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UNIVERSITY OF TWENTE.



Are you ready for Citizen Science?

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- Assistant Professor
- Department of Information Science – Open University
- Specialization:
Knowledge management, organizational learning,
technology and new ways of working, such as Crowdsourcing & Citizen Science.
- Background/Experience:
PhD – KIN research group – VU Amsterdam
Information specialist – University Library VU
Market research manager – Philips Consumer Electronics
Management & Business Administration – Universitat Autònoma de Barcelona

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- Assistant Professor
- Department of Geoinformation Processing, Faculty of Geo-Information Science and Earth Observation (ITC), University of Twente
- Specialization:
geo web technology, spatial data infrastructures, interoperability standards, volunteered geoinformation, citizen science and semantic modelling
- Background/Experience:
PhD – TU Delft
Visiting scientist at Google
Lead architect ontology development Living Textbook application
Organiser OpenStreetMap mapathons

COURSE

What is Citizen Science?



Is this Citizen Science?

“Jane is a long-time supporter of the charity British Trust of Ornithology (BTO) work, as she cares about birds. She is an active supporter of the Garden Birdwatch programme (GBW) and happy to give it £17 a year. However, she doesn’t have time to carry out the birdwatching survey. She is reading with interest the reports from the BTO GBW and finds the information motivating to continue her support of the project.”

(Haklay et al., 2021, p. 11)



Is this Citizen Science?

“Erik is a teacher in Uppsala, Sweden. For the past 15 years, he is running a weather station that is part of the Weather Underground’s Personal Weather Station Network with over 250 000 participants who share their observation data, just like Erik. In return for the data sharing, the company is providing tech support, data management services and customized, free-of-charge access to forecasts. The company uses the data to produce a global weather forecast as a commercial service.”

(Haklay et al., 2021, p. 11)



Is this Citizen Science?

“Femke is a teaching assistant in Eindhoven, the Netherlands. She has heard about a website where you can help astronomers by classifying images of galaxies. She didn’t expect to get hooked on the experience, but after a few classifications, she finds that looking at these images is fascinating and in doing so, she has learnt new things about the universe and the composition of galaxies. She is dedicating significant time every evening to classify galaxies on the website. The results of her analysis will be used by the scientists who developed the platform to publish important scientific papers.”

(Haklay et al., 2021, p. 12)



Citizen Science

Participative form of organizing research where citizens and researchers work together to answer empirical questions.



https://youtu.be/HUQF_YfGcJI



Examples of Citizen Science

The screenshot shows the eBird website homepage. At the top, there's a navigation bar with 'eBird' and a 'Sign Up' button. Below that, a banner reads 'Welcome to eBird' with a 'Sign Up' button. A central section promotes 'GLOBAL BIG DAY 2013' with a world map and a 'Learn More' button. To the right, there are logos for 'The Cornell Lab of Ornithology' and 'Audubon'. A 'Help Support eBird' section with a 'Donate Now' button is also visible. At the bottom, a 'News and Features' section highlights 'Global Big Day: Worldwide Success 18 May 2013' and lists '6013 species, 42920 checklists, 13664 people. One Glob al Big Day. Inspiration: Amazing'.

The screenshot shows the Galaxy Zoo website. The top navigation bar includes 'CLASSIFY', 'ABOUT', 'SCIENCE', 'GALLERY', 'FORUM', 'FAQ', and 'LANGUAGE'. A prominent yellow banner at the top right says 'GALAXY ZOO'. The main heading reads 'Few have witnessed what you're about to see' with a sub-headline 'Experience a privileged glimpse of the distant universe as observed by the SDSS, the Hubble Space Telescope, and UKIRT'. Below this, a large image of a galaxy is shown. The text 'Classify Galaxies' is followed by a brief description: 'To understand how galaxies evolved we need your help. Identify galaxies according to their shape. If you're good, you'll earn the title of Citizen Scientist. If you're not so good, you'll be a citizen.' A yellow 'Begin Classifying' button is at the bottom left.

The screenshot shows the FoldIt website. The top navigation bar includes 'FOLDIT', 'CATEGORIES', 'GAMES', 'FORUM', 'HELP', 'FAQ', 'ABOUT', and 'TROUBLE'. A green banner at the top right says 'fold it' with the tagline 'Solving Protein Folding Problems for Science'. Below this, there are several navigation links: 'FREEZE', 'CATEGORIES', 'GAMES', 'FORUM', 'HELP', 'FAQ', 'ABOUT', and 'TROUBLE'. A 'GET STARTED: DOWNLOAD' section is visible on the right, with buttons for 'Mac OS X', 'Windows', and 'Linux'.

