPA Vijayawada

*We are currently interacting with them on regular basis, older ones are not listed.
Statistics

- 13085 worldwide downloads of code from Sourceforge.net
- 18613 user on http://brihaspati.nmeict.in
- 5941 course areas
- 268 institute partitions.
- 35 installations of BGAS in Various institutes
- Direct checkouts from subversion repository - not known
- Statistics from other institutional installations of Brihaspati-3 not known.
What is needed?

- Extension of project for one year from date of grant of extension.
- Release of grant for the extension period
  - Approx ₹50 lakhs (with only online workshops)
  - Approx ₹76 lakhs (with four offline workshops at IITK)
Why extension needed?

- Users at other installation
  - not paying for support, initial hitch.
  - Once operations are stable, they will contribute.
- Feedback from the users - need to update the software system on a continuous basis.
- If possible, identify a few institutes
  - give them funds in the second year.
  - They should sign MoU with IITK and give money to IITK for support.
  - Once institutes pay, they can be questioned on the adaption of these systems. Initial hesitation can be taken care of.
## Budget requirement

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
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<tbody>
<tr>
<td>Manpower (@20K average for 15 developers)</td>
<td>36 lakhs</td>
</tr>
<tr>
<td>Travel</td>
<td>3 lakhs</td>
</tr>
<tr>
<td>Training</td>
<td>24 lakhs</td>
</tr>
<tr>
<td>(considering the travel expanses of the participants) / Nil*</td>
<td></td>
</tr>
<tr>
<td>Equipments (PC upgradation + batteries for UPS etc.)</td>
<td>5 lakhs</td>
</tr>
<tr>
<td>Contingency (AMC of machines+UPS+Batteries)/consumables</td>
<td>4 lakhs</td>
</tr>
<tr>
<td>Overhead (5%) for DoRD</td>
<td>3.6 lakhs</td>
</tr>
<tr>
<td></td>
<td>/1.44* lakhs</td>
</tr>
<tr>
<td>Total required</td>
<td>75.6 lakhs</td>
</tr>
<tr>
<td></td>
<td>/49.44* lakhs</td>
</tr>
</tbody>
</table>

* if Online training is opted in lieu of offline training
URLs

http://brihsvn.iitk.ernet.in/repos - source code repository
http://brihaspati.nmeict.in/ - Brihaspati-3 installation
http://brihsvn.iitk.ernet.in/~brihaspati/BGAS - BGAS test installation
http://educontent.iitk.ernet.in/ - test installation of all the products.
http://14.139.62.116/pico - Test installation of PICO at JMI, Delhi (older version)
Scheduled Workshop

BVM Engineering College, Vallabhbh Vidyanagar, Gujarat 10-12 May 2016.
Part online, part offline.
For offline, expanses are borne by host.
धन्यवाद
Thank You
Development of National Digital Library of India

Towards Building a National Asset

A PILOT PROJECT

Project Brief: 02-MAY-2016
Domain Expert Committee on e-Content, Pedagogy & Related Activities

Presented by
Prof. PARTHA PRATIM DAS
ppd@cse.iitkgp.ernet.in
Joint PI, NDL Project, NME-ICT, MHRD
Indian Institute of Technology, Kharagpur
Agenda

- Scope, Status & Challenges
- PRSG
- Target: FY 16-17
- Fund Requirements
NDL – A Pilot Project: Scope

- NDL is a pilot project of 3-year duration
- Start: April, 2015
- Scope of the pilot project
  - Creation of a 24X7-enabled Infrastructure suitable for 10,000 Concurrent Users
  - Harvesting IDR (Institutional Digital Repository) of 100 Contributing Institutes
  - Integrate contents from eLearning repositories like INFLIBNET, NPTEL, NCERT, DLI, NMEICT projects
  - Participatory adoption by 100 Participating Institutes
  - Host 1000 LMS Courseware
Status

