

**Report of the second workshop**  
**Defining principles for mobile apps and platforms development in**  
**citizen science: Interaction, Interoperability, Innovation**  
**Gothenburg, April 25th-27th, 2017**



**Recommended citation**

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## Summary

A broad range of citizen scientists, social scientists and other interested individuals met at Gothenburg University for the [second workshop on apps and platforms for Citizen Science](#). The three-day workshop was packed with practitioner talks, discussions, working groups and other activities to share peoples' experiences and knowledge on the topic.

The aim of the workshop was to develop a series of principles, specifically focused on using apps and platforms in citizen science. Three working groups explored in more detail issues around citizen science data interoperability, user interface and experience design in citizen science, and also outreach, learning and other rewards of participation in citizen science.

The event was co-organized by Naturblick, a project of the [Museum für Naturkunde Berlin](#), the [European Citizen Science Association \(ECSA\)](#), and the [University of Gothenburg](#) and was supported by the [Marianne and Markus Wallenberg Foundation](#).

An on-going set of principles and guidelines were discussed, with the aim of publishing them to make them more widely available and useful for all working in this area. The aim was also not to repeat the work that was undertaken to develop [the Ten Principles of Citizen Science](#), but to ensure that these principles and guidelines for apps and platforms for Citizen Science speak to the Ten Principles.

A strong overall theme that came out of the workshop was around trying to find ways to re-use existing apps and platforms to avoid duplication of work, and to ensure learning from previous experiences in app and platform development in citizen science. This of course raised many interesting practical and ethical questions about how best to do so.

Another theme that arose from discussions was that learning can take place at any stage of engagement with citizen science, for instance even from the outset, at the point at which someone first visits a citizen science project website. However, we are still a long way off understanding the complexities surrounding learning and participation in citizen science and there is much work to be done.

More information about the discussions and working groups can be found via the following resources:

- The [Trello board](#), where it is possible to see the progress on the principles developed. Please feel free to add comments and reflections.
- A [Google folder](#) with relevant publications and all the information from the first workshop. Again please feel free to add any publications that might be missing.

## 1. Introduction

Several citizen science apps and platforms are being developed to efficiently gather and manage citizen science data. They are related to different user bases, project durations, aims and goals. In order to address the complexity and pitfalls of app and platform development in citizen science, we planned a series of two workshops to define principles for mobile apps and platforms development in citizen science for citizen science project developers.

Following the first workshop on December 13th- 14th in Berlin, Germany, the second workshop was held on April 25th -27th in Gothenburg, Sweden. It was co-organized by [Naturblick](#), a project of the Museum für Naturkunde Berlin and the [European Citizen Science Association](#) (ECSA), the [University of Gothenburg](#) and was supported by the [Marianne and Markus Wallenberg Foundation](#) and the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety. The event welcomed 31 participants with experience in in citizen science apps and platform development, data, tools and technology, best practice, education and communication. The workshop was open to a broader participation by using the open tools [trello](#) and [google drive](#) to share and exchange ideas and results. Twitter input was collected using the hashtag *#citsciapp*.

The objective of the workshop was to continue the discussion and to define, based on the results of the first workshop, principles to develop mobile apps and platforms for citizen science, with reference to the [Ten Principles of Citizen Science \(ECSA 2015\)](#). Therefore, participants continued their work in the three working groups that were established in the first workshop: (1) *Interoperability and data standardization* (2) *User Interface & Experience Design* (3) *Outreach, Learning, Education, and other Rewards of Participation*. Also group discussions on the topics: re-use, sharing learning and tracking of participants were added as a follow-up activity from the first workshop.

In this report we provide a summarized overview of the results of the second workshop. Notes of the workshop participants were compiled and slightly edited.

### 1.1 Definitions

In order to establish a common understanding, we kept the definitions that we agreed on during the first workshop regarding app, platform and portal. Additionally, we found it useful to identify a common definition of citizen science practitioner.

**App:** "a self-contained program or piece of software designed to fulfil a particular purpose. It is an application, especially as downloaded by a user to a mobile device." (Oxford English Dictionary)

**Platform:** A (computing) platform is a technical framework on which one or more applications may be run and where data are kept. For the purposes of user interaction (UI) and user experience (UX), the term "website" instead of platform will be used.

