



# 10 Key Interviews

INSIGHTS INTO THE SUSTAINABILITY OF  
OPEN INFRASTRUCTURE SERVICES

**01** An Invest in Open Infrastructure project  
*More info: [www.sparceurope.org/ioiinterviews](http://www.sparceurope.org/ioiinterviews)*



# ABOUT THE PROJECT

## Gleaning Insights

Research and scholarship is underpinned by a variety of tools, technologies and services ranging from for-profit commercial solutions and offerings from vendors to community-owned, open technologies and infrastructure. We often hear about the challenges for open infrastructure tools and services to scale, maintain, and compete in the broader market.

The 10 interviews comprised in this project highlight some of the key decision-making points, funding mechanisms and models, and other learnings from a series of commonly used services and technologies used to support research and scholarship. These include both for-profit and not-for-profit services, highlighting perspectives on sustainability across the sector.

This work is supported by Open Society Foundations and SPARC Europe, in collaboration with Invest in Open Infrastructure.

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# WHO WAS INTERVIEWED?

## Overview

**Mendeley** *Featured in this document.*

Code Ocean

Dryad

EDP Sciences

F1000 Research

Figshare

Our Research

arXiv

Redalyc

4TU.Research.Data

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## Interview: Mendeley

**"When building something, solve a real problem and listen to the people who are going to use it"**

William Gunn, Director of Scholarly Communications, Elsevier

# MENDELEY

William Gunn,  
Director of Scholarly  
Communications, Elsevier



## At a Glance

### Type of activities:

Reference manager and academic social network

### Life-cycle stage:

On the other side of the adoption curve (established product)

### Current legal structure and funding model:

Founded in 2008, acquired by Elsevier in 2013, now part of their suite of institutional services. Sustainable in a financial sense and customer retention (charging customers for the services provided).

### Technology:

Platform is proprietary, open APIs

## Sustainability

The idea with respect to sustainability was to become a profitable company, to provide a valuable service that researchers and institutions would be willing to pay for, and we had hoped it would be a profitable going concern.'

## Piece of Advice

*"One thing I'd really like to emphasise in the conversation about sustainability and open infrastructure is: when you're building something, it is really important to listen to the people who are going to use it. It's not going to be immediately apparent which of the people that are expressing their opinions about it most strongly are those who are actually going to invest in you, build you into their products and pay for your services and so on, and which of them are just going to continue to carp from the sidelines about your politics not being their politics.'*

*'It is important for people who are building in this space to understand that your early adopters are going to have very strong opinions, but if you are successful, they are not going to be the majority of your users. They are the route to getting there.'*

*'When looking at our story, the lesson to be learned is: solve your own problem, a real problem. Do not be afraid to release a little early, when it may still be sloppy. Do quick iterations at the beginning. Don't let yourself be led astray by cool new technologies or opinions of people who aren't going to be your customers.'*

# MENDELEY

**Mendeley is a reference manager and collaborative citation tool for academics with a social network function. It was founded in 2008 and acquired by Elsevier in 2013.**

## **Original vision**

Mendeley's former Head of Academic Outreach, William Gunn, explains that Mendeley's founders Jan Reichelt and Victor Henning were PhD students working towards their degrees and were having trouble managing their research papers and collaborating remotely. 'They were thinking: "This should really be easier. We should have tools that allow us to share references, and to write together and build collections of references where you don't have to email databases back and forth, or email PDFs back and forth." It seemed like, with everything else that was going on the web at the time, that there should be some sort of cloud-based collaborative tool that would facilitate that for researchers. That was the basic idea.'

## **Growth and sustainability challenges**

Mendeley's legal and organisational set-up remained roughly the same until the acquisition by Elsevier in 2013. Gunn says, '

When I joined, it was a limited company in the UK. Founders Reichelt and Henning had also raised some venture capital funding from a group of investors, including the technical founders of Skype, and were joined by Paul Foeckler as technical co-founder. The three of them owned the company and hired developers for reasonably good salaries and fairly generous equity. It was broadly consistent with what the tech industry was doing at the time.'

Mendeley set up another company in the US in order to facilitate doing business there, but we then realised that the bottleneck did not lie in business development, but in software development – that's why we closed down the US office.

'So we had a Mendeley Inc. and a Mendeley Ltd. It was a standard subsidiary company opened for business development purposes (we had a firm that handled HR, a firm that handled payroll, etc.) and a few employees there. We eventually realised that the US office

wasn't providing us with the organisational agility that we really needed. Jan spent some time there, while Victor remained in the UK, and I was going to go to New York, but we agreed that it made more sense for me to remain on the West Coast to have better coverage. So, I think it was a good thing to try, but it didn't prove to be the right decision in the long term.'

