# Welcome!

crossref

Founding organizations

American Association for the Advancement of Science

**American Institute of Physics** 

Association for Computing Machinery

Elsevier Science; Academic Press, Inc.

#### IEEE

Springer Verlag; Kluwer Academic Publishers; Nature Publishing Group Oxford University Press

John Wiley & Sons, Inc.; Blackwell Science <u>Gallery: Sample</u> <u>Articles</u>

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Members Only



#### The central source for reference linking

As technology is transforming the flow of information and ideas everywhere, we at CrossRef are pleased to offer the scientific and scholarly community a milestone for online publishing - a collaborative reference linking service, through which a researcher can click on a reference citation in a journal and immediately access the cited article.

The world's leading scientific, technical, and medical publishers have joined to form the non-profit, independent organization, Publishers International Linking Association, Inc. (PILA), which operates CrossRef. The PILA Board of Directors comprises representatives from AAAS (Science), Academic Press (Harcourt), AIP, ACM, Blackwell Science, Elsevier Science, IEEE, Kluwer, Nature, OUP, Springer, and Wiley.

To date, there are well over 50 publishers participating in CrossRef, accounting for over 3,000 journals with about 1.9 million article records in the database. In the near future, CrossRef will begin incorporating other reference content such as encyclopedias, textbooks, conference proceedings, and other relevant literature. Both the organizational structure and the technology of CrossRef guarantee its rapid and ongoing expansion and its growing service to publishers, libraries, and researchers worldwide.

CrossRef functions as a sort of digital switchboard. It holds no full text content, but rather effects linkages through Digital Object Identifier (DOI) numbers, which are tagged to article metadata supplied by the participating publishers. A researcher clicking on a link (the format of which is determined by publisher preference; for example, a CrossRef button, or "Article" in html) will be connected to a page on the publisher's website showing a full bibliographical citation of the article, and, in most cases, the abstract as well. The reader can then access the full text article through the appropriate mechanism; subscribers will generally go straight to the text, while others will receive information on access via subscription, document delivery, or pay-per-view. CrossRef costs the researcher nothing; its expenses are covered by nominal charges to the publishers for depositing their metadata, annual membership fees, and fees to publishers of abstracting and indexing databases and libraries for accessing CrossRef's bank of DOIs to create links to full text articles.

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#### **BOARD MEMBERS**

Michael Spinella American Association for the Advancement of Science (The Publisher of Science) www.sciencemag.org

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# This meeting is different

crossref INE 19

### Workshop - have your say

- Crossref at a turning point
- Scholarly research and communications is rapidly changing
- Data shows things have shifted dramatically
- Need more discourse
- You are here to help shape the next phase
- You are here to talk to each other
- Follow and tweet #CRLIVE19 (see/share photos of slides and data)

# Agenda, Wednesday, November 13

- 13:45 Welcome & objectives (Ed)
- 14:00 The perceived value of Crossref (Ginny)
- 14:20 Strategic scene-setting (Ed)
- 14:45 Break
- 15:15 "In their own words" talks Wrap-up: Striving for balance (Geoffrey)
- 16:30 Governance & board election (Lisa)
- 16:30 Introduction to workshops
- 17:00 Reception: Chat over drinks and canapes

### Agenda, Thursday, November 14

- 08:45 Grab a coffee & find your assigned roundtable
- 09:00 Workshop 1: What is our mission and who do we serve?
- 10:00 Report back & discussion
- 11:00 Break
- 11:30 Workshop 2: How are we sustained?
- 12:15 Report back & discussion
- 13:15 Lunch
- 14:15 Workshop 3: How should our priorities change?
- 15:15 Report back & discussion
- 16:15 Next steps & follow-up
- 17:00 Close

## Fact File

Our annual report this year is a workbook based around a set of statistics, tables and charts, with key questions posed throughout as a guide for the workshops.

