The state of science and Wikimedia: Who is doing what, and who is funding it?

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Abstract

This research examines Wikimedia related publications to see who did them, what was done, and most importantly who has funded this sort of work in the past. Our goal is to understand what has been done and identify which sponsors or contributors supported those activities, both as a service to the community and as the basis from which to grow future projects and collaborations. We use the Scholia dataset, and do a bibliometric analysis of it, to enhance our existing efforts to identify relevant projects, people, and opportunities for the Wikimedia Research and Science communities. This work is mainly for the community, and to lay the framework for more coordinated action.

Introduction

Wikimedia projects are among the world's most valuable and popular sources of science information (Eveleth, 2013; Ford, 2020), including science-related articles in Wikipedia (*Economist*, 2021; Heilman et al., 2011; Gherkin, 2010; Penev et al., 2011), the reuse of general reference Wikidata datasets for off-wiki research (Mehdi et al., 2017; Arroyo-Machado et al., 2020; Bragazzi et al., 2017; Cao et al., 2020; Falk & Hagsten, 2022; Nielsen, 2007; Rasberry et al., 2022; Rasberry & Mietchen, 2024), and use of Wikimedia Commons media for illustrations in global media of all sources (Erickson et al., 2018). Despite this, the Wikimedia Movement lacks a narrative of its successes in the sciences, a profile of the hundreds of past projects, an accounting of the tens of millions of dollars of funding which scientific Wikimedia projects have solicited outside of Wikimedia Foundation donations, and the overall documentation infrastructure which would enable engagement between science and Wikimedia and coordination between science related affiliates.

Who is doing what, exactly? How can we help? Even while there is an overall lack of coordination, there exist many initiatives across academic (Buttliere et al., 2024; Jemielniak & Aibar, 2016; Shafee et al., 2017), educational (Ackerly & Michelitch, 2022; Friesen & Hopkins, 2008; Konieczny, 2016; Konieczny, 2012; Lim, 2009; Mkrtchyan, 2021), scientific (Buttliere, 2014; Severo, 2019; Teplitskiy et al., 2017; Shafee et al., 2018; Waagmeester et al., 2020), and professional (Davenport, 2015; Duncan, 2020) domains, so many that it is difficult to actually know all of who is doing what, or even what is being done actually, even for the most well connected of Wikimedians.

Having a better understanding of who is doing what, and especially who is funding that work, also helps us better organize and makes it easier to take up projects together. There are many people working on similar topics but often they do not know each other in order to coordinate and collaborate on relevant grants.

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The goal of this grant is to understand what the Wikimedia Research and Science Communities have done, who did it, and importantly, who funded it; as a part of our longer term efforts to replicate and build on these successes and engage large/ state funderswith Wikimedia.

Related work

Our team has been working in a coordinated matter for the last years on getting Wikimedia taken more seriously as a science communication platform. Academics have the choice to choose what they do and the expertise that Wikimedia projects want and need, but there have been few coordinated efforts to engage academics with Wikimedia.

The academics that do engage often both as a part of the Wikimedia community because they cannot be full time, but also in the academic hierarchy because they are spending time organizing the Wikimedia community rather than publishing traditional academic output that is more visible to universities.

Our theory of change is that if academics can get professional recognition for developing open resources in the Wikimedia platform, then they would contribute more, and the scholarly reputation of Wikimedia would improve (Buttliere, Vetter, & Ross, 2024). This project identified many highly engaged networks of Wikimedia community members who contribute to the science, but also found that the community is so large, varied, and undocumented that no one has a usable and actionable narrative of the scientific Wikimedia community. Thus this project is aimed at getting a really good understanding of what is going on, who is doing what, and where we can reasonably look to create synergies.

One outcome of this work from the last year was an early version of the Research Persons database, also in partnership with Kinneret Gordon and the Wikimedia Research Community more generally. This was a quite good success, the project has by now over 140 signatories, but it is not as good as it could be, and it is certainly not exhaustive or as detailed as it could be. For instance, it could be better linked with ORCID, or be more explicit about opportunities where people can collaborate.

This project is intended to be a quite explicit search for others in this area, to populate and expand this dataset and e.g., the WikiResearch ListServ, understanding what they are doing, and hopefully bringing them into some action.

Initiatives to understand who is doing what.
An example of this work is Flavia Varella and her team, who are also collaborators of ours (but notably not on the research persons database), who recently did a 3 year community and strategy grant in a quite similar direction, but for educational initiatives (Varella & Figuredo; 2023). Whereas Varella et al. focused on Wikimedia's educational initiatives, which has also led to a much stronger team in this area, and especially in Latin America, we intend to focus on Science initiatives. They found 13,000 educational initiatives in general.

