Publications in the Field of Citizen Science

Issues of Identification and Dissemination

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ECODOC

Introduction

Context

- Strong directives for Science With and For the Society and Participatory Science & Research (PSR) (= Citizen Science) in French universities since 2021.

- The Bordeaux University asked the academic library for a list of publications related to Participatory Science and Research/Citizen Science between 2018 and 2022.

Introduction

A problem of bibliometry and of definition

How to identify Citizen Science publications?

*"It overlaps with a **wide array of terms that are used to describe** various forms of participatory action research and digital volunteerism, including Community Science, Civic Science, People-Powered Science, Participatory Mapping, Participatory Science, Volunteered Geographic Information (VGI), Community Remote Sensing, Citizen Observatories, Crisis Mapping and Citizen Generated Data."*

Haklay M., et al. Contours of citizen science: a vignette study, Royal Society Open Science, 8 – 2021

What keywords should we use to identify articles in Citizen Sciences (CS)?

Introduction

Issues

- Improving the indexing of Citizen Science publications to increase their visibility and citations
  - Enhancing the identification of CS publications to better understand the diverse range of CSs and assist researchers in utilising them.
  - Enhancing the identification of CS publications to facilitate their exposure, especially within libraries.

Introduction

A thesaurus for Citizen Science?

If there are numerous keywords, can we identify one or several keywords that would be selfsufficient, such as Citizen Science for instance?

Can we identify relations (and which ones) between main keywords – that are almost selfsufficient – and secondary keywords – that are dispensable?

Can we identify keywords suiting every CS specifity?

→ On what conditions can a suitable thesaurus be designed?

Literature Review - Thesauri

- INRAE (National Research Institute for Agriculture, Food and Environment)
  - Languages: French + English
  - Reference document within the organisation to index publications regarding agriculture, food, environment and scientific research in general

INRAE

Citizen Science
- Citizen Research
- Community-Based Participatory Research
- Cooperative Research
- Participatory Action Research
- Participatory Experiment
- Participatory Trial

- LOTERRE (Linked Open TERminology REsources)
  - Designed by the INIST (Institute of Scientific and Technical Information) from the CNRS (French National Centre for Scientific Research)
  - Platform for exhibition and sharing of scientific terminologies

LOTERRE

Citizen Science
- Civic Science
- Crowd-Sourced Science

Community Science
- Crowd Science
- Crowd-Sourced Science
- CS
- Participatory Action Research
- Participatory Monitoring
- Public Participation in Scientific Research
- Volunteer Monitoring

- MeSH (Medical Subject Headings)
  - Created by the NML (U.S. National Library of Medicine)
  - Biomedical reference thesaurus

MeSH

Citizen Science
- Community-Based Participatory Research
- Community Participation

2 preferential concepts
4 generic concepts
19 synonym concepts

Literature Review

Research Literature

- Bibliometric studies focusing on Citizen Science
- Studies on definition of CS

- In the CS field of research, not in library and information science

Literature Review

Identified Issues

- ‘Citizen science’ keyword’s centrality ?
- A need for a specification per discipline?
- Possibility to reflect on the CS variety in levels of hierarchies in a thesaurus ?
- What visualisation and representation of relationships between terms within a thesaurus?

Bibliometrics & Semantics

Goals

- Constitute a large corpus of publications to analyse the use of keywords

    - To observe if there is “natural” hierarchy between the keywords, considering the number of publication using them.
    - To observe the emergence or the disappearance of some keywords
    - To observe a Citizen Science ecosystem