The screenshot shows the Cyclone Center website. The top navigation bar includes 'Home', 'About', 'Public', 'FAQ', and 'Blog'. The main heading reads 'Cyclone Center'. Below this, there's a section titled 'What is Cyclone Center?' with a description: 'Cyclone Center is a leading cyclone research center. Our research and forecasting efforts are best recognized by the human eye, so we need your help analyzing these storms.' At the bottom, there are two buttons: 'Get Started' and 'Learn More'.

The screenshot shows the Nanocrafter website. The top navigation bar includes 'Home', 'About', 'Public', 'FAQ', and 'Blog'. The main heading reads 'NANOCRAFTER' with the tagline 'Try our new scientific discovery game! Be creative and build your own nanoscale world.' Below this, there's a section titled 'GET STARTED: DOWNLOAD' with buttons for 'Mac OS X', 'Windows', and 'Linux'. A 'SEARCH' section is visible on the right, with a 'Google Search' button and a 'Do a search' button. At the bottom, there's a 'Release!' button.



Advantages of Citizen Science

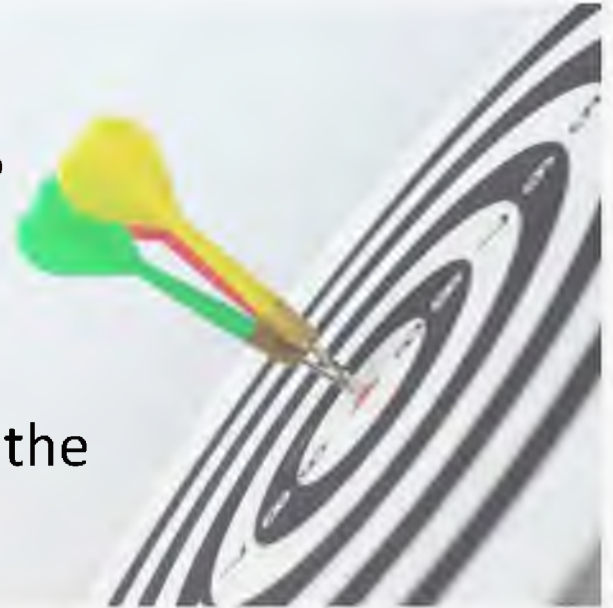
- The use of the Internet can bring:
 - Greater reach and knowledge diversity
 - Time and resource efficiency
- Engaging in citizen science can also contribute to a greater understanding of science among the public in general.

OPEN

When is a Citizen Science project successful?

Objective of the project

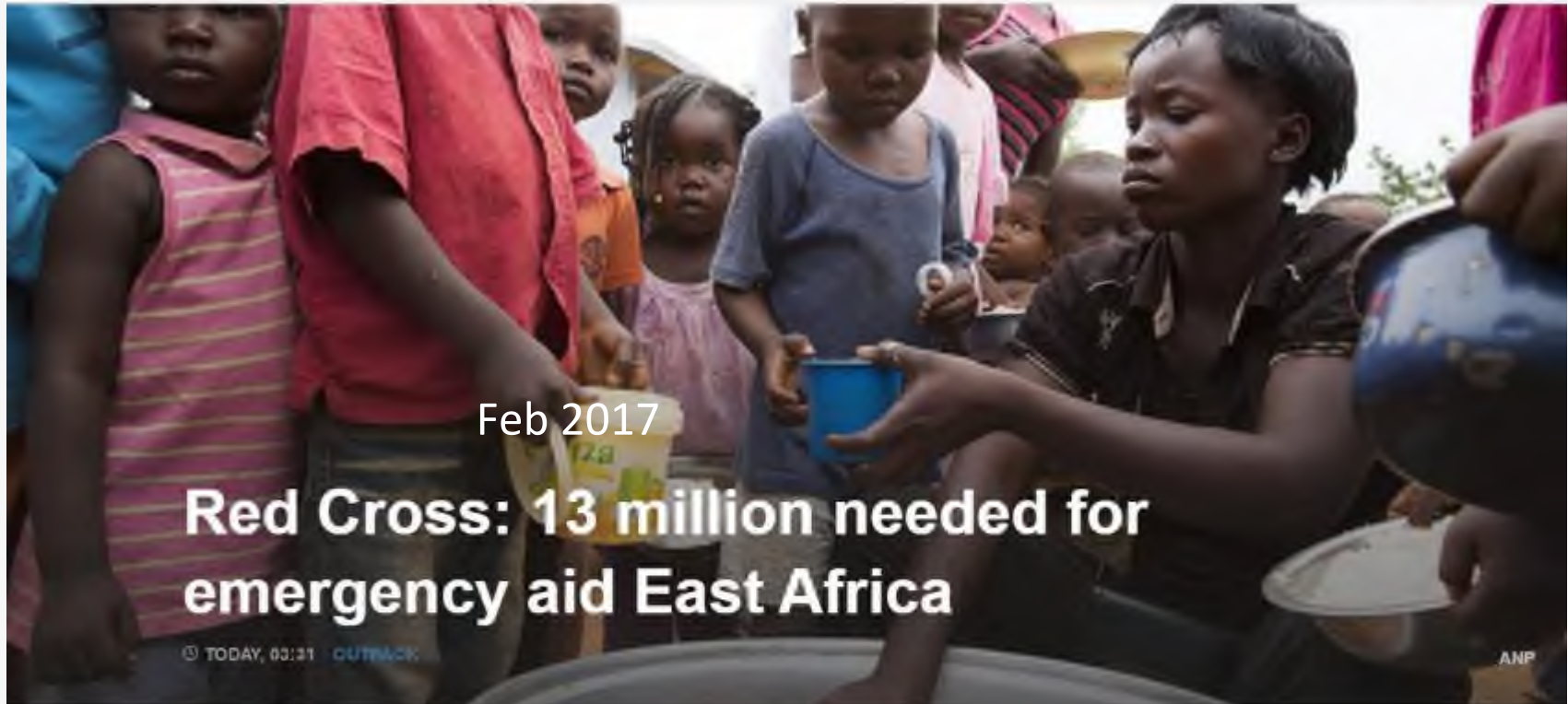
- What do you want to achieve?
- Why is Citizen Science an option for you?
- How will you measure success?
- What kind of impact do you expect from the project?





