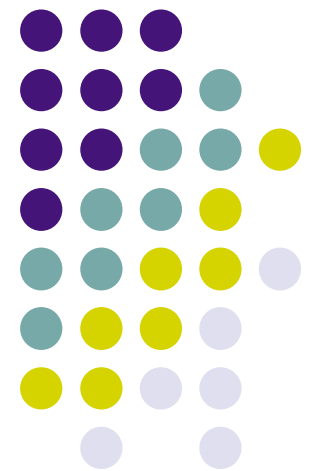
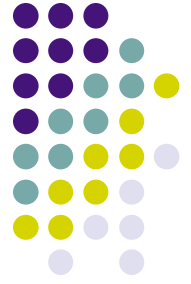


CommScape & OpenII

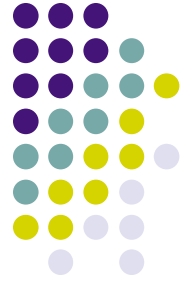
Lessons learned so far





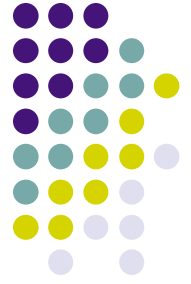
Agenda

- First attempts: CommScape, OpenII
- Field work
 - Data mgmt a large HIV/AIDS treatment program
 - Community healthcare workers
- Next steps
 - New CommScape
 - Improving data entry
 - Grass-roots business intelligence



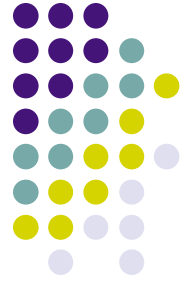
CommScape motivation

- Healthcare in Developing Regions
 - Life expectancy of 1 billion poorest people is 35 years less
 - Few doctors, inadequate infrastructure like electricity, roads
 - Rely on Community Health Workers (CHW)



Community Health Workers

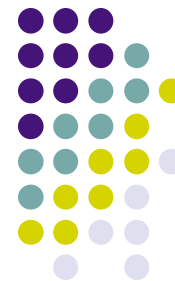
- Responsibilities
 - Home visits, basic care and referrals
 - Disease prevention education
 - Monitor population health
- Challenges
 - Little health training and high staff turnover
 - Data rarely captured
 - Minimal supervision
 - Isolated, poor infrastructure



But really...

- I make databases... people need clean water
 - Coordinate! Hey Tap... Uh, Joe...
- Stuffing in “research”
 - Multi-tenancy data architecture
 - Replication semantics
 - Collaborative visualizations
 - Delay tolerant networking

Maybe something like this...?



Panel 1 (Top Left): Anita is shown with a mobile phone and a Wi-Fi tower. A cloud contains a Wi-Fi symbol.

Panel 2 (Top Middle-Left): News & Alerts
[Rise in malaria](#)
[Antibiotic shortage](#)
[New maps for Milimani](#)
 Messages
[Charles quit, cover Milimani](#)
[Don't miss Bindoi household](#)

Panel 3 (Top Middle-Right): Anita is shown with a mobile phone. A patient chart displays a line graph of blood sugar levels over time. A table below the graph shows data points.

Panel 4 (Top Right): A patient form is shown with fields for Name, First Name, Middle Name, Last Name, Gender, Title, Village, and Age. A line graph shows temperature over time.

Panel 5 (Bottom Left): Caria is shown with a laptop. A list of updates and dashboards is displayed:
Updates
[Anita Status Report](#)
[Hilda Status Report](#)
Dashboards
[High Priority Incidents](#)
[Malaria](#)
[ARV Compliance](#)
[CHW Assignments](#)
[Consulting Doctors](#)
Create Charts
Task Assignments

Panel 6 (Bottom Middle-Left): Caria is shown with a laptop. A patient chart displays a line graph of blood sugar levels. A thought bubble says "Send to consulting doctor...". A form below the graph has fields for Subject and Body, and a Submit button.

Panel 7 (Bottom Middle-Right): Dr. Mhila is shown with a laptop. A patient chart displays a line graph of blood sugar levels. A thought bubble says "Refer to specialty clinic!". A table below the graph shows data points.

Panel 8 (Bottom Right): Anita is shown with a mobile phone. A message box says "Refer Nilton Gladys ...". A thought bubble says "Doctor says go to the specialty clinic!".

CHWs doing analysis?