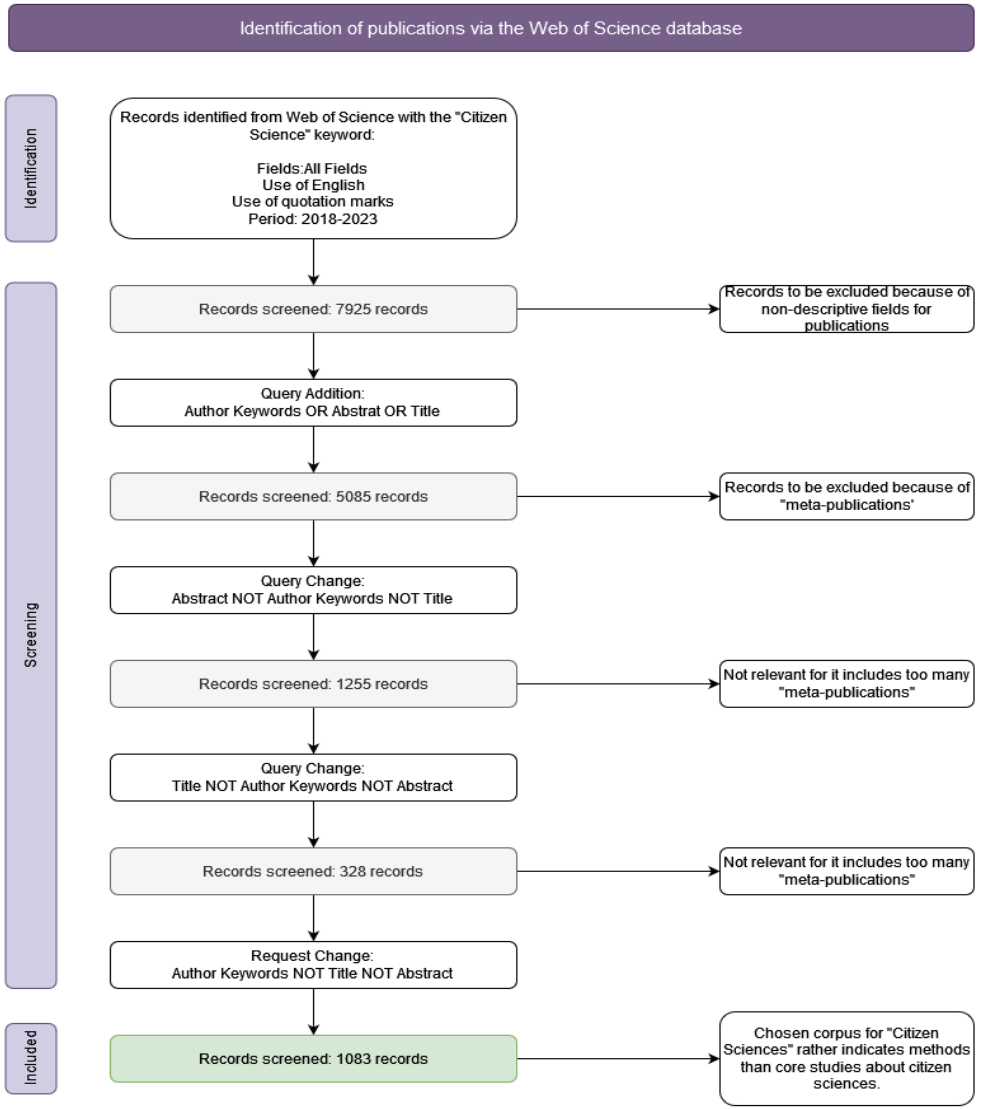
Bibliometrics & Semantics

Corpus Conception Method

- Method based on the PEO model (Bettany- Saltikov, 2016) used previously by colleagues to identify relevant literature for Bordeaux University
  - Population: Worldwide science literature
  - Exposure: Citizen Science (first tested on CS)
  - Outcomes: Good practices and recommendations

- Initial steps
  - Finding keywords associated to ‘Citizen Science’
  - Narrowing for numerous meta-articles were found
  - Keeping the author keywords field only since it describes the method rather than the core content
  - Excluding the ’Keywords Plus’ in the query to centre the analysis on keywords chosen by the authors

- Final query
  - "CITIZEN SCIENCE" (AUTHOR KEYWORDS) NOT "CITIZEN SCIENCE" (TITLE) NOT "CITIZEN SCIENCE" (ABSTRACT) AND "> 2018-01-01 < 2023-12-31" (PUBLICATION DATE)
  - And for all keywords of the three thesauri : “COMMUNITY SCIENCE" (AUTHOR KEYWORDS) NOT "CITIZEN SCIENCE" (TITLE) NOT "CITIZEN SCIENCE" (ABSTRACT) NOT “CITIZEN SCIENCE" (AUTHOR KEYWORDS) "> 2018-01-01 < 2023-12-31" (PUBLICATION DATE)



Bibliometrics & Semantics

Main corpus Analysis

Main corpus:

Keyword	Publications
Citizen Science (CS)	1083
Community-Based Participatory Research (CBPR)	1391
Community Participation (CP)	1206
Participatory Action Research (PAR)	1238

- Community science : not enough publications.
- Focus on:
  - Keywords
  - Publication Year
  - Publisher
  - Times Cited
  - WoS Categories/Research Areas
  - *Considered approach to explore: Geographic Areas*

Bibliometrics & Semantics

- Moving Beyond Single Keywords

Recommandations

- Avoiding the use of a single keyword: combining Citizen Science with something else. Not making Citizen Science the sole entry point in the thesaurus.

- Avoiding the use of a single keyword in general: exploring connections between different terms to understand what brings them together and sets them apart, beyond disciplinary boundaries.

- Not relying solely on disciplines to select keywords.

Bibliometrics & **Semantics**

Goals

- To identify a wide amount of keywords related to the Citizen Science Field.
- To identify relationships (thematic, conditional, hierarchical) between all of the keywords.

Corpus

- First corpus / Citizen Science: **1 083** publications
  - Unique keywords (Including Author Keywords and Keywords Plus): **5 574**
- Second Corpus / PAR, CBPR, CP : **3 914** publications
  - Unique keywords (Including Author Keywords and Keywords Plus): **16 291**

Bibliometrics & **Semantics**

Data

- Selection of terms based on our experience and knowledge of CS:

- Total without duplicates : 505 words related to CS
    - 124: PAR (total: 224 ; 55%)
    - 103: CP : (total : 165 ; 62%)
    - 117: CBPR (total : 205 ; 57%)
    - 161: CS (total 237 ; 68%)

Bibliometrics & **Semantics**

Semantic Fields

Topic	Examples of Keywords from LO, InRAE and MeSH thesauri
Monitoring	Participatory Monitoring and Volunteer monitoring (LO)
Community	Community-based participatory research (INRAE + MESH), Community Science and CS (LO), Community Participation (MESH).
Citizen	Citizen Science (INRAE, LO, MESH) ; citizen research (INRAE); Civic Science and CS (LO)
Cooperation	Cooperative research (INRAE)
Crowd	Crowd Science and Crowd-Sourced Science (LO)
Participation	Community-based participatory research (INRAE + MESH) ; participatory action research (INRAE + LO) ; participatory experiment (INRAE) ; Participatory Trial (INRAE) ; Participatory Monitoring (LO) ; Public Participation in Scientific Research (LO) and Community Participation (MESH).