Cite as: "Crossref Annual Report & Fact File 2018-19", retrieved [date], <u>https://doi.org/10.13003/y8ygwm5</u>

Ginny Hendricks; Ed Pentz; Rosa Clark; Ryan McFall; Dominika Tkaczyk; Anna Tolwinska



crossref.org/strategy

### Value research

The report of our survey and interviews into the value of Crossref is now available as a google slide deck:

bit.ly/crvalue

# Discussion - have your say

**Roundtable discussion groups:** For the Thursday workshops we are organised into tables of 11 with facilitators:

- W1: What is our mission and who do we serve?
- W2: How is Crossref sustained?
- W3: How should priorities change?

Thanks to our brilliant staff for their unfailing resilience, balance, and diligence, in these times of dynamic change.

# Perceived value of Crossref

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# Research into the value of Crossref

- 40+ 1:1 telephone interviews
  - Only in English and UK timezone so quite weighted
- 600+ survey respondents (much more global)
- Members of all sizes & types, metadata users + community
- Asked about mission, perception, services
- First such wide-ranging study still to digest all the feedback
- Full report at bit.ly/crvalue

### **Overall perceptions: solar system vs desert**

Community-driven, not concerned w/ commercial gain, mision appreciated.

Friendly, helpful, staff, collaborative with diverse stakeholders.

Aiding discoverability/findability

"Planet Crossref is also investing in space travel and investing in exploring other planets within the solar system, or beyond it, and trying to make those connections." Distracted/self-interested

Opaque (no product roadmap)

Technical debt, unclear documentation

"Vast swaths of lush green fields which are well-cared for ... things work beautifully. And then it quickly devolves into decaying areas where there's a fading out into desert. A few little oases along the way that show prospect of something grander, but there's a large desert you have to cross to get there."

# Asked what our mission is

Most agreed:

- To improve the **persistence and stability** of content
- To enable its discoverability
- To improve its interconnectedness



Some confusion:

- To push open science and encourage open access by default
- To sustain current **publishing models**

# **Recent changes**

On the plus side:

- Outreach expansion
- Professionalism
- Innovation

"I think they've become much more than just a service, they're very much an influencer and they're part of the discussion that's going on in scholarly communications now. ...they lend weight to the argument that's going on at the time about something, a good example again being organisational IDs." Society Publisher

One or two don't like:

- Been too open to new publishing models/content types (issues of quality?)
- New "non-member" services

# Some large publishers feeling left behind

#### **EXPECTATION**

- An organization that **serves the needs of scholarly publishers**, and represents the industry.
- A distinction made between traditional publishers which takes into account their **historic contribution** to Crossref, and smaller content owners, e.g. independent journals or those working with sponsoring organizations.
- Any change in this strategy which alters the balance of value should mean a change to the sustainability model – they want to pay less for content registration.

#### EXPERIENCE

 A scholarly communications infrastructure organisation which seeks to develop services to funders, institutions, researchers and new players in the scholarly information discovery chain.

• A feeling that the **funding burden significantly falls to the larger, traditional publishers**, with Crossref income remaining largely correlated with content registration volumes.

# Value for small/medium members vs. large

#### SMALL/MEDIUM

Their fees feel manageable, there are tangible benefits to being more visible, and they are invested in Crossref's mission.

#### LARGE

Large scale and strong reputations means that visibility is not a priority.

Faltering profits from traditional models mean that corporate survival was balanced against support for the wider community.

Feeling that costs should reduce with scale.

# Tensions between some content owners and metadata use

"I don't know that Crossref really appreciates any more the mission of traditional publishers. (How?) Well advocating, making our metadata free, our citation data free and for use by other companies to set up services using our own data."

- Large society

"If there are people who provide the kinds of services we do, the kind of database products where the metadata is useful, but don't publish anything, then they can get all of that value by paying very little, we're not really contributing to where the value lies, right? It's almost like we're paying to have Crossref make money from distributing metadata and enabling our competitors to take advantage of it, which makes no sense."

- Publisher

# However, metadata distribution seen as key member value by majority

"Linking and the availability of metadata had been tremendously helpful to scholarly communications over the years, accelerating the pace of innovation".

