



Crossref

2017/2018 Annual Report

You are
Crossref

Crossref makes research outputs easy to find, cite, link, and assess.

We're a not-for-profit membership organization that exists to make scholarly communications better. We rally the community; tag and share metadata; run an open infrastructure; play with technology; and make tools and services—all to help put scholarly content in context.

**It's as simple—
and as complicated
—as that.**

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It's all about metadata. The connections it enables. The relationships it reveals. The context we all so desperately need to see where we've been and where we might go next.

The narrative in this year's report serves as a kind of report card. First, we layout the strategic landscape as we envision it and then we give you an update on how we're performing against these goals.

Ed Pentz
Executive Director

Letter from the Executive Director

Scholarly communication is changing and putting scholarly content into context is becoming more complicated. Our membership is part of a community that values and exchanges metadata between themselves as well as with a broader community.

All-in-all, I'm pretty proud of the work we've done and the progress we've made. Here are just a few highlights:

A big number, even bigger ambitions

This year we reached a milestone as a community. 100 million records have now been registered with Crossref. This is down to the 11,000+ members across 118 countries who have joined since the year 2000, and to all our longstanding community of members and users who continue to shape, support, and believe in our mission. Thank you.

Our 100 millionth record marks a significant moment for research communications. The vision that twelve publishers had back in 1999 is now a reality; thousands of valuable tools and services now rely on our metadata registry, and they don't have to create bilateral links and agreements with each other. The Crossref community is continuously creating solutions to try to overcome multiple challenges in communicating research, based on the opportunity that this collective metadata and infrastructure enable.

Throughout the last year we have spent a lot of time and resource looking at the "Why?" Why is metadata important? That's one of the reasons we got involved with Metadata 2020, a cross-community collaboration that advocates richer, connected, and reusable, open metadata for all research outputs.

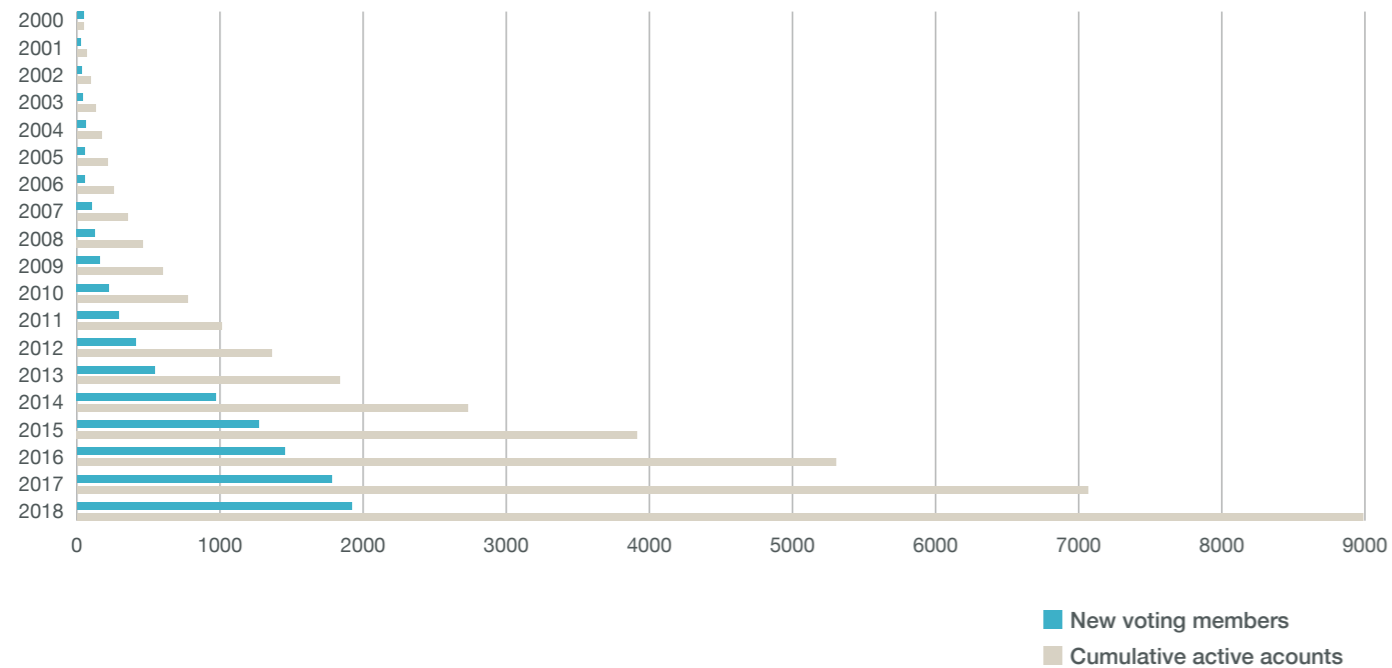
What does good metadata look like? That is one of the reasons we launched the beta version of the Participation Reports. This is a first step to provide a lot more information to our members so they can see what's going on in our shared goal to provide better and richer metadata.

In addition to all the services we offer our members, there's also the opportunity for anyone in the scholarly ecosystem to get our metadata using our APIs. I am especially excited about the launch of Metadata Plus.

For Crossref and its membership to remain relevant in this new environment, we need to adapt, do, and encourage new things. But we have limited resources. So, in order to adapt and do new things, we also need to also make sure that we are currently doing the right things efficiently. This is why our strategic agenda is a combination of consolidation and expansion.

Here's to the next 100M and everything that represents.

Voting members



This marks my first letter as Chair of the Crossref Board of Directors. It's hard to believe that it has been a year since we were all gathered together for the annual meeting in Singapore. It's amazing how much can be accomplished in 12 short months.

One of our 'Truths' is "Here today, here tomorrow". Thinking about the changing landscape of scholarly communication, it occurs to me how incredibly important it is that we continue to build a strong, enduring organization. From my point of view, there are two key elements required to ensure the continued success of Crossref: People and Technology.

