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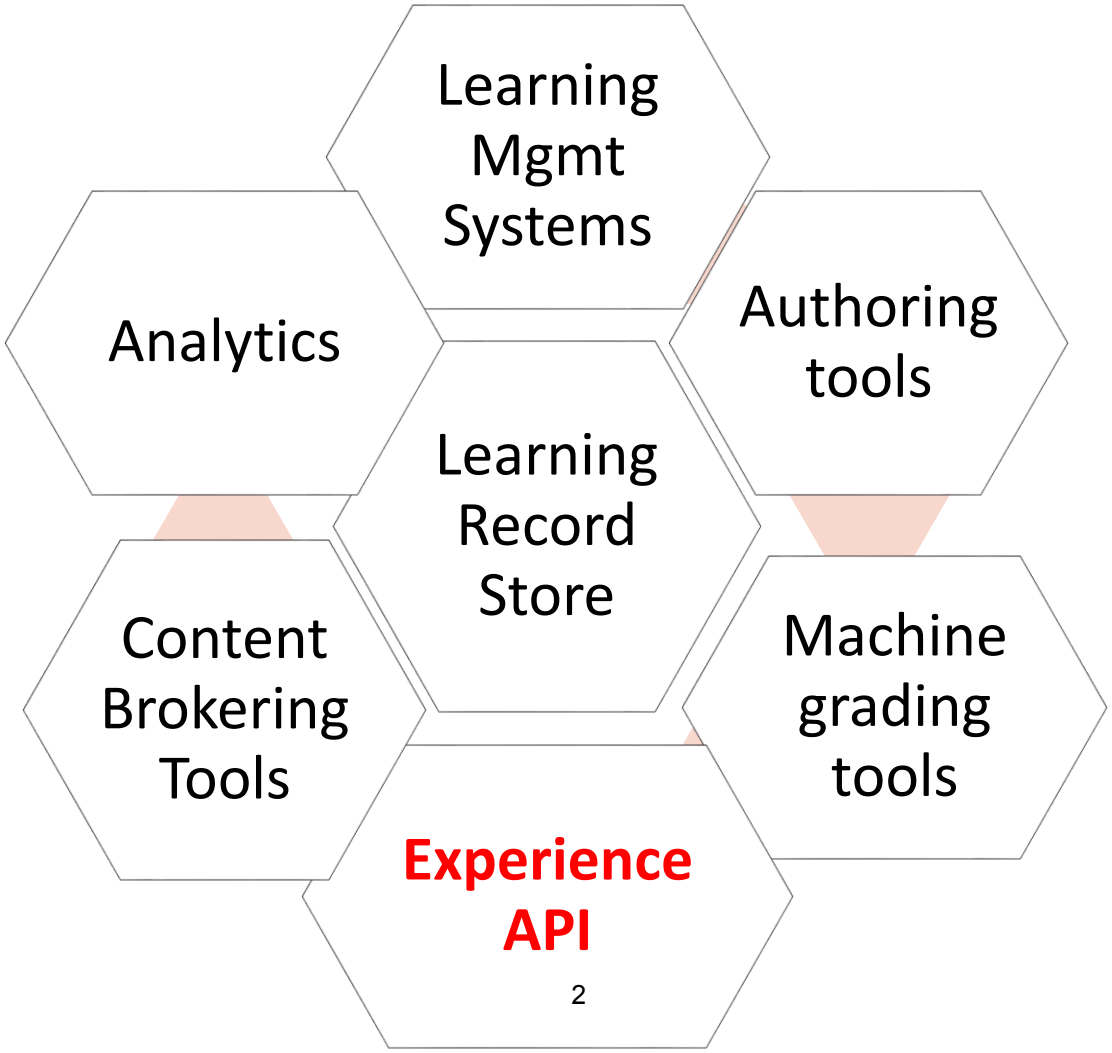
Delivering High Quality Higher Education for Everyman

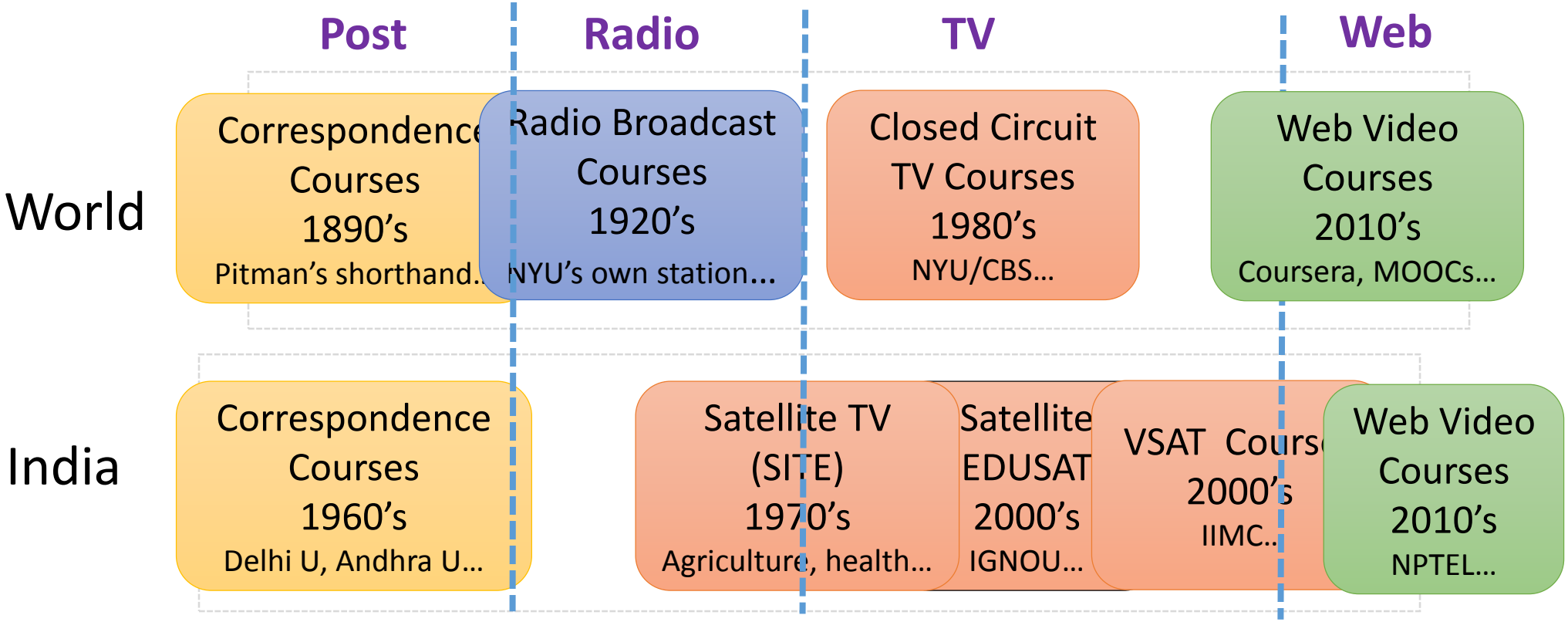
Ajit Balakrishnan

Committee for use of ICTs at IIMs

The New Learning Architecture



Every media innovation has led to an attempt to improve education



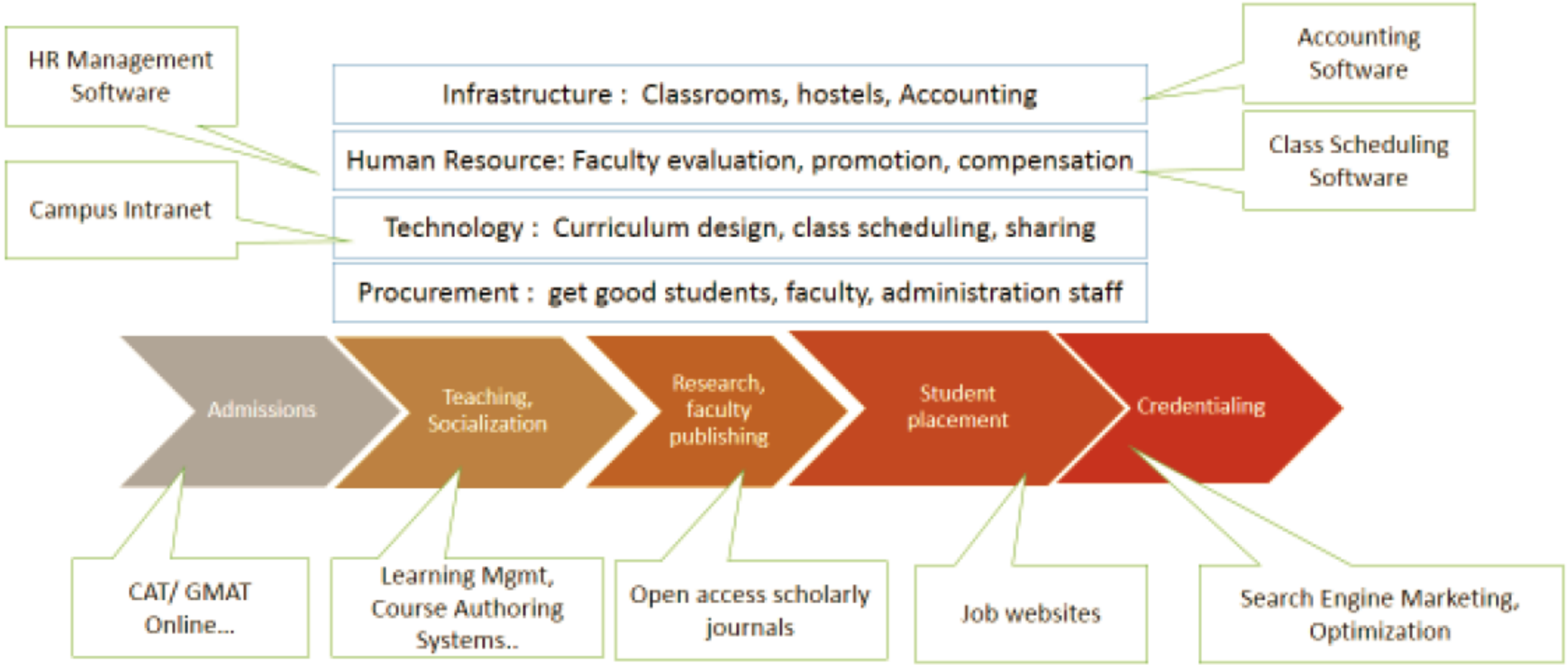
Most such efforts aimed at solving the "distance problem"