- Huge user of metadata: members
- All working groups or new metadata initiatives are initiated by members, e.g.:
  - Initiating new metadata projects:
  - License urls,
  - Full-text links (TDM);
  - "author DOIs" (ORCID);
  - funding data;
  - updates/retractions

## Functional value vs. higher order

- Working with Crossref also conferred important higher order benefits to respondents, making them feel current and keeping them plugged into the conversation. For one, this made them feel like they were taking "a step into the future". They wanted to feel part of a wider community, and Crossref represented an important information hub for them.
- Crossref provided validation for those publishing on a smaller scale that the work they were dealing with had real impact – not just in academia, but across wider society. Some Crossref users really valued seeing the development of more and more functions based upon the infrastructure, especially where they involved new data, or less work for them.

# Crossref for Open Scholarship

- **Supporting open scholarship:** Working with Crossref was a natural extension of organisational commitments to open scholarship.
- **Being connected to others:** Feeling part of a wider community pushing towards these aims felt like an important part of many organisations' core identity, and enabled them to stay current.
- **Fighting the Reproducibility crisis:** For some sponsoring organisations, their work was in the name of creating all round better science, and they felt Crossref was best placed to equip them with the tools to do this.

# DOI brand vs Crossref brand

- Crossref largely promoted the DOI in the early days over its own service
- Now problems with the "get a DOI" mentality (e.g. govt mandates, confusion between Crossref and DataCite)
- Despite best efforts, concerning that DOI is seen by some as a mark of scholarly credibility
- Some belief that working with Crossref provides "validation" but we do not vet for deceptive publishing

"DOIs - it's sort of the gateway drug. It's like, 'Okay, you need DOIs, you have a sense of that as important', but once you've get in there, saying, "Look, you can get access to this plagiarism check, or similarity check early in peer review. You want to know when people are quoting your...citing your article on Twitter or on blogs, well, Crossref actually already has a version of that, with event data."

Publishing service/tool

# Community hub

- Many respondents took value from the way blogs and conference appearances kept them informed, and created **an informal network where best practice and new developments could be shared**.
- For many this is what 'community' meant a loose grouping which Crossref helped to bind together via standardisation and information provision.
- Many respondents told us of how they trusted Crossref's stance on various sector issues, and valued the leadership they provided.
- A space for publishers to **openly discuss sector and technical developments**, focusing on the needs of all stakeholders and coming to agreements with mutual benefits for the industry as a whole.

# If Crossref went away

- Research outputs would be worse, because of the additional costs and time required to access the same materials
- The landscape would become balkanised and complex to manoeuvre within
- Large publishers would likely profiteer from the content they held, which was felt to be incompatible with the value of open scholarship
- The end to progressive developments with the likes of preprints
- An existential threat to scholarship in general, with many less likely to support this agenda if there was the scope for such catastrophe.

# If Crossref went away



- A sense of 'chaos' in the scholarly publishing ecosystem
- Less discoverable content for smaller publishers, with the very small perhaps unable to publish digitally at all
- New workflows, and a great deal of internal work required to look for alternative arrangements, or to create these themselves
- The end of their business for smaller enterprises unable to pay for alternatives.
- For those that used multiple services, this would mean negotiating a swathe of new contracts from different suppliers
- Enterprises had invested huge amounts of time getting to grips with Crossref and aligning their systems, which would need to be spent again

# Striving for balance. Have your say

# Strategic scene-setting

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# As Crossref prepares to turn 20 in January 2020 we have an opportunity

Crossref has stayed ahead - but not too far ahead - of developments in the community More than ever, we need to have this discussion with a broad and representative group.



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

We're a not-for-profit membership organization that exists to make scholarly communications better.

"To promote the development and cooperative use of new and innovative technologies to speed and facilitate scientific and other scholarly research."



#### Come one, come all

We define publishing broadly. If you communicate research and care about preserving the scholarly record, join us. We are a global community of members with content in all disciplines, in many formats, and with all kinds of business models.

#### One member, one vote

Help us set the agenda. It doesn't matter how big or small you are, every member gets a single vote to create a board that represents all types of members.

#### Smart alone, brilliant together

Collaboration is at the core of everything we do. We involve the community through active working groups and committees. Our focus is on things that are best achieved by working together.