**MISSING
MAPS**





Feb 2017

Red Cross: 13 million needed for emergency aid East Africa

© TODAY, 03:31 OUTBACK

ANP

The Red Cross warns of humanitarian disaster in East Africa. Eleven million people in Somalia, Ethiopia and Kenya are likely to die from hunger due to extreme drought.

Source: Red Cross



Bvumbwe

S150

**Thousands of
people live here!**

Thunga

Namington
Tea Estate

Conforzi
Aerodrome

Pumula

Source: Red Cross



Use maps to improve planning and coordination

Source: Red Cross

#2541 - Missing Maps - Kenya - Mara region (buildings)

Mara Region, Kenya

Description Instructions **Contribute** Activity Stats

Task #622

Locked by you (10 minutes ago)

Edit with ID editor

Leave a comment

Stop mapping Mark task as done

Locked by Rob Lemmers 8 minutes ago

OSM changesets | [view](#) | [undo](#)



Missing Maps

South Sudan

Uganda

Rwanda

Burundi

Kenya

Nairobi

Dodoma

Tanzania

200 km

100 mi

Hot priority

Can't work on this
Investigate
Done
Validated

Buildings

Can't work on this
Investigate
Done
Validated



Challenges

1. Recruiting enough people
2. Keeping participants engaged
3. Ensuring quality of outcomes

1. Recruiting enough people

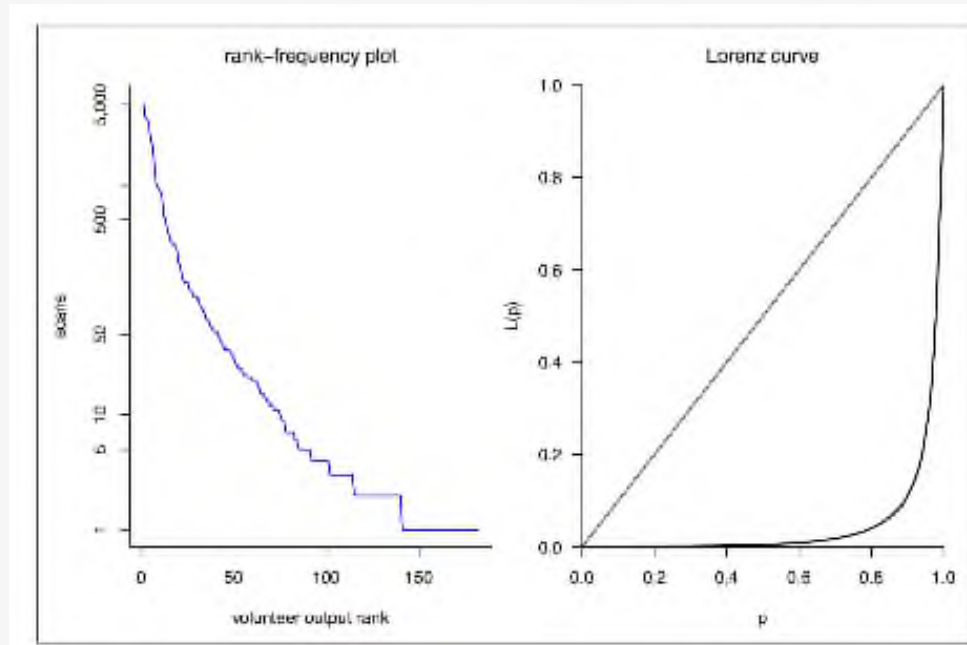


Figure 5

Recruiting volunteers

Challenge: Match between project objectives & volunteers' motivations

- Motivations
- Self-evaluation
 - ✓ What is the objective?
 - ✓ What is the task?
 - ✓ What knowledge is needed?



