2ND VU SYMPOSIUM ON ICT FOR DEVELOPMENT (ICT4D)

THIS YEAR'S THEME: "*DATA FOR DEVELOPMENT*"

ORGANISED BY:

- VU-COMPUTER SCIENCE
- VU-INTERNATIONAL OFFICE
- THE NETWORK INSTITUTE
- SIKS RESEARCH SCHOOL

HTTP://TINYURL.COM/VUICT4D2015

#VUICT4D2015

VU VRIJE UNIVERSITEIT AMSTERDAM

IS VERDER KIJKEN

2ND VU SYMPOSIUM ON ICT FOR DEVELOPMENT (ICT4D)

ICT FOR DEVELOPMENT M.SC. COURSE AT VU

NETWORK INSTITUTE PROJECT

RESEARCH PROJECTS
(FP7-VOICES, FUROBA BLON, DATAFRICA, ICT4ATM)

VU VRIJE UNIVERSITEIT AMSTERDAM

IS VERDER KIJKEN

2ND VU SYMPOSIUM ON ICT FOR DEVELOPMENT (ICT4D)

09.50 WELCOME AND OPENING

10.00 GAYO DIALLO - “MOBILE DATA IN SENEGAL, A HEALTH DECISION ENABLER”

10.35 MARIJE GELDOF - ‘MOBILE HEALTH AND THE ROLE OF DATA IN MALAWI’”

10.55 HANS AKKERMANS & CHRISTOPHE GUÉRET FOLLOWED BY Q&A

11.25 COFFEE & TEA – PITCH BY NETWORK INSTITUTE ACADEMY ASSISTANTS: GOSSA LÔ) AND MYRTHE VAN DER WEKKEN

11.40 ROLF KLEEF & KARL LUNDFALL FOLLOWED BY Q&A

12.10 CHEAH WAISHIANG & CHRIS VAN AART FOLLOWED BY Q&A

12.40 WRAP UP AND CONCLUSIONS

13.00 END OF SYMPOSIUM

VU VRIJE UNIVERSITEIT AMSTERDAM

IS VERDER KIJKEN

Mobile Data in Senegal, a Public Health Decision Enabler

Gayo Diallo
ERIAS ISPED INSERM U897 & LaBRI
Gayo.Diallo@u-bordeaux.fr

Second International Symposium “Perspectives on ICT4D“
VU Amsterdam, 22 May 2015

université de BORDEAUX

Post-2015 Sustainable Development Goals

Ending poverty is one of the 12 goals set out in the panel's report
Copyright: N. Durrell McKenna/Wellcome Images

Source: http://www.scidev.net

When data come from mobile usage…

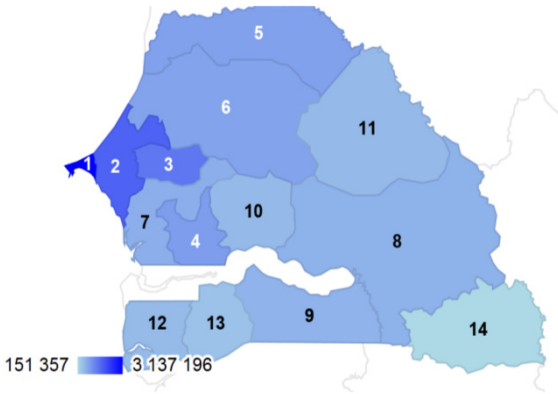
Orange Data for Development Challenge in Senegal

‘Data for Development Senegal’ is an innovation challenge open on ICT Big Data for the purposes of societal development.

Source: http://www.orange.com

Senegal: Demographic and administrative division

Region Number on the map	Name of the region	Number of males	Number of females	Global Population	Area (km²)	Density (/km²)
1	Dakar	1 579 020	1 558 176	3 137 196	547	5735.3
2	Thies	896 572	892 292	1 788 864	6670	268.2
3	Diourbel	716 460	780 995	1 497 455	4824	310.4
4	Kaolack	474 404	486 471	960 875	5357	179.4
5	Saint-Louis	453 315	455 627	908 942	19241	47.2
6	Louga	433 715	440 478	874 193	24889	35.1
7	Fatick	353 716	360 676	714 392	6849	104.3
8	Tambacounda	344 475	336 835	681 310	42364	16.1
9	Kolda	335 018	327 437	662 455	13771	48.1
10	Kaffrine	282 093	284 899	566 992	11262	50.3
11	Matam	276 481	286 058	562 539	29445	19.1
12	Ziguinchor	281 813	267 338	549 151	7352	74.7
13	Sedhiou	229 468	223 526	452 994	7341	61.7
14	Kedougou	78 867	72 490	151 357	16800	9.0
	Total	**6 735 417**	**6 773 298**	**13 508 715**	**196 712**	**68.7**



Source: General Population Census (RGPHAE) 2013

Outline

- Orange D4D Challenge
  - Context
  - Dataset and example of prized applications
- Large CDR data as Public Health Decision Enabler
  - Objective and Context of the study
  - Consortium and Data used
  - Approach and Results
- Conclusion

Orange D4D Challenge

- Launched in 2012 by the Orange compagny
- Partnership with University of Louvain (Belgium) and MIT (USA)
- The first edition, D4D-Cote d'Ivoire (2012/2013), made available five months of mobile phone metadata while D4D-Senegal (2014/2015) provided one year
- ~360 applications from around the world were submitted for the two editions
- 80 in 2013 Vs 60 in 2015 research papers had been produced
- Various topics covered
  - optimizing bus routes, analyzing social divisions, studying disease containment policies, etc.

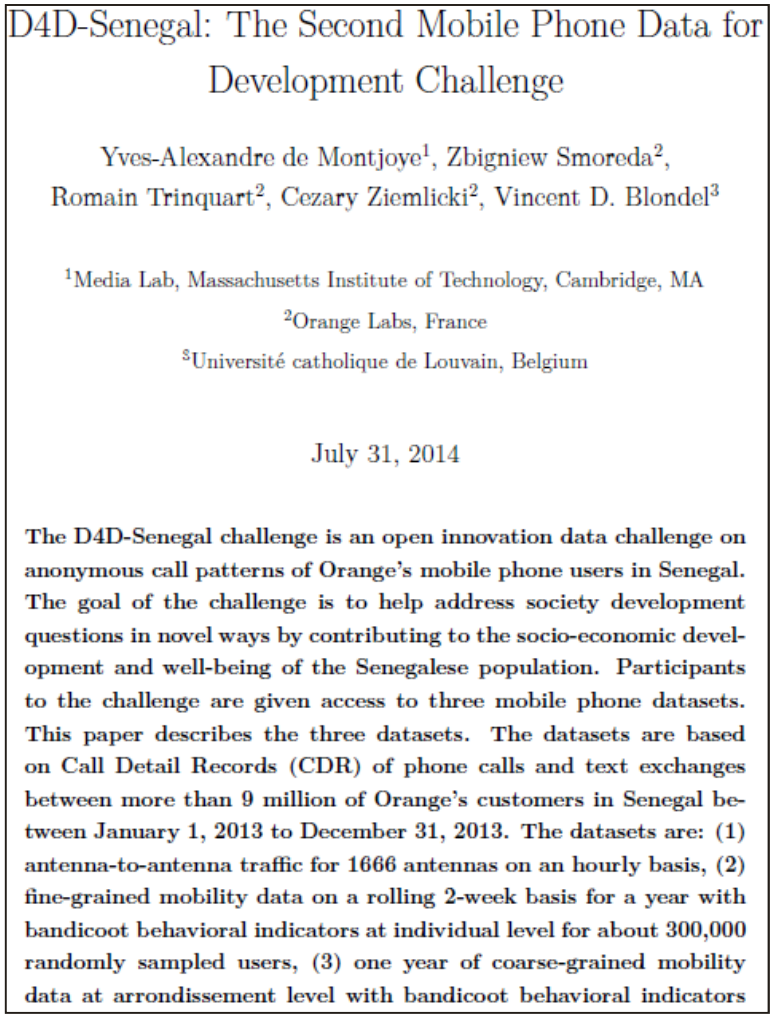
Detail about the D4D Challenge Sénégal

D4D-Senegal

- Sonatel and the Orange Group made available anonymous data, extracted from the mobile network in Senegal

- From April 2014 to April 2015 (project submission: 31st December 2014)

- 5 priority subject matters
  - health
  - agriculture
  - transport/urban planning
  - energy
  - national statistics



D4D-Senegal: The Second Mobile Phone Data for Development Challenge

Yves-Alexandre de Montjoye[1], Zbigniew Smoreda[2], Romain Trinquart[2], Cezary Ziemlicki[2], Vincent D. Blondel[3]

[1]Media Lab, Massachusetts Institute of Technology, Cambridge, MA

[2]Orange Labs, France

[3]Université catholique de Louvain, Belgium

July 31, 2014

The D4D-Senegal challenge is an open innovation data challenge on anonymous call patterns of Orange's mobile phone users in Senegal. The goal of the challenge is to help address society development questions in novel ways by contributing to the socio-economic development and well-being of the Senegalese population. Participants to the challenge are given access to three mobile phone datasets. This paper describes the three datasets. The datasets are based on Call Detail Records (CDR) of phone calls and text exchanges between more than 9 million of Orange's customers in Senegal between January 1, 2013 to December 31, 2013. The datasets are: (1) antenna-to-antenna traffic for 1666 antennas on an hourly basis, (2) fine-grained mobility data on a rolling 2-week basis for a year with bandicoot behavioral indicators at individual level for about 300,000 randomly sampled users, (3) one year of coarse-grained mobility data at arrondissement level with bandicoot behavioral indicators

Example of needs in the transport domain

- identify the demand for mobility by region and by period over the year,
- measure the need for temporary infrastructure due to ad-hoc events (football match, pilgrimage)

- optimize tourist infrastructure
- model towns, and display the main streams for optimization
- measure the "before-after" impact of the introduction of facilities. In particular regarding the following events
  - opening of the Dakar motorway in 2013
  - refurbishment of the railway network

Example of needs in the healthcare domain

- mapping of the determining factors of non-communicable diseases
- geographical accessibility of healthcare training
- distribution and specific features of healthcare requirements in rural and urban environments
- correlation between poverty and health
- the health of ethnic groups
- correlation between food, diet, access to water and health
- conditions of access to treatment (average distance from treatment centres, location of vaccination stores, location of doctors, etc.)
- outbreak simulation: how would Ebola spread in Senegal? Of particular interest at the moment as Senegal has just closed its border with Guinea due to the Ebola outbreak

2014/2015 D4D Dataset

➔Criteria of inclusion

- Year concerned: 2013
- users having more than 75% days with interactions per given period (biweekly for the second dataset, yearly for the third dataset)
- users having had an average of less than 1000 interactions per week. The users with more than 1000 interactions per week were presumed to be machines or shared phones

Detail of the Dataset

Dataset 1

One year of site-to-site traffic for 1666 sites on an hourly basis

Dataset 2

Fine-grained mobility data (site level) on a rolling 2-week basis for about 300,000 randomly sampled users

Dataset 3

One year of coarse-grained (123 arrondissement level) mobility data with bandicoot behavioral indicators at individual level for about 150,000 randomly sampled users

Dataset 1: Antenna-to-Antenna traffic, example

➔ Traffic for the whole year: 25 compressed files totalizing ~1billion of tuples

timestamp	outgoing_site_id	incoming_site_id	number_of_calls	total_call_duration
2013-04-01 00	2	2	7	138
2013-04-01 00	2	3	4	136
2013-04-01 00	2	4	7	121
2013-04-01 00	2	5	13	272
2013-04-30 23	1651	1632	1	3601
2013-04-30 23	1653	575	1	20
2013-04-30 23	1653	1653	2	385
2013-04-30 23	1659	608	1	3601

timestamp	outgoing_site_id	incoming_site_id	number_of_sms
2013-04-01 00	2	12	16
2013-04-01 00	2	14	1
2013-04-01 00	2	21	1
2013-04-01 00	2	28	9

Dataset 2: Fine-grained mobility

➔ 300,000 randomly selected users, for 25 two weeks periods

user_id,	timestamp,	site_id
1,	2013-03-18 21:30:00,	716
1,	2013-03-18 21:40:00,	718
1,	2013-03-19 20:40:00,	716
1,	2013-03-19 20:40:00,	716
1,	2013-03-19 20:40:00,	716
1,	2013-03-19 20:40:00,	716
1,	2013-03-19 21:00:00,	716
1,	2013-03-19 21:30:00,	718
1,	2013-03-20 09:10:00,	705
1,	2013-03-21 13:00:00,	705

Dataset 3: Coarse-grained mobility

➔ the trajectories at arrondissement level of 146,352 randomly selected users

user_id,	timestamp,	arrondissement_id
37509,	2013-01-29 15:00:00,	3
84009,	2013-01-14 07:00:00,	3
84009,	2013-01-14 07:00:00,	3
84009,	2013-01-14 07:00:00,	3
80150,	2013-01-27 16:50:00,	3
52339,	2013-01-09 19:50:00,	48
52339,	2013-01-06 17:50:00,	48
52339,	2013-01-13 15:40:00,	48
52339,	2013-01-03 19:00:00,	48
52339,	2013-01-07 01:30:00,	48

Contextual data

- Administrative divisions of Senegal shapefiles provided by the ADSN
- Weather related data
- Demographic and socio-economic data (RGPHAE 2013)

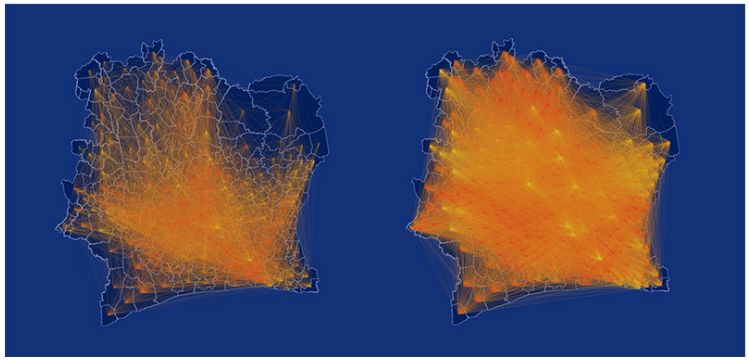
```
ARR_ID,REG,DEPT,ARR
1,DAKAR,DAKAR,PARCELLES ASSAINIES
2,DAKAR,DAKAR,ALMADIES
3,DAKAR,DAKAR,GRAND DAKAR
4,DAKAR,DAKAR,DAKAR PLATEAU
5,DAKAR,GUEDIAWAYE,GUEDIAWAYE
6,DAKAR,PIKINE,PIKINE DAGOUDANE
```

Additional Sources

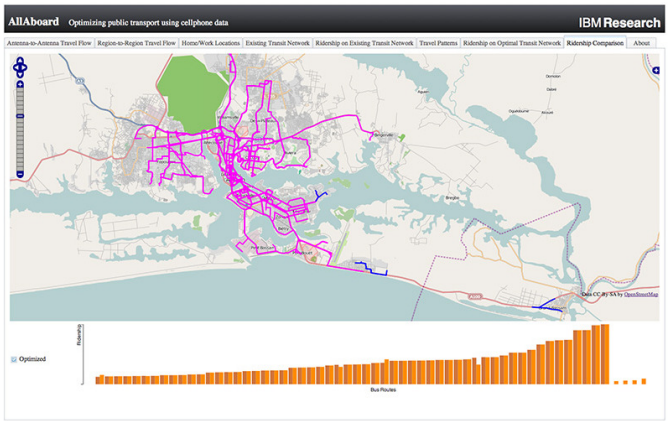
- National Statistics Agency
- Open Street Map
- Paris21
- Etc.

The winners of 2013

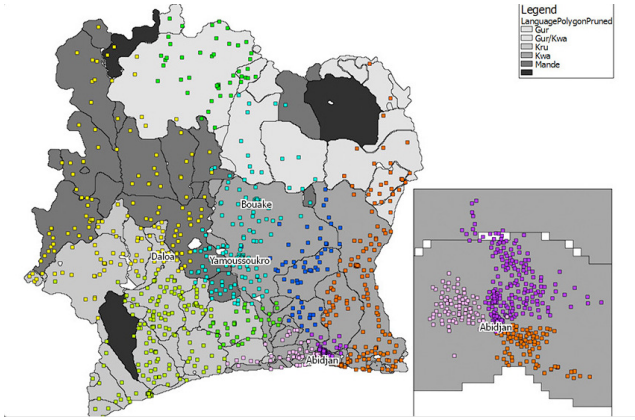
- **1: Exploiting Cellular Data for Disease Containment and Information Campaigns Strategies in Country-Wide Epidemics [University of Birmingham]**



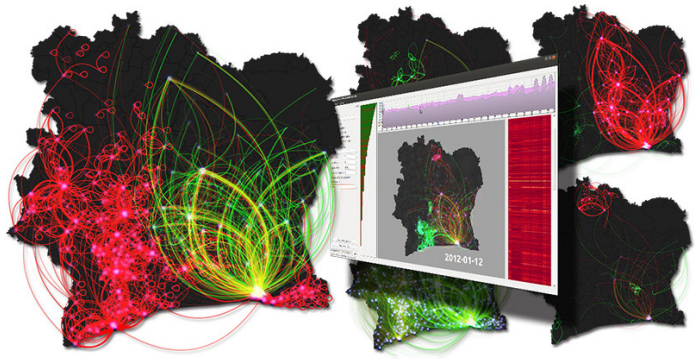
- **2:Tous à bord (AllAboard) : a system for exploring urban mobility and optimizing public transport using cellphone data [IBM, Dublin]**



- **3: Analysis of social categories by using cell phones data [University of California/San Diego]**



- **4: Study and analysis of massive mobile data [Eindhoven University of Technology/SynerScope BV/MIT]**



Some of the winners of 2015

First Prize and Energy Prize: Using mobile phone data for electrification planning

E.A. Martínez-Ceseña [1], P. Mancarella [1], M. Ndiaye [2], and M. Schläpfer [3]

Knowledge of local energy needs is crucial for the electricity infrastructure planning of a country. We have shown that mobile phone data are an accurate proxy of the energy needs and can be used to develop bottom-up demand models. The new methodology supports and prioritizes the electrification plans in areas with scarce information on local activities and energy consumption.

(1)University of Manchester, UK - (2) Ecole supérieure polytechnique de Dakar UCAD, Senegal - (3) Santa Fe Institute, USA

Agriculture Prize: Genesis of millet prices in Senegal: the role of production, markets and their failures

D.C. Jacques [1], R. d'Andrimont [1], J. Radoux (1), F. Waldner [1], and E. Marinho [2]

Information asymmetries are responsible for price differentials in only the few areas where the mobile phone coverage has not yet reached its full potential, which damages both poor producers and food insecure consumers. To address this issue, we have integrated it in a spatially explicit model that simulates the functioning of agricultural markets.

(1) Earth and Life Institute, Université Catholique de Louvain, Belgium - (2) Independent researcher, Rio de Janeiro, Brazil

Transport Prize: National and Regional Road Network Optimization for Senegal Using Mobile Phone Data

Y. Wang [1], G. Homem de Almeida Correia [1], and Erik de Romph [1,2]

Anonymous mobile phone traces can be filtered with an algorithm to generate a proxy for a trip origin-destination matrix. This is used to develop a gravity model that predicts the future mobility in the country dependent on travel time and number of calls and messages between the departments. This information is then used to improve decision making for road network planning.

(1) Department of Transport and Planning, Delft University of Technology, The Netherlands - (2) DAT.mobility, The Netherlands

Large CDR Data as Public Health Decision Enabler: A Case Study of Cardiac and Neurological Emergencies

Practical Application Prize of D4D 2015

université de BORDEAUX

Objective of the Study

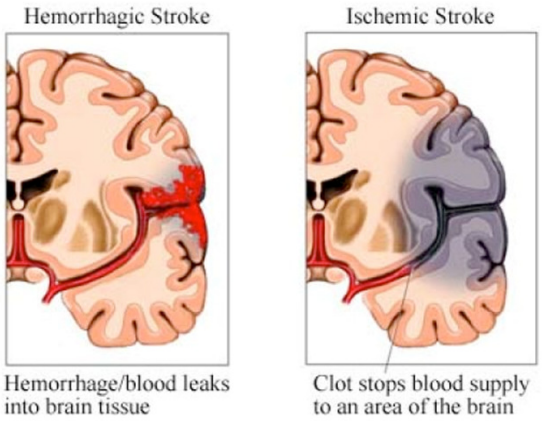
- The problem of optimum location of hospital facilities to maximize population coverage is crucial, particularly for case of time-critical medical emergencies

- We assess the risks due to inaccessibility of acute care for increasingly common issues in Public Health

- The objective of the study is to show the areas in which the absence of a nearest hospital can result in death or serious sequelae, thanks to the use of CDR data

Context of the study (cont.)

- Certain diseases require very early medical intervention
- Absence of care => patient death or serious sequelae
- 2 use cases : Stroke and Myocardial infarction

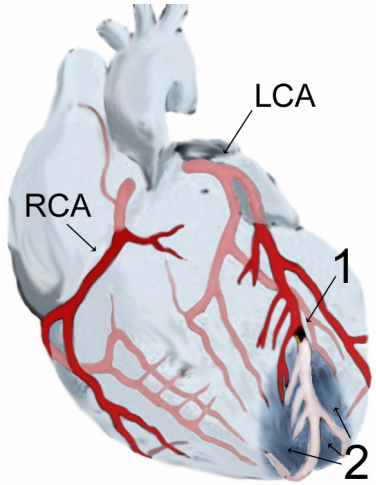


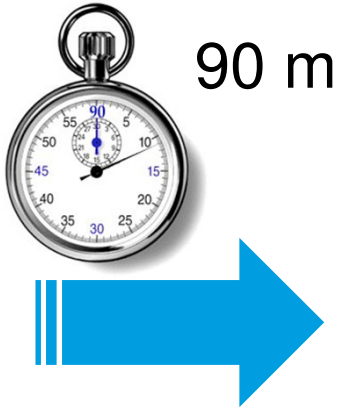
180 min

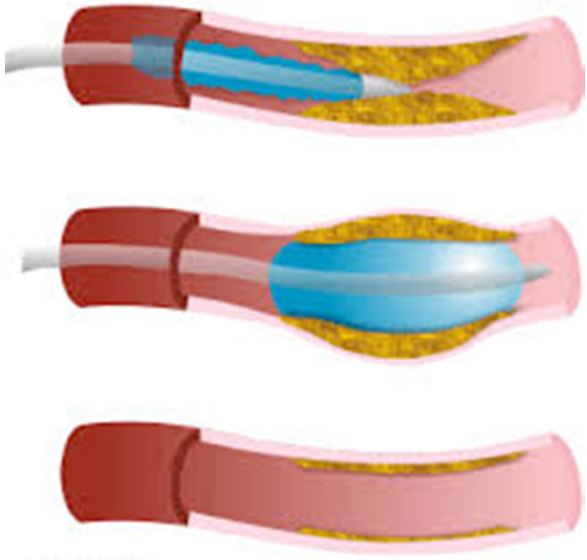
thrombolysis

Context of the study (cont.)

➔ Myocardial infaction







percutaneous coronary intervention

Context of the study (cont.)

➔ Epidemiology of Stroke and Myocardial Infarction in Senegal

› Incidence rate of stroke:

100 per 100000 inhabitants (~13.500 cases/year)

the incidence of stroke in Europe is between 63 and 159 for 100000 women, and between 101 and 239 for 100000 men

› Incidence rate of Myocardial Infarction:

150 per 100000 inhabitants (~24.300 cases)

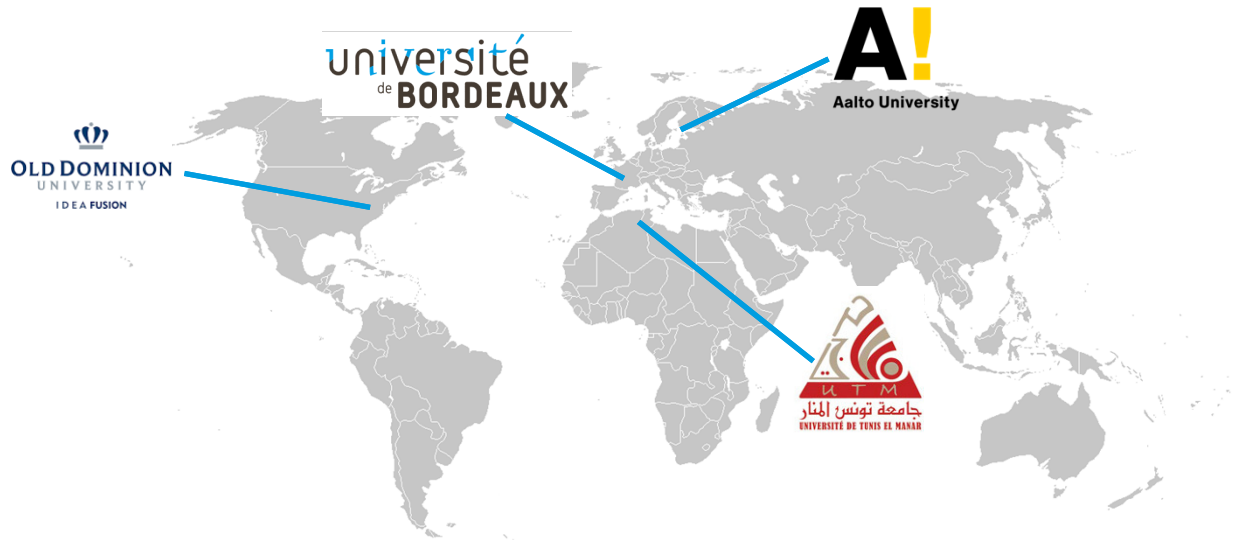
180 per 100000 inhabitants in France

➔ Number of cases directly proportional to the density of population

➔ How many patients cannot reach the hospital in time ?

