SERIAL
Science, Education Research & Innovation in Academic Libraries

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BIJU PATNAIK CENTRAL LIBRARY
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Contents:

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In order to create .......

**Knowledge** → **Progress** → **Cycle**

*Intellectual Creations*
What is **Intellectual Property**

1. **Industrial Property**
   Paris Convention, 1883
   - patent
   - trademark
   - geographical indication
   - industrial design

2. **Copyright**
   Berne Convention, 1886
   - music and performances
   - literary and artistic works
   - phonograms
   - broadcasts
   - computer programs

As tool IPR
- to protect creativity
- generate revenue

But... how to create **intellectual base**
Strategy for Intellectual Base

change in...

- Perception
- Structure
- Processes
- Implementation

commitment and contributions

to make community better, more transparent, and more valuable

how to create, improve & share

Academic Writings

need

Content
Content is King

Content Ubiquitous

93% information/content in digital form

(See, K., Guttenberg, N. and McCravy, V., 2002)

Content not captured is faded/lost

Creations in the forms of Content

Printed Books – In US, tripled last 5 years (Bowker)
Output grew 6% in 2011 (from 328,259 titles in 2010 to a projected 347,178 in 2011) - (Bowker)

E-books – 30% to 40% growth (Nik Bogaty, IDPF)

Journals – more than 10 millions articles in a year (Jha, 2001)

Patent – filings worldwide grew by 7.2% in 2010 (WIPO 2011)

Trademark – filings worldwide grew by 11.8% in 2010 (WIPO 2011)

Webpage – In UK, every 2 sec. (Schaffner, 2000)

Online and Newspaper ratio: 8:1 articles (Carlson, 03 2003)

Blog – about 420 lac posting & 5 lac new posts daily (WordPress.com)

Facebook – 30 billion pieces (web links, news, posts, notes, photos etc) shared each month (Infographic)

Youtube - More than 4 billion views per day
72 hours of video uploaded every minute

A famous declaration by Bill Gates in 1996
LIBRARY of an Academic Setting

Central and integral part of academic system

not only serve academic community but also manage & provide content

No. library in the world is self-sufficient

As a tool, library system is redesigned to support academic system in production of new knowledge, products, processes and services
Library is connecting content in economic way

enriched content..... would make the system healthy

- empowers
- educates
- entertains

however...

Price would no longer be an obstacle to connecting a **qualitative content**
Proliferation of Publishing Sector

Proportions of Article Output by the Publisher

- University Presses: 30%
- Society: 64%
- Commercial: 4%
- Others: 2%

Source: Journal Citation Database, Thomson Reuters

Over 90% of STM journals are now online

- ~2000
- Jr. Publisher
- ~25,400 STM Journal titles
- 1.5 million Articles in a year
- more than 150 Disciplines in S&T

Average growth rate ratio for the last two Centuries

Journal titles: articles: researcher

3.5 : 3 : 3

The global market for English-language STM journals is about $5 billion.

In order to Acquire Branded Content
Librarians look for branded content

- Nature of content
- Peer review system to ensure its quality

Publishers monopoly over content

- Exorbitantly high prices
- Bundles
- Discount offer
- Retain Copyright

E-resources sub. at NIT Rourkela from 2010 to 2013

Scientific Misconduct

2,047
Biomedical and Life-science research articles
Indexed by PubMed as retracted on May 3, 2012
Why because........

21.3% of retractions were errors
67.4% of retractions were attributable to misconduct

- Fraud or suspected fraud - 45.4%
- Duplicate publication - 14.2%
- Plagiarism - 9.8%

Source: PNAS, 2012

Commercial publishing being replaced by open access models

Every model involves costs

Huge Lobbying (misuse power to publish papers without peer review)

Pay and publish policy in reputed journals

Therefore,
Librarians look for ...

Content...

**Acquisition** - originality, quality, reliability, validity

**Accessibility** - creating high-end infrastructure facilities for print and electronic

**Availability** - 24/7 both local and remote

**Affordability** - to minimize the costs involved

- Return on investments
- Create new sources of revenue

**CONTENT**

design
discourse
delivery
development
discover
Advantages

Libraries creates space for capturing, storing, providing and disseminating content for best needs of the academic community.