Crossref continues to grow at an impressive rate. In light of this expansion, I am particularly pleased that the organization continues to ramp up user and member engagement. Developing stronger ties with the broader scholarly community—rather than focusing on the relatively small number of publishers represented on the board—is critical to our success.

I am proud of the efforts Crossref has made to have more of an international presence. Holding the annual meeting in Singapore and LIVE local events are recognition of the diversity of the membership and the importance of supporting our global community.

Crossref continues to establish itself as an innovation and technology leader. We have introduced services that support our members and encourage the deposit of high-quality metadata. Participation Reports are an indispensable tool that will help to ensure that we are all working toward the same goal. If you haven't already looked to see how your organization is performing, I encourage you to do so.

We've also seen others build tools and APIs that leverage the collective power of our metadata. We're really opening it up for anyone—whether they're start-ups, established technology companies, or publishers themselves—to develop rich, innovative systems and tools.

I'm also excited about the efforts to work more closely with research funders and bring them into the Crossref community. We're going to take the Funder Registry to the next level by helping to link individual research outputs to specific grants, which will allow for analytics and tracking of outputs that weren't possible before.

All of these enhancements require significant investment, which requires thoughtful planning and careful management. We plan a smaller surplus than normal in 2018 because we are investing in more staff and improved services for our members. Despite this, Crossref continues to be financially strong with significant resources in reserve.

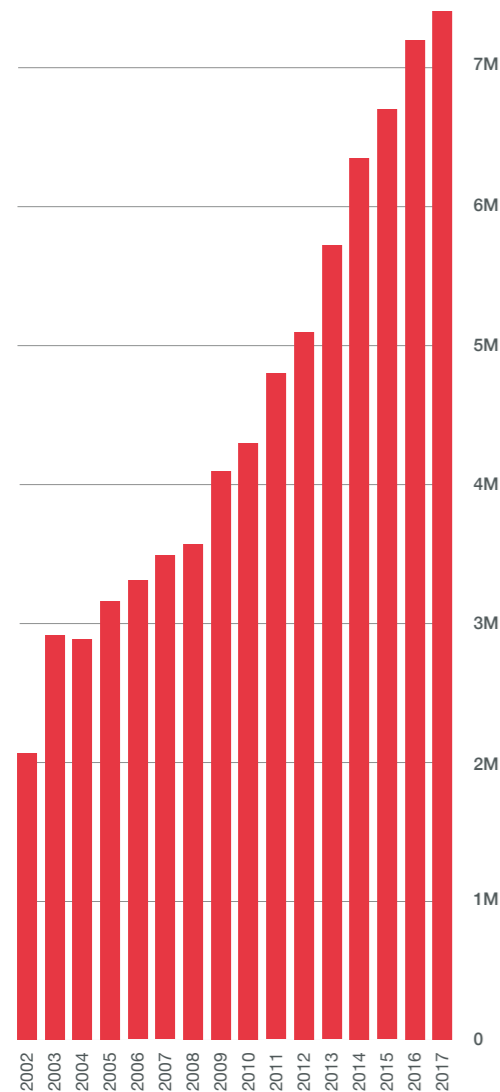
Over the past year, there have been really important changes in the way Crossref engages the community in terms of governance and transparency. The election process has encouraged a lot more engagement and it has brought a much more diverse group into our governance. It has been great to see organizations on the board like SciELO and F1000 that represent new geographies and constituencies.

We are transitioning from an organization that provided infrastructure for publishers so they could link their outputs, into an organization that also provides tools for funders, institutions, and individual researchers—all of which ultimately benefits publishers. This happens through the services Crossref offers, through the metadata that we provide, and through our collaborations. It's best summed up as the shift from infrastructure for publishers to infrastructure for the entire scholarly ecosystem. A lofty but worthy goal. It's not always easy, but I'm confident we'll get there.

Letter from the Chair

Paul Peters
Chair, Board of Directors

Revenue growth by year (Millions)



Statement of activities

Years Ended December 31, 2017 and 2016

Unrestricted Net Assets	2017	2016
Revenue and support:		
Deposit fees	\$ 4,921,489	\$ 4,426,246
Member fees	2,936,809	2,684,468
Interest income	12,430	22,818
Investment return	41,105	36,220
Total revenue and support	7,911,833	7,169,752
Expenses:		
Salaries, taxes and benefits	4,281,785	3,835,082
Travel and entertainment	655,410	625,968
Data center	484,423	376,679
Advertising and marketing	419,441	343,221
Professional fees	323,959	179,875
Other general and administrative expenses	273,426	298,523
Registration fees, related party (Note 3)	263,286	263,117
Consulting	246,990	71,052
Depreciation	186,479	160,056
Rent	186,391	184,254
Dues and subscriptions	46,871	54,499
Product development	37,795	33,019
Insurance	27,308	25,642
Bad debt expense	22,666	24,353
Program initiatives	8,637	7,393
Total expenses	7,464,867	6,482,733
Change in net assets from operations	446,966	687,019
Other (income) expenses:		
Foreign currency exchange (gain) loss, net	(19,886)	117,453
Loss on disposal of property and equipment	2,145	15,725
Total other (income) expenses	(17,741)	133,178
Change in total net assets	464,707	553,841
Net Assets, beginning of year	7,188,149	6,634,308
Net Assets, end of year	\$ 7,652,856	\$ 7,188,149

Crossref completed 2017 in excellent financial health and is well positioned for 2018 and beyond.

Capping off a successful year of continued growth, Crossref closed its 2017 fiscal year with total revenues and expenses of \$7.9M and \$7.5M respectively, which represents 11% growth on the top line and an increase of expenses by 15% (3% over budget). We deliberately increased staffing levels and operational costs during the fiscal year, as part of a long-overdue drive to better position Crossref to evolve its services for members and the broader scholarly community. As planned, our operating margin declined by 4% from the previous year to 6% and our year-end cash position was \$5.6M, representing an increase of 11.7% over the previous year.