**Portal:** web-site providing access or links to other sites. Here, especially pointing to apps, platforms, projects etc.

**Citizen science practitioner:** anyone involved in the active development of citizen science, e.g. researcher/scientist, project manager, technical person, science communication professionals, educators, volunteer contributor, authorities, institutions, NGOs

## 1.2 Workshop participants

- Adam McMaster, Zooniverse, University of Oxford
- Agnes Mair, National History Museum Vienna
- Alda Terracciano, UCL / University of Gothenburg
- Alexandra Albert, University of Manchester
- Åsa Mäkitalo, University of Gothenburg
- Candan Eylül Kilsedar, PhD Student, Politecnico di Milano
- Cecilia Lindhé, University of Gothenburg
- Chris Phethean, University of Southampton
- Christopher Kullenberg, University of Gothenburg
- Dick Kasperowski, University of Gothenburg
- Dilek Sahin, TEMA Foundation (The Turkish Foundation for Combating Soil Erosion, for Reforestation and the Protection of Natural Habitats)
- Ella Vogel, National Biodiversity Network (UK), and representing GBIF
- Erik Thorelli, BioNote, University of Gothenburg
- Flavia Bartoccioni, University of Rome Tor Vergata
- Giannis Haralabopoulos, University of Southampton
- Guilherme KODJA Tebecherani, IPM - Iniciativa Pro Mar, Brazil
- Gunilla Ullman
- Jakub Trojan, Tomas Bata University in Zlin, Czech Republic
- Janice Ansine, The Open University
- Jari Silander, Ymparisto, Finland
- Jaume Piera, Institute of Marine Sciences (ICM-CSIC)
- Jonathan Brier, University of Maryland
- Lars Kristensen, University of Aarhus
- Lina Andersson, Royal Institute of Technology, Sweden
- Luigi Ceccaroni, 1000001 Labs
- Marisa Ponti, University of Gothenburg
- Niclas Hagen, University of Gothenburg
- Ola Langvall, Swedish University of Agricultural Sciences/Swedish National Phenology Network
- Patricia Paulsson, BioNote, Chalmers University of Technology
- Philipp Hummer, SPOTTERON
- Sean Lynch, University College Cork
- Soledad Luna, ECSA
- Sven Schade, European Commission, Joint Research Centre (JRC)
- Ulrike Sturm, Museum für Naturkunde Berlin
- Vanessa Lemos Campos, independent

## 2. Presentations and Working Groups

### 2.1 Presentations and Posters

During the three day workshop several projects shared insights into success and failure in development, engagement and user interaction. [Games in Citizen Science](#) were presented by Marisa Ponti (University of Gothenburg), [Lessons learned on re-usability and the way how to define success](#) by Sven Schade (JRC), [Zooniverse Platform](#) by Adam McMaster (University of Oxford), [SciStarter](#) by Jonathan Brier (University of Maryland) and [UK National Biodiversity Network and GBIF](#) by Ella Vogel (National Biodiversity Network). Ulrike Sturm (Museum für Naturkunde Berlin) and Soledad Luna (ECSA) outlined [what happened so far and the expectations of the workshop](#).

Christopher Kullenberg (University of Gothenburg) reflected on [collecting social science data with smartphone apps and school children](#). Dick Kasperowski (University of Gothenburg) gave an insight into [epistemological ideals of participation](#). Luigi Ceccaroni (1000001 Labs) reported on [ontology of citizen science](#). Posters on [Impacts of Design](#) by Jonathan Brier, [Building a Player Base](#) by Lars Kristensen (University of Aarhus), and the app [Marine Megafauna](#) by Guilherme KODJA Tebecherani (IPM - Iniciativa Pro Mar) were presented in the poster session.

All presentations and posters can be retrieved under the following link: [Google folder](#).