➤ Communication



Recruiting volunteers: Accessing knowledge

- Open call
- Targeted call
 - Network of project leader
 - Interest in the topic
 - Knowledge



2015-2016 THE UNIVERSITY OF TWENTE

NOVEMBER 14TH

MAPPING PARTY

READY TO SAVE LIVES WITH YOUR LAPTOP?

Help the Red Cross to map the world and help the people of a disaster zone in South America using OpenStreetMap.

Monday 14th November 2016
ITC, University of Twente
Auditorium and Restaurant
15:00 to 20:00 Hours

Bring your laptop!
Pizza and drinks are on us!

SPONSORS






Mapping Party

MAP THE WORLD



15:00 - 18:00 ITC
Registration, Welcome, OpenStreetMap & OpenStreetMap for Disaster Preparedness, OpenStreetMap for Disaster Preparedness, OpenStreetMap for Disaster Preparedness

18:00 - 20:00 ITC
OpenStreetMap for Disaster Preparedness, OpenStreetMap for Disaster Preparedness, OpenStreetMap for Disaster Preparedness

15:00 to 20:00
ITC Auditorium

ITC, University of Twente
Auditorium and Restaurant

SPONSORS





Motivations to participate:

- Learn
- Solve a problem
- Win a prize

Second Hackathon



Seema, India, focuses a human touch.

Water, Health and Technology experts work in solidarity to empower citizens.



The annual SEMA Hackathon is a 24-hour event where participants work together to solve real-world problems. The event is a great opportunity for students to gain hands-on experience in problem-solving, teamwork, and innovation. Participants are encouraged to bring their own ideas and projects to the event. The event is held at the Seema Research Center, India.

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Challenge 1. Simple mobile phone client for water point status reporting

Background

Up to date live status of water point status is required for a general water management. We need to create a simple mobile phone client for water point status reporting. The client should be able to report the status of water point status. The client should be able to report the status of water point status. The client should be able to report the status of water point status.

Objective

The client should be able to report the status of water point status. The client should be able to report the status of water point status. The client should be able to report the status of water point status.

Challenge

The client should be able to report the status of water point status. The client should be able to report the status of water point status. The client should be able to report the status of water point status. The client should be able to report the status of water point status. The client should be able to report the status of water point status.



OSM Africa June Mapathon: Map Lesotho

3 days Virtual
10th - 12th June 2016

World Refugee Day Mapathon (Korea)

20 days Virtual
10th - 29th September 2016



2. Keeping participants engaged

Challenges:

- Distributing tasks (volunteers and project organisation)
- Keeping volunteers motivated
- Dealing with different motivations

Volunteer engagement

- Motivations
- CS Experience
 - Feedback
 - Learning



Volunteer engagement: Activities

Events	Date
Lecture: De Moor	13/03/2014
Workshop	10/06/2014
Lecture: Prak	22/10/2014
Workshop	27/11/2014
Workshop	18/02/2015
Lecture: Yntema	07/03/2015
Workshop	15/04/2015
Workshop	13/05/2015
Lecture: Deneweth	11/06/2015
Lecture: Van Oostrom	23/09/2015
Workshop	03/11/2015
Lecture: Simoens	12/11/2015