PORTAL
CONTENT SOURCES
CONTENT PIPELINE
METADATA STANDARD
SYSTEM STATUS
AWARENESS DRIVE & EVENTS
USER REGISTRATION
NDL Portal (https://ndl.iitkgp.ac.in) gone live in Feb’16 with

- 24X7 infrastructure
  - Partial server capacity (about 30% of planned)
  - Partial access bandwidth (about 50% of planned)
- English and Vernacular (Hindi & Bengali) User Interface
- 11 lakh+ content
- 36 Harvested IDRs from Contributing Institutes
- Contents of INFLIBNET, NPTEL, NCERT, DLI & a few NMEICT projects
- Contents of couple of international publishers
- Got users from about 150 Participating Institutes registered
Registration instruction

Registration has been opened only for following mail domains:

ac.in ernet.in  gov.in  nic.in  res.in

OK
New User Registration

Full Name *: Partha Pratim Das

E-mail ID *: ppd@see.iitkgp.ernet.in
Will be your login id

Password *: 

Confirm Password *: 

Date of birth: 1961 - JULY - 30

Gender: Male | Female | Other

The mail-id is available for you

Matched with Password
Transport, magnetic, and Sn-119 Mossbauer studies on magnetically ordered valence fluctuating compound SmRuSn3

Title: Transport, magnetic, and Sn-119 Mossbauer studies on magnetically ordered valence fluctuating compound SmRuSn3

Author: MAZUMDAR, C; HOSSAIN, Z; NAGARAJAN, R; GODART, C; DHAR, SK; GUPTA, LC; RADAIA, BD; VIJAYARAGHAVAN, R

Abstract: SmRuSn3 is a unique compound among the known Sm-based valence fluctuation (VF) systems. Its crystallographic structure has two inequivalent Sm sites and Sm ions at only one of them are in VF state while the Sm ions in the other site orders magnetically. Our (119)Mossbauer studies show a quadrupolar splitting at the Sm site, consistent with the monoclinic symmetry of the Sm site. A broadening of the Mossbauer spectrum is seen due to magnetic ordering of the material. The transferred hyperfine field at Sm site at 4.2 K is small. (C) 1996 American Institute of Physics.

URI: http://dx.doi.org/10.1063/1.361996
http://dspace.library.iitb.ac.in/xmlui/handle/10054/14412
http://hdl.handle.net/100/1441

Date: 1996
Transport, magnetic, and Sn-119 Mossbauer studies on magnetically ordered valence fluctuating compound SmRuSn3

Author: Mazumdar, C. • Hossain, Z. • Nagarajan, R. • Godart, C. • Dhar, S. K. • Gupta, L. C. • Padalia, B. D. • Vijayaraghavan, R.

Source: IIT Bombay

Content type: Text

Publisher: AMER INST PHYSICS

File Format: HTM / HTML

Language: English

Subject Other: cerusn3

Abstract: SmRuSn3 is a unique compound among the known Sm-based valence fluctuation (VF) systems. Its crystallographic structure has two inequivalent Sm sites and Sm ions at only one of them are in VF state while the Sm ions in the other site orders magnetically. Our (119)Mossbauer studies show a quadrupolar splitting at the Sn site, consistent with the noncubic symmetry of the Sn site. A broadening of the Mosbauer spectrum is seen due to magnetic ordering of the material. The transferred hyperfine field at Sn site at 4.2 K is small. (C) 1996 American Institute of Physics.

Other Identifier: JOURNAL OF APPLIED PHYSICS,79(8)6349-6351 0021-8979 http://dx.doi.org/10.1063/1.361996 http://hdl.handle.net/100/1441
Transport, magnetic, and 119Sn Mössbauer studies on magnetically ordered valence fluctuating compound SmRuSn3


Citation: J. Appl. Phys. 79, 6349 (1996); doi: 10.1063/1.361996
View online: http://dx.doi.org/10.1063/1.361996
View Table of Contents: http://iap.aip.org/resource/1/JAPIAU/v79/i8
Published by the American Institute of Physics.