### 2.2 Working group Principles for Interoperability: Data Standardization & Data Quality

The working group “Principles for Interoperability: Data Standardization & Data Quality” was facilitated by Luigi Ceccaroni and Jaume Piera. During the discussions and revision of the results of the first workshop, the participants of this group found that the principles that they were defining were not exclusive for apps and platform development, but rather they could be applicable to any citizen science project in a broader sense. Therefore, they did not need to define new principles, but add to ECSA’s Ten Principles of Citizen Science. Additionally, they identified guidelines and further recommendations and finally listed additional topics that might be missing in ECSA’s Ten Principles. Below, we grouped the topics for guidelines under the main topics linked to the principles.

#### 1. Sharing of outcomes, when possible

- Adapt ECSA’s principle #7 (see appendix) to include source code additionally to data and metadata.
- If possible, use of standards for data, metadata and use services that make these accessible.
- Consider data privacy and *intellectual property rights* (IPR).
- Existing fit-for-purpose platforms/project-portals/apps (and the communities using them) should be taken into account for re-use. We recommend building on known to work tools and develop them to the next level. For example, if you need an app for biodiversity monitoring, re-use the [iNaturalist](#) or [Natusfera](#) app, instead of creating a new one or for custom smartphone apps use e.g. [Spotteron](#)'s platform service.
- The challenge is to discover what already exists and works. [Scistarter](#), Living Atlas are examples of databases that can be used to discover existing projects and their tools.
- Apps (*sensu lato*) should have an API to share as many data as possible (if project leaders wish this).

- New developments should be well documented, if possible in English (e.g., methods for data quality validation/assessment). All of the technical work should be documented, including scope of the use, assumptions taken, known limitations, implications when using a particular solution (e.g. software, among others). In fact, such documentation should apply to re-use in the same way.
- If possible, use modular development of apps and platforms.
- Consider language translations.

## 2. Legal and ethical issues

- Regarding principle #10 of ECSA's Ten Principles of Citizen Science, consider the following questions when developing or re-using an app: Which rights does an app request at install? It strongly depends on what the app (or the project) wants to do. Minimal necessary app rights on mobile devices?
- Special attention should be given to licenses; also, if sharing data with other countries, pay attention to national and international differences; the license should allow re-use; there should be transparency about where data are stored.
- Privacy: open scientific data but closed personal data of participants (fully respect privacy of personal data; take only as much personal data as required according to the objectives of the project; provide participants ways to decide about the privacy of their data; secure data transmission and storage; delete personal data as soon as possible if they are not needed anymore in relation to project objectives) [[http://ec.europa.eu/justice/data-protection/reform/index\\_en.htm](http://ec.europa.eu/justice/data-protection/reform/index_en.htm)]
- We recommend using encryption and only minimum App Rights Requests on mobile devices.

## 3. Interoperability with projects that do not have a genuine science outcome or do not involve citizens.

- There are citizen science projects that are not meant to produce a scientific outcome. This includes for example governmental projects.
- Existing standards and metadata schema should be used in all cases to support interoperability (ALA - [BioCollect](#), [SciStarter](#), PPSR-CORE - CitSci.org, The US Federal Crowdsourcing and Citizen Science Catalog, Dublin Core, GBIF - IPT, Project Open Data Metadata Schema - POD v1.1, CKAN API, DCAT, Schema.org, OGC, CobWeb, ADIwg, ISO 19115/19110, Inspire) until a recommendation is made available by CSA-ECSA-ACSA (foreseen by October 2017); this ontology of citizen science, which is being developed by the international "Data and metadata working group", should be taken into account and, when available, should be adopted; each observation site/ data point should have a universally unique identifier (UUID coming from an existing standard).
- Apps (*sensu lato*) should have an API to share as many data as possible if project leaders wish to share data.

## 4. Feedback and Acknowledgement

- Tracking the use of data, makes it easier to acknowledge peoples' contributions.

## 5. Evaluation

- Interoperability of quality assurance procedures (esp. including validation processes).

This group discussed if it was needed to formulate a specific principle regarding re-use, however, the discussion showed that all topics foster re-use and therefore no specific principle are needed. The group recommends respecting the existing ecosystem of communities and technical solutions by collaborating and acknowledging them.

