HunchWorks: Combining human expertise and big data

September 23rd, 2011





www.unglobalpulse.org
@unglobalpulse
#hunchworks

Chris van der Walt,

Project Lead, HunchWorks, Global Pulse @cvanderwalt

Dane Petersen,

Experience Designer, Adaptive Path @thegreatsunra

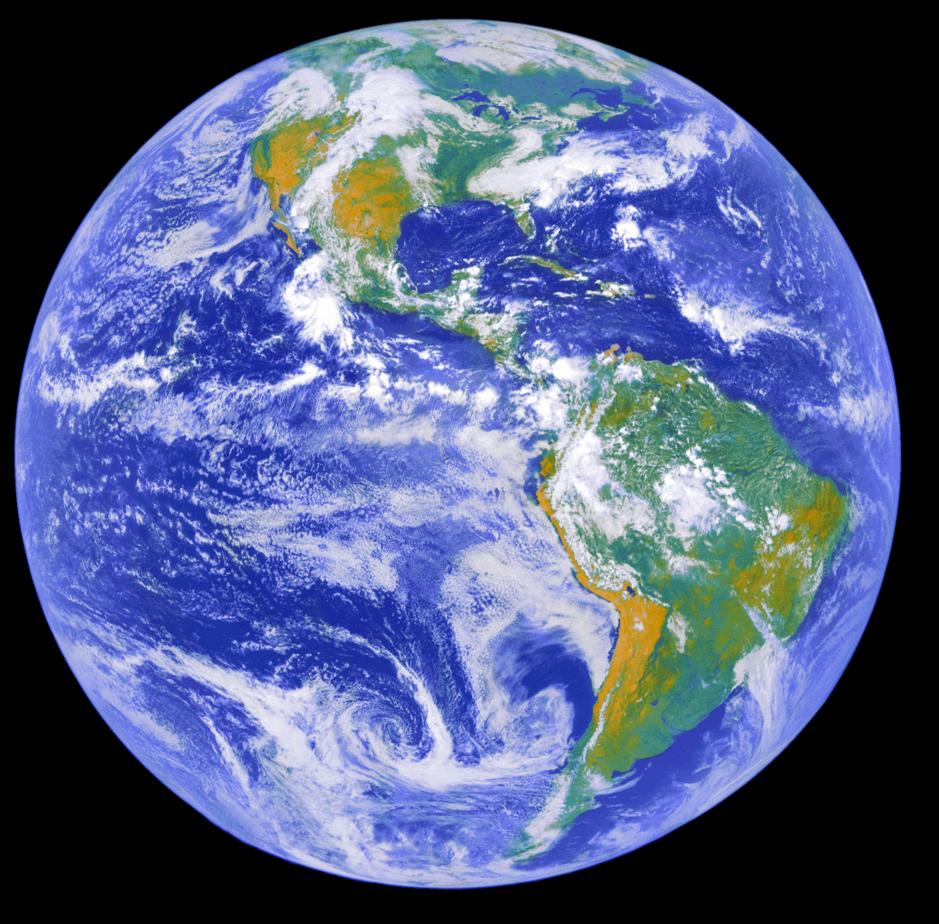
Sara Farmer,

Chief Platform Architect, Global Pulse @bodaceacat

Harnessing innovation to protect the vulnerable

Vulnerability:

The risk of households falling in or remaining in poverty due to idiosyncratic or aggregate hazards.



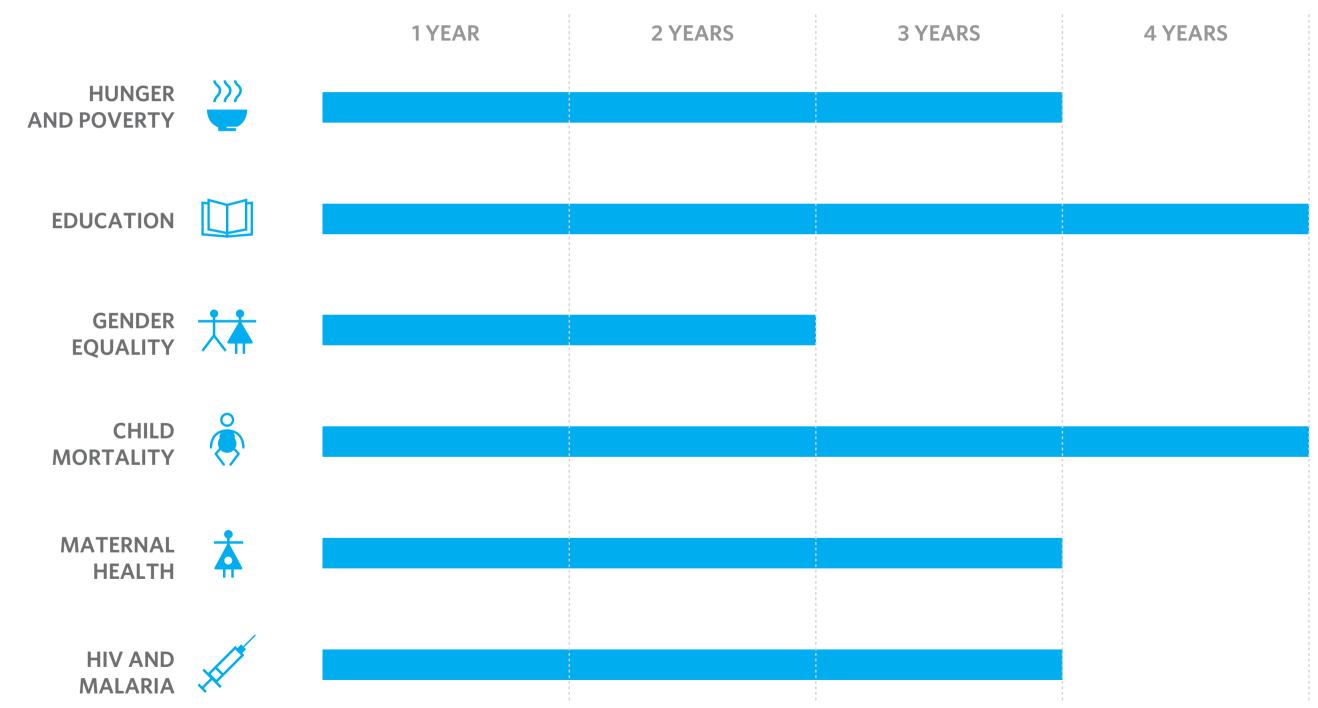
1.373

billion people

living on less than \$1.25 per day and **billions more** at risk of falling into extreme poverty

Source: The World Bank

Information Gap



Ok, so now what?

OPPORTUNITY 1:

Proliferation of sensors

 millions of networked sensors are being embedded in the physical world in devices such as mobile phones and automobiles, sensing, creating, and communicating data

OPPORTUNITY 2:

Big data

- → 30 billion pieces of content shared on Facebook every month.
- 40% projected growth in global data generated per year vs 5% in global IT spending.
- increasingly massive amount of information out there, problem is separating signal from noise

OPPORTUNITY 3:

Social & collaboration technologies

 we can engage human beings all over the world and leverage their situational awareness, expertise and capacity.

OPPORTUNITY 4:

Assistive reasoning

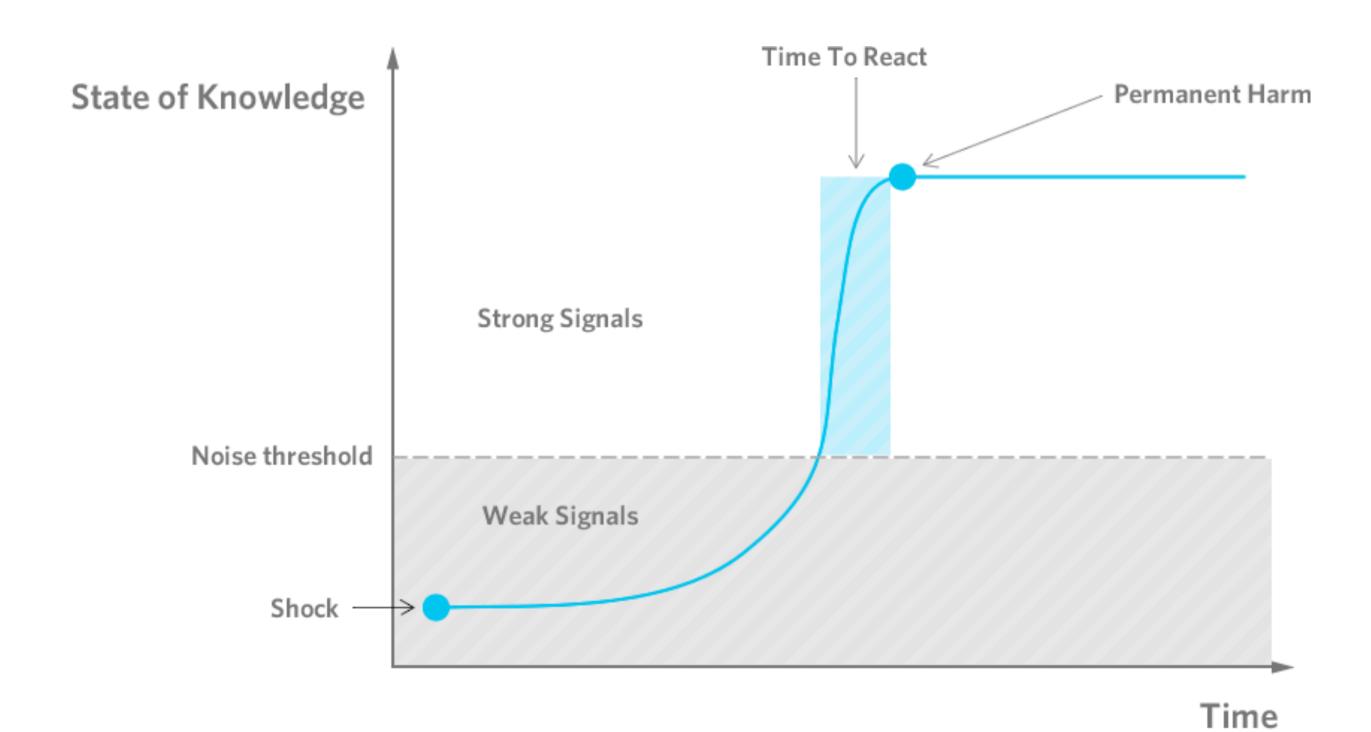
- human capacity to sift through data to detect and understand meaningful connections can be vastly magnified
- combine human understanding and computational reasoning capacity to take advantage of the strengths of both