Multiple learner segments with different "problems-to-solve"[1]

Jobs-to-be done learner segments	Course Type that gets this job done	Examples
Learners who want a good first job in the corporate world	Classical 2 year-fulltime residential MBA	IIM PGP, Harvard MBA…
Leaners who are in mid-career and want shift of industry or break into management ranks	1 Year residential Executive MBA	IIM PGPEx, European I year MBA
Companies who want to reward promising mid-career executives	Short-term Executive Education Programmes	MDPs and In-company programmes at IIMs, Harvard…
Learners seeking personal development	MOOCS	Coursera, edX, IIMC LDP

1: "Customers …find themselves with a problem that they need to solve. With an understanding of the "job" for which customers find themselves "hiring" a product or service, companies can more accurately develop and market products well-tailored to what customers are already trying to do: www. christenseninstitute.org/key-concepts/jobs-to-be-done

Points where technology is currently being applied at the IIMs



IIM Calcutta's Online Programme

Teaching staff	Calcutta
Students	India
Students	70 cities, 170 centres, 2000 students
Annual Revenue	Rs 20 crores

Generation 0:Online Tutoring &Teaching Marketplace

Find Online Tutors

WyzAnt
TUTORING, TEACHING & COACHING

Tutoring Using Online Tools

Meritnation

TutorVista

Discover & Watch Course Webcasts

SKILLSHARE

iTunes U

Generation 2 : Adaptive Learning

Learning systems personalized to student

Pace of Course, Assignments tailored to individual students

Direct to Student (B2C)

Teacher to Student (B2B2C)

Desire2Learn

KNEWTON

Generation 3 : Gamification

Adding Gamification elements to learning

Rewarding progress, performance and completion through virtual and real-world benefits

Used extensively in language learning

ROOT-1

BrainNook
@school

Generation 4: Adaptive Gamified Learning by Doing

"Learning by Doing" - primary means of teaching is through interactive assignments

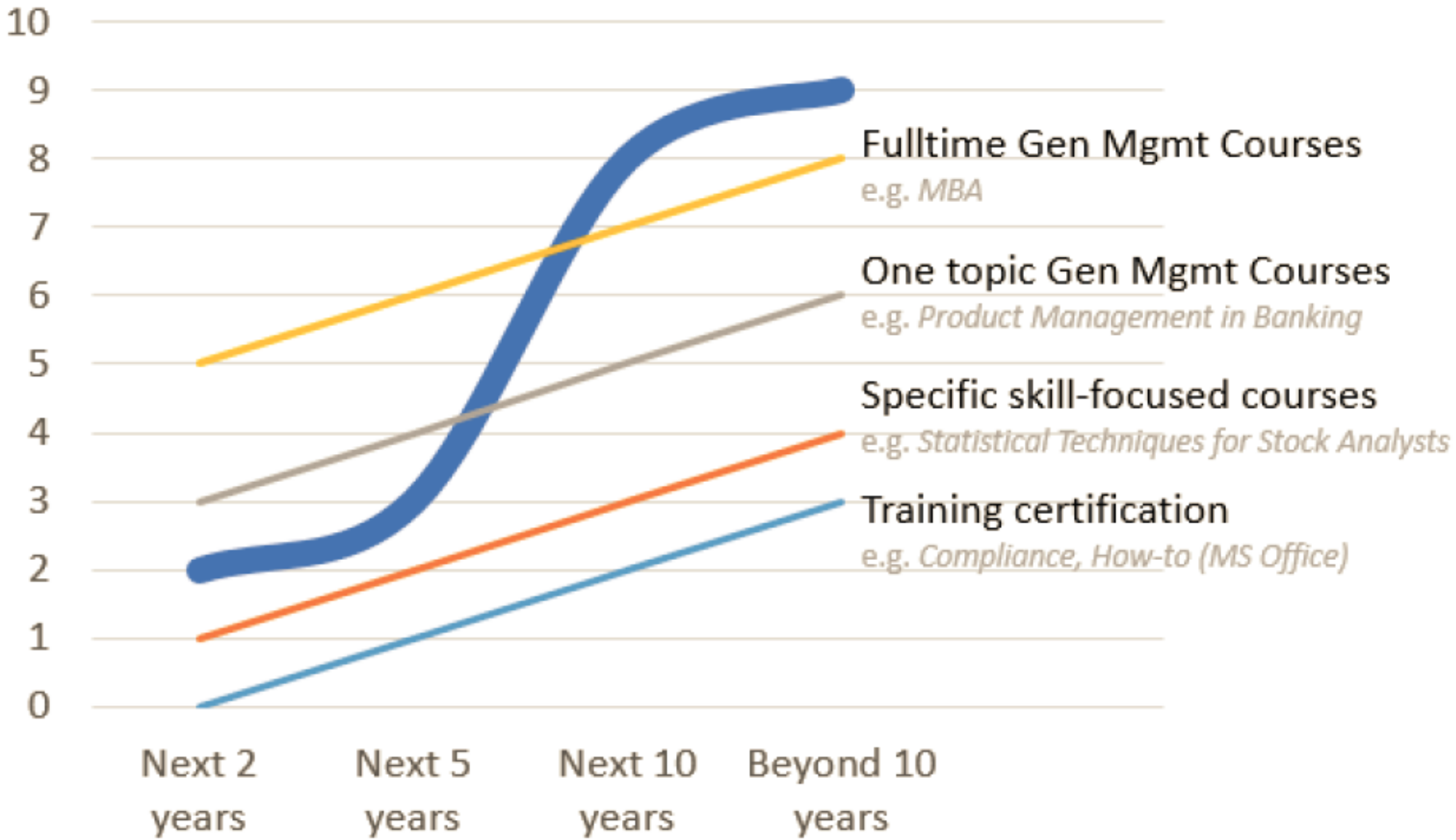
Assignments and Deliverables are customized to student's pace, knowlddge and progress

Gamification elements introduced to keep students engaged

Desire2Learn

treehouse

Codecademy


10
9
8
7
6
5
4
3
2
1
0
Next 2 years
Next 5 years
Next 10 years
Beyond 10 years
Fulltime Gen Mgmt Courses
e.g. MBA
One topic Gen Mgmt Courses
e.g. Product Management in Banking
Specific skill-focused courses
e.g. Statistical Techniques for Stock Analysts
Training certification
e.g. Compliance, How-to (MS Office)

Financial Times, London etc, will soon rank Online Programmes –IIMs should aim to top that as we did this year in some areas

Top for general management

Rank	Business school
1	University of St Gallen
2	Cems
3	WHU Beisheim
4	Kozminski University
5	City University: Cass
6	Eada
7	HEC Paris
8	Vlerick Business School
9	HHL Leipzig Graduate School of Mgt
10	Rotterdam School of Management, Erasmus University

Top for economics

Rank	Business school
1	London School of Economics and Political Science
2	Indian Institute of Management, Calcutta
3	[illegible]
4	University of St Gallen
5	Stockholm School of Economics
6	Nova School of Business and Economics
7	[illegible]
8	Indian Institute of Mgt, Ahmedabad
9	HEC Paris
10	Durham Business School

Top for marketing

Rank	Business school
1	Mannheim Business School
2	Esade Business School
3	University of St Gallen
4	Indian Institute of Management Ahmedabad
5	HEC Paris
6	University of Bath School of Management
7	IE Business School
8	University of Strathclyde Business School
9	City University: Cass
10	Università Bocconi

Top for international business

Rank	Business school
1	University of St Gallen
2	Esade Business School
3	Rotterdam School of Mgt, Erasmus Uni
4	Leeds University Business School
5	WHU Beisheim
6	St Petersburg State University GSM
7	HEC Paris
8	Maastricht University School of Business and Economics
9	Aston Business School
10	Grenoble Graduate School of Business

Top for organisational behaviour

Rank	Business school
1	University of St Gallen
2	Durham Business School
3	London School of Economics and Political Science
4	Leeds University Business School
5	University of Edinburgh Business School
6	Imperial College Business School
7	Corvinus University of Budapest
8	HHL Leipzig Graduate School of Mgt
9	HEC Lausanne
10	Antwerp Management School

Top for finance

Rank	Business school
1	Indian Institute of Management, Calcutta
2	HEC Paris
3	Mannheim Business School
4	Stockholm School of Economics
5	Edhec Business School
6	WHU Beisheim
7	University of St Gallen
8	ESCP Europe
9	HHL Leipzig Graduate School of Management
10	Università Bocconi

