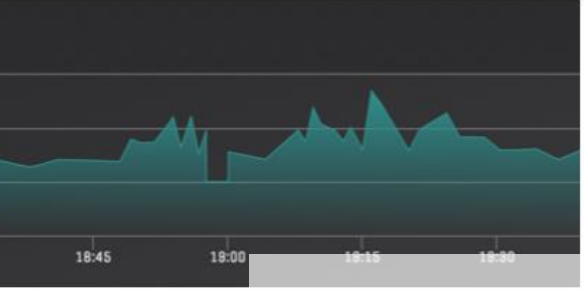
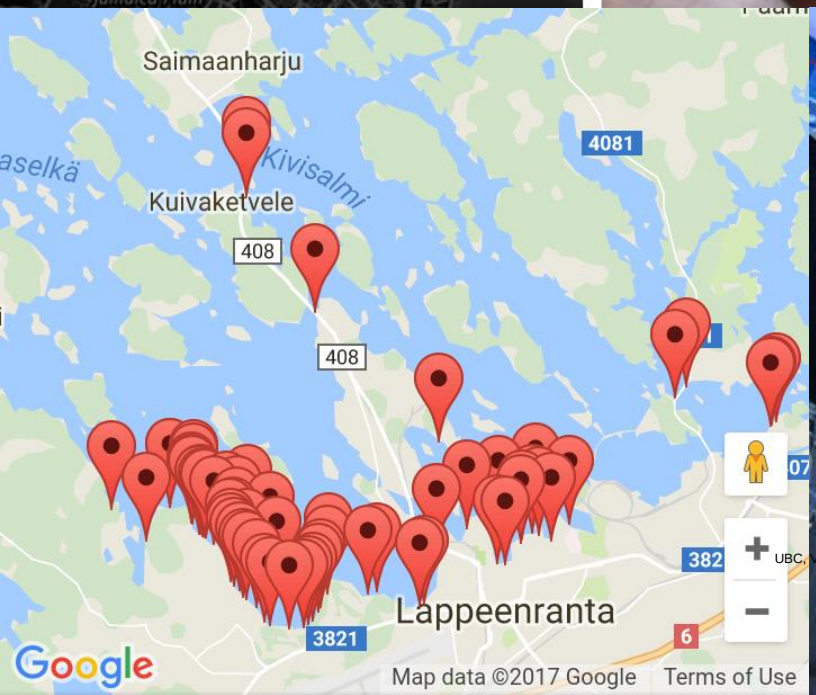


Understanding Civic Participation in Environmental Sensing

A values driven approach

Maria Palacin Silva (maria.palacin.silva@lut.fi)



Public Participation Across History

Institutionalization of environmental politics

1960s

Awareness rising

1980s

Recognition of local knowledge

2000s

Recognition of e-participation

1970s

Incorporation of local perspectives

1972 Conference on the Human Environment

1990s

Participation as a norm as part of sustainable development

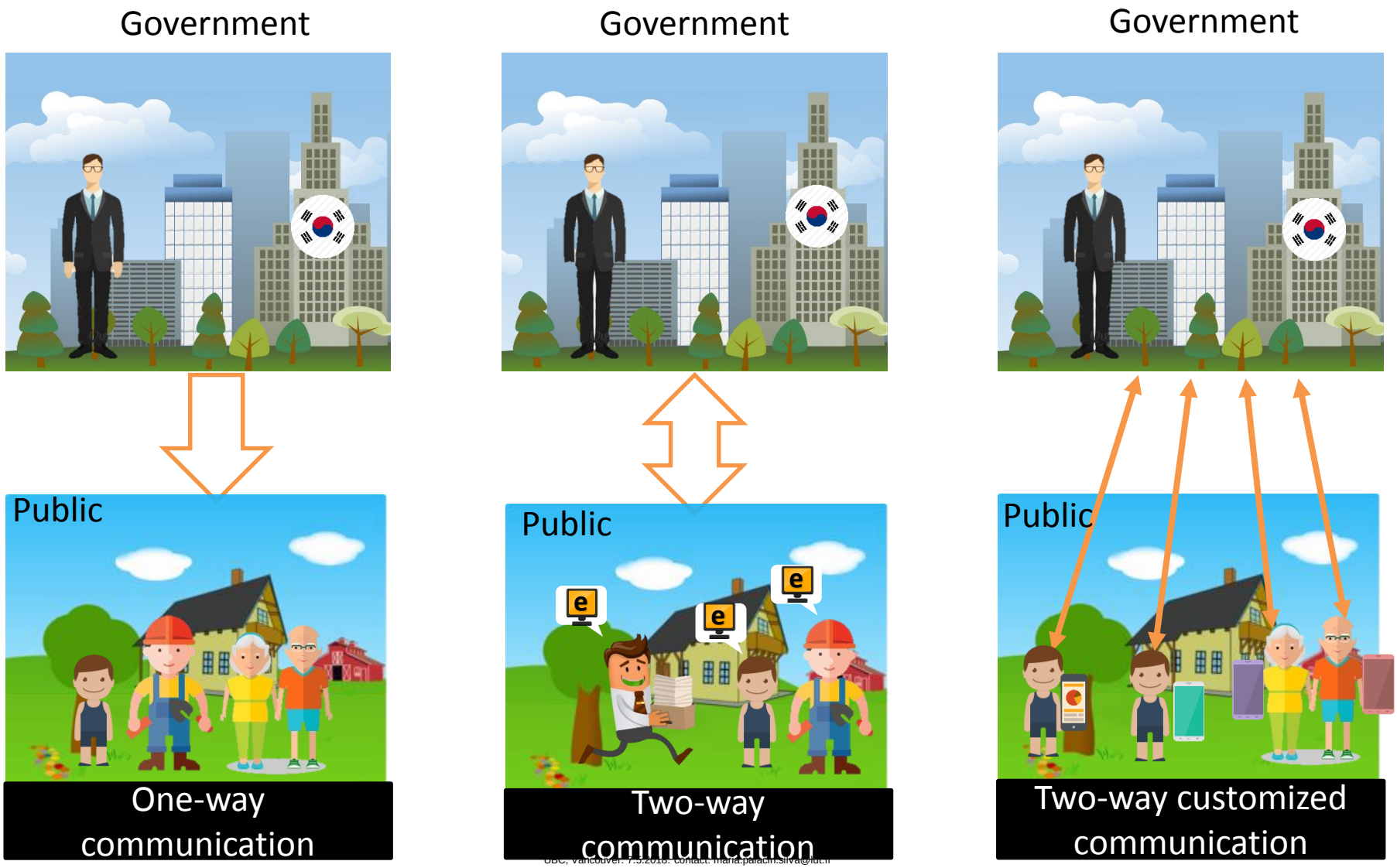
UNCED 92'
In our hands

AARHUS CONVENTION
for our environment

2010s

Rising of ICT-enabled participation (active and passive)