We believe a systematic and detailed study within science is warranted and will bring benefits similar to the way that the education community has benefitted from such. Here we want to go systematically through e.g., grants, preprints, and publications about Wikimedia.

Look at who is funding this work.
To our understanding, there has been little work done to explicitly look at who is funding Wikimedia related research. This also makes our work some what novel and potentially important to help fund future work.

Another example of this work upon which we expect to expand is the European research projects related to Wikimedia during 2021. The goal is to develop some understanding also for the Foundation so that it can more effectively fundraise on behalf of the community.

The need to get contributions taken seriously. One thing that all of this past work made clear is that the Wikimedia community could get more professional credit for this work and it would benefit the community. This also helps Wikimedians of all times meet their goals in terms of professional development.

In order to gain respect for Wikimedia contributions, and to organize individuals to apply more systematically for funds external to the Wikimedia Foundation, the field needs to establish a shared understanding and citable narrative which demonstrates what successes the community has achieved. and what funders have already recognized these successes with grants and sponsorship.

Methods

This project is essentially a bibliometric review of papers, grants, affiliates and etc, with the ultimate goal of developing a communal understanding of what is being done, who is doing it, and who is funding that work.

The core of the grant is to collect publications which study or are about Wikimedia-related topics, and then look at their bibliometric data in particular the 'sponsor' variable as made available in Scholia, looking both for ways to improve the variable and at who is funding this work in general.

This data will be used as a basis not only to understand what is currently happening, but also from which to grow new projects by linking partners for grantmaking opportunities at the funders that we expect to identify.
Beyond creating these databases of projects, people, and funders, we expect the project to be a key update as to what exactly is going on with Wikimedia and Science/ Research, and a key part of additional projects to develop the community into a force for WikiScience.

The nature of the database can be explored at this link. The goal is to dig into the Scholia dataset of about 15,000 papers that include Wikimedia/ Wikipedia/ Wikidata or other closely related subjects as a topic and to see where there are clusters of projects, how the work has changed over time, who is doing it, and who is funding it. This is a bibliometric analysis in the style of Turki et al. (2024) of the keywords and annotations in Wikidata on any amount of papers, but looking in particular at who is funding the work for the most important 200 works. Check in the acknowledgements for who or what grantmaker is funding it in the style of Hegde, Garg, Murray-Rust, & Mietchen (2022).

Key research questions this project answers
This project addresses itself to many relevant questions for the research and community more generally:

- What keywords and in what areas is the work? What exactly is being done?
- What journals are publishing Wikimedia work?
- Who are the main authors in different areas? Are there particular groups?
- Who is funding this Wikimedia work?
- What are the main universities?
- How to bring these people together?

Looking systematically at the scientific output around Wikimedia will be of benefit to many areas of the community, especially in relation to

future works to bring people together. Below we outline some of the specific questions and how we intend to tackle them while analyzing these data. The project will focus on academic papers and scholarly content published about Wikimedia, as identified by the Scholia tool. Scholia currently has a database with several thousands of papers in it.

The goal is to categorize what is being done, identify who is active, and what they are doing. The goal is to also bring people together so that in the future we can survey them as to what they want to do and recruit them for other projects.

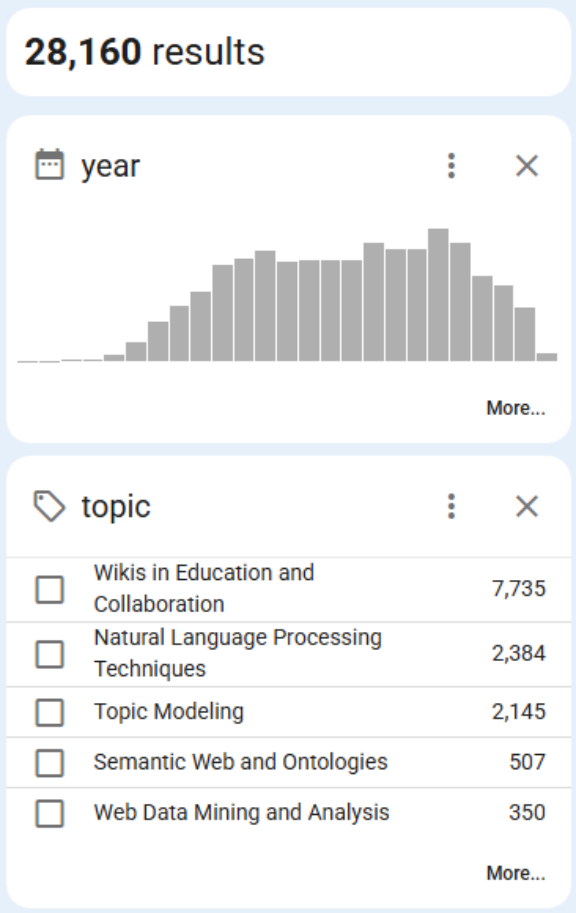
While organizations like OpenAlex offer an overarching and broad modeling of these different communities, for instance with authorship networks, we would like to use these existing metrics and really do the work of reading those important papers and bringing those individuals into some community.

