

Academic startup co-creating values in the scholarly communication ecosystem

J-STAGE 20 years' anniversary symposium
2020.2.13

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Who we are

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Yasutomo Takano (Co-Founder)

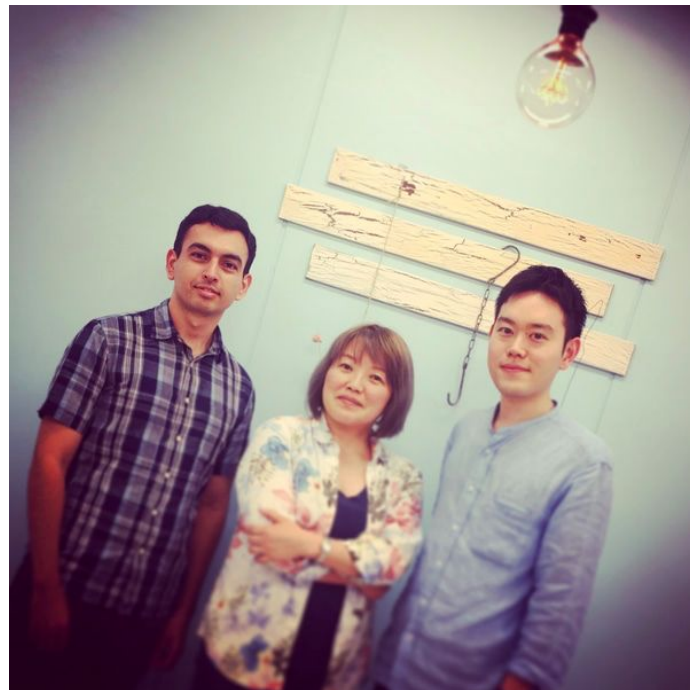
- PhD, Tokyo Institute of Technology
- Project Researcher at UT

Cristian Mejia (Co-Founder)

- PhD, Tokyo Institute of Technology
- Specially Appointed Assistant Professor at TokyoTech

Nobuko Miyairi (Strategic Advisor)

- MLIS, University of Hawaii at Manoa
- Scholarly Communications Consultant



What is Paper Digest?

Latest updates

As an academic start-up
from Japan to global

What is Paper Digest?

Latest updates

As an academic start-up
from Japan to global

Language barriers slow down reading

5



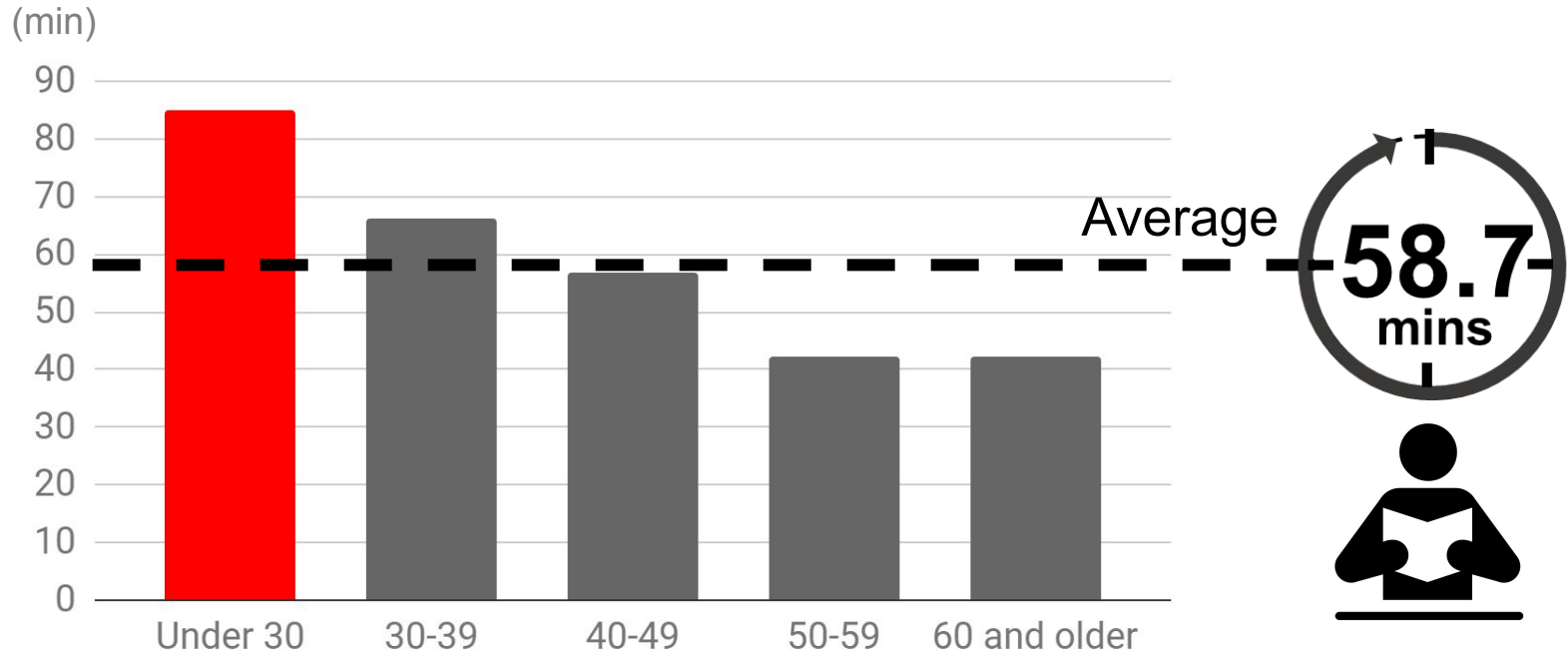
Tenopir, C., King, D. W., Christian, L., & Volentine, R. (2015). Scholarly article seeking, reading, and use: a continuing evolution from print to electronic in the sciences and social sciences. *Learned Publishing*, 28(2), 93-105. <https://doi.org/10.1087/20150203>