At the close of the fiscal year, the Board directed \$10,000 of excess operating cash to be added to the Capital Investment Fund and to invest an additional \$90,000 in the Capital Reserve Fund. Crossref continues to operate debt-free and continued strong financial management has allowed the organization to maintain membership and registration fee levels flat for the eleventh year running, although a thorough fee review is planned by the Membership & Fees committee during 2019.

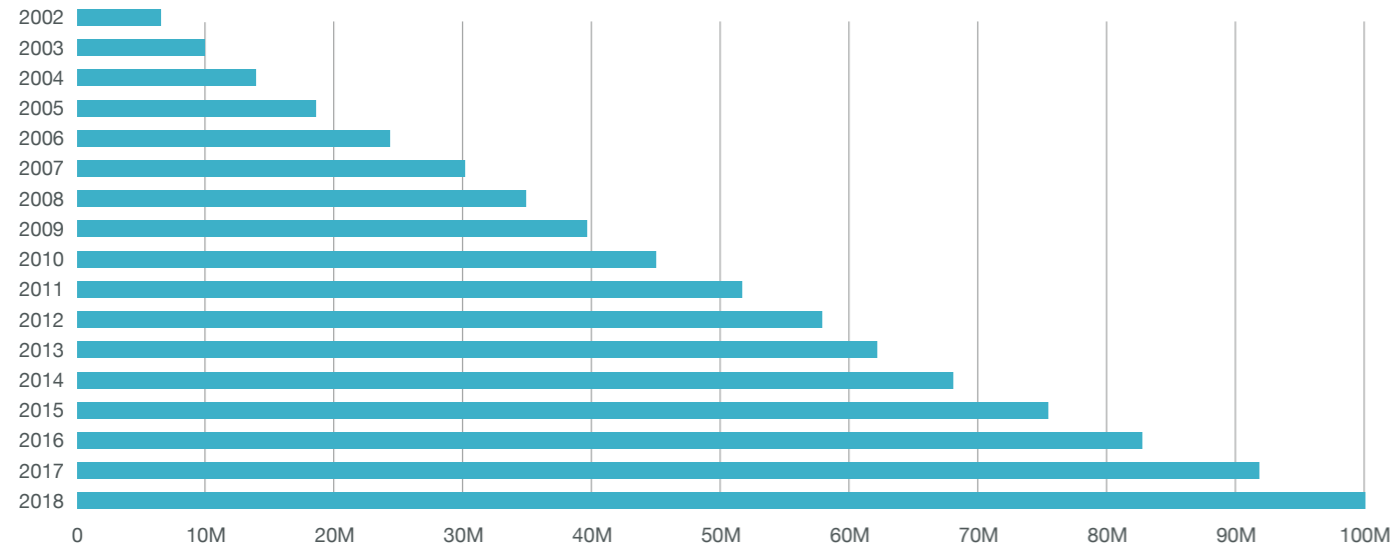
As expected, membership growth and Content Registration continue to be the main drivers of the organization's growth, increasing by 12% and 10% respectively.

Also at the close of the fiscal year, Crossref conducted its annual financial audit, and the result was positive, with no negative findings.

As Crossref continues to grow, it will increasingly be challenged to diversify its range of services and deliver value to its members and the community at-large, while continuing to deliver on the organization's long-standing promise of persistence. Strong financial management and oversight is key to reaching these goals, and I am very happy to say that 2017 was a very positive year in this respect.

Scott Delman
Treasurer

Letter from the Treasurer



Crossref is governed by a Board comprising 16 member organizations who meet in person three times a year. The Board strives to be truly representative of our global and diverse membership. As one of our truths is “one member, one vote”, it doesn’t matter how big or small you are, each member gets a single vote.

In 2017 our updated By-laws allowed for more candidates than seats—and our first open call for expressions of interest, as well as our first contested election, was held. At the 2017 annual meeting in Singapore (with a record number of voters) the following organizations were elected: AIP (Jason Wilde), F1000 (Liz Allen); MIT Press, (Amy Brand); OpenEdition, (Marin Dacos); SciELO, (Abel Packer); Vilnius Gediminas Technical University Press, (Eleonora Dagiene).

A new ad-hoc Governance Committee was established at the November 2017 Board meeting to develop some questions/recommendations for discussion at the latest board meeting (11-12 July 2018):

1. Development of a policy on canvassing campaigning in Board elections;
2. Development of policies on nominations to each of the Chair, Treasurer, Executive Committee members, the Nominating Committee Chair, and the Audit Committee Chair;
3. Analysis of how best to achieve balance and representation on the Board going forward;
4. Analysis as to whether to impose term limits on directors;
5. Analysis as to how best to handle independent nominations to the Board; and
6. Review the governing documents’ provisions on vacancies to confirm that the Board follows the required steps on the filling of vacancies.

These discussions resulted in a change to our By-laws to clarify membership qualification. We amended Article. I Section. 1 by replacing the text in its entirety with “Membership in Crossref shall be open to any organization that publishes professional and scholarly materials and content and otherwise meets the terms and conditions of membership established from time to time by the Board of Directors, and to such other entities as the Board of Directors shall determine from time to time.”

This change and any future governance changes will set the scene for Crossref to fully achieve its expanded mission.

Scholarly communication is changing

Some of our existing members no longer classify themselves as “publishers”, and some of our newer members have never classified themselves as “publishers”. Governments, funders, institutions, and researchers—parties who once had tangential involvement in scholarly publishing—are taking a more direct role in shaping how research is registered, certified and disseminated. Low income (but emerging) countries increasingly see it as a strategic imperative that they own and manage a research communication system that reflects their regional research priorities.

Researchers are increasingly insisting that new kinds of research outputs, like data, software, preprints, and peer reviews form a critical part of the scholarly record. New players (e.g. sharing networks, altmetrics services, and Current Research Information Systems) are becoming critical elements of the research landscape. New technologies like ML and AI promise to change the way in which research is produced, assessed, and consumed.