- What usage for semantic fields?
- How to interpret terms found within these semantics fields?

Bibliometrics & **Semantics**

Categorisation

The study of keywords allowed us to identify 4 major categories to characterize a project.

Identification & Valorisation Tool

A better keywords system understanding through

- Use
- Preferentials
- Meaning
- Organisation
- Role

- Keyword presentation tool adapted to citizen sciences

What tools to represente knowledge organisation?

Identification & Valorisation Tool

As each tool is presented, we will specify its ability to meet the identified needs. As a reminder:

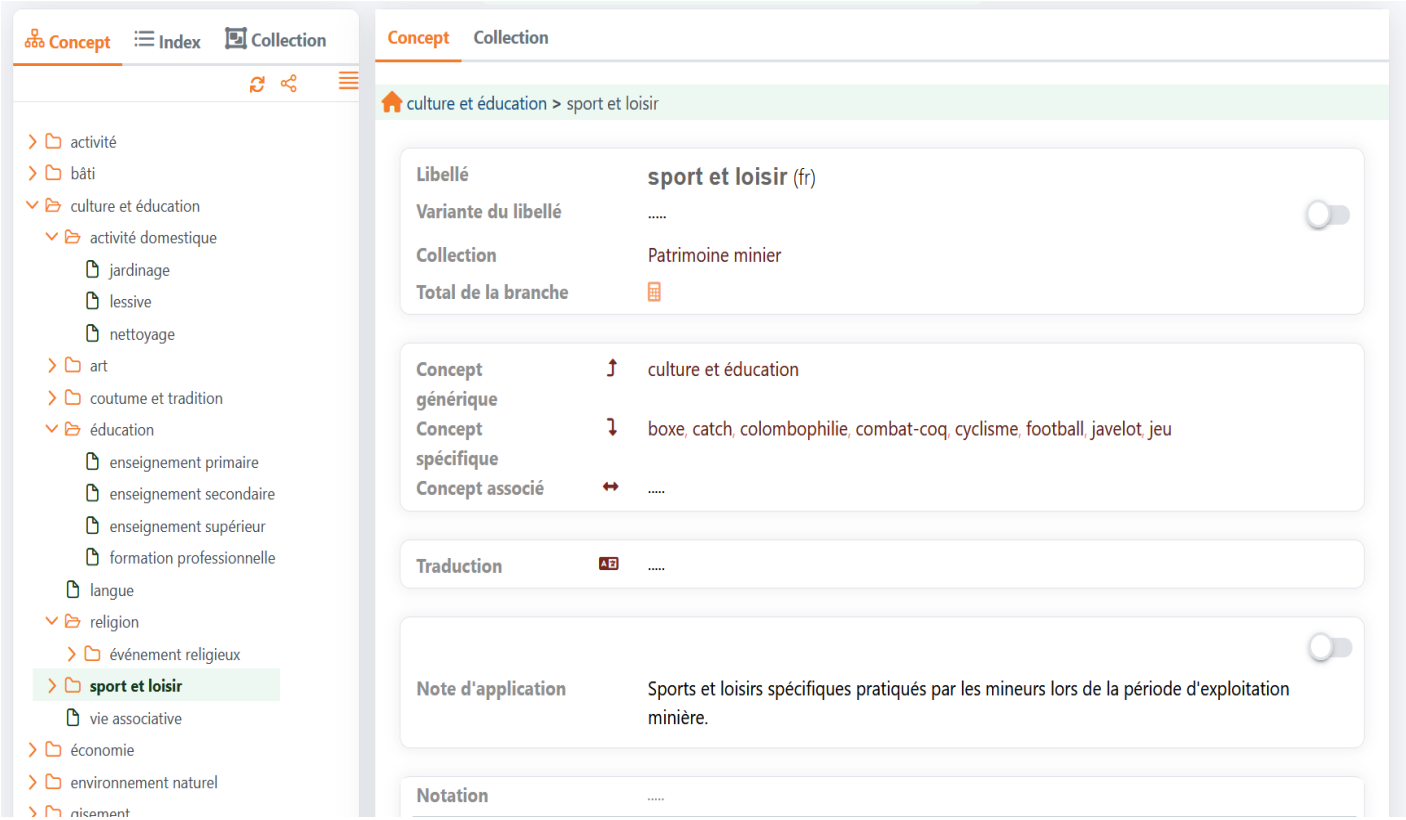
Researchers' needs:

- To define keywords;
- To define the kind of CS project that will be made;
- To discuss with participants their implication and the terms used to describe their participation.