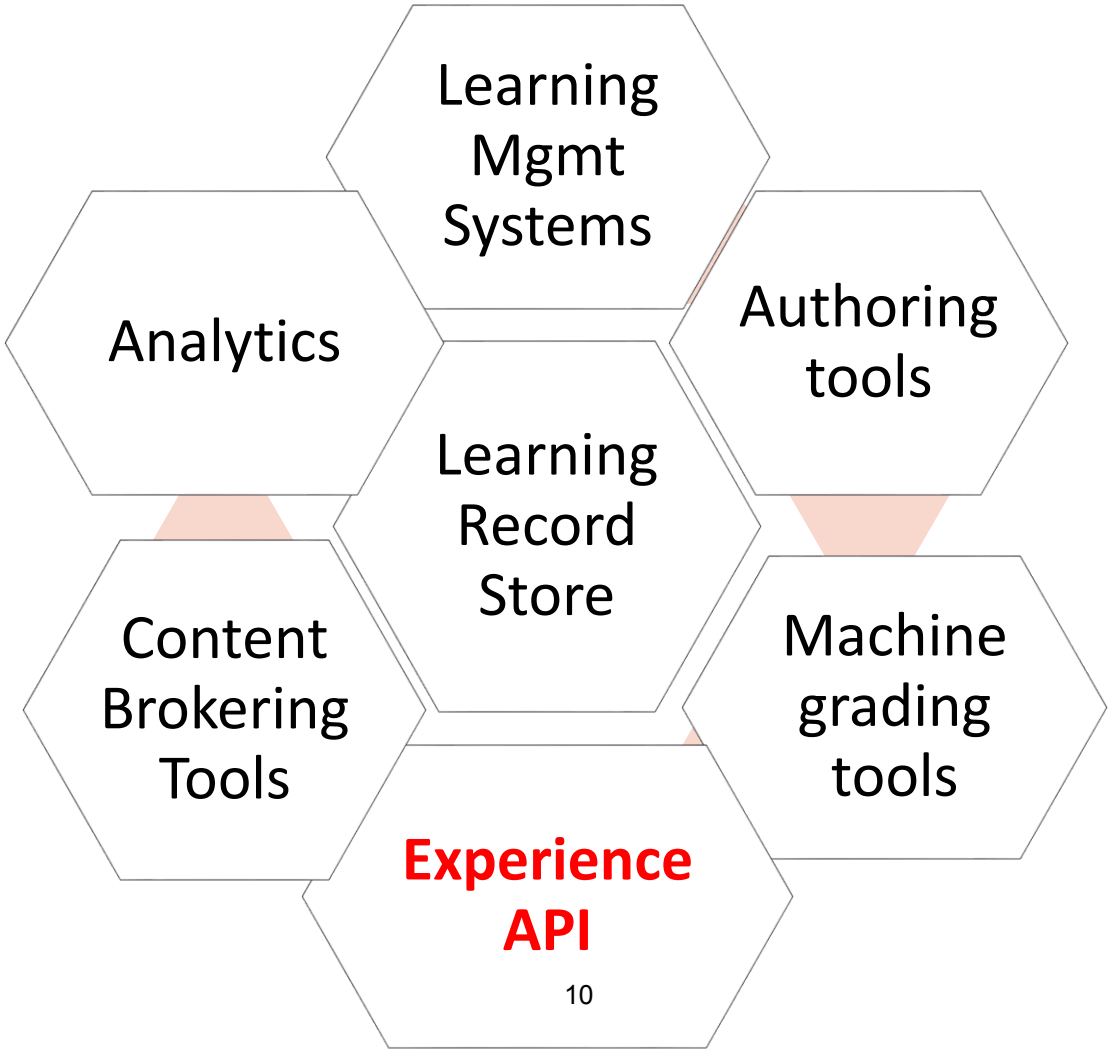
Top for ebusiness

Rank	Business School
1	Shanghai Jiao Tong University: Antai
2	Télécom Business School
3	Kozminski University
4	Sun Yat-Sen Business School
5	Politecnico di Milano School of Management
6	HHL Leipzig Graduate School of Mgt
7	University of St Gallen
8	WHU Beisheim
9	University of Strathclyde Business School
10	City University: Cass

Top for CSR/ethics/environment

Rank	Business School
1	Esade Business School
2	Imperial College Business School
3	University of St Gallen
4	HHL Leipzig Graduate School of Management
5	Audencia Nantes
6	Eada
7	Bradford University School of Management
8	University of Strathclyde Business School
9	Copenhagen Business School
10	Louvain School of Management

The New Learning Architecture



Members

Ajit Balakrishnan (Chairman & Chairman IIM Calcutta), Dr BK Gairola (Mission Director, National e-Governance Plan), Prof Ashok Jhunjhunwala (IIT Madras), Praveen Prakash (Mission Director, National Mission on Education through ICT), Pradeep Gupta (Chairman, CyberMedia), Saibal Chattopadhaya (Director IIM Calcutta)

The Committee thanks the following experts for the ideas they contributed:

Ganesh Krishnan (IIMC Board Member), Prof Pandey (IIMA), Prof Sahay (IIM Raipur), Prof Rishi Krishnan (IIM Indore),Prof Anindya Sen (IIMC), Prof Ashok Bannerji (IIMC),Prof Uttam Sarkar (IIMC), Prof Rahul Roy (IIMC),Prof VK Unni (IIMC), Prof Bhaskar Chakrabarti (IIMC), Prof Rahul De (IIMB), Prof Mangala Sunderakrishna (IITM), Prof Kannan Moudgalya (IITB), Deep Kalra (Founder, MakeMyTrip), Venki Nishtala (CTO,rediff.com) and Shailendra Kumar (MHRD)

DEVELOPING A JOINT ENTRANCE EXAMINATION (Main) (JEE) ONLINE ITEM BANK FOR REMEDIAL TEACHING AND LEARNING OF CANDIDATES

Centre for Assessment Evaluation & Research

Shri Vineet Joshi – Chairman CBSE and Executive Council CAER

Mrs. Sarita Manuja - Director CAER

CBSE – CAER
CORE PROJECT TEAM

- **Shri Vineet Joshi**, IAS (Chairman, CBSE & Chairman CAER – Executive Council)
- **Ms. Sarita Manuja** (Director, Centre for Assessment, Evaluation & Research)
- **Prof. James Stephen Tognolini** (Senior Vice President, Research and Assessment Pearson and Visiting Professor, University of Oxford)
- **Dr. Sadhana Parashar** (Professor and Director - Training and Academics, CBSE)
- **Mr. Arjun Bahadur** (Deputy Director, Centre for Assessment, Evaluation & Research)
- **Dr. Priyanka** (Research Officer, Centre for Assessment, Evaluation & Research)
- **Dr. Akanksha Bapna** (CEO, Evaldesign)

Centre for Assessment Evaluation & Research

DEVELOPING A JOINT ENTRANCE EXAMINATION (Main) (JEE) ONLINE ITEM BANK FOR REMEDIAL TEACHING AND LEARNING OF CANDIDATES

Background

• High-stakes examination for which students from across the country spend significant amounts of time practising to maximise their score

• While preparation for examinations is a very useful learning tool, it starts to have a negative impact on broader learning when the focus is purely on “practising for the test”

• The fact that students are paying significant amounts of money to have this tuition is also impacting on the “social fabric” of society

• CBSE - CAER is proposing to develop an item bank of JEE (Main) items which students preparing for the JEE can access online. These items will be linked to learning materials which are designed to help students improve their learning

• Designed to identify areas of potential weakness; promulgate corrective strategies that have been identified through an analysis of the assessment items; and, give further practice examples from similar JEE items which assess the same skill to make sure that the student has understood the concept

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DEVELOPING A JOINT ENTRANCE EXAMINATION (Main) (JEE) ONLINE ITEM BANK FOR REMEDIAL TEACHING AND LEARNING OF CANDIDATES

Scope and Coverage of Solution

- Online Portal which will allow students to access practice questions which is linked to conceptual subject matter to ensure that learning happens
- Portal will have 501 questions (for 3 subjects) taken from previous years question papers. These questions will be linked to concepts tested in the examination and then mapped to the Table of Specifications developed.
- For each question, there will be Rationale written for the selection of each wrong option (3 incorrect options). A detailed explanation will be provided to the student explaining the error and misconception which led to the selection of that wrong option.
- This will be followed by a Corrective Measure which the student can adopt to arrive at the right answer. The key here is to guide the student to the right answer and not encourage learning by rote. This explanation will then linked to the Key Concept which is being tested by the question to encourage self learning

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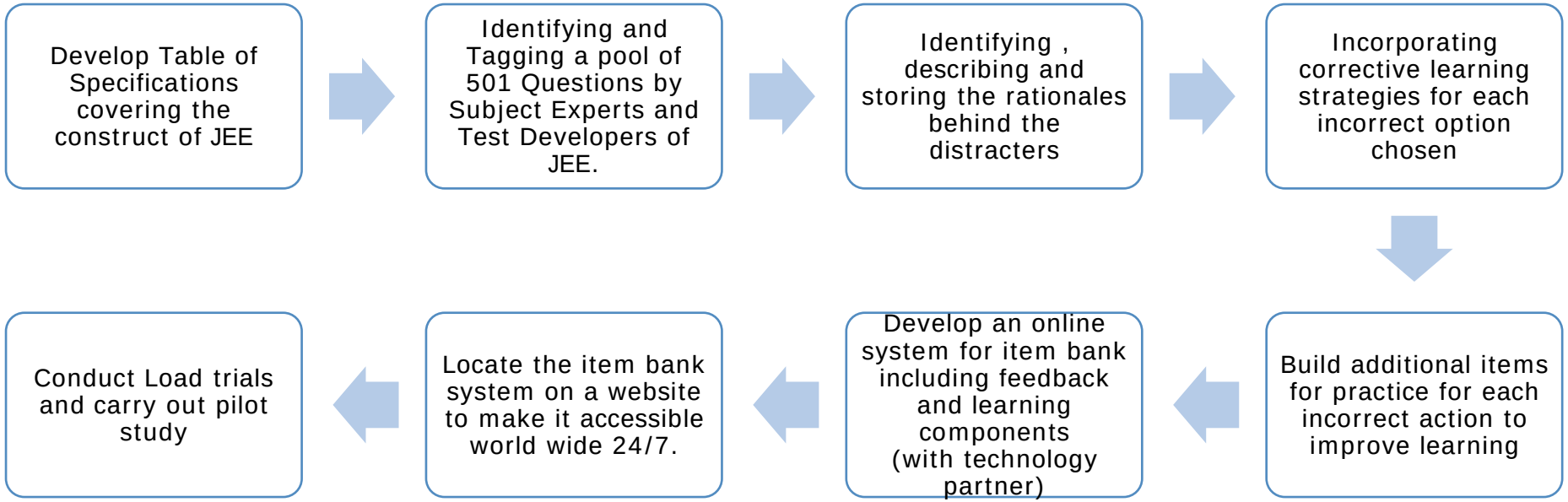
DEVELOPING A JOINT ENTRANCE EXAMINATION (Main) (JEE) ONLINE ITEM BANK FOR REMEDIAL TEACHING AND LEARNING OF CANDIDATES

Steps Involved



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DEVELOPING A JOINT ENTRANCE EXAMINATION (Main) (JEE) ONLINE ITEM BANK FOR REMEDIAL TEACHING AND LEARNING OF CANDIDATES

Deliverables and Timelines

Key deliverables	Expected time of delivery
Inception of the Project	1 July 2014
Development of item bank with 501 items	31 Oct 2014
Completion of technology Platform along with Hosting	31 Dec 2014
Pilot run of the Platform	1 Jan 2015 – 31 Dec 2015
Update of Platform	1 Jan 2016 – 31 Mar 2016
Release of Updated Version	1 Apr 2016

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DEVELOPING A JOINT ENTRANCE EXAMINATION (Main) (JEE) ONLINE ITEM BANK FOR REMEDIAL TEACHING AND LEARNING OF CANDIDATES

Cost of the Content Development

	Number of Professors	Number of PhD Scholars	Number of Days	Cost
Table of Specifications + Selection of Questions coded with Meta Data + 10 additional similar items	3	12	10	900000
Development of Rationales, Corrective Measures and tying to Concept tested	9	12	16	2400000
Cost of Review	9	3	(12 + 8)	1200000
Program Manager	1			1200000
Total Cost				**5700000**