For Crossref and its membership to remain relevant in this new environment, we need to adapt, do, and encourage new things. But we have limited resources. So, in order to adapt and do new things, we also need to also make sure that we are currently doing the right things efficiently. Hence, our strategic agenda is a combination of consolidation and expansion.

SIMPLIFY AND ENRICH SERVICES

The characteristics of our members and users continue to diversify—to scholar publishers, library publishers, and other emerging organizations. Furthermore, the use of our APIs has grown significantly in recent years as Crossref becomes better known as a source of metadata. Users are therefore asking for a more predictable service-based option in addition to the public options. We have and will continue to develop service-level guarantees in order to meet this growing demand, which will strengthen Crossref’s position as a way for the whole community to access information from 11,000+ publishers centrally.

We are also focusing our efforts on ensuring there is broad support for systems in accessing Crossref metadata so that reuse reaches its fullest potential across the entire research ecosystem. This necessary evolution of Crossref services will ensure that we can support the changing needs and priorities of all involved in research.

We do not want to add resources infinitum, so we must make sure that we are performing our existing functions efficiently. To this end, we are streamlining processes to improve member experience, modernize infrastructure, and upgrade tools and data provision capabilities. These activities will achieve efficiencies for members, metadata users, as well as staff.

Here is a sampling of some of the highlights from the last year.

Metadata Manager

The first phase of Metadata Manager was launched in 2018. It supports Content Registration by offering a simpler, more flexible way to register and update metadata—for both single and multiple deposits.

“We want to make it easier for members to register their content,” says Ed. “For many years we had a web deposit form, but it was very basic. As part of this upgrade we looked at use cases on the needs of our members with the goal of enhancing the user experience.”

Another goal of Metadata Manager is to encourage higher quality metadata. “Now we are funnelling users to naturally provide the correct information,” says Jennifer. “With the deposits we’ve seen come through, the rejection rate is lower.”

All members benefit from Metadata Manager. “There’s a lot of help and support that’s provided in the context of the service to make sure that the metadata is good quality. You can even use it to check references,” says Ginny. “We’ve also had feedback from larger publishers. Even though their main registration is automated, they often have corrections and updates for a handful of articles, now it’s easier to do that.”

Metadata Plus

For the first time, users can access multiple interfaces under one agreement that offers a predictable way to get Crossref metadata. Metadata Plus provides flexibility, robust functionality, and improved support for the diverse and growing needs of the variety of organizations that use metadata in systems and services throughout research communications.

“Metadata Plus is a major overhaul of our metadata delivery services. It was all very fragmented in the past but now everything is streamlined,” says Ed. “Metadata is open though a number of interfaces without restriction, but we offer extra support and functionality through Metadata Plus.”

“Now we have dedicated servers to ensure up times and workflows to guarantee dedicated support,” says Chuck. “We also have snapshots of all the metadata deposited with us, so members can get a copy in one go.”

Metadata Plus is up and running but it is a work-in-progress. “We are planning to develop features that will benefit those using it in production, high-reliability situations,” says Ginny. “The big thing that’s coming up is notifications, a facility that lets users know what’s changed so they can keep their metadata current.”

The REST API, which is available to everyone, is very powerful and flexible in terms of the queries you can extract. “Overall we’ve seen a huge increase in queries, particularly with the REST API,” reports Ed. “That’s a good thing because that means the metadata is getting disseminated and reused, which makes all our members’ content more usable.”

Improving the Crossref experience

Improving member and user experience has been a focus for the last few years and now there's a dedicated team working to embed a new education strategy and improve our processes.

Member satisfaction has always been a priority at Crossref but now it's seen as a strategic imperative. "We've started to redesign the concept of member experience," explains Ginny. "The member and user experience team has a focus on improving satisfaction and with that has come improved processes to onboard new members."

"We know that our members and users can struggle to understand how to work with us," says Geoffrey. "Now we are offering one-on-one 'health checks' alongside the participation reports so that people can see for themselves how they're doing, compare with others, and learn how to level up. This is a productivity benefit as well, which is good for everyone."

"It's about how we onboard new members, how we educate them and also how we interact with them on an on-going basis," says Ed. "We've made a lot of improvements to the sign-up process for new members and we are also improving the CRM system for better data management."

"We've grown tremendously. These changes in our processes have been a long time coming. Now we have adequate staff in all departments so that no one has to wait a long time before they're signed up," says Lisa.

"The new click-through membership terms introduced in July are already a huge time saver for both members and our team."

IMPROVING OUR METADATA

The metadata provided by our members is the foundation of all our services. Crossref membership is a collective benefit. The more metadata a member is able to put in—and the greater adherence to best practice—the easier it is for other members and community users downstream to find, cite, link, assess, and reuse their content. The more discoverable and more trusted is the content. Better quality metadata improves the system for each member and all of Crossref's other members and stakeholders.

Existing Crossref members may have joined Crossref when only providing minimal bibliographic metadata was required for reference linking. But, increasingly, Crossref is becoming a hub which the community relies on to get both complete bibliographic metadata and non-bibliographic metadata (e.g. funding information, license information, clinical trial information, etc.) We need to help our existing members meet the new metadata expectations. Our objectives are to better communicate what metadata best practice is, equip members with all the data and tools they need to meet best practice, and achieve closer cooperation from service providers.

We will focus on expanding the links between scholarly objects to all their associated research outputs. We will also expand support for new content types to ensure that they are integrated into the scholarly record and can be discovered. At the other extreme, some new Crossref members have little technical infrastructure for creating and maintaining quality metadata. We need to help provide them with tools to ensure that we don't dilute Crossref with substandard and/or incomplete metadata.

We will also employ mechanisms that engage the broader community to fill in gaps and correct metadata with a clear provenance trail of every metadata assertion in the Crossref infrastructure.

Participation Reports

Participation Reports give a clear picture for anyone to see Crossref metadata. The activity of each member—which has long been available via our public REST API—is now visualized. It's an opportunity to see where the gaps are and what could be improved.