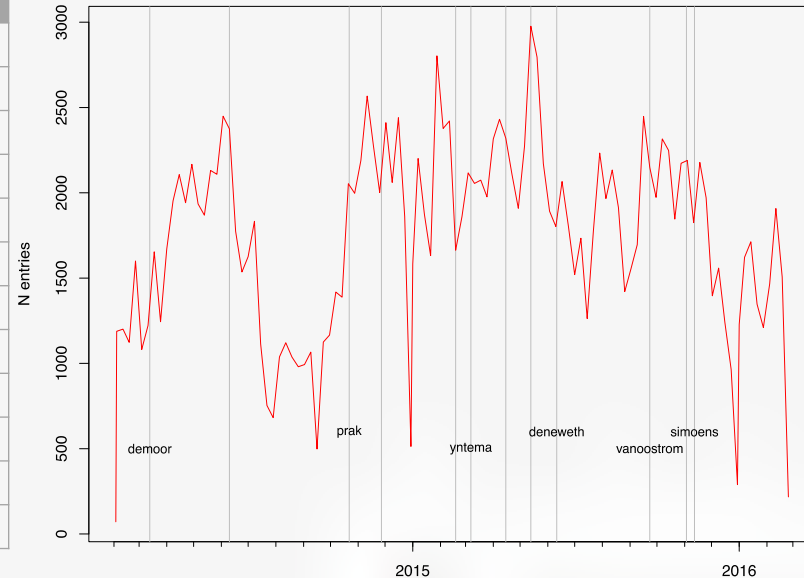


Figure 3

Volunteer engagement: Feedback

Feedback delays



Decreasing
participation
intensity

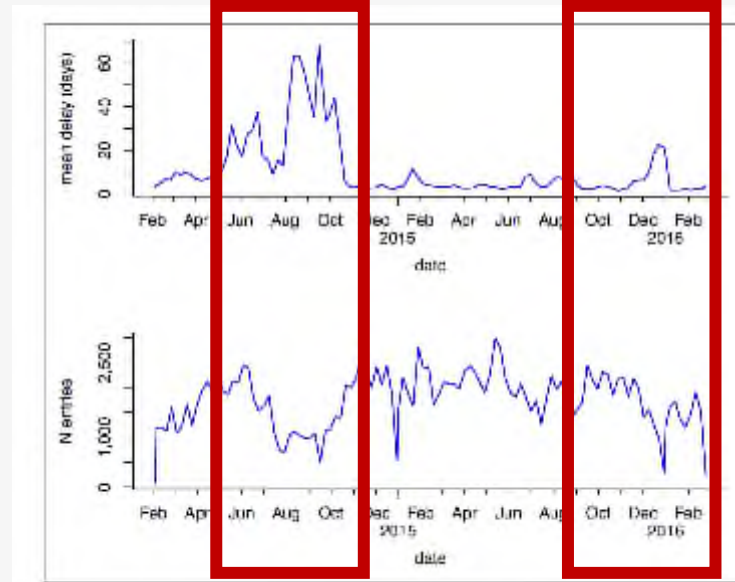


Figure 8



Volunteer engagement: Learning

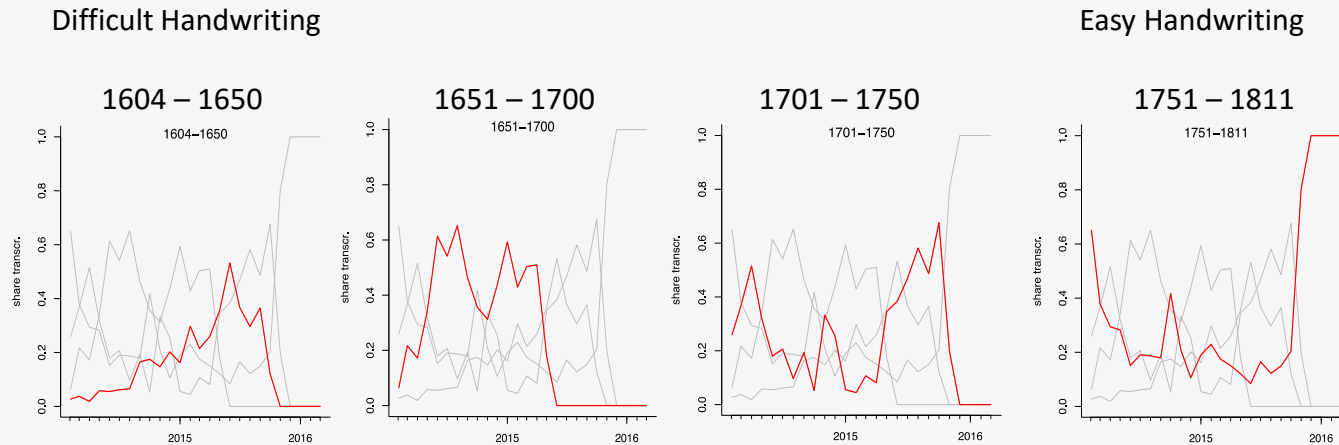


Figure 7




Sharing and Integrating Knowledge

- Training
- Manual
- Meetings
- Regular communication
- Forum



Leaderboards – Missing Maps



LEADERBOARD

missingmaps

Add Competitor

CURRENT LEADER

missingmaps

75,113,384

Total Edits

65,647,791 Buildings

1,362,790 km Roads

Source: OpenStreetMap

LEADERBOARD MAP VIEW

Leaderboard

RANK	NAME	TEAM	TOTAL EDITS	BUILDING EDITS	KM OF ROAD	LAST UPDATE
1	patrickmbaya_import	missingmaps	905,241	792,318	102.2 km	3 months ago
2	mmahmud	missingmaps	683,799	622,793	6,198.3 km	3 months ago
3	amos_import	missingmaps	660,409	672,782	75.0 km	3 months ago
4	Sauran Sharlar	missingmaps	673,279	621,525	2,433.7 km	1 days ago
5	mhsamu98	missingmaps	609,346	574,449	7,156.3 km	6 months ago
6	Libor Bednarik	missingmaps	404,319	526,991	5,916.1 km	12 days ago

Mapathon results

BEFORE



AFTER





3. Ensuring Quality of Outcomes

- Knowledge & Skills
 - What knowledge do volunteers have?
 - What knowledge is needed for the project?
 - How can you bring this knowledge to the participants?
- Quality
 - What are your expectations?
 - How will you ensure quality throughout the project?
- Authorship
 - All contributions must be acknowledged.
 - How will you do that?