Per Day Cost of IIT Professor	**10000**
Per Day Cost of PhD Student	**50000**

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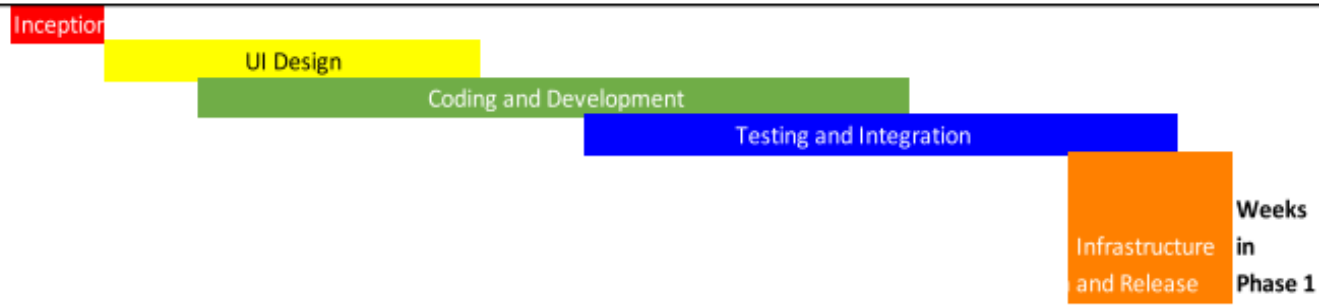
DEVELOPING A JOINT ENTRANCE EXAMINATION (Main) (JEE) ONLINE ITEM BANK FOR REMEDIAL TEACHING AND LEARNING OF CANDIDATES

Cost of the Platform Development

Platform Development Financial Details



Resource	Salary Per Month	Total Cost for Resource	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24	
1 senior ruby on rails programmer with 4-5 yrs experie	125000	562500																									18
1 junior ruby on rails programmer with 2+ yrs of experi	60000	330000																									22
1 junior ruby on rails programmer with 2+ yrs of experi	60000	330000																									22
1 HTML, JS, Ajax, XML, developers with 3+ yrs experie	60000	270000																									18
1 HTML, JS, Ajax, XML, developers with 1+ yrs experie	50000	225000																									18
1 visual designer with 5+ yrs experience	100000	400000																									16
1 test engineer with 1-2 yrs experience	50000	150000																									12
1 senior manager resource for project management	150000	675000																									18
Total Cost		**2942500**																									

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DEVELOPING A JOINT ENTRANCE EXAMINATION (Main) (JEE) ONLINE ITEM BANK FOR REMEDIAL TEACHING AND LEARNING OF CANDIDATES

Cost of the Monitoring and Update Phase

Development Heads	Cost (INR)
Program Manager	900000
Data Analyst	600000
System Upgrade	900000
Academic Advisors	600000
Hosting Cost	300000
Total	**3300000**

Thank You!

Centre for Assessment, Evaluation and Research (CAER)
4th Floor, 17 Rouse Avenue, New Delhi 110 002
Email: contactus@indiacaer.org
Website: www.indiacaer.org

ERNET India
(Education and Research Network)

An autonomous scientific society of
Department of Electronics & Information Technology
Ministry of Communications & Information Technology, GoI

Areas of Core Competency

DIVERSITY OF DISCIPLINES

- Terrestrial and satellite based WAN Connectivity
- Campus LAN
- BASIC IT Solutions (Computing, Digitization, Content /application hosting)
- Collaborative communication (Email/VC/Domain/Website)
- Next generation R&D, consulting and solutions (IPV6/IoT)
- Data Center & Cloud Solutions
- Awareness & Training Programs

HORIZONTALS

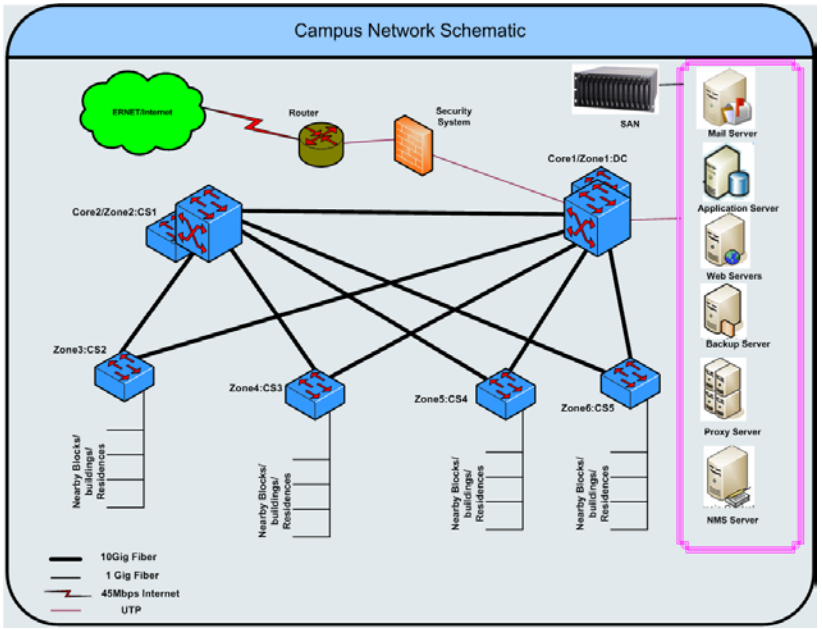
- Education Institutions
- Research Institutions
- Health Care.

Campus LAN at Institutions

3

- Optic Fiber based Gigabit Campus LAN and Connectivity
- Wi-Fi enablement of Campus
- Servers storage & Services
- Link Faculties, Academic, Admin, Finance, Library and Hostels
- Facilitate content development including digital library
- EDUROAM Services:

  Free roaming services over shared wi-fi networks across the globe in Eduroam enabled campuses.
- Network implemented at:
  - Delhi University(4000 nodes)
  - IIT Madras (6000 nodes)
  - Annamalai University (2400 nodes)
  - JNU (1300 nodes)
  - Allahabad University (2400 nodes)
  - Jamia Millia Islamia(750 nodes)
  - Rajasthan university (1600 nodes)
  - Kashmir University, Arunachal University
  - NIPER, UGC, Manipur University
  - IIITMG, NUJS



Under implementation:

- NIFTEM for 1400

LAN Essentials

- Wired LAN
- Gigabit switch redundancy
- CAT6 cabling

Component	Quantity	Cost (In Rs)
Router (Gbps capability)	1	500000
Gigabit Switch(For HA 1+1 Redundanc	2	650000
Switch 24 port with Fiber Uplink	20	2500000
UTP Cat6	400 Nodes	1400000
Fiber (7.5 Kms)	7.5 Kms	1500000
TOTAL		**6550000**

Thank you

dg@eis.ernet.in

Agenda for 28th meeting of Project Approval Board(PAB) of National Mission on Education through ICT (NMEICT)

Date: 26th June 2014

Proposal to make the BSNL Agreement of 1 Gbps Connectivity Coterminous with NKN.

- The proposal was discussed in the meeting of the Implementation-cum- Monitoring Committee of NMEICT on dated 16.06.2014; the Committee has recommended the proposal.

- The above proposal to make the BSNL Agreement of 1 Gbps Connectivity Coterminous with NKN is placed before the PAB of NMEICT for consideration and its approval.

Empanelment of Government Undertakings and State IT Organizations for installing LANs at Universities.

- The proposal was discussed in the Meeting of the Implementation-cum- Monitoring Committee of NMEICT on dated 16.06.2014; the Committee has recommended the proposal.

- The above proposal of Empanelment of Government undertakings and State IT Organizations for installing LANs at Universities is placed before the PAB of NMEICT for consideration and its approval.

Pilot on LAN for Universities.

- The proposal was discussed in the meeting of the Implementation-cum- Monitoring Committee of NMEICT on dated 16.06.2014; the committee has recommended the proposal.

- The above proposal of Pilot on LAN for Universities is placed before the PAB of NMEICT for consideration and its approval and release of Rs. 2.52 Crore to M/s NIC.

LAN Funding to NKN Universities and Institutions

- The proposal was discussed in the meeting of the Implementation-cum- Monitoring Committee of NMEICT on dated 16.06.2014; the Committee has recommended the proposal.

- The above proposal of providing LAN funding of Rs. 38.1 Crores to 127 Universities and Institutions connected under NKN is placed before the PAB of NMEICT for consideration and its approval.

Creation of Common Computing Infrastructure (Release of 2nd Installment).

The proposal was discussed in the Meeting of the Implementation-cum- Monitoring Committee of NMEICT on dated 16.06.2014; the Committee has recommended the release of Second Installment of Rs. 12.0 crores for the project. The committee has also recommended that "Rack Space Charges" of Rs. 6.6 crores for three years to NIC should also be paid from the second installment due to the project. Prof. Huzoor Saran, IIT Delhi and PI of the Project has also agreed for the same.

The following are put before PAB for consideration and approval :

Release of Second Instalment of Rs. 12.00 Croresof the Project "Creation of Common Computing Infrastructure".

Permit BSNL to provide 10 GbpsConnectivity between NMEICT Data Centre and NKN central node from the fund released for providing Connectivity to Universities till Dec, 2019.

Providing 1+1 Redundancy to all Centrally Funded Institutions in North East and J & K States.

- The proposal was discussed in the Meeting of the Implementation-cum- Monitoring Committee of NMEICT on dated 16.06.2014; the Committee has recommended the proposal.

- The above proposal of providing 1+1 redundancy to all Centrally Funded Institutions in North East and J & K Statesat a cost of Rs. 13.8 Crores with NIC as Implementing Agency is placed before the PAB of NMEICT for consideration and its approval.

NKN/ NMEICT Direct Peering with Google.

- The proposal was discussed in the meeting of the Implementation-cum- Monitoring Committee of NMEICT on dated 16.06.2014; the committee has recommended the proposal. As recommended by the committee, the proposal has been made coterminous with NKN.

- The above proposal of NKN/ NMEICT Direct Peering with Google at a cost of Rs. 7.272 crores with NIC as implementing agency is placed before the PAB of NMEICT for consideration and its approval.

Special Permission to NIT Sikkim for 1 Gbps Connectivity.