#### Love metadata, love technology

We do R&D to support and expand the shared infrastructure we run for the scholarly community. We create open tools and APIs to help enrich and exchange metadata with thousands of third parties, to drive discoverability of our members' content.

#### What you see, what you get

Ask us anything. We'll tell you what we know. Openness and transparency are principles that guide everything we do.

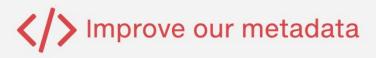
#### Here today, here tomorrow

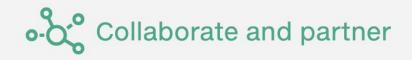
We're here for the long haul. Our obsession with persistence applies to all things—metadata, links, technology, and the organization. But "persistent" doesn't mean "static"; as research communications continues to evolve, so do we. crossref.org/strategy

## Strategic roadmap

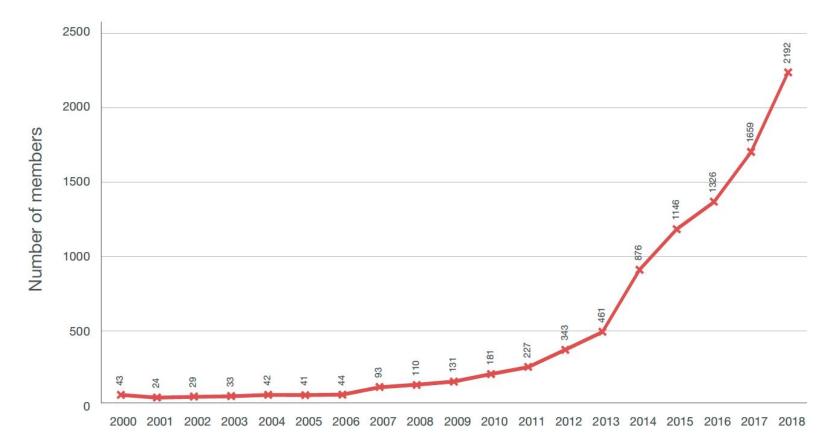






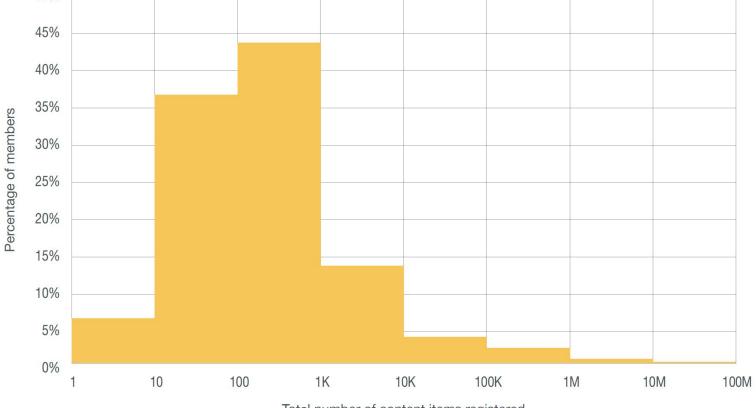


#### New members joining each year





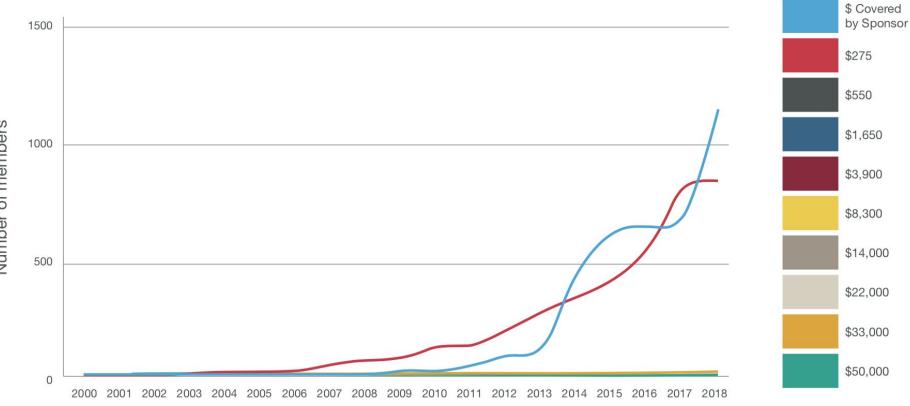
## Percentage of members by number of content items registered