Measuring Quality

Optimal string alignment (OSA) distance

Table 4

groom address 1	groom address 2	groom address final	Sim (1, final)	Sim (2, final)
aan de Slijpstenen, in de Botertom	Slijpstenen in de Botertom	Slijpstenen, in de Botertom	0.794	0.963
over de Balmstraet	over de Balonsbaen	over de Balonsbaen	0.722	1
's Gravenland	'S Gravenland	's Gravenland	1	0.923

Tracking Quality

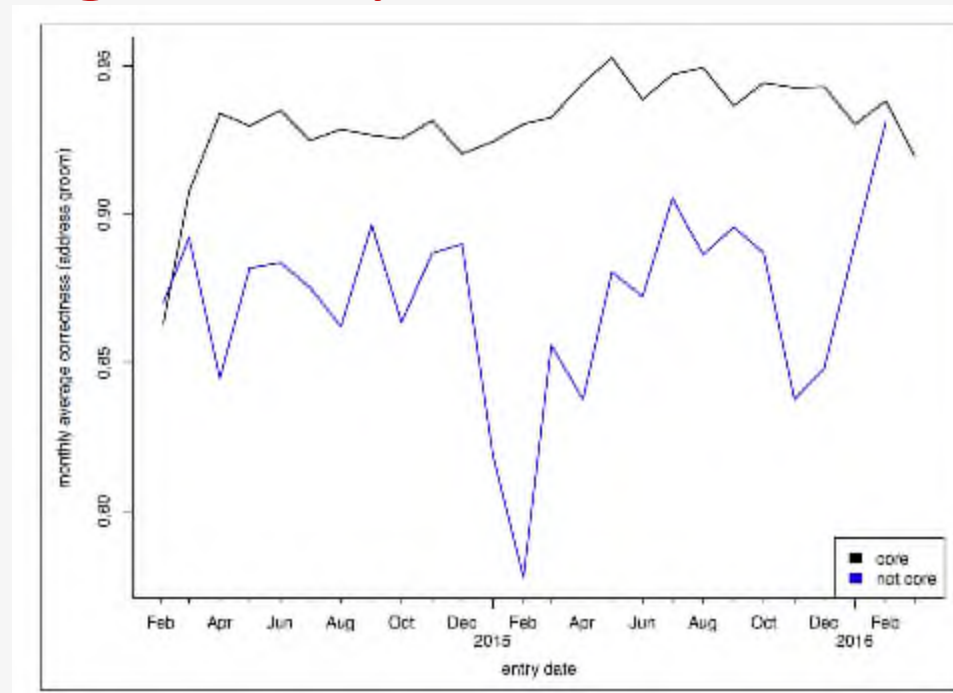
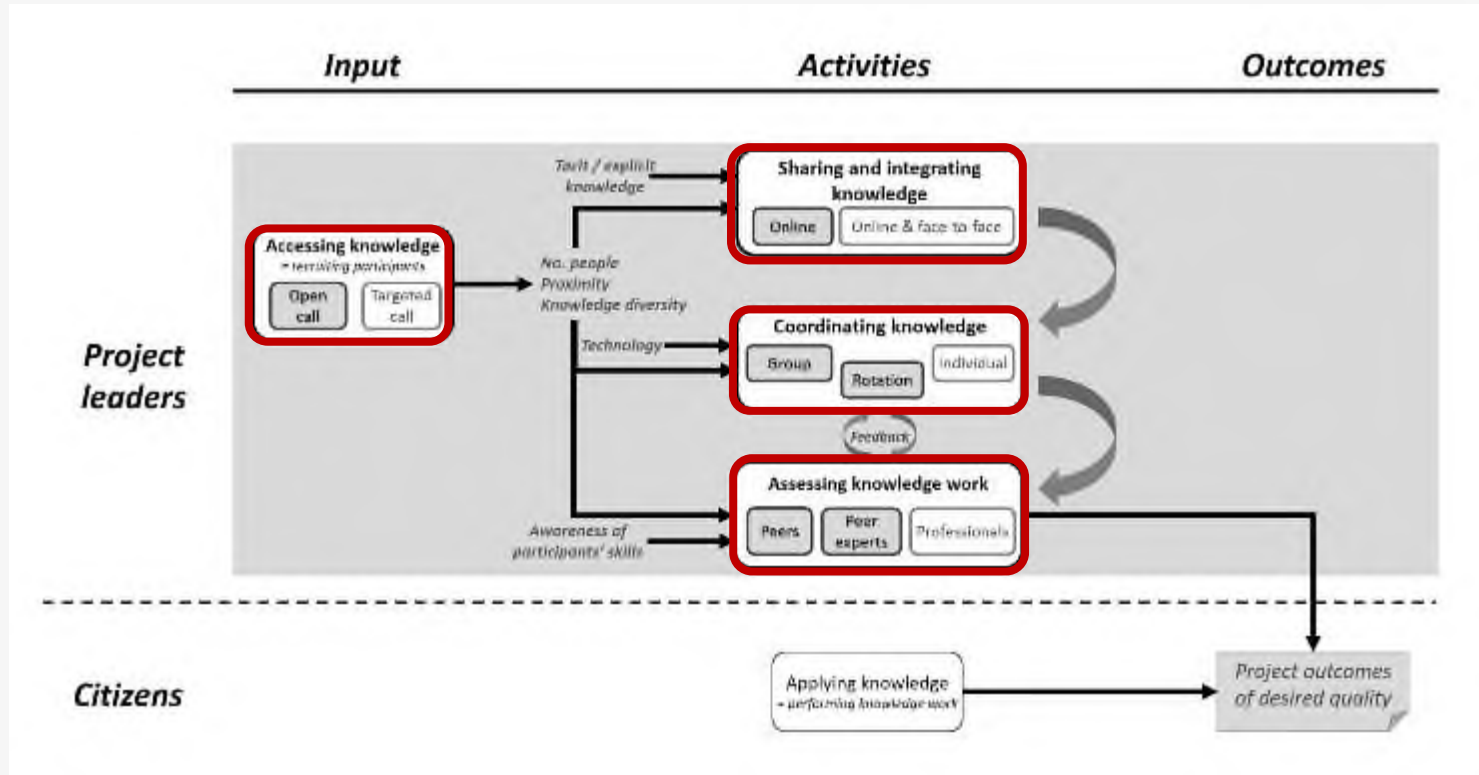