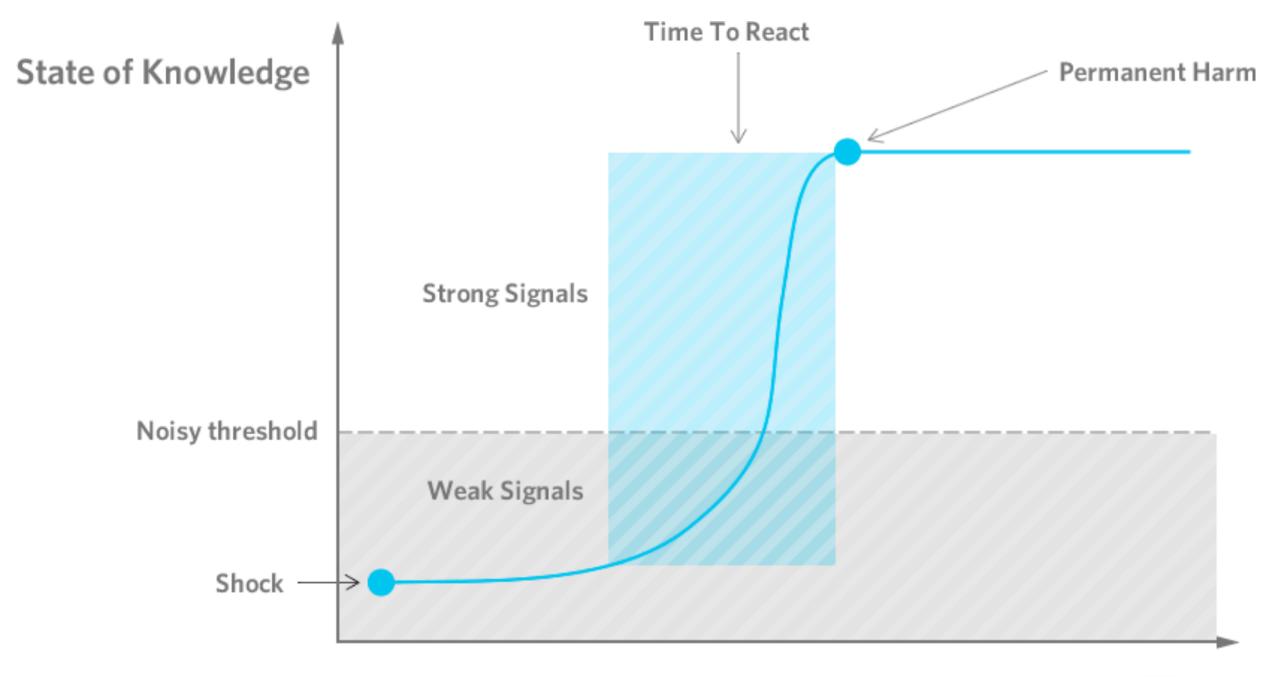
opportunity 5: People

- 5 billion mobile phones
- the international community has staff on the ground in many developing countries
- the reach of the organization can be increased through engaging others outside of the organization via social technologies
- challenge is communication

Weak signals:

Advanced, noisy and socially situated indicators of change in trends and systems that constitute raw informational material for enabling anticipatory action.





Time

HunchWorks Overview

What is HunchWorks?

- a hypothesis management system to detect weak signals
- both humans and data mining tools (wrapped as intelligent agents) can post 'hunches' about anomalous or interesting data and observations that might indicate that a social crisis is starting to unfold.
- a tool to engage and connect the global network of UN and international development field staff with the greater institution to rapidly collect information about emerging situations

The hunch mechanism

- 1. Detect an interesting "weak signal"
- 2. Hypothesize (make a hunch) about the nature of the signal
- 3. Share the hunch with the network
- 4. Hunch acts as an attractor for related signals and other evidence
- 5. Engage communities of practice to support rapid verification through the social graph
- 6. Use confirmed hunch as a basis for further action and to refine trust within the system

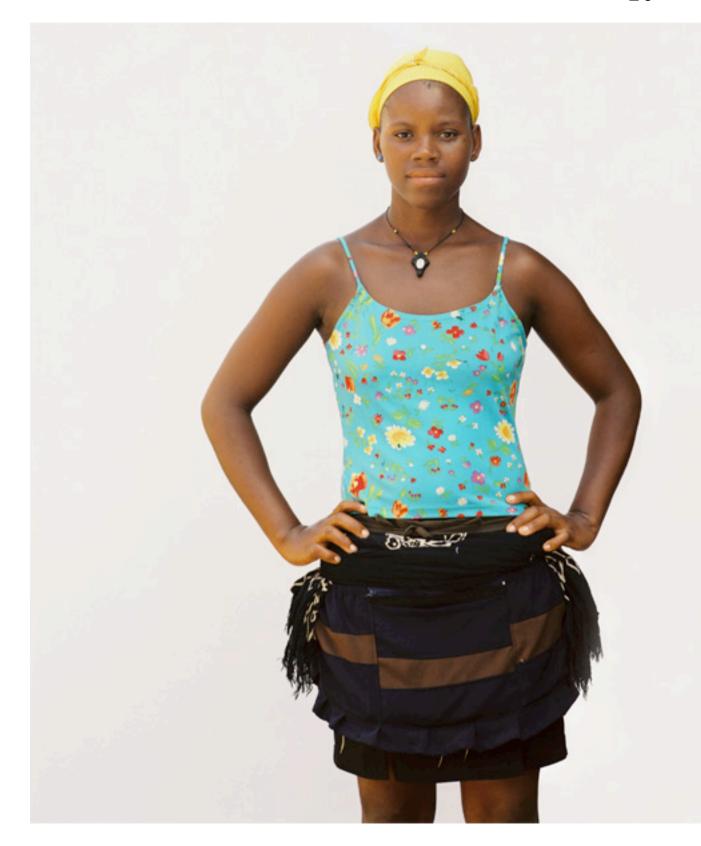
HunchWorks: a use case

Kissa: analyst

Kissa works in Pulse Lab, Uganda.

She notices an increase in population movements from Kenya and suspects that it is in response to the unfolding drought in the Horn of Africa but lacks concrete evidence.

She decides to post to HunchWorks to gather further evidence.



Create a new hunch

Title: (required)

Horn of Africa drought causing influx of displaced persons in Uganda

Description: (required)

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Add evidence: TWEET DATASET LINK PHOTO VIDEO OBSERVATION

Upload a photo | Create an album

Tags: (optional but recommended)

+ Add another piece of evidence....

+ Add another tag

climate change agriculture uganda

Location: **GIS COORDINATES** PINONMAP DRAW ON MAP LOCATION NAME Alero-Quiu Baroga Nebbi Pakwach Apala Raidhao Nyaravur Parombo Logo Kabarega National Park Obalang o Niarembe Boroboro OAc. Amuria Aduku Apac Bugungu Game Reserve A 104 o Aminteng Kigumba Lac Albert Lake Ky an a Soroti Masindi Uganda Bulindi Lake Kyoga Kikube Kibuye Palissa o Nalweyo Kakindu Kiboga Luweero Naminage II Buta Nawanyago

Existing hunches that may be similar to yours....

BY KEYWORDS BY LOCATION BY EVIDENCE

Drought in Somalia resulting in IDPs

by Jason C. and 10 others

10 pieces of evidence 25 comments

Food crisis impacting communities in southern Uganda

by Brett M. and 5 others

5 pieces of evidence 50 comments

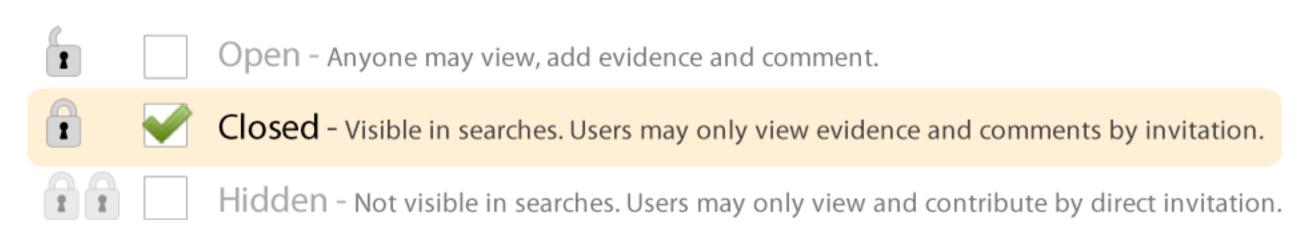
Climate impacts forcing communities to abandon farmland