Librarians' needs:

- For their own CS projects
- To help researchers in their paper research
- To help researchers to define their keywords
- To help governance to define what kind of bibliometry related to CS they want you to produce
- To train themselves in the diversity of CS

Identification & Valorisation Tool



- Familiar tool
- Easy to navigate
- Space for definition and contextualisation

- Suggests equivalence of the terms in its structure
- No outside guidance

https://opentheso.huma-num.fr/opentheso/index.xhtml

Identification & Valorisation Tool

From Thesaurus to Decision Tools

Maybe the solution to

1. Show the relationship
2. Express the condition
3. Offer a useful tool, easy to use, even if there are more than 500 words in it

would be to propose an interactive thesaurus.

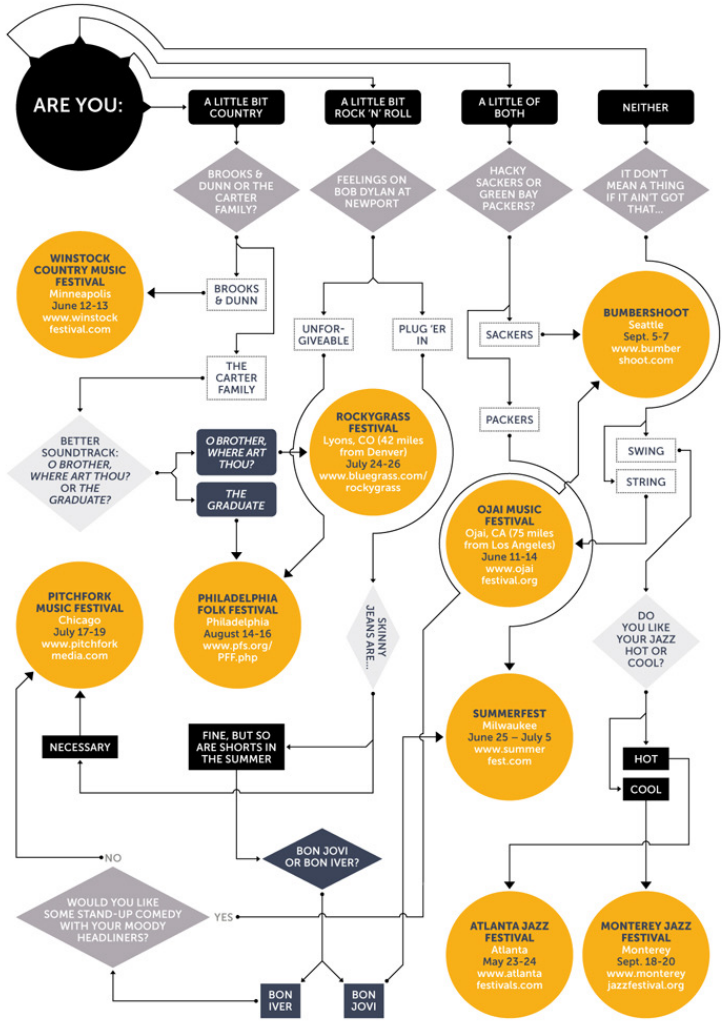
Example :

I do research in sociology and information science, I work with a group of Indigenous people, that are also librarians, to study how their collective tales/myths can be dialoguing with research data on a forest study. The participants have been co-opted. And the participants take part to collect data, analyse data, interpretation and definition of new research question.

How to define the perfect keywords to describe our future paper ?

- Flow diagram
- Decision database

Identification & Valorisation Tool



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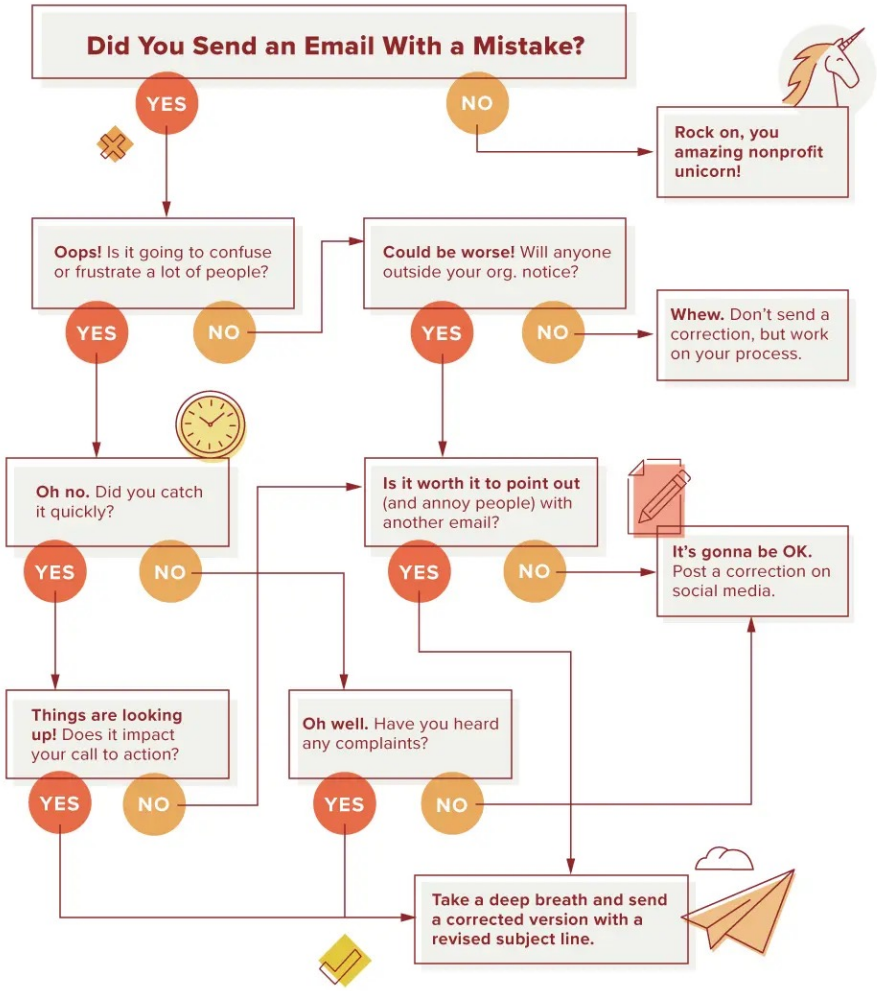