A paradigm shift in governance



Nam T. Government 3.0 in Korea: fad or fashion? Proc 7th Int Conf . 2013

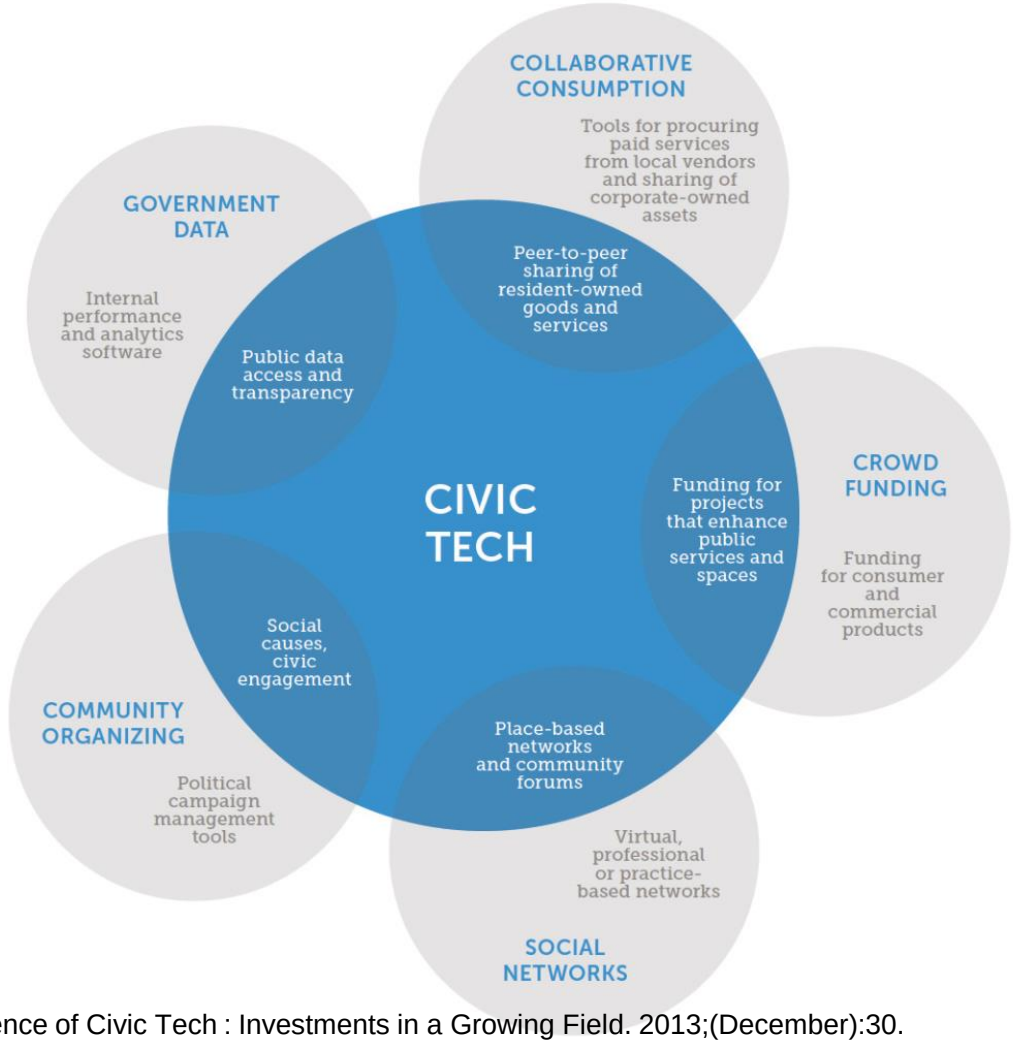
Why do we need to involve citizens in smart cities?

Whose priorities should a smart city prioritize?

People makes cities,
Thus, people should be at the core of smart cities

UBC, Vancouver. 7.5.2018. contact: maria.palacin.silva@lut.fi

The landscape of civic tech by the Knight Foundation



Knight Foundation. The Emergence of Civic Tech : Investments in a Growing Field. 2013;(December):30.

Citizen Sensing Rise

Humans have always been interested in observing phenomenon

1900s Citizen Science Birth

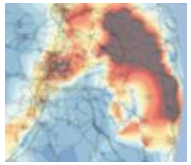
ICT-enabled Citizen Science

FixMy Street

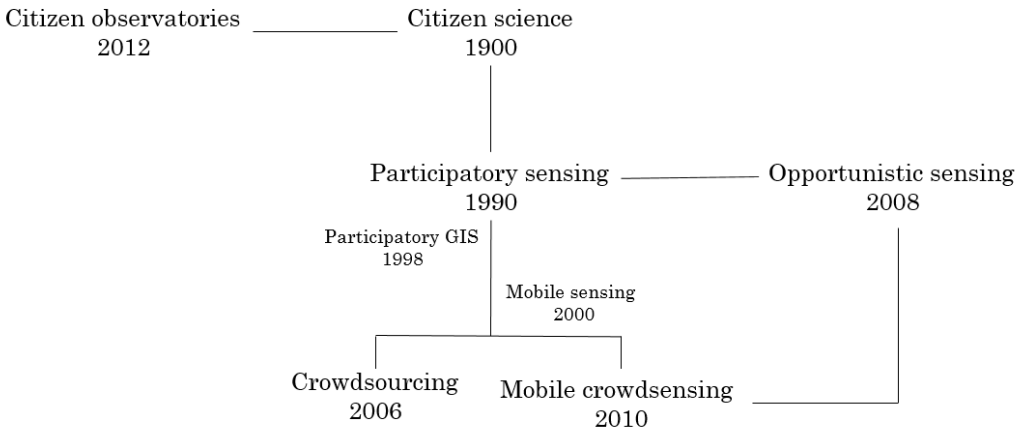
waze

GALAXY ZOO

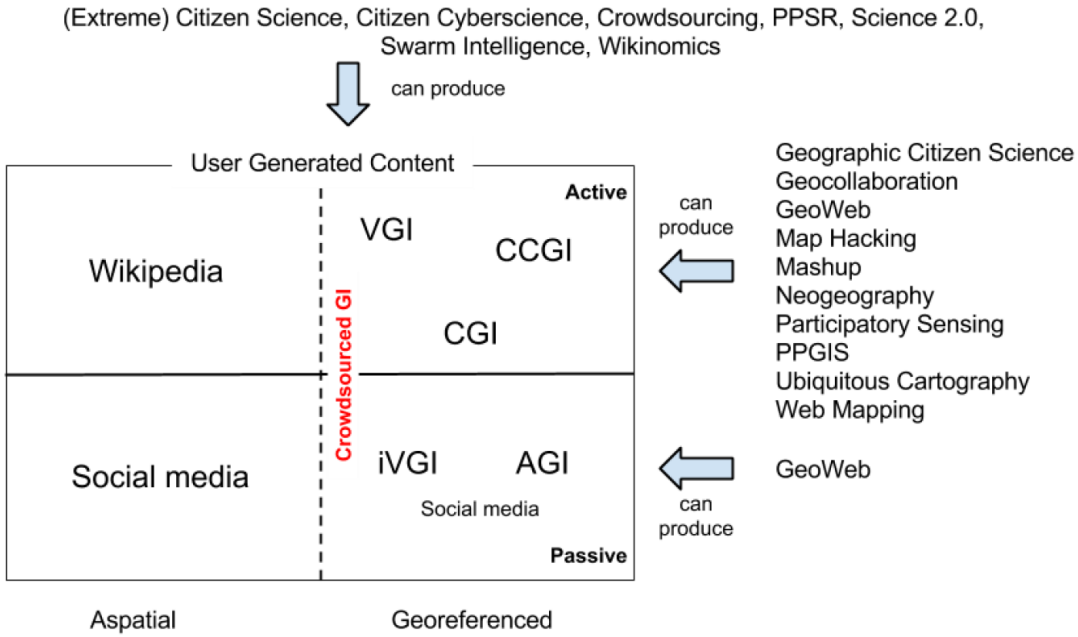
SAFECAST



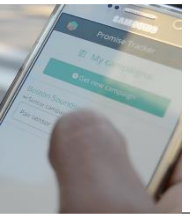
Same practice, different terms



Palacin-Silva M,, et al. State-of-the Art Study in Citizen Observatories: Technological Trends, Development Challenges and Research Avenues