by Jason C. and 10 others

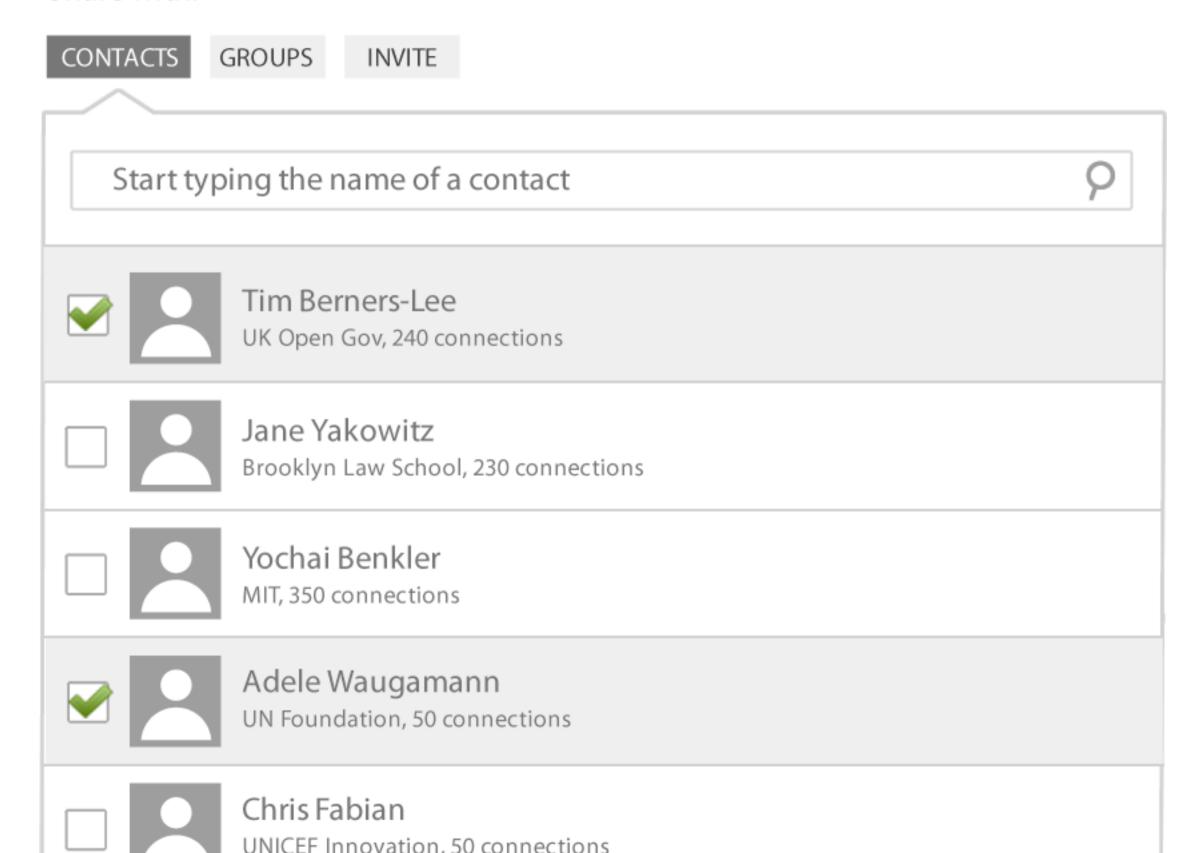
10 pieces of evidence 25 comments

Marketplace figures suggest climate impacts on

Security and sharing settings: (required)



Share with:



CONFIDENCE TITLE



Drought in Somalia resulting in IDPs in Uganda

Jason C. commented on the evidence | 10 pieces of evidence | 25 comments just updated



Food crisis impacting communities in southern Uganda

Brett M. added evidence | 5 pieces of evidence | 50 comments

10 minutes ago



Climate impacts forcing communities to abandon farmland

by Jason C. and 10 others | 10 pieces of evidence | 25 comments

15 minutes ago



Marketplace figures suggest climate impacts on Somali economy

by Brett M. and 5 others | 5 pieces of evidence | 50 comments

10 minutes ago



Environmental impacts forcing migration from Horn of Africa

by <u>Jason C.</u> and <u>10 others</u> | 10 pieces of evidence | 25 comments

1 day ago



Food crisis impacting communities in southern Uganda

by Brett M. and 5 others | 5 pieces of evidence | 50 comments

1 day ago

75%

Climate impacts forcing communities to abandon farmland

by Jason C. and 10 others | 10 pieces of evidence | 25 comments

1 day ago



dailymonitor Daily Monitor 13 by rassina

#dailymonitor A row has broken out in Kenya's government over the huge influx of Somalis fleeing the region's worst drought in 60 years.

6 hours ago

globaldevelopment

Africa drought pushes Kenya and Somalia into pre-famine conditions



UN says that more than 10 million people are affected in areas of Djibouti, Ethiopia, Kenya, Somalia and Uganda

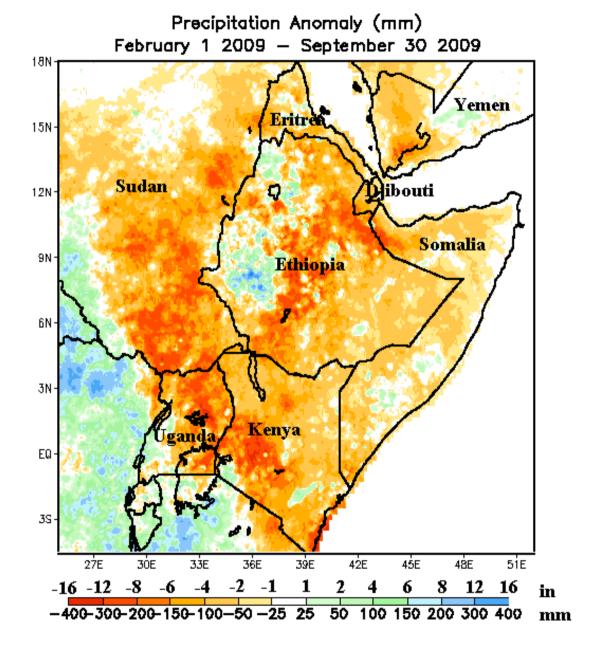
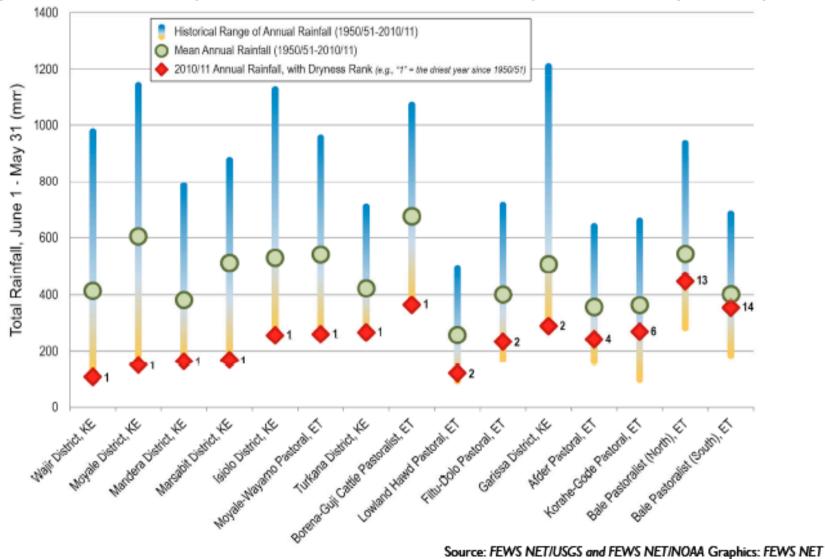


Figure 2. 2010/11 rainfall compared to historical totals since 1950/51 in select pastoral areas of Kenya and Ethiopia



Recent Activity

+ 25 **-** 0



Evidence 1 details			
Evidence claim Does this evidence support or r	refute the hunch?		
9 Strongly refute 7 Refute 6 Neutral 2 Support 4 Strongly support	This evidence does not support the hunch.		
Contributor review Does the claim made by this evidence hold water?			
9 Strongly support 7 Support 6 Neutral 2 Refute 4 Strongly refute	I support the claim made by this hunch.		



John Doe Expert

Regional data analyst, Western Sahara area. Independent Data Firm Skills

Data mining

Data tracking

Weather patterns

Credibility

Trustworthiness	+ 241	— 41	
Activity	+ 60		
Contribution	+ 36	— 2	
Expert opinion	+ 40	— 3	

- 36 Supported arguments
- 10 Hunches contributed to
- 2 Hunches opened
- 20 Credible evidence
- Hunch confirmed
- 2 Times worked together

Resolving a hunch

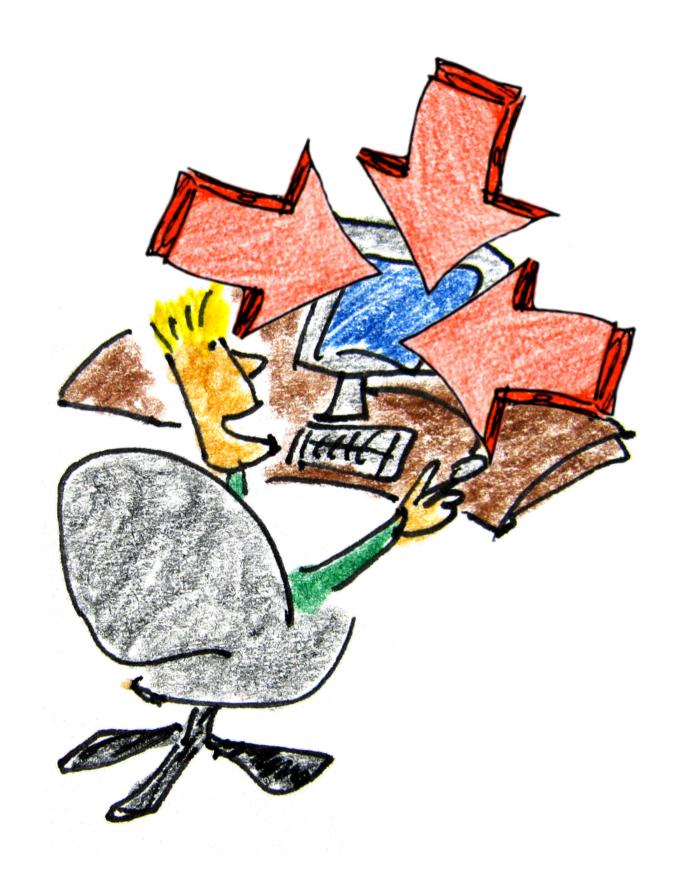
Once Kissa has determined that enough credible evidence is amassed, she may **opt to change the status** of the hunch to reflect the hunch being:

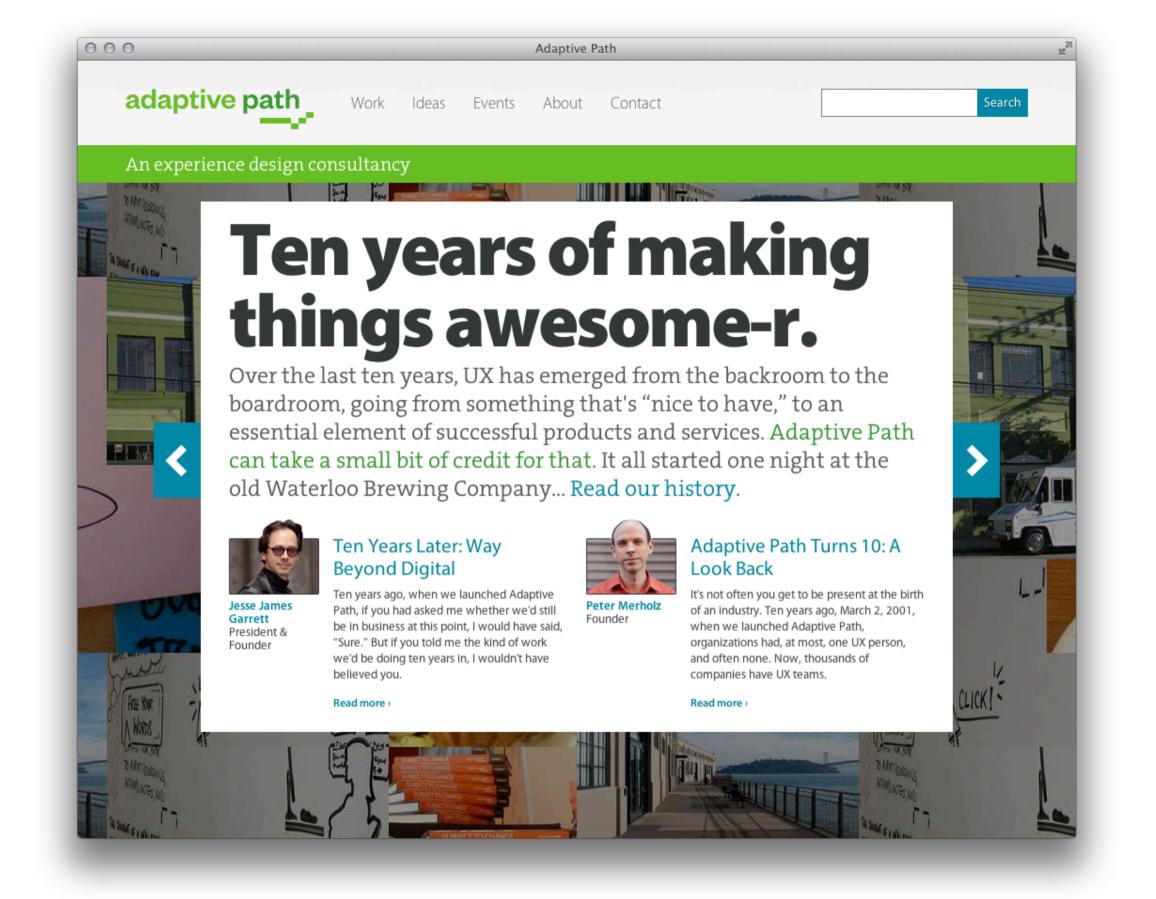
- proven
- disproven
- closed

We are also considering allowing contributors to vote on hunches where the hunch owner allows it or for whatever reason is no

Designing the HunchWorks Experience





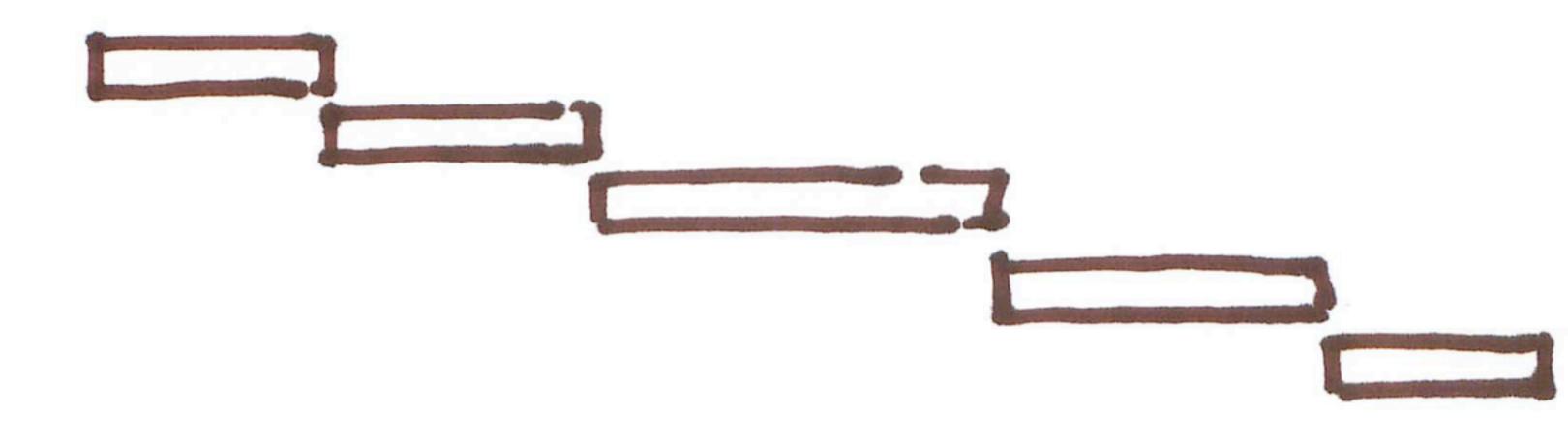


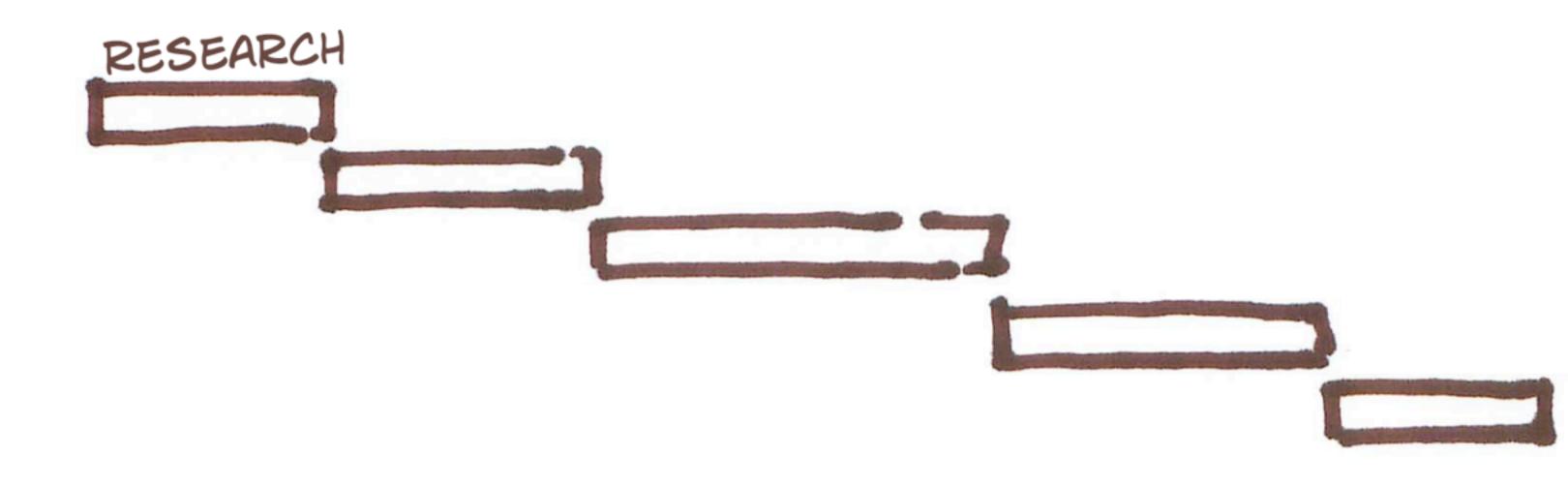












INSIGHTS



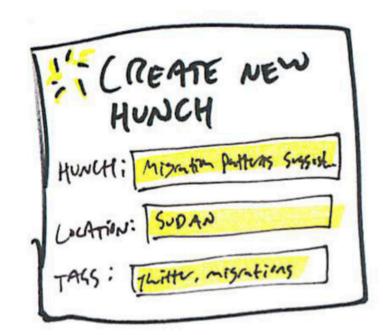


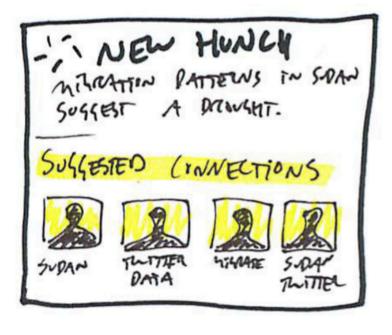
TINSIGHTS

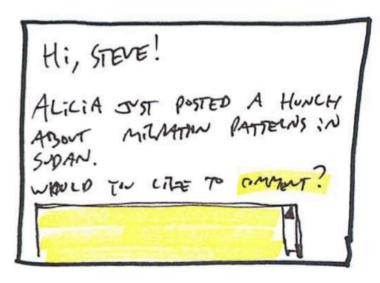
CONCEPTS

"INSTANT CONNECTIONS FOR A NEW HUNCH."

