Essays in the Art and Science of Academic Journal Editing and Publishing

Trust, Quality Assurance and the Classification of Academic Publishers

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Contents

Abstract

The behaviour of publishers is central to the sustainability of trust in the academic world. The internet and the open access publishing movement have transformed the modern academic publishing industry through the inherent ease of setting up an academic publishing operation by any institution, professional association or commercial body.

In consequence, a very large number of new and primarily online publishers have surged into the industry since the early 2000s from around the world. The ethics, governance, trustworthiness and vulnerability to malign exploitation of these publishers vary hugely. The scope of malign behaviours includes citation and authorship malpractice; paper mills which forge and market content for profit; false content, and bribery and corruption in the editorial process.

These factors individually and collectively threaten to undermine the global ecosystem of trustworthy knowledge creation and research investment by nations with a flood of fakery. The recent explosive growth of artificial intelligence systems further empowers malevolent behaviour and threatens further harm to the industry.

Modern bibliometric systems can closely analyse the performance of authors, institutions, journals and their publishers with a range of indices and data analytic tools. However, these analyses are demanding of human and technical resources and of scarce bibliometric expertise. There is as yet there no system for the validation and classification of publishers, of the transparency and ethical basis of their business practices, and of their defences against malpractice.

The formal development of such a system is overdue. In this essay, I set out a range of issues of relevance to the quality assurance of academic publishers, so as to encourage debate on this complex and controversial subject, where there are many competing interests and a very strong profit motive with high margins for the successful participants.

Introduction

Publication malpractice is a major threat to the integrity and trustworthiness of academic research, authorship and journal publishing and to the reliability of the bibliometric and artificial intelligence (AI) systems that underpin it. This observation has recently been evidenced in detailed research work by Reece Richardson and colleagues at the University of Colorado (Richardson et al 2025).

Academic Publishing is the process of distributing the outputs of scholarly research and outputs. These may include books, academic journals, conference proceedings, patents, theses and dissertations, reviews and policy documents. High quality academic publishing encompasses a series of quality assurances processes, which includes the employment of subject editors and supporting editorial boards, the use of peer review processes, and feedback mechanisms for public responsiveness and quality control.

The ecosystem of academic publishing also encompasses a large professional commentariat, and major commercial systems to process, interpret and harmonise the outputs of academic publishing and the indicators of quality that they generate. The profitability and lack of regulation of academic publishing has increasingly attracted new actors who are in pursuit of profit at the expense of quality, and aspirational actors who are in pursuit of reputational gain, but who are vulnerable to publication malpractice.

Until recent times, malpractice concerns in academic publishing were generally directed at individual bad actors, including researchers, authors, peer reviewers, editors and individual journals. However, the behaviour of publishers is inextricably linked with the behaviour of the academic journals which they publish, and with the people who drive those behaviours.

The industrial scale of publication malpractice now makes all publishers vulnerable to exploitation, but those publishers with limited technical and investigational resources who are unable to recognise or mount a defence against malpractice are particularly vulnerable to malign exploitation.

High ethical standards, responsible motives, technical resources in depth, professional education and the global integrity of each and every academic publisher are therefore essential collective foundations to an effective defence against academic fraud and to sustaining trust in academic publishing.

The worldwide pressures on researchers in academic careers to "publish or perish" have led to an explosion of new entrant businesses and institutional publishing entities to meet the vast global demand. Beyond the long established major academic publishing companies, there is now a vast ecosystem of more than 10,000 commercial, institutional and society publishers of academic journals and books, with a wide range of business and operational models, motivations and behaviours. Within this ecosystem is a significant cohort of publishers and affiliated businesses whose behaviours cause particular concern.

The Impact of Jeffrey Beall on the Global Awareness of Publication Malpractice

Jeffrey Beall was a librarian at the University of Colorado in Denver until 2017. He earned much opprobrium through his efforts to characterise and publicise journal titles and publishers which caused him concerns. These concerns arose from their quality, purpose and integrity in the matter of exploiting the "author-pays" open access model for profit without apparent regard to quality or coherence of the content. He also recognised that the business models of individual journals are often inextricably intertwined with the behaviour of their publishers.

Beall popularised the term "predatory" through his Scholarly Open Access blog to describe these malign behaviours until growing institutional and legal pressures silenced his public commentaries in 2017 (Beall 2017). An educational resource on predatory publishing is maintained by librarians at the Health Sciences Library of George Washington University, in Washington DC (Himmelfarb 2025).