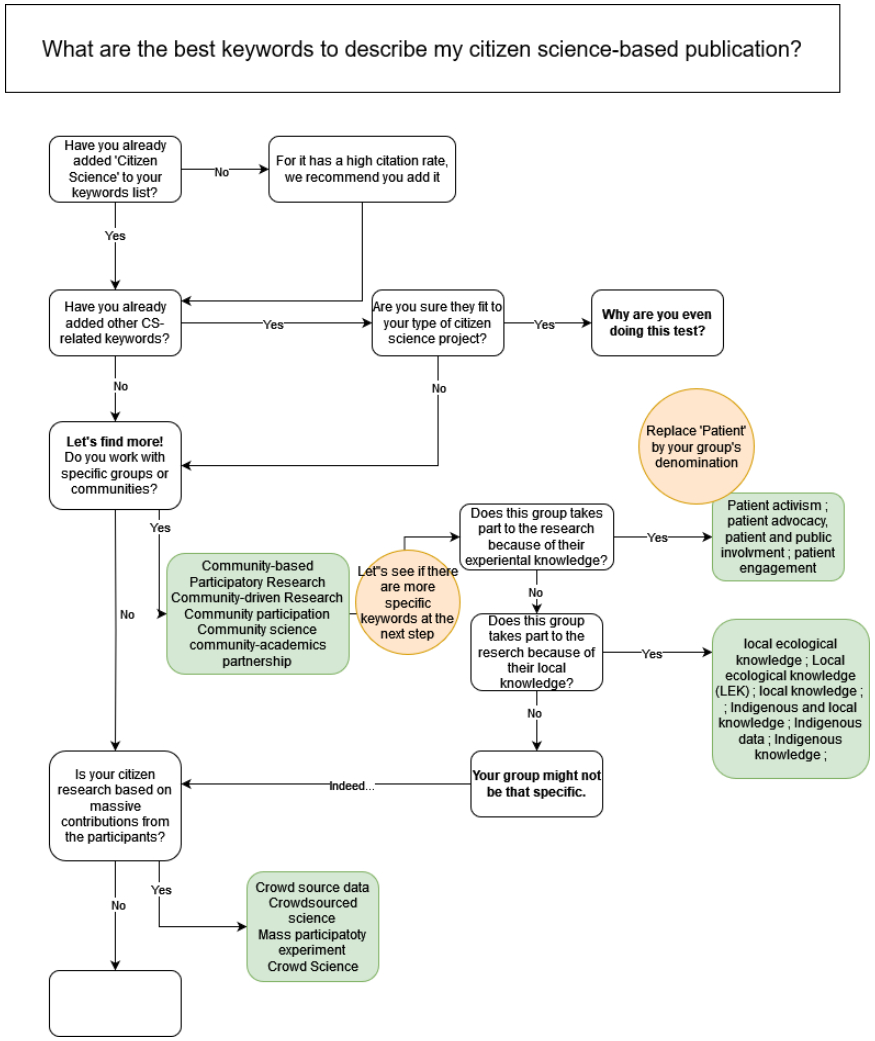
WIREDIMPACT

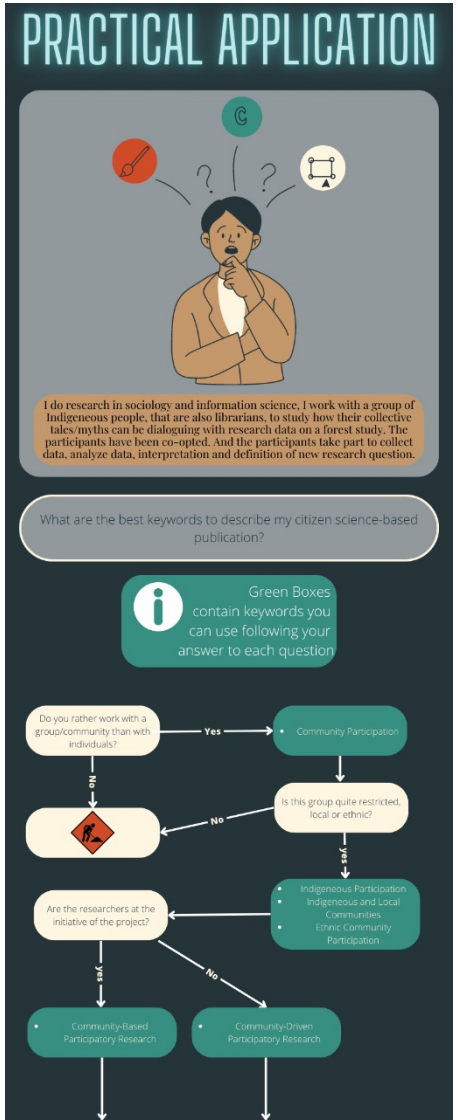
https://wiredimpact.com/blog/nonprofit-email-marketing-mistakes/