### 2.3 Working group Principles for User Interface & Experience Design

The working group “Principles for User Interface & Experience Design: Interaction, Mechanisms to support Motivation” was led by Soledad Luna and Ulrike Sturm. The discussion was based on the thoughts of the first workshop. The group discussed the proposed guidelines and principles and draw up three major topics to formulate principles: Re-use, design for the citizen scientists and two-way communication as essential part for app and platform development and use.

#### 1. Re-use

- Re-use of apps and platforms includes more than only code. It also includes design (e.g. icons, and interaction). Also design should base on existing standards if applicable; it should be innovative but familiar.
- Re-use from the industry sector might result in privacy issues (e.g. user-data monetization or app rights at install) and psychological impact in participants. There might be an overlap from being a consumer to become a participant. Possible bridges are values into citizen Science and the “ownership” of the product/result.
- Also re-use needs time to adapt it to the project needs.
- Open Education Resources (OER) might be a good example for best practice in re-use

#### 2. Design for the citizen scientists

- The design for the citizen scientists can be realized by different approaches, such as, target group centered design or co-creation.
- Balance designing for citizens and designing for the scientists and keep in mind to design for the people who are supposed to use the app or platform.
- Define your target group (the ones you try to reach) and design for their needs to attract and support them.
  - Make your target group as big as possible, but be okay with excluding people if you risk losing attraction and/or quality in data.
  - Think about the participant’s journey: “take care”/ consider throughout the processes of your project, think about their motivation.
- Design to prevent bias.
- Communicate constantly with the participants and react to feedback, ideas (appropriation e.g. IKEA).

#### 3. Design for two-way communication

- Design for communication: start by deciding on the right “tool” (app, platform, website, or not digital tools, or a mix of it).

- Give transparent and easy to access information about the app and project. People should not need to download the app to find out what it does and how it relates to them.
- The design requirements are based on whether it is an app, platform or responsive website and also the reach of the project.

In this group, participants questioned themselves if the discussed issues are specific for app and platform development or may also apply to other citizen science projects. Another important reflection was if the design guidelines for citizen science differ from industry guidelines.

## **2.4 Working group Principles for Outreach, Learning, Education, and other Rewards of Participation**

The working group “Principles for Outreach, Learning, Education and other rewards of participation” was led by Alexandra Albert and Dick Kasperowski. The group based the discussion on the position that the focus should be on the people. They concluded that the phrasings “facilitate learning, communication and sharing of knowledge transparently” may be too passive on the part of the scientist, and that the scientists need to be more responsible for the learning. Citizen science apps and platforms should enable participants to come into contact with other project practitioners. The social component of the project is very important and has to be put in place in order to make it possible for participants to get to know about other projects and be able to migrate between projects if they wish to.

The discussion in this group started around thoughts of the first workshop, and later they identified gaps and focused on these aspects that were not covered during the first workshop: learning and ethics.

### **1. Learning**

- Learning takes place at every step of the way, from the initial engagement with an app/platform to actually doing the tasks, and beyond.
- Learning and communication are reciprocal (two-way) and occur in tangible as well as in intangible ways. Unstructured learning and communication should be recognized as valuable. Furthermore, an unstructured space for informal learning and reflexivity among citizen scientists should be allowed.
- It is important to focus more on the individual perspective instead on the scientist’s perspective.
- Participants need to be able to communicate amongst themselves (e.g. in forums).
- [iSpot](#) represents a best practice example on learning. A person evolves through participation and learning is recognized as a process.
- The Zooniverse platform (<https://www.zooniverse.org>) represents a best practice example on providing discussion forums for facilitating learning and discussion among contributors, researchers and moderators.

### **2. Ethics**

- In citizen science are blurred between objects and subjects and they become the enquirers themselves. Conventional research ethics are formulated to address issues concerning the

objects of research. Citizen scientists are active research subjects contributing to the research process.

- When doing research on what people are learning, participants then turn into research objects. Therefore, for ethical reasons, they need to be informed about this.
- Citizen science apps & platforms must perform ethical due diligence.
- Ethical considerations can obstruct data quality.

The group discussed about the use of the term “participant”, and asked if this also encompasses both the citizen scientist and the professional scientist. This led to the idea to do an analysis of the use of terms in citizen science.