"One of the biggest things that we're trying to do across the board is make it clear that Crossref is a membership organization. When they participate in the system, they make it better. Conversely, if they shirk their obligations they are short-changing other members," warns Geoffrey.

"If Publisher A doesn't have good metadata that affects publishers B through Z. They will have a harder time matching records, generating citations, etc. Who's providing links to full text? Who's providing references? Who's automatically notifying us of updates/retractions? Who's collecting funding information? These are all very important things. We want the community to understand that these obligations are mutual and, therefore, it's important that members can see what others are doing."

"We realized that for a lot of our members there wasn't an easy way for them to know the status of their metadata and how complete it is. Participation Reports provides a nice visual way for them to check their metadata completeness and what they're registering," explains Ed. "It also gives some context. We're highlighting key items of metadata that they should be submitting in order to participate fully."

"We've had automated systems for a long time that deluge our members with information on how they're doing. These reports have been around for some time but they're overwhelming to be honest. I'm an engineer and they were developed from that point of view," reflects Chuck. "Participation Reports makes the visualization of the problem much more accessible and digestible."

As was the case with Metadata Manager, there's been a lot of attention to the user interaction. So far, member reaction has been overwhelmingly positive.

"We launched it as a central tool for the health checks we conduct with our members. Now they can see how they compare with competitors or use it to lobby for resources," says Ginny. "If the reports are good, and the scores are high, they can highlight this with their Editorial Boards or use the data when negotiating society or vendor contracts."

In this first phase, Participation Reports focus on quantity not quality. "Many members don't know what they've deposited, maybe because they have a lot of content or because they don't own their platform," says Jennifer. "This is a first pass at a system we will continue to develop." Chuck concurs: "It's not a done deal. What exists today is the low hanging fruit that we could put together on a dashboard. More must be done."

Event Data

Event Data captures and records "events" such as comments, links, shares, bookmarks, and references that occur on the web. It provides open, transparent, and traceable information about the provenance and context of every event.

"We're increasingly collecting metadata about how research outputs are used and referred to outside of scholarly literature and within newly emerging scholarly communication outputs," explains Geoffrey. "Event Data makes it possible for users to track things that have been part of scholarly communication but aren't part of the traditional citation tracking."

"One of the reasons we collect metadata is to help users establish relationships. For example, collecting funding data so they can tie grants to publications that report on the research those grants fund," explains Ed. "The research nexus makes it possible to establish relationships about the content itself, but Event Data is about providing context about things that happen after content is published."

"With Event Data, you can see the provenance of everything that we're collecting. Anyone with a developer who knows how to use an API can use it," says Ginny. "It's a new kind of metadata, it's not bibliographic, publisher-defined metadata. It's from other sources where conversations about research now take place."

"Event Data doesn't provide metrics or evaluation, so people can do their own analysis and integrate into their other systems."

The service was declared to have reached 'technical readiness' this summer. Jennifer reports on the reactions: "The community's response to Event Data has been overwhelmingly positive and uptake has exceeded expectations. Already, we have bibliometricians using the data for analysis and librarians using it for their outreach work."

Data citations

If we don't cite data how will people know it exists and how will they find it? Research integrity and reproducibility depend on it. The importance of linking data with literature can't be understated.

"One of the fundamental tensions that we're seeing in the industry is that the citation, which has traditionally played several roles, seems to have been co-opted," explains Geoffrey. "There are two things that you're doing when you cite something. Pointing to evidence and providing credit to someone who might have said something first. I would suggest, credit isn't as important as reconstructing and building on the evidence."

"We're committed to exposing the links between the literature and the data or software that supports it and so we partnered with DataCite to make this a reality."

"In effect, we're creating a database of data citations. All of the data citations coming in from Crossref and DataCite are being pulled into Event Data," explains Jennifer. "Event Data will capture mentions or links to Crossref DOIs outside of the publisher platform."

"It's about transparency and improving research. Identifying data and making it available is really important so the community can make connections to the publications that Crossref captures," says Ed. "If we link the data users can go back to the publications to establish the relationship which is important to citation and reproducibility."

"We are working closely with DataCite so that we have a unified message to both communities; the publishers providing links to their articles in step with the data repositories providing links to the articles," explains Ginny. "We're covering it on both ends, but the community is slow with the uptake."

"Data is often relegated as a second-class citizen in the scholarly research because it doesn't (yet) count toward academic incentive systems," says Chuck. "Citing data gets to the heart of the problem and brings data front and center."

EXPAND CONSTITUENCIES

Membership is at the core of our identity. Scholarly publishers are geographically expanding at a rapid pace and Crossref currently has members in 118 countries. With that comes the need to increasingly and proactively work with emerging markets as they start to share research outputs globally. To this end, we will expand our geographic support through concerted efforts in international outreach, working with government education/science ministries and local Sponsors and Ambassadors, and developing as much localized content as we can.

Furthermore, funders and research institutions are increasingly involved in the scholarly publishing process. As the research landscape changes, we need to ensure our relevance by evolving in a way that better reflects these shifts. Our overarching objective is to expand our value proposition to convince these new constituents of Crossref's relevance, getting them into our system and using this foundational community infrastructure.

Ambassador program

Crossref ambassadors are our trusted contacts who work within our communities (as librarians, researchers, publishers, and innovators) around the world and who share a great enthusiasm and belief in our work.

The program launched in January 2018 with a team of 12 ambassadors. "The strategic goal is improving education about global research infrastructure in general and the opportunities that are enabled through richer metadata," says Ginny. "Many of our ambassadors were already advocates for Crossref. We're formalizing what they were already doing informally."

"The ambassadors can expand their networks and forge relationships in the community and they get recognition for what they're doing, which can benefit their careers," says Ed. "We provide our ambassadors with a lot of training and support and we fund their attendance at meetings, which can be beneficial to their work."