Tenopir, C., Christian, L., & Kaufman, J. (2019). Seeking, Reading, and Use of Scholarly Articles: An International Study of Perceptions and Behavior of Researchers. *Publications*, 7(1), 18. <https://doi.org/10.3390/publications7010018>

Younger ones are even slower

6



Tenopir, C., Christian, L., & Kaufman, J. (2019). Seeking, Reading, and Use of Scholarly Articles: An International Study of Perceptions and Behavior of Researchers. *Publications*, 7(1), 18. <https://doi.org/10.3390/publications7010018>

Solution

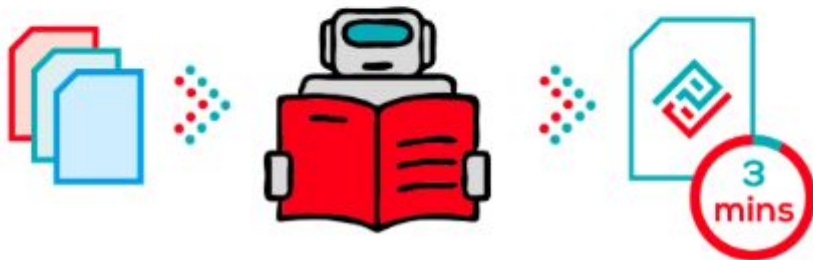
7

A service that generates “**digest**” containing the essence of a paper



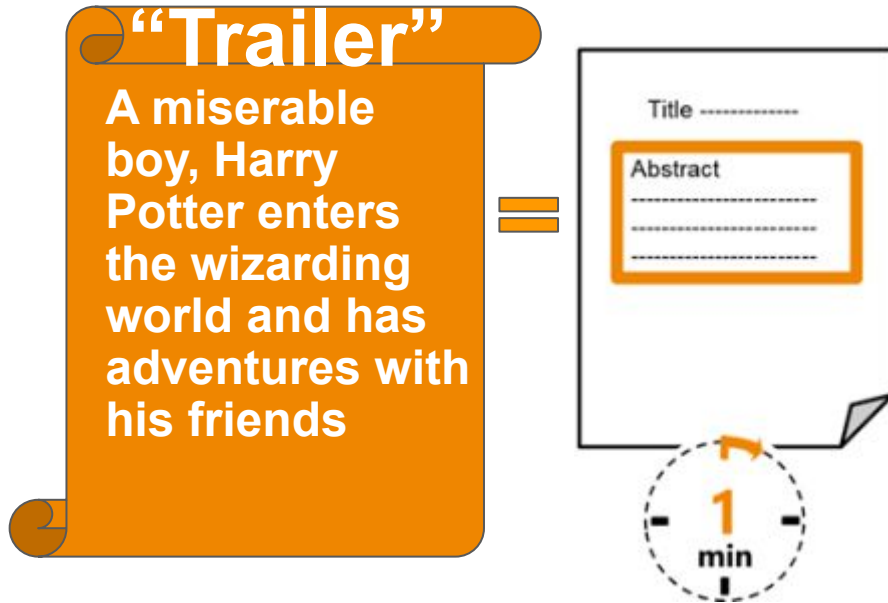
Artificial Intelligence summarizes
academic articles for you