The founders envisioned Mendeley becoming a profitable company whose services researchers and institutions would be willing to pay for. 'We had at that time revenue growing 300% per year and a path to profitability. One of the big forks in the road was the decision to partner with Swets, to benefit from their institutional sales force and international presence: a revenue-sharing deal to develop an institutional product that we were going to sell to universities. This was coming out of the platform idea for the company: here we have this piece of desktop software that researchers were using and talking about, but now we have this platform

# YOUR EARLY ADOPTERS ARE GOING TO HAVE VERY STRONG OPINIONS, BUT IF YOU ARE SUCCESSFUL, THEY ARE NOT GOING TO BE THE MAJORITY OF YOUR USERS. THEY ARE THE ROUTE TO GETTING THERE.

vision, and we're going to leverage some of the data that we're seeing, from what people are reading and how they are interacting with research, to help universities understand their competitive position and what their researchers are doing. So we needed a group of skilled people to sell into the institutional market and that's where we made the deal with Swets. The idea was, in exchange for reduced amounts of the future revenue streams, we could piggyback on their sales force. That was a strategic decision because it was easier, at the time, for us to make an agreement with a company that had an established sales force than it would have been for us to attempt to hire institutional sales staff and develop a worldwide sales force on our own. However, the deal with Swets did not work out in the way we had hoped it would. It took a while for us to get them trained up on how to sell it, and they leaned on us a lot to be there and talk about Mendeley and explain what it was. So, the actual execution of the partnership failed in some of the specifics of the interaction between the two companies. But it was the

right thing to have tried at the time.'

Mendeley also faced a number of challenges in obtaining funding for its operations, especially since, at the time, the academic software industry was rather small and not very active. 'I think that in the end, we did a lot to help wake up the industry a bit. Jan and Victor knew people in the music industry and pitched Mendeley as "A Last.fm For Research." Back then, the idea of collaborative filtering was coming up: if you listened and liked these eight or nine songs, and your friend liked the same songs but also liked this tenth one, you'd probably like the tenth one as well. This is how the "Last.fm" system worked: you would plug in what you would listen to, and it would periodically make recommendations to you. And it had some social features added on to it. In the early days of fundraising, we pitched some of the investors on the idea of "A Last.fm For Research."'

Another challenge was that they had to convince institutions and researchers alike. 'We had reasonably good investors. We were

looking for investors around the time that Academia.edu and ResearchGate were also raising funds and we did a lot of the things that a lot of start-ups do: participate in pitch competitions and things like that to build the brand's profile among investors. You not only have to build your brand among your target users, but also among investors, and in academia it is even more challenging, as the ones who pay for it are often not the ones who use it (institutions versus researchers). So, that was a complicated needle we had to thread: make a pitch that made sense to people who invested, but also to academia (which is this collaborative filtering and making it easier to discover research that you didn't know you were looking for).'

Rolling out a Mendeley product related to the altmetrics project was an endeavour that the company ultimately did not pursue. Reasons included concerns about handling data. 'At the time, we were providing altmetrics data via the Mendeley API and we had several groups such as Highwire who were using the information in their products. We didn't quite get to a stage

where that made a whole lot of sense to roll out as a product, because altmetrics was so new and it wasn't really moving the needle. We had to be careful about the way we talked about the use of data, as librarians are often very concerned about patron privacy. So we had to think of ways to deal with that, like aggregating data or leaving data out if there wasn't enough to aggregate up.'

Mendeley also considered assisting universities in populating their institutional repositories. 'One of the things we also wanted to do was based on feedback from universities; they wanted to get more information about the research output of their researchers and they could access that better through us than they were able to get themselves. We wanted to help them develop more of a relationship with their researchers, and help us with making a collection. So far, managers of Institutional Repositories (IR) have to spend time going after their researchers and having them deposit their work in the IR, while Mendeley has this tool where researchers were just dragging and dropping it into this folder. So we thought, "Wouldn't it be really nice if we could synchronise this with the repositories in some way?" And we began to work on that.'

'That deal was a sort of co-development deal with a group called Symplectic. We were to build this tool with them, and we would make

their existing product more valuable by integrating with it. With repositories, there is an ideology; they are often open source, and you would have to integrate with those. We ended up working with a project funded by a Jisc committee on repositories, a for-profit-not-for-profit partnership deal that was going along really well, until it fell upon some political rocks. This could have been a great example of Mendeley as a platform, versus just a product, had we been able to navigate the political waters a little bit more sawily. That is a challenge for any start-up, if you're dealing with people who have thirty-year-old histories in an industry, and you are new.'