Related Articles
Valence fluctuation and electron–phonon coupling in La68–xCexAl10Cu20Co2 (x = 0, 34, and 68) metallic glasses
Intermediate valency of Eu in a cubic intermetallic compound Ce0.5Eu0.5Pd3
Appl. Phys. Lett. 84, 182503 (2009)
Interface and Mn valence effects in ferromagnetic insulating multilayers based on Mn and tin oxide
J. Appl. Phys. 103, 07D129 (2008)
Charge states of strongly correlated 3d oxides: from typical insulator to unconventional electron–hole Bose liquid
The effect of mixed Mn valences on Li migration in LIMn2O4 spinel: A molecular dynamics study
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Mathematics ▼
General principles of mathematics ▼

234 results found in 0.0405 secs

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Source: MIT OpenCourseWare
Self Learning | UG and PG

Lecture 18: Probability Introduction
Source: MIT OpenCourseWare
Self Learning | UG and PG

Abstract: Gives an overview of probability, including basic definitions, the Monty Hall problem, and strange dice games.

Lecture 2: Asymptotic Notation; Recurrences; Substitution, Master Method
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Self Learning | UG and PG
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Author: Ashwathama, V.H
Research | UG and PG

Relative Efficiency Of Urea, Ammonium Sulphate And Calcium Ammonium Nitrate And Studies On Techniques To Inc...

Source: KrishiKosh - Indian National Agricultural Research S...
Author: Rao, E.V.S.Prakash
Research | UG and PG

Agricultural Marketing In India : Preliminary Guide To Indian Fish Fisheries Methods Of Fishing And Curing

Source: KrishiKosh - Indian National Agricultural Research S...
Author: Alfred Stefferud
Reading | UG and PG

Lipid Biosynthesis In Mammary Gland Of Cattle And Buffalo

Source: KrishiKosh - Indian National Agricultural Research S...
Author: Garg, Manohar Lal
Research | UG and PG
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<tr>
<td>पढ़ो:</td>
<td>XI and XII</td>
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<tr>
<td>मध्य:</td>
<td>हिंदी</td>
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<table>
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<td>I to IV</td>
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</tbody>
</table>

सारांश: इस अध्याय में महात्मा गांधी के विचार फल्यक रूप से उदाहरणों और आदर्शों के जरिए प्रस्तुत किए जाते हुए गांधी जी का विचारधारा ज्ञात किया जाता है। गांधी जी ने इंद्रधनुश के आदर्श के तहत पुरातात्विक और समस्तता नेतृत्व में जीते हुए विश्वविद्यालयों के अर्यादेश का उपयोग किया।

सारांश: वह "राष्ट्रीय के क्रियाकलाप कुछ विपथ: भाग - 3" का वीम अध्याय है। इस अध्याय का नाम "महात्मा गांधी और राष्ट्रीय आंदोलन" है। इस अध्याय में 1915-1948 के महात्माघुर्ण काल के दौरान भारत में गांधी जी के गतिविधियों का अधिकार दर्शनित किया गया है।

सारांश: वह अध्याय में महात्मा गांधी जी की जीवनी पर आधारित है। महात्मा गांधी जी आर्थिक से तथा अपने पूरे जीवन में, जीवन के भीतर जिस मुद्दों को महत्वपूर्ण माना जाता था और उनकी वायुद्ध की उपलब्धि तर्क सिद्ध है।

सारांश: इस अध्याय में हमारे राष्ट्रपति महात्मा गांधी के भारत लोकों आंदोलन पर आधारित एक इतिहास का कहानी है।
### NDL: Statistics (2016-05-01)

#### NDL users
- Users from 257 institutions have been registered with NDL
- Number of users who have activated their accounts: 33,903
- Number of users who have not activated their accounts: 181,989
- Total number of registered users: 215,892