The Consortium

Edward Mutafungwa[d], Frantz Thiessard[b], M. Pathé Diallo[b], Ross Gore[c], Vianney Jouhet[b], Fleur Mougin[b], Sadok Ben Yahia[a], Chiheb Karray[a], Nouha Kheder[a], Rym Saddem[a], Jyri Hämäläinen[d], Gayo Diallo[b]



- [a] *Faculté des Sciences de Tunis, University of Tunis, Tunisa*
- [b] *ERIAS INSERM U897, ISPED, University of Bordeaux, F-33000, France*
- [c] *Virginia Modeling Analysis and Simulation, Old Dominion University, VA, USA*
- [d] *Department of Communications and Networks, Aalto University School of Electrical Engineering, Espoo, Finland*

Data used

- Anonymised Dataset provided by Orange and Senegal context data
- General Population and Housing Sensus data (2013)
- Guidelines of treatments from French HAS and incidence rates from scientific literature
- Hospital data from *SenDoctor* and *Senegal Medical Directory*
- Maps of Senegal (OpenStreetMap)

Approach

- Distance evaluation and times taken to reach the nearest hospital

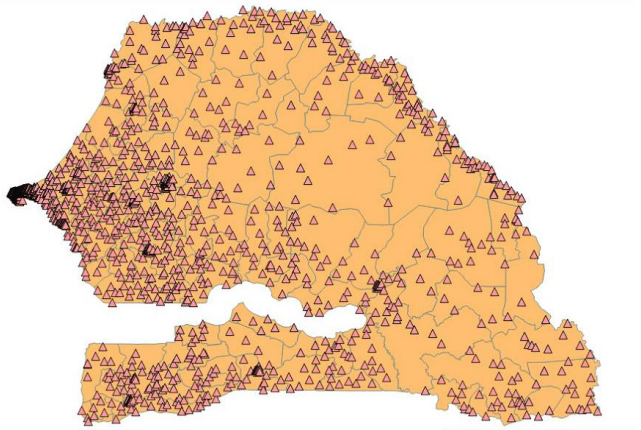
- Computing the population density + incidence rates at antenna (site location) level

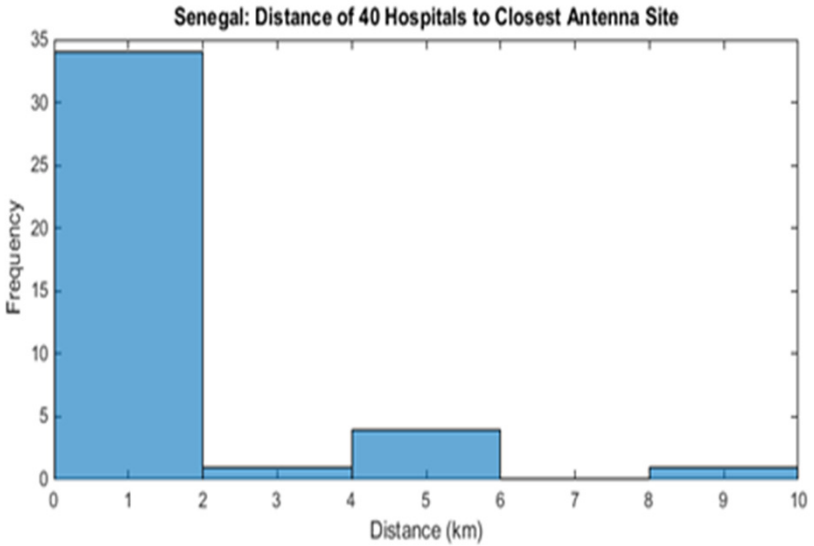
- Identification and highlighting zones at risk and estimate the population

Approach (cont.)

➔ Distance Evaluation

- Objective: to evaluate distance from each location in Senegal to nearest hospital
- Geographical location of the hospitals approximated by nearest antenna site
  - Under this approximation 85% of the 40 hospitals considered where within 2 km of their real geographical locations
  - The impact of this error is minimal when evaluating the travel time to the hospitals.



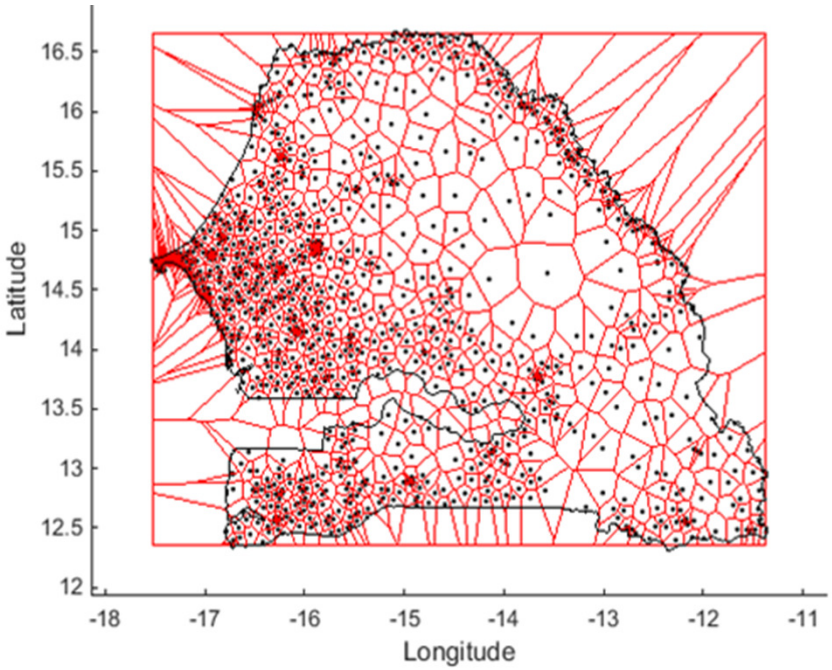


Approach (cont.)

➔ Distance Evaluation

- Different geographical locations are then app segmented according to antenna coverage areas
- Coverage area evaluated using Voronoi tesselations
- Antenna site location assumed to be default location for whole the coverage area

Voronoi cell layout for Senegal based on provided 1666 site locations



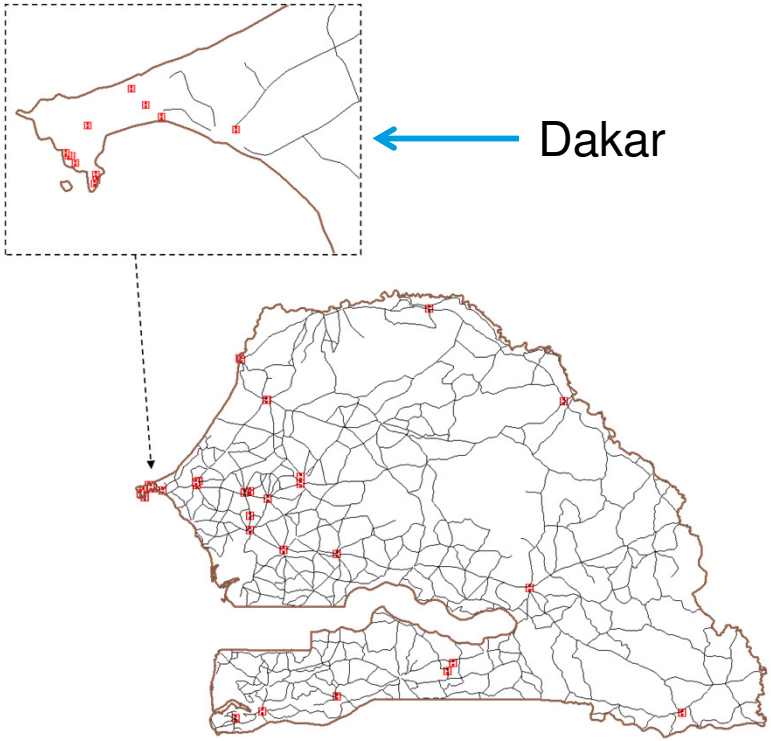
Approach (cont.)

- Distance Evaluation
  - Distance is then evaluated as straightline (Euclidean) distance between a coverage area (area's antenna location) to nearest hospital (also represented as an antenna location)
    - Correction factor known as **detour index** is applied on distance to account for actual route of road network (road density), road quality, road congestion control, etc.
    - Detour index of 1.2-1.6 usually assummed in countries with well developed road infrastructure
    - For Senegal a more conservative detour index of 2.0 is used

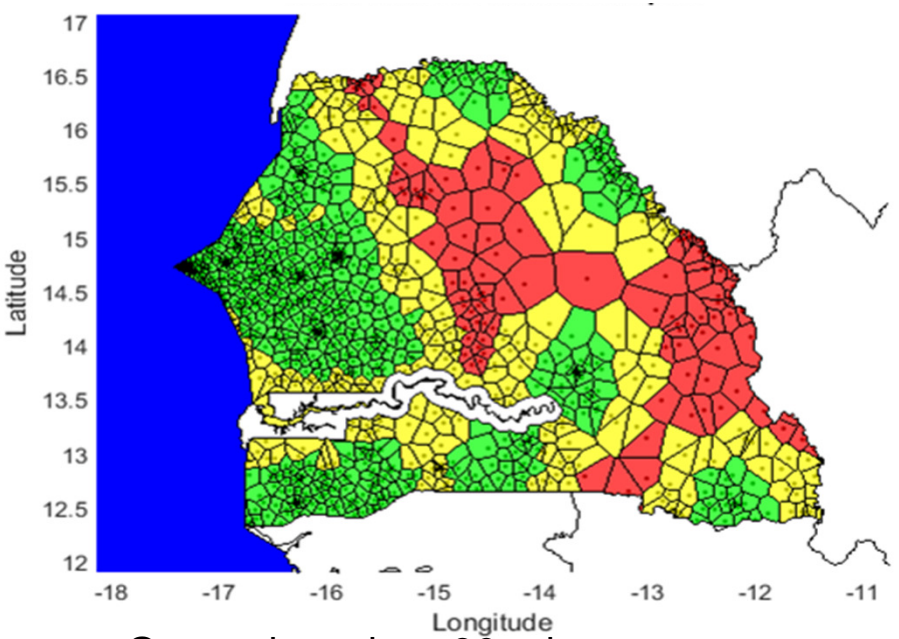
Approach (cont.)

➔Estimating travel times to reach the nearest hospital

Location of the 40 hospitals considered in the study



Travel Times to nearest Hospital

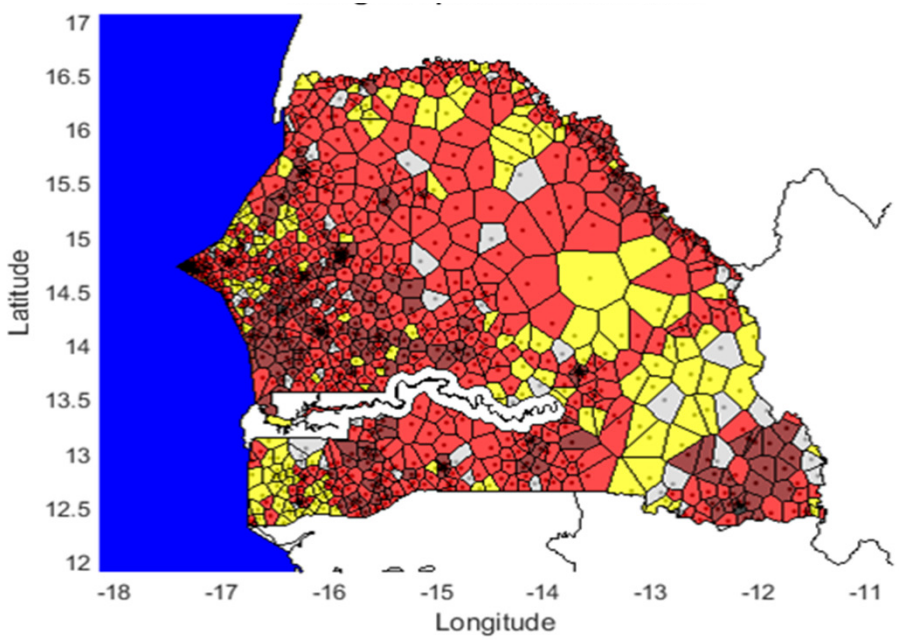


Green: less than 90 minutes,
Yellow: 90 to 180 minutes,
Red: over 180 minutes

Approach (cont.)

➔Computing the population density + incidence rates at antenna (site location) level

Distribution of Senegal Population according to the mobile antenna



grey N < 100,
yellow for 101<N<1000,
red for 1001<N<10000,
brown for 10001<N<100000
black for N > 100000

Correction Factors

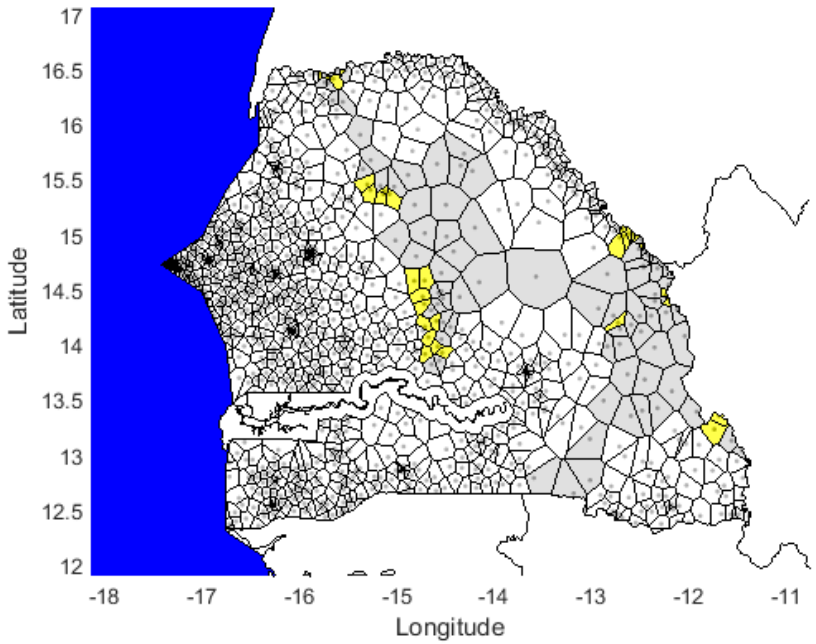
$$\alpha = U_S * 1.2 * {}^{1}/_{Oms}$$

$$\beta = \frac{U_R}{O_R}$$

Approach (cont.)

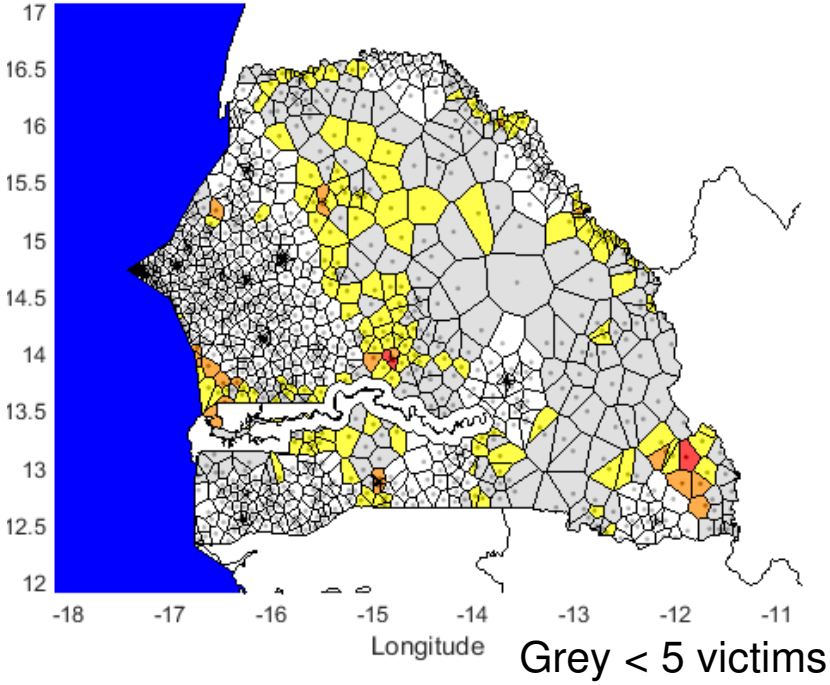
➔Highlighting white zones: areas where people are at high risk in case of Stroke or Myocardial Infarction

Estimated incident cases of strokes from different areas (432)



Grey < 5 victims,
Yellow 5 to 25

Estimated incident cases of Myocardial Infarction from different areas (4241)



Grey < 5 victims,
Yellow 5 to 25,
Orange 26 to 50,
Red 51 to 100

Limitations of the study

- Bias related to the extrapolation of population at a given antenna coverage area
  - As if any single individual had a cell phone
  - As if Orange was the only mobile provider in Senegal
- A filtering on data is performed by Orange
- The study is based on an estimated incidence rate of the considered medical emergency as there is no recent official figures for Senegal, but probably very close.

Conclusion

- Our findings suggest that the analysis and cross linking of big anonymized mobile dataset helps making prediction

- The identification of areas at high risk in case of stroke of myocardial infarction in Senegal could help Public Health decision makers to take the required actions on the earlier

- Future Work
  - Risk estimation based on more fine-grained population density estimation
  - Introducing parameters on the hospital capabilities and additional contextual conditions (Linked Open Data exploitation)
  - Taking into account other emergency cases, relying on Semantic Web technologies and Ontology Modelling

Thank you for your attention

Questions?

Gayo Diallo, University of Bordeaux
(Gayo.Diallo@u-bordeaux.fr)

université de BORDEAUX

Mobile health and the role of data in Malawi

22 May 2015

Marije Geldof

Mobile Health in Malawi

- Active community and much going on
- mHealth Malawi working group chaired by the Ministry of Health involving many stakeholders
- Annual Health Sector ICT Innovation Fair
- Wide range of projects:
  - cStock (JSI)
  - Chipatala cha pa foni (VillageReach)
  - SMS printer system (CHAI)
  - National Child Helpline (YONECO)
  - Community Case Management (D-tree)
  - RapidSMS for nutrition (UNICEF)

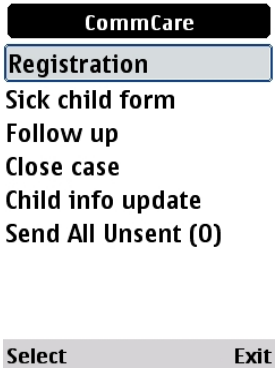
D-tree International background

- An NGO dedicated to improving the quality of health care available to the world's poor by using innovative technology to provide accurate and effective point-of-care diagnosis and treatment based on clinical guidelines

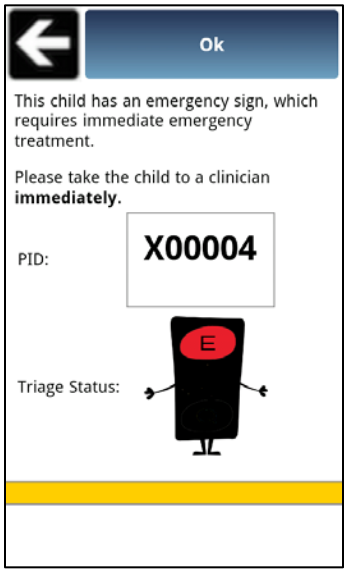
- Founded in 2004: Currently 3 staff in US, 9 in Tanzania and 7 in Malawi

DTREE INTERNATIONAL

Mobile applications for decision making

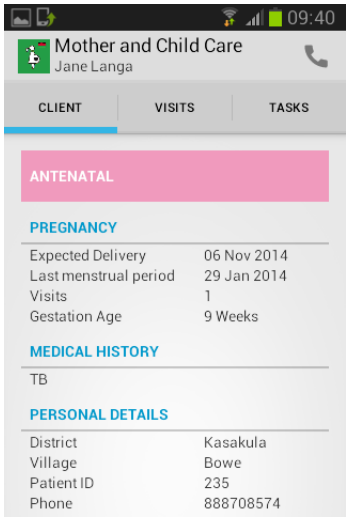


Improving quality of care at point-of-care by better adherence to guidelines



CommCare on Nokia feature phones, Mangologic on Android phones

Data send to cloud server. GPRS data transmission at $0.00006/Kb



Better diagnosis, better treatment, better health care…

D-tree's mobile applications in Malawi

Community:

- Child Status Index (CSI)
- Community Case Management (CCM) (incl. RDTs)
- Integrated Community Case Management (CCM) and Community Based Maternal and Neonatal Health (CBMNH)
- Mother-infant pair follow up (MiP)

Facility:

- Maternal Health application (incl. PMTCT)
- Emergency Triage and Assessment (ETAT)
- Facility IMCI

CCM application

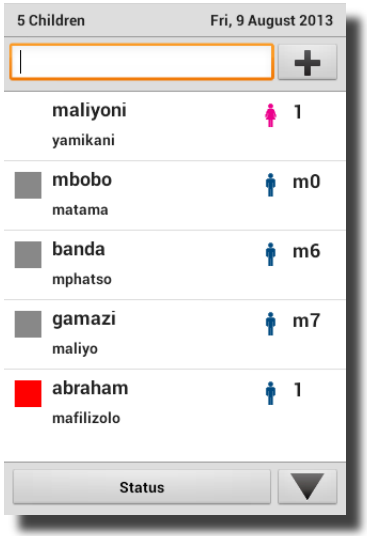
Mobile application implementing Government of Malawi Community Case Management guidelines

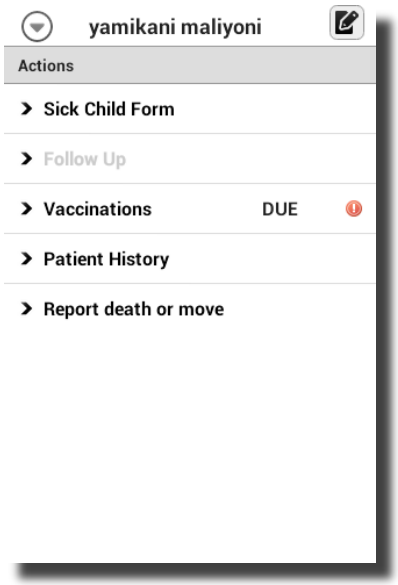
Related application for supervisors and integration with SMS based stock management system

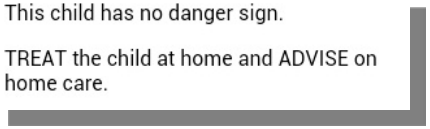
First Java version developed in 2011, new Android version developed in 2013

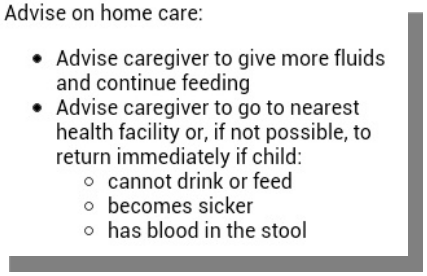
Over 350 HSAs in 10 districts using application, over 110.000 children assessed with application