- Accuracy-in-content
- Speed-in-access
- Availability-in-24/7
- Sharing-in-content
- Interface-in-user friendly way
- Affordability-in-costs
- Efficiency-in-operations
- Flexibility-in-format
- Frequent-in-updates
- Quality-in-service
- Results-in-time
India: Education and Research in Engineering and Science

India's Higher Education System (HES)

**Largest in the world**: Institutions - 26455 (504 universities and 25951 colleges) - Gupta & Gupta, 2012

**3rd largest in the world**: Enrollment - after China and USA

**Total Enrollment**
1950 - 3, 97,000  
2001 - 83, 99,000  
2010-11 - 1, 69, 75,000

**Girls Enrollment**
(UGC annual report 2009-10)  
1950 - 43,000  
2001 - 33, 06,000  
2010-11 - 70, 49,000.

12.4 % of students go for higher education from the country - MHRD Report 2009-10

**1989–2009**

S&E doctorates
Foreign Recipients of US
223245  
China (57,700)  
India (24,800)

NSF, 2012)

**Doctoral degrees**

in science and engineering

India - 6,000  
US 25,000  
China 9,000

Agarwal, 2006

**Engineers**

India - 3,50,000  
USA - 70,000  
China - 6,00,000

USDE, 2006

**PhD & M.Phil Awarded**

2008 - 10,781  
2009-8,525

**Science**

Ph.D - 3317  
M.Phil - 2374

**Approved intake**

2012-2013
UG, PG/Diploma  
technical colleges/institutions
34,49,355

(AICTE, 2013)

Two-third of India’s colleges and universities are below standard - South Asia Monitor, 2010.

FICCI Edu. Summit - HRD Minister Kapil Sibal said “We will need 800 new universities and 40,000 new colleges to meet the aim of 30 percent GER (gross enrolment ratio) by 2020. Government alone cannot meet this aim,”
India: Research Outputs and Innovation

Research outputs

Total No. of publications

<table>
<thead>
<tr>
<th>Year</th>
<th>2001-05</th>
<th>2006-10</th>
<th>2011-15</th>
<th>% of Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,06,456</td>
<td>1,77,208</td>
<td>3,00,000</td>
<td>66%</td>
<td></td>
</tr>
</tbody>
</table>

No. of publications in Subject Wise

<table>
<thead>
<tr>
<th>Subject</th>
<th>Number of Publications 2001-05</th>
<th>Number of Publications 2006-10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemistry</td>
<td>25719</td>
<td>38920</td>
</tr>
<tr>
<td>Physics</td>
<td>13490</td>
<td>20525</td>
</tr>
<tr>
<td>Clinical medicine</td>
<td>10046</td>
<td>19273</td>
</tr>
<tr>
<td>Engineering</td>
<td>9605</td>
<td>18596</td>
</tr>
<tr>
<td>Materials Science</td>
<td>7987</td>
<td>14190</td>
</tr>
</tbody>
</table>

3.5% of global research output and expected to reach 5% global share by 2017

Comparison of Indian research outputs with China

<table>
<thead>
<tr>
<th>Subjects</th>
<th>India</th>
<th>China</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials Science</td>
<td>6.4%</td>
<td>26%</td>
</tr>
<tr>
<td>Physics</td>
<td>4.6%</td>
<td>19%</td>
</tr>
<tr>
<td>Computer Science</td>
<td>2.4%</td>
<td>15%</td>
</tr>
<tr>
<td>Mathematics</td>
<td>2%</td>
<td>17%</td>
</tr>
</tbody>
</table>

Innovation performance in the world

World Innovation Index

- 2004-08
  - Japan - 01
  - India - 56

Global Innovation Index

- 2012
  - Switzerland - 01
  - India - 64

Based on no. of patents per million - Economist Intelligence Unit 2009

Lower-middle (LM) income in the world

- Denmark - 01
- Sweden - 02
- India - 03

Central and Southern Asia (CSA) Region - India hold Rank No. 01

2012 Innovation Efficiency Index

- India Ranks at 96th in inputs
- India Ranks at 40th in outputs

Strengths

- ICT Ranks at 04 (Access (108th) ) Use 117th
- Creative outputs (34th)
- Market sophistication (46th),
- Knowledge and Technology outputs (47th)

Weaknesses

- Research & Development (55th)
- Elementary education (113th)
- Institutions (125th)
- Tertiary education (135th)
- Human capital and research (131st)

Source: Evidence report of Thomson Reuters December 2011
Conclusion

Technology is every part of library system
Library shelves become empty
It is a change the format not death of print
93% of world content in digital form

Selection of Content

richness of the content & its quality
reaching domestic and global academic and research needs
more discoverable way
more economic way

“as king, content is creating and ruling innovation society by its nature, scope, mode and speed”
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Questions