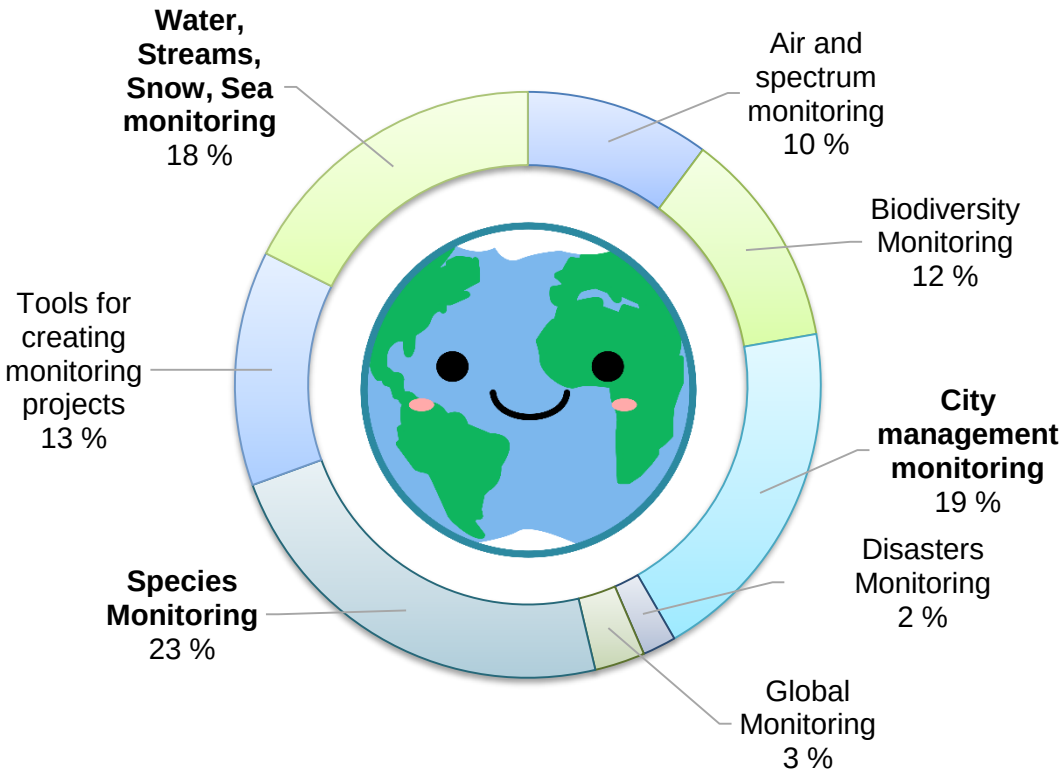
See L, et al. Crowdsourcing, Citizen Science or Volunteered Geographic Information? The Current State of Crowdsourced Geographic Information.

Technologies	Best Feature	Interaction
 Sensors	Accurate measures Easy Installation	AUTOMATED
 Social media	Dynamic Reflects trends and opinions Can be used for campaigning	
 Mobile Apps	Interactive Pervasive Simple	
Surveys 	Reliable Deep Effort and knowledge required	
Interactive Voice Responder 	Fast and easy to use Almost universal	INTENTIVE

“Environmental issues are best handled with the participation of all concerned citizens”

United Nations in the Rio Declaration 1992 and Aarhaus Convention

Around the world



- 66% Have an environmental focus
- 83% Uses active participation
- This field is 5x more active than in the 1900s
- Passive participation has risen since 2000s

Palacin-Silva, M., Seffah, A., Heikkinen, K., Porras, J., Pyhälahti, T., Sucksdorff, Y., Anttila, S., Alasalmi, H., Bruun, E. and Junttila, S., 2016. State-of-the Art Study in Citizen Observatories: Technological Trends, Development Challenges and Research Avenues.

Palette of Participation

POKEMON GO NESTS
THE GLOBAL NEST ATLAS

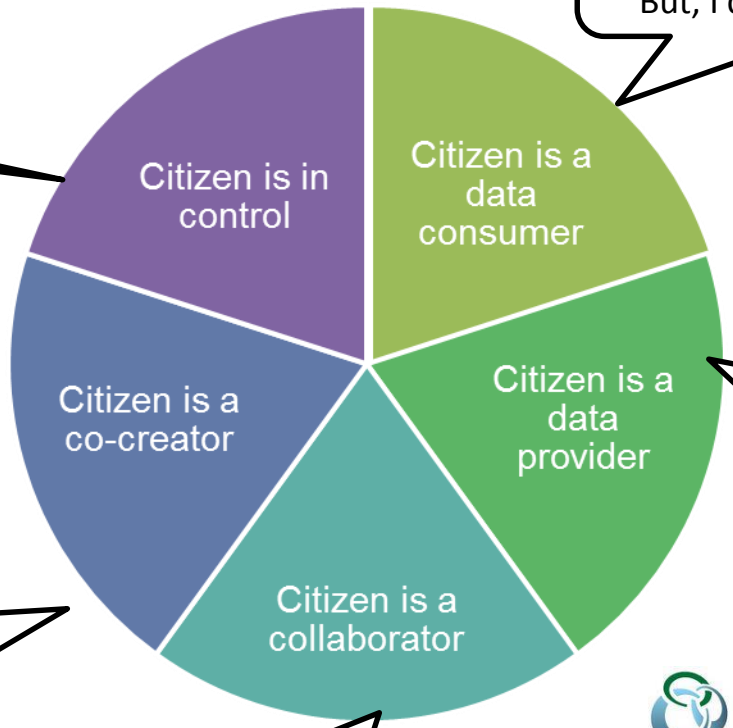
Mustikka GO

Ushahidi

SAFECAST

I launch and run a monitoring initiative because I care about it.

I use an app to avoid areas with pollen because I'm allergic to it. But, I do not contribute to it.



FixMy Street

waze

GALAXY ZOO

I contribute to monitoring projects by collecting data

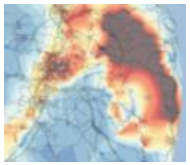
I decide the monitoring priorities along authorities or scientists and participate actively in the entire process

WeSenseIt
Citizen Water Observatories

I collaborate with authorities or scientist to monitor a phenomenon by collecting data, designing a solution and disseminating the results in my circles

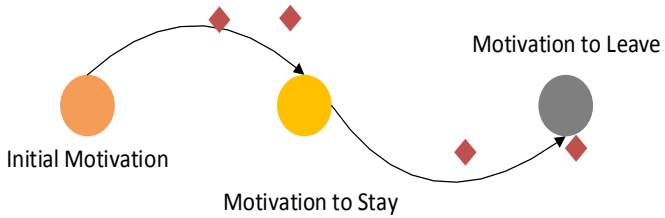
Palacin-Silva, M., Porras, J. 2018. Shut up and take my environmental data! A study on ICT enabled citizen science practices, participation approaches and challenges. 2018. Proceedings of the 2018 International Conference on ICT for Sustainability

Challenges in the field



- Privacy
- Data Quality
- Standards
  - Data
  - Architecture
- Participation
  - What motivates citizens?
  - How to engage participants to stay?
  - It is unclear what drives different volunteers to join, stay and abandon these initiatives in specific domains