Total number of content items registered

Country	\$275 USD equivalent (PPP)*
Turkey	\$339.03
Brazil	\$556.60
Ukraine**	\$2,227.50
India	\$4,885.93
Russia	\$6,630.52
Colombia	\$351,460.73
Indonesia	\$1,152,384.48

\* OECD (2019), Purchasing power parities (PPP) (indicator), <u>https://doi.org/10.1787/1290ee5a-en</u> \*\*Ukraine data from <u>https://data.worldbank.org/indicator/pa.nus.ppp?end=2017&start=2017&view=bar</u> Membership growth by fee tier by year

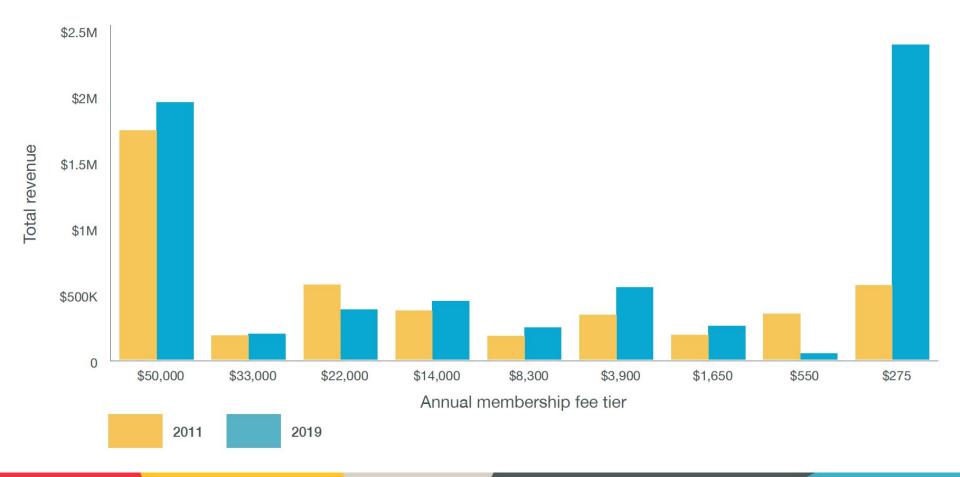


Number of members

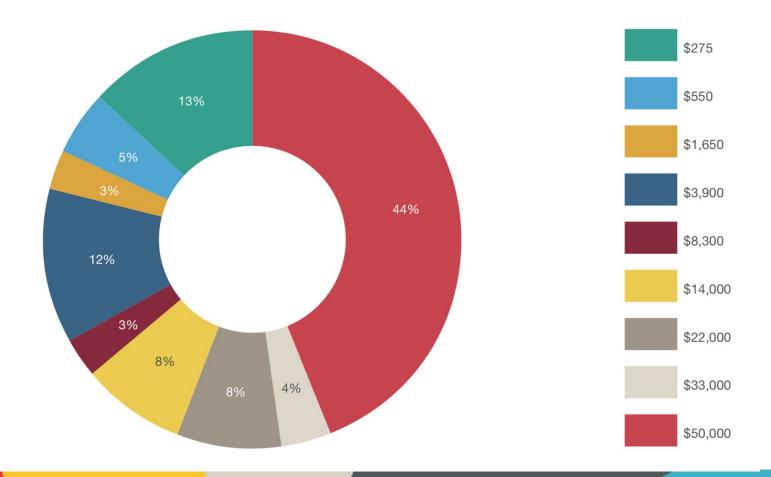
## It's okay, we have the Membership & Fees Committee

(representing the largest 1.19% of members (2))