The role comes with a high degree of flexibility. Crossref ambassadors write their own job description taking into account their interests, skills, and the time they feel comfortable contributing.

"The Crossref community is global and we have a lot of members around the world, but every country is different and has its own setup, for example how research is funded and how the journal systems work," says Ginny. "For a small organization like Crossref it can be a challenge to respond to the needs and invitations from all our members. Ambassadors are an extension of our team; they allow us to extend our reach and provide a much closer interaction that is focused on the local conditions."

Sponsors program

Some small publishers find it advantageous to join Crossref through a local or segment-specific sponsor, either Sponsoring Members or Sponsoring Organizations. Both types of sponsor work directly with us in order to provide administrative, billing, technical and, if applicable, language support to their sponsored members.

"It's an increasingly popular program. More than half of new members join through sponsors," says Ginny. "It's part of inclusiveness and our 'come one, come all' philosophy. We're levelling the playing field."

"There can be barriers and expense to paying Crossref invoices in US dollars. Sponsors offer consolidated billing," says Lisa. "Working with sponsors is a way to expand our reach".

LIVE locals

As well as the two-day Crossref LIVE annual event, we're scaling up our program of local events which take place all around the world to cater to our global membership, with a program tailored to each country. These one-day seminars aim to cover the key elements of our community and our services, and also allow us to get to know the market situation a lot better so we can respond to trends.

"They are a series of events around the world where we hold workshops about Crossref. We organize them with sponsoring organizations or ambassadors," reports Ed. "Having a face-to-face interaction and being able to ask questions makes it a really invaluable experience."

In the last year, Crossref has held LIVE Locals in Hannover, Germany; Tokyo, Japan; Ulyanovsk, Russia; Cape Town and Pretoria, South Africa; and Yogyakarta, Indonesia, among others.

"Our sponsors program supports small and emerging publishers that may not have the financial resources or technical understanding to work with us directly," explains Ginny. "It's great for us because it gives us one point of contact, relieving a huge burden on our helpdesk, and it's great for publishers who are not be able to join otherwise."

"There's quite a high bar to becoming a sponsoring organization. We'll have a previous history with them and they have to communicate regularly and submit a report at year-end on how they've supported Crossref goals, for example by translating materials, growing participation, or conducting training. Some very large publishers essentially act as sponsors too, and we'll be formalizing that role in the coming year."

We're keen to support our sponsors by listening to their feedback, running LIVE events, and other outreach activities.

"It's a great way to impart information on things we're working on and, importantly, get feedback from our users. Even with sponsors and ambassadors there's no substitute for face-to-face interaction," says Ginny. "We're trying to keep our ear to the ground. Really dig in to what they might need."

"In addition to the traditional challenges that localization brings, there are often other, mitigating circumstances. "We have a list of countries where we feel there is a need because, suddenly, there are lots of new members, but they aren't really active. Often we find that a government has mandated DOIs for all research outputs."

Geoffrey underscores the importance of local-level outreach. "We realize that publishing and context can be very different from country-to-country. There are perceived barriers and needs. We are doing more outreach locally where we can engage with the scholarly community."

SELECTIVELY COLLABORATE & PARTNER

Crossref faces a tension. We want to—where possible—take advantage of existing organizations, services, tools and technologies. We aim to do more, more efficiently, by focusing on expanding existing infrastructure and organizations rather than creating things from scratch. We don't want to reinvent the wheel.

So that our alliances with others have the greatest impact, we must align our strategic plans for scholarly infrastructure with others and ensure that the community has the most up-to-date and accurate information.

This is an essential part of our role as a community-wide infrastructure provider as we achieve our mission by supporting the entire research ecosystem. But at the same time, we need to ensure that we do take care not to introduce risky dependencies for the entire community. Hence, the bulk of our collaborations are with open initiatives.

Some are led and driven by Crossref. Others are not.

Metadata 2020

Metadata 2020 is a collaboration that advocates richer, connected, and reusable, open metadata for all research outputs, which will advance scholarly pursuits for the benefit of society. Over 130 volunteers—including publishers, librarians, researchers, and other stakeholders—from 86 organizations, are working in six project groups.

"It was our idea, and I took the lead in getting things up and running, but now it's very much community-driven," says Ginny. "Things have taken off quickly and I can't tell you how gratifying that is."

It's clear that Crossref's strategic roadmap and Metadata 2020 align. "That's true," says Ed. "But they're taking it to a higher level. What's really been fantastic is to see the engagement from the community. People are really enthusiastic about coming together to examine some of the challenges the industry is facing. The projects are very strategically focused, and they are looking at key issues like researcher communications, incentives, and sharing best practice."

"Metadata 2020 is a continuation of a theme. Metadata is important to a lot of constituencies. There's a tendency to think that we're just a bunch of obsessive librarian types, but metadata actually has practical application for a lot of people," says Geoffrey. "It's not just about matching references and tracking traffic. The metadata enables a whole bunch of other stuff that's hugely important to the community."

"More and more publishers are starting to understand the lost opportunities and realise the value in metadata quality and completeness. It's becoming a strategic priority."

ROR.community

Content identifiers like DOIs and contributor identifiers like ORCID iDs are foundational infrastructure for the scholarly community. But, there is one piece of infrastructure that is missing. There is currently no open, stakeholder-governed infrastructure for research organization identifiers and their associated metadata. Until now.

The Research Organization Registry (ROR) is a new, community-led project to develop an open, sustainable, usable, and unique identifier for every research organization in the world.

Seventeen organizations have collaborated over the last two years to come up with a solution that will work globally and will represent scholarly literature: Alfred P. Sloan Foundation; American Physical Society, California Digital Library, Cornell University, Crossref, DataCite, Digital Science, Editeur, Elsevier, Foundation for Earth Sciences, Hindawi, Jisc, ORCID, Ringgold, Springer Nature, The IP Registry, and U.S. Geological Survey.

"There is no global persistent identifier for research organizations. Normalizing affiliations and identifying relationships has been an ongoing challenge for the community. ROR is probably the most expansive collaboration we've been involved in for a number of years," says Ginny.