My Research Motivation

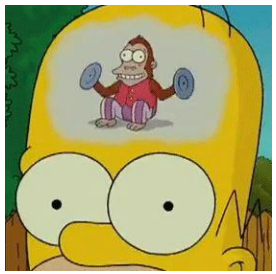


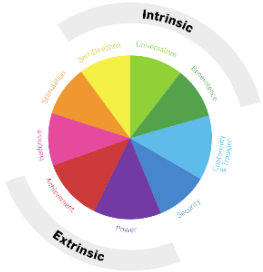
SAFECAST

GALAXY ZOO

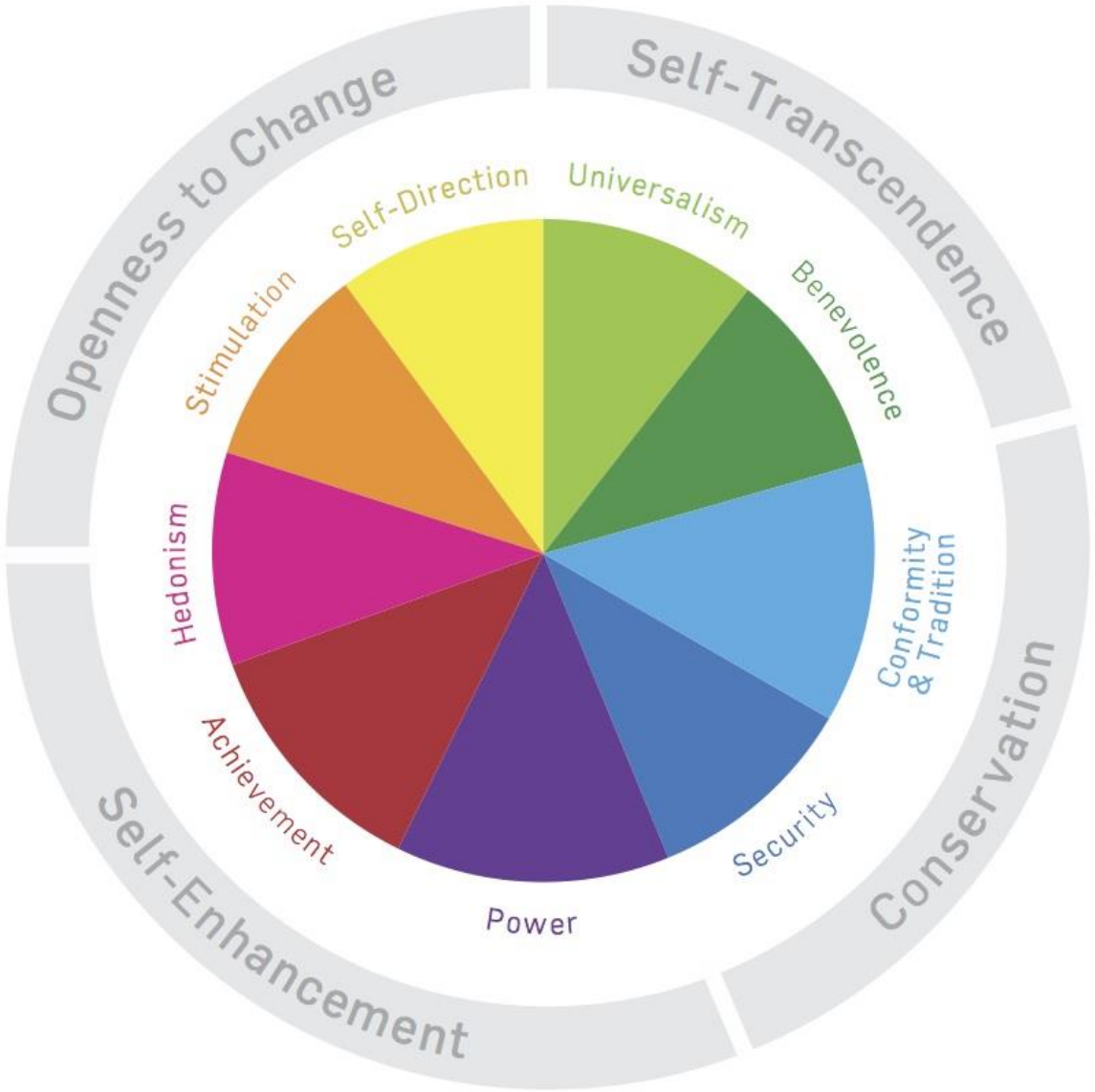
Participatory sensing initiatives struggle to engage citizens in long term. Current engagement approaches are centered around incentives.

What does motivate people to engage in environmental sensing?



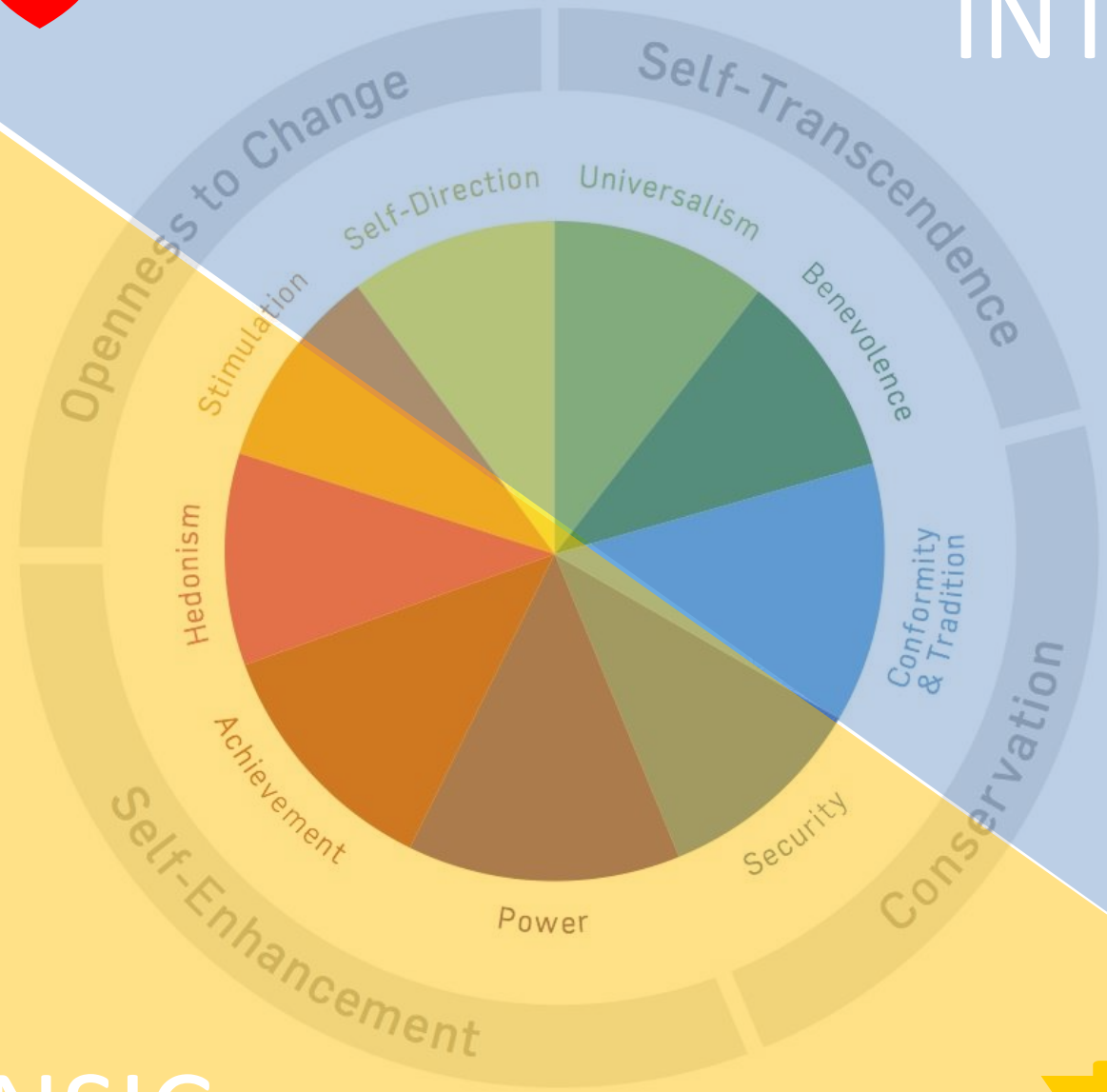


I study user engagement in environmental sensing from the lens of human values. The ultimate aim is to introduce guidelines to build and sustain user engagement.



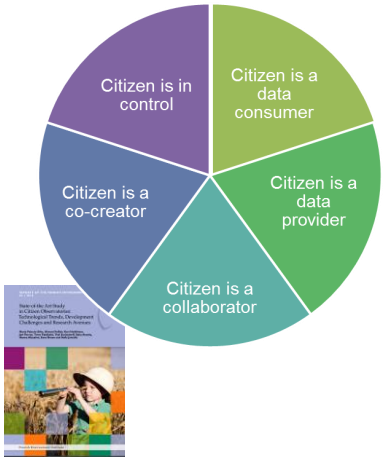
Holmes, Tim, Elena Blackmore RH, Wakeford T. The common cause handbook: a guide to values and frames for campaigners, community organisers, civil servants, fundraisers, educators, social entrepreneurs, funders, politicians, and everyone in between. 2011.