CCM application







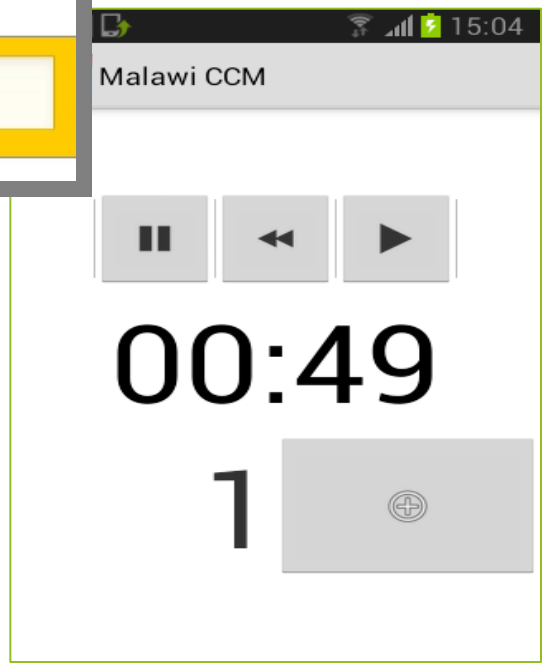


Counting breaths per minute

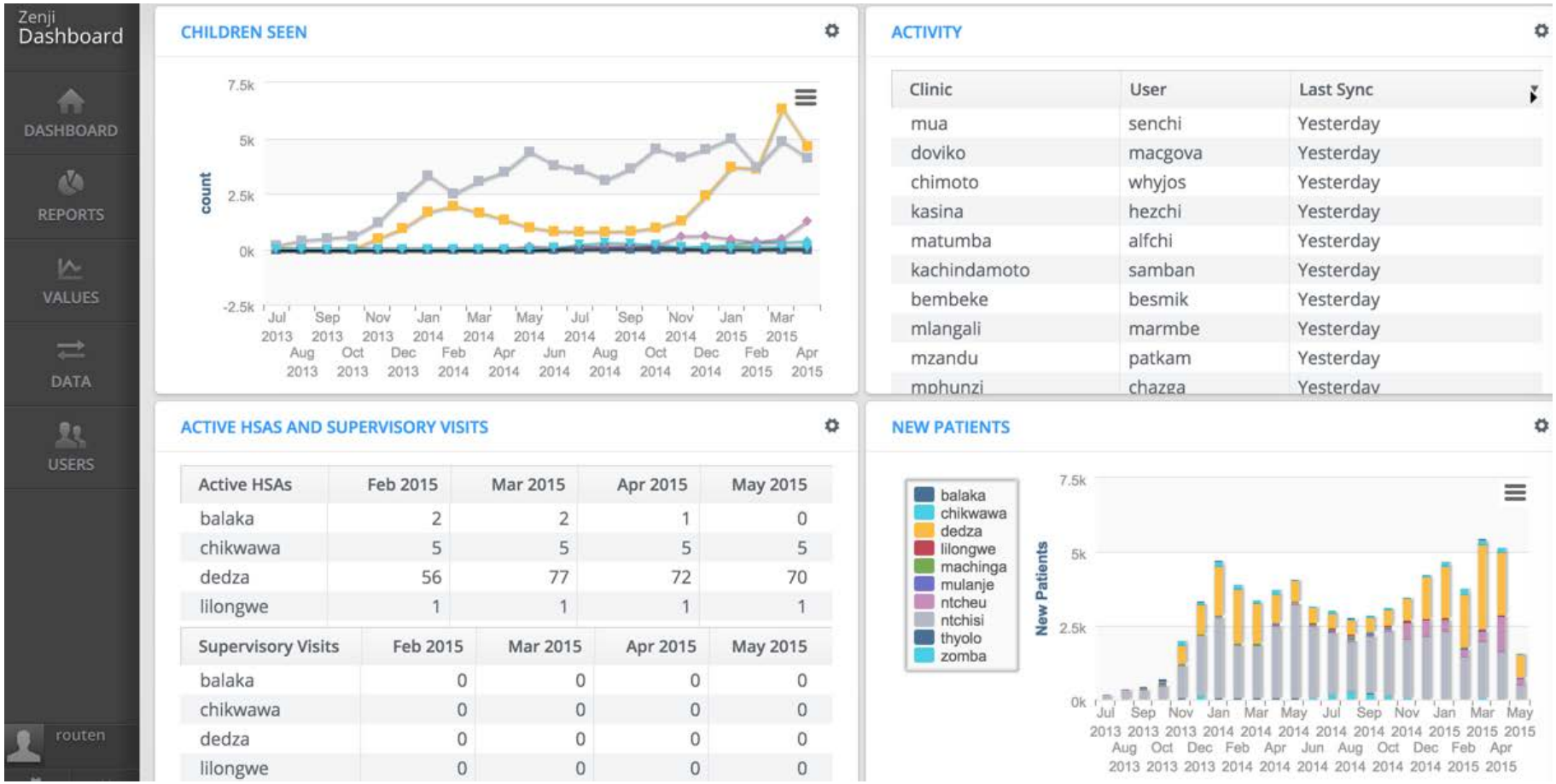
Uses phone for time measurement

Count breaths in 1 minute:

- Click on the menu button to use the **Stopwatch** while counting
- Enter count of breaths per minute (bpm) here



Dashboard Zenji



Feedback health workers and caregivers

“When the phone was used my child got a proper examination’”

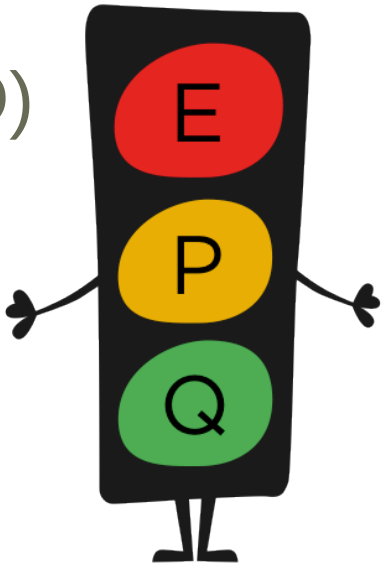
“The application guides us in following the right diagnostic and treatment steps for under 5 children”

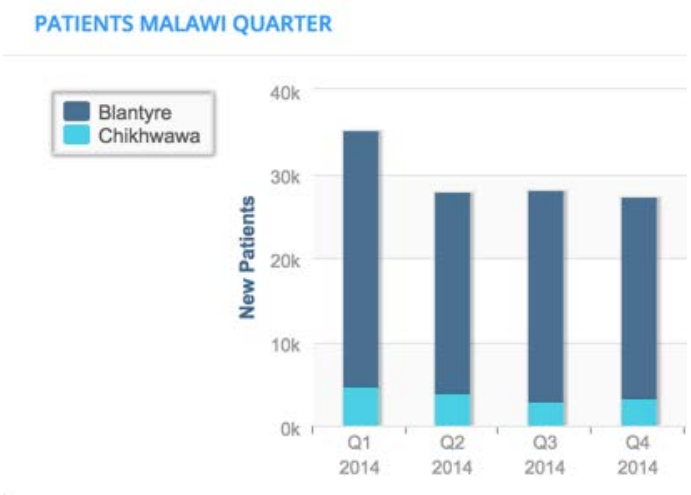
“The phone is like a colleague reminding us about things we would otherwise forget”

“People in the community have more confidence in our work because of the phone”

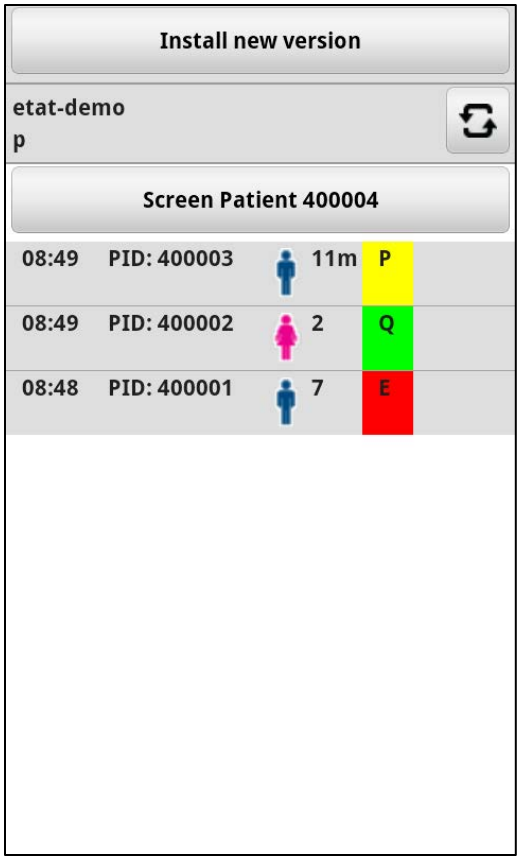
ETAT application

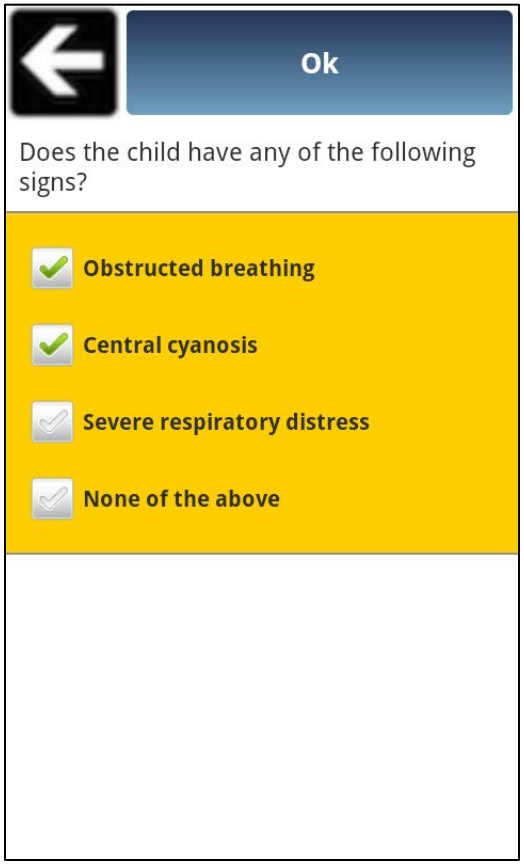
- Collaboration with Action Meningitis
- Mobile application to implement WHO ETAT protocol at health center level
- Children up to 14 are assessed (E, P, Q) and queued accordingly
- Over 200.000 children triaged so far

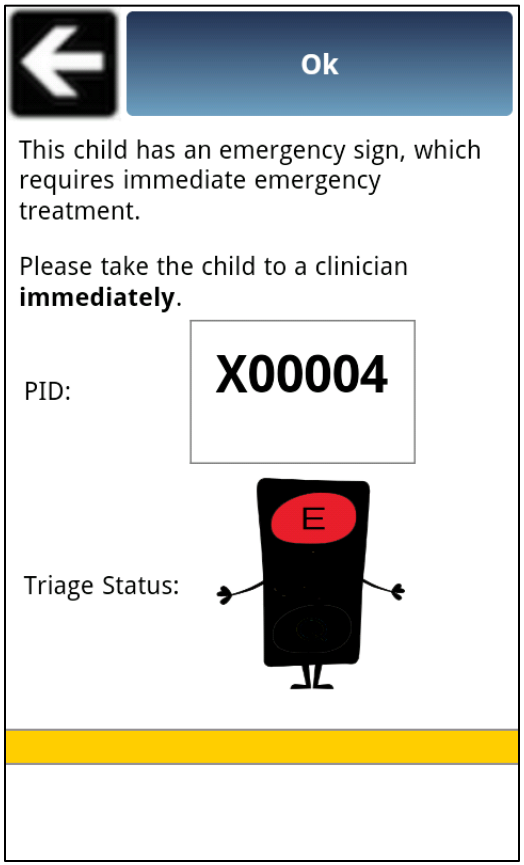




ETAT application – Triage







Why engaged mHealth?

The challenge:

- Without systems of support and motivation, use of phones declines over time
- Even with functioning dashboards, program managers and supervisors often do not engage with data for decision-making

What's needed?

- Motivated health workers who **use the tools** with every client encounter
- Motivated managers who **use the data** for supervision & decision-making
- Models for training, supervision & support **at scale**

What is engaged mHealth?

- Involving Ministry of Health
- Testing and refining with the users
- Effectively training health workers
- Developing systems for scale
  - Robust support & maintenance strategies
- Motivating health workers
- Developing dashboards & training stakeholders
- Analyzing & using data

The ‘data obsession’

“In short, dis is de way of documentation of sick children @ a village clinic using a 4n”

- Most projects and organizations are obsessed with collecting data and statistics, often for M&E purposes
- Collecting data means monitoring health care, which in itself does not lead to improved health care
- Only when data is actually used to establish changes in the health care system might there be improvement

Thank you!

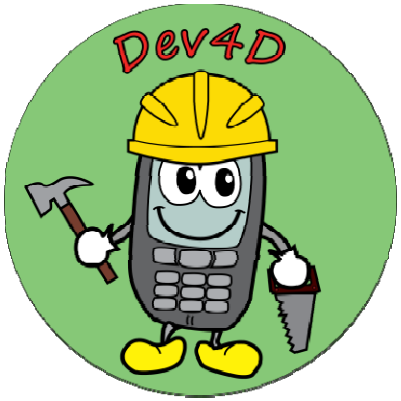
The Network Institute

ICT4D 3.0 - "Smart Rural" Big & Open Data 4D?

Hans Akkermans

The Network Institute

VU University Amsterdam



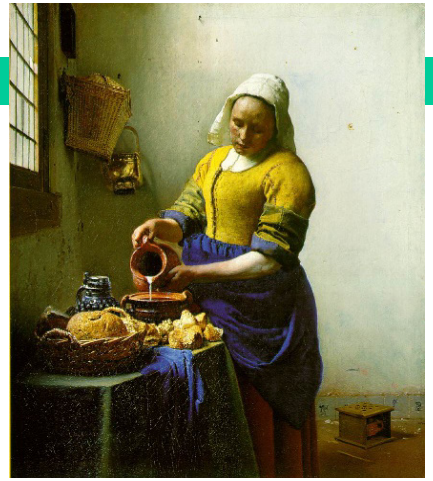
Big & Open Data

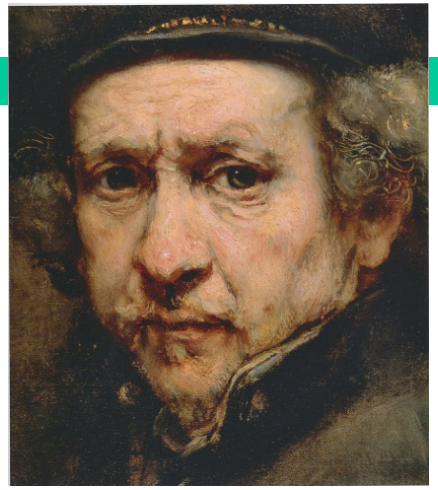
- Big Data – big business data in the west
- Open Data – many, often public, initiatives, many of them concentrated on the “smart city”
  - *Argument: within a generation (25 years) half of the world population is living in urban environments*
- ICT 4 Rural Development: focus on “smart rural”
  - *Argument: hence, also for a next generation, half of the world population is NOT urban!*

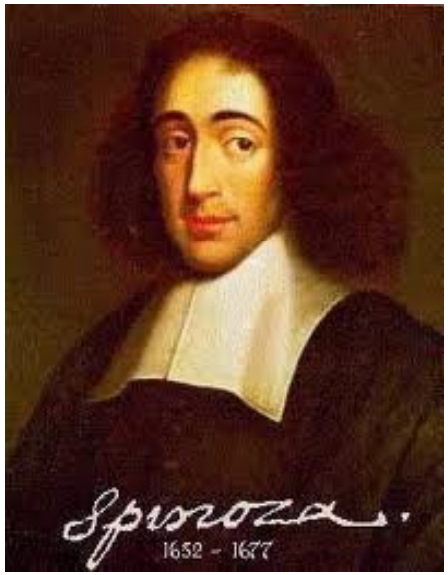
DATAfrica
Linking Data for Development

SMART CITY 1: AMSTERDAM – A COSMOPOLITAN CENTRE OF CULTURAL AND INTELLECTUAL LIFE

- Amsterdam - 17th century onwards
- Centre of Enlightenment and Scientific Revolution
- The "new knowledge"
- "Immigration" played key role (cf. Spinoza)
- Today: people from >170 nationalities live in Amsterdam



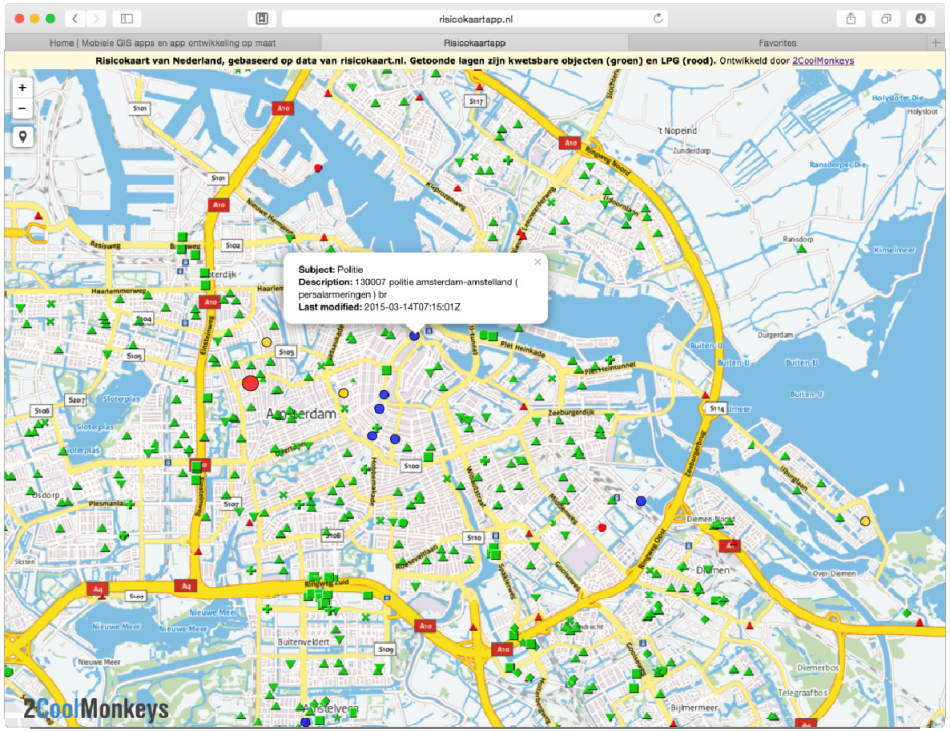




SMART CITY 2 – OPEN DATA EXCHANGE WITH THE AMSTERDAM MUNICIPALITY (ANNO 2015)

http://smartcityapp.nl

http://risicokaartapp.nl (etc.)



How do you fancy living in a city with which you can interact? A city that acts more like a living organism, a city that can respond to your needs.

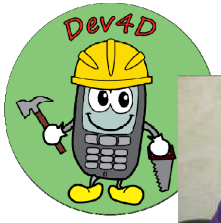
Related Stories

amsmartcity

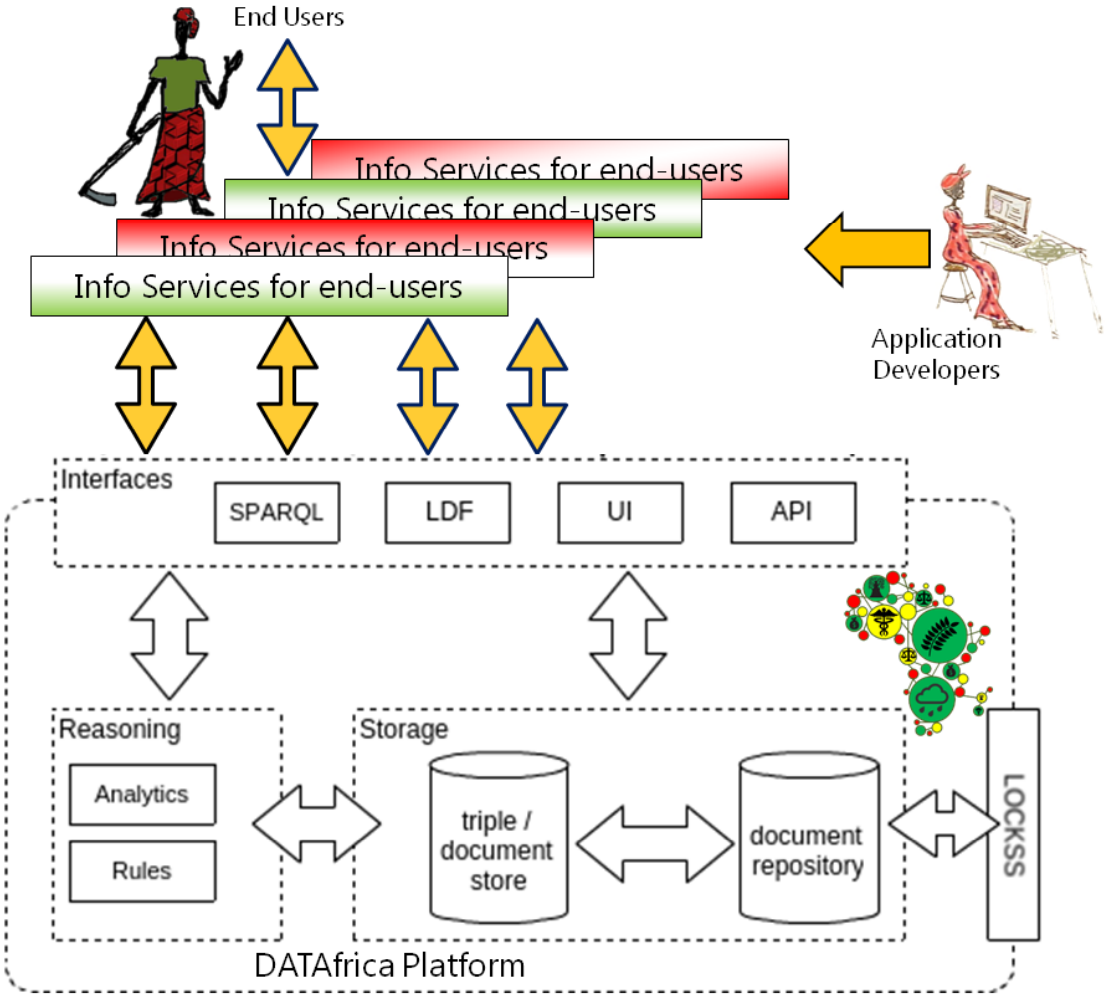
SMART RURAL – INFORMATION SERVICES 4 DEVELOPING COUNTRIES

W4RA

- W4RA program ICT4D
- How employ advanced ICT to support **on-the-ground, grassroots** information exchange & knowledge sharing?
- **In-the-field**: remote rural/agro areas in Africa (Sahel)
- Web – Mobile – Voice Services – Radio technology mix



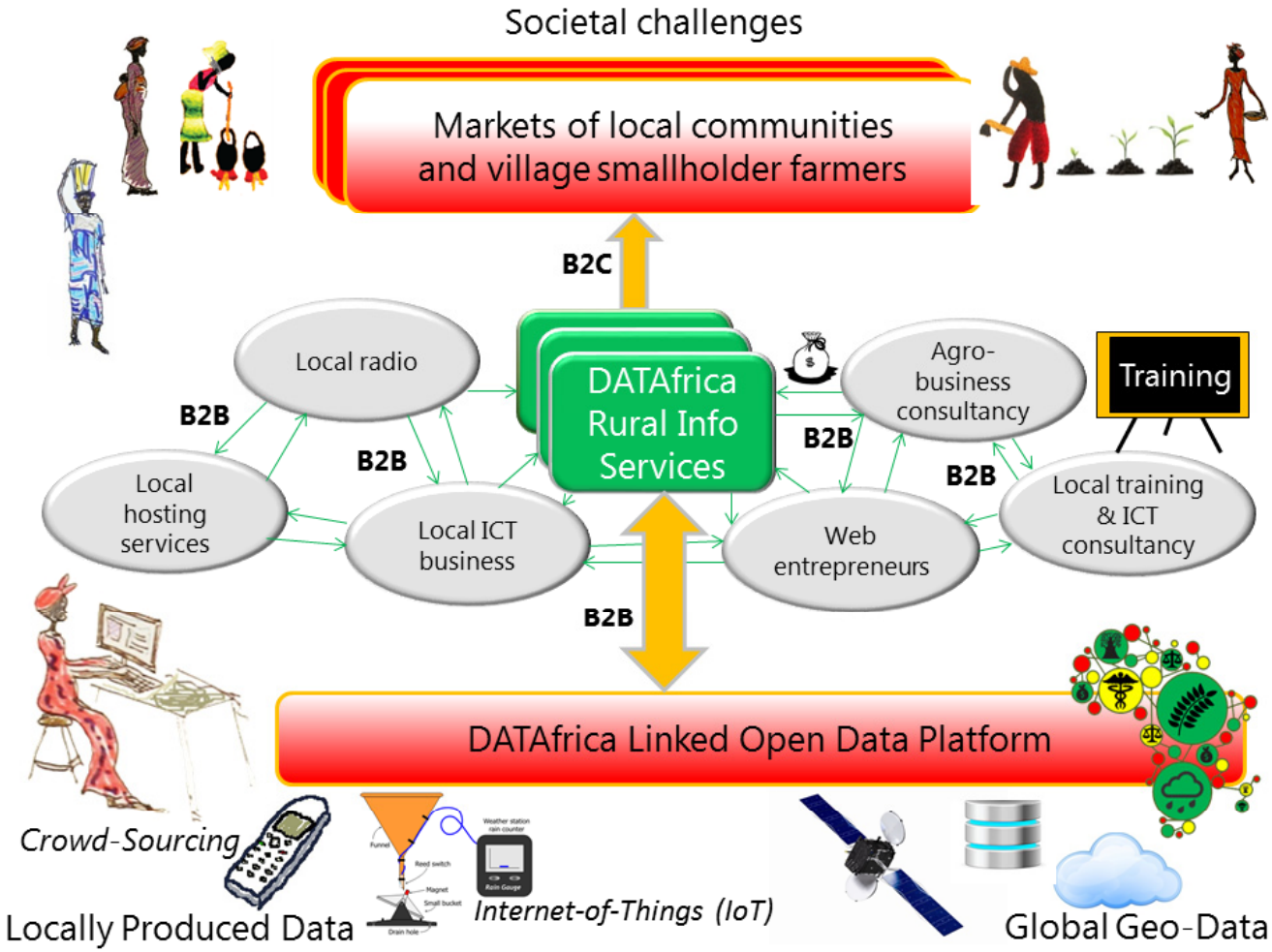
Data Architecture



Smart Rural Data Issues

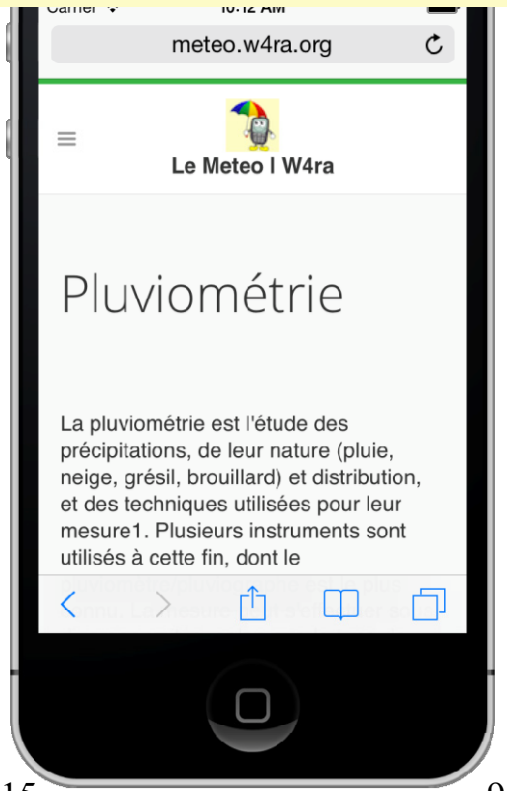
- 1. Local relevance of data 
- 2. Producing local data 
- 3. Integrating local and global data 
- 4. Lightweight data and service platforms 