The word "Predatory" oversimplifies the complex spectrum of behaviours, motivations and external threats that undermine trustworthy publishing. Nevertheless, the term "predatory" has stuck in informal use for suspect publishing entities, whether applied to individual journals or to their publishers. It still serves as a useful descriptive term in such discussions.

Beall's work on predatory journals was superceded by the Cabells' Scholarly Analytics Company of Beaumont, Texas. Cabells maintains a "Whitelist" of internally validated journals using a combination of metrics data and more than 70 qualitative and quantitative criteria which are curated by a Board of Advisers.

Cabells also maintains a "Blacklist" of journals which are non-compliant to a greater or lesser degree around graded criteria which include Integrity, Peer Review, Publication Practices, Indexing, Metrics, Fees, Access and Copyright, Business Practices, and Website factors. These findings are published in the "Journalytics Medicine with integrated Predatory Reports" product, but Cabells does not offer such gradings at the Publisher level.

The lessons of Jeffery Beall's experiences were important and enduring. He unintentionally demonstrated how difficult it is to quantify and classify subjective observations and suspicions about the integrity of a publisher in a form that will stand up to rigorous cross-examination. Moreover, newcomer publishers with novel internet publishing models who originally gave rise to "predatory" concerns have proved adaptable, evolutionary and resilient in the academic marketplace.

Therefore, in this essay, I seek to define a functional journal classification scheme which will help to characterise quality and defend against vulnerabilities in academic publishing. This may to help develop best practices for all publishers, and to call out weak and malign practices for authors, readers and legislators. The global form, leadership and ownership of a regulatory or registration system for publishers has yet to be developed in detail. However, rigorous collective thinking about it is long overdue, as is an accepted public and international framework of best practice guideline and codes of conduct for public assurance and legal enforcement.

Working together, the academic community has a strong track record in addressing standardisation issues, as with the Orcid scheme, the doi scheme, and the Creative Commons system. The full extent and scale of publisher vulnerabilities is now on the radar of publishers and of the professional commentariat.

The Impact of the Internet on Academic Publishing

The cost of academic publishing in the era of paper was considerable, with high barriers to entry for printing journals and for postal distribution of the product. The development of the publishing market by the major academic publishers in the second half of the 20th century generated large profits from subscription based publishing, while generally excluding small and would be publishers from the market.

Over the past 25 years or so, the academic publishing landscape has moved to digital systems and processes. The economic barriers to entry into a profitable industry have collapsed. On line publishing technology has transformed the costs of production and global distribution, along with off-the-shelf software for websites and with content submission and manuscript management systems. Institutions, Faculties, Academic Societies and even individuals have become their own publishers in large numbers.

Entrepreneurs of various motivations can set up new publishing operations and fraudulent business which profitably exploit the huge vulnerabilities in the traditional trust-based knowledge ecosystem. Such businesses can be set up in any geographic location with an internet connection and with access to on-line banking. From these locations, they can source copy editors, web site designers and editorial boards globally, to create convincing publishing operations.

Moreover, in the online world, the only interaction that the general user will have with the publisher and a journal is through the website, the design of which is now formulaic. Therefore, it can be very difficult for the unsuspecting user to tell the wheat from the chaff, and indeed website mimicry and hijacking are well recognised forms of criminal deceit. This Issue has recently been highlighted in a Guest post on 3rd September 2025 in Retraction Watch by Mahmood Anwar, in relation to fraudulent mimickry of the *Journal of China University of Mining and Technology.*

Many new entrant businesses have ethical publishing models which take full advantage of the utility of the Internet in terms of software driven operations and global distribution, while maintaining a focus on quality. Some have prospered mightily in the development of

large portfolios of new, online only journals. However, other publishing businesses only pay lip service to quality. Some are outright criminal enterprises to separate authors from their money in devious ways without any consideration of academic probity or quality.

The Open Access Movement and the Expansion of Academic Publishers

During the 1990s, the rising costs of acquiring scholarly literature lead to a burden on the acquisition budgets of scholarly libraries, and to wider concerns that many universities and scientific societies had outsourced academic control to commercial publishers. The open-access.network project, which is funded by the German Federal Ministry for Education and Research (BMBF), notes that open access publishing can be traced to the founding by Paul Ginsparg in 1991of the arXiv archive for physics preprints at Los Alamos National Laboratory (LAN-L). This was the first of many preprint and eprint archives.