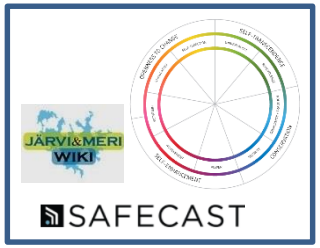
INTRINSIC

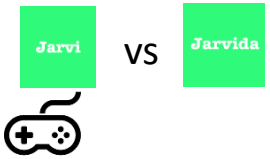


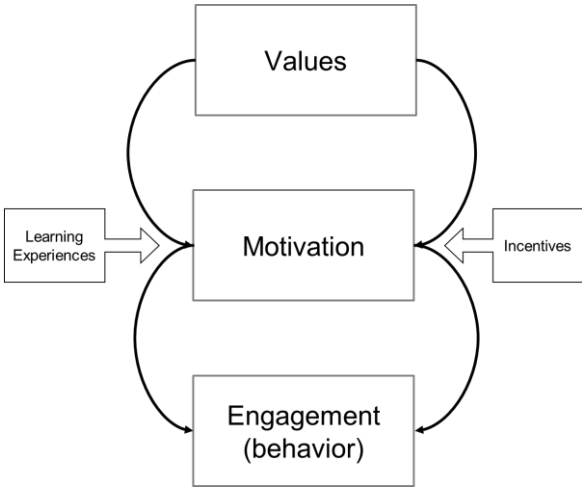
EXTRINSIC

Current Results









Stage 1

Understand the current state of practice

Stage 2

Understand the motivations in environmental sensing

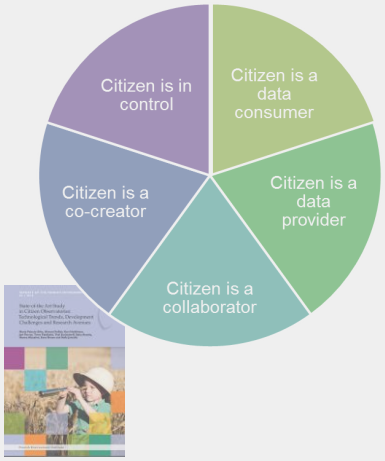
Stage 3

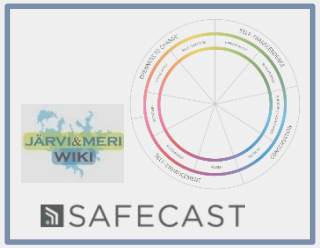
Explore the dynamics of motivation and engagement in environmental sensing

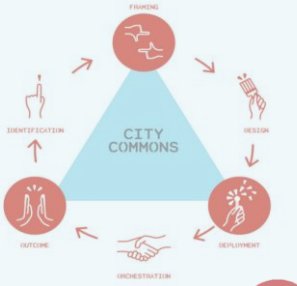
Stage 4

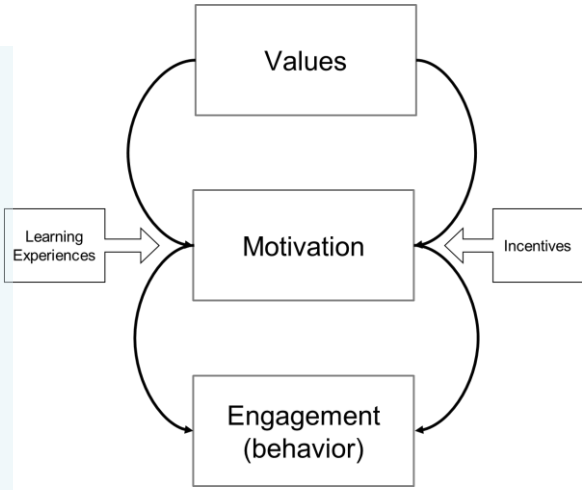
Explain the observed relation between values, UE and UM

Current Results









Stage 1

Understand the current state of practice

Stage 2

Understand the motivations in environmental sensing

Stage 3

Explore the dynamics of motivation and engagement in environmental sensing

Stage 4

Explain the observed relation between values, UE and UM

The Role of Gamification in Participatory Environmental Sensing

A study in the wild

Maria Palacin-Silva
(maria.palacin.silva@lut.fi)
vpalacin
Antti Knutas
Maria Angela Ferrario
Jari Porras
Jouni Ikonen
Chandara Chea

LUT
Lappeenranta
University of Technology

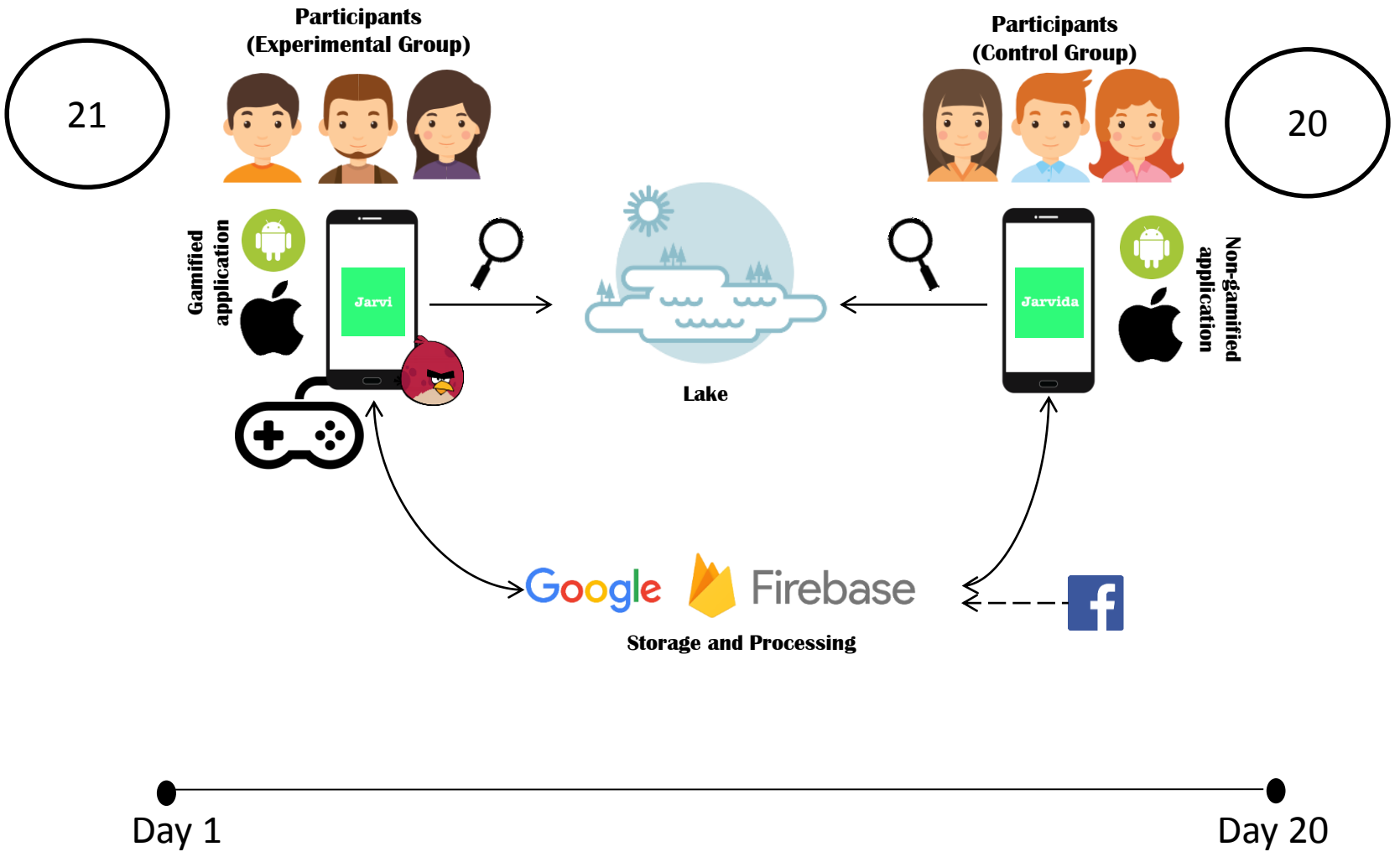
DCU

Lancaster
University

To play or not to play? That is the question

Civic Engagement

Not to play	To Play
	
Not good for pro environmental behavior change	Foldit engages over 200k volunteers in a game like experience
Game elements activate negative values	Games impact extrinsic motives that can enhance pro-environmental change
	Games empower actions