Reducing reading time to **3 minutes!**



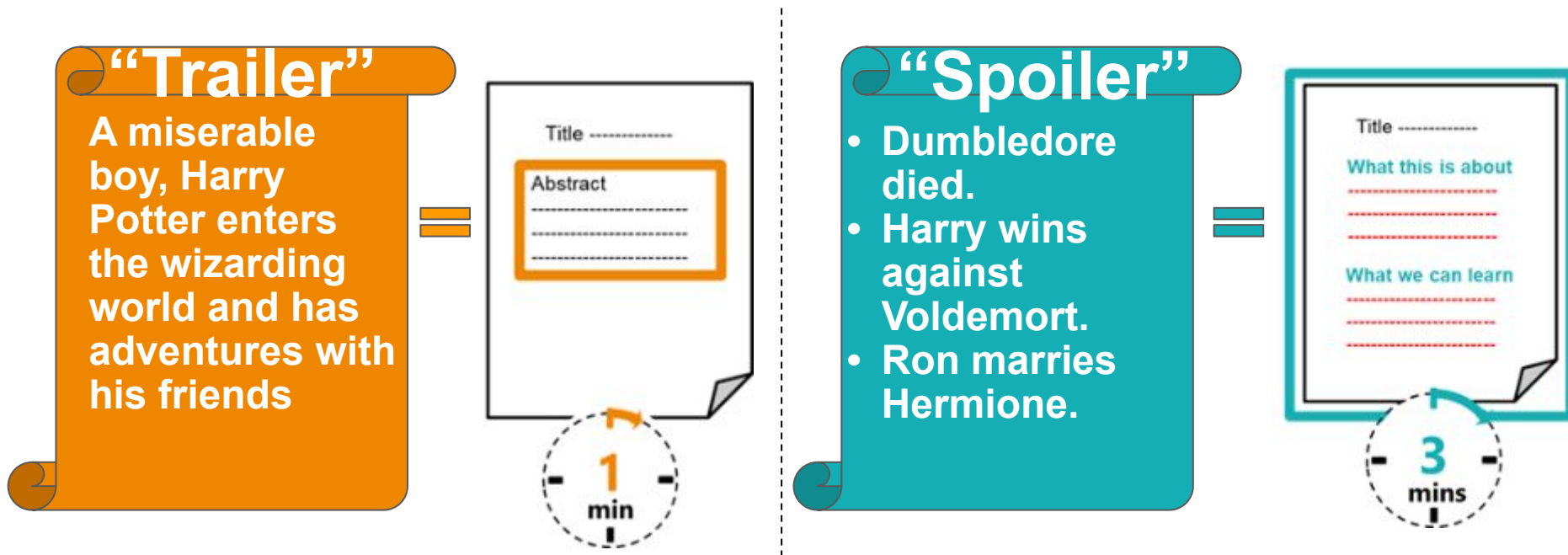
What is Paper Digest?

Let's say the abstract is something like a movie **“trailer”**.



What is Paper Digest?

Let's say the abstract is something like a movie **“trailer”**. Paper Digest intends to provide a **“spoiler”** of the paper.



Prototype (available for free)

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Enter DOI

Any of these formats

10.XXXX/YYYY
doi.org/10.XXXX/YYYY
<https://doi.org/10.XXXX/YYYY>

Try it out for free!

We are in beta. Now it works for more than 2 million **Open Access** articles

<https://doi.org/10.a.paper.doi> OR https://.../a_paper.pdf

Digest

[How to use?](#)

<https://www.paper-digest.com/>

Digested in 10 sec!

Are university rankings useful to improve research? A systematic review

Vernon, Balas, Morani *PLOS ONE* 2018
<https://doi.org/10.1371/journal.pone.0193762>

What this paper is about

Introduction and Objective

- Considering the significance of university innovation, there is a pressing need for outcome studies and quality improvement initiatives in the research enterprise.
- Research quality issues exist within university research; in the last 10 years, several studies and commentaries have highlighted the need for improvement in transparency, replicability, and meaningful research outcome reporting.
- Assessment of the validity of research and academic quality indicators in university rankings is often unexplored; only once in the literature were two ranking systems so evaluated.