(NEW HUNCH, TAGGING, METARATA, SUGGESTIONS, COMPLEMENTAT SKILLS, COMMENTS)









Welcome Back, Sarah.
You've located in New York City.
You've retworking Huncles created: 2 shows whenhales

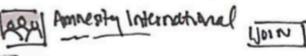
START A NEW HUNCH	HUNCH
RECENT HUNCH UPDATÉS	
Migration Patterns juggest a thranget by Jason C. and loomers. Zimays	9 just now
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Migration Patterns Eggs a drought by mil 6. and 7 omers , i inage	Q 'S min
Mryahan Patterns suggest a draght.	0 ' nr
	VIEW MOPE
DECENT CONFIRMED HUNCHES	
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Migramon Patters ruggests a drught by Philo. and 30 mars. 5 images	orbinad 1 day ago
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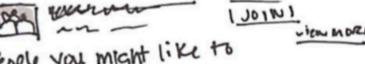
YOUR HUNCHES | COMMUNITY HUNCHES



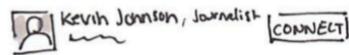
Communities you might like to join based on your interests

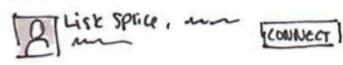


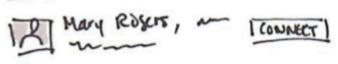




People you might like to connect with based on your interests







NIEW MOLL

INSIGHTS

CONCEPTS

WIREFRAMES

Suggested Connections

Complementary









Similar









Invite Colleagues

john@redcross.org, tina@nytimes.com, jane@standford.edu

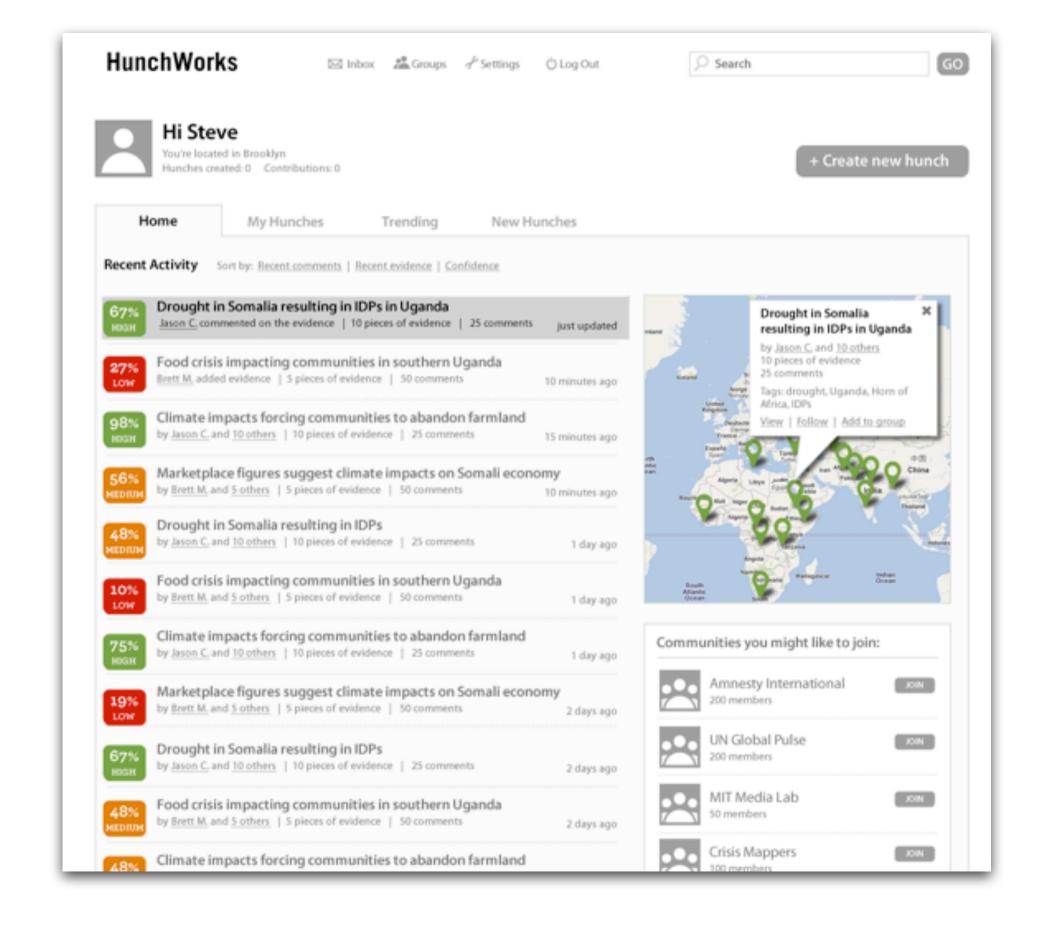
I'm using this service to mature my hypothesis, care to help?

Welcome Leah!

Profile 50% Complete

Fill in your education history to become 66% complete.