- The proposal was discussed in the meeting of the Implementation-cum- Monitoring Committee of NMEICT on dated 16.06.2014; the Committee has recommended the proposal.

- The above proposal of special permission to make OFC Ring of 1 GbpsConnectivity provided under NMEICT to NIT Sikkim at a cost of Rs. 291.527 lakhs (Rs. Two Crore Ninety One Lakh Fifty Two Thousand Seven Hundred only) is placed before the PAB of NMEICT for consideration and its approval.

1 Gbps Connectivity to the New Private Universities.

- The proposal was discussed in the Meeting of the Implementation-cum- Monitoring Committee of NMEICT on dated 16.06.2014; the committee has recommended the proposal. The committee has also recommended that connectivity to all Government/ State Universities and Centrally Funded Institutions may be provided under NKN. The Connectivity to the New Private Universities/ University Level Institutions may be provided under NMEICT.

- Accordingly the above proposal of providing 1 GbpsConnectivity to the New Private University/ University Level Institutions under NMEICT at a cost of Rs. 91.8 Crores (Rs. Ninety Crore Eighty lakhs only) is placed before the PAB for consideration and its approval.

Develop an Online Joint Entrance Examination (Main)(JEE) Item Bank to Prepare Candidates for Developing the Skills that Underpin Performance on the JEE (Main) Construct.

- PAB may consider approval of the Project for 2 years with a Total Budget of Rs. 1.23 Crore as recommended by KPMG after Financial Due Diligence.

Consulting work for preparing a Project Report for Creation of "Virtual University" in PPP model and draft "Virtual University Bill" for enactment by Parliament.

- PAB may consider and approve for award of the Consulting Work forpreparing a Detailed Project Report for Creation of Virtual University in PPP model and draft "Virtual University Bill" for enactment by Parliament with 3 deliverables mentioned above within 6 months, to M/s Ernst & Young at the total cost of Rs. 24.9 lakhs (including Out of Pocket Expenses) + Service Tax, with payment schedule agreed as above.

Consulting work for Review and Amendment of applicable UGC/AICTE Regulations for incorporating Technology Enabled Learning in Higher Education.

PAB may consider and approve for award of the Consulting Work forReview and Amendment of applicable UGC/AICTE Regulations for incorporating Technology Enabled Learning in Higher Education, to M/s Abacus Legal Group Advocates at the total cost of Rs. 9 lakhs, with 20% Mobilisation Advance on award of the work and remaining 80% after satisfactory receipt of 2 Deliverables.

Setting up and Providing VPN Connectivity to 200 ITIs under Director General, Employment and Training (DGET) Ministry of Labour and Employment (ML&E) Government of India.

- PAB may consider approval for setting up and providing:

- VPN Connectivity to 200 ITI's under DGET, ML&E upto March 31, 2017.

- The financial implication of the Project is Rs. 4.00 Crore.

Office Space for Mission Secretariat NMEICT.

- Submitted for perusal and kind consideration of the PAB.

Budget Estimate for TSG-EdCIL & Mission Secretariat of NMEICT for the Financial Year 2014-15

- The Budget proposed for the year 2014-15 for the TSG-EdCIL & Mission Secretariat of NMEICT is well within the overall ceiling of 1% of the total outlay fixed for the Project.
-
- The Project Approval Board (PAB) is requested to consider and approve "Budget Estimate" of ` 399.92 lakhs for the Mission Secretariat for the year 2014-15 and consider to release the 1st installment of ` 199.96 lakhs (being 50% of the total Budget) after adjusting the unspent amount available with EdCIL.

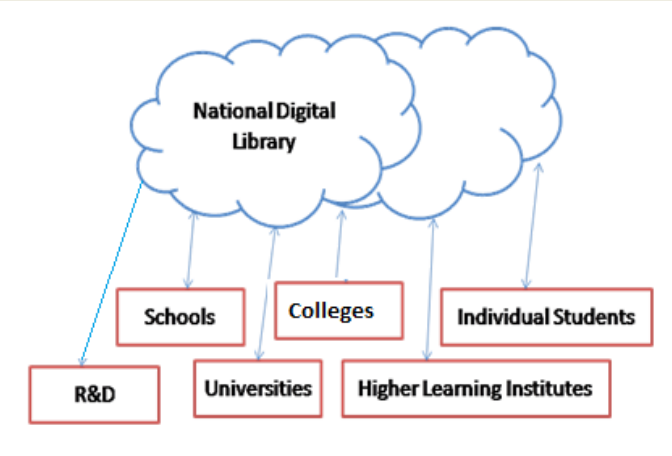
Table Agenda

Thank You

Development of National Digital Library of India

Towards Building a National Asset

Initial Concept Developed by Indian Institute of Technology Kharagpur.
Pilot Phase proposed to be carried out by a Consortium of CFTIs, Central Universities, Colleges and Schools



Presented by
Prof. PARTHA PRATIM CHAKRABARTI
Director
Indian Institute of Technology, Kharagpur

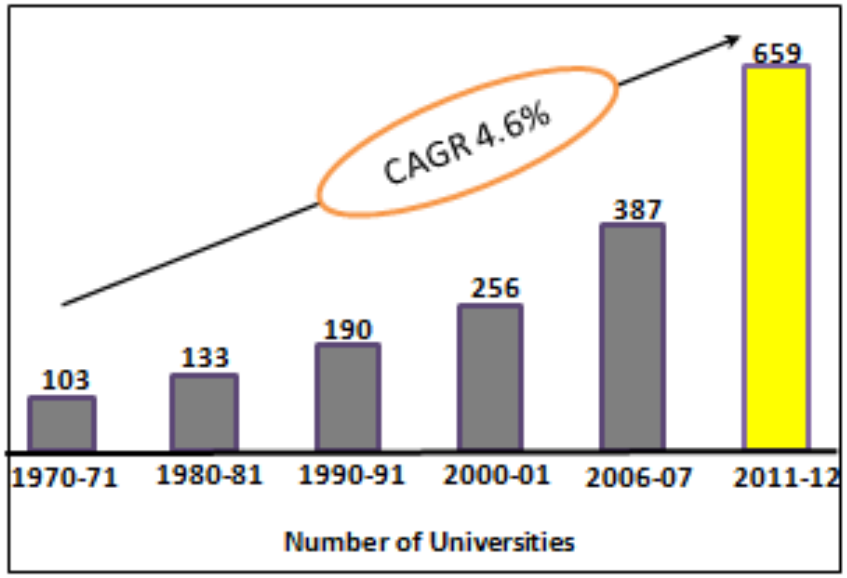
Introduction

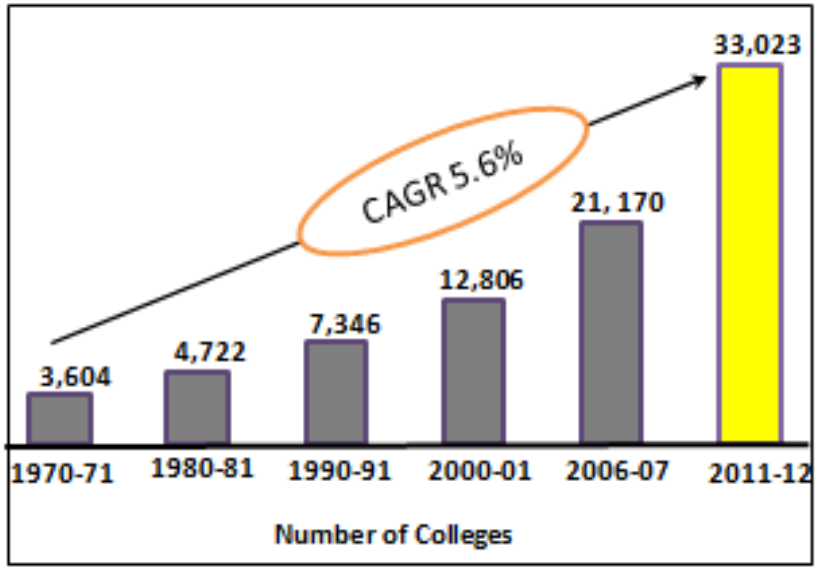
- ✓ **A National Digital Library is a national asset that is a key driving force for its education, research, innovation and knowledge economy.**
- ✓ **National Digital Library will cover the gaps that exist in the wide range from literacy to advanced knowledge discovery and development of scientific knowledge.**
- ✓ **It will also enable integrated knowledge gathering on diverse topics on core issues from economic, strategic and social sectors.**

Growth of Schools & Higher Learning Institutions in India

There are 1,24,500 secondary schools and over 11 Lakh elementary schools
[Source: MHRD – NISG Report]

There are 659 Universities, 33,023 colleges and 11356 Stand Alone Institutions
[Source: FICCI HE Summit 2012]





Source FICCI HE Summit 2012

Education market growth in India

- ✓ **In India education market growth is estimated to be US$ 135 billion by 2020, of which the e-learning market alone will constitute US$ 7 billion.**

  [Source: Ernst & Young]

Drivers of the Growth

- ✓ **Huge growing student base**
- ✓ **Lack of quality e-content in various digital forms and formats**
- ✓ **Poor quality of connectivity due to lack of infrastructure**

Challenges faced by the users or students

1. **Users have to visit individual websites to access e-resources**

2. **Users need to learn retrieval techniques / search techniques separately as different Digital Library (DL) follows different DL software (DL software employees different text retrieval engines like Solr, MGPP, Lucene, Zebra etc)**

3. **Few e-Learning environments are available for the students and teachers that access information from all available sources**

4. **Non integration of learner-learner, teacher-teacher and teacher-learner communication tools within learning environment**

5. **Learning resources are generally outside the integrated learning environment**

Challenges faced by the users or students

6. Distance mode of learning in India is helping mainly to increase learner-base not the knowledge base as effectively as needed

7. In most of the cases user interfaces are not interactive, collaborative and participative

8. Single window search facility is not available for accessing all available digital resources

9. For differently abled learners few mechanisms are available

10. Knowledge Repository on various subjects are not yet available for scholars

S0me Digital Library Related Initiatives

National

- NMEICT, NPTEL
- NISCAIR
- Million Book Project (DL of India)
- IG Centre for the Arts
- National Mission on Libraries
- INFLIBNET
- MUKTBODHA
- Traditional Knowledge DL
- NCERT
- Other Databases

International

- MIT Open Courseware
- Hathi Trust Digital Library
- Project Gutenberg
- Alexandria DL, California DL
- Networked DL of Thesis
- Library of Congress
- National Science DL
- Digital Public Library of America
- Electronic Library of UK
- DL programme of Europe
- Others in Asia & Australia