Biomed Central (BMC) was the first open access publisher. It was founded by Vitek Tracz in 1999 and sold to Springer In 2008. The **Open Archives Initiative** (OAI) was also founded in 1999 to promote technical standards for the interoperability of metadata. In 2002, The **Directory of Open Access Journals (DOAJ)** was launched at Lund University in Sweden.

Open Access and the Law of Unintended Consequences

The open access movement has also brought profound consequences to global academic publishing. Open access was developed and promoted with high principles, but with the benefit of hindsight it clearly illustrates the workings of the Law of Unintended Consequences.

Subscription based publishing in the era of paper provided natural checks on the quality of the published product. Open access models surrendered the funding of publication to authors and to their purchasing powers. This opened up the market to a huge number of new entrant publishers to meet the expanding demand from a global pool of authors and early career researchers who were driven to pay for publication and who were now in effect able to demand it from some publishers, regardless of the quality of their academic outputs.

The publishing majors have responded to the open access philosophy by creating their own portfolios of open access journals, and by charging substantial access fees in their legacy subscription journals for authors who wished to continue to make their papers widely and freely available under Creative Commons principles.

Contrary to the original aspirations of the proponents of the open access movement, this strategy has protected their profitability through a shift in the underlying business model. Respected, trusted, well managed and high quality journals remain profitable in the academic marketplace, but they are now funded primarily by the authors and institutions themselves. This very complex marketplace with a wide range of pricing also challenges intending authors to make difficult choices as to where to send their articles for publication, and how to fund the publication. The challenges of choosing a vehicle for publication for a manuscript are further compounded by a range of Open Access models, as for example Green and Gold Open Access.

The Modern Landscape of Academic Publishing

Academic publishing addresses the publishing of many forms of academic output, including books, book series, monographs, journals, conference proceedings, Theses and Dissertations. Some publishers have offer portfolios of subject coverage, while others may focus on STEMM (Science, Technology, Engineering, Medicine and Mathematics) subjects, or on Arts, Humanities and Social Sciences subjects. Others may specialise in single topics.

There are more than 7000 publishers of SCOPUS listed Journals, which are recorded on the regularly updated SCOPUS Source title list of ~47,000 journals, wherein 12 major publishers accounted for 40% or the titles in 2023 (Figure 1). Many other publishers only publish one or two journals. However, these figures do not address the full extent of the academic publishing ecosystem. The SCOPUS data only reflects those publishers whose content has been accepted in the SCOPUS collections. Reece Richardson and colleagues have identified almost 75,000 journals in publication (Richardson 2025b)

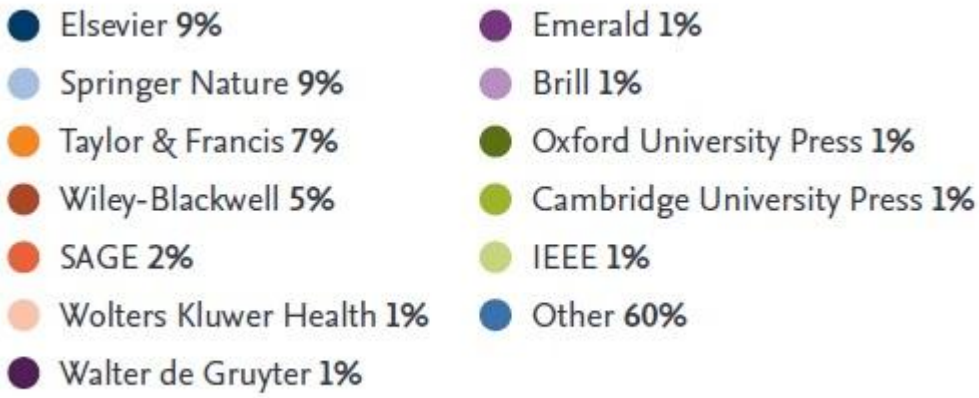

Figure 1: the leading publishers by percentage of content in SCOPUS in 2023 (see text)
https://www.elsevier.com/products/scopus/content

The Characterisation of Trustworthy Academic Publishers

Trust at all stages in academic publishing was once taken for granted and it was key to the professional culture and reputation of research. It can no longer be taken for granted. Human nature being what it is, it became easier and easier to secure publication of an article, regardless of its (lack of) quality, by payment to a publisher whose quality assurance standards and practices were weak, non-existent or fictitious.

It may be overly simplistic to categorise the academic publishing universe into two broad categories: the Trustworthy and Untrustworthy. Many small Institutional and Society publishers have worthy aspirations, ambitions and principles