#### Site usage (by registered users only)
- Number of currently logged-in users: 4
- Number of sessions where the user stayed in the site more than 30 minutes: 34,468
- Number of users who visited the site more than 5 times: 1,869

#### Server statistics (since 2016-05-01 18:51:19)

<table>
<thead>
<tr>
<th>Server</th>
<th>Average hits / second</th>
<th>Response time (in sec)</th>
<th>Content accessed</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.02175439</td>
<td>0.96050482</td>
<td>5</td>
</tr>
</tbody>
</table>
Another 16 IDRs harvested and ready to go Live

IIT-JEE Question Papers & Answers (8 years) ready to go Live

Satyajit Ray Redbook archive ready to go Live
  - 39 Cinematography Redbooks of Ray goes public first time

Metadata of OECD curated and put on test server ([https://ndl-test.iitkgp.ac.in](https://ndl-test.iitkgp.ac.in))
  - UNESCO/OECD to review and approve for making Live

LibriVox (audio books) site crawled and metadata curated: Live by May’16
Ver-1 of NDL Metadata Schema Manual published
(www.ndlproject.iitkgp.ac.in/)
Systems Status

- 2nd lot of servers ordered
- Disaster Recovery system
  - Site (at Kolkata Centre of IIT Kharagpur) preparation started
  - System architecture and server capacity planning started
  - Access bandwidth request initiated
Awareness Drive & Events

- 5 Workshops on NDL familiarization and IDR setup conducted across the country
- Contributing & Participating Institute support
  - Hand-holding Contributing Institutes to set up IDR and making IDR harvestable
  - Hand-holding users of Participating Institutes
    - Registration
    - Usage
    - Query response
Awareness Drive & Events

- Workshop @ INDEST Meet @ Mohali, 29/30-Apr-15
- National IDR WS @ IIT Kharagpur, 15/17-June-15
- Regional (North-East) IDR WS @ IIT Guwahati, 04/05-July-15
- National Seminar on “Emerging Trends in Academic Libraries” @ IIT Kharagpur, 21-Aug-15
- Regional (North-I) IDR WS @ IIT Roorkee, 24/25-Aug-15
- ETD 2015 India @ JNU New Delhi, 05/06-Nov-15
- 4th NKN Annual WS @ JNTU Hyderabad, 21/22-Jan-16
- Regional (West-I) IDR WS @ M S University, 28/29-Jan-16
- National VC Address over NKN, 03-Feb-16
- Regional (South-I) IDR WS @ IIT Madras, 25/26-Mar-16

- Regional (South-II) IDR WS @ IISc, Bangalore, 20/21-May-16
- National Workshop for Open-Source Software for Library Management (OSSLM 2016) @ IIT Kharagpur, 13/18-Jun-16
- Regional (South-III) IDR WS @ IIIT, Hyderabad, 01/02-Jul-16
- Regional (West-II) IDR WS @ Pune University, 21/22-Jul-16
User Registration

- Controlled registration to ensure
  - Gradual build up of load on the system
  - Security issues, if any, gets addressed with a smaller user base
  - Limited to CFTIs and institutes in NDL Workshops and VC
- Bulk registration of users through a back-end process
  - Too many errors (wrong e-mail id)
  - Unformatted/incomplete data
  - Institutes not sending data in time and need too much follow up
- Self-registration for selective domains
  - ernet, ac, res, nic, gov
  - Many users don’t have e-mail id in these domains
User Registrations

- IITs: 16
- NITs: 21
- IISERs: 5
- IIITs: 3
- IIMs: 11
- SPA: 1
- Other CFTIs: 35
- CSIR Institutions: 5
- ICAR Institutions: 11
- Defence Organizations: 2
- Medical Institutions: 5
- State Institutions: 28
- Other Institutions: 22
Challenges & Issues