Major Gaps

1. **Total number of classrooms in India- 4Mn, out of which 0.15Mn is having some or little facility of ICT and e-contents.**

2. **95% of the colleges still do not have basic amenities**
   [Source: Rothin Bhattacharya]

3. **Many remote colleges do not have e-Learning contents or access infrastructure**

4. **Lack of single point of reference for integrated digital contents for variety of user groups**

5. **Suitable reading contents in Vernacular medium absent.**

6. **Content needs to be converted to suitable format due to technology shift.**

7. **Technology needs to be developed for differently abled learners.**

Solution: Intensive use of technology

1. **The Indian higher education system has undergone massive expansion to become the largest in the world enrolling over 70 million students.**

2. **Such expansion would have been unimaginable without the extensive use of ICT tools.**

3. **If India needs to build physical infrastructure then, it would have to build 6 universities and 270 colleges each and every month in the next 20 years.**

4. **MOOCs model (massive open online courses) makes it possible for the country to provide a quality education to the masses despite less faculty-student ratios.**

5. **MOOCs is an online course aimed at unlimited participation and open access via the web / Mobile Devices. MOOCs provide interactive user forums that help build a community for students, teachers, and teaching assistants.**

Possible ways to address the above Gap

1. **ICT and e-contents @Schools, @Universities, @Colleges will help us to minimize this gap.**

2. **Collaborative e-Learning Framework needs to be implemented where all the stakeholders work together in the learning phase.**

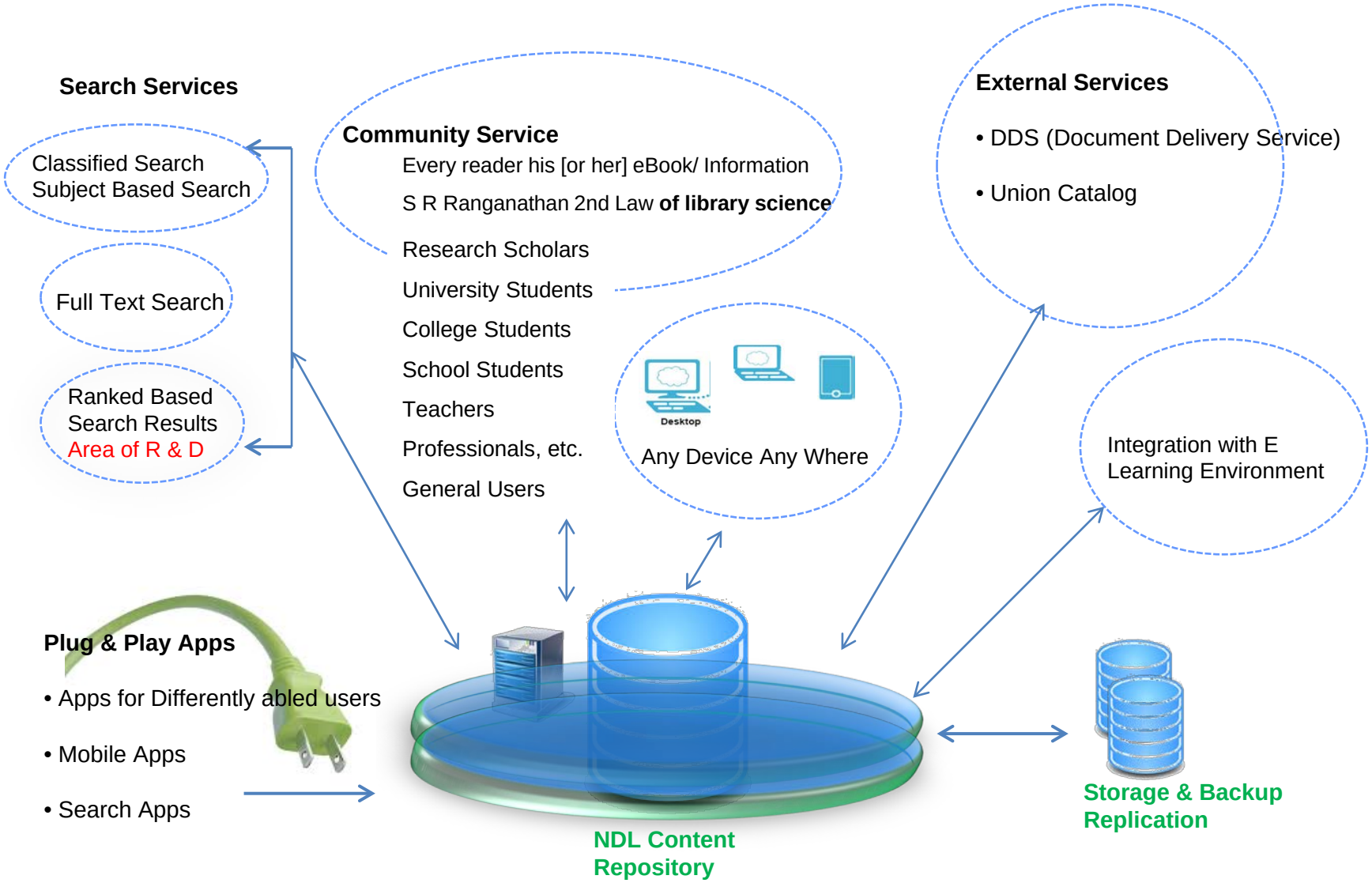
3. **Self Based Learning Framework (SBLF) will be the next most important learning phenomena therefore Digital Library access is required for self based learning**

4. **Tablet & mobile devices will also play a major role in SBLF.**

5. **New apps will be designed and developed for accessing e-contents from proposed National Digital Library**

6. **Many Entrepreneurs will participate in this project in future to design and develop application software for providing value added services.**

NDL – Services to "The Nation & World Wide"



Objectives

1. **Integration of access and creation of Digital content across educational institutions of the nation.**

2. **Creation of a 24X7-enabled Infrastructure for NDL. The Infrastructure will include hardware systems, networks, software tools, applications and interoperability standards.**

3. **Facilitate select institutes to disseminate existing content and create new content.**

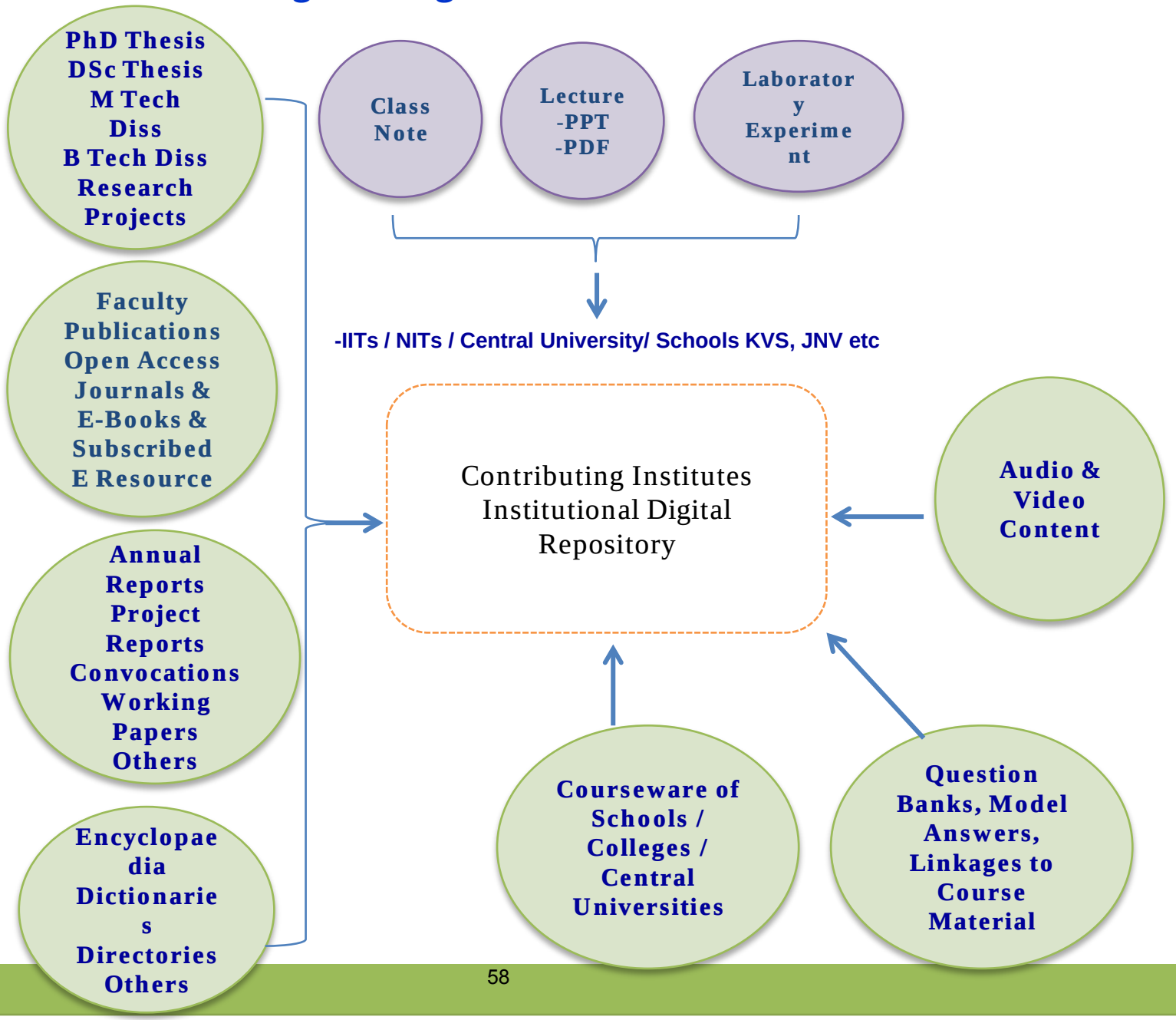
4. **Provide support for immersive E-learning environments at multiple levels.**

5. **NDL is envisaged to span across all academic levels, all disciplines and all languages (vernacular) used as medium of instruction. Support for differently abled users will be provided.**

Target Users

1. School Children
2. College Students
3. University Library Users
4. Higher technical education Library users
5. Legal Community Users
6. Life-long learners

