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LitReach: A Shiny App for Assessing the Global Reach and Usage of Published Work

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Summary

LitReach is a Shiny app developed in R (R Core Team 2021) that allows authors to assess the global reach and usage of their published work.

The app provides a range of visualisations that allow authors to explore the scope of their work in a variety of ways, from citations in types of literature to global reach. The app also includes a data tidying tool that formats their citation data for use by the app. We provide exemplar data from our assessment of the global reach and usage of one of the outputs from the second study of infectious intestinal disease (IID) (O'Brien et al. 2010) in the UK (C. C. Tam et al. 2012; C. Tam et al. 2012).

One problem often faced by researchers is, first, how you assess the reach of your work and second, how you communicate this to others. LitReach aims to provide a platform for authors to upload data from sources such as Scopus, Web of Science, PubMed and Google Scholar that can then be summarised and viewed in an easy to understand and interactive way. Creating similar visuals would require a good understanding of R and the use of a variety of packages. LitReach aims to streamline this process for authors by providing a simple-to-use interface that can be used by individuals with little to no experience in R or other programming languages.

Statement of Need

Authors of published scientific literature are often required to demonstrate the impact of their work. This can be challenging, as the impact of a publication is frequently measured in multiple different ways, including citations, downloads, social media engagement, effect on policy and global reach. The need for LitReach in the form of a readily accessible shiny application is:

1. To provide researchers at academic institutions with an easy method for determining the global reach and usage of published works and provide them with clear and comprehensible visuals.
2. To help support further funding bids that relate to or are follow-on works from the original publication.
3. To provide a tool that can be used by researchers to demonstrate their research usage to a broader audience.
4. To facilitate the further development of methods to measure and visualise the scale of the reach of scientific literature both in the scientific community and in policy and public engagement.

Data Sources and Structure

LitReach uses data from Scopus, Web of Science, PubMed, and Google Scholar (through the Publish or Perish software ("Publish or Perish" 2007)), and the data are uploaded

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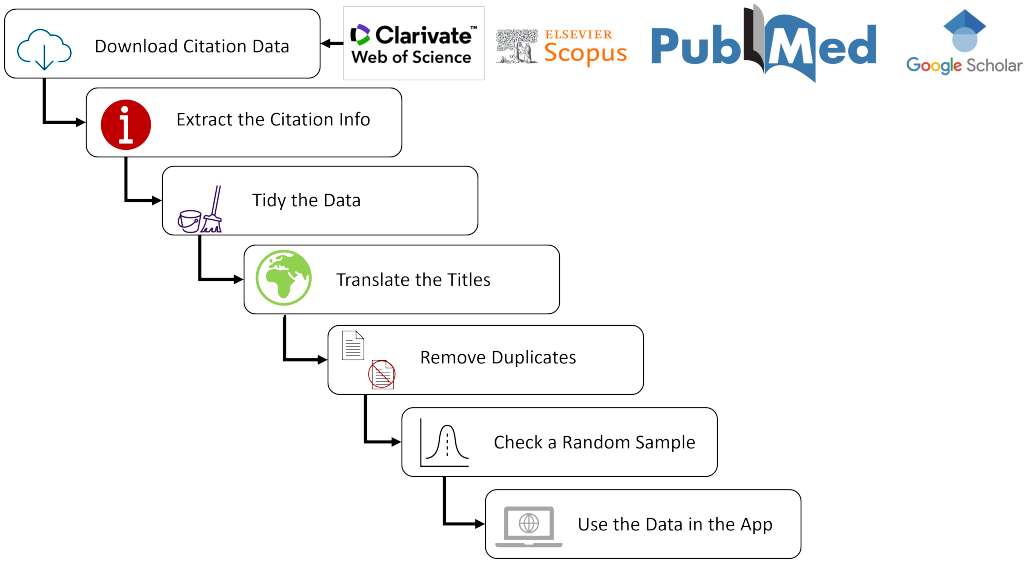

Figure 1: The process of citation data preparation and tidying

by the user in the form of a CSV files. The user can upload raw CSV files from those sources to the app's inbuilt data tidying tool, which will concatenate the search results into one usable CSV file, the process of which is described in Figure 1. After data tidying, the CSV file involves some manual input of the data as not all sources export the same information when exporting citation information, particularly the type of literature and country of affiliation if using data from Google Scholar.

The app requires data to be in the following format (Table 1) which is also provided in the app as an example of the data format needed:

Table 1: An example of the data format needed by the app.

ref_id	type	author	title	year	country
1	JA	OBrien	methods for determining disease burden and calibrating national surveillance data in the united kingdom the second study of infectious intestinal disease in the community iid2 study	2010	United Kingdom
2	JA	Mroc	european data sources for computing burden of potential vaccinepreventable diseases in ageing adults	2021	Belgium

Table 1: An example of the data format needed by the app.

ref_id	type	author	title	year	country
3	JA	Harris	norovirus strain types found within the second infectious intestinal diseases iid2 study an analysis of norovirus circulating in the community	2019	United Kingdom
4	JA	Adams	social patterning of telephone healthadvice for diarrhoea and vomiting analysis of 24 million telehealth calls in england	2020	United Kingdom
5	JA	Schmidt	a model for rapid active surveillance for medicallyattended acute gastroenteritis within an integrated health care delivery system	2019	United States of America

Where ref_id is the unique identifier, author is the last name of the first author, title is the title of the publication, year is the year of the publication, and country is the country the first author is affiliated with.

The data also includes columns that identify the citation as one of your papers of interest in the event you are looking at multiple outputs, the number of citations, policy mentions, mentions in other places, views and pdf downloads of the piece of literature.

Application Structure

The application is divided up into five tabs:

1. The 'Instructions and Data Upload' tab, where the user can upload raw data and have it prepared for the app, and where the user uploads the data for the app to display.

2. The 'Research Outputs' tab displays the number of citations, policy mentions, mentions in other places, views and pdf downloads of the literature.
3. The 'Uses in Literature' tab where the app displays information on how the piece of work has been cited in the literature.

4. The 'Global Reach' tab is where the app displays information on the number of citations from other countries the literature has received.

5. A 'FAQ' (frequently asked questions) tab that provides information on app development.

Ongoing Research

LitReach was developed in part to help assess the impact of the ongoing Third Study of Infectious Intestinal Disease (IID3) in the UK. It was used to support the bid for further funding of the IID3 study.

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