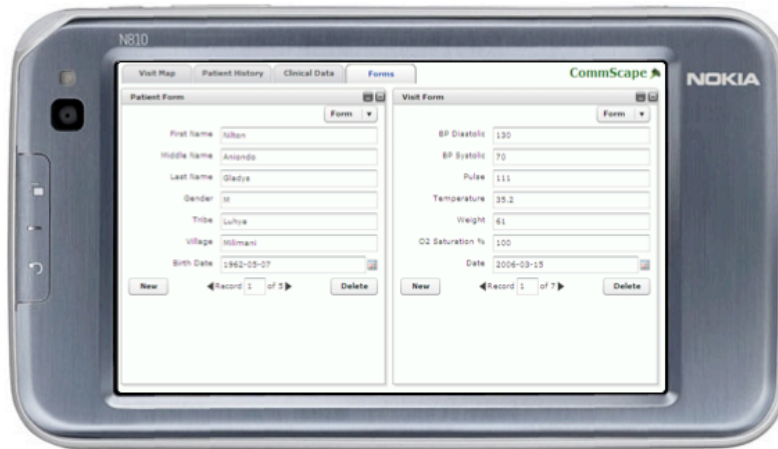
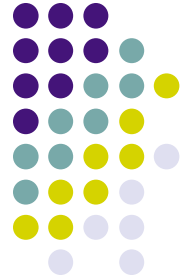


Figure A. Form entry on a household visit



Figure B. House map and a timeline of visits to a patient



Figure C. Selecting a part of a visualization and annotating

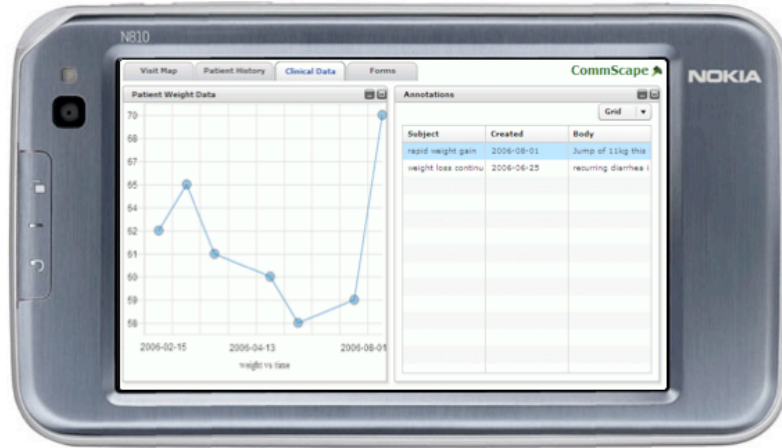
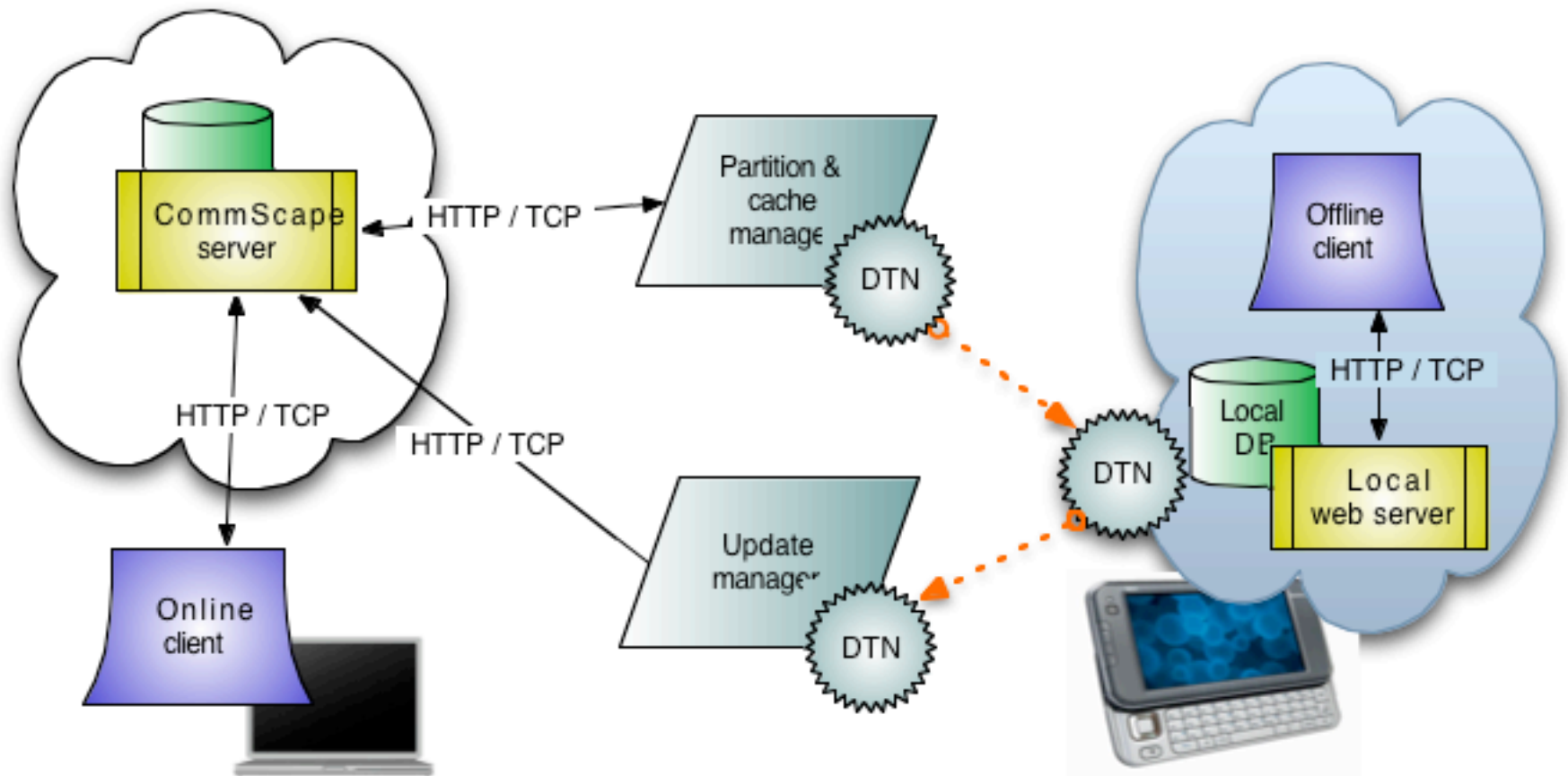