21
Participants
(Experimental Group)
Participants
(Control Group)
20
Gamified
application
Jarvi
Jarvida
Non-gamified
application
Lake
Google
Firebase
Storage and Processing
Day 1
Day 20

Saimaa Lake

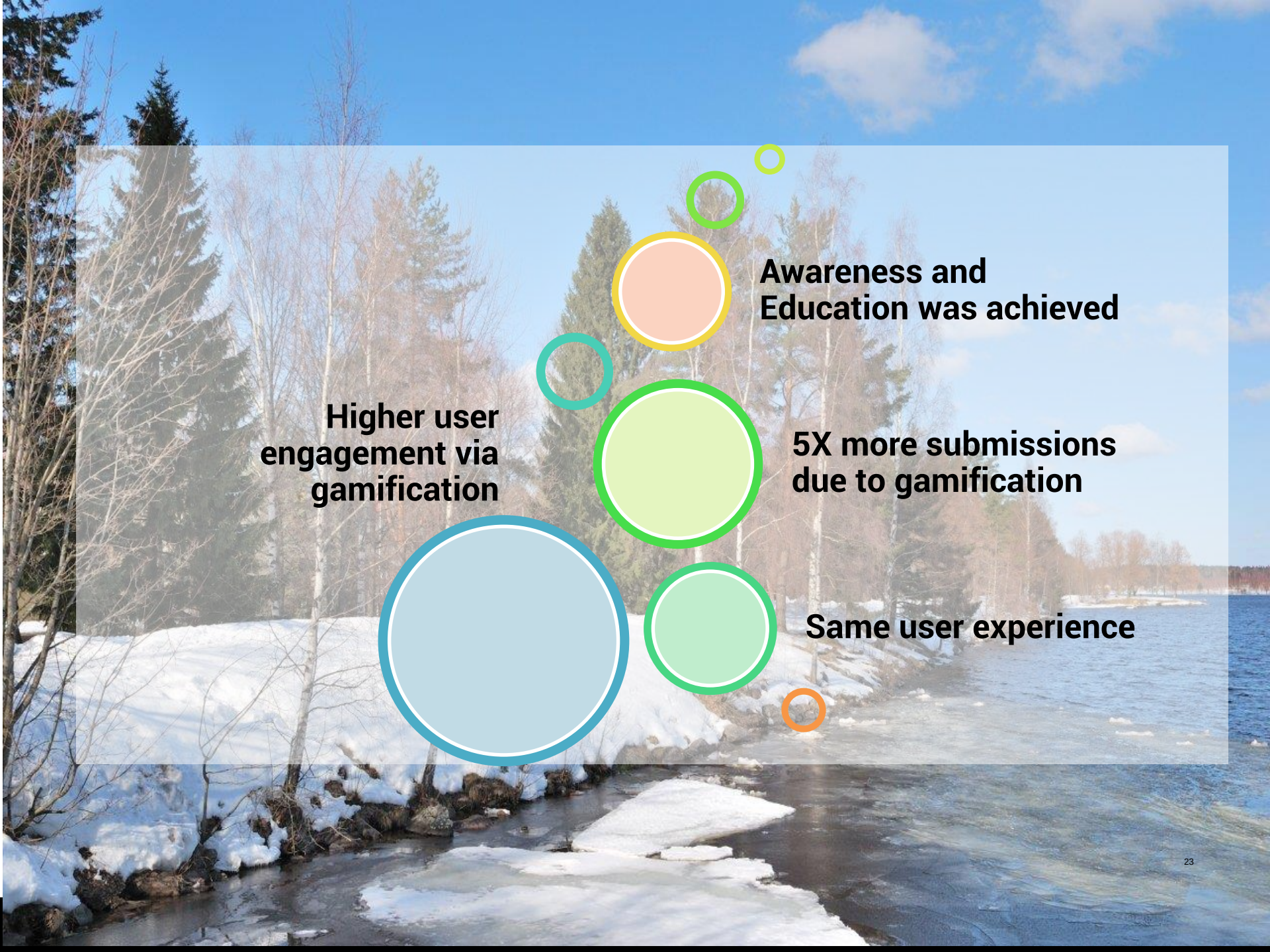
4th biggest lake in Europe

Largest lake in Finland

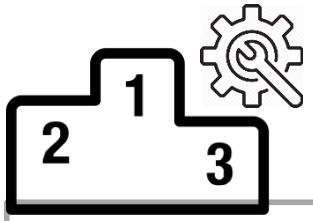
Frozen: Dec - April

Talk data to me

- 41 volunteers (20-35 yo)
  - 304 observations
- We collected data about: **Usability, Satisfaction, Acceptance and Playfulness** via pre and post questionnaires.
- Mann-Whitney U test was chosen to analyse the dataset


Awareness and
Education was achieved
Higher user
engagement via
gamification
5X more submissions
due to gamification
Same user experience

Design Reflections



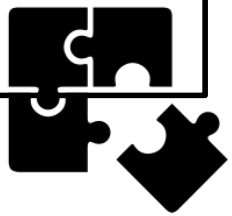
Support personalized notification triggers