I'm not Interested



INSIGHTS

CONCEPTS

WIREFRAMES

VISUAL

WHAT IT ACTUALLY FEELS LIKE

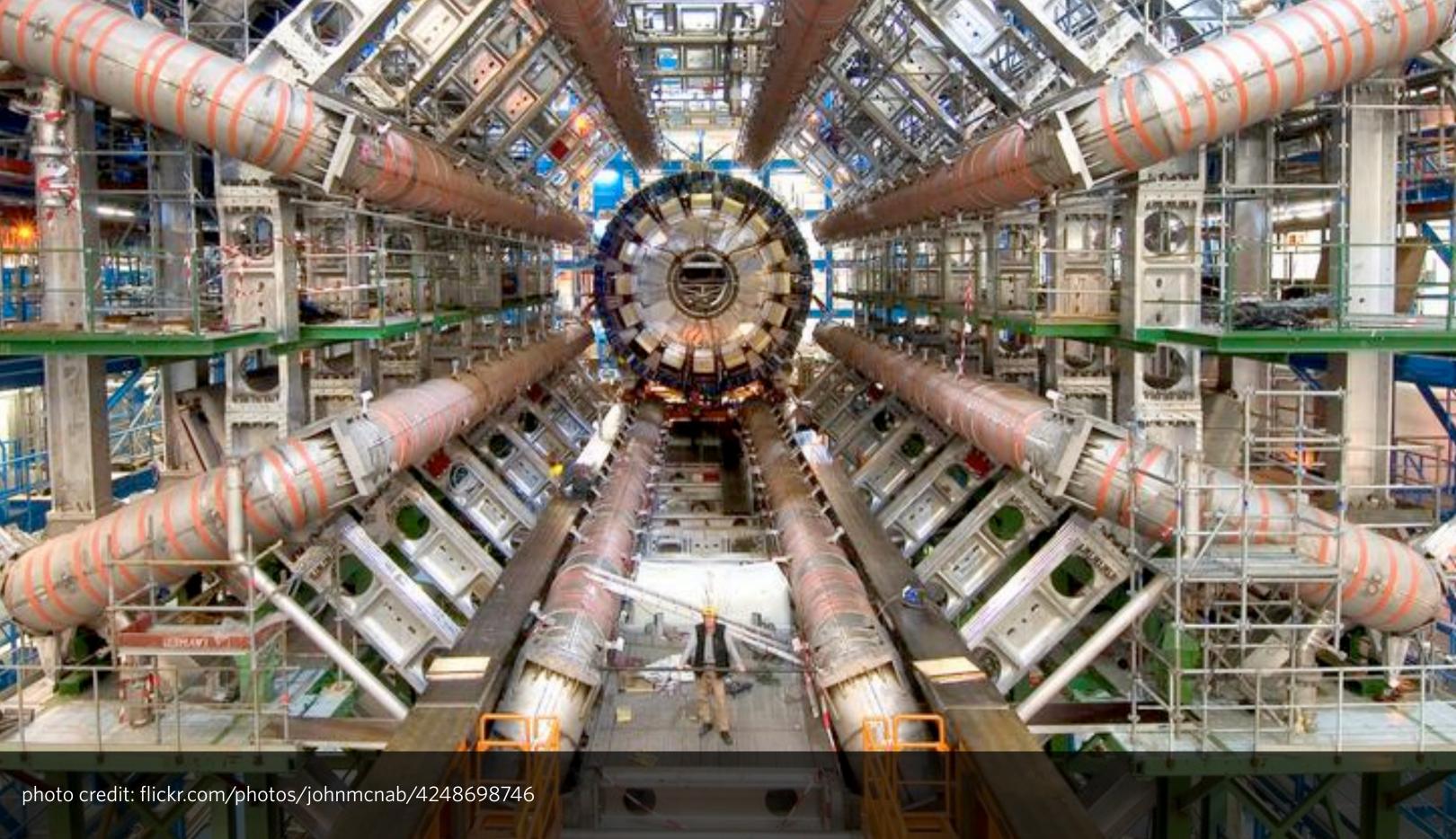


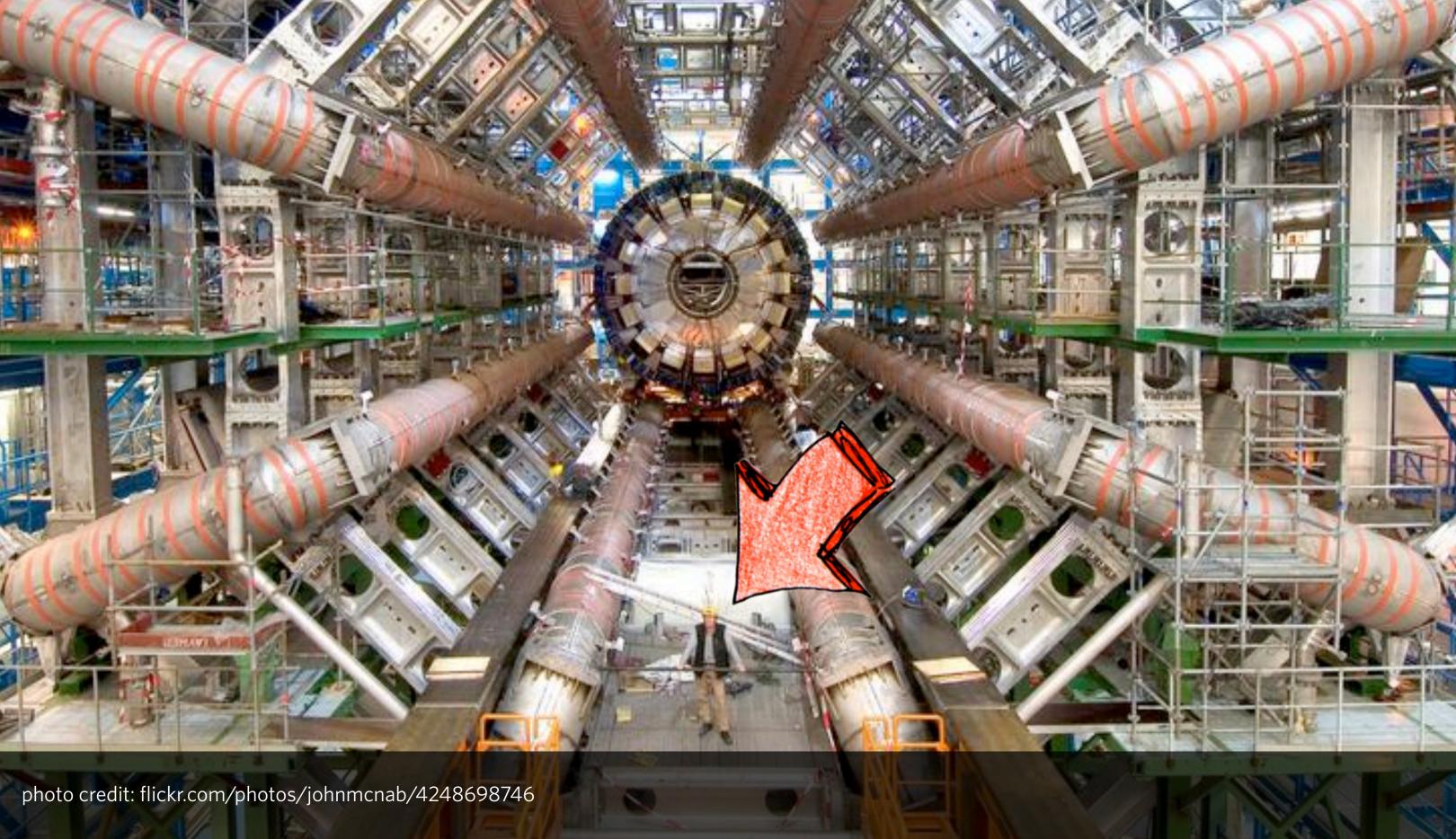
WHAT IT ACTUALLY FEELS LIKE

People are complicated.

Saving the world is complicated.

Trying to save the world with people?





7 billion people.

7 billion people.5 billion mobile phones.

People are more than tailpipes.

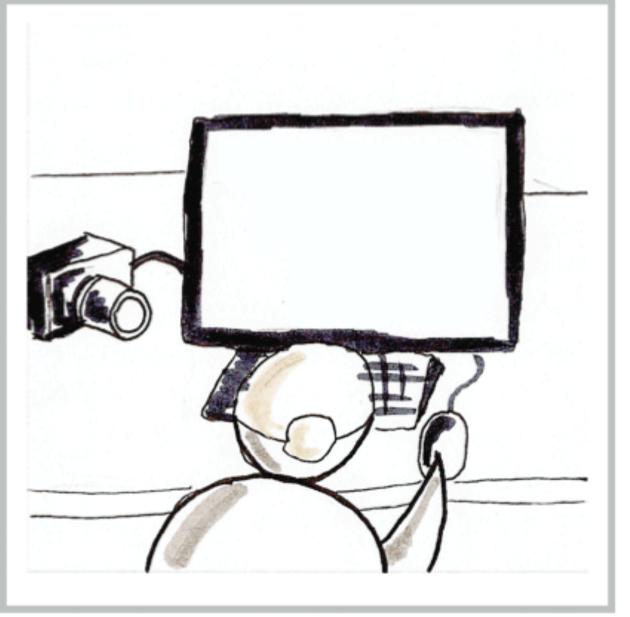
People are more than tailpipes. 7 billion HunchWorks users?

From 7 billion to 2,000.

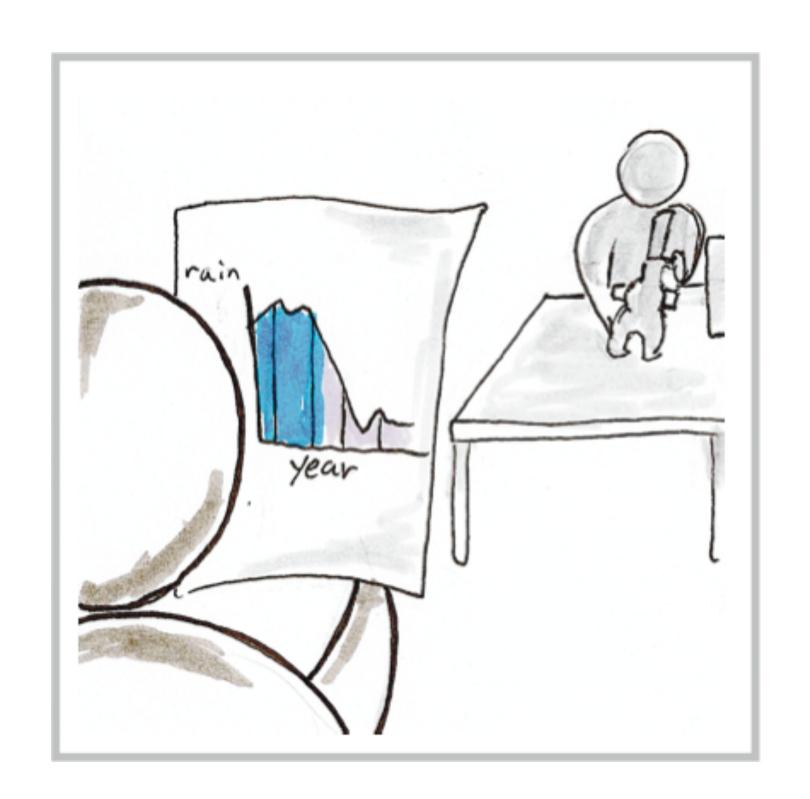
HunchWorks Users





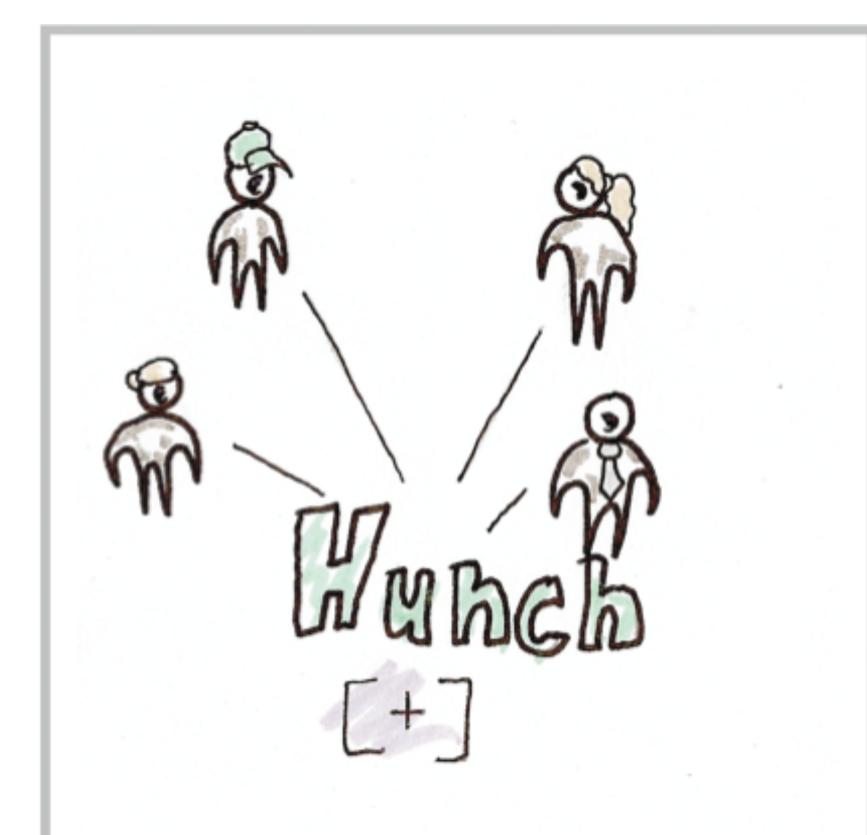












How?

How?

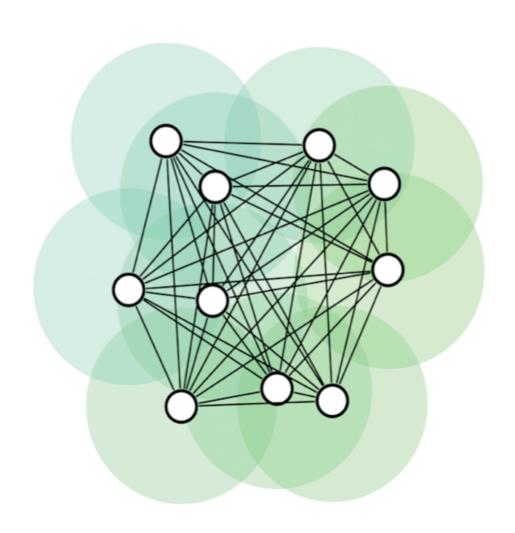
How? Why?

Tools alone will not be enough to sustain HunchWorks.

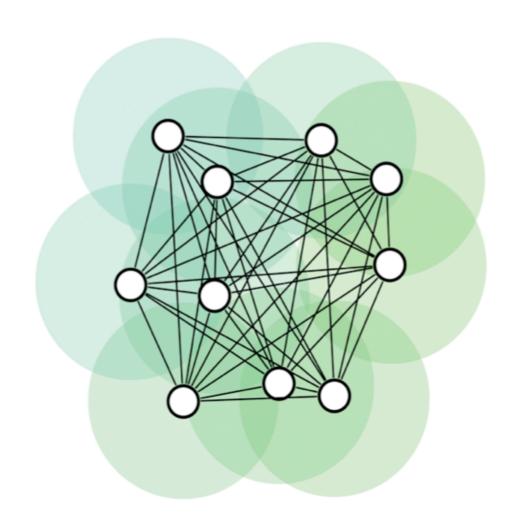
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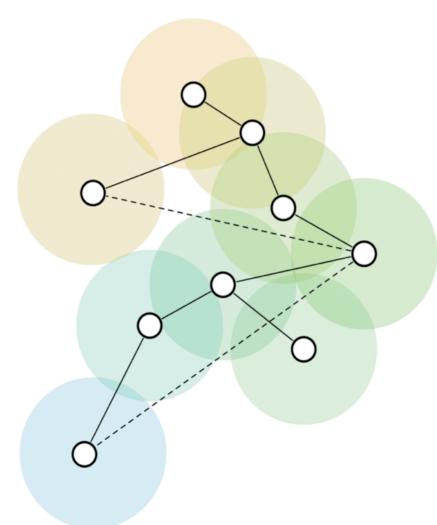
We must build a strong community around these tools.