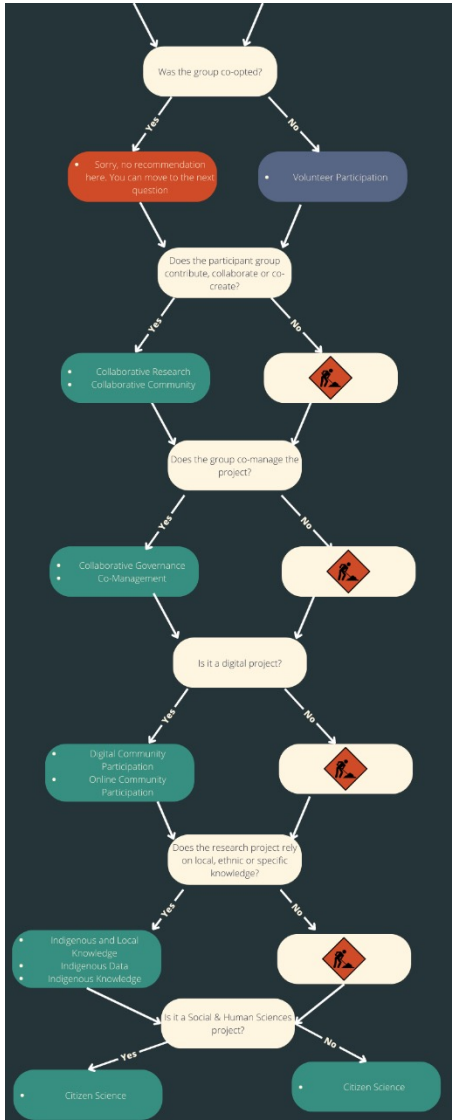
- Decision-making process overview
- Show types of relationships between objects
- Difficult to insert additional textual information

Identification & Valorisation Tool

Attempts to contextualize a flow diagram







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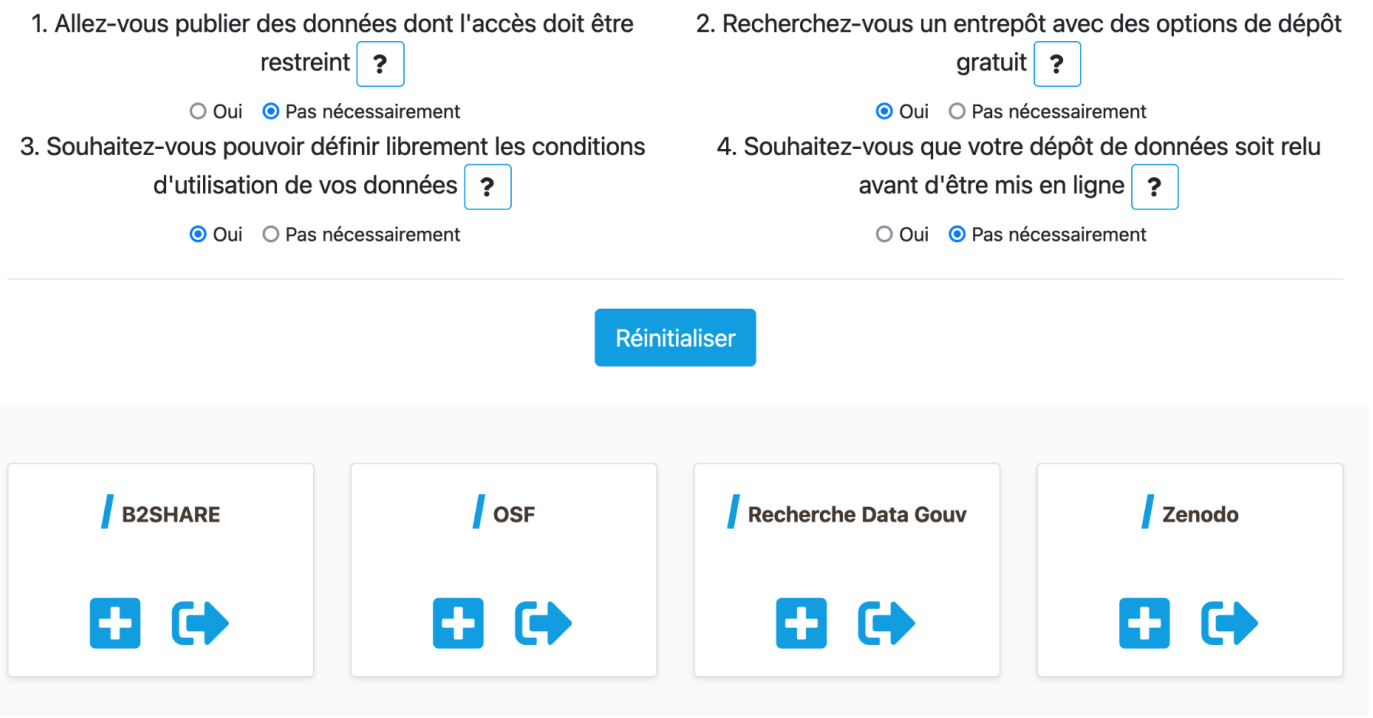