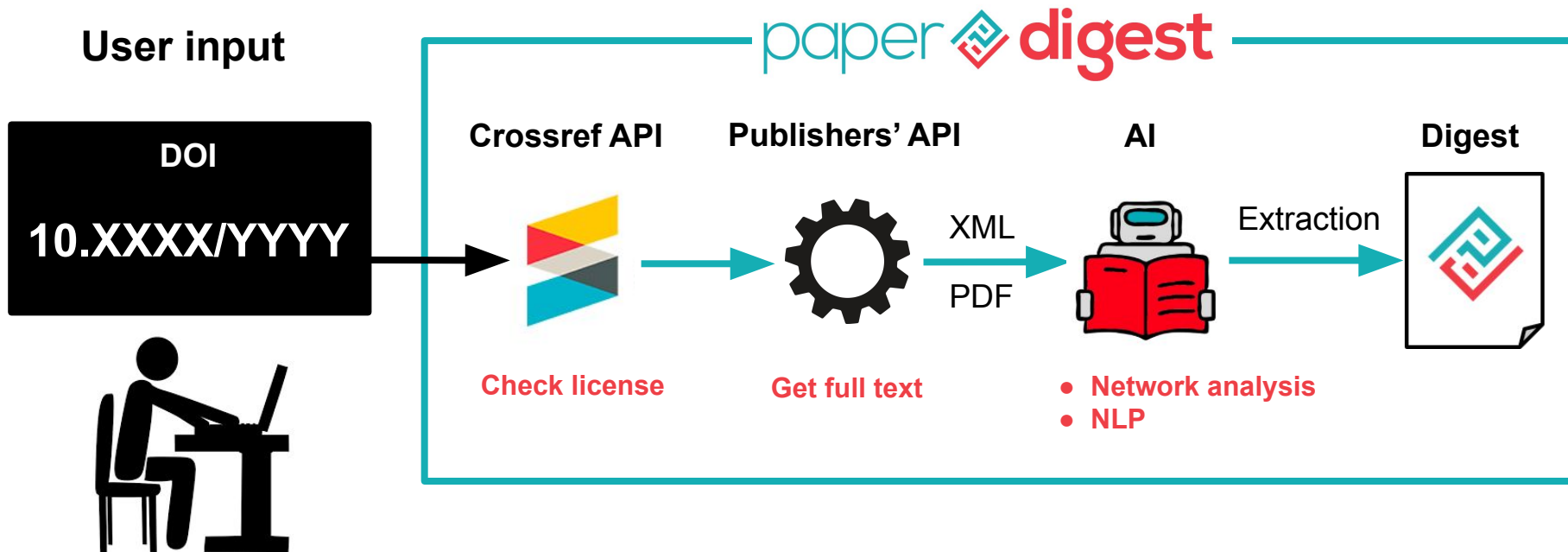
What you can learn

Results

- Excluded ranking systems were either no longer being published, did not include research performance indicators, or did not publish ranking methodologies.
- While the US News and World Report ranking of American universities was not eligible due to a lack of research performance indicators, the US News and World Report Global Ranking is included.
- Tables and list the indicators utilized by the ranking systems to evaluate research performance or quality.

Discussion and Conclusions

- In our sample, eight of the thirteen systems include indicators to measure academic quality.
- Many ranking systems are marketed either for academic choice/comparison, yet, these indicators do not sufficiently reflect the teaching and learning environments of students.
- Consultation with ranking system developers and research administrators has provided support for the included list.
- There is a need for a credible quality improvement movement in research that develops new measures, and is useful for institutions to evaluate and improve performance and societal value.
- Quality over quantity should be emphasized to affirm research performance improvement initiatives and outcomes, which benefit society through scientific discovery, economic outcomes, and public health impact.
- We suggest that future research evaluate three dimensions of research outcomes: scientific impact, economic outcomes, and public health impact for evaluating research performance within an academic institutional environment.





for registered users only

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User input



Crossref API



Publishers' API



XML

PDF

AI



Extraction

Digest



Now registered users can **upload a PDF file** to Paper Digest
(we don't retain the full text after processed)

What is Paper Digest?



Latest updates

As an academic start-up
from Japan to global

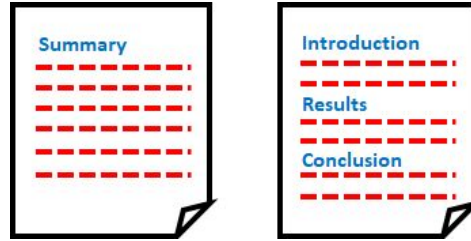
Access through API

Documentation: <https://documenter.getpostman.com/view/5368325/SVfJWCX5?version=latest>