The group discussed if there is the need of new principles for app development and if so, how do they differ from ECSA’s Ten Principles of Citizen Science. It was concluded that there is a considerable gap on knowledge and research regarding learning and ethics to base the principles on.

## **2.5 Working group How to foster re-use?**

The working group “How to foster re-use” was a follow-up activity from the first workshop, in which participants identified this very specific and practical question: What is the necessary information to make a list of apps and platforms usable for re-use? The existing lists are not easy to find and are dispersed. Thus, improvements are needed. The working group elaborated around this issue and did not address specifically other challenges to foster re-use, such as reputation, recognition and reward systems. The group was led by Sven Schade.

The discussion started with identifying the needs. First, the group discussed how to search for already existing apps and platforms that may be relevant. They concluded that the most effective way would be to focus the search on people. On the one side, look for persons who are working on the same or related topics and, on the other side for the technical developers. To search for all existing apps and platforms and their functions would be quite time consuming, especially considering the fast growing field. Also different fields need to be considered when searching for best practice examples. Additionally, there are challenges because of culture and language differences.

The following questions were raised: How to evaluate in how far this app or platform fits your needs, and if it could be adapted? How to actually re-use this app or platform, and why? How to share your results and the experience of re-using a particular app or platform with others?

To be able to identify and re-use an existing app or platform the key metrics need to be known, including licensing and the availability of the community. For this, it is important to provide indicators of contributions to the system, including contracting of developers etc., and a documentation, learning material, and guidance on how to contribute. At the moment, it takes too long to learn how to contribute and therefore people start to develop their own apps and platforms from scratch.

At the present, re-use is not a topic specifically supported in project calls. Seldom is it possible to propose to build on to a common resource, as well as are seldom calls on improving that “system” (if fair competition). There is also a trust issue on quality assurance and common values. However, best

practice examples for a network of developers that share resources exist, e.g. around the Atlas of Living Australia (ALA) or the Geographic Resources Analysis Support System (GRASS).

As the next step, the group discussed the lead question: In how far could a list of apps and platforms cover your requirements?

A list needs curation and maintenance or will get obsolete with time. Therefore, such a list demands resources for maintenance. One option to generate permanent resources for maintenance can be through paying for using it or becoming a “member” in the same way as scientists pay for publications (e.g. open access publications). Another option is to manage it on distributed nodes. The group discussed more concrete ideas, such as, ranking aspects and a tree structure to guide searching according to your needs. Apps and platforms could be indexed similar to e.g. Scopus in scientific publishing, and ECSA could be acting similar to e.g. European Network of Living Labs (ENoLL).

Examples of open resource:

- Open Source Software: <https://github.com/>
- Open Data: <http://data.jrc.ec.europa.eu/dataset/jrc-citsci-cs-survey-15>
- OER: <http://www.exploerer.gu.se/wp-content/uploads/2014/11/Recommendations-for-Policies-Supporting-Reuse-of-Open-Educational-Resources.pdf>

Examples of existing lists include, for example:

- <http://digitalearthlab.jrc.ec.europa.eu/apps>
- <https://www.ceh.ac.uk/citizen-science-apps>

See also the discussions of the January 2016 at the JRC, Ispra:

<https://ecsa.citizen-science.net/blog/data-and-metadata-reporting-citizen-science-data-and-service-infrastructure-meeting-italy>

## **2.6 Working group How to share learning of citizen science practitioners around the designing and building of apps and platforms, managing data and involving participants?**

The working group “How to share learning of citizen science practitioners around the designing and building of apps and platforms, managing data and involving participants?” was a follow-up activity from the first workshop. The group discussed on how to share and learn from each other regarding their experiences on developing and using apps and platforms for citizen science. They compiled recommendations for sharing learning in online and offline projects.

### **In projects:**

- Recognize that the exchange of knowledge moves in many directions. For example, managers learn from volunteers etc.
- Document and share learning “behind-the-scenes”, about both failures and successes.

### **Online:**

- Creating an online body of knowledge about apps and platforms (open to anyone).
- Documenting apps/platforms, technical issues, user-experience, grade/ranking.
- Webinars, YouTube.

- Forums for dissemination of immediate experiences. Where you can ask for solutions.