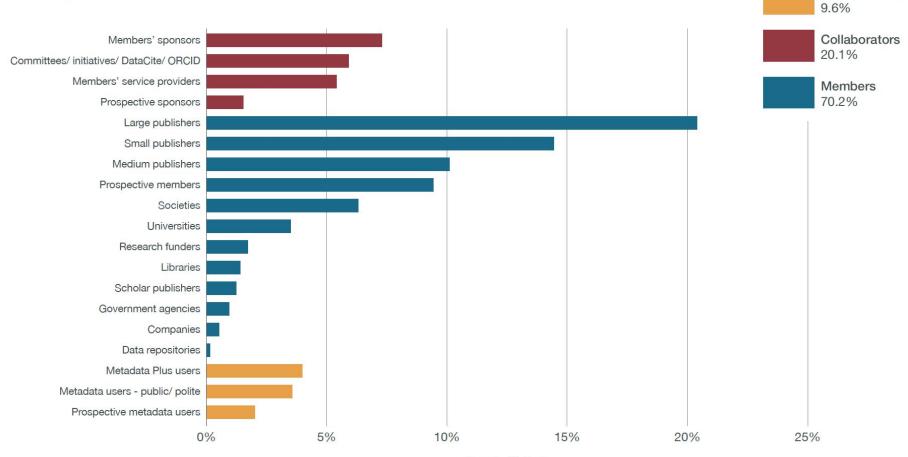
#### Revenue distribution comparing 2011 to 2019



#### Total registered content distribution by annual membership fee tier – all time



#### Average time spent by constituency - detailed



Team's % time

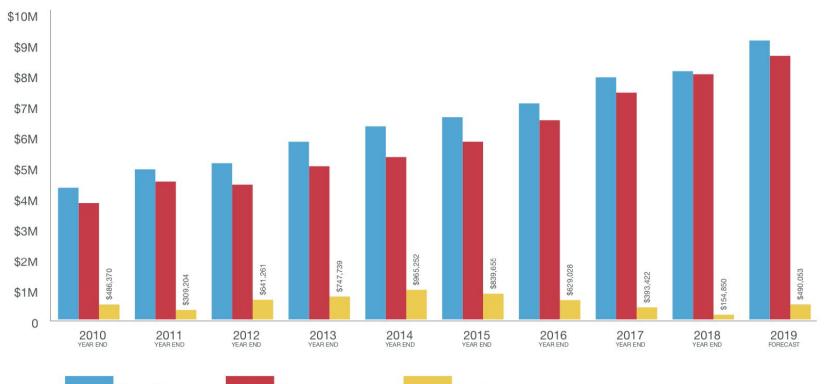
Metadata users

## Large publishers have pushed Crossref to progress

We wouldn't have most of this metadata if weren't for the large publishers. Also, they've invested a lot in:

- Initiating new metadata projects: license urls, full-text links (TDM); "author DOIs" (ORCID); funding data; updates/retractions
- Putting skilled staff on working groups, chairing groups, writing papers

#### Income and expense history 2010-2019



Earned Revenue

**Operating Expenses** 

Net Operating Income

## Looking to the future

- Consider what's been successful
- Consider where we are at the moment
- Think about infrastructure
- Think about what can best be, or only, achieved by working collectively
- Don't be wedded to the current way of doing things - must be prepared to change.

## Crossref at a crossroads

#### Amy envisions that:

"The Crossref of 2040 could be an even more robust, inclusive, and innovative consortium to create and sustain core infrastructures for sharing, preserving, and evaluating research information."

## In their own words

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Wiley Hindawi Ukrinformnauka Swiss National Science Foundation CWTS, University of Leiden

## Board election

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## Governance update

- In March the board voted to amend our bylaws, analyzing by revenue to split 16 seats 50/50 into 'large' or 'small'
- Segmented this way we have ~40 large members & ~11,000 small
- Guidance was given to the Nominating Committee to propose a 2019 slate consisting of one Revenue Tier 1 seat and four Revenue 2 seats
- For 2020 the slate will inlcude four Revenue Tier 1 seats and two Revenue Tier 2 seats which will be about equal between representing Revenue Tier 1 and Revenue Tier 2

## 2019 candidate slate

### For large (4 open seats)

- Clarivate Analytics
- Elsevier
- IOP Publishing
- Springer Nature
- Wiley

### For small (1 open seat)

- eLife
- Royal Society

## Workshop intro

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## Thursday's workshops

W1: What is our mission and who do we serve?W2: How are we sustained?W3: Therefore what priorities should change?