Leverage existing connections...



Leverage existing connections... and suggest new ones.





HunchWorks Complete these steps to start 1. Profile 2. Connections 3. Hunches Tell us about yourself Or import your profile info...

First Name	Occupation
	Companion
Last Name	Organization
Location	Expertise
Email Address	Skills (separate with a comma) e.g. data visualization, GIS analysis, mobile data collection etc
Twitter	
@username	
Skype	Background and interests
	give a brief overview of yourself
What I've Studied	

in Import from LinkedIn





HunchWorks Complete these steps to start 1. Profile 2. Connections 3. Hunches Tell us about yourself Who I Am First Name Occupation Sign In Import from LinkedIn

Organization Last Name Location Expertise Email Address Skills (separate with a comma) e.g. data visualization, GIS analysis, mobile data collection etc Twitter @username Background and interests Skype give a brief overview of yourself What I've Studied Institution



Connections depend on trust.

TRUST IS FORMED 1 +0 1

COMMUNITY
LEADERS
HAVE A
RESPANSIBILITY
TO CONNECT
VITH NEW
USER1



COMMUNITY

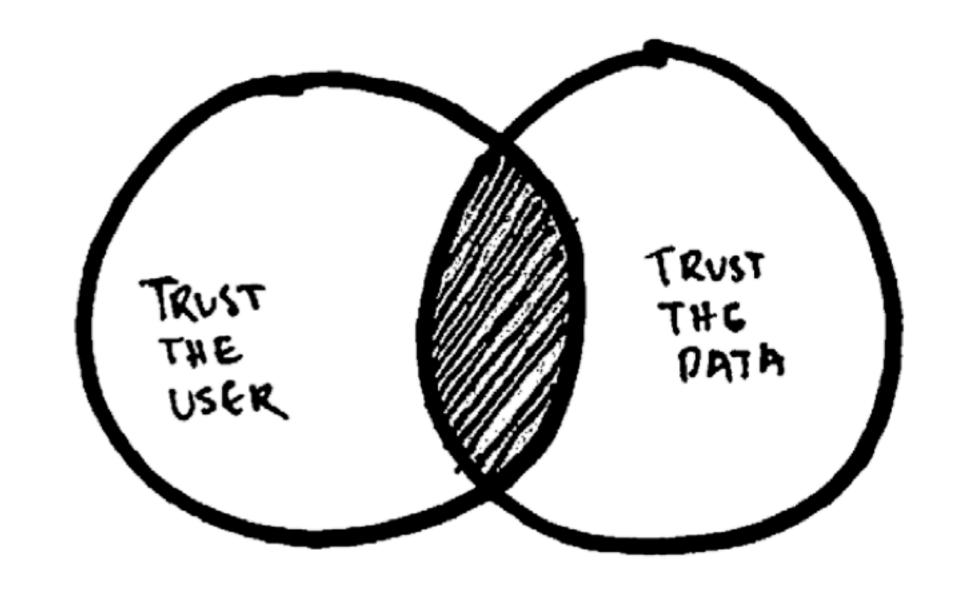
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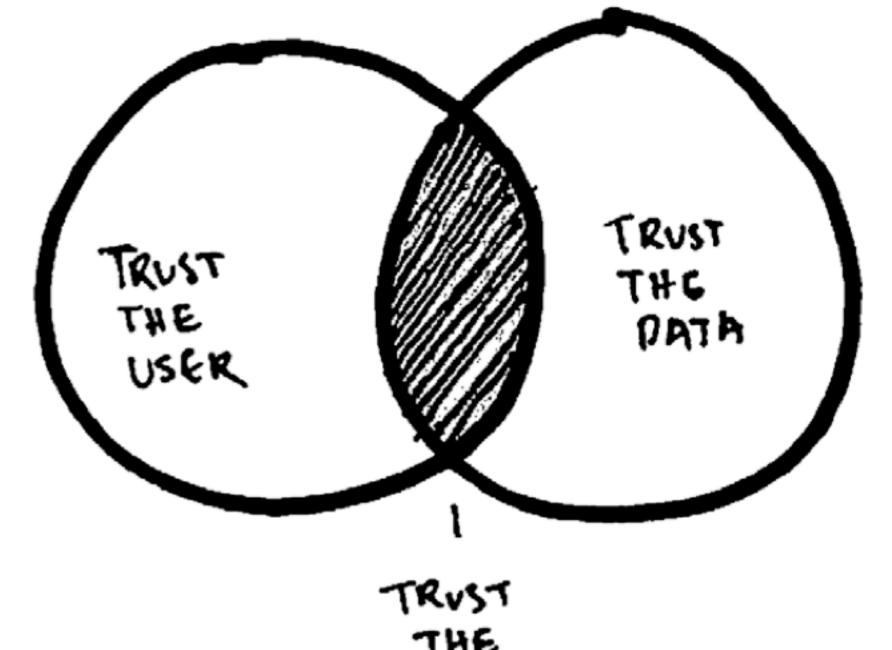


NEW USER JOHN

Hi John! Our community is very excited to have you. If you need anything or have any questions at all, don't his tate to contact one







TRUST THE HUNLH

Create a new hunch

Title: (required)

Horn of Africa drought causing influx of displaced persons in Uganda

Description: (required)

Bold Italic |≡ Bullets |≡ Numbers & Link

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Tags: (optional but recommended)

dimate change agriculture uganda

Lac Aberl Nation Gis COORDINATES Pin ON MAP DRAW ON MAP Location NAME Reserve Kabarega National Park Nation

Related Hunches

Existing hunches that may be similar to yours...

BY KEYWORDS

Y LOCATION

BY EVEDENC

Drought in Somalia resulting in IDPs

by Jason C. and 10 others

10 pieces of evidence 25 comments

Food crisis impacting communities in southern Uganda

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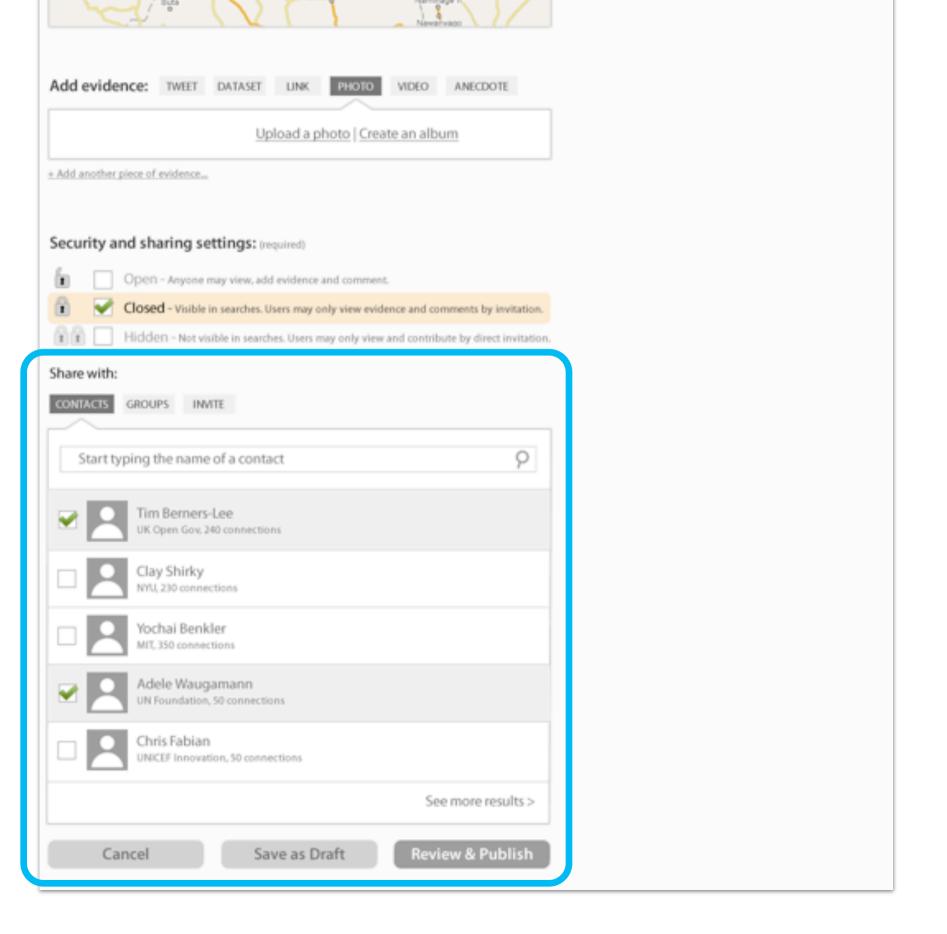
by Jason C. and 10 others

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Marketplace figures suggest climate impacts on Somali economy

by Brett M. and 5 others

5 pieces of evidence 50 comments



A hunch is the discussion surrounding it.

Confidence 67% HIGH

Horn of Africa drought causing influx of displaced persons in Uganda

Created August 8, 2011 by Author (you)



Unfollow

Add to group

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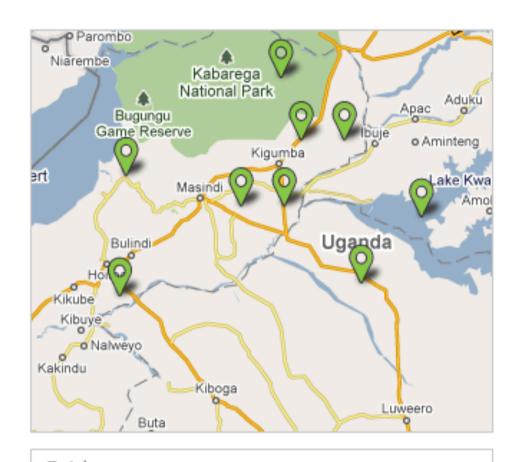
HIGH recent activity in the past week

- + Significant credibility gained
- + Evidence added
- Estimated confidence is HIGH

- + 16 positive contributions
- 2 negative contributions

OPEN Anyone may view, add evidence and comment.