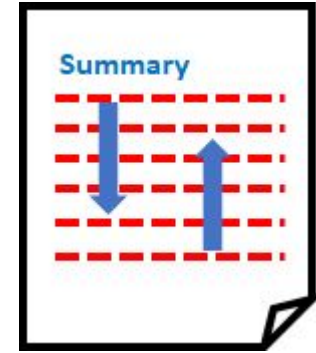
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    ],
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    ],
    "journal": [
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    ],
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    ],
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    ],
    "authors": [
      "Baxter, Ashurst, Read, Kennedy, Belpaese"
    ],
    "abstract": [
      "The benefit of social robots to support child learning in an educational context over an extended period of time is evaluated. Specifically, the effect of personalisation on child learning is evaluated. The study was conducted in a primary school in the UK. The study was conducted in a primary school in the UK. The study was conducted in a primary school in the UK."
    ],
    "objective": [
      "While a number of studies demonstrate the benefit of social robots in terms of preference and for adult learning, studies with children have shown that personalisation of the robot can improve learning outcomes. A number of other studies have recently followed from these seminal works to further explore the specific potential role that such social robots can play in helping children learn. A range of evidence comes together to support this perspective: it is known that one-to-one tutoring leads to significant learning improvements, classroom engagement is a key factor in learning outcomes, and social robots can provide a safe and controlled environment for learning."
    ]
  },
}
```



Control the number of sentences to be extracted



Overall summary or by sections



Sorting sentences

Currently running pilot tests with 2 companies in the publishing industry.

Our learnings:

- The quality of summaries is accepted. Or at the very least not challenged
- Positive perception of the usability of summaries

Identified opportunities:

- Increasing interest on summarizing preprints
- Need of summarizing other document formats (e.g. Microsoft Word)
- Using Paper Digest along with recommender systems

Evaluation of Paper Digest

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Evaluating the ability of reproducing structured summaries of approx. 1000 articles in different fields of research.

Evaluation method: ROUGE-1 (Normalized)

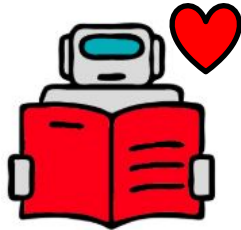
Summarizer	Computer Science	Engineering	Life Sciences	Medicine	Social Sciences
Paper Digest	1.00	1.00	1.00	1.00	0.99
LexRank	0.90	1.00	0.88	0.89	1.00
Teaser	0.64	0.55	0.69	0.79	0.60
PytlDr	0.56	0.58	0.51	0.51	0.47
Luhn	0.52	0.29	0.46	0.46	0.28
TextRank	0.49	0.37	0.33	0.34	0.41
LSA	0.46	0.02	0.61	0.55	0.05