"For whatever reason, no organizational ID has emerged with the same kind of ubiquity that DOIs have for references. We've gone through a rather lengthy process to figure out why that is," reports Geoffrey. "The IDs that currently exist don't offer unambiguous affiliation information."

FREYA Project

The FREYA project is funded by the European Commission under the Horizon 2020 programme. It aims to "extend the infrastructure for persistent identifiers (PIDs) as a core component of open research, in the EU and globally."

One of the project goals is to "improve data discovery by extending and cross-linking PID core services" and building on existing infrastructure.

"This is a really exciting initiative and we're proud to play a role," says Ed. "FREYA is fully funded by the EU and involves a lot of preeminent institutions like the British Library, CERN and the Science & Technology Facilities Council."

"We don't want to create something new if it already exists. On the other hand, no one wants the entire community to be dependent on a solution that they don't have any governance over or say in the way things are operated."

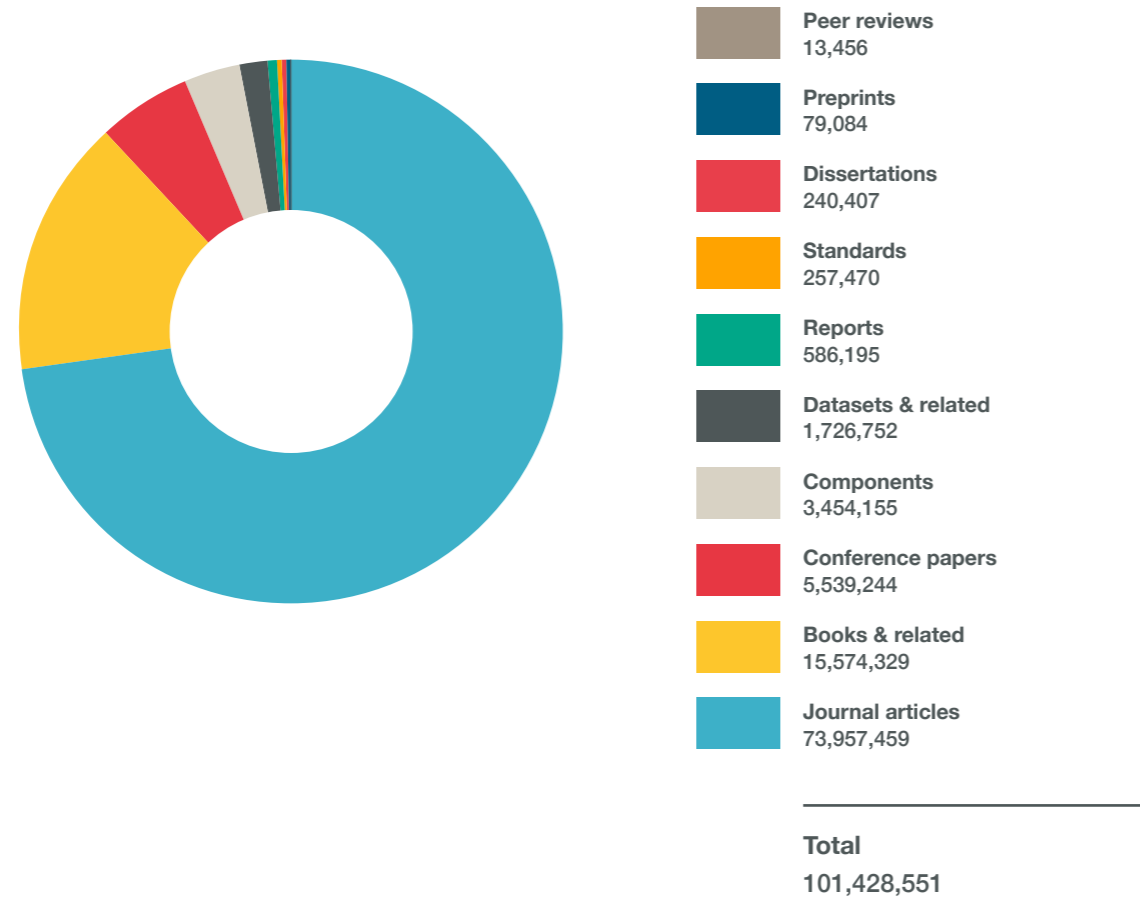
"Our main use case is recording affiliation data. Some existing registries have proprietary licenses, some exclude crucial data that publishers, institutions, and funders need, all of them are the by-product of a service in support of something else and so the community was unable to rely on them."

"There are organization identifiers being used but there isn't one common ID that meets the research affiliation use case. ROR is coming at it from that point of view," says Ed. "It's really valuable and important for publishers but it means collaboration with other organizations so that we can have a broader group of stakeholders. We've got some real momentum behind ROR now and it's going to happen in 2019."