## Almost there

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## Chat with someone you don't know

1. Which one thing is surprising from today?

2. What is the one key question facing Crossref right now?

## Morning! Your work today

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#### Table 1

Angela Maltseva Geoffrey Bilder Rachel Bruce Scott Delman Carolina Dodon Peter Elekes Sang Won Lee Jim Longo Istvan Mile Mohamad Mostafa Michael Takats Tom Weterings

#### Table 6

#### **Catriona MacCallum**

Joe Aparo Milos Cuculovic Ana Silvia Ferreira Takafumi Kato Helen King Vasily Kozhevnikov Rachael Lammey Jason Priem Lisa Schiff Jasper Simons Craig Van Dyck

#### Table 2

Tom Olijhoek Roberto Camargo Jae Hwa Chang Jessica Dennesen Christine Ferguson Pieter Lamers Catherine Mitchell Ed Pentz Etienne Posthumus Reshma Shaikh Marie Soulière Jason Wilde

 Table 7

Graham McCann

**Claudio Aspesi** 

Catriona Fennell

**Uli Fechner** 

**JuSung Ha** 

Elina Locmele

Abel Packer

Stuart Taylor

**Bryan Vickery** 

Dan Smith

Gareth Malcolm

Sebastian Mellen

#### Table 8

Maxim Mitrofanov Denis Bilotta Jez Cope Martin Fenner Melissa Harrison Lisa Hart Martin Jihee Jeon Rachel Martin Kirsty Meddings Craig Rodkin Anjum Sherasiya Elza Vecpuise

#### Table 9

Table 3

Harry Blom

**Carol Riccalton** 

Helena Cousiin

**Bianca Kramer** 

Lisa Murphy

**Birait Orthofer** 

Shiva Prasad

**Chris Shillum** 

Clifford Tatum

Rui Seabra Ferreira

Paola Mazzucchi

Paula Graham-Dwyer

Stephanie Dawson Sabine Guerry Ginny Hendricks Esther Heuver San Kim Roman Laputyn Heather Piwowar Oleksandr Rovniahin Dominika Tkaczyk Todd Toler Sarah Whalen Woei Fuh Wong

#### Table 4

Robert Wheeler Blessing Abumere Duncan Campbell Yvonne Campfens Patricia Feeney Patrick Hargitt Mariia Holdenblat Mike Nason Pablo Palmeiro Paul Peters Christopher Ryalino Ludo Waltman

#### Table 10

Eefke Smit Rafael Araujo Volker Boeing Anke de Looper Shokhrud Fayziev Christian Gutknecht Neil Jacobs Jennifer Kemp Rosa Morais Clark Priya Parvatikar Stanislav Popov Nandita Quaderi

#### Table 5

#### **Mark Patterson**

Ricarda Braukmann Jean-Sébastien Caux Anna Danilova Mirela Dias Stewart Gardiner John Haynes Ivo Hunink Ingrida Kasperaitiene Ryan McFall Nastasiia Rabei Joe Wass

#### Table 11

Alice Meadows Dinara Atadjanova Amanda Bartell Christopher Brown Jonathan Clark Emily Cooke Carrie D'Ottavio Lauren Danahy István Kothencz James McKee Susan Murray Wim van der Stelt

## W1.1: What is our mission and who do we serve?

5 minutes: Introduce yourselves to each other - be brief!

**10 minutes**: Individually, read the current mission statement, statement of purpose in 2000 at incorporation, and consider the community/membership makeup and representation. Write responses to the following questions on post-its (one idea/topic per post-it):

- 1. What is or isn't clear to you?
- 2. Is anything missing?
- 3. Is there anything that you would remove?