INSTITUTIONAL – IDR
METADATA – GENERATION, CURATION & INGESTION
SEARCH
USER REGISTRATION
Institutional Challenges

• Contributing Institution
  - Weak IT infrastructure & poor bandwidth
    - Unstable IDRs: NDL Users facing difficulty
  - Quality issues in metadata: NDL Users facing difficulty
  - Inadequate availability of technically skilled personnel
  - Too much follow up required to resolve any issue

• Participating Institution
  - Bulk registration
    - Data sent had too many errors (wrong e-mail id)
    - Unformatted/incomplete data
    - Need too much follow up to send data
  - Poor bandwidth
Metadata Challenges

- Accurate and Indexed metadata essential for proper functioning of Search & Browse
- Contents contributed/acquired
  - Without metadata
  - With metadata
- Manual annotation time consuming and error-prone
  - Being done in a very limited scale
- Content available as image (raw scanned file)
  - Not amenable to full-text searching
- Automation of metadata extraction
  - Different types of contents (text / pdf / ppt / video / audio / simulation etc.) for scaling up
  - OCR Technology for Vernacular & Mixed Language contents
Metadata Challenges

- Metadata Generation, Curation & Ingestion is complex
  - Compatibility with metadata standard – Schema mapping
  - Population of missing data elements
  - Anomalies in metadata field values
  - Duplicates to be detected and deleted
  - Variations of content organization between sources
  - Widely varying subject classification norms
  - Website crawling challenges

- Automation for
  - Schema translation
  - Bulk anomalies curation
  - Subject classification translation
  - Duplicate detection and deletion
Scaling: Planned as Pilot (DPR), Revised to Full-Scale

<table>
<thead>
<tr>
<th>Item</th>
<th>DRP</th>
<th>Revised</th>
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<tbody>
<tr>
<td># of Concurrent Users</td>
<td>10000</td>
<td>25000</td>
</tr>
<tr>
<td>Type of Users</td>
<td>Institutional</td>
<td>Open</td>
</tr>
<tr>
<td>Nature of Content</td>
<td>Only from IDR, Select sources</td>
<td>Several large repositories, publishers included, Nationally licensed sources</td>
</tr>
<tr>
<td># of Content</td>
<td>500K (IDR), 10K purchased</td>
<td>5000K+</td>
</tr>
</tbody>
</table>
Infrastructure Issues

- **Bandwidth**
  - Required: 20 Gbps (Kharagpur), 10 Gbps (Kolkata)
  - Existing: 10 Gbps (Kharagpur)

- **Not included in DPR. PRSG recommended inclusion in the scope of the project:**
  - Disaster Recovery
  - IDR Service
    - Free remote IDR set-up and maintenance for various institutions
Challenges in Search

- Query suggestion
  - based on initial query and current corpus
- Spell checking
- Search intent expressed in natural language query
- Duplicate detection of similar but not identical contents, improving diversity in retrieved results
- Federated search framework
- Domain specific metadata and search engine organization
- Personalized ranking of search results
Challenges in UI

- Vernacular User Interface
  - Vernacular metadata
- User category based User Interface
- Real time transcoding of content hosting pages
• Willing but unable to do due to restricted registration
• Registered in back-end but user has not activated
• User activated registration but not using
  o All contents are not free
  o Some contents have access limited only respective institute
  o Content repository is limited
  o CFTI users already have access to rich repositories
• NDL not usable on mobile
• Users, especially in remote areas, do not have stable internet access and good bandwidth
OBSERVATIONS & RECOMMENDATIONS
PRSG Meeting

Held on 9-Sep-15 at IIT Center, Kolkata

Attended by:

- Prof. H. P. Khincha, IISc Bangalore: PRSG Member & Chairman
- Dr. Jagdish Arora, Director, INFLIBNET: PRSG Member
- Prof. Uma Kanjilal: IGNOU: PRSG Member
- Shri Pradeep Kaul, Sr. Consultant, NMEICT, MHRD: PRSG Member
- Prof. Swapan K. Chakravorty: Kabiguru Rabindranath Tagore Distinguished Professor in the Humanities, Presidency University: Member Invitee
- Dr. Neena Pahuja: Director General, ERNET: Member Invitee
- Representatives of Shri A. K. Balani, Director & HOD, NKN from NIC, Kolkata
• **Identity**
  - Logo / Name of NMEICT may be put up in NDL portal. Done.
  - NDL should buy its own domain name
  - NDL becoming a part of EduGain and EduRoam may be explored

• **Launch**
  - Restricted launch was recommended. Done in Feb-16.

• **Content**
  - IDR of Sahitya Academy should be included if possible
  - Link to NSS (National Sample Survey) and ASI (Annual Survey of Industries) of Ministry of Statistics and Programme Implementation may be explored
  - Link to Nehru Memorial Museum and Library (NMML) may be explored

• **Users / Access**
  - Shibboleth may be used to track users accurately and comprehensively
• Localization
  ○ Cross-lingual dictionary of National Vocabulary Commission to be used for cross-lingual search

• Personalization
  ○ There was a discussion on the feature “Personalization” (“Myshelf”)

• Statistics – <Online now>
  ○ Number of concurrent users logged in to NDL should be monitored
  ○ Data on how many concurrent users linked IDR/portals can handle may be collected for causal analysis of user access bottleneck

• Data Center
  ○ Data Centers coming up as a part of Government’s Digital India initiative may be used for full-scale NDL

• Crowd-sourced Metadata
  ○ During the Pilot project, experiments on crowd sourcing of metadata to curate metadata fields (such as Subject, Difficulty Level, Pedagogic Objective) that involve subject matter expertise, should be carried out.
• Technical Aspects
  ○ A comparative study between NDL and other leading digital libraries by Prof. Uma Kanjilal, Dr. Jagdish Arora and Prof. P. S. Mukhopadhyay
  ○ Security audit of the NDL portal by an external entity
  ○ The aspects of business process continuity in case of disaster including total outage of NKN should be considered
  ○ MoU, ratified in writing by legal experts, should be done with all external agencies whose content is sourced/linked by NDL, including crawled external portals – underway.
  ○ User scenarios and response to the user scenarios should be identified
**Disaster Recovery**
- Servers, in sufficient numbers, to ensure business process continuity to a reasonable extent.
- Storage, sufficiently sized, to ensure business process continuity.
- UPS.
- Site preparation at IIT Kharagpur Kolkata Extension Center.
- Support for 10 GB NKN link at IIT Kharagpur Kolkata Extension Center for Disaster Recovery.

**IDR Service**
- IDR Service to be provided to those who are unable to develop their own
Budget Re-Appropriation

- Budget under “Equipment at 100 Contributing Institutions for IDR” (Rs. 4 Cr.) will not be fully utilized as many such institutions may already have the necessary resources for the initial phase.
- PRSG therefore recommends apportioning
  - Rs. 2 Cr. for equipment for Disaster Recovery System for this Pilot project
  - The balance Rs. 2 Cr. for the IDR Service for those who are unable to develop their own
Targets
Target for FY 16-17

- **Systems**
  - 100% planned server capacity operational
  - Disaster Recovery site preparation
  - Disaster Recovery server ordering
  - Data Centre planning for Phase II (2018-21)
**Target for FY 16-17**

### Content

- South Asia Archive (National Licensing underway)
- World e-book Library (National Licensing underway)
- Journal Archives (National License)
- Contents subscribed under e-Shodh Sindhu
- Ministry of Culture
  - National Library, IGNCA, Nehru Memorial Museum and Library (NMML), etc.
- Ministry of Statistics and Programme Implementation
  - NSS (National Sample Survey) and ASI (Annual Survey of Industries)
- IEEE repository
- UNESCO
- Gandhi Heritage Portal
- Baul Archive
- Sahitya Academy
- Contents of domain-specific verticals
  - School, Medical, Law, Culture, etc.
- More harvested IDRs
- More NMEICT projects (eAcharya)
Target for FY 16-17