Local Relevance of Data and Content

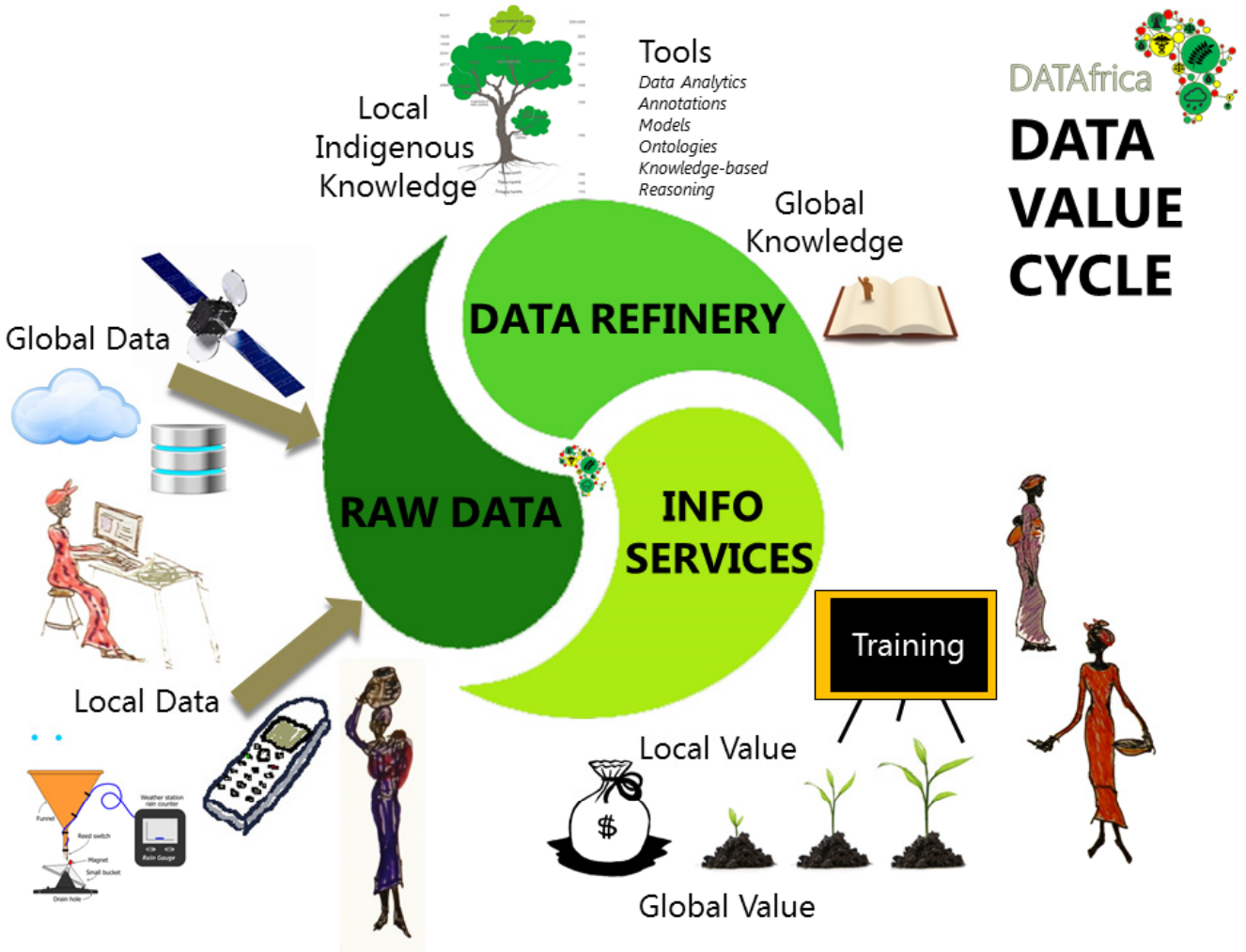


Producing Local Data

- Example: “Mr. Meteo”
- Crowdsourcing, IoT, ...



Linking Local and Global Data for Info Services



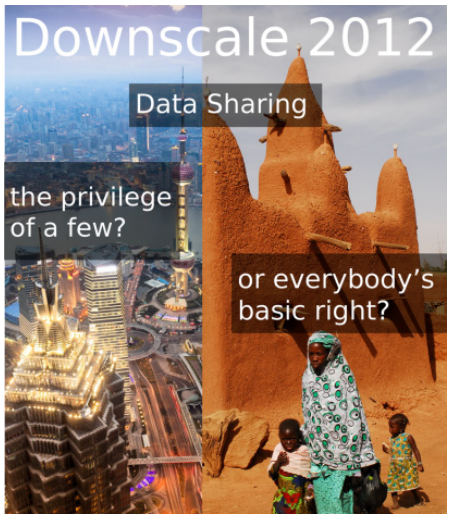
“Smart Rural” Requires Lot of Field Research & Grass-roots Inputs

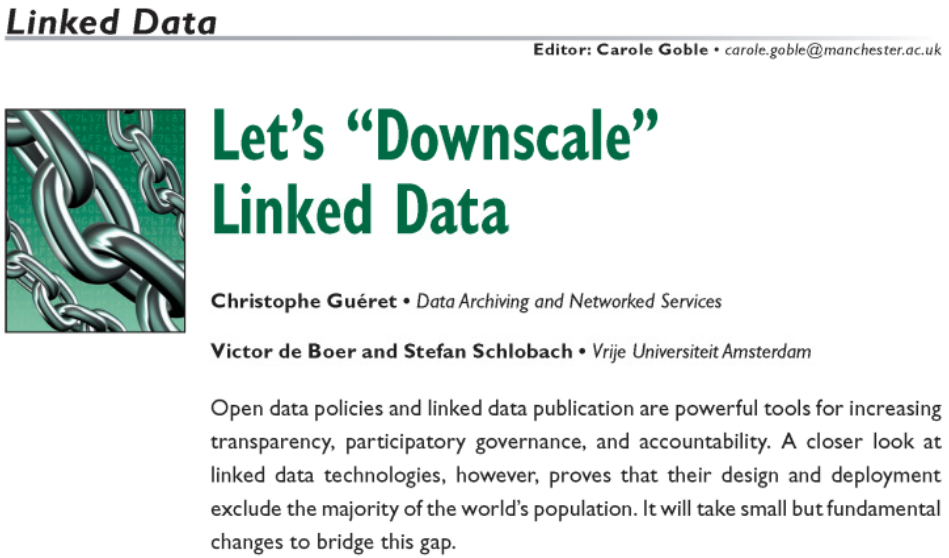
- ICT4D “participatory” =
- Discursive
- Collaborative
- Adaptive (“agile”)
- Supportive to bottom-up self-organization

Lightweight Solutions Called For

(= the opposite of BIG)

- Smart Rural Data solutions must function in very decentralized ways: extremely distributed & scattered, sparse, intermittent ICT/data
  - In contrast to western big heavyweight data bias
  - In other words: do not upscale but **downscale**





Data Archiving and Networked Services

Downscaling ICT

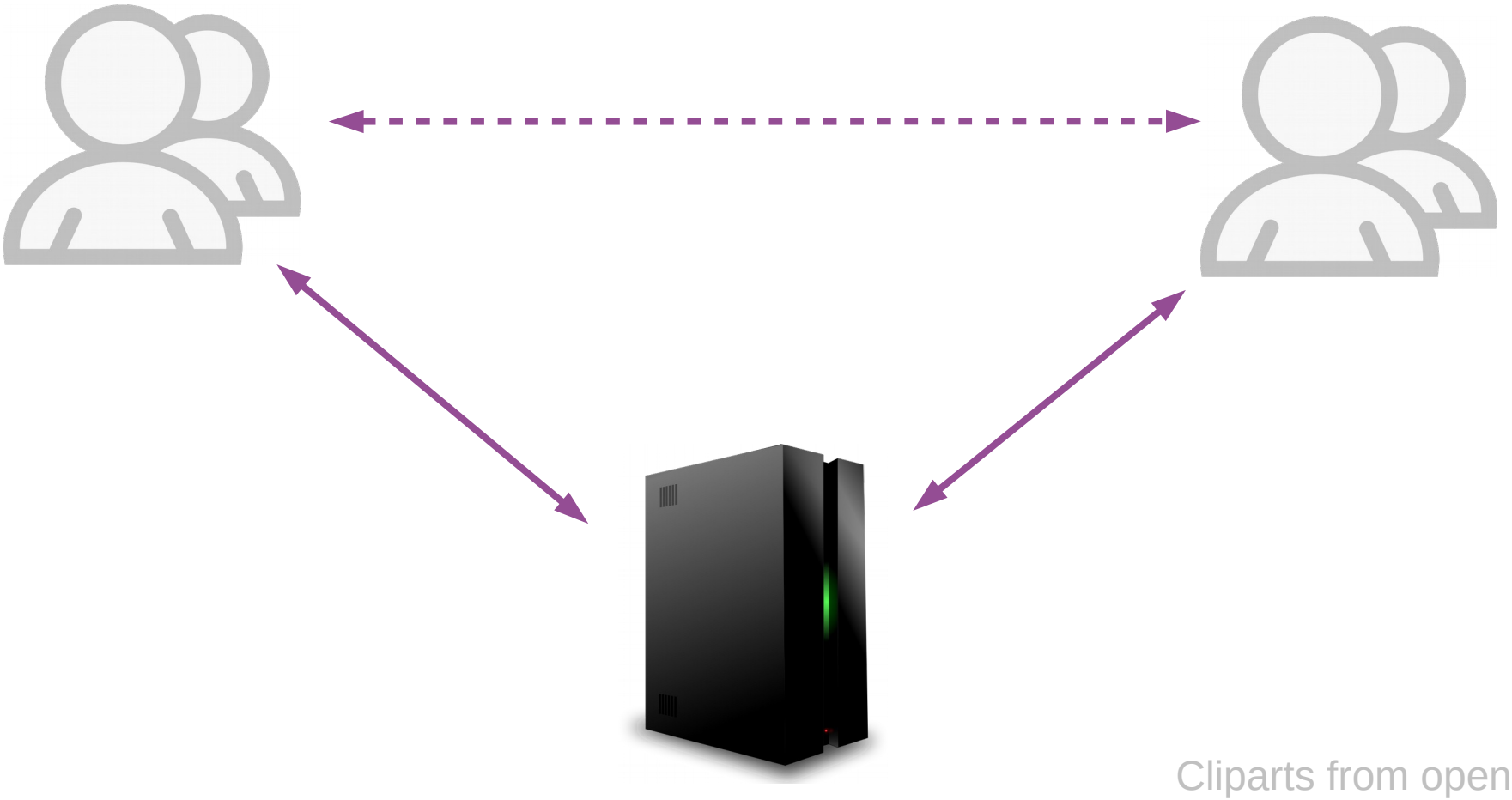
or why we will make DataFrica as small as possible

Christophe Guéret (@cgueret)

"Perspectives on ICT4D", Amsterdam, 22 May 2015

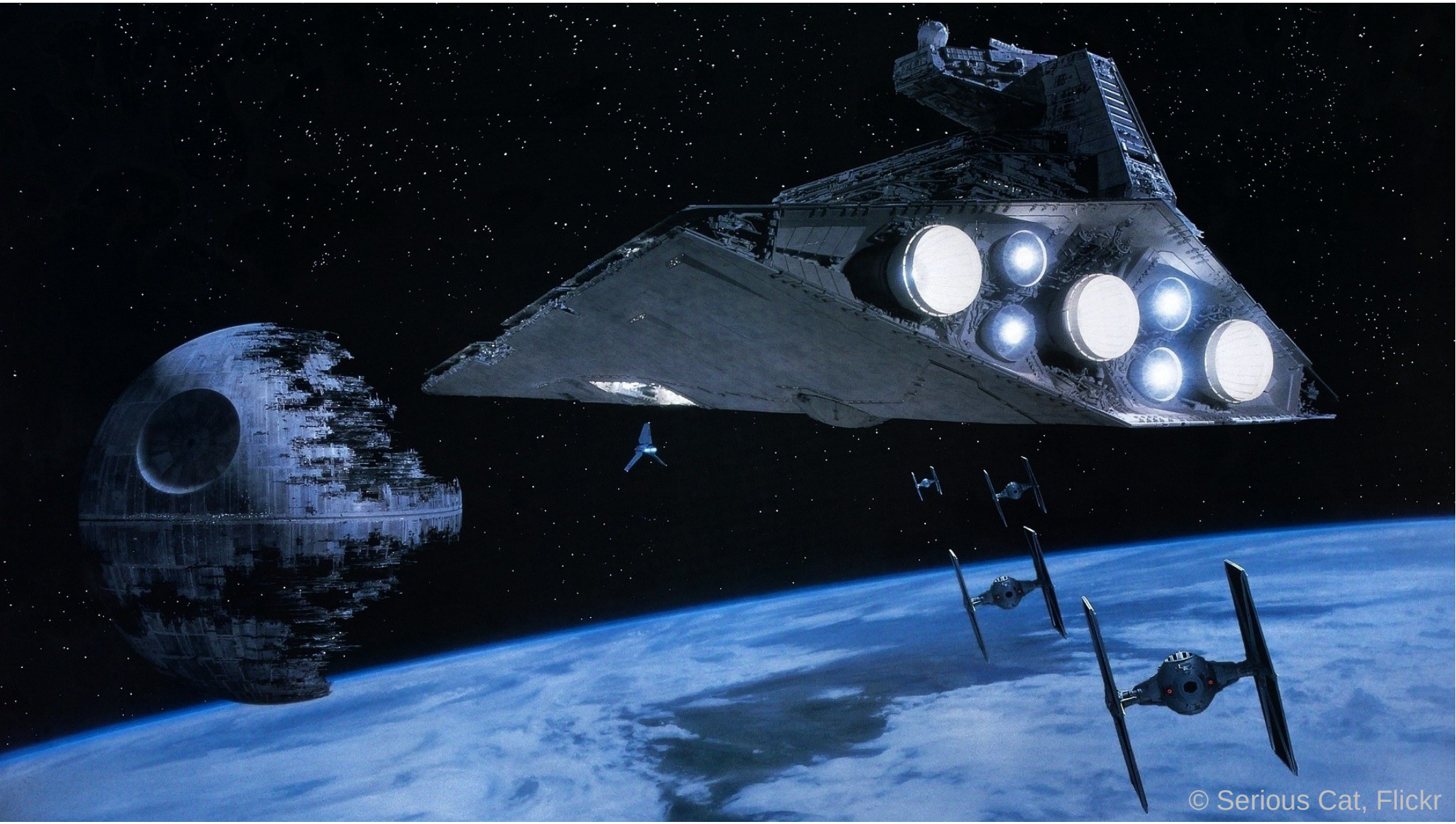
Goal: improve knowledge sharing

- Technology-based mediated communication



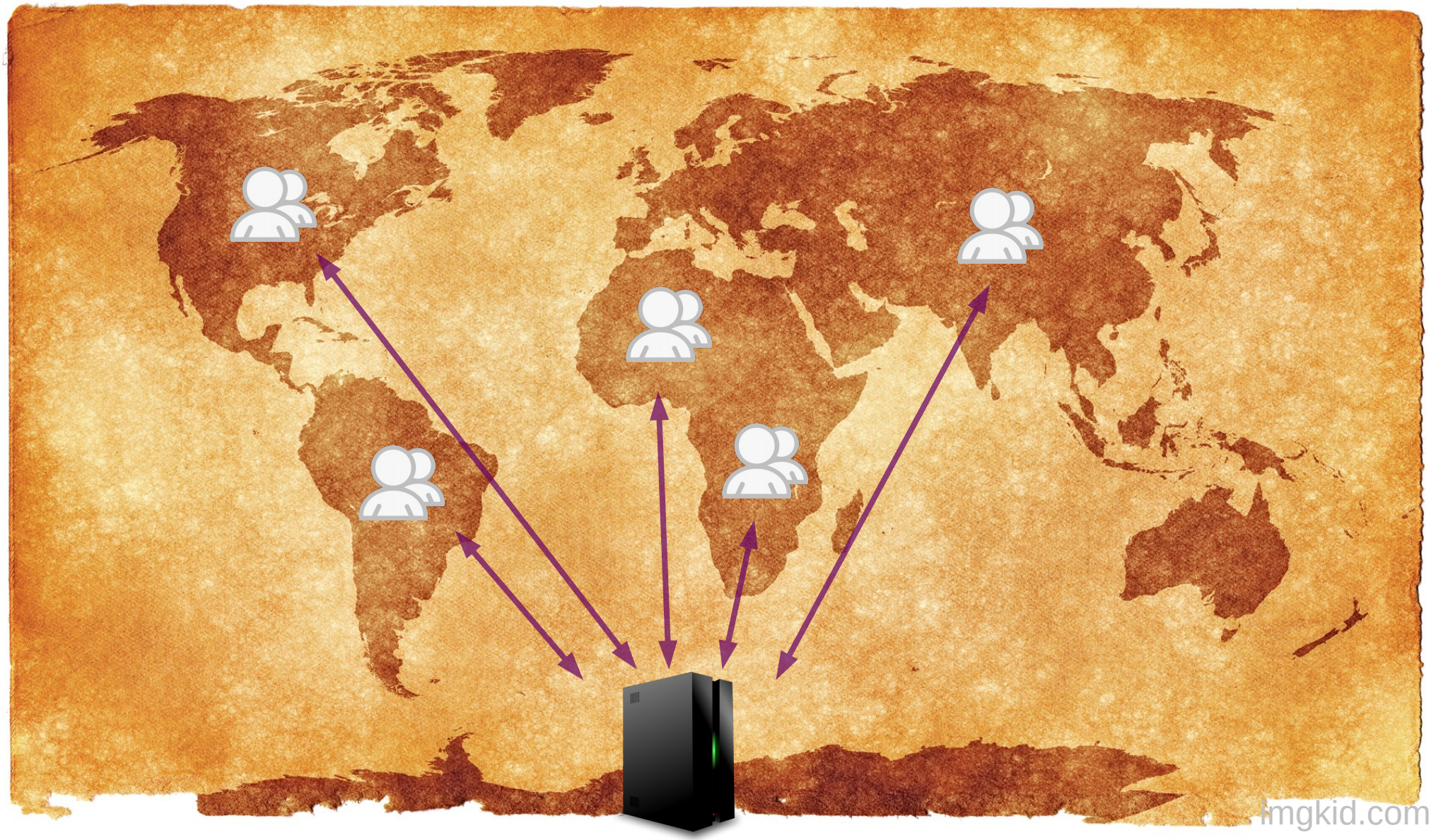
Cliparts from openclipart

Upscaling



Centralise and aim big (but try not to be evil)

Starting technical solution



Some characteristics of this approach

- Target the smallest common denominator among all users, no space for details and specificities
- Easy to scale up vertically and horizontally to care for more users
- A lot of data in one location
- Very challenging to make sense of large sets of centralised data (*c.f.* “Big Data”)

3 reasons why we won't upscale

1) We don't want to ship all the data in Antartica !
   that could lead to ownership/privacy issues

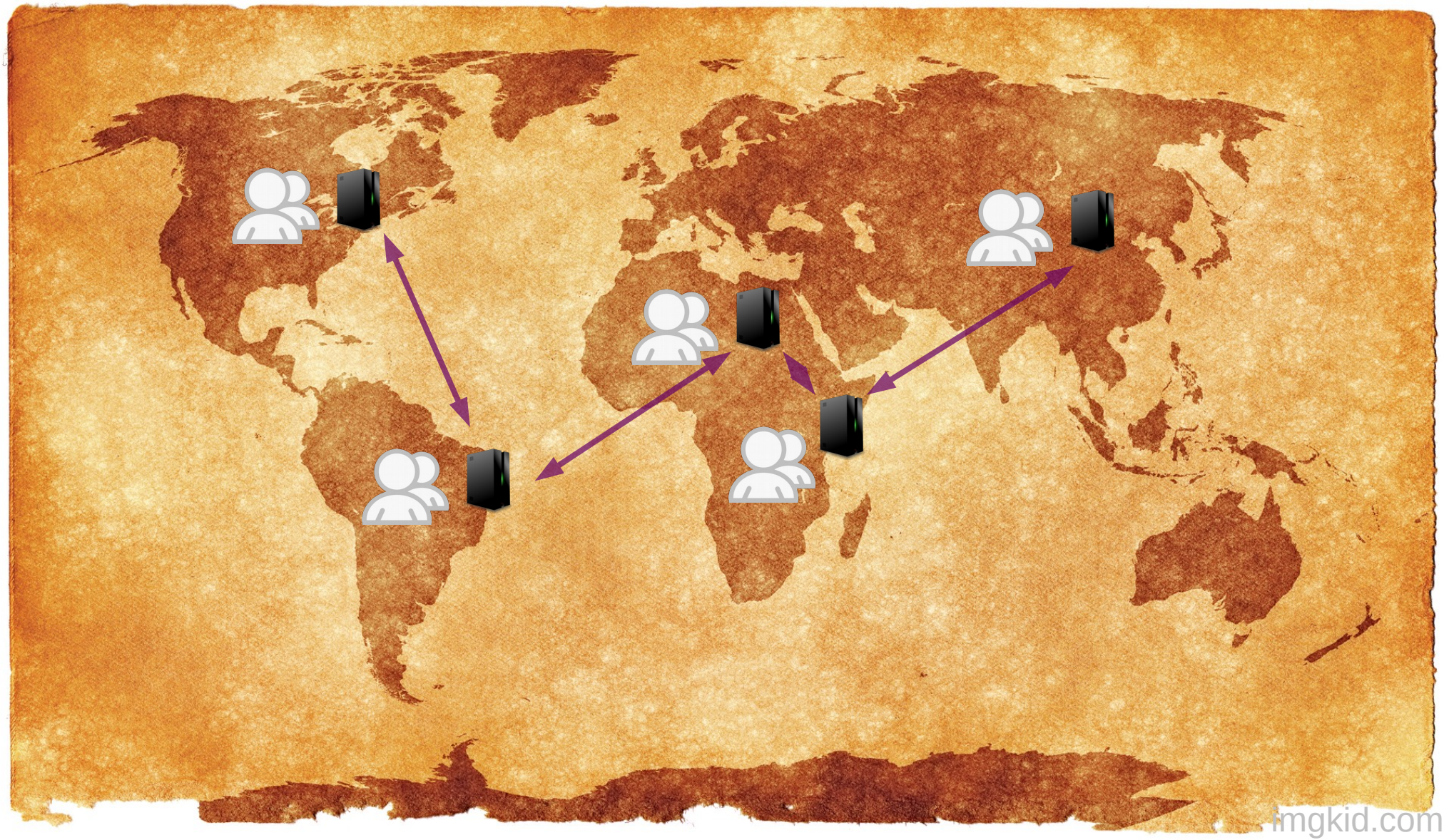
2) We want to care for users that have specificities,
   not force them all into one target group

3) We just can't do it anyway because the
   infrastructure and demand is not there !