Figure 9

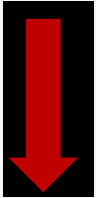
De Moor, T, Rijpma, A. & Prats López, M. (2019). Dynamics of Engagement in Citizen Science: Results from the “Yes, I do!”-Project. *Citizen Science: Theory and Practice*, 4(1), 38. DOI: <http://doi.org/10.5334/cstp.212>

How Complex CS Projects Ensure Quality



Coordinating Knowledge

- Number of people
- Proximity
- Technology

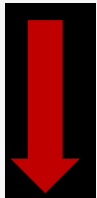


- Individual / group
- Rotation



Assessing Knowledge Work

- Number of people
- Project leaders being aware of participants expertise



- Professionals
- Peer-experts
- Peers



Validation of map quality

The screenshot displays the OpenStreetMap software interface. The main window shows a street map with numerous yellow highlights indicating validation errors. The 'Layers' panel on the right shows 'Validation errors' and 'Data Layer 2'. A 'Validation Results' dialog box is open, listing the following warnings:

- Warnings (253)
- 'cross-designated' is meaningless, use more specific tag
- abbreviated street name (2)
- Crossing buildings (1)
 - 2 ways
- Crossing ways (2)
- deprecated tagging - power=sub_station is deprecated, use power=power_line
- House number without street (217)
- Isolated node which must be connected to a way (4)
 - barrier-gate (1)
 - entrance=yes (3)
- missing tag (3)
 - alternative name without name (1)
 - amenity=recycling without recycling_type=container or recycling_type=recycling
 - electrified without railway (1)
- Odd house number in even address interpolation (7)
- Property values contain multiple white spaces - Key 'name' is not a valid key
- Route scheme is unspecified - Add public_transport=route
- Unconnected nodes without physical tags - Has tag containing 'node'
- Way end node near other highway (3)
- Way terminates on Area (5)

The bottom of the screen shows a partial view of a person's face and another person's head, suggesting a collaborative work environment. The bottom status bar contains the text: 'Lockfield Avenue (23 ... | Ctrl to toggle; Shift-Ctrl to rotate selected; Alt-Ctrl to scale selected; or ch...



Technology

What functionality is required?

Building or Buying?

- Flexibility and match with the task -> Build
- Standard functionality -> Buy

Motivation versus Satisfaction

- Learning, discovering, challenge levels -> Motivation
- Compatibility, ease of use, login -> Satisfaction

There is no ideal system!

Different projects have different needs and available resources.

project search

- Projecten
- Hulpmiddelen
- Training
- Organisaties
- Platformen
- Gebruikers

★ Onze Gold Star selectie

Search...

Meest recent bijgewerkt Land Status Tag Mogelijkheidsgraad Biodiversiteit Deelnemersgraad

Wanneer? (Multi-select) Wanneer? (Multi-select)

79 gevonden projecten



Algforskarsommar

Landen: [Sweden](#) [Denmark](#) [Finland](#)

The citizen science algae project was launched in May 2021, and since then citizens have been engaged in finding new knowledge about algae along the Swedish coast in the Baltic ...