- **Software**
  - NDL Mobile App
  - User Interface upgradation: making it mobile-friendly
  - Feature addition in User Interface
  - Federated search
  - Vernacular User Interface for 2 more languages
  - Automation of metadata acquisition/curation

- **Search**
  - Domain specific organization
  - Query suggestor
  - Query spell-checker
**Target for FY 16-17**

- **Enlarge User Base**
  - **Expand Access**
    - All CFTI
    - All Institutions
    - Colleges & Schools
    - Public
  - Collation of interest areas and personalization
  - Explore Shibboleth to track users accurately and comprehensively
  - NDL Facebook Page – Monthly update

- **IDR Service for Contributing Institutes**
  - Assist smaller institutes to set up Digital Repository by providing IDR hosting service

- **Workshops on NDL familiarization and IDR setup**
  - 5 more: 3 scheduled till Jul’16
Fund Requirements
# Utilization Certificate

**SPONSORED RESEARCH AND INDUSTRIAL CONSULTANCY**
**INDIAN INSTITUTE OF TECHNOLOGY, Kharagpur**
**CONSOLIDATED STATEMENT OF ACCOUNTS**
(RECEIPTS & PAYMENTS ACCOUNT FOR THE PERIOD 26/03/2015 TO 20/04/2016)

**Title of the Research**: "Development of National Digital Library of India, towards Building a National Asset (BNA)"

**Sponsoring Agency**: MHRD, New Delhi

**Name of the Investigator-in-Charge**: Prof. Partha P. Chakrabarti & Prof. Partha Pratim Das  
**Department**: Central Library

**Date of Commencement**: 26/03/2015  
**Date of Termination**: 25/03/2018

### Receipts

<table>
<thead>
<tr>
<th>Year</th>
<th>Grant</th>
<th>Total</th>
<th>Salary/Manpower/ Honorarium</th>
<th>Travel</th>
<th>Consumables</th>
<th>Contingency</th>
<th>Equipment</th>
<th>Misc. Expenditure/ Others</th>
<th>Total</th>
<th>Closing Balance</th>
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<td><strong>119400000</strong></td>
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<td><strong>1246406</strong></td>
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</tr>
</tbody>
</table>

* Grants sanctioned for the FY 2014-15 received on next financial year i.e. 2015-16 through online transfer dated: 04/04/2015

---

**Signature of PI with Stamp**

Prof. P.P. Das, PI-BNA  
Department of Computer Science & Engineering  
Indian Institute of Technology Kharagpur

**Signature Finance Officer with Stamp**

S.K. Biswas  
St. Accounts Officer (F&P)  
Sponsoring Research & Industrial Consultancy  
IIT, Kharagpur-721302

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IIT, Kharagpur  
02-May-16
## Fund Requirements

<table>
<thead>
<tr>
<th>Sl. #</th>
<th>Item</th>
<th>Amount in Rs. Cr.</th>
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<tbody>
<tr>
<td>1.</td>
<td>Total Sanction (2015-18)</td>
<td>39.80</td>
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<td>2.</td>
<td>Fund received as on date</td>
<td>11.94</td>
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<td>3.</td>
<td>Total expenses as on 20.4.16</td>
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<td>4.</td>
<td>Unspent balance as on 20.4.16 (#2–#3)</td>
<td>6.64</td>
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<tr>
<td>5.</td>
<td>Expected expenditure for FY 16-17</td>
<td>14.55</td>
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<tr>
<td>6.</td>
<td>Fund release requirement for FY 16-17 (#5–#4)</td>
<td>7.91</td>
</tr>
</tbody>
</table>
Request for Approval