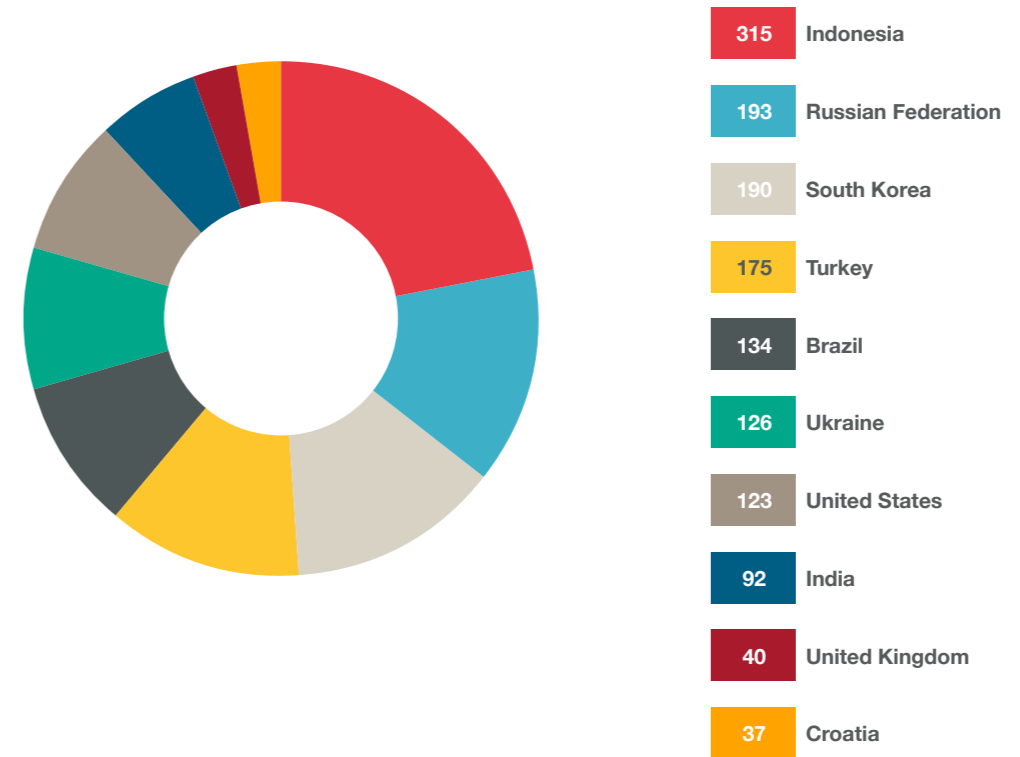
"We're trying to use the lessons from founding Crossref and also how DataCite and ORCID have been set up. We're trying to be a bit more innovative and not introduce yet another organization with more overhead and cost. The group is therefore looking at the technical aspects but also the governance and sustainability aspects."

"Essentially, we're trying to leverage existing systems where we can, and when that's not possible, work together to create new systems," says Geoffrey. "The goal is to link content in as robust a way as possible. One of the projects that we'll be working on is an initiative to get all of the PID and metadata organizations together to link them in efficient ways."

"It's about connecting identifiers and metadata and looking at how that fits into researcher workflows. It's a collaboration to ensure provenance so that researchers can understand the context of every record."



New members by top countries in 2018





Amanda Bartell
Head of Member Experience



Amy Bosworth
A/R Manager



Andrew Gilmartin
Senior Software Developer



Anna Tolwinski
Member Experience Manager



Christine Buske
Product Manager



Chrissie Cormack Wood
Head of Marketing & Communications



Maria Sullivan
Staff Accountant



Mike Yalter
Software Developer



Patricia Feeney
Head of Metadata



Patrick Polischuk
Product Manager



Paul Davis
Technical Support Specialist



Chuck Koscher
Director of Technology



Dominika Tkaczyk
Principal R&D Developer



Ed Pentz
Executive Director



Esha Datta
Principal R&D Developer



Geoffrey Bilder
Director of Strategic Initiatives



Ginny Hendricks
Director of Member & Community Outreach



Paula Graham-Dwyer
Controller



Rachael Lammey
Head of Community Outreach



Rakesh Masih
User Experience Designer



Rosa Clark
Marketing Coordinator



Ryan McFall
Accounting Manager



Gurjit Bhullar
Member Experience Coordinator



Isaac Farley
Support Manager



Jason Hanna
Software Developer



Jennifer Kemp
Head of Business Development



Jennifer Lin
Director of Product Management



Jillian Jones
HR Associate



Shayn Smulyan
Technical Support Specialist



Susan Collins
Community Outreach Manager



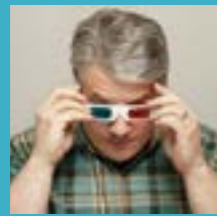
Tim Pickard
Systems Support Analyst



Vanessa Fairhurst
Community Outreach Manager



Joe Wass
Principal R&D Engineer



Jon Stark
Software Developer



Kirsty Meddings
Product Manager



Laura J. Wilkinson
Education Manager



Lindsay Russell
HR Manager



Lisa Hart
Director of Finance and Operations

Crossref staff

Chair**Paul Peters, Hindawi**

Term: 2015 - 2018

Treasurer**Scott Delman, Association for Computing Machinery (ACM)**

Term: 2015-2018

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Director of Finance & Operations

Assistant Secretary**Ed Pentz**

Executive Director

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Term: 2017-2020

BMJ

Helen King

Term: 2016-2019

eLife

Mark Patterson

Term: 2016-2019

Elsevier

Chris Shillum

Term: 2016-2019

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Term: 2017-2020

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Term: 2015-2018

MIT Press

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Term: 2017-2020

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Term: 2017-2020

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Term: 2015-2018

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Term: 2016-2019

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John Shaw

Term: 2015-2018

SciELO

Abel Packer

Term: 2017-2020

Springer Nature

Wim van der Stelt

Term: 2016-2019

Vilnius Gediminas Technical University

Eleonora Dagiene

Term: 2017-2020

Board Members

Many Crossref staff contribute to the boards, advisory or working groups, and committees of the following community organizations:

ASAPBio

BioSharing

CHOR Inc.

Council of Asian Science Editors (CASE)

DataCite

Digital Object Naming Authority (DONA)

DOI Foundation

Dryad

European Association of Science Editors (EASE)

FORCE11

FREYA

hypothes.is

International Association of STM Publishers (STM)

Joint Roadmap for Open Science Tools (JROST)

Journal Article Tag Suite (JATS)

Learned Publishing

Make Data Count

Metadata 2020

National (USA) Information Standards Organization (NISO)

OpenCon Oxford

OpenPharma

OpenTrials

ORCID

PIDapalooza

Professional & Scholarly Publishing (PSP, part of AAP)

Registry of Research Organizations (ROR)

Research Data Alliance (RDA)

Scholarly Link Exchange (Scholix)

Society for Scholarly Publishing (SSP)

UKSG

Workplace Equity Project

Zappylabs

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