Plataforma INVASORAS.PT

Platform: [Biodiversity](#) [Biology](#)

A platform for sharing information on biological invasions, particularly invasive plants, with various aspects:

We have created complete profiles of the species considered invasive in the portuguese territory, and ...



OSDG Community platform

Themen: [Biology](#) [Genetics](#)

Contribute to a citizen science project on Sustainable Development Goals (SDGs)

The project is undertaken by a partnership between [PPML](#), [UNEP SDG AI Lab](#), and a community of ...



INCREASE - Intelligent Collections of Food Legumes Genetic Resources for ...

Sub: [Biodiversity](#) [Food & Agriculture](#)

==> Register now for the 2nd round of INCREASE CSE! The deadline is 15th of March 2022 ==>

Human plant protein intake is on the rise in many RI ...

Projects

WELCOME, YOU'RE STILL HERE! BEST!

With the help of our amazing community, we've made some great progress.



PHOTOGRAPHY



Measuring evolution in action

PHOTOGRAPHY



PHOTOGRAPHY



PHOTOGRAPHY



PHOTOGRAPHY



PHOTOGRAPHY



PHOTOGRAPHY



PHOTOGRAPHY



PHOTOGRAPHY

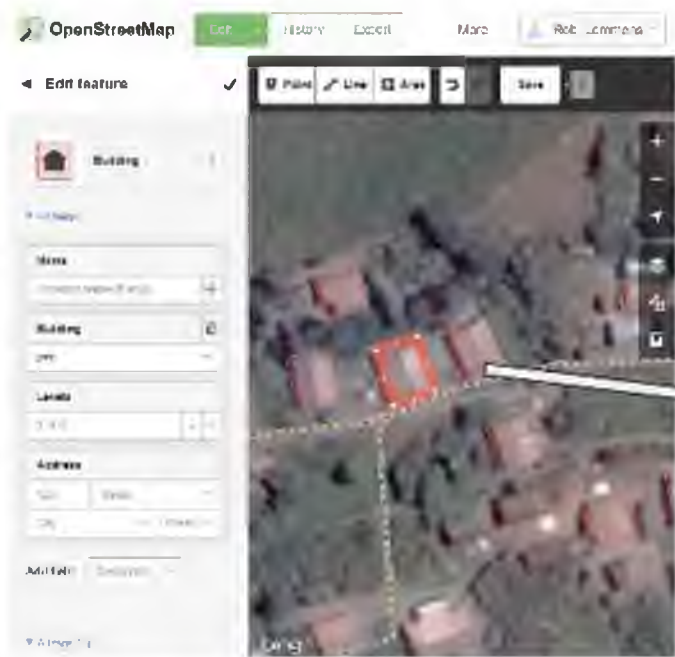


NASA GLOBE CLOUD GAZE

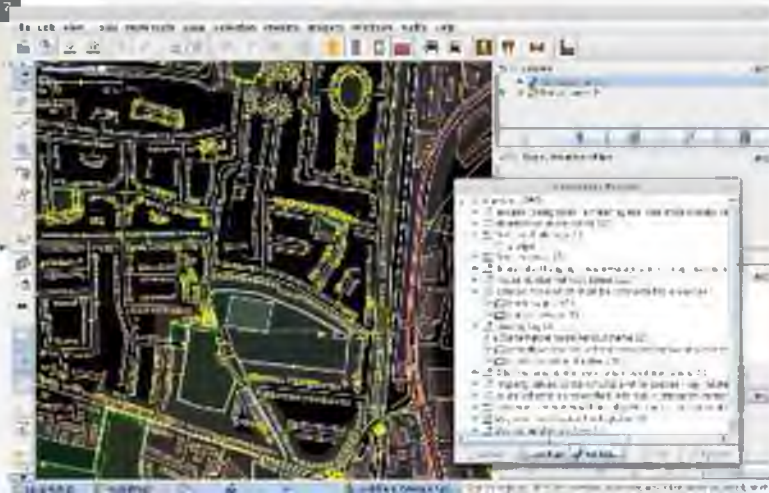
PHOTOGRAPHY



Tools – Open Street Map



After drawing roads and buildings they will appear on the map





Other challenges...

- Integrating contributions
- Storing data in own database
- Project leadership
- Project resources (time, money and technical resources)



And now...

- Talk to experienced citizen science project leaders
 - [European Citizen Science Association](#)
 - [Citizen science lab – Leiden University](#)
 - [Citizen science hub – Universiteit Twente](#)
- Get inspiration from other projects
 - [EU-Citizen.Science](#)
 - [Velehanden.nl](#)
 - [Zooniverse.org](#)

Remember -> every project is different!

... or contact us 😊

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&

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Questions?

Are you ready for Citizen Science?

**BEDANKT
VOOR
UW
AANDACHT**

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