Ultimately, Elsevier acquired Mendeley after long discussions. 'We had had a number of conversations with Elsevier, with Thomson Reuters (not yet spun off as Clarivate), with EBSCO and several other groups. We thought at the time that it made more sense for us to be at a publisher-neutral provider, but the conversations with Elsevier and the strategic direction that Elsevier was deciding to go in, namely to pursue this direction of data services and platforms, aligned with what we were doing. The conversations with their sales force on how we might fit in their overall product strategy just made sense. This was combined with their professionalism, and they made a better offer. So, the fit with Elsevier was best because of their product strategy, professionalism and their financial offer.'

## **Opportunities, considerations and choices**

Mendeley had strong ideas about its responsibility to maintain an open infrastructure. 'We were influenced to a fairly large degree by how Crossref thought about infrastructure, in the sense that if you want to integrate yourself and become part of an infrastructure, you want it to be reasonably stable and sustainable. We believe that there is a responsibility that comes along with developing the infrastructure part of what we did. For example, we launched the open API, which was the first really open API for research, with the idea that developers would be able to use it to build it into their web services and other applications. We had a pretty rigorous change management process that went into that to give developers a certain degree of confidence that if they were going to build on our API, it wasn't going to be something that would cause breakage or trouble for them on an ongoing basis.'

It tried to build open infrastructure with standardized metadata. 'So, we were thinking that we would be building a piece of infrastructure, and we viewed that as core to the product strategy of Mendeley. The aim from the very beginning, and to this day, was to keep it open, particularly when we started adding extended metadata, such as the metrics and the readership number, to the



Mendeley API. We participated in discussions over the years led by NISO, the altmetrics working group, to report our data in a standardised way so that everybody had the ability to understand the provenance of the information. That was one of the big focuses; many of the questions that were asked of us, Altmetric.com and others were centred around the provenance of the information.'

Mendeley was always receptive to apps being developed for its platform. 'Our thought process resembled that of Twitter at the time, although they changed their course a bit, in the sense that we're a platform, and we would get criticised very regularly for the client not being open source. We always said that the Mendeley client was just "a" client of the interfaces with the platform; you're more than welcome to build any open source client you want and have full access to all the functionality that our client does, and documents groups, the whole works. Several developers took us up on that and built clients for Android and Apple, and there was even a Kindle app.'

However, most users were interested in using Mendeley's data. 'So there were a few apps out there that people were using, but we found that there were far more people who were interested in consuming the data and using it in their own products that weren't

strictly reference manager products. Those tended to be less like hobby products. For example, Impact Vizor at Highwire has used the Mendeley data as a core part of their product to provide the journals that are hosting on Highwire with some intelligence around how their journals and their articles are doing. That was how we wanted to go, for Mendeley to be a platform that many different services would interface with. There were some Pharma companies that were using our data in their own proprietary ways to do their own proprietary things, and there were some obviously open efforts to consume the data and make it available to the users of that service. So, it was important to be a neutral platform that supported a lot of use cases.'

A final consideration about infrastructure was that Mendeley aimed to reduce the number of individual citation styles (CSs) journals used, but did provide an open source tool for journals to develop their own citation style language (CSL) if they wanted to. Gunn sees this as proof of Mendeley's commitment to making researchers' lives easier. 'The citation style language describes what a citation should look like in a word-processing document. We worked with an open repository of CSL specifications to extend their coverage and developed the infrastructure that hosted and updated the CSLs. We recruited volunteers to work on building

individual CSLs for their specific journal, country or field, especially in South America. We built an open-source tool to facilitate journals that needed a particular house proprietary style of citation to work on the platform.'

'We also did a lot of advocacy to reduce the number of CSs that were out there. There are a handful of styles, and the rest are dependencies. Our support of altmetrics was key in growing that and put pressure on companies like RefWorks and EndNote to begin using the CSL standard. We were lobbying large publishers like Elsevier to not require a lot of specific citation styles and just work with a common format. This speaks to Mendeley's vision to improve science: even though having many styles would be in our interest, we actively pushed back against that, because we wanted to make researchers' lives easier. We were very successful as well: Elsevier, with a lot of our influence, has a "Your Paper, Your Way" initiative, where you can send your manuscript in using any reasonable citation style you want. Overall, this is a win for research.'

'So, those are two big contributions that we made to open infrastructure, that we're pretty proud of.'

## Consequences of current funding model

While Mendeley's acquisition by Elsevier was not received in a universally positive way, Gunn is adamant that it was a good idea. 'The deal with Swets was good in theory, but the execution wasn't as good. Many people told us when we announced the acquisition by Elsevier that it was a terrible idea, but it turned out the execution was very good. We really got to see two different perspectives: first, the theory/ideology of what should happen, and second, the practical realisation of what is most likely to happen. That's something that every start-up founder feels keenly.'