Random	0.47	0.11	0.46	0.49	-

Future developments

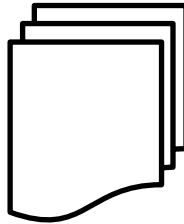
18

User feedback

- ♡ Blah blah blah
- ♡ Blah blah blah
- ♥ EUREKA! EUREKA!



Multi-inputs



Lay summary

Extraction-based

We demonstrate that PD-1 knockdown on HBV-associated, HCC antigen-specific T cells boosts their effector function and capacity to kill tumor cells in a PD-L1hi 3D microfluidic system.



Abstraction-based

A two-pronged genetic manipulation of T cells of the human immune system could lead to more effective cancer treatments.

What is Paper Digest?

Latest updates



As an academic start-up
from Japan to global

1. How AI will impact on scholarly communication?
2. What changes Open Science will bring, other than making scholarly contents open?
3. Why we hardly see any “global” “researcher-driven” scholarly information startups from Japan?

Background1: AI's impact on scholarly communication

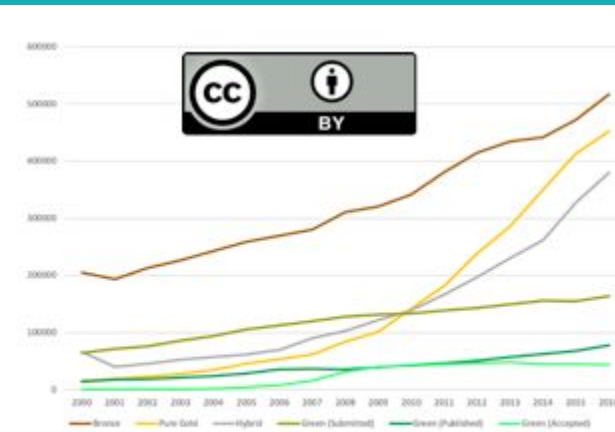
artificial intelligence noun

Definition of *artificial intelligence*

- 1 : a branch of computer science dealing with the simulation of intelligent behavior in computers
- 2 : the capability of a machine to imitate intelligent human behavior

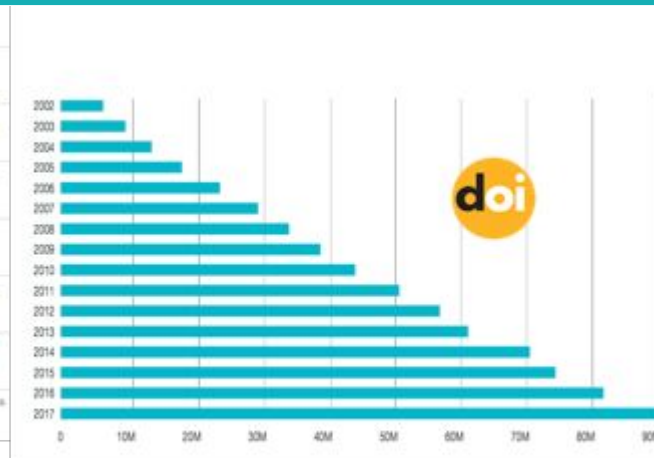
If AI is something to imitate highly intelligent human behaviors, how does that happen in scholarly communication ecosystem?

Background 2: Opportunities enabled by Open Science



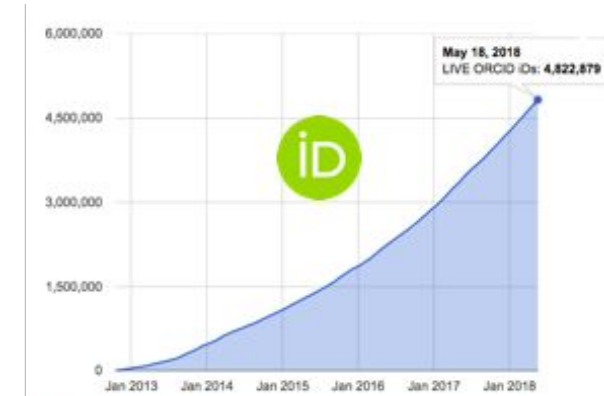
The Ascent of Open Access

<https://doi.org/10.6084/m9.figshare.7618751.v2>



Crossref. 2016-17 annual report.

<https://www.crossref.org/pdfs/annual-report-2016.pdf>



ORCID live IDs

<https://support.orcid.org/knowledgebase/articles/150557-number-of-orcid-ids>

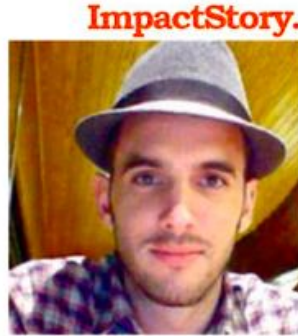


“Open” and “machine-readable” scholarly information is increasing, and ready to be processed by AI.

What are the opportunities enabled by open contents?

Background 3: Researcher startups

Researchers using their own skills & expertise to launch “a service that I need”.



ImpactStory.



ResearchGate
SCIENTIFIC NETWORK

Paper Digest as “a solution”

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Grants, market exposure, award

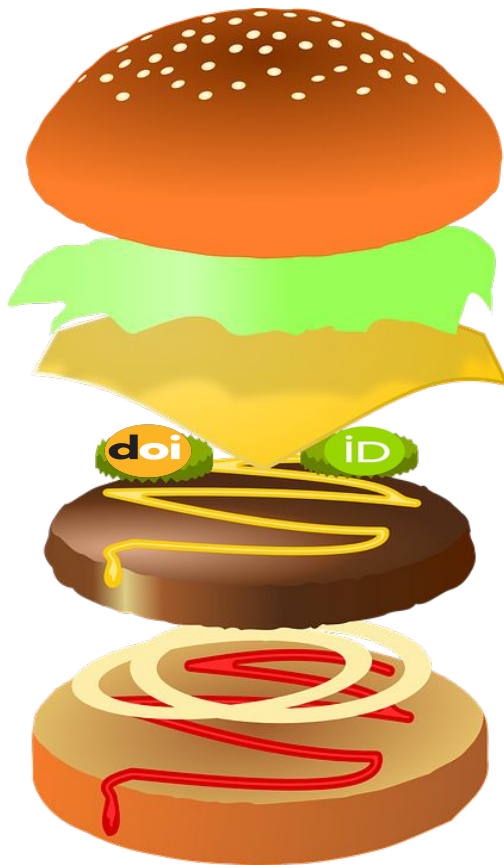
API that are freely available

Machine-readable identifiers

Open contents

Industry experience & network

Motivations, ideas, skills



Grant and market exposure

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9 Oct

Digital Science Announces New Catalyst Grant Winners

TAGS: [cadmore media](#) , [Catalyst Grant](#) , [confref.org](#) , [paperdigest](#)

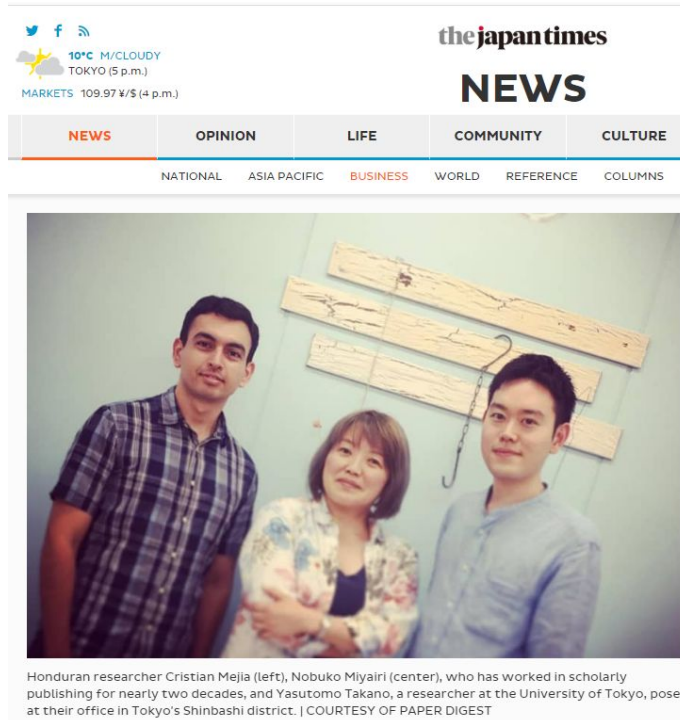


Cadmore Media