Downscaling

Co-design small-scale optimised systems

Technical solution



Some characteristics of this approach

- Swarm of local servers scaled-down to the community / end-user level

- Specific challenges
  - **Interfaces** : care for different interaction means
  - **Infrastructures** : work with limited resources
  - **Relevancy** : focus on the most useful data
  - **Data** : global and local level integration

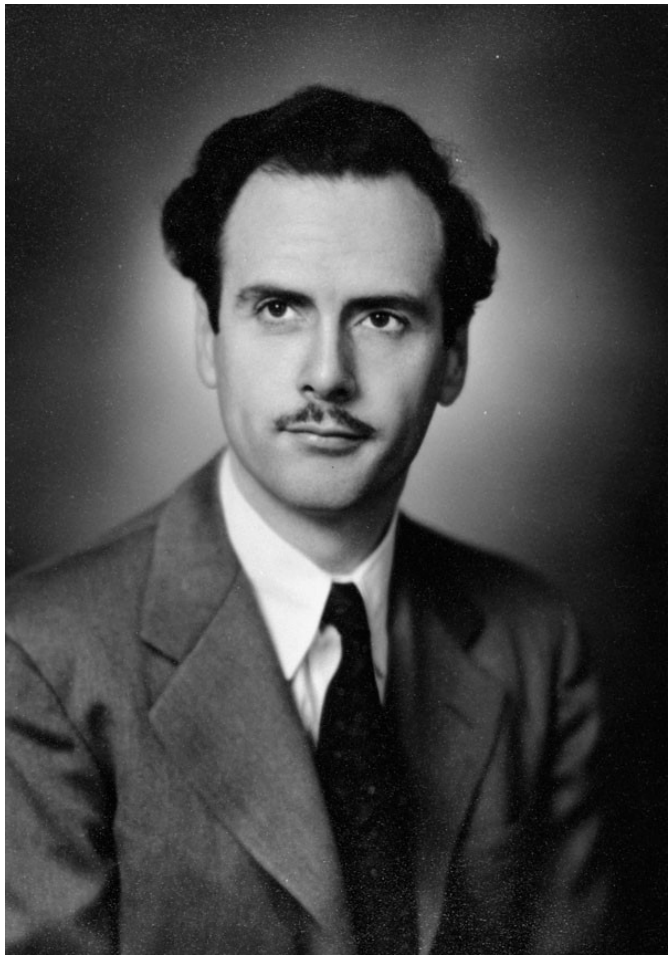
The "KasaDaka"

- A small all-in-one data-sharing platform
  - Open design and open source software
  - Low-cost and replacable parts
  - Dust-proof, low-energy demanding
  - Fit to work in peer-to-peer and offline contexts
  - Usable via different interfaces

Next design ?

VU Network Institute's Academy Assistants in Ghana


OPENFOR
CHANGE



We shape our
tools
and afterwards our
tools
shape us.

We shape our
open data standards
and afterwards our
open data standards
shape us.

IATI makes information about aid spending easier to access, use and understand.

News & Events

TAG agenda is live!

Published by Joni Hillman - 1 day ago

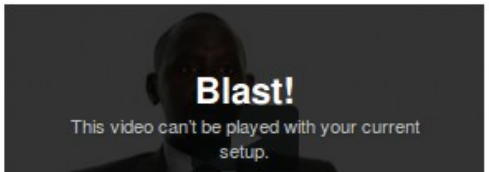
The agenda for the 2015 IATI TAG meeting in Ottawa is now live. If you're coming to the event, please ...

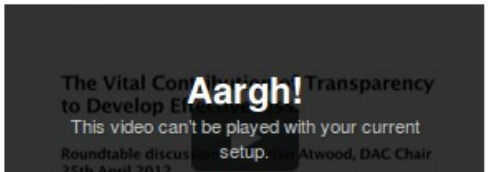
Welcome to our latest member – Catalpa

Published by Joni Hillman - 7 days ago.

We are delighted to welcome Catalpa International as the latest member of IATI. Launched in 2010, Catalpa builds tools ...

Videos





Publishers

Over **300 organisations** have published so far. See the full list on the Registry

Partner Countries

24 Partner Countries have endorsed IATI by joining the Steering Committee - Find out why

Transparency Tweets

Tweets about "#iati OR #opendev OR #aidtransparency"

DISASTER-RESPONSE 2013 INDIA

WATER SHOPS FOR INDIA

Add a comment

OPEN DATA

raincap *Photo: Martijn Nitzschge*

Summary

Creating access to clean drinking water

The drought situation in the states of Gujarat and Rajasthan is critical and is the cause of shortage of drinking water during the dry period. The construction of special Raincap tanks and waterboxes in 7 communities will provide access to water for the inhabitants. The water will be sold in watershops by local entrepreneurs who can generate an additional income.

Project Location(s)
Gujarat, India
Rajasthan, India

Project details

Project ID	110165
Status	Active
Project period	01-10-2013 to 30-09-2014
Total budget	**€ 250,000**
Funding through Cordaid	€ 250,000
Funding through other parties	€ 0

Project Partners

Implementing partners

Aqua-Aero WaterSystems BV

UNNATI

Funding partners

Cordaid

Browse all Cordaid partners ▶

Project Updates +

PROJECTS

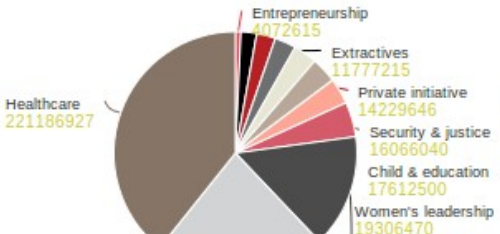
Topics ▼ Countries ▼ Sectors ▼ Start date ▼ Status ▼

Total projects: **1,241** | Total budget: **565,266,219** | Countries: **64** | Sectors: **129**

Reset Filter

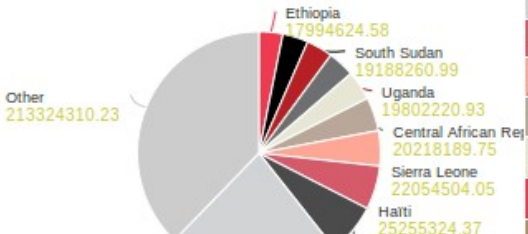
Budget per theme

Amount in euros



Budget per country

Amount in euros



Sectors

FILTERS

Keywords

What we aim for

Our approach

Project | Actor | Financial | Media

A-04508 Nepal Earthquake Response

Project ID	Project title
A-04508-02	OGB

Total budget

2,293,256 €

Past expenditure

Committed expenditure

2015-05-01	2,293,256 €	SHO NEPAL

OXFAM Novib

FILTERS

Keywords

What we aim for

Our approach

Project | Actor | Financial | Media

A-04508 Nepal Earthquake Response

Project ID	Project title	Aims
A-04508-02	OGB	1

A-04508-02 OGB

Country	Nepal
Start date	2015-04-25
End date	2017-04-30
Status	Planned/appraisal
Grant	

Project description

OXFAM Novib

Within an organisation

Challenges

Finding data sources

Combining domains

Safety, security

Data literacy of staff

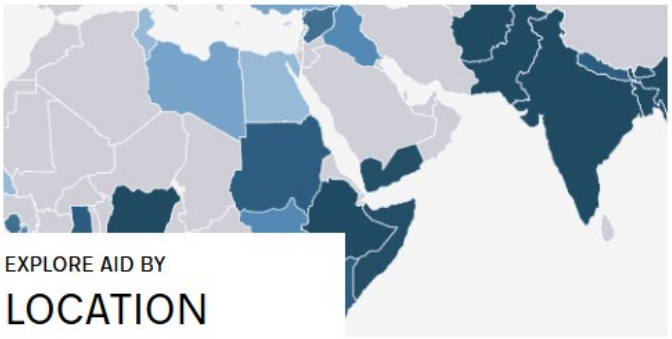
Follow how the UK invests in developing countries

UKaid
from the British people

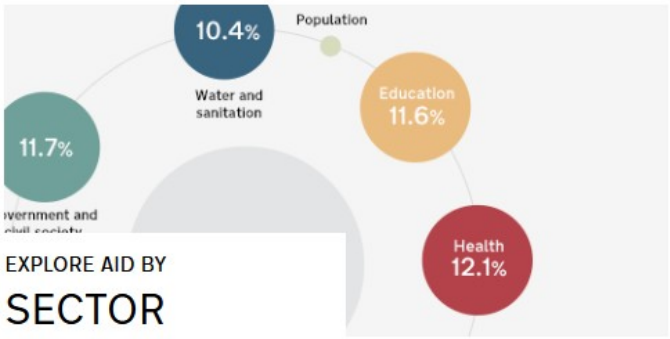
Search Projects

e.g. location, sector, organisation or keyword

Search



EXPLORE AID BY
LOCATION



EXPLORE AID BY
SECTOR

UK AID TOP 5s

Top 5 places we work

Ethiopia
£399.23m

Pakistan
£293.05m

Nigeria
£211.62m

Tanzania
£201.4m

Bangladesh
£198.64m

Project budgets for each country [FY14/15]

Top 5 things we do

Health
£1800.6m

Education
£776.1m

Government
£350.6m

Disaster
£336.8m

Environment
£333.9m

Project budgets for each sector [FY14/15]

Top 5 things we achieve

People with choice and control over their own development
33,400,000

People with access to financial services
30,300,000

People with access to a water, sanitation or hygiene intervention
19,600,000

People with improved rights to land and property
3,800,000

Births delivered with the help of nurses, midwives or doctors
1,600,000

Results achieved (up to 2012/13 inclusive) from DFID Annual Report 2012-13

IATI visualisation pilot - 2

Back Workbook

Copy and Paste link into your email message

http://public.tableausoftware.com/view

Copy and Paste html code to embed the Viz in your website

<script type='text/javascript' src='http:

Partners | Sectoren per land | Funding per land | Implementing per land | Uitgaven per land | Sectoren per locatie | Landen resultaten | Locatie resultaten

Sectoren per land Stichting Cordaid

	Niet gespecificeerd	Education	Emergency aid	Environment	Food security	Health	Other multisector	PDGG	Productive sectors	Support to NGO's	Water and sanitation	Grand Total
AFGHANISTAN	210,431	96,930				4,367,719	42,750	117,568	941,254	0		5,776,651
Africa, regional	25,000							74,202	177,990			277,192
America, regional	25,000						45,000		47,798			117,798
Asia, regional	25,000							74,202	272,965			372,167
BANGLADESH		515,977	1,284,237			897,308		340,894	36,074		502,832	3,577,321
BELGIUM	294,656											294,656
BOLIVIA, PLURINATIONAL S..									170,786			170,786
BURUNDI	153,817	26,000				1,542,986		550,683	82,594	79,394		2,435,474
CAMBODIA									6,250			6,250
CAMEROON		909,335				942,484		73,746	1,094	136,788	209,370	2,272,817
CENTRAL AFRICAN REPUBL..		423,882			175,000	1,070,859		48,878	1,094	11,880	125,000	1,856,592
Central Asia, regional									25,477			25,477
COLOMBIA	317,618			40,000				256,853	97,500	44,100		756,070
CONGO	4,256					2,128,922		4,256	1,094			2,138,527
CONGO, THE DEMOCRATIC ..	282,416	846,756	809,563			17,915,494		1,082,143	1,371,435			22,307,807
EL SALVADOR	8,826	61,779	282,107	325,620			17,651	70,604	17,651		590,834	1,375,072
ETHIOPIA	125,585	292,326	399,593	162,041	59,509	584,404	23,279	190,393	2,408,073		379,030	4,624,234
Europe, regional								74,202	162,851			237,053
GHANA	40,000	61,000				459,738	17,000		437,533		34,000	1,049,270
GUATEMALA	238,500	128,834		95,000	100,000		184,993	96,631	68,056	57,696	193,071	1,162,781

Share

Between organisations

Challenges

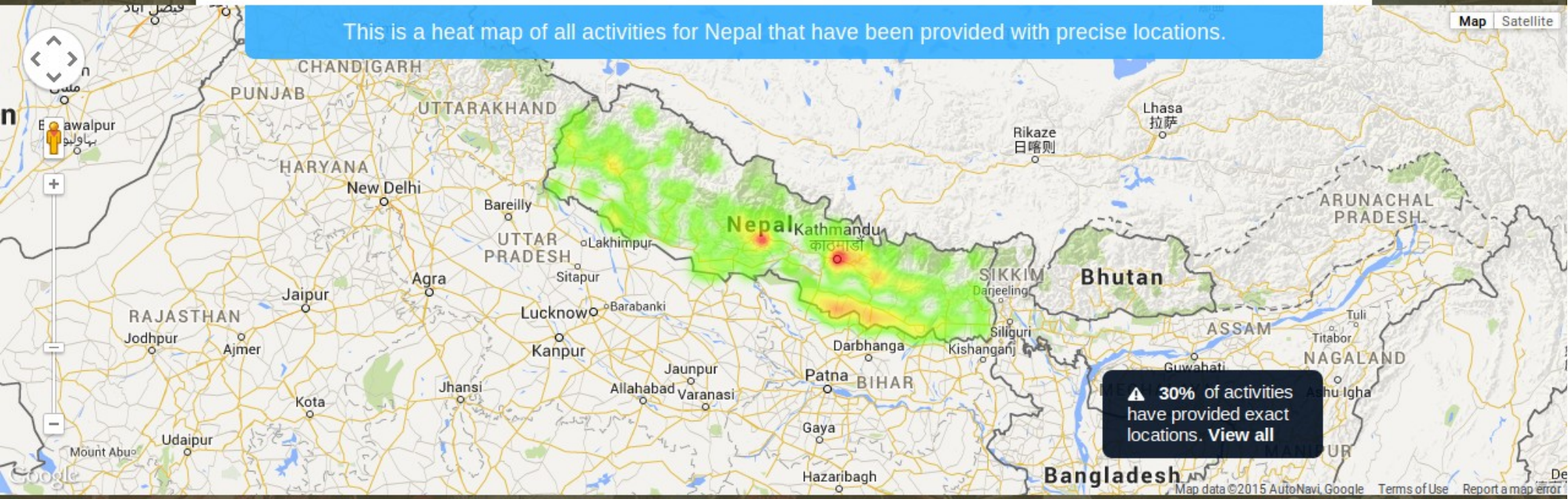
Multiple purposes, multiple uses

Standardising code lists, content

Connecting and aligning systems

d-portal.org

Nepal



Currently published in IATI

Active Projects	Ended Projects	Total Projects
584	1858	3818

Planned Projects	IATI Publishers

$671,311,611

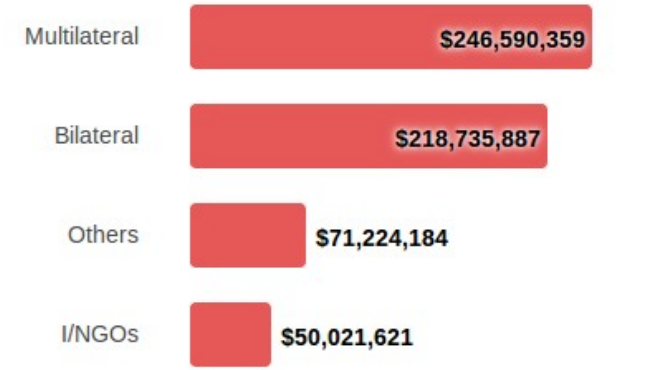
relief aid pledged for Nepal Earthquake 2015

as of May 19, 2015

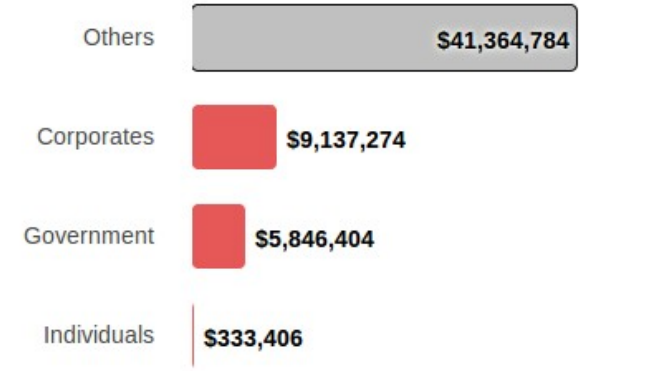
Find out more!

Pledges are commitments made by donors that might be different from actual cash or in-kind disbursements. Actual data on disbursements might not be available for all the donors as of now.

International $614,584,496



National $56,725,948



Sector-wide

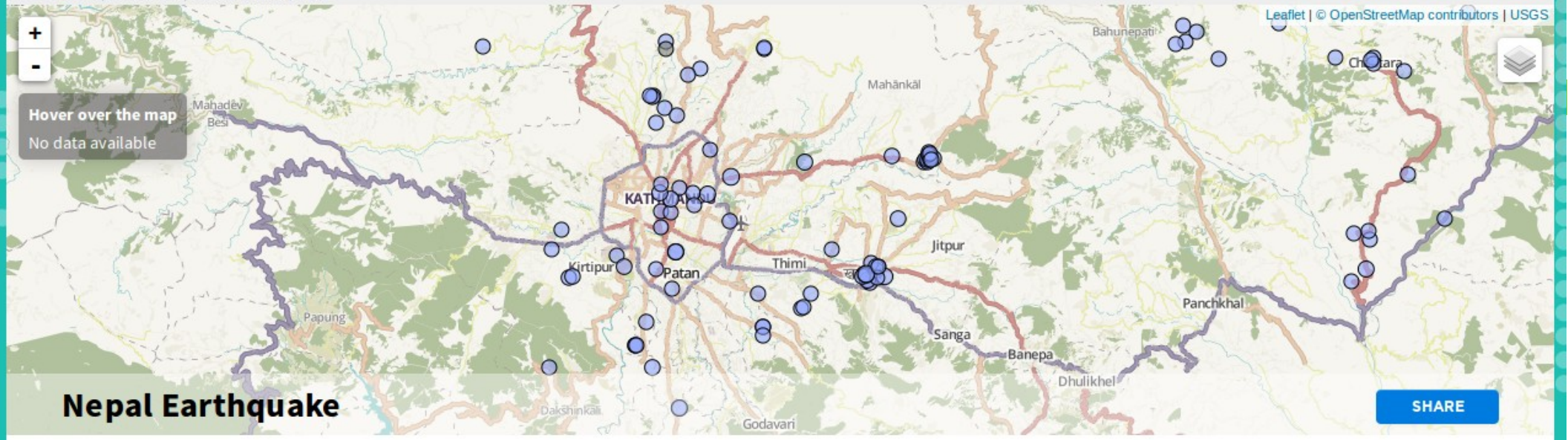
Challenges

Quality and coverage of data

Licenses and metadata

Identifiers

Multiple standards



Nepal Earthquake

SHARE

Key Figures

Number of People Killed (estimate)

8,631

UNRCO (Nepal)

Data - May 21, 2015

Number of People Injured (estimate)

16,808

UNRCO (Nepal)

Data - May 18, 2015

Number of Assessed IDP Camps

191

IOM

Data - May 20, 2015

Funding received

$ 250.5 million

FTS

Data - May 21, 2015

Datasets [72]

Show all datasets

Nepal: Official figures for casualties and damage

OCHA Nepal - May 21, 2015

Contains frequently updated figures for deaths, injuries, and damaged government and public buildings, by district.

GOOGLE SPREADSHEET

Nepal earthquake operations by Himalayan Disaster Relief Volunteer Group (3W)

This data shows where we distributed what, and when. Complete with GPS coordinates, names of districts and

Multiple standards

The nice thing
about standards
is that you have
so many
to choose from.

Integrating data to reach the world

K. Lundfall

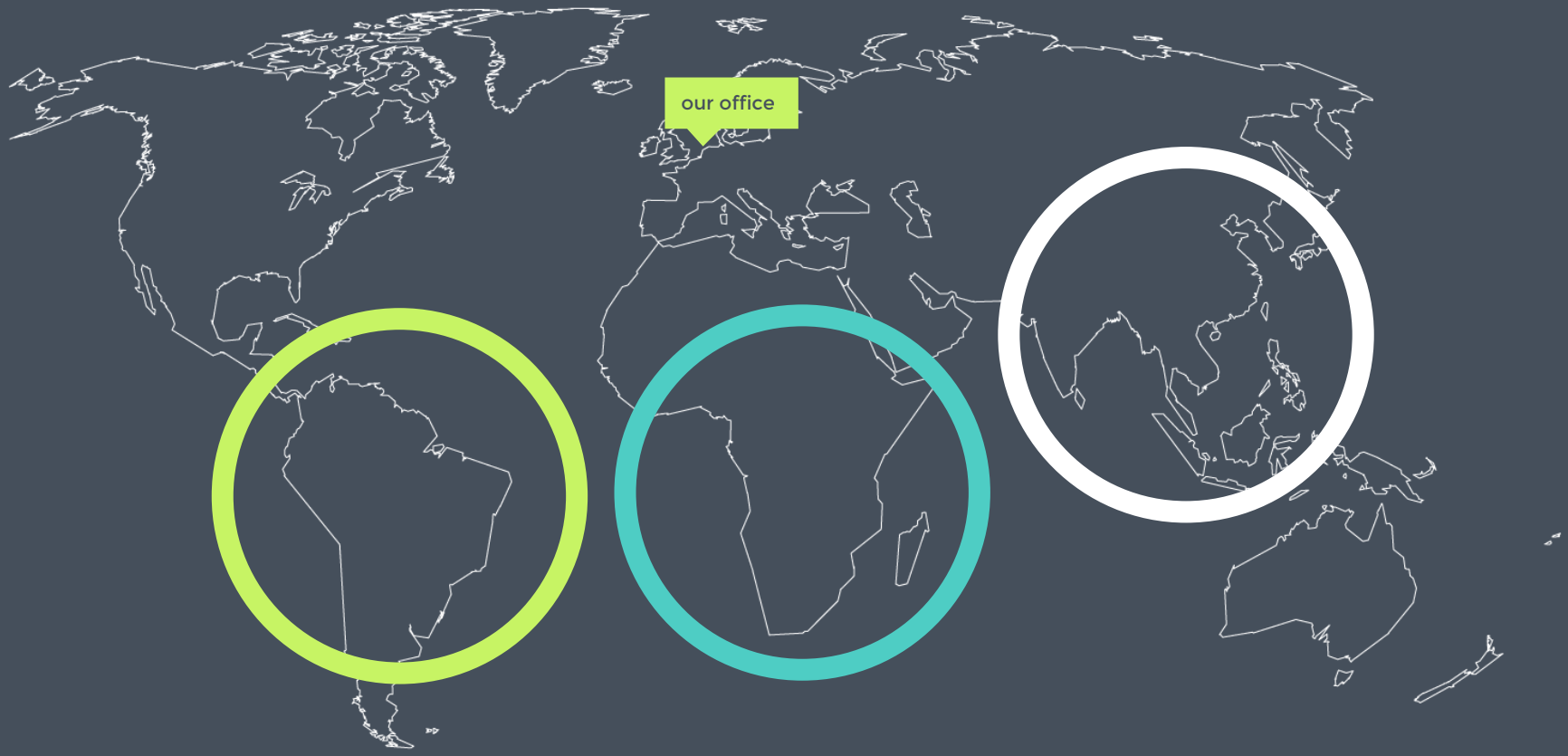
Msc. student @ VU

Doing an internship and writing thesis with TTC Mobile

TTC Mobile (Text to change)

- Use mobile services to create a social change

Coverage

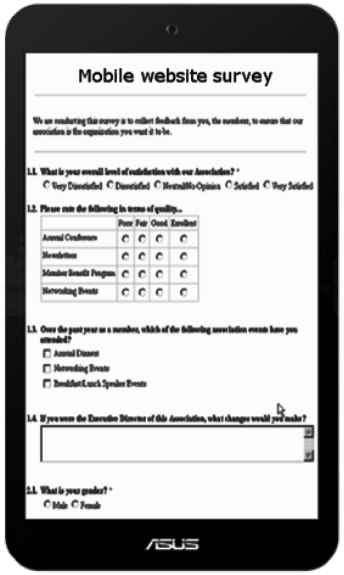


What we're heading for

USSD

SMS

Traditional phone website



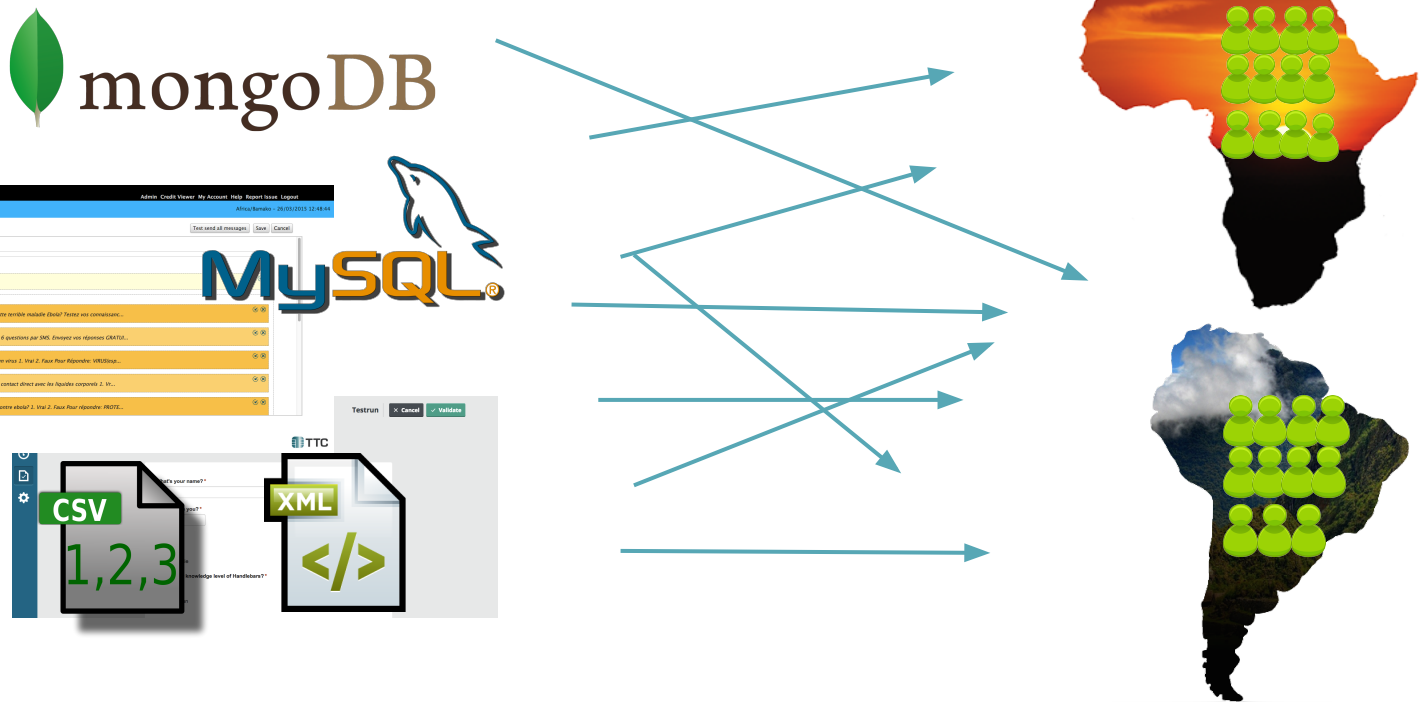
Mobile website

Native app

Voice (IVR)