Finding a data repository
http://busec2.u-bordeaux.fr/aide-choix-entrepot/

- Dynamic display of required answer

- Exploration difficult
- Limits to textual information

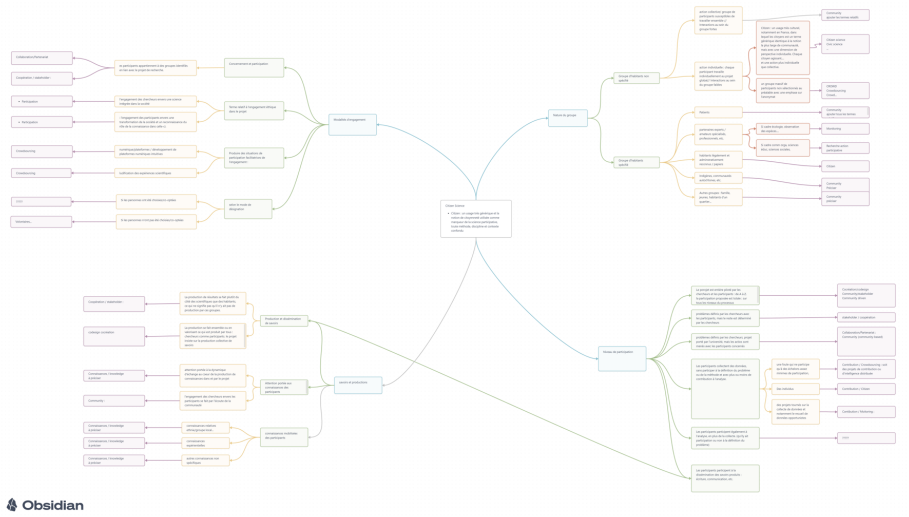
Identification & Valorisation Tool

Current experimentation

Need to consider the elements obtained while studying these visualisation proposals in order to build a tool that is tailored to our specifications

- Questions system
- Pop up : explanation
- Room for additional textual information
- Flow diagram running in the back end
- Final proposal gathers all keywords