A platform which enables scientific organisations to publish scholarly, professional and technical information through streaming video and audio.

ConfRef.org
A one-stop pan publisher place for scientists and research evaluators to find information about conferences and to reliably reference conferences via a globally unique persistent ID.

Paper Digest
Paper Digest is a tool which uses artificial intelligence to generate an easy-to-read summary of academic papers.

Research industry technology company Digital Science has today revealed the latest winners of its prestigious Catalyst Grant award: Paper Digest, Cadmore Media and ConfRef.org have each been awarded a grant.



thejapan times
NEWS

10°C M/CLOUDY
TOKYO (5 p.m.)
MARKETS 109.97 ¥/\$ (4 p.m.)

NEWS OPINION LIFE COMMUNITY CULTURE

NATIONAL ASIA PACIFIC **BUSINESS** WORLD REFERENCE COLUMNS

Honduran researcher Cristian Mejia (left), Nobuko Miyairi (center), who has worked in scholarly publishing for nearly two decades, and Yasutomo Takano, a researcher at the University of Tokyo, pose at their office in Tokyo's Shinbashi district. | COURTESY OF PAPER DIGEST

<https://www.digital-science.com/press-releases/digital-science-announces-new-catalyst-grant-winners-2/>

<https://www.japantimes.co.jp/news/2018/10/24/business/tech/tokyo-researchers-paper-digest-makes-academia-jargon-cinch/>

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Paper Digest wins SSP Previews Session People's Choice Award

June 12, 2019 – Mount Laurel, NJ – At the Society for Scholarly Publishing (SSP) 41st Annual Meeting held on May 29-31, in San Diego, CA, [Paper Digest](#) was awarded a People's Choice Award for their artificial intelligence (AI) tool for scholarly communications during the *SSP Previews Session, New and Noteworthy Product Presentations*.



Pictured from left, David Myers, Dr. Cristian Mejia, Nobuko Miyairi, Dr. Yasutomo Takano, and SSP President, Adrian Stanley

This "lightning-round" plenary offered the chance to learn more about the industry's newest and most innovative products, platforms, and/or content in 5-minute, back-to-back presentations. Attendees left with exposure to a wide breadth of content on new and updated products of interest to the scholarly publishing community. After the 13 presentations, attendees were asked to vote via the mobile meeting app for the product, platform, service, or content that would likely have the most positive impact in scholarly communications.

Expanded user base

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Oct 2018

About
10,000 users
130 countries

As of now

1. Japan	6. India
2. United States	7. Iran
3. China	8. Peru