Mendeley watched the academic community's reaction closely, but did not notice any negative effects. 'Hashtags like "#deleteMendeley" never made any difference to the business. For the most part, the people who pay for the product, our customers, are very practical about it. Yes, there is a group of people (not our paying customers) who are wary about the morals and ethics of the situation. But paying customers mostly like what we're doing. They say, "We're actually kind of glad that you're getting a good deal, and that you're going to be around, and be sustainable, and continue to provide this API that we've integrated into our products. Now

that you're partnered with a large organisation, that's going to provide you the resources that you need to grow."'

One thing I'd really like to emphasise in the conversation about sustainability and open infrastructure is: when you're building something, it is really important to listen to the people who are going to use it. It's not going to be immediately apparent which of the people that are expressing their opinions about it most strongly are those who are going to invest in you, build you into their products and pay for your services and so on, and which of them are just going to continue to carp from the sidelines about your politics not being their politics.'

'After the acquisition, we saw growth in terms of users. There were a lot of people who may have been uneasy, that weren't early adopters, but once we got acquired by Elsevier, they thought: it makes sense for me to understand this software product, or it makes sense to sign a deal with this company, because you're not going to be a flash in the pan; you are going to be around now that you have this strong institutional support and backing.'

Eventually, the news around Mendeley being acquired got quieter and Gunn changed his message. 'This is because we're on the other side of the adoption curve. When you're a new product, you create some hype and news

around yourself, and we did a huge amount of effort around that. I was on the road at least one week per month, drumming up attention and telling our story, until we got to a point that our narrative was out there. After being acquired, we were an established product, so we were not news anymore. We were talking to different groups of people at that point to make the leap from early adopters to more majority/mainstream adoption. At this stage, you're going to be dealing with a lot more people that are not so idealistic.'

'At this point, one of the things that I started talking about was how we helped open up the space for start-ups. Our acquisition was a fairly large one in the space and caused some investors to take note of it, who wouldn't have taken note of it before. A number of founders told me that it has been easier for them to raise money, because we did a lot of that initial work. We helped get investors' attention and showed them that this is actually a place where you can invest money and make something out of it. If you look at Academia.edu, for example, they have been a going concern for a long-long time, but their initial investors have not seen the return on investment that they had been hoping for, in my opinion. It was good that we were a success story; it helped to open up the space for other start-ups because potential investors now saw the academic software industry as lucrative.'

## Future vision for sustainability

Mendeley's current business model is as follows: 'It remains an end-user-faced product and the users are the researchers. But, we're less focused on monetizing the storage and we incorporated additional products. Overall, Mendeley has been incorporated into a larger portfolio of Elsevier services. That was the vision that Elsevier sold in the beginning: it is going to be part of a suite of products, including Plum Analytics, Bepress and SSRN. All of these pieces of the research workflow get assembled into something that Elsevier can offer as a suite of services, and this services side of the revenue for Elsevier has been the growth area of the company. Now people that are investing in RELX are starting to take note that the services are where they're getting their growth from.'

'Five years from now, I would like us to continue to grow and develop the API and continue to pursue the vision to be the platform that runs a lot of services that people use in academia, whether these are Elsevier services or not. I'd like us to be a platform that start-ups can use as a source of data. Being part of Elsevier, a large organisation, means that you have to deal with a big complex machine with many moving parts. I'd like to get to a place where the narrative within the company and the marketplace makes a bit more sense. I see us being part of the broader

ecosystem, working seamlessly with other writing or discovery or collaboration tools that a researcher might use, whether or not they're from Elsevier, and I'm happy to say that the overall product vision for Elsevier is indeed one of this sort of interoperability.

## Advice for peers

It is important to understand which problems you are solving. Do you follow popular sentiment, or still track along and solve a real problem? 'When looking at our story, the lesson to be learned is: solve your own problem, a real problem. Do not be afraid to release a little early, when it may still be sloppy. People would tell us: "You're not doing a beta, you're doing an alpha." At the time we released a new version, we listened to our early users, and tried to understand what the real problems were. It may be well that the initial community of people were hyper-focused on part of the overall problem (ideological?). You have to have a good understanding of the actual problem. You need to listen to users, but understand the problem yourself too!'

Gunn advises others to think about who their end-users will be. 'It is important for people who are building in this space to understand that your early adopters are going to have very strong opinions, but if you are successful, they are not going to be the majority of your users.

A lot of them might leave to use whatever other new product comes along. And that has less to do with their morals and ethics, and more with interest in a new exciting thing.'

' This is the same advice Y Combinator is giving their start-ups: do quick iterations at the beginning. Don't let yourself be led astray by cool new technologies or opinions of people who aren't really going to be your customers. This is a universal lesson!'

'Over the years I have advised a number of start-ups (on a pro-bono basis) who wanted to understand the academic space, build an engagement program, or understand the strategic contours. I am always happy to talk to anyone. The way that we get innovation in this space is by having more people empowered to try new things and be experimental, so I am happy to advise people, whatever their business model or strategy is. Feel free to reach out.'