**Offline:**

- Workshops, hackathon, meetups.
- Publications, case studies.
- “Citizen science day”.

**Dimensions:**

- Learning and research.
- Benefit / reward of participation.
- Upstream or downstream in the research process.
- Formal (accreditation) / informal / non-formal learning (puzzles etc.).

Useful resources for definitions of non-formal and informal learning:

- European guidelines for validating non-formal and informal learning
  - <http://www.cedefop.europa.eu/en/publications-and-resources/publications/4054>
  - <http://www.cedefop.europa.eu/en/publications-and-resources/publications/3073>
- Science Education for responsible citizenship
  - [http://ec.europa.eu/research/swafs/pdf/pub\\_science\\_education/KI-NA-26-893-EN-N.pdf](http://ec.europa.eu/research/swafs/pdf/pub_science_education/KI-NA-26-893-EN-N.pdf)

## **2.7 Working group How to track participants’ contribution across different citizen science projects?**

The working group “How to track participants’ contribution across different citizen science projects?” was a follow-up activity of discussions concerning privacy and ethics in tracking participants’ contributions across projects. The discussion was based on the first iteration of the SciStarter API: <https://scistarter.com/api#participation>.

The discussion focused on concerns regarding ethics of sharing data about participants and the responsibilities that comes with it. As an example, the group analyzed the case of [SciStarter](#) where projects share participants’ emails with SciStarter, but in the privacy terms of some projects it was said that the email addresses would not be shared. The SciStarter solution to this case is to make it optional and to update the terms to specify that sharing would only occur when the user takes action to link the accounts and activity takes place.

The group agreed that the ethics responsibility is shared between the project’s implementation of the tracking, and SciStarter’s handling of the tracking. Also privacy should be scalable at the minimal to the more public. The approach of opt in will create self-selection bias, but in any case this will provide more information.

Considerations of an ethics review of projects with 3rd party certification:

- Who should define the evaluation parameters? Recommend a cross collaboration of ACSA, ECSA, and CSA defining criteria for evaluation and certification?
- How to include appropriately non institutional citizen science projects (grassroots, etc.)?

References on ethics:

- <https://bmcomedethics.biomedcentral.com/articles/10.1186/s12910-016-0117-1>

### 3. Conclusion

The results of the second workshop lead to the conclusion that all topics and principles defined are applicable beyond apps and platforms development. Therefore, all participants propose feed the results of the two workshops to ECSA's Ten Principles of Citizen Science. Specific guidelines and recommendations should accompany the principles to support citizen science project developers.

Additionally, we found synergies with other existing initiatives among them: Cost Action on Citizen Science working groups, ECSA Working Groups, International Interoperability Working Group, and the Open Geospatial Consortium (OGC). We plan to pass the results into these groups and maintain the discussion on apps and platforms in citizen science together.

Further discussion and research to propose evidence based recommendations are needed on the following topics:

- ethics in citizen science;
- learning in citizen science; and
- re-use.

Keep in touch with [ECSA](#) to find out more about these developments, future events and publications.

## Appendix

### Appendix 1: Agenda of the workshop



**Defining principles for mobile apps and platforms development  
in citizen science: Interaction, Interoperability, Innovation  
Second Workshop**

25th-27th April in Gothenburg

25.04.2017

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15:00	<b>Welcome</b>
15:30	<b>Presentations</b> Getting it Right or Being Top Rank: Games in Citizen Science <i>Marisa Ponti, University of Gothenburg</i> Lessons learned on re-usability and the way how we define success <i>Sven Schade, JRC</i> Building the Zooniverse Platform <i>Adam McMaster, University of Oxford</i> SciStarter <i>Jonathan Brier, University of Maryland</i> Citizen science in an open data infrastructure: the UK National Biodiversity Network and GBIF <i>Ella Vogel, National Biodiversity Network</i>
16:45	<b>Coffee break</b>
17:00	<b>Results of the first Workshop</b>  1) Principles for Interoperability: Data Standardization & Data Quality <i>Luigi Ceccaroni, 1000001 Labs &amp; Jaume Piera, Institute of Marine Sciences (ICM-CSIC)</i>  2) Principles for User Interface & Experience Design: Interaction, Mechanisms to support Motivation <i>Soledad Luna, ECSA</i>  3) Principles for Outreach, Learning, Education, and other Rewards of Participation <i>Dick Kasperowski, University of Gothenburg</i>
17:30	<b>What happened so far and expectations of this workshop</b> <i>Ulrike Sturm, Museum für Naturkunde Berlin</i> <i>Soledad Luna</i>
18:00	<i>Poster session &amp; drinks</i>
19:00	<b>Dinner (self-paid)</b>