Identification & Valorisation Tool



Nature du groupe

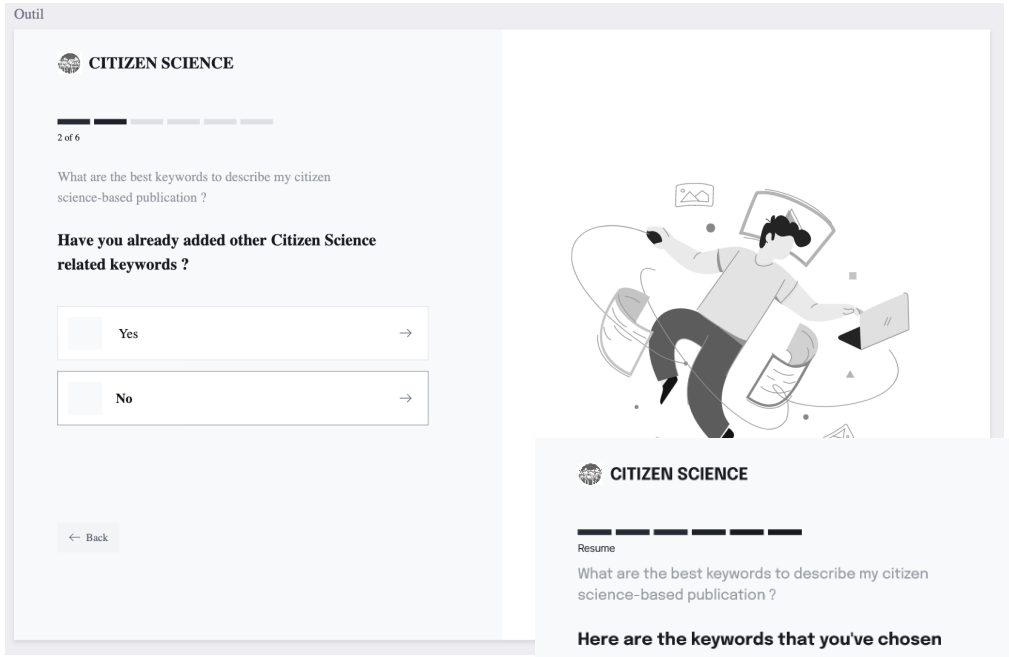
Groupe d'habitants non spécifié

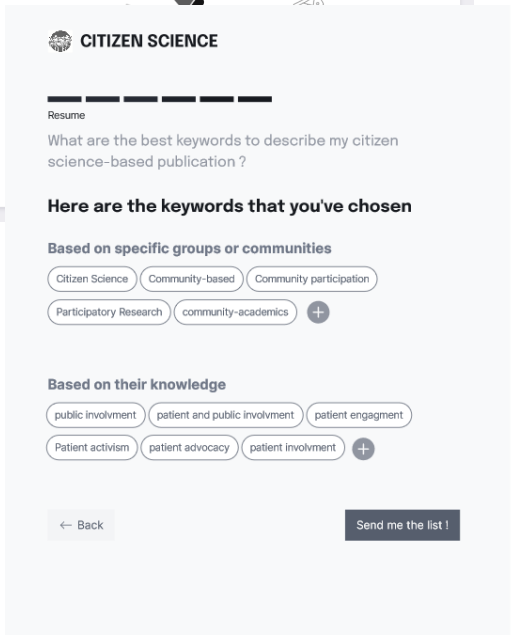
- action collective/ groupe de participants susceptibles de travailler ensemble // Interactions au sein du groupe fortes
  - Community
    ajouter les termes relatifs
- action individuelle : chaque participant travaille individuellement au projet global// Interactions au sein du groupe faibles
  - Citizen : un usage très culturel, notamment en France, dans lequel les citoyens est un terme générique identique à la notion la plus large de communauté, mais avec une dimension de perspective individuelle. Chaque citoyen agissant....
    et une action plus individuelle que collective.
    - Citizen science
      Civic science
      ...
  - un groupe massif de participants non sélectionnés au préalable avec une emphase sur l'anonymat
    - CROWD
      Crowdsourcing
      Crowd...

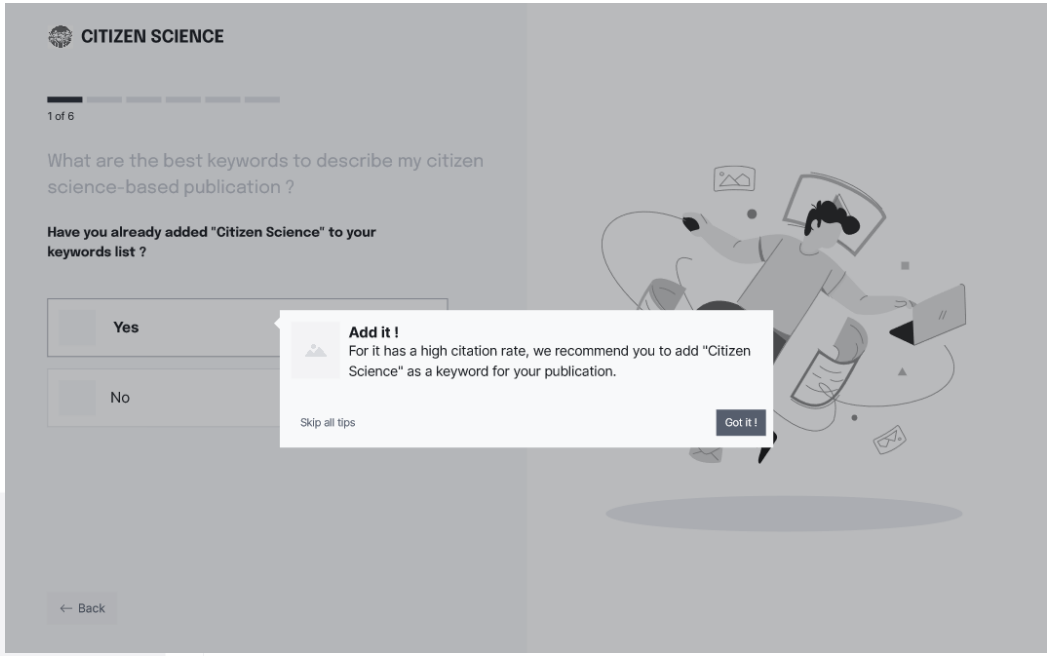
Groupe d'habitants spécifié

- Patients
  - Community
    ajouter tous les termes
- partenaires experts / amateurs spécialisés, professionnels, etc.
  - Si cadre écologie, observation des espèces....
    - Monitoring
  - Si cadre comm orga, sciences éduc, sciences sociales,
    - Recherche action participative
- habitants légalement et adminstrativement reconnus / papiers
  - Citizen
- Indigènes, communautés autochtones, etc.
  - Community
    Préciser
- Autres groupes : famille, jeunes, habitants d'un quartier...
  - Community
    préciser

Identification & Valorisation Tool







Conclusion

What we hope having achieved:

- Better understanding of the CS ecosystem of information
- Creating a tool that reflects this ecosystem
- Making recommendations for librarians to find their way through CS field, as a bibliometric task.
- Use in our research project ECODOC as a mean to explore enrichment of knowledge organisation systems.

We hope that it could help academic libraries to act and to be seen as a pivot within the university, connecting Citizen Science projects and their visibility and their accessibility, to students, to researchers, but also to citizens.

Thank you!

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