Target Range of Contents



Roles & Responsibilities

1. Host Institute :

- **Principal coordinator of the pilot project**
- Hardware Configuration, Software installation & Configuration
- Software development, Apps Development for differently abled users
- Software development for creation of E Learning environment
- Assistance in Infrastructure Development for the Contributing Institutions for content creations
- Metadata Harvesting from IDRs
- Support Services to the Contributing & Participating institutes
- Co-ordination for course content creation

Roles & Responsibilities

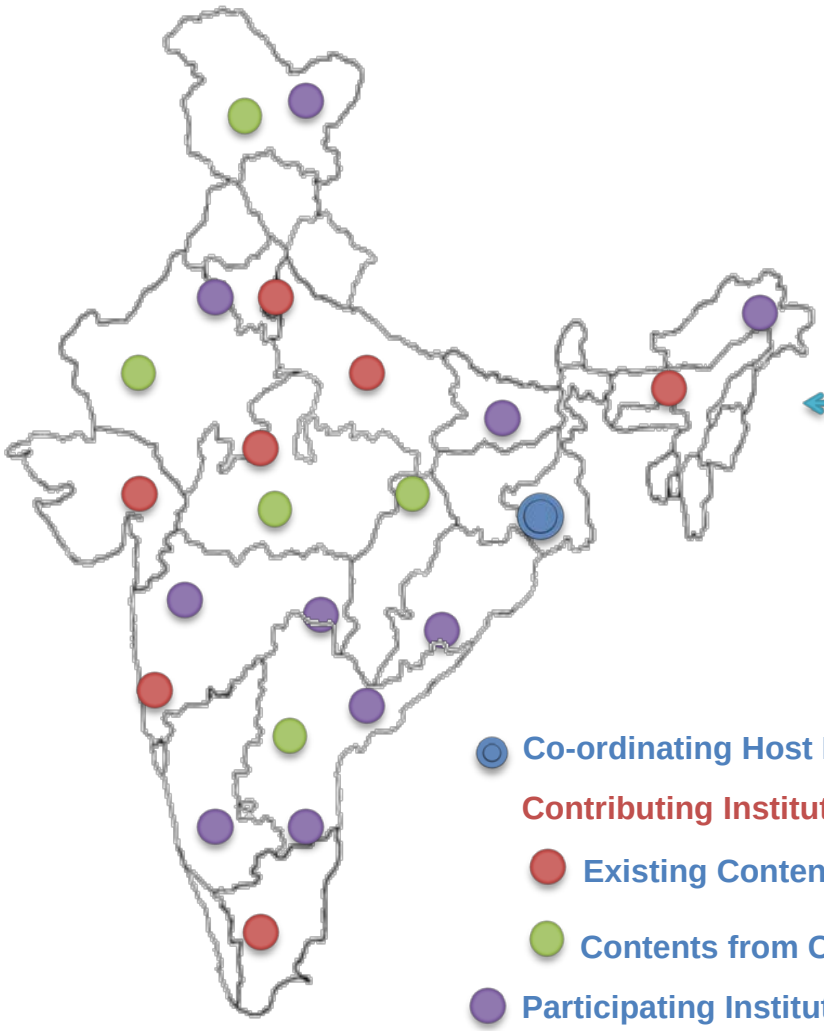
2. Contributing Institute :

- **Content Contributor and Consumer**
- IDR Development & Maintenance
- Ensure each faculty member submits or uploads information on preprint / post print article in their IDR within 3 months of its publication
- Uploading the local content for NDL
- Reporting to NDL co-ordinator
- Provide base URL of the IDR Server for Metadata Harvesting

3. Participating Institute :

- **Content Consumer**
- Feedback

Host, Contributing & Participating Institutions



Central Harvesting Server

- Co-ordinating Host Institution NDL @IIT Kharagpur
- Contributing Institute's
  - Existing Contents of IDR Developed by various Institutions / DL Projects
  - Contents from Contributing Institute's IDR
- Participating Institutions

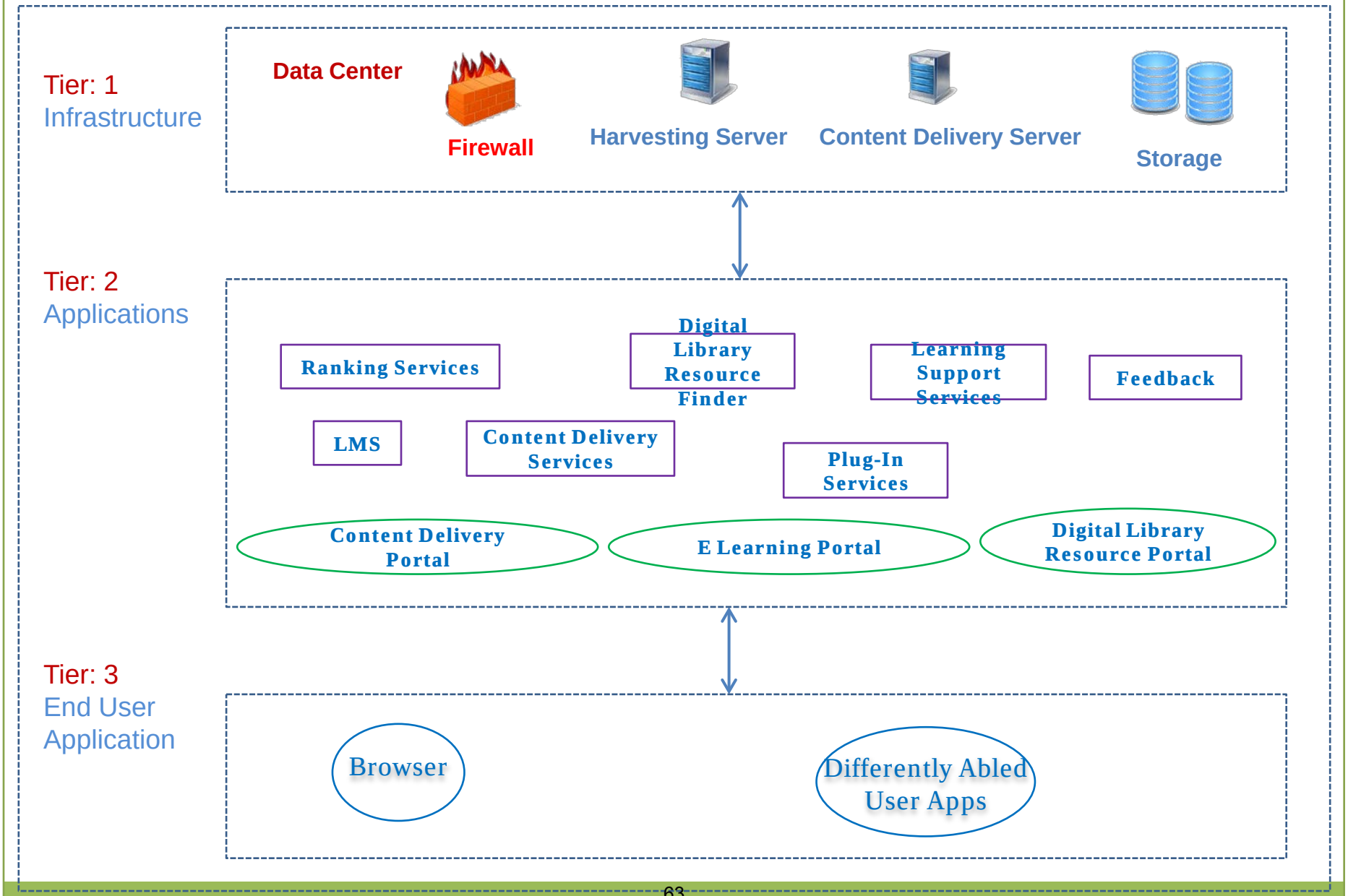
Host Institution

- NDL IIT Kharagpur

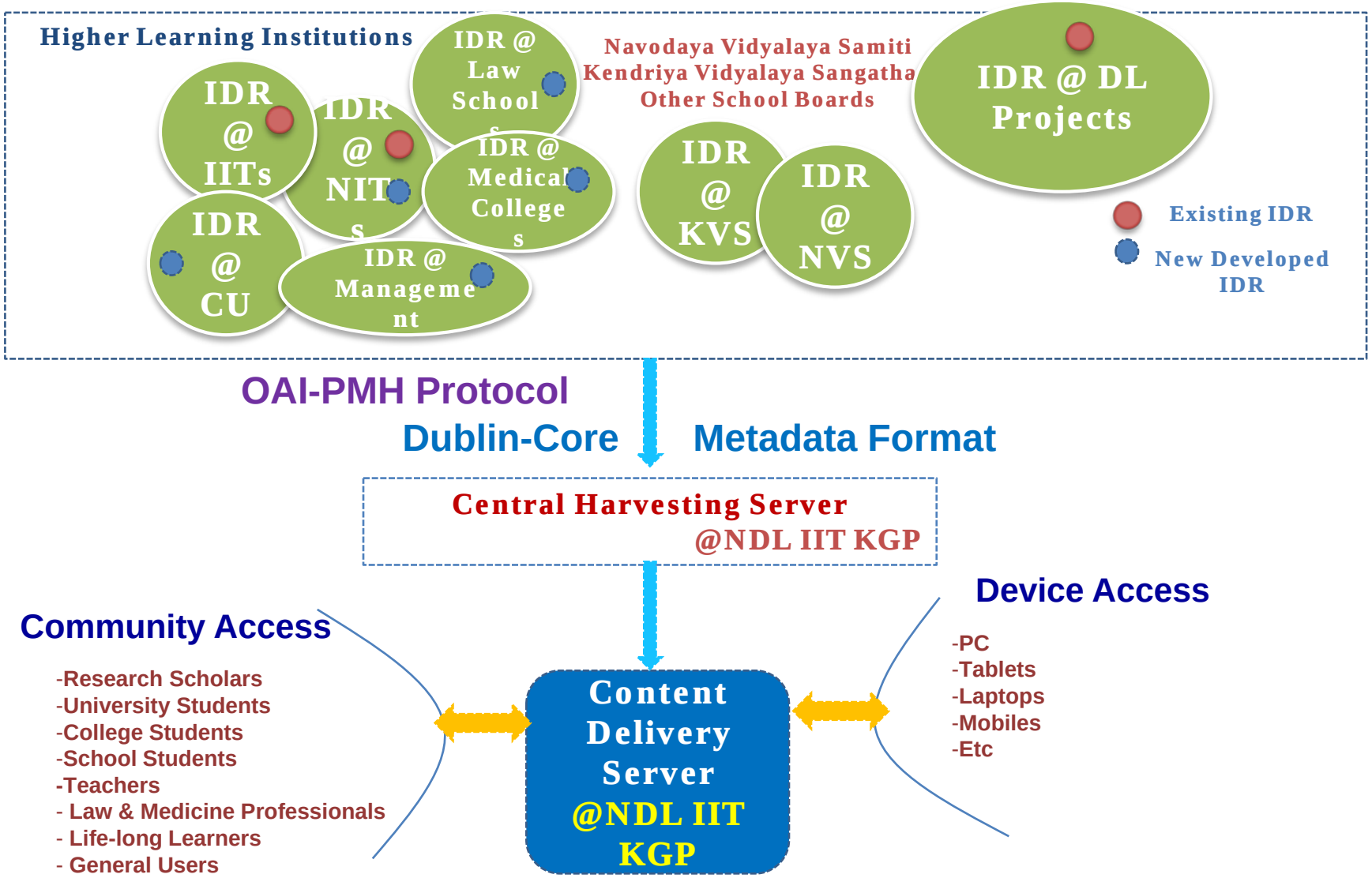
Contributing & Participating Institution List

