The Digital StudyHall

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The Village Schools

Chinhat, UP

The Villages

Madantoosi, UP
Doubts and questions

- Can you learn by watching TV?
- Can content acquired in middle-class schools be meaningful to rural and slum kids?
- How do you provide realistic cheap high-bandwidth connectivity?
- How do you scale content production, distribution, and teaching?
Common themes

- Cheap, easy to build, effective
- Support for point-to-point communication
- Support for high bandwidth communication
- Build whole systems (“people systems”)

Outline

A people’s database
- Mediation-based Pedagogy
- Postmanet-based distributed system

A “People’s Database”

- Videos of live classes, by best teachers
- Of all subjects
- Of all grades
- In all languages
- Built by the people, for the people

Videoing live classes
Videoing live classes

Videoing live classes

Videoing live classes

Recording of Live Lessons

- Based on state government textbooks
- Carefully planned coherent sequences
Recording of Live Lessons

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Recording of Live Lessons

- Highly interactive, with lots of:
  - Questions and answers
  - Role plays
  - Activities

Recording of Live Lessons

- Math, science lessons taught in Hindi, Marathi, Kannada, Tamil...
Recording of Live Lessons

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  - Questions and answers
  - Role plays
  - Activities
  - Math, science lessons taught in Hindi, Marathi, Kannada, Tamil..
**Drama Rehearsals and Performances**

**A “People’s Database”**
- Freely available to all, not just the index, but content itself
- Not created, owned, controlled by a giant corporation
- A constantly evolving, highly-interlinked “consciousness”
- Democratize knowledge and education!

**The “People’s Database”**
- Classes
- Stories
- Plays

**The Digital Water Tanks**
- Rain water harvest project
  - Good stuff lost forever if not carefully collected and stored
  - Once stored, can be used and shared at times and places beyond rain’s reach
- Digital water tanks and tubes: non-degradable, non-exhaustible, dirt-cheap to replicate and distribute
Outline

A people's database

Mediation-based Pedagogy

Postmanet-based distributed system

Pune

Calcutta

Bangalore

Lucknow

Network of hubs and spokes

A Network of Hubs and Spokes

• Networked centers of excellence
  • “Radiating” content and methodology into neighboring slums and villages
  • Content in local languages

A Network of Hubs and Spokes

• Decentralized content production, distribution, sharing, training, monitoring

Hub expansion experiences

• StudyHall, Lucknow

• Rewachand Bhojwani Academy, Pune

• CLT, Bangalore

• AID, Sulagiri, Tamil Nadu
A Tale of three schools

- StudyHall morning sessions
- StudyHall after-school program for slum girls (Prerna)
- Madantoosi (village) school (public)
- Prerna as an “in-house testbed” of village schools

A Tale of three schools

- Morning lessons → villages?
- Afternoon lessons → villages?
- Morning lessons → afternoon classes?

A Tale of three schools

- Teacher qualification difference
- Language difference
- Student background (environment) difference
- Different text books
- Systemic difficulty of bridging the education gaps

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“Impedance matching”

- Stage sequences of model lessons
- By best teachers from morning school
- Conducted in front of after-school girls
- Recorded for reuse by both:
  - Village schools, and
  - Future afternoon classes

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Distribution to villages
DSH hub: impedance matching

- Good teachers
- Connections to underserved schools
- An appropriate student audience for the good teachers to teach to
  - (Rich private schools are not the only eligible DSH hubs)

Hub expansion experiences

- StudyHall, Lucknow
- Rewachand Bhojwani Academy, Pune
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Rewachand Bhojwani Academy, Pune

- Best teachers from good private school
- Teach in neighborhood government school (Ambedkar School, Pune)
Private-public school partnership

- Best teachers from good private school
- Teach in neighborhood government school

Benefits to the public school partner

- Free “star guest teachers”
- Teachers learn methodology
- Get recorded content and player equipment

And distribution to rural schools
Hub expansion experiences

- StudyHall, Lucknow
- Rewachand Bhojwani Academy, Pune
- CLT, Bangalore
- AID, Sulagiri, Tamil Nadu

CLT: an NGO embedded in the public school system

- Government public school literally next door
- Students, teachers, CLT staff freely mingle
- Students receive live instructions at CLT
- CLT staff provide extensive teacher training

Recording lessons at CLT

- Experienced CLT staff
- Well-trained government school teachers
- Volunteers (scientists, college professors, etc.)
Recording lessons at CLT

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- Well-trained government school teachers
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The CLT “network”

- Overlay a digital network on top of existing social networks
Hub expansion experiences

- StudyHall, Lucknow
- Rewachand Bhojwani Academy, Pune
- CLT, Bangalore
- AID, Sulagiri, Tamil Nadu

Association for India Development, Sulagiri

- Science and other programs developed by AID officers
- A full-time staff receives extensive training
- The full-time staff teaches in 20 schools in a block

AID innovative science programs

- Experiments on simple household items
- Highly interactive, participatory
- Kids love the program!
AID innovative science programs

- Experiments on simple household items
- Highly interactive, participatory
- Kids love the program!

But ...