Support customizable challenges to avoid negative feelings

Support social interaction between users

Allow users to explore submitted data

Enhance indoor experiences



Support interactive feedback

SENSEI

Environmental sensing via co-created civic technology in Lappeenranta

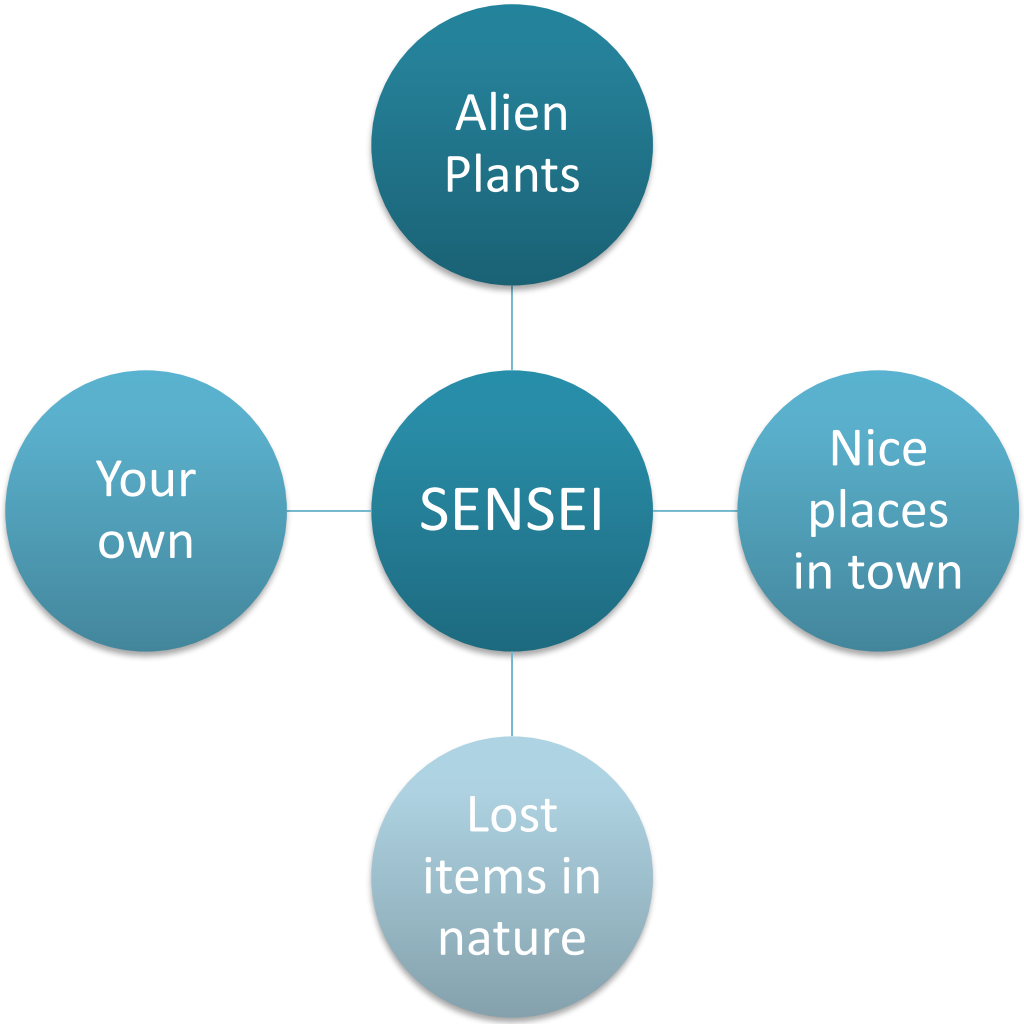
Lappeenranta University of Technology

Lappeenranta

Population: 73000

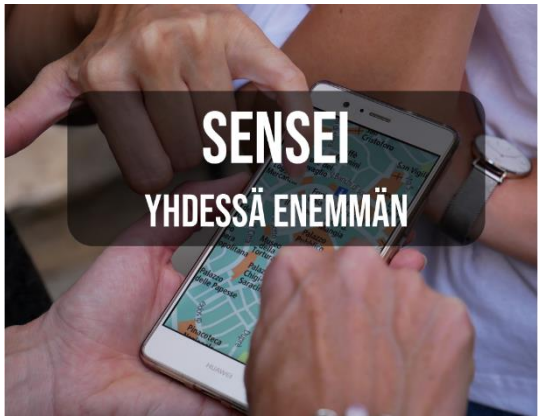
- Capital of South Karelia
- 2014 Greenest city of Finland (by WWF)
- 2015 Cycling City of the Year
- National Earth Hour Capital
- Lappeenranta aims to be carbon neutral by 2050
  - 80% of district heating is renewable energy

SENSEI monitoring priorities



SENSEI Objectives

- Design and launch a monitoring campaign for environmental issues in Lappeenranta during summer 2018
- Monitor different environmental issues across Lappeenranta area in collaboration with citizens
- Co-creating technology prototypes with citizens
- Involving 50 citizens or more in environmental sensing in Lappeenranta
- Publish collected environmental data openly
- Sharing environmental data with citizens to explore uses and solutions
- Report lessons learned from the initiative, to support future environmental sensing initiatives in the South Karelia region



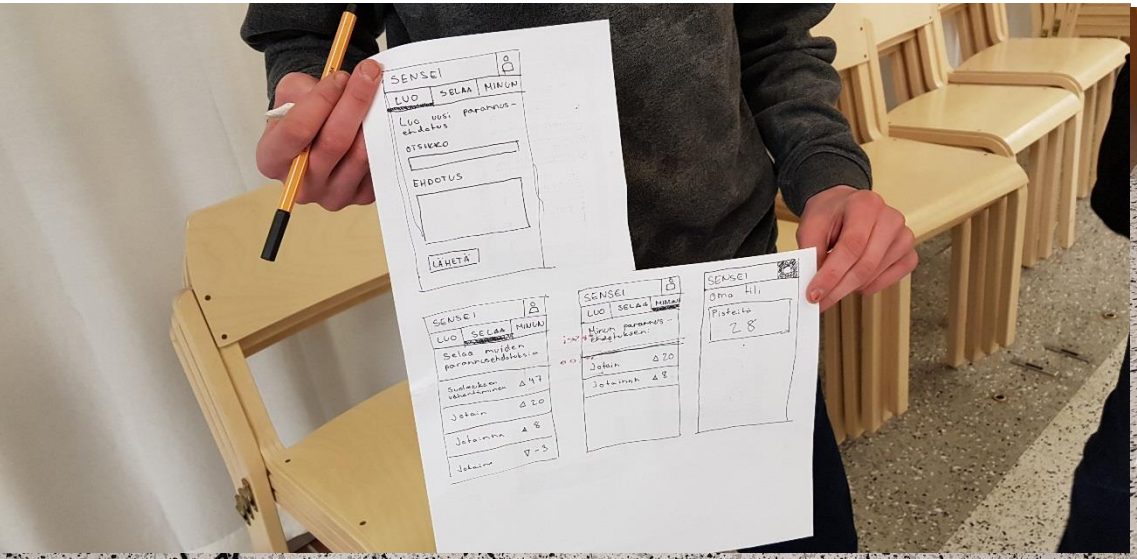
maria.palacin.silva@lut.fi

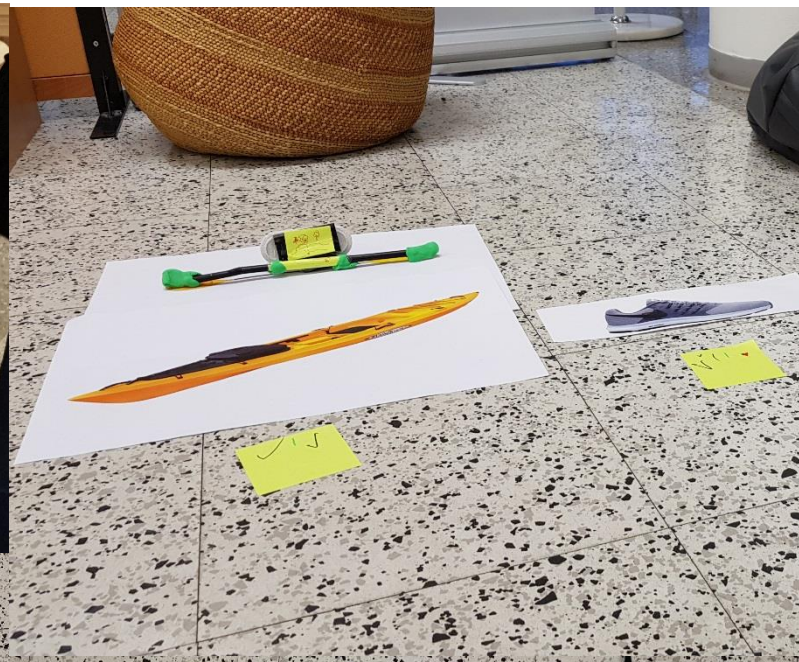
LUT Lappeenranta University of Technology

