IMPACT OF NRENs in Universities – The ZAMREN Experience

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Presentation Outline

Challenges Facing Universities in Developing Countries

NREN’s Mission

Strategic Role of NREN’s in Research & Education

ZAMREN Case Study

Lessons Learnt
Challenges facing Universities in Developing Countries

- Inadequate Funding
- Inadequate Advanced Laboratories
- Competition From Industry For Best Academics
- Limited Physical Space For Teaching & Learning
- Limited ICT Infrastructure
- High Cost of Procurement of Physical Publications (Text Books and Journals)
NREN’s Mission

“Develop necessary communication protocols and find innovative ways of using the network to support education and research”

- Customer Segment
  - Education and Research Institutes...

- Product Classifications
  - High Speed Connectivity
  - Unique Communication Protocols

- Resources
  - Computers and Network infrastructure
  - Technical and Administration Staff
  - Finances (generated revenues, grants, loans...)
Strategic Activities

- Through its Network, NRENs provide opportunities for sharing laboratory facilities and thus enable researches undertake joint research.

- Provide sufficient low-cost Bandwidth to enable deployment of bandwidth-hungry applications e.g. high quality video conferencing, podcasting e.t.c.

- Facilitate access and sharing of education and research resources.

- Establish and implement governance and management structures.
ZAMREN Case Study

Genesis
- Built as a result of collaboration among three public universities

Driving Factors
- High cost of Internet connectivity
- Need to provide and expand programmes beyond university’s physical location
- Mutual desire to share academic resources to deliver university programmes, and
- Poor access to digital educational and research resources
Support and Collaboration Initiatives

- NICHE Project
  - Financing of initial investment to build the NOC and technical capacity building (total project cost Euro 2.24 million)
  - Development of Business Model

- Founding Universities
  Financing to cover initial operating costs. (Euro 200,000)

- ZESCO (quasi-government power utility company)
  Use of inland cross-town fibre for transit (gratis), actual cost (Euro 240,000 per annum per STM-1)
ZAMREN Case Study…..cont.

- Support and Collaboration Initiatives…
  - ICT Ministry
    - Last-mile connectivity for the three public universities (Euro 625,000 for universities, Euro 700,000 other institutions)
    - Licensing as a closed user group
    - Assigned to host and manage HPCs
  - Regional Network (UbuntuNet Alliance)
    - Provision of global transit services
    - Connectivity to other RENs in the region
  - Collaboration with Commercial ISP
    - Negotiate contracts for leased local circuits
IMPACT
Zambia Fibre Network Coverage
Reduction on Cost of Connectivity

Bandwidth Costs/Tariffs

<table>
<thead>
<tr>
<th>Time</th>
<th>ZAMREN Tariffs</th>
<th>Commercial Providers (Min)</th>
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<tbody>
<tr>
<td>Pre ZAMREN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>July. 2012</td>
<td>27000</td>
<td></td>
</tr>
<tr>
<td>Dec. 2013</td>
<td>15000</td>
<td></td>
</tr>
<tr>
<td>Dec. 2014</td>
<td>8000</td>
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<tr>
<td>Dec. 2015</td>
<td>5000</td>
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<tr>
<td>Dec-16</td>
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ZMW
Increased uptake of use of Internet

Connected Institutions

<table>
<thead>
<tr>
<th>Date</th>
<th>Institutions</th>
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<tbody>
<tr>
<td>31-Dec-2013</td>
<td>17</td>
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<tr>
<td>31-Dec-2014</td>
<td>39</td>
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<td>31-Dec-2015</td>
<td>52</td>
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<td>31-Dec-2016</td>
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</tbody>
</table>
Network Capacity Growth

Network Capacity Growth

![Network Capacity Growth Chart]

- 31-Dec-2013: 0 Mbps
- 31-Dec-2014: 500 Mbps
- 31-Dec-2015: 1000 Mbps
- 31-Dec-2016: 2000 Mbps

Network Capacity

ZAMREN
Performance for 2016

✓ Positive Surplus: 16% on Total Operating income
✓ Increase in Revenue by 24%
✓ Improved Liquidity Ratio of 2.98:1
５５％ Direct Operating Costs: Procurement of Global transit and lease of Local Metro circuits

２０％ Staff Costs

２２％ Administration Costs.
Summary of Impact

- Ability to access and share educational resources
- Increased research collaboration through communities of practice
- Open regional and global network opportunities (participation in global research initiatives and science gateways)
- Ability to undertake Big Data Research on HPCs
- Ability to offer programmes through Open and Distance Learning
Lessons Learnt

- NRENs have a positive impact on the operations of Universities and research institutes, and they are the backbone of the Regional Network. The following needs careful consideration when building the REN:

  - Involvement of diverse range of stakeholders
  - Having an appropriate governance and management structures
  - Develop a viable Business Model
  - Constant evaluation and monitoring of service portfolios and NREN sustainability
Thank You
For Your Attention.