- Re-appropriation of budget for equipment and infrastructure for:
  - Disaster Recovery
  - IDR Service
  - Scale up of Service
  - Budget
    - Already utilized: Rs. 4 Cr
    - Requirements: Rs. 3.2 Cr

- Gradual release of access to
  - All Institutes
Thank You
## Budget at a Glance

<table>
<thead>
<tr>
<th>Budget Head</th>
<th>26-Mar-15 to 20-Apr-16 (in Rs. Lakh)</th>
<th>21-Apr-16 to 31-Mar-17 (in Rs. Lakh)</th>
<th>Remarks</th>
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<tbody>
<tr>
<td>Manpower</td>
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<td>256.00</td>
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<tr>
<td>Travel</td>
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<td>Consumables</td>
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<tr>
<td>Equipment</td>
<td>409.09</td>
<td>312.00</td>
<td>Including DR Servers &amp; H/W</td>
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<tr>
<td>Misc. Expenditure</td>
<td>12.46</td>
<td>850.00</td>
<td>Includes site preparation for DR and Content Access Fee for Selected Sources</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>529.88</strong></td>
<td><strong>1455.00</strong></td>
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<tr>
<td>Received</td>
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<td>Closing Balance</td>
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<tr>
<td>Aligarh Muslim University (IDR)</td>
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<td>Gokhale Institute of Politics &amp; Economics (IDR)</td>
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</table>
# Content Sources

<table>
<thead>
<tr>
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<th>Institute</th>
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<tbody>
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<td>Indian Institute of Technology Delhi (IDR)</td>
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<td>Indian Institute of Technology Guwahati (IDR)</td>
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## Content Sources

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<td>MIT OpenCourseWare (Website Crawled)</td>
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<td>NCERT (Content Downloaded)</td>
<td>3.2</td>
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<td>Khan Academy (Website Crawled)</td>
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<td>NIT Rourkela (IDR)</td>
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## Content Sources

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Action Plan
Action Plan/Proposal

- Popularize NDL
  - Campaign on Social Media
    - NDL Facebook Page
    - NDL Twitter Account
  - Organize Student Contests
    - App Development – building various use-models
    - Challenge Problems – R & D problems to improve NDL
    - Content Contribution – student group with faculty coordinator
  - Institutional Channels
    - Reminders to inactive users
    - Message to users from Institute Head
  - Register with scan-copy of Institutional ID
Action Plan/Proposal

- System
  - Servers ordered to be operational by Q2: FY 16-17
  - Some security issues detected, fixing going to start
  - Once security issues are resolved and new servers are operational, open registration to all

- NDL on mobile
  - Mobile App under development
  - Work on making User Interface mobile-friendly going to start
• **Content**
  
  - MHRD already initiated pan-India licensing for South Asia Archive & World e-book Library
  - MHRD already instructed publishers contracted under e-Shod Sindhu to share metadata with NDL
  - MHRD may look into possibility of pan-India licensing for popular e-contents
  - Addition of Domain vertical specific contents

• **To work out Crowd Sourcing promotion policy**
### Approved

<table>
<thead>
<tr>
<th>Head</th>
<th>Amount (INR Cr.)</th>
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<tr>
<td>Equipment &amp; Office Setup for NDL at IIT Kharagpur</td>
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<td>Equipment at Contributing Institutions for IDR Service</td>
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<td><strong>7.72</strong></td>
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### Adjustment Proposal

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<td>Equipment, IDRS Service for Contributing Institutions &amp; Office Setup for NDL at IIT Kharagpur</td>
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### Reason:

IDR Service for Contributing Institutions are now being provided by NDL from IIT Kharagpur
## Approved

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<tr>
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<td>Manpower Requirement at Contributing Institution</td>
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## Adjustment Proposal

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**Reason:**
IDR Service for Contributing Institutions are now being provided and supported by NDL from IIT Kharagpur.