Different expected analyses:

What are the most cited papers in the area and what are the growing subareas in this field? The most general and first analysis we will do is an analysis by citation at the (sub)field level, also looking for the odd paper that should be getting more than it is. A summary paper would make the full dataset available and have likely the top 10 papers in a table. Such data can also be used to develop syllabi for future classes, as a key readings list in terms of what should be taught or read when learning about Wikimedia.

Who are the most prolific/ authors? This analysis is mostly just collating and disambiguating author names. Already Scholia has expressed interest in taking part in this to improve their dataset and process of disambiguation. The goal would be to identify key actors in that network as levers for change.

Figure 1: Results from OpenAlex of papers using Wikipedia in the title or abstract, The drop off is notable after 2020. One result we would be to understand what is this downward trend in the last years.



What journals are publishing Wikimedia work? This is a bibliometric analysis of which journals (or other venues, such as conferences) the papers are published in. This analysis will be useful for people in the area to know where they should best be targeting their papers.

In what topics or areas is the most work being done? A keyword analysis in terms of frequency and co-occurrences. This will show the most common areas that works are being published in and the most common keywords. Already

OpenAlex and Scholia have some rough analysis, but knowing who is doing what allows us to contact particularly those people.

Who is funding the work? The Key and most interesting analysis is who exactly is funding this work. Scholia has a 'Sponsor' variable that indicates the sponsor of the work, similar to e.g., the Web of Science's funder variables. The idea will be to analyze and fill in the variable.

Expected output

This research grant is expected to result in a number of outputs as described below:

Database of Wikimedia related Research papers. The primary goal of this research grant is to examine the projects that Scholia has about Wikimedia, to categorize and understand them bibliometrically. This means examining e.g., the keywords associated with papers, the authors on those papers, and especially the acknowledgements and funding sections.

Database of science contributors. Associated with those papers are people, and they are a key target of this research project. This database should contain information not only about who is actually doing the work but also what they are doing, where they are located, what methods they are using and other details so that the community understands where it has expertise. Such a database is also expected to help with project development, especially for international projects and grants which can be difficult to apply for without a large community and network to build from.

Understanding for the Wiki(Research) Community about who is funding what types of Wikimedia related research. Ultimately, our long term goal is to facilitate getting grants and building networks within the Wikimedia community. This research project builds on recent successes to push this work in a more systematic and needed direction to get full coverage of the community.

Improvements to Scholia. Given that we are using the Scholia dataset and in some ways trying to improve it, and that two of our collaborators are key players in Scholia, it makes sense to add our contributions to their system. For instance, we will intend to contribute to their disambiguation protocol and their funding statement indexer how we can.

Presentations about the project at WikiVenues. We believe our project will be relevant for a number of Wikimedia Communities including the WikiData and Research conference, the WikiCite Conferences, and the WikidataCon series of events. This would be aside from more mainstream Wikimedia and Academic Conferences like WikiManis, WikiConNorth America, the Metascience conference, etc.

Paper(s) presenting the results. One key outcome of this work will be a paper presenting what the Academic and Wikimedia Research communities are working on and calling for scientists to join us in these efforts. This project is a part of a longer term program of research focused on getting scientists engaged with Wikimedia.

Plans/ Framework for Science Hub. The final major goal of the project is to lay the foundation of a Science Hub within Wikimedia, which we also recently began working on as a part of our project. To do this, the goal will be to bring together many of the major science affiliates, to apply together. This project is foundational, so that we can identify and bring in all of the appropriate people, at least for a starting point.

Understanding how to get contributors credit for their work. The penultimate goal of the project is to get researchers and Wikimedians

credit for their work. This will also hopefully result in people being able to get paid to work on Wikimedia-related activities, which will lead to a more resilient and happier community overall.

Improved public knowledge
The goal of the project is not to just get scientists credit, but to bring more high quality contributions to the community so that public knowledge in general is higher quality, more comprehensive, better connected, and more accessible.

Risks

The risks

- People access the database and use it for malign purposes.
- The Wiki community is not interested in organizing (into a hub structure).
- The projects we organize fail.