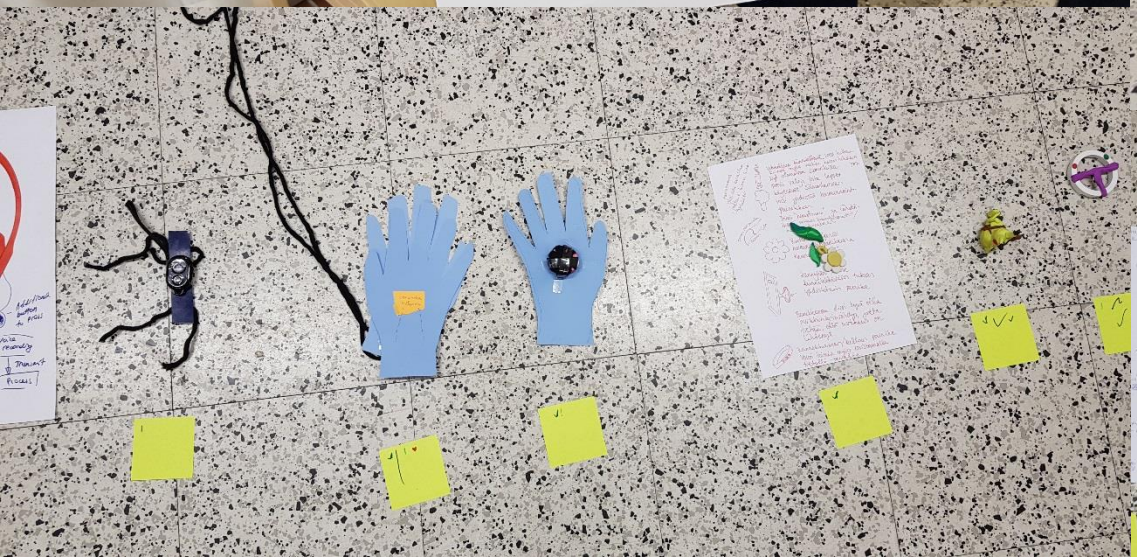
LAPPEENRANTA

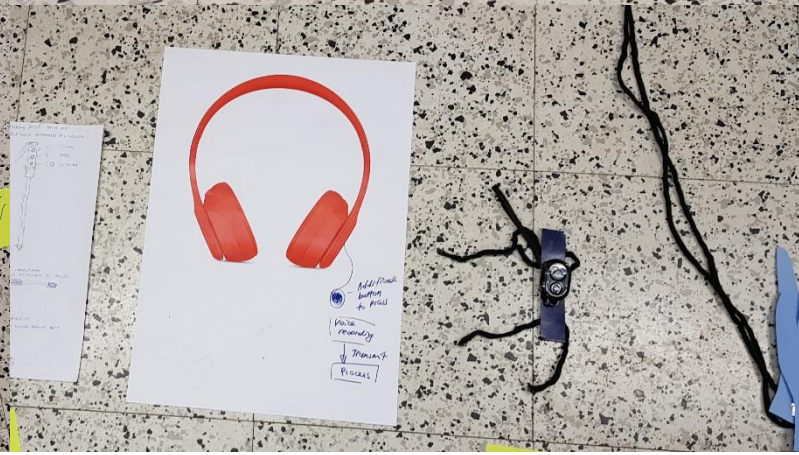
Ideation Workshop

Prototyping Workshop

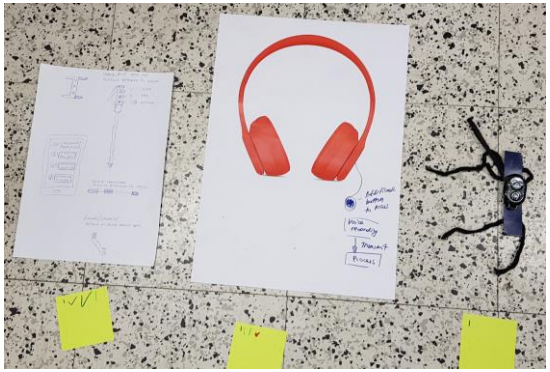








What did we learn so far?

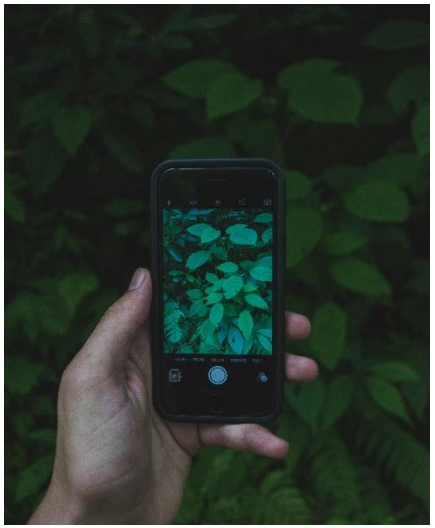


- People enjoys these activities a lot
- It clarified some misconceptions (not only ”negative things” we can map positive note forty things too, like ”local things to see in Lappeenranta (e.g. to give citizens a tool to help city to promote summer city image))

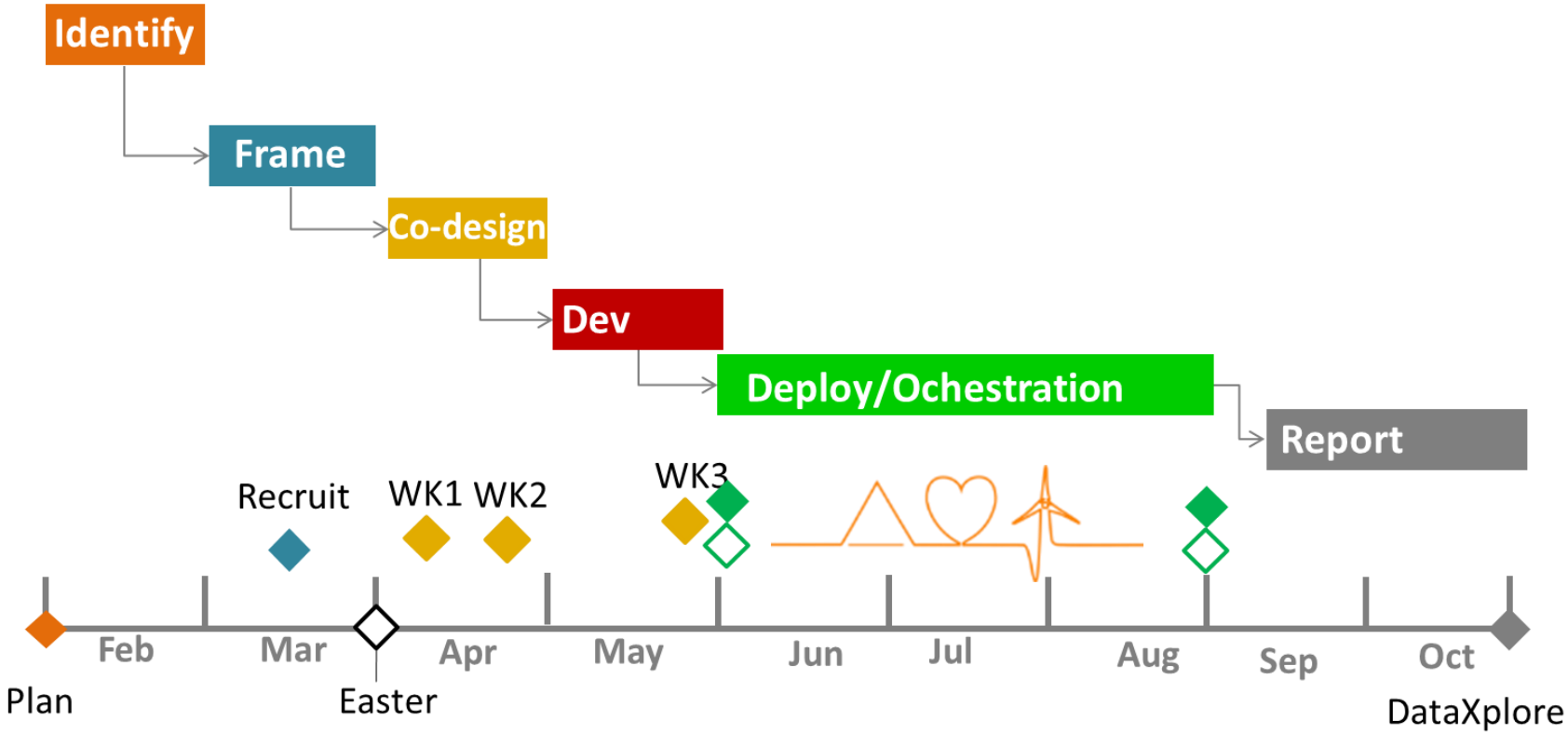
Research Questions

- What is the effect of co-creation practices onto user motivation and engagement?
- What values underpin the volunteers' motivations to engage?

vs



Timeline


Identify
Frame
Co-design
Dev
Deploy/Ochestration
Report
Recruit
WK1
WK2
WK3
Plan
Feb
Mar
Easter
Apr
May
Jun
Jul
Aug
Sep
Oct
DataXplore

Take away!

- Citizen sensing holds potential to enhance civic action and balance powers in society
- Motivation is temporal and there is a need for methods and techniques to enhance this temporality
- Gamification works but, it has a limit of deconstruction.
- Does co-creation enhance user engagement?