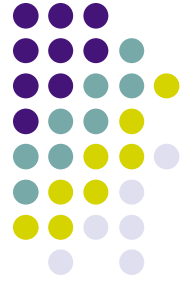
Figure D. Viewing annotations associated with a visualization



CommScape, original recipe

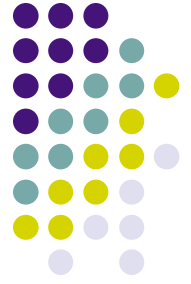
- “ahead of ~~its time~~ reality”





Getting feedback

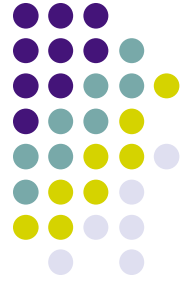
- Talk to people who know what's up
 - Thanks to Tapan & friends, TIER folks
 - Talk, talk, talk
- Apply for funds
- Get side-tracked...



OpenII motivation

- What is data integration?
- Data management in NGOs
 - Nature conservancy
 - International rescue committee (IRC)
- Open source information integration
 - Leverage existing tools
 - \$

Schema search and visualization



- A first step for OpenII

The screenshot displays the Schemr application interface, which is split into two main views: the Schemr Search View and the Schemr Visualization View.

Schemr Search View:

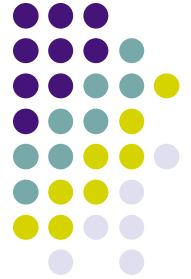
- Enter keywords:** A text input field containing "berkeley location attribute:course".
- (And/Or) Specify a schema file:** A text input field containing "/Users/kuangc/workspac", with a file selection icon to its left.
- Results:** A list of search results including:
 - [berkeley course catalog](#)
 - [berkeley](#)
 - [rachel.xml](#)
 - [stanford](#)
 - [umd](#)
 - [metu](#)

Schemr Visualization View:

This view displays a graph visualization of a schema. The graph consists of several nodes and edges:

- A central node labeled "stanford" (highlighted in green) is connected to two other nodes.
- The top node is a blue circle, which is connected to five red rounded rectangular nodes: "Room", "CourseName", "DayTime", "CourseCode", and "Instructor".
- The bottom node is a blue circle, which is connected to one red rounded rectangular node: "SectionCredit".
- There is also a red rounded rectangular node labeled "Course" connected to the bottom blue node.

How to make it relevant?



- Talk...
- Read...
- Listen...
- Plan a trip...

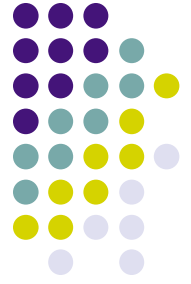


Field work

- Do something useful
- Find partners, be flexible, observe
- Fun!

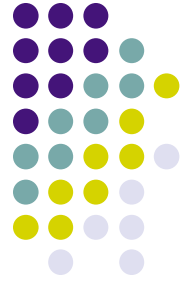


MDH data consultation



- Lost-to-Followup
- A legacy workflow
- Paper forms, 11 clinics
- Data entry multiple times over
- MS Access and SAS
- Prioritizing research and clinical care

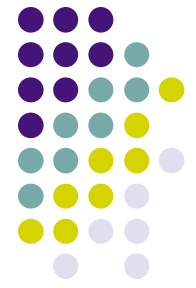




MDH Take Away

- Give: a solution, future recommendations
- Get: insight, data, partner on the ground
- It's all about data quality & decision making
 - A vicious cycle

Helping CommCare





Community health workers

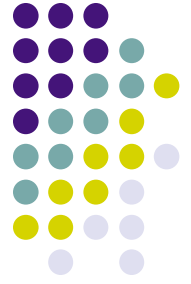
- Find real scenarios
 - CommCare household canvassing
 - Map cues automation, sensors
 - Extending telemedicine



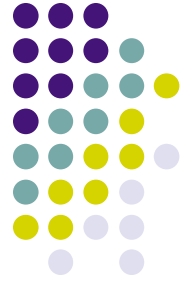
Weekly Reporting Form:	Mon	Tue	Wed	Thu	Fri	Sat	Sund
Activities	10/10/10	10/10/10	10/10/10	10/10/10	10/10/10	10/10/10	10/10/10
Total HH Surveyed	10	10	10	10	10	10	10
Total CHW	1	1	1	1	1	1	1
Total Cases							
Malaria							
Combined	1	1	1	1	1	1	1
Total HH	10	10	10	10	10	10	10
Total CHW	1	1	1	1	1	1	1
Total Cases							



Time to rethink things...

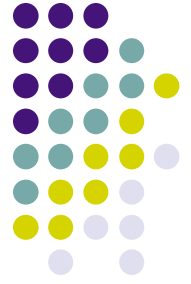


- Take an inventory of the real problems, tools and methods you know
- Pattern: do something, rethink, repeat



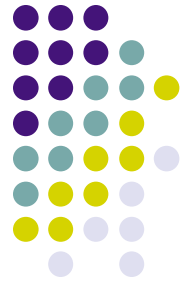
New direction

- “Data enablement” for developing regions
 - Focus on NGO/community organization capacity
- Context appropriate data systems
- Data quality & decision support



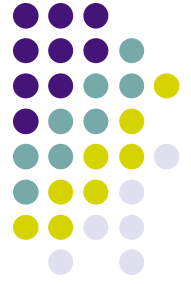
New CommScape

- Focused on validated use cases
- Data quality at time of entry
- GPS navigation, and other sensor-based enablement
- Distributed decision support



Improving Data Entry

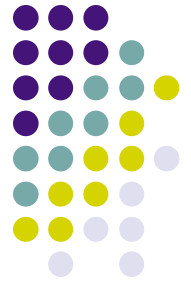
- Address data quality at time of entry
- Assess cost / benefit of data entry widgets
- Statistical model of forms based on
 - value distributions, cross-field correlations, info gain from questions answered, widget cost/benefit
- Information theoretic approach to
 - Question ordering, formulation, repetition
 - Widget configuration
 - Selection, default values, type-ahead, auto-complete
- Make it harder to enter incorrect data



Data Ecosystem Vision

- Start with data managers at NGOs
 - Integrate local DBs and spreadsheets
 - Facilitate day-to-day tasks (OpenII)
- Create community for sharing metadata
 - Let them tag, vote, create code-books, argue
 - Extend to form creation, visualization, analysis

CommScape + OpenII = Grass-roots business intelligence!



- Like enterprise data warehousing and business intelligence
- Harmonizes data sources
- Summarizes into analytical representations (visualizations)
- Shares aggregate information
- Enables *everyone* to participate in analysis.

Questions