- Training staff is not easy
- A staff only visits a school once a week
- Only one class per school sees the program
- Schools not reached by the AID program
The role by DSH

• This is what DSH may be able to address:
  – Training staff is not easy
  – A staff only visits a school once a week
  – Only one class per school sees the program
  – Schools not reached by the AID program

Hub expansion experiences

• Enable existing organizations to do what they have always wanted to do
• Overlay a digital network along side of existing social networks

Hub expansion experiences

Inter-hub sharing

• Enable existing organizations to do what they have always wanted to do
• Overlay a digital network along side of existing social networks
Outline

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Mediation-based Pedagogy

Postmanet-based distributed system

Network of hubs and spokes

Outline

Just watching TV doesn’t work

Mediation-based pedagogy

Mediation

- The digital feed and a teacher form a team
- Digital content provides model and framework
- Teacher supplies an interactive component
- Pause: questions/answers, activities, board work, role playing, poems/songs, etc.
Training for mediation

Distribute to villages

Distribute to villages

Distribute to villages
Motivated teacher took own initiative
Uses the system to train/teach self
Abandons crutch during live lessons
“Graduating” teachers: the ultimate success

Mediation-based pedagogy

• Three key ingredients to turn an unskilled teacher into a part of a competent “team”:
  (1) a digital feed, (2) training in mediation, and
  (3) work ethics

Student projects at hubs

Morning school kids
Madantoosi village
Afternoon school
Madantoosi village
Afternoon school (Prerna)
Kannar village

Drama

Madantoosi village
Drama

Peer-teaching

Madantoosi village

Afternoon school

- Importance of influencing public schools
- Public schools: kids eager, most teachers lazy
- Enlist good students to be class “leaders”
- Potential promise of solving teacher absenteeism
- Potential of scaling skilled and motivated mediator
Outline

A people’s database

Mediation-based Pedagogy

Postmanet-based distributed system

Pune

Calcutta

Bangalore

Lucknow

Network of hubs and spokes

What Is A Postmanet Router?

• Start with a conventional router

What Is A Postmanet Router?

• At the end of the day, it spits out a DVD
What Is A Postmanet Router?

- Picked up by a postman

What Is A Postmanet Router?

- The postman may also drop off an incoming DVD

A Postmanet Router

- Basic idea of using DVDs not new
- What is new: general and transparent
  - General:
    - Support for multiple applications
    - Generic infrastructure (public transit system)
    - 2-way communication
    - Multiplexing/demultiplexing onto/from minimum disks
  - Transparent:
    - No manual inspection of DVD content
    - No manual staging, copying
    - No manual handling of acks, losses, duplicates, ...
    - Just insert/remove DVDs from the box

Advantages

- Wide reach: a truly global "network"
- Great bandwidth potential, technology trends:
  - "Sneaker nets" becoming more powerful
  - Storage density growth > Moore's Law
  - Wide area bandwidth growth bound by digging ditches, launching satellites, erecting WiMax towers…
- Low cost
- Incremental deployment:
  - Classic chicken & egg problem: infrastructure, applications, users
- Good scalability
phttp: Postmanet-enabled http

- Network packets carried by DVDs in the postal system
- Transparency:
  - Minimum manual involvement beyond postal workers’ leg work
  - Crucial for scale-up
- Village-side cache that absorbs most of the requests
- Not just sync data, but also make “cgi-bin” work

A peer-to-peer distributed database

- A distributed system built on top of:
  - Postmanet, and
  - Conventional connectivity, when available

DVD Robot

- Why DVDs? Capacity, cost, weight, …
- Robot automation

A peer-to-peer distributed database

- A distributed system built on top of:
  - Postmanet, and
  - Conventional connectivity, when available
A peer-to-peer distributed database

- Just insert DVDs and push button

Components:

- Workflows: content capture, remote monitoring, ...
- Pedagogy research

Synergy: phttp + EdTV

- A natural two-hop “network”
- The phttp “hop:” pervasive, high-bandwidth, cheap, asynchronous
- The EdTV “hop:” cheap end devices, bridging last mile

Status and conclusions

A people’s database

Mediation-based Pedagogy

Network of hubs and spokes

Postmanet-based distributed system
Status: the “people’s database”

- Project in existence for 1.5 years
- 240 classes in English, math, science
- In Hindi, Marathi, Kannada, Tamil
- 150 pieces complementary material: student projects, drama, science courseware, etc.

Status: network of hubs and spokes

- Operational hubs in Lucknow, Bangalore, and Pune
- Each hub works with a number of poor village and slum schools (experimentally)
- Many more in various stages of discussion

Status: mediation-based pedagogy

- Unscientific initial results seen by unbiased visitor:
  - Impressive results in accountable private schools
  - Poor results in government schools that lack accountability
- Working on approaches to address government schools

Status: Postmanet-based distributed database

- Postmanet-based distributed database in production use since 07/2005
- Working on integrating conventional connectivity
Common themes

- Cheap, easy to build, effective
- Support for point-to-point communication
- Support for high bandwidth communication
- Build whole systems ("people systems")

Common themes

- Not about any one particular piece
- It’s about building an “eco-system” of symbiotic pieces
- Close collaboration between education experts and computer scientists

The Digital StudyHall

- Fundamentally redefine and democratize education!

Thank you!

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