**15 minutes**: As a group, place your post-its on to the large sheet of paper against the three questions, and discuss your responses

**5 minutes:** Group comments into themes, identify 3 key themes overall and prepare your report back. (report back for Pt1 & Pt 2 is 05:00 minutes in total)

## W1.2: What is our mission and who do we serve?

**10 minutes**: Individually, look at the makeup of the membership, board & committees (crossref.org/committees & crossref.org/board-and-governance), and where staff expend most effort. Comment in response to the following questions on post-its (one idea/topic per post-it):

- 1. Looking at these, do you feel it positions the organization for the future?
- 2. Looking at the complexion of the board and committees, and considering the makeup of the membership, what, if anything, would you change?

**10 minutes**: As a group, place your post-its on to the large sheet of paper. When everyone has added their post-its, discuss your responses

**5 minutes:** Group post-its into themes, identify 3 key themes and prepare your report back (report back for Pt1 & Pt 2 is 05:00 minutes in total)

## W2: How are we sustained? (45 minutes)

10 minutes: Individually, review the background material in the Fact File:

- Sustained revenue growth (p 19)
- Income and expenses (p 21)
- Distribution of revenue and content registered (p 23)
- Fee structure (crossref.org/fees)

Comment in response to the following questions on post-its (one idea/topic per post-it)

- Does anything surprise you about Crossref's revenue streams?
- If there was one thing you could change about Crosserf's revenue streams, what would it be?

**25 minutes**: As a group discuss and record comments in response to the following questions:

**10 minutes**: Identify key themes, on the Google slide, and prepare your report back (report back is 05:00 minutes)

## W3: Therefore what priorities should change?

**10 minutes**: Individually, review the strategic themes in the Fact File pages 27-33

**40 minutes**: Discuss the highest priorities for Crossref, in each strategic area. As a group, select up to 3 priorities per area and write these on the large printed sheet

**10 minutes**: Individually, place your bets on <u>your</u> highest priorities. Select the 5 highest Group priorities (with the most chips) and prepare to discuss in your report back

(report back is 05:00 minutes)



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 wider community to centrally access information from 10,000+ publishers.

A focus on user experience will allow us to make it easier for all of them to participate in Crossref as fully as possible, irrespective of their depth of need or their level of technical skill.

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.

### </>> Improve our metadata

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. Furthermore, 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 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 the Crossref system with substandard and/or incomplete metadata.

But metadata quality is a strategic focus across the entire Crossref membership. While we improve this across our entire membership by implementing stronger validation measures internally in our deposit processes, 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 system.

## X Adapt to expanding constituencies

Members are at the heart of the Crossref community. Scholarly publishers are geographically expanding at a rapid pace and we currently have members in 120 countries. With that comes the need to increasingly and proactively work with emerging regions 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 respond and 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 our infrastructure.

### • & Collaborate and 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.

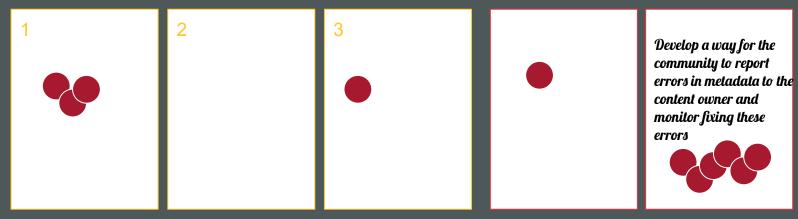
So that our alliances with others have the greatest impact, we align our strategic plans for scholarly infrastructure with others, and ensure that the community has the most up-to-date and accurate information.

This is part and parcel of our role as an community-wide infrastructure provider as we achieve our mission by supporting the entire research ecosystem. But at the same time, we 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.

#### Simplify and enrich existing services

#### mprove our metadata



#### Adapt to expanding constituencies

#### Collaborate and partner



# Wrap-up & next steps

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## Facilitators

- Angela Maltseva Tom Olijhoek
- **Carol Riccalton**
- **Robert Wheeler**
- Mark Patterson
- Catriona MacCallum

- Graham McCann Maxim Mitrofanov
- Stephanie Dawson
- Eefke Smit
- Alice Meadows



### Thanks