Confidence 67% HIGH

Horn of Africa drought causing influx of displaced persons in Uganda

Created August 8, 2011 by Author (you)



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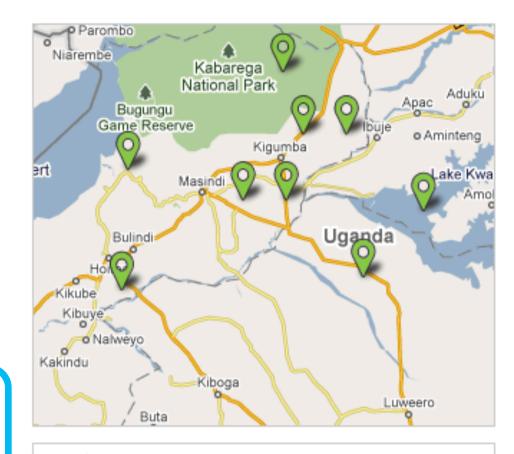
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VIEW I

















Confidence 67% HIGH

Horn of Africa drought causing influx of displaced persons in Uganda

Created August 8, 2011 by Author (you)



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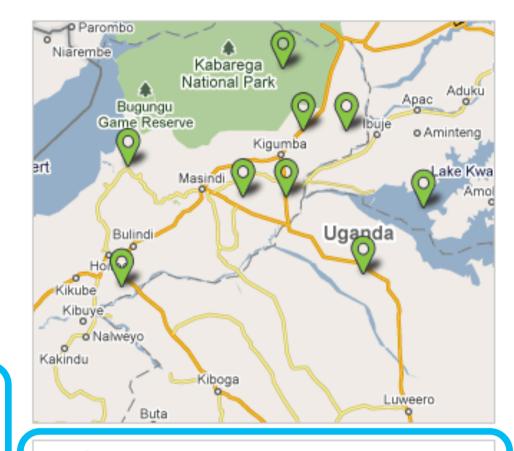
HIGH recent activity in the past week

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- + 16 positive contributions
- 2 negative contributions

VIEW I















5 observations



OPEN Anyone may view, add evidence and comment.



Horn of Africa drought causing influx of displaced persons in Uganda

Created August 8, 2011 by Author (you)



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Share

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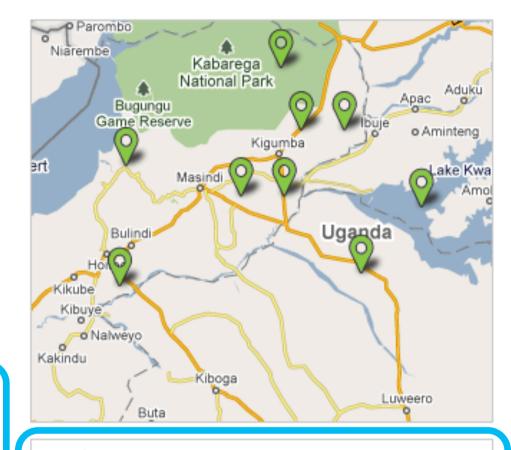
HIGH recent activity in the past week

- + Significant credibility gained
- + Evidence added

Estimated confidence is HIGH

- + 16 positive contributions
- 2 negative contributions

VIEW I





⊙⊚ □ [1] 3 videos





300 links

5 observations



OPEN Anyone may view, add evidence and comment.

HunchWorks is an action engine.

HunchWorks is an action engine.

"Is this hunch true enough to do something about it?"

Making that action happen.



Open Source and the UN

Code Jams

Blue Hacks
Open Innovation

Git Repositories Hackathons

Licensing Models

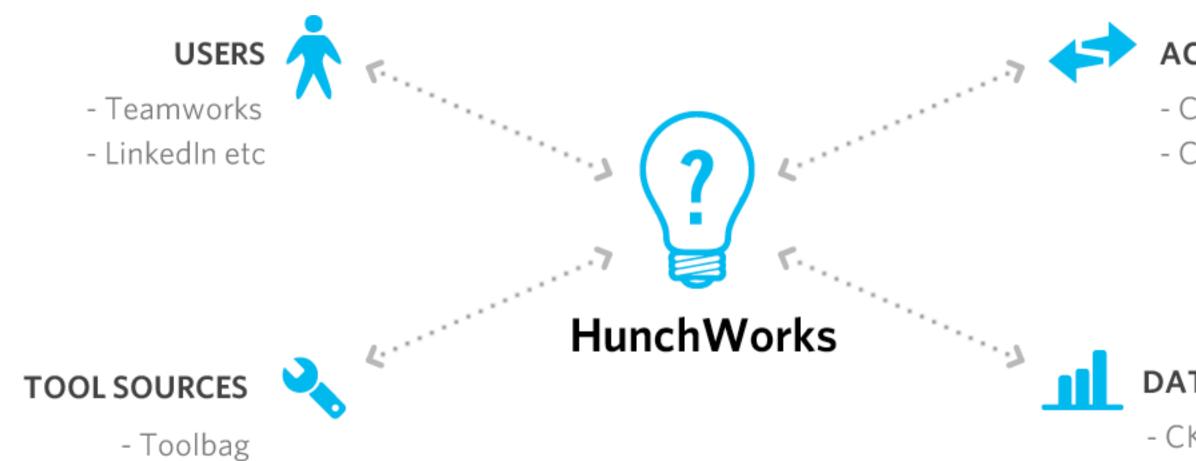
Facilitation

Integration

- disaster kit,

- apps, tools,

- open source + commercial plugins





- CRMAT
- CIMS

DATA SOURCES

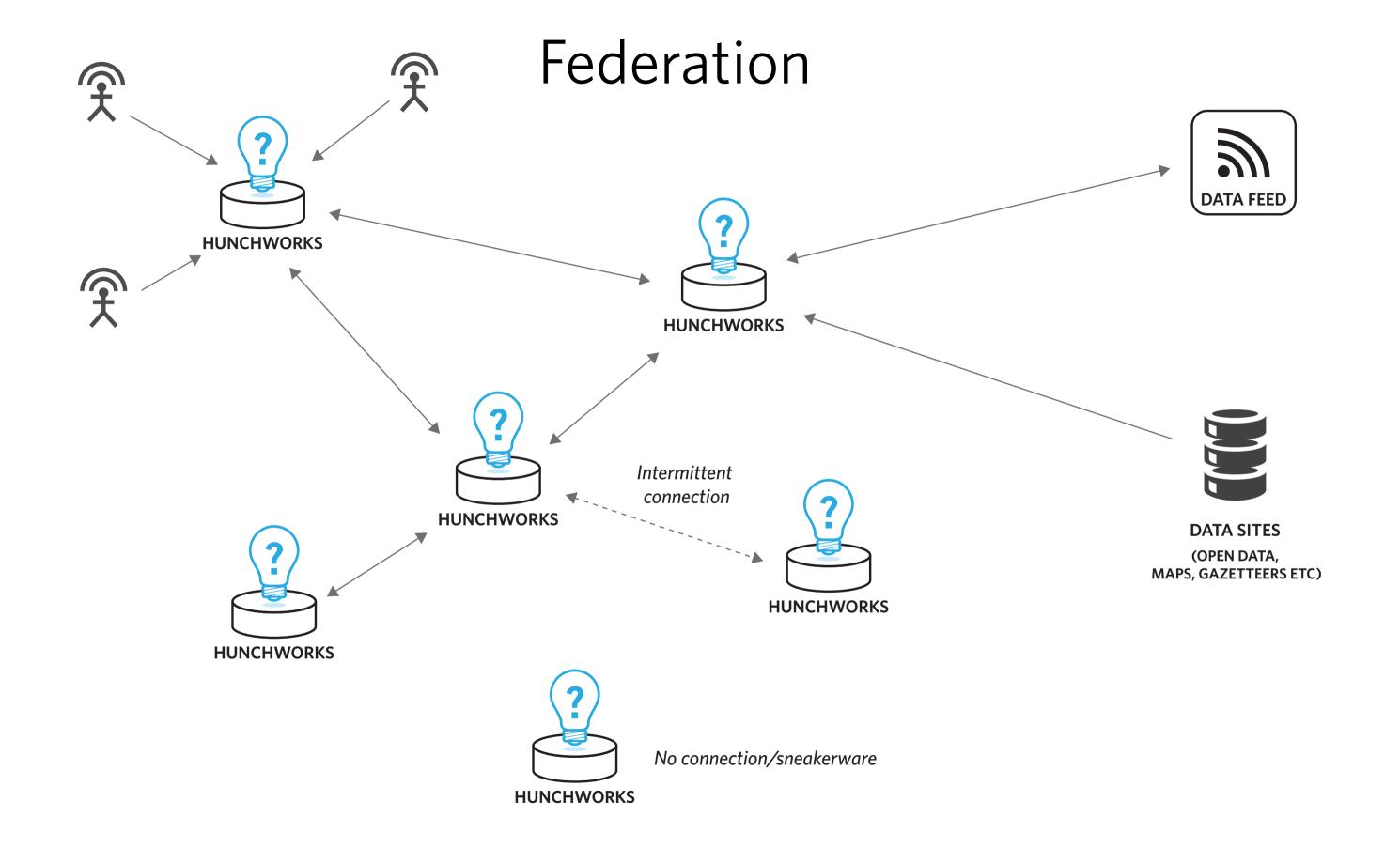
- CKAN
- commercial sites
- Geonode
- UNSDI

Algorithms

- Similarity and complementarity metrics
- Relevance
- Credibility
- Hunch splitting, merging and clustering
- Mixing human insight with big data results

System Issues

- Security
- Localisation
- Federation



Timeline

Roadmap

- to November 2011 (prototype delivery)
 Hunchworks is in the Proof of Concept stage.
- From November 2011 til January 2012 (first release)
 Hunchworks is in seed stage (early development), looking for angel-style funding through UN Foundation.
- From Feb 2012 till Jan 2013 (first full-featured release)
 HunchWorks is in early stage development

We need your help!

- Funding
- Beta Communities
- Development partners
- Did I mention funding...?

Thank you

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