4. Indonesia	9. Germany
5. United Kingdom	10. Canada

Top 10 countries



Taster

October 30th, 2019

Should we use AI to make us quicker and more efficient researchers?

5 comments

Estimated reading time: 5 minutes





Paper Digest is only at a beta stage and is an early stage technology, but its presence and framing tell us something about the wider ideas about research and learning of which it is a part. It may not be Paper Digest in itself that is a concern, indeed, it could be a useful tool, but its underpinning reasoning and ideals are part of a relentless push towards research efficiency and the acceleration of thinking. If left unchecked, we might well end up undermining the conditions that actually facilitate creativity, thoughtfulness and an eye for a good idea.



David Beer, *Professor of Sociology at the University of York*

Next step?

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Hang on,
were we not doing this for
non-English natives?

We cannot even
get to the creativity
if we need to keep reading
everything!?



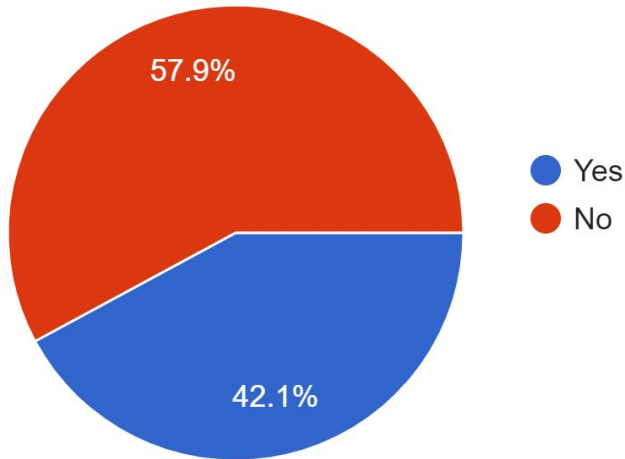
What else
should we add?
More meat?
More vege?

Why don't we
ask our users?

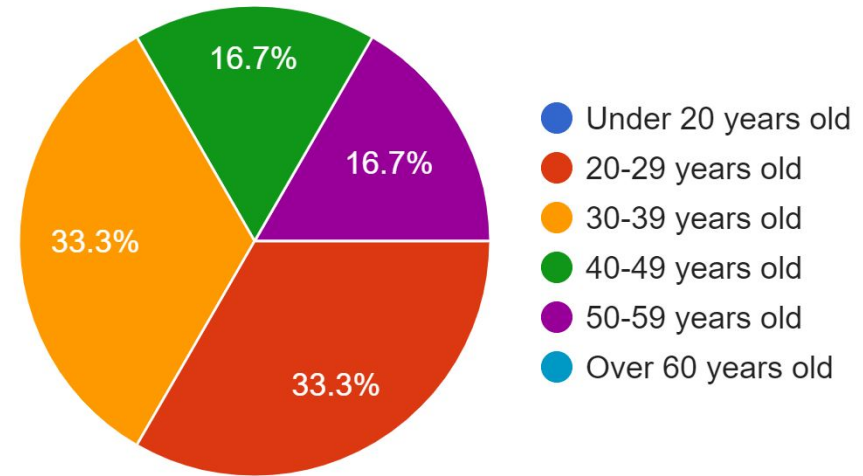
Who are using Paper Digest?

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Are you a native English speaker?



What is your age?

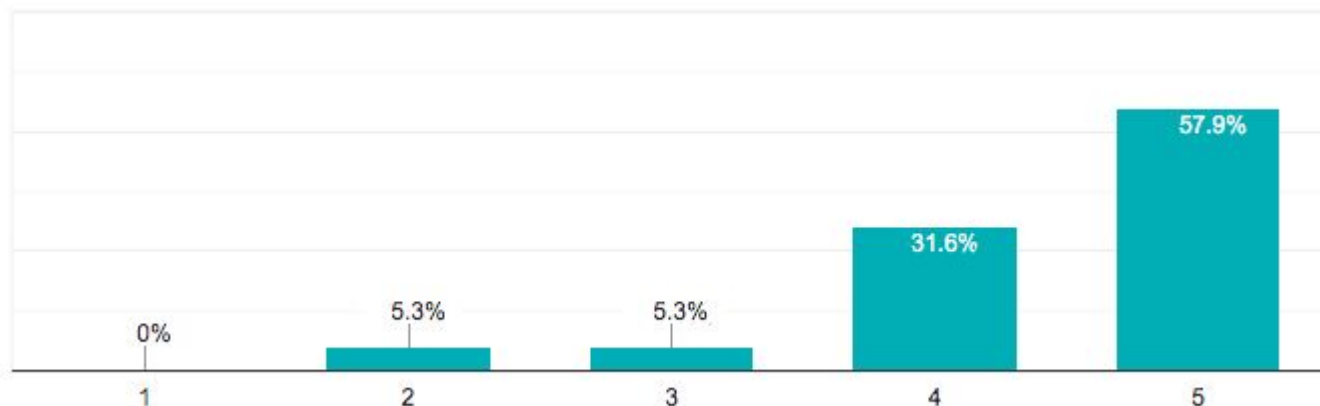


Do they support Paper Digest?

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There is too little time for researchers to read all the papers they want to read. A solution to quickly grasp the core ideas of a paper without reading the whole thing is needed.

To what degree do you agree with this statement?



“

There used to be much fewer researchers back in the day. But now, there's so much more. It's not a bad thing. But how does one keep up? You don't want to miss out on important information in your field of expertise. You never know what it might cost you. Thus, a quick and easy way to taste it all would be very helpful.

”

“

Different researchers have different understandings and needs for content. Important information can be lost through machine learning.

”

- We started off from our own challenges at hand
- Early adopters were from non-English speaking countries
- Our user base expanded as we attracted more attentions
- Our motivations are more or less supported by our users
- The next steps:
 - How to transform our MVP into a full-fledged service
 - that caters to both native and non-native English speakers
 - without compromising research process but enhancing it
 - and achieve business sustainability through collaborations



Thank you very much