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26.04.2017

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- 9:00 **Collecting social science data with smartphone apps and school children**  
*Christopher Kullenberg, University of Gothenburg*
- 9:30 **Epistemological ideals of inclusion: Mobilizing citizens in science and the humanities**  
*Dick Kasperowski*
- 10:00 **Report on Data Standards by CSA-ECSA-ACSA**  
*Luigi Ceccaroni*
- 10:30 **Coffee Break**
- 11:00 **Working Groups**
- 1) Principles for Interoperability: Data Standardization, Data Quality  
*Luigi Ceccaroni & Jaume Piera*
  - 2) Principles for User Interface & Experience Design: Interaction, Mechanisms to support Motivation  
*Soledad Luna & Ulrike Sturm*
  - 3) Principles for Outreach, Learning, Education, and other Rewards of Participation  
*Dick Kasperowski*
- 12:30 **Lunch**
- 13:30 **Working Groups**
- 1) Principles for Interoperability: Data Standardization, Data Quality
  - 2) Principles for User Interface & Experience Design: Interaction, Mechanisms to support Motivation
  - 3) Principles for Outreach, Learning, Education, and other Rewards of Participation
- 15:00 **Presentation of preliminary results & discussion**
- 15:30 **Coffee Break**
- 16:00 **Exercise regarding principles and guidelines**
- 17:30 **Cultural/Social activity in Gothenburg**
- 19:00 **Dinner (self-paid)**

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27.04.2017

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- 9:00      **Working Groups**
- 1) How to foster reuse? Which is the necessary information to make a list of apps and platforms accessible for reuse?  
*Sven Schade*
  - 2) How to share the learning of citizen science practitioners around the designing and building of apps & platforms, managing data and engaging and retaining participants?  
*Christopher Kullenberg*
  - 3) How to track participant's contribution across different citizen science projects?  
*Jonathan Brier*
- 10:30      **Presentation of results, discussion and next steps for publication of the principles**
- 12:30      **End of meeting with lunch**

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 Bundesministerium  
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## Appendix 2: ECSA's Ten Principles of citizen science

- 1. Citizen science projects actively involve citizens in scientific endeavour that generates new knowledge or understanding.** Citizens may act as contributors, collaborators, or as project leader and have a meaningful role in the project.
- 2. Citizen science projects have a genuine science outcome.** For example, answering a research question or informing conservation action, management decisions or environmental policy.
- 3. Both the professional scientists and the citizen scientists benefit from taking part.** Benefits may include the publication of research outputs, learning opportunities, personal enjoyment, social benefits, satisfaction through contributing to scientific evidence e.g. to address local, national and international issues, and through that, the potential to influence policy.
- 4. Citizen scientists may, if they wish, participate in multiple stages of the scientific process.** This may include developing the research question, designing the method, gathering and analysing data, and communicating the results.
- 5. Citizen scientists receive feedback from the project.** For example, how their data are being used and what the research, policy or societal outcomes are.
- 6. Citizen science is considered a research approach like any other, with limitations and biases that should be considered and controlled for.** However unlike traditional research approaches, citizen science provides opportunity for greater public engagement and democratisation of science.
- 7. Citizen science project data and meta-data are made publicly available and where possible, results are published in an open access format.** Data sharing may occur during or after the project, unless there are security or privacy concerns that prevent this.
- 8. Citizen scientists are acknowledged in project results and publications.**
- 9. Citizen science programmes are evaluated for their scientific output, data quality, participant experience and wider societal or policy impact.**
- 10. The leaders of citizen science projects take into consideration legal and ethical issues surrounding copyright, intellectual property, data sharing agreements, confidentiality, attribution, and the environmental impact of any activities.**