Mixing incentives can cause problems, especially when people start doing it for work and looking for ways to get more for doing less. Still, we believe that overall, the risks of not doing this project and organizing ourselves into a community are far greater than organizing.

The most significant risk is simply that the work takes much more time than originally anticipated.

Community impact plan

The goal of our proposal is to understand what is actually being done in the field, and how we can help develop this action.

This project will help the community in a number of ways. In particular, we will have quite a comprehensive list of e.g., scientific authors that are doing some Wikimedia related Science related work, what is being done, and who is funding such work.

Understanding what is going on.
There are a wild number of projects, affiliates, user groups, and other organizations that are Wiki affiliated. So many that it makes it hard for many people to find their places or even know where to begin. Having an overview will help the whole community know what it wants.

Developing some organized directions to go in.
Having an understanding of what exactly is being done among all of the disparate groups and fields also allows us to understand what is important to the research community.

Helping people find collaborators
One of the biggest problems that we have experienced in the work so far is finding the right people at the right time to take advantage of a grant opportunity. Wikimedia is in a unique position of having people all over the world, which is a huge benefit for complex grants.

Fostering projects and bringing resources to the community. The ultimate goal is to help people get resources for the Wikimedia-related work they want to do. A major hurdle in this endeavor is finding the grants themselves and more importantly project partners with the proper expertise to do the parts that the team is not expert in, and to meet the grant criteria.

Evaluation

Number of papers and projects found.
The proximal goal of the project is to have a pretty complete overview of the Wikimedia Research Landscape. The goal is to have quite an exhaustive overview and categorize and understand these actions such that we have an overview of what is happening in the community. To this extent, the more projects and people we find, the better.

Number of champions identified. These initiatives are not actors in themselves, so the key will be to find particular people associated with these initiatives that we can potentially engage with when and where relevant. The ultimate goal will be to have a database of people who are interested in working on Wikimedia, especially for future granting opportunities that are international.

Paper about what WikiScience is doing. The main formal outcome of this grant should be a paper outlining what WikiScience and Research are working on in general. This paper is expected to also call for others to join.

Grants and further projects generated. Ultimately, the goal of these activities is to bring more resources to the community, thus helping people do the work they want to do without financial or time commitment struggles. To this end, the whole point of this project and trying to develop a community in general is to support grants in the community. By better identifying opportunities and the appropriate people to engage with on that project, we will help everyone do the work they want to do with the appropriate resources needed.

Budget

The budget is here, but in general we plan to use most of the funds to pay for people to work on the project. This is justified because the work is explicitly for the community, it is community building rather than career building with the ultimate goal of helping professionalize contributing to Wikimedia in general (Buttliere, Vetter, & Ross, 2024).

The figures in the budget are gross gross, meaning before currency exchange, social insurances, and all sorts of taxes. Net pay will be more like 70% of the quoted figures. This money will be distributed among the authors corresponding with their workload, with most of it expected to go to the first authors (Buttliere & Vetter) who are expected to do the most work.

These are gross gross estimates also of realistic wages for the time of these professionals.

- Selecting and downloading the data from Scholia, Web of Science, Open Alex, for papers that include 'Wikipedia' in the title or abstract:
  - ~1 week each system. $2,000 per system 6,000 USD
- Scanning/ Collating the data. Collating authors and journals. Collating and analyzing funders. Developing reproducible R code for this.
  - 10 minutes per paper to find, skim, code the data: up to 500 papers = 5,000 minutes = 88 hours = 11 work days = 2 boring weeks 6,000USD
- Reading/ mining high relevance papers in preparation for a group paper outlining the history and different areas of Wikimedia.
  - Authors reading ~10 papers: 1 paper = half day: 5 days per author (30 work days) 6 weeks: 12,000USD
- Impacting the community: Reaching out to authors of high relevance. Putting these data into e.g., the Research persons database. Using the funder data to help Wikimedians get projects.
  - Regular meetings, open science meetings, conference submission/ presentation: 2 weeks: 5000USD.
- Reporting/ writing the paper: Writing the report for the grant, preparing the paper for publication. Goal would be to invite the key network levers to join a paper about science for Wikimedia.
  - Writing the report for the WikiResearch project. 1 week:

Writing the paper for a journal. 6 weeks: Going through the Review process. 2 weeks 9 weeks 15,000USD

- 15% for the university/ fiscal sponsor: 5,500USD

In total we are estimating spending approximately 23 full time weeks, half a year, on the project across the six collaborators, and we are asking for 49,450USD in total for the project. We believe this project will have many downstream benefits for the community.

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