- INFLIBNET
- Old IITs – 7
- IISc Bangalore – 1
- IIMs – 5
- NIITs – 10
- IISER – 5
- Central Universities – 42
- Law School – 5
- Medical Colleges – 5
- Schools from KVS
- Schools from NVS
- Non-MHRD Institutions (Min of Law, Min of Culture, ISI, etc)

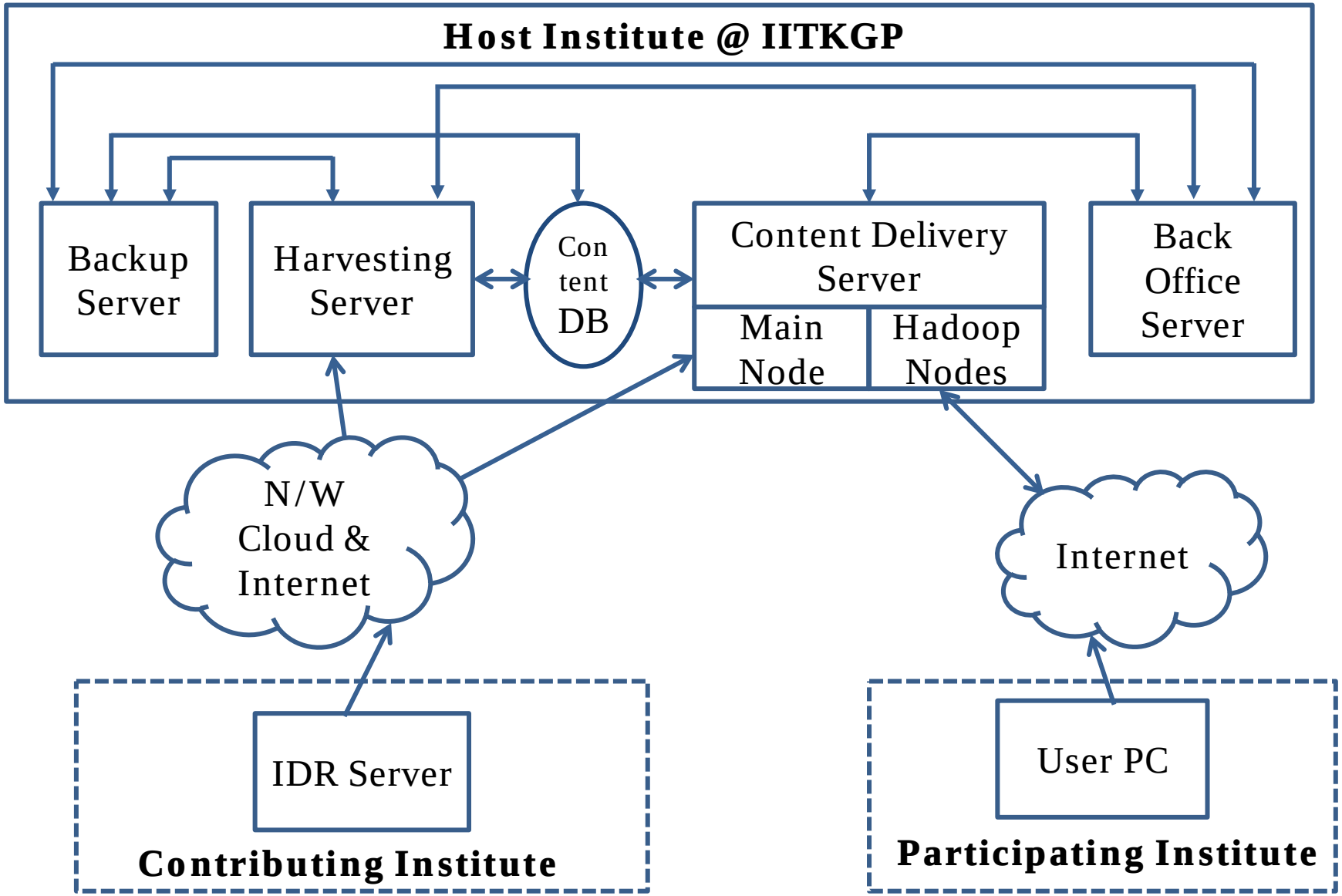
NDL – 3 Tier Architecture



Protocol for Metadata Harvesting from various IDRs



Hardware Architecture for NDL



Methodology

1. **Identification of learning objects on global scale;**

2. **Selection of contributing and participating Institutes at various level.**

3. **Detailing of Hardware Architecture**

4. **Development of a composite Software Architecture (digital archive to store learning objects, Learning Content Management System (LCMS) to provide teaching-learning-evaluation functionalities, Search and retrieval layer with Indio-script-enabled user interface)**

5. **Selection and creation of course contents for school and higher education students**

6. **Selection of learning objects and incorporation of metadata (SCORM-compliant domain-specific metadata schema will be used for the purpose)**

7. **Testing and debugging of NDL.**

Project Plan

The whole project will be divided into 3 phases. Initially a Pilot Project is proposed.

Phase -1: **Pilot Project initiated by IIT Kharagpur in collaboration with some other selected CFTIs including IITs, NITs , Central University libraries, Schools libraries, Legal Libraries and INFLIBNET (This Pilot project is estimated to cost Rs 100 crores. The Pilot project will be for three years)**

Phase -2: **Centrally Initiated implementation, which will cover all CFTI libraries**

Phase -3: **State Initiated Implementation, which will cover all state funded university, college and school Libraries.**

Implementing Phase – 1: The Pilot Project

Step 1: Course contents creation by subject experts for schools and higher education students

Step 2: Metadata Harvesting from Existing Digital Repositories in India

Step 3: Development of New Institutional Digital Repository (IDR)

Step 4: Development of Central Indexing and Resource Discovery Server

Step 5: Development of Access Mechanism

Step 6: Development of Collaborative E-Learning Framework

Step 7: Development of Knowledge Discovery Framework (KDF)

Step 8: Development of differently-abled and Immersive Learning Projects

Step 9: Specialized e-learning Verticals

Development of National Digital Library of India

Project Plan (Duration 3 Years)

Sl.No.	Task	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36
1	Core Team & Staff Recruitment																																				
2	Workshop and Training																																				
3	Infrastructure Development for Host Institute																																				
	a) Hardware & Software Purchase																																				
	b) Hardware & Software Installation																																				
	c) Software Development, Configuration, Metadata preparation																																				
	d) Testing & Launch																																				
4	Infrastructure development for Contributing Institutions																																				
5	Training and Workshop for the Participating Institutes, Rural Schools and Colleges																																				
6	Course Content Development by Contributing Institutes																																				
7	Uploading Course Content by Contributing Institutes																																				
8	Uploading Course Contents to Access																																				
9	Live Access																																				

Budget Proposal for NDL

Nature of Expenditure / Item (Brief Descriptions)	Budget in Crore				
A) Equipment at National Digital Library @IIT Kharagpur	**Yr 1**	**Yr 2**	**Yr 3**	**Total**	
Metadata Harvesting Server	0.40			0.40	
Content Delivery Server	0.80			0.80	
Backoffice Server	0.40			0.40	
Backup Server	0.40			0.40	
National Digital Library Center Setup	0.50			0.50	
Office Infrastructure @ Host	0.31			0.31	
Aakash Tablet for Testing & Debugging		0.03		0.03	
Software	0.02			0.02	
Web - Scale Discovery Service	0.25			0.25	
B) Equipment Requirements at Contributing 100 Institutions					Annexure II
IDR Server (for Content Development & Storage)	3.00			3.00	@ 0.03cr * 100
Office Infrastructure @ Contributing Institute	1.00			1.00	@ 0.01cr * 100
Software	0.01			0.01	@ 10000 * 100
C) Infrastructure Development for Participating Institutions					200 Numbers
Computer Infrastructure		2.00		2.00	@ 1lakh * 200
D) Infrastructure Development for Setting-up of Video Recording Room					100 Numbers
Video Recording & Lecture Room	2.00	2.00		4.00	@ 4lakh * 100
E) Manpower Requirement at NDL @IIT Kharagpur	1.10	1.20	1.20	3.50	
F) Manpower Requirement at Contributing Institution					100 Numbers
Staff Man-power	2.30	2.30	2.60	7.20	
Consultants		0.20	0.30	0.50	
G) Open Access E-learning Content Development					
600 Course Content Development for Colleges / University	9.60	15.00	15.00	39.60	
300 Course Content Development for Schools	4.00	5.90	6.00	15.90	
H) Technical Training for Contributing Institutions	0.30	0.20		0.50	6 in 3 Yrs
I) Workshop / Conference (6 Workshops in 3 Yrs)	0.20	0.30		0.50	
J) Travelling	0.30	0.30	0.40	1.00	
K) Consumable Items	0.50	0.50	0.50	1.50	
L) Honorarium to Core Team	0.50	0.25	0.25	1.00	
M) Contingency	0.10	0.20	0.20	0.50	
N) Fees for Consultants	0.50	0.25	0.25	1.00	
O) Subscription to E-Resources based on requirements	4.00	6.00	6.00	16.00	
Grand Total	**32.49**	**36.63**	**32.70**	**101.82**	

Thank you