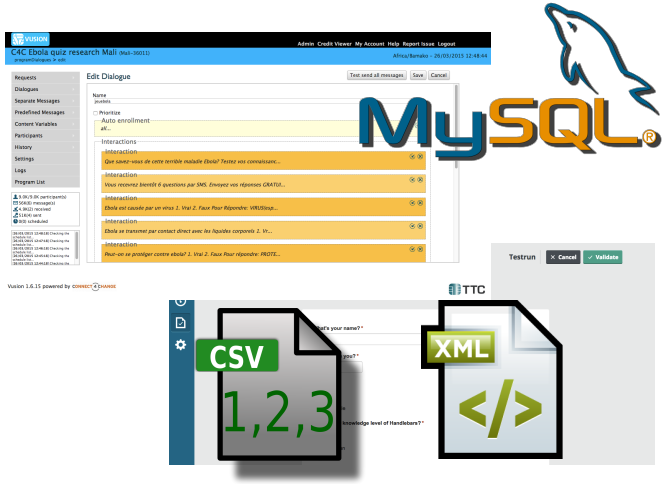
Challenge

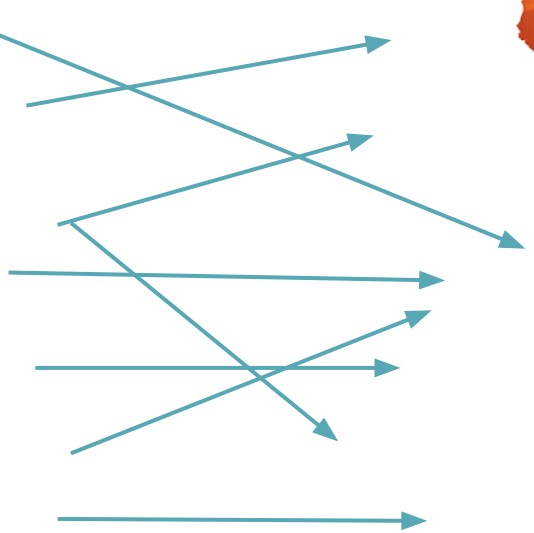
- Different user information in different places

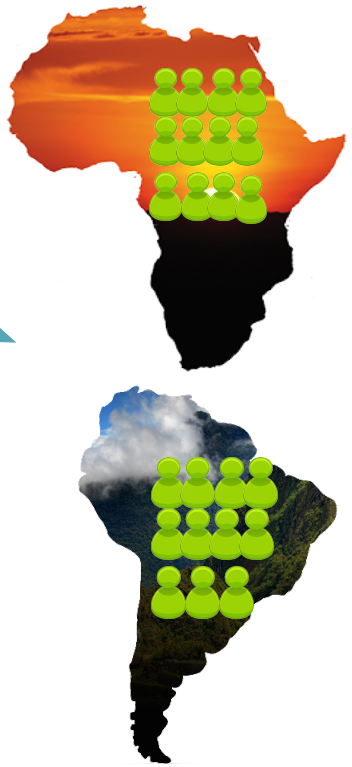


Challenge

- Information is spread out and cannot easily be reused!

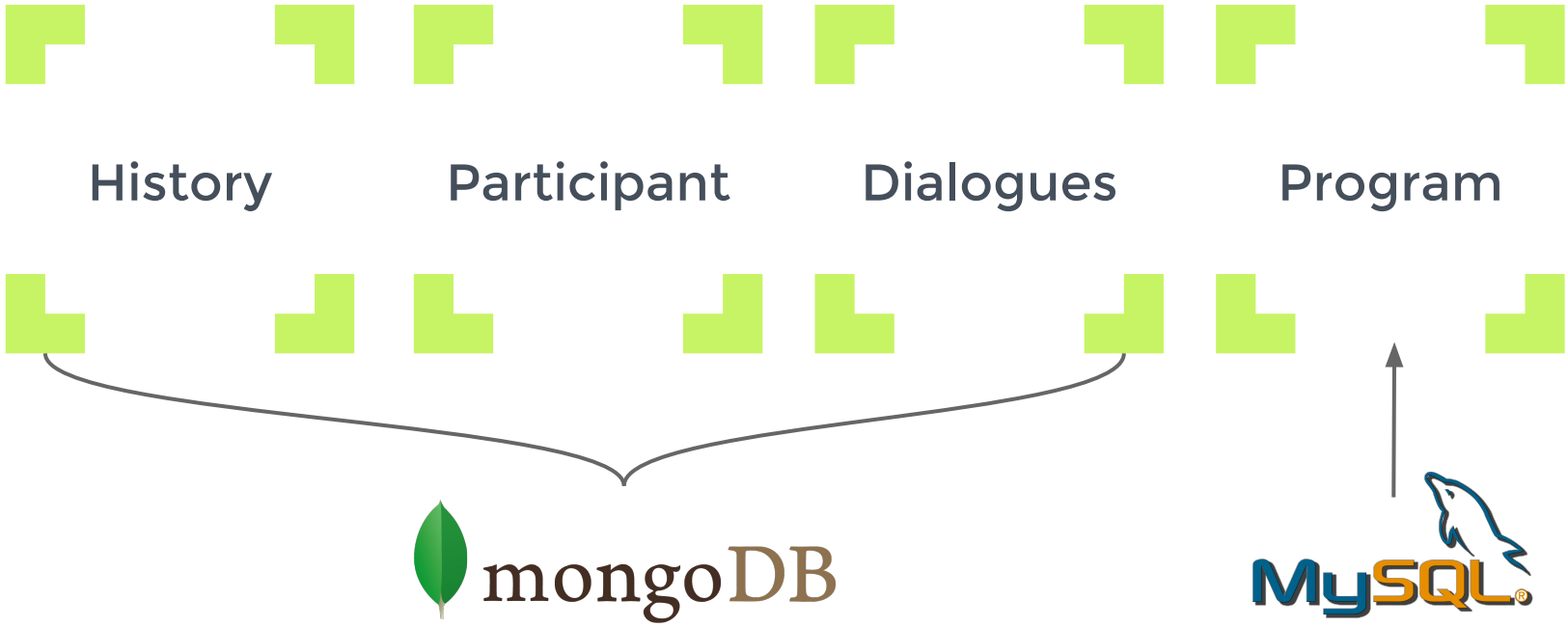






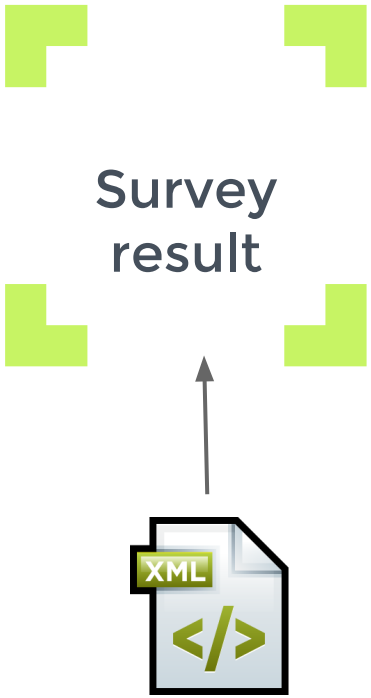
Data structures

- SMS platform
  - Interactive campaigns with conditional logic



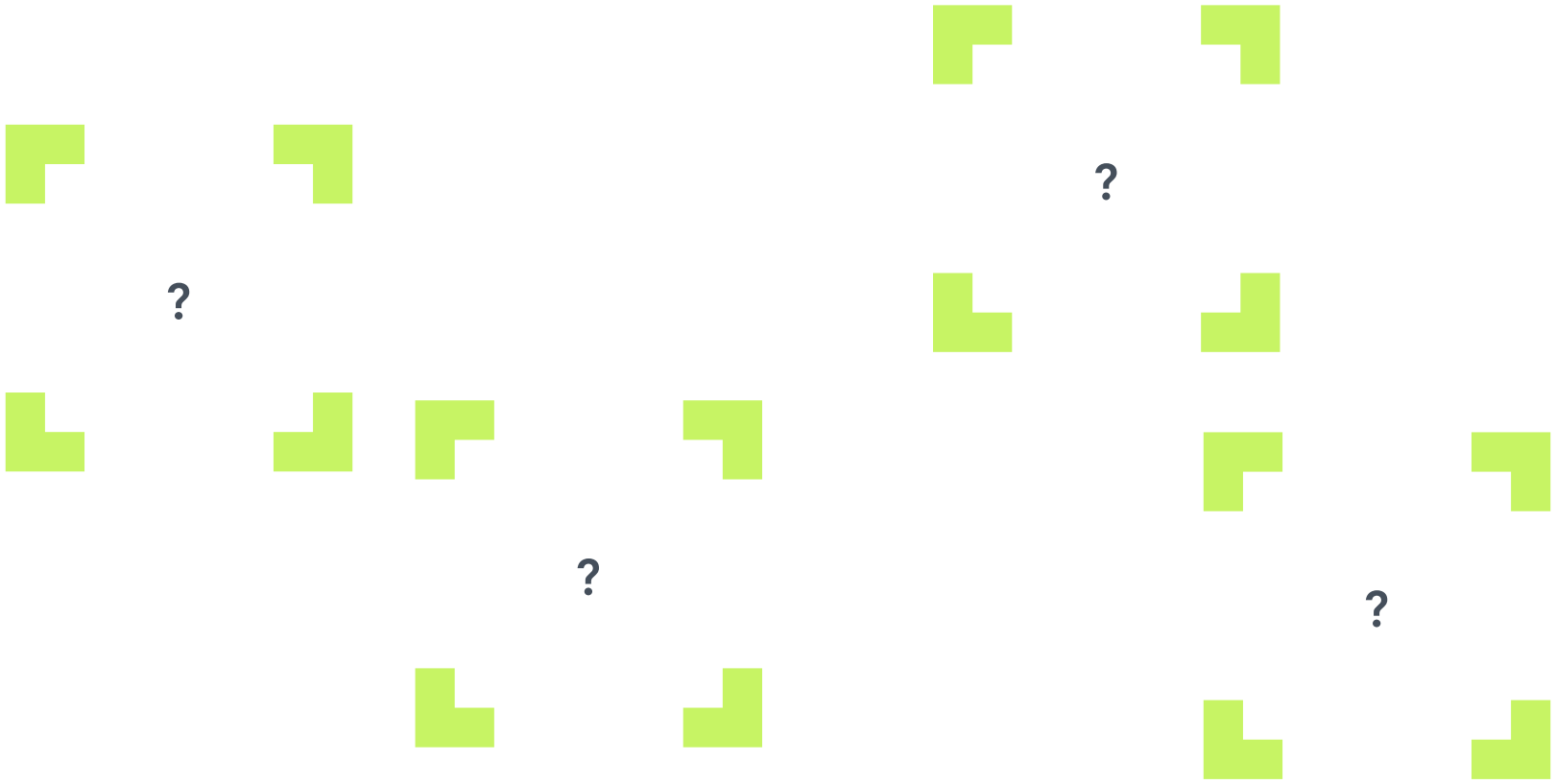
Data structures

- Call center platform



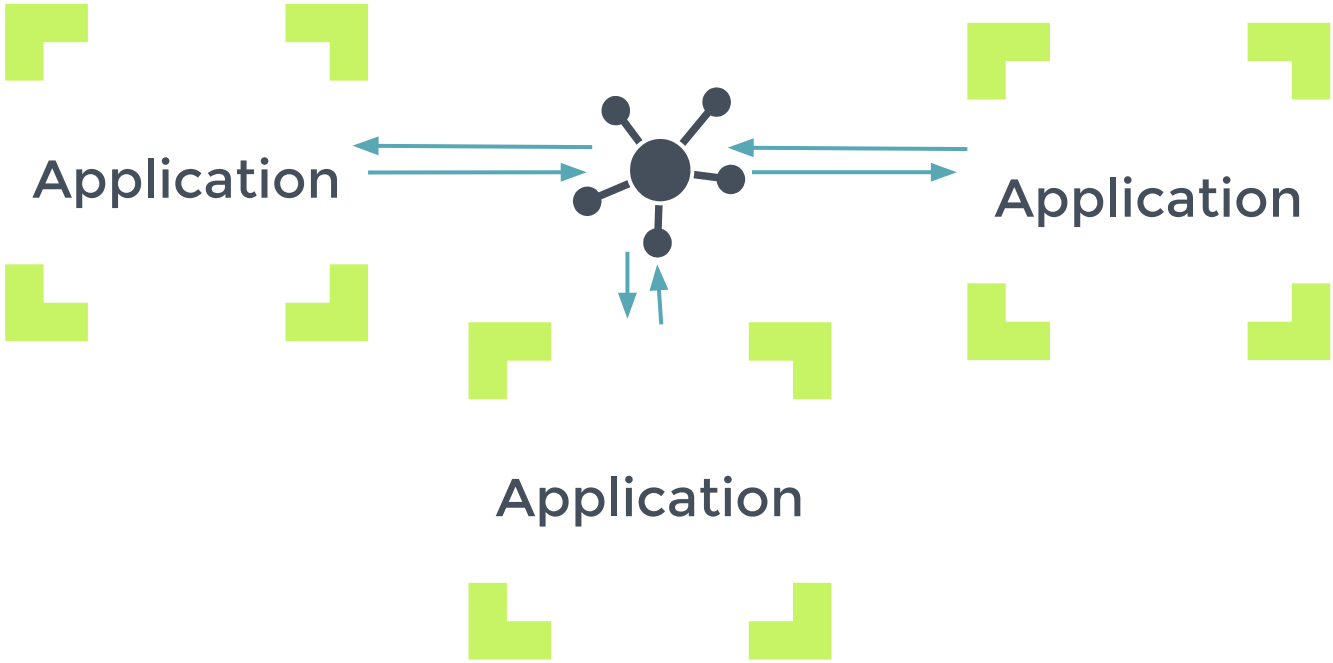
Data structures

- Future application



Goal

- A central hub mediating between applications



Requirements

- Applications can reuse data through API
- Provide statistical overviews through interface
- If fields are overwritten, the old value should be accessible with a date stamp (versioning)

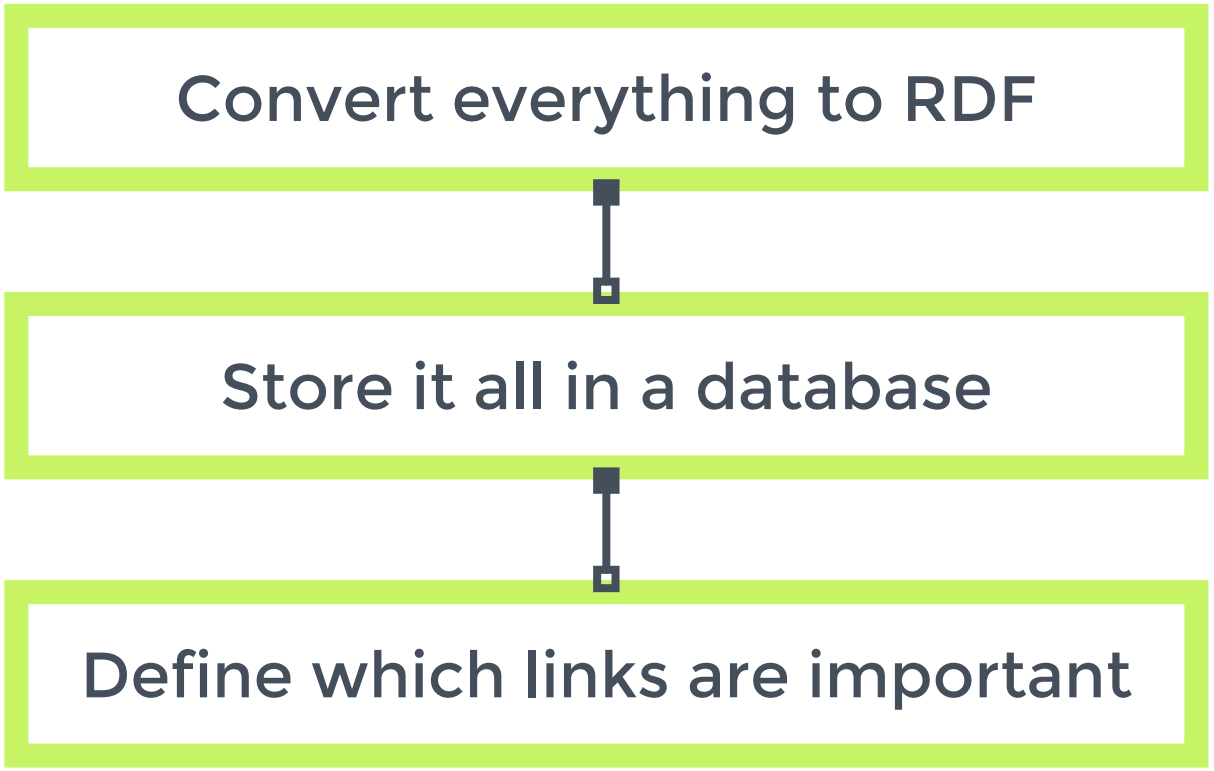
Problem

- Different data structures need to fit the same format
- We need a future proof data model
  - Which fields should be stored and how?
  - We want to store as much information as possible while still being able to manage the data easily

[RDF is of use when linking] heterogeneous systems within one organisation that, historically, have not easily interoperated at the data level.

Bizer, C., Heath, T., Berners-Lee, T.: *Linked Data - the Story so Far*. International Journal on Semantic Web and Information Systems (IJSWIS) 5(3), 1–22 (2009)

Solution

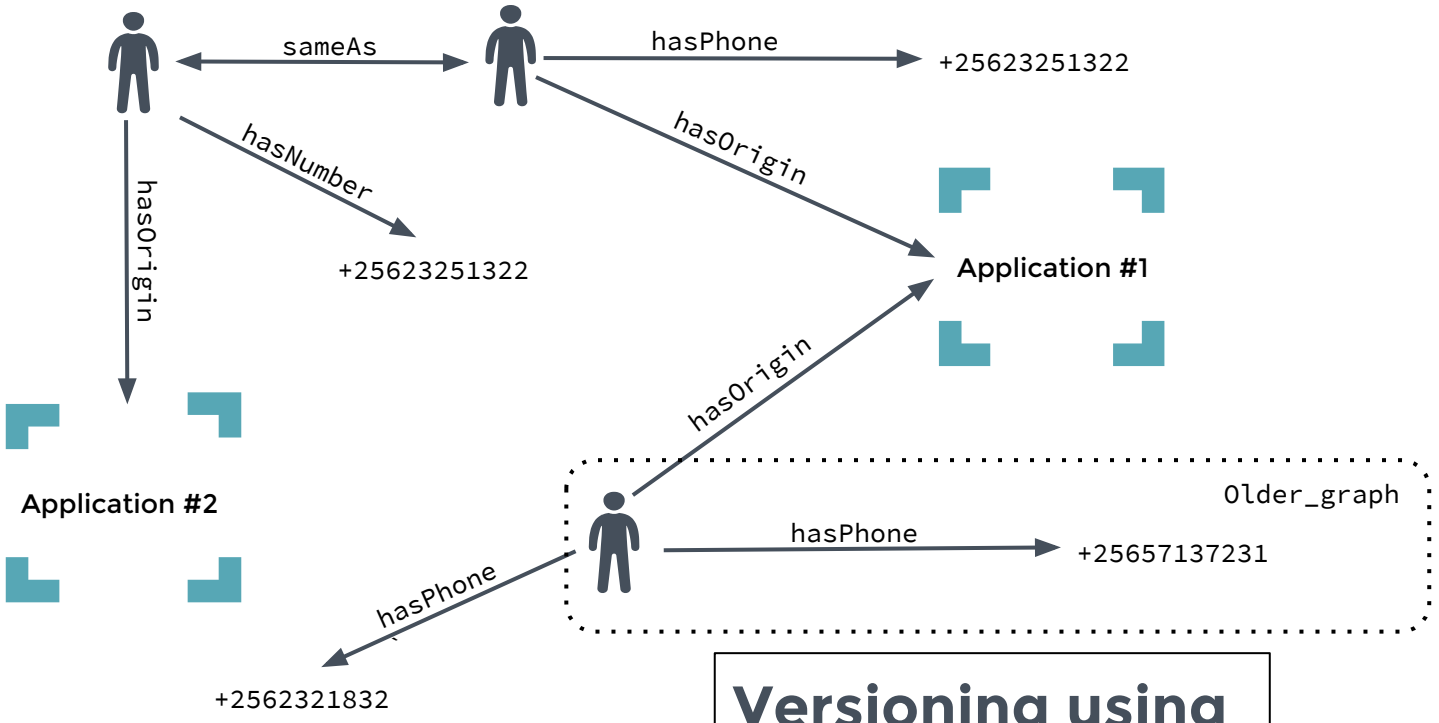

Convert everything to RDF
Store it all in a database
Define which links are important

Features

Users with same number are linked

Subproperties for different label names

```
hasNumber rdfs:subPropertyOf hasPhone
```



Versioning using named graphs

Concerns

- RDF is a relatively new technology
- Not very popular at the moment
- In order to asses the risks of using RDF, evaluate by comparing with a solution using a document-oriented database

Expected results

+ RDF will be more flexible and architecturally extendable

- Scalability could be an issue compared to more optimized and maintained database platforms

- More complicated for developers without experience of RDF

The end

Questions?

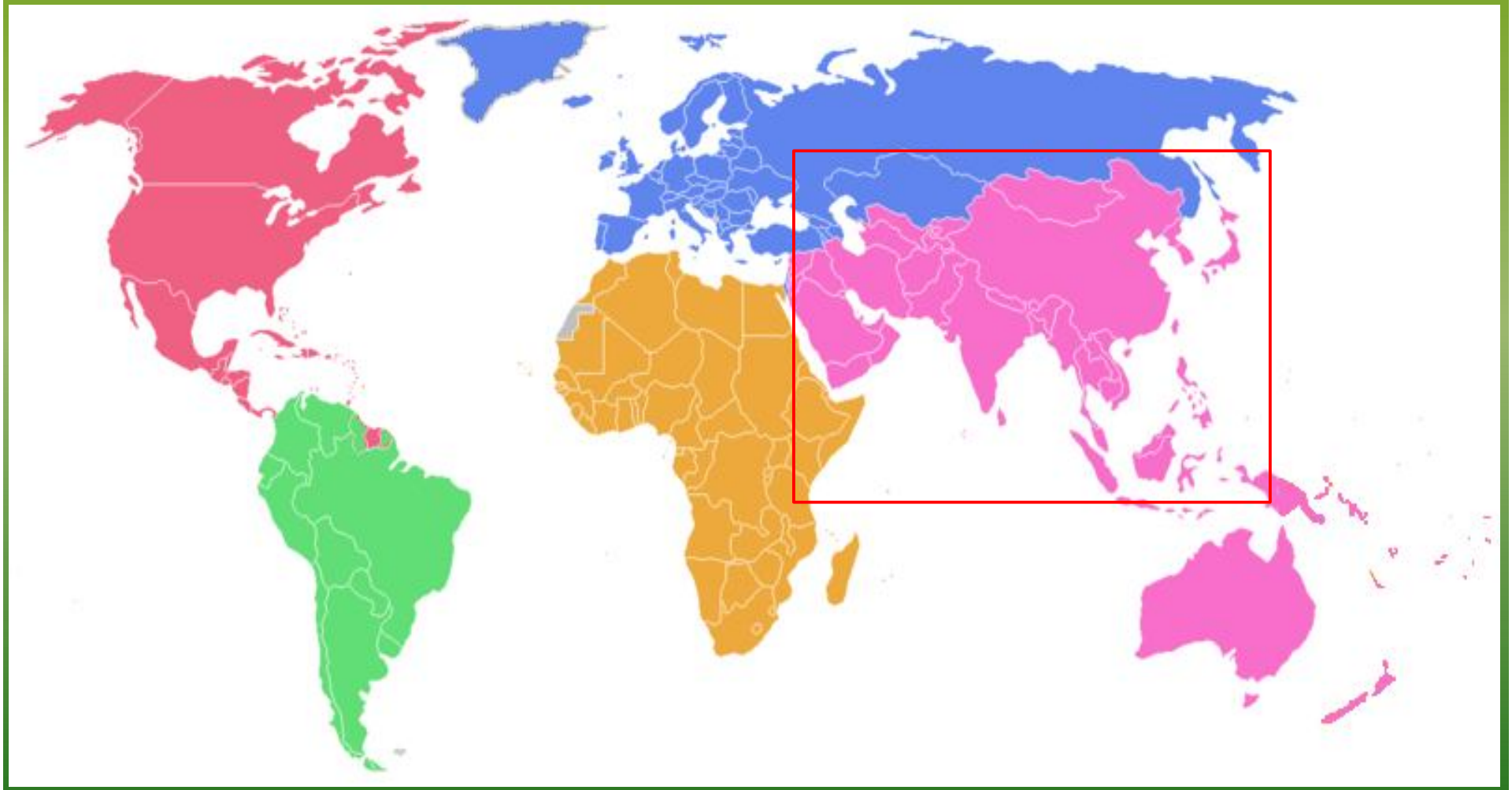
klundfall@ttcmobile.com

Empowering knowledge through digital story telling: A potential tool for rural community Sarawak, Malaysia

Cheah Wai Shiang, *UNIMAS*

ICT4D Symposium 2015

Where is Kuching?




RUSSLAND
KASACHSTAN
MONGOLEI
GEORGIEN
ASERBAIDSCHAN
ARMENIEN
USBEKISTAN
KIRGISISTAN
TADSCHIKISTAN
TÜRKEI
TURK-
MENISTAN
NORDKOREA
SÜDKOREA
JAPAN
ZYPERN
SYRIEN
LIBANON
ISRAEL
PAL.
IRAK
JORDANIEN
IRAN
AFGHANISTAN
CHINA
KUWAIT
BAHRAIN
KATAR
V.A.E.
SAUDI-
ARABIEN
PAKISTAN
NEPAL
BHUTAN
BANGLADESCH
TAIWAN
INDIEN
MYANMAR
LAOS
OMAN
JEMEN
THAILAND
VIETNAM
PHILIPPINEN
KAMBODSCHA
MALEDIVEN
SRI LANKA
BRUNEI
MALAYSIA
SINGAPUR
INDONESIEN
OSTTIMOR

Where is Kuching?

UNIVERSITI MALAYSIA SARAWAK

www.unimas.my




Kontemporari dan Berpandangan Jauh

UNIMAS SARAWAK

Institute of Social Informatics & Technological Innovations (ISITI)

Centre of Excellence for Rural Informatics (CoERI)

Research Group

- Social & Cultural
- Energy
- Information Technology
- Telecommunication
- Business and Economics
- Health
- Education

- **VISION:**
  - Communities transformed into a knowledge-based society by leveraging on ICT innovations
- **MISSION:**
  - To generate, disseminate, apply and preserve knowledge through innovative and multidisciplinary approaches to empower society to sustainably address their developmental needs in a wider social and economic contexts

Work with (very) Remote Communities

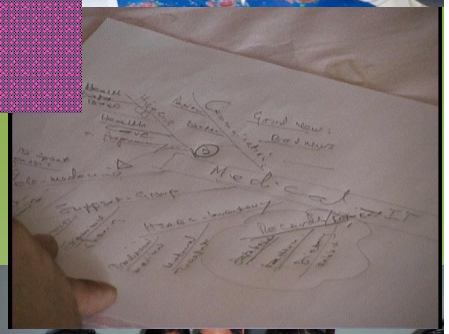
CoERI Model

Social Scientists

Community Engagement & Needs Analysis

Social Scientists
Technologists
Economics & Business

Planning & Design

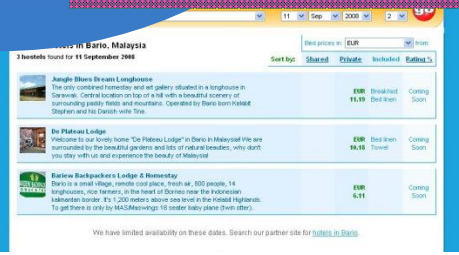


Evaluation & Reflection

Technology access & Deployment

Social Scientists
Technologists
Economics & Business

Technologists
Economics & Business



Telecentre Approach

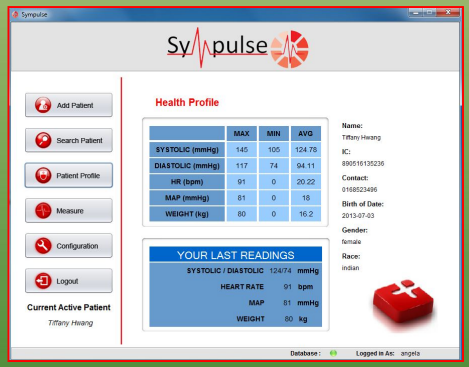
- **eBario Telecentre**
  - Run by local community
  - Solar powered; VSAT connectivity
- **Event management**
  - Communication hub
- **Infrastructure**
  - 12 years on, still no 24-hour power
  - Mobile coverage
- **Living laboratory/Incubation centre**
  - Community radio, long range wi-fi

Project Sites

My role in the ISITI

LifeTree: Mobile Game about teaching Children on How to Live Green[1]

MyKliKs: Social Network for Remote Rural Children



Sympulse- "Community health record" system for public health screening[4]

Rimba Ilmu: Shared single display technology[2,3]

Current education technology deployment issues...

- lack of facilities (e.g. computer, power supply, clean water supply, internet, human resources)
- inaccessibility ($, time)
- lack of local content and context (e.g. cannot imaging or visualize the concept; local language)
- teachers overload with duties (e.g. do not encourage to adopt education technology)
- community - elderly and kids

Case study

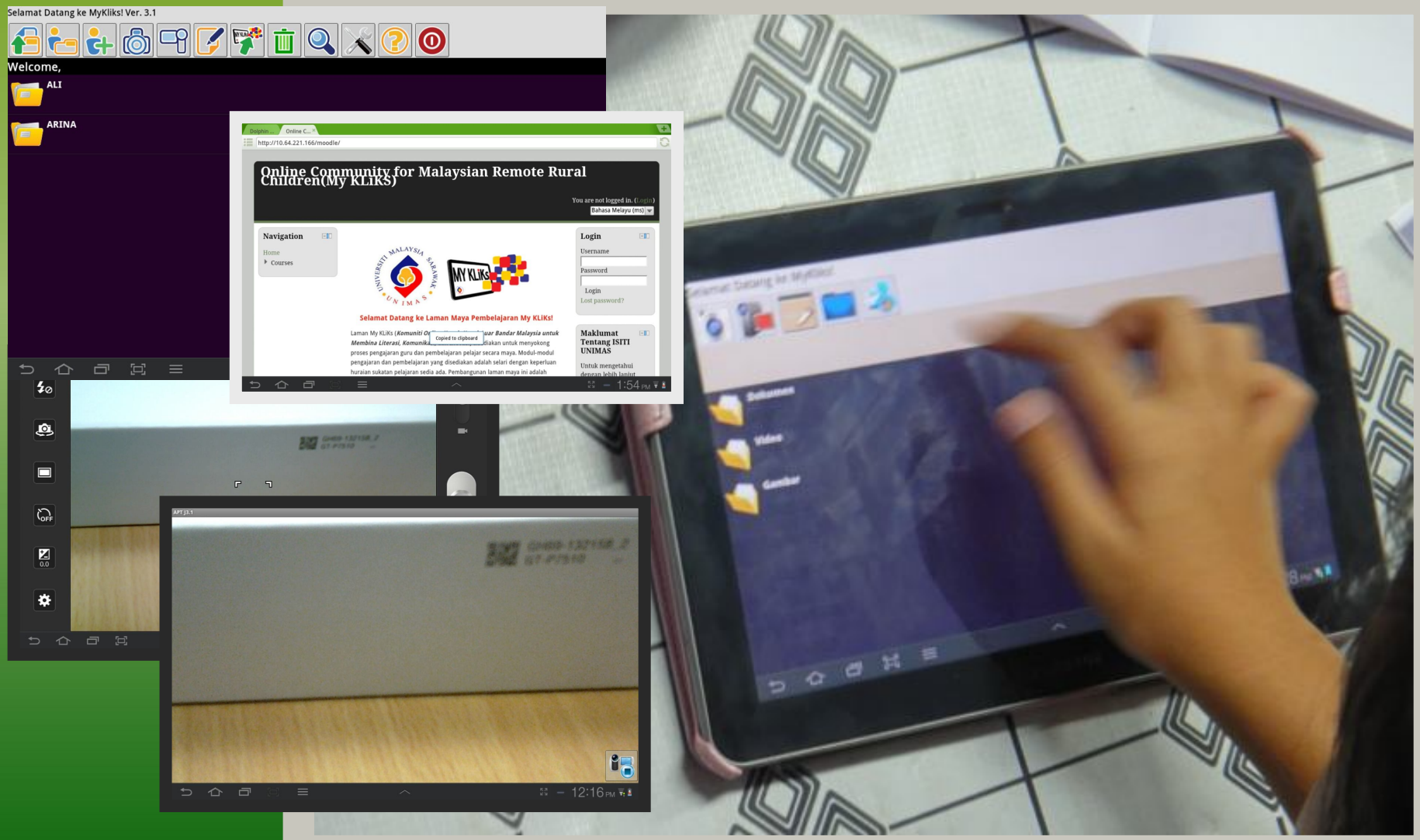
Digital story telling in Bario community, Sarawak- APTJ3 project 2012-2013

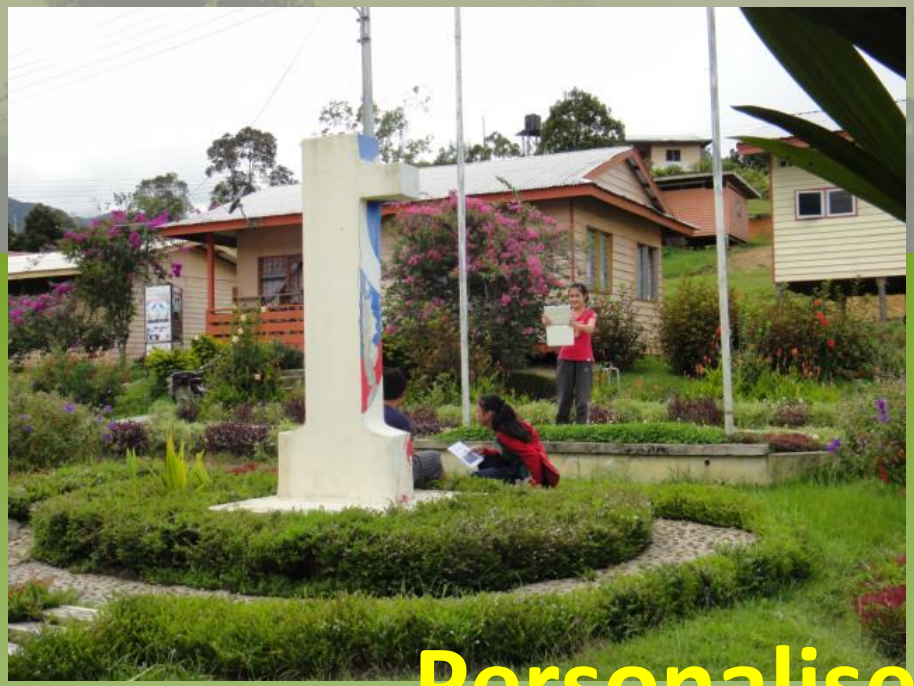
A highlighted project...

The agenda is simple

- The team wanted to mobilize the local communities to educate their peoples about fundamental knowledge on science, mathematics, arts, language and history, to enhance their capabilities and moving into digital knowledge-based economy'

Digital story telling platform....





Personalised Learning

Peer to peer learning

Shared tablet…..

From the observation...

- **Digital Gap among Remote Rural Children**
  - Students pick-up very fast
  - Students enthusiastic about the data capturing process
  - Students are able to create their own multimedia products using the tools provided
- **Personalized learning through ICT tools**
  - Potential sustainable solution for remote local children
- **Challenge**
  - **maintaining the digital repository**
  - **remote monitoring**
  - **transforming into local learning materials**
  - **sustainability**


Potential MyKliks Network between
Remote Rural Sites in Sabah & Sarawak
Kudat
Kota
Marudu
Tuaran
Kota
Kinabalu
Tuaran
Penampang
Papar
Tambunan
Beluran
Sandakan
Bandar
Begawan
Tenom
Lawas
Seria
Brunei
Limbang
Labi Forest
Reserve
Marudi
Belaga
Kunak
Tawau
Nunukan
Regency
Tarakan
Municipality
of Bongao
Sitangkai

MyKliks Network between Remote Rural sites in Sabah & Sarawak

Bario

Larapan

myKliks

Ba'Kelalan

Long Lamai

Conclusion

- **Critical success factors**
  - Engage & involve community
  - Needs-driven
  - Local Champions
  - Smart-partnerships
    - Multi-disciplinary

References

- [1] WaiShiang C., ZhenWei T., HueKee B., ZiXuan L., Muhamd F. (2013), Sustainability education for fun: An interactive mobile learning system, at
- International conference on Informatics and creative multimedia, 2013, Kuala Lumpur, Malaysia.
- [2] WaiShiang C., Edwin M., Marlene L., Azman bin Bujang (May, 2015), An exploration study of RimbaIlmu:A qualitative evaluation of shared single display groupware in Sarawak, Malaysia" to International Journal of Emerging Technologies in Learning (iJET).
- [3] WaiShiang c., Edwin M., Alfian Abdul Halim, (Feb, 2015), Shared Single Display Application: An Interactive Patterns Approach, Journal of software engineering and its application.
- [4] WaiShiang C., Marlene Lu, Gary Low, Sympulse- “Community health record” system for public health screening to community, accepted at electronic journal of health informatics, 2015.
- [5]. WaiShiang C. Masli A., Mit E., (2013), Sustainability modelling of ecommerce for rural community- a case from Long lamai ecommerce initiative, International
- Conference on Informatics and Creative multimedia, Kuala Lumpur, Malaysia.

Questions?

c.waishiang@gmail.com
C.WaiShiang@uu.nl

Thank You

Acknowledgement to APT for the J3 Funding,
team members: Dr Fitri, Prof. Alvin Yeo

Data, "there is an App for that" perspective

Chrisvanaart@2coolmonkeys.nl

2coolmonkeys.com

2CoolMonkeys

Experts in Open Data apps

NEEM CONTACT OP

NIEUWS DIENSTEN KLANTEN PORTFOLIO PRODUCTEN OPEN DATA INNOVATIE CONTACT

Ontwikkeling van *native* apps

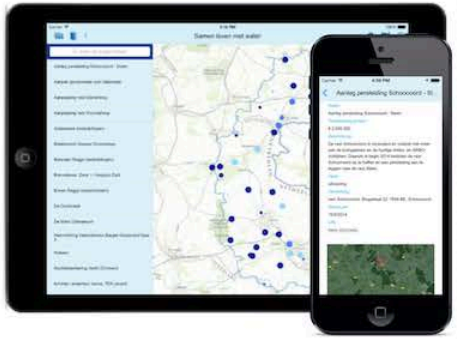
Android iOS

Diensten

Full service app development

LEES MEER

Portfolio



Bekijk al onze apps

LEES MEER

Klanten

Provincie Flevoland

provincie Gelderland

Bekijk onze klanten

LEES MEER

Organisation

Problème

Difficile

Collection

Information

Solution avec TIC

Téléphone / Voix

Avantages

Distance

Rapide

Stabile

Organisations	Problèmes
Les paysans et les organisations d'accompagnement (ONG, ST)	Difficulté de déterminer la densité d'arbres sur une parcelle donnée ○ Détermination de la superficie de la parcelle ○ Comptage du nombre d'arbres
Solutions avec le TIC	**Avantages**
○ Détermination de la superficie et le comptage du nombre d'arbre avec le portable	○ Gain du temps ○ réduction du coût ○ fiabilité des données

play.google.com

Google play

Search

+Chris

Apps

Categories

Home

Top Charts

New Releases

My apps

Shop

Games

Editors' Choice

Forest Tracker

2coolmonkeys - May 26, 2014

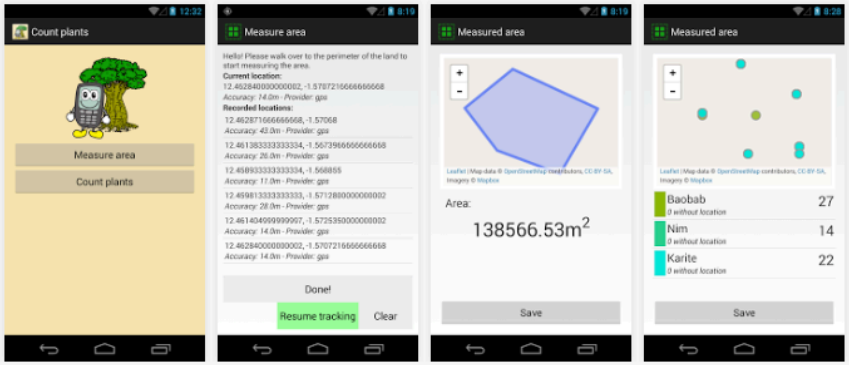
Tools

Install

Add to Wishlist

This app is compatible with some of your devices.

+1 Recommend this on Google



Description

Mr. Tiiga (Mr. Tree or Forest Tracker) is an app that allows you to collect data about trees in the field. It is built through requirements set by users in Mali in Burkina Faso. With M. Tiiga you can estimate tree densities and count trees in the field, using your smartphone. It processes the data and allows you to save them for further calculations. Walk around a terrain and it will measure its perimeter and calculate the superfice. Count the trees and their species. It will recalculate the density per species.

Mr. Tiiga shows your position on a small map. It uses Openstreetmap to display locations using your phone's GPS to find out where you are. You can add your position, add trees and calculate statistics. You can select the name of the tree you want to locate. You can make a photo and save it with the tree data. There is a list of trees in the app, from which you can select the name and lookup more details (data directly linked from Wikipedia). The location of all trees can be listed and exported as an Excel sheet. You can zoom out and see the overview of all trees you collected. Every tree is stored with its metadata in the system. You can later make awsome statistics of the trees you collected in the field.

W4RA is a networked community involving ICT professionals, computer scientists, NGOs, community radio stations, experts in sustainable land

play.google.com

Google play

Search

+Chris

Apps

Categories

Home

Top Charts

New Releases

My apps

Shop

Games

Editors' Choice

Arbres de Mali

2coolmonkeys - March 31, 2014

Books & Reference

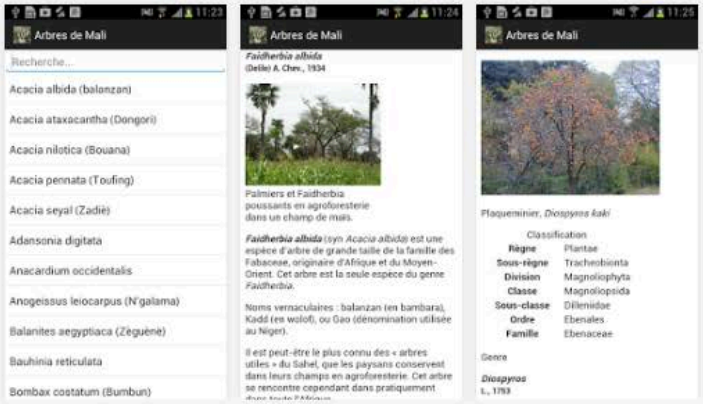
Install

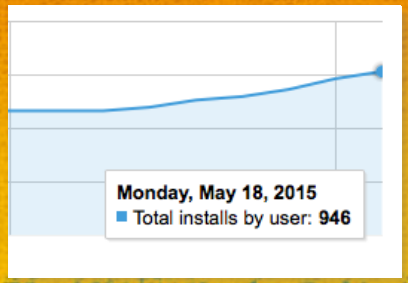
Add to Wishlist

This app is compatible with all of your devices.

★★★★★ (24)

+1 +6 Recommend this on Google





RATINGS & REVIEWS

Export as CSV

# of Ratings			Average Rating
24	★★★★★	20	4.83
	★★★★☆	4	
	★★★☆☆	0	
	★★☆☆☆	0	
	★☆☆☆☆	0	

★★★★★
Galaxy Note (GT-N7000)

Konate Moussa on **Mar 13, 2015** at **4:25 PM**

Auto-translated from French

If love trees think has even protects against you .... Hide original review

Original review

Si aime les arbres pensent a les protege contre toi meme....

Reply to this review

★★★★☆
Galaxy Grand duos (baffin)

tiek Tra on **Nov 28, 2014** at **9:52 PM**

Auto-translated from French

Tiek-Between This is important and a way to know full tree and names Hide original review

Original review

Tiek-Tra C'est important et une manière de connaitre plein d'arbre et leur noms

Reply to this review

★★★★★
App version 1.0
Garmin-Asus A10 (a10)

Boubacar N Diaye on **Aug 29, 2014** at **1:49 PM**

Auto-translated from French

I love Hide original review

Original review

J'adore

Reply to this review

★★★★★
App version 1.0
LG Optimus L3 II (vee3e)

Zeant Diarra on **Aug 28, 2014** at **9:23 PM**

Auto-translated from French

This is one better applications Hide original review

Original review

C'est l'une de meilleure des applications

Reply to this review

★★★★★
App version 1.0
Galaxy W (GT-I8150)

Fofana Sidikifofana on **Aug 24, 2014** at **9:37 PM**

Auto-translated from Zulu

Sidiki Fofana be Hide original review

Original review

Sidiki Fofana maliba

Reply to this review

★★★★★
App version 1.0
Galaxy Note II (t03g)

ULTIMACTE CONSEIL on **May 27, 2014** at **7:42 PM**

Auto-translated from French

Trees in Mali This is a great application Hide original review

Original review

Arbres du Mali C'est une superbe application

Reply to this review

★★★★★
App version 1.0
Galaxy S4 (jflte)

Ibrahima Cissoko on **May 15, 2014** at **3:50 PM**

Auto-translated from French

Very good I am very happy to find this application. For I hear many names of trees in Bambara without knowing what it is. If can even make it to the animals. Thank you a lot. Hide original review

Original review

Très bien Je suis très content de trouver cette application. Car j'entends beaucoup de noms d'arbres en bambara sans connaître ce que c'est. Si pouvez même en faire pour les animaux. Merci beaucoup.

Reply to this review

Les innovateurs

DIRECTION DE LA METEOROLOGIE

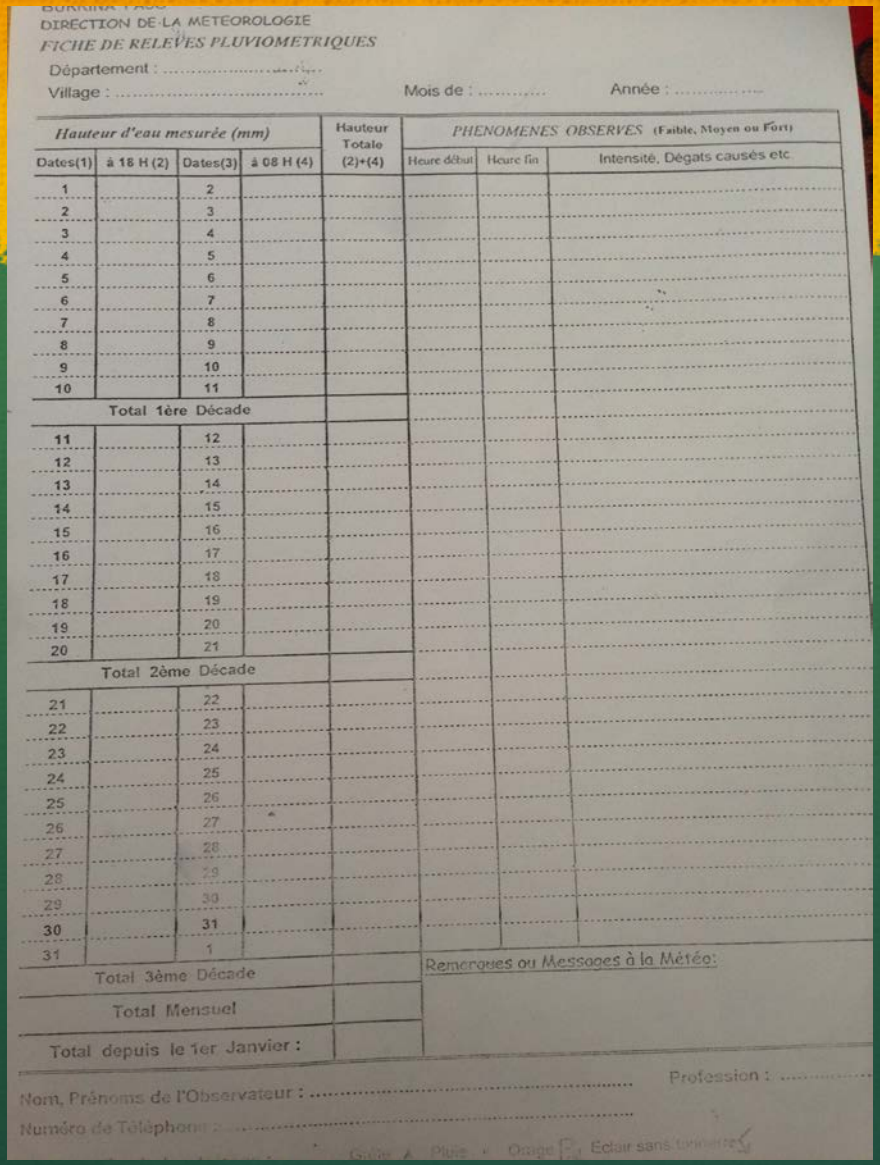
FICHE DE RELEVES PLUVIOMETRIQUES

Département : .....

Village : ..... Mois de : ..... Année : .....

Hauteur d'eau mesurée (mm)				Hauteur Totale (2)+(4)	*PHENOMENES OBSERVES* (Faible, Moyen ou Fort)		
Dates(1)	à 18 H (2)	Dates(3)	à 08 H (4)		Heure début	Heure fin	Intensité, Dégats causés etc
1		2					
2		3					
3		4					
4		5					
5		6					
6		7					
7		8					
8		9					
9		10					
10		11					
Total 1ère Décade							
11		12					
12		13					
13		14					
14		15					
15		16					
16		17					
17		18					
18		19					
19		20					
20		21					
Total 2ème Décade							
21		22					
22		23					
23		24					
24		25					
25		26					
26		27					
27		28					
28		29					
29		30					
30		31					
31		1					
Total 3ème Décade					Remarques ou Messages à la Météo:		
Total Mensuel							
Total depuis le 1er Janvier :							

Nom, Prénoms de l'Observateur : ..... Profession : .....



DIRECTION DE LA METEOROLOGIE

FICHE DE RELEVES PLUVIOMETRIQUES

Département : .....

Village : ..... Mois de : ..... Année : .....

Hauteur d'eau mesurée (mm)				Hauteur Totale (2)+(4)	*PHENOMENES OBSERVES* (Faible, Moyen ou Fort)		
Dates(1)	à 18 H (2)	Dates(3)	à 08 H (4)		Heure début	Heure fin	Intensité, Dégats causés etc.
1		2					
2		3					
3		4					
4		5					
5		6					
6		7					
7		8					
8		9					
9		10					
10		11					
Total 1ère Décade							
11		12					
12		13					
13		14					
14		15					
15		16					
16		17					
17		18					
18		19					
19		20					
20		21					
Total 2ème Décade							
21		22					
22		23					
23		24					
24		25					
25		26					
26		27					
27		28					
28		29					
29		30					
30		31					
31		1					
Total 3ème Décade							
Total Mensuel							
Total depuis le 1er Janvier :							

Remarques ou Messages à la Météo:

Nom, Prénoms de l'Observateur : ..... Profession : .....

Numéro de Téléphone : .....

Goutte d'eau : Pluie - Orage : Eclair sans tonnerre

Le Meteo | W4ra

localhost:8888/2014_workspace/meteo/index.php?item=addobservation

Reader

2cm osmdroid pr arcgis afr

Le Meteo I W4ra

Ajouter l'observation

Vilages

Banfora (Comoe)

Date:

2014-05-15

Hauteur d'eau mesureé(mm) a 18H

10

Hauteur d'eau mesureé(mm) a 08 H

30

Hauteur Totale

40

Phenomenes Observes (optional)

Heure dé

8:00

Heure fin

10:00

Intensité, Degats, Causé etc

20

Remarques

Ajouter

Le Meteo I w4ra

Le Meteo | W4ra

localhost:8888/2014_workspace/meteo/index.php

Reader

2cm osmdroid pr arcgis afr

Le Meteo | W4ra

- Accueil
- Meteo Map
- Meteo Table
- Observartions
- Ajouter observartion
- Messages

Pluviométrie

La pluviométrie est l'étude des précipitations, de leur nature (pluie, neige, grésil, brouillard) et distribution, et des techniques utilisées pour leur mesure1. Plusieurs instruments sont utilisés à cette fin, dont le pluviomètre/pluviographe est le plus connu. La mesure peut s'effectuer sous diverses unités, selon que le type de précipitations soit solide ou liquide, mais elle est ramenée en millimètre d'équivalence en eau par mètre carré de surface pour fin de comparaison. Toute précipitation de moins de 0,1 mm est qualifié de trace2.

La pluviométrie, avec la répartition de la température terrestre, conditionne les climats terrestres, la nature et le fonctionnement des écosystèmes ainsi que leur productivité primaire. Elle est l'un des facteurs conditionnant le développement des sociétés humaines et un enjeu géopolitique.

Carrier 10:12 AM

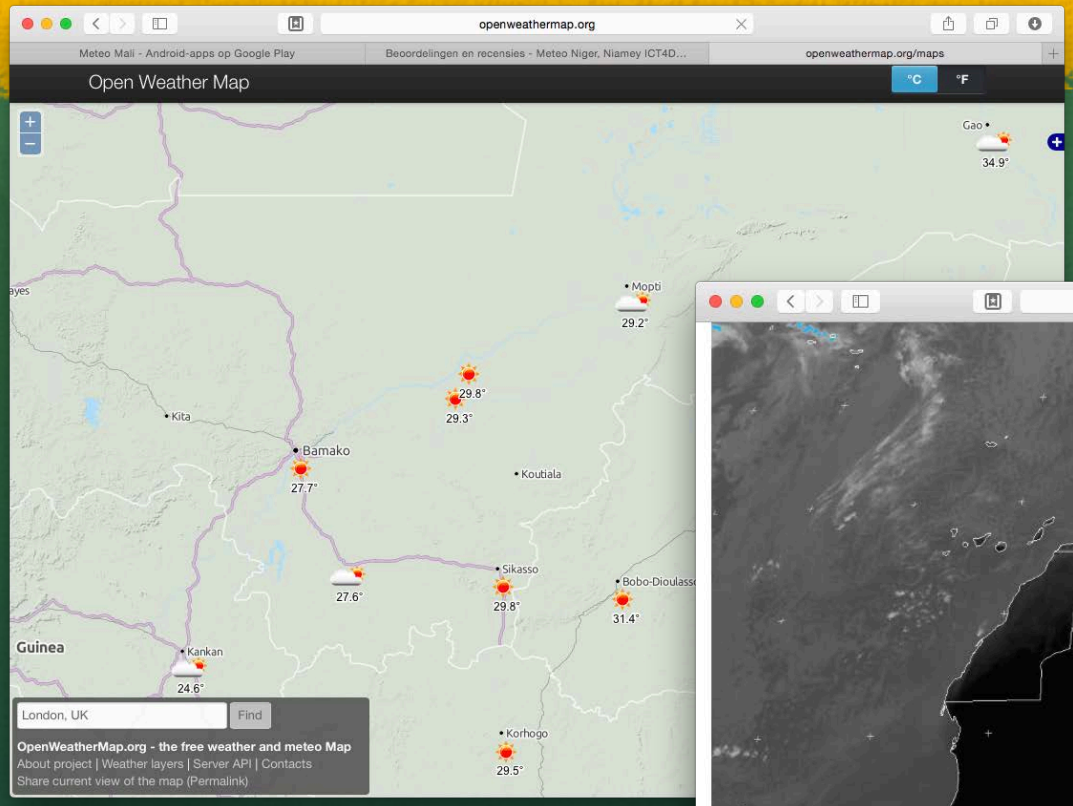
meteo.w4ra.org

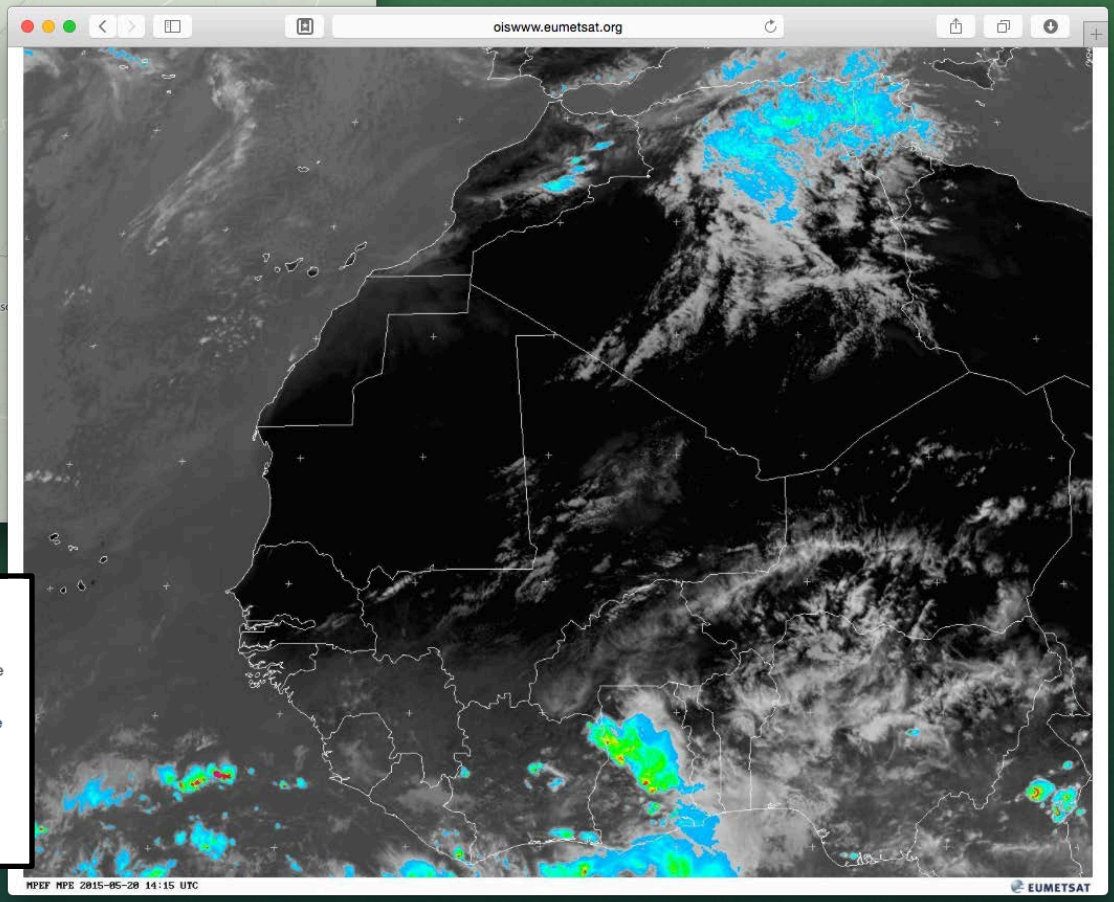
Le Meteo | W4ra

Pluviométrie

La pluviométrie est l'étude des précipitations, de leur nature (pluie, neige, grésil, brouillard) et distribution, et des techniques utilisées pour leur mesure1. Plusieurs instruments sont utilisés à cette fin, dont le

WeatherServices

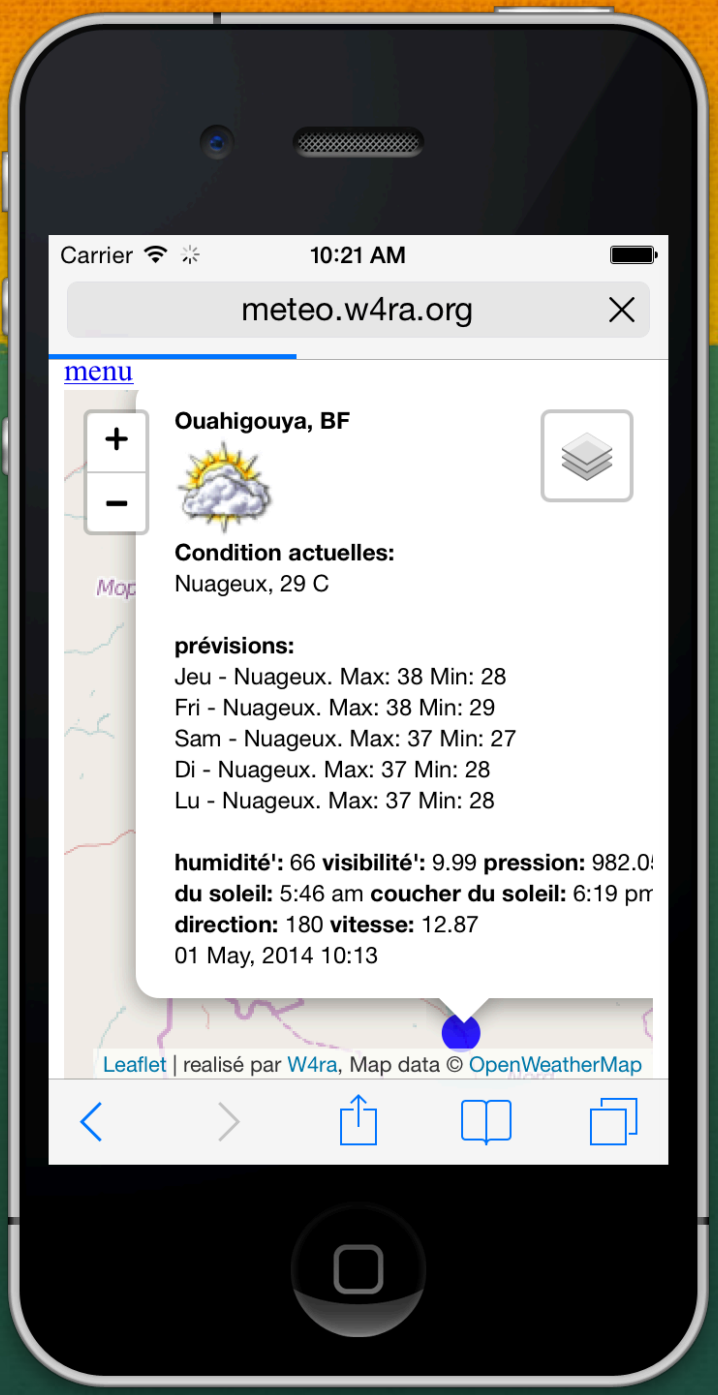




METAR Report for Ouagadougou (DFFD), Ouagadougou, Burkina Faso

DFFD 201400Z 22007KT 170V260 9999 FEW030 BKN260 38/20 Q1011 NOSIG

This is a report for **Ouagadougou, Burkina Faso**. The report was made **49** minutes ago, at **14:00** UTC. The wind was blowing at a speed of **3.6** meters per second (**8.1** miles per hour) from **southwest** (**220°**), varying between **south** (**170°**) and **west** (**260°**). The temperature was **38** °C (**100** °F), with a dew-point at **20** °C (**68** °F). The temperature felt like **41** °C (**106** °F). The atmospheric pressure was **1011** hPa (**29.85** inHg). The relative humidity was **35.3%**. There were **a few** clouds at a height of **914** meters (**3000** feet) and **broken** clouds at a height of **7925** meters (**26000** feet). The overall visibility was greater than **10** kilometers (**6.2** miles).



Rainradar Ghana 20-05-15 06:05:25 powered by w4ra...

Mr.Metero <mrmeteo@w4ra.org> Today 06:11

To: chris van aart <cj@vanaart.com>, and 8 more...

Reply-To: Mr.Metero <mrmeteo@w4ra.org>

Rainradar Ghana 20-05-15 06:05:25 powered by w4ra

Current conditions in Ghana, 20-05-15 06:05:25:

Dodo-Iri : light rain, last 3h = 0.215mm
Kalesesi : light rain, last 3h = 0.335mm
Langa : light rain, last 3h = 1.575mm
Navrongo : light rain, last 3h = 0.335mm
Savelugu : light rain, last 3h = 1.575mm
Tamale : light rain, last 3h = 1.575mm
Upper West Region : light rain, last 3h = 0.215mm

Predictions for Ghana (16 days):

Aboso : 19-05-15: very heavy rain
Aburi : 19-05-15: very heavy rain
Accra : 19-05-15: very heavy rain
Achiaman : 19-05-15: very heavy rain
Adibo : 19-05-15: light rain
Agogo : 19-05-15: heavy intensity rain
Akim Oda : 19-05-15: very heavy rain
Akim Swedru : 19-05-15: very heavy rain
Akropong : 19-05-15: very heavy rain
Akwatia : 19-05-15: very heavy rain
Akwechi : 19-05-15: very heavy rain
Anloga : 19-05-15: very heavy rain

play.google.com

Google play

Zoeken

+Meteo

Apps

Categorieën | Startpagina | Populairst | Nieuwe releases

Mijn apps

Winkelen

Games

Keuze van de redactie

Meteo Mali

Meteo Afrique - 24 september 2014

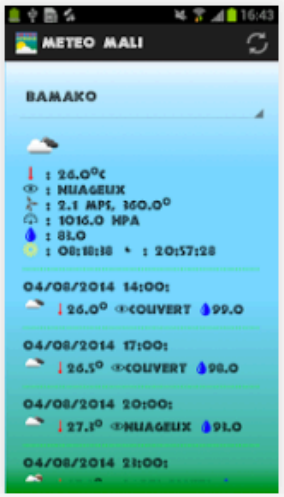
Weer

Installeren | Toevoegen aan verlanglijstje

Je hebt geen apparaten

★★★★½ (6)

+1 +1 Dit aanbevelen op Google



APP	PRIJS	HUIDIG/TOTAAL AANTAL INSTALLATIES	GEM. BEOORDELING / TOTAAL AANTAL	CRASHES EN ANR'S	LAATSTE UPDATE
Meteo Benin Porto-Novo 1.2	Gratis	38 / 135	★ 5,00 / 1	—	24 sep. 2014
Meteo Burkina Faso Ouagadougou 1.2	Gratis	59 / 212	★ 5,00 / 1	—	18 mei 2015
Meteo Burundi Bujumbura 1.2	Gratis	18 / 84	—	—	24 sep. 2014
Meteo Cameroun Douala ICT4D 1.2	Gratis	138 / 397	★ 4,00 / 3	1	24 sep. 2014
Meteo Congo Kinshasa ICT4D 1.2	Gratis	280 / 746	★ 3,50 / 6	2	24 sep. 2014
Meteo Cote D'Ivore 1.4	Gratis	116 / 405	★ 4,60 / 5	1	19 mei 2015
Meteo Guinea Conakry ICT4D 1.2	Gratis	59 / 319	★ 4,33 / 3	—	24 sep. 2014
Meteo Madagascar Antananarivo 1.4	Gratis	121 / 446	★ 5,00 / 3	—	19 mei 2015
Meteo Mali 1.2	Gratis	101 / 528	★ 4,67 / 6	—	24 sep. 2014
Meteo Niger, Niamey ICT4D 1.2	Gratis	121 / 408	★ 3,88 / 8	—	24 sep. 2014
Meteo Rwanda Kigali 1.2	Gratis	36 / 98	—	—	24 sep. 2014

~1100/3500

★★★★☆

GIONEE

boubacardjibo kalilou op **7 mei 2015** om **16:57**

Automatisch vertaald uit het Engels

C tres koel Oorspronkelijke recensie verbergen

Oorspronkelijke recensie

C tres cool

Reageren op deze recensie

★★★★☆

Appversie 1.2

mbk72_wet_lca_fwvga

Mahmoud Mohamed op **27 apr. 2015** om **12:20**

Automatisch vertaald uit het Engels

Jaim tro cette applicatie Oorspronkelijke recensie verbergen

Oorspronkelijke recensie

Jaim tro cette application

Reageren op deze recensie

★★★★☆

J900

ousmane moctar op **9 jan. 2015** om **19:39**

Automatisch vertaald uit het Engels

Koel Oorspronkelijke recensie verbergen

Oorspronkelijke recensie

Cool

Reageren op deze recensie

★★★★★

Appversie 1.2

Galaxy S (SGH-I897)

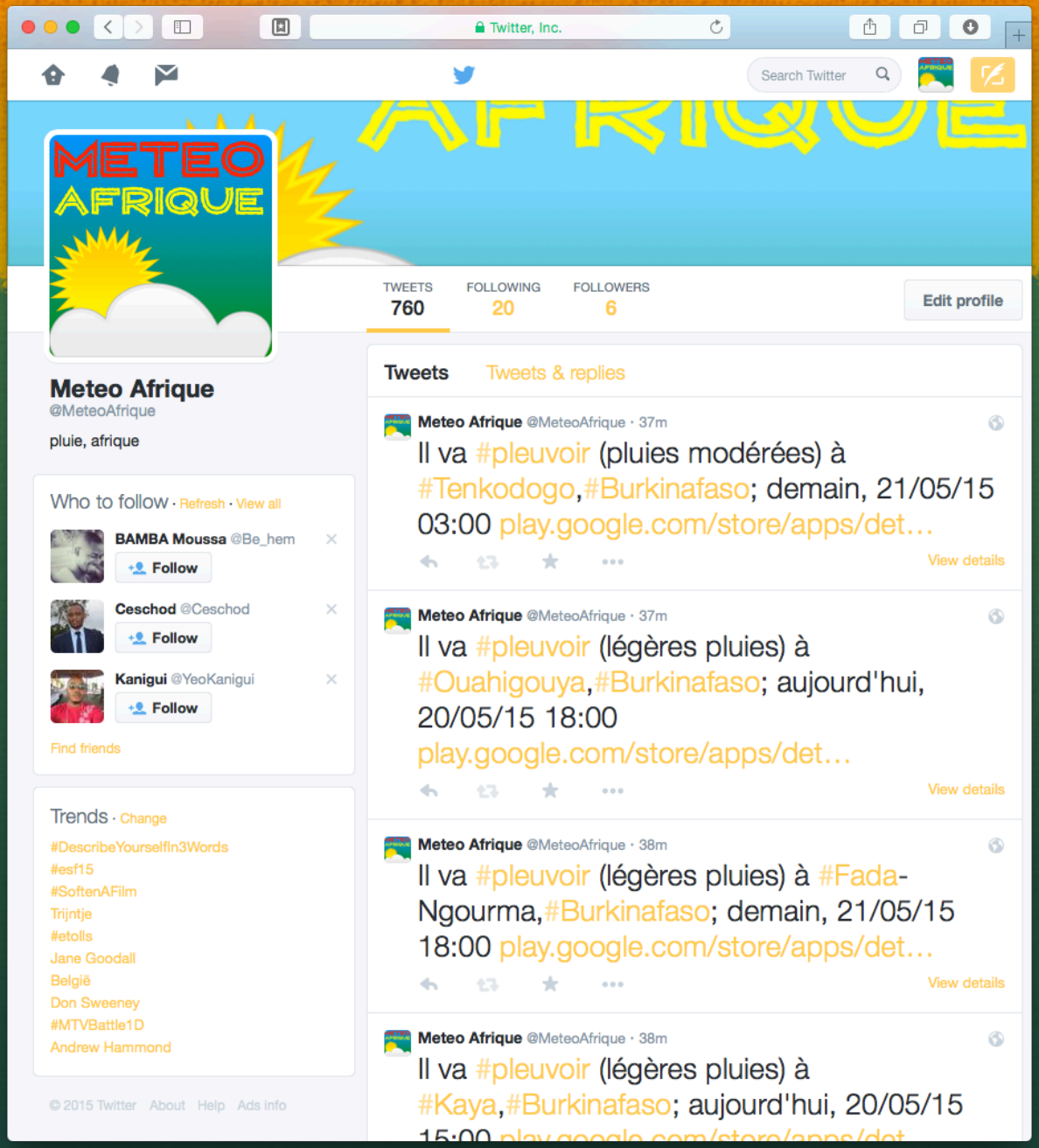
Haboubacar Zakary Manzo Manzo op **30 okt. 2014** om **15:41**

Automatisch vertaald uit het Welsh

Geniallll ... Oorspronkelijke recensie verbergen

Oorspronkelijke recensie

Geniallll...


Twitter, Inc.
Search Twitter
METEO AFRIQUE
TWEETS 760
FOLLOWING 20
FOLLOWERS 6
Edit profile
Meteo Afrique
@MeteoAfrique
pluie, afrique
Who to follow · Refresh · View all
BAMBA Moussa @Be_hem
Follow
Ceschod @Ceschod
Follow
Kanigui @YeoKanigui
Follow
Find friends
Trends · Change
#DescribeYourselfIn3Words
#esf15
#SoftenAFilm
Trijntje
#etolls
Jane Goodall
België
Don Sweeney
#MTVBattle1D
Andrew Hammond
© 2015 Twitter About Help Ads info
Tweets
Tweets & replies
Meteo Afrique @MeteoAfrique · 37m
Il va #pleuvoir (pluies modérées) à #Tenkodogo,#Burkinafaso; demain, 21/05/15 03:00 play.google.com/store/apps/det…
View details
Meteo Afrique @MeteoAfrique · 37m
Il va #pleuvoir (légères pluies) à #Ouahigouya,#Burkinafaso; aujourd'hui, 20/05/15 18:00 play.google.com/store/apps/det…
View details
Meteo Afrique @MeteoAfrique · 38m
Il va #pleuvoir (légères pluies) à #Fada-Ngourma,#Burkinafaso; demain, 21/05/15 18:00 play.google.com/store/apps/det…
View details
Meteo Afrique @MeteoAfrique · 38m
Il va #pleuvoir (légères pluies) à #Kaya,#Burkinafaso; aujourd'hui, 20/05/15

Data, "there is an App for that" perspective

- Understand local context
- Sparks / Ideas are born at unusual places
- Random / Unplanned Innovation
- "Innovate" one thing at the time
- Content is king
- Contextual content is more important than ….

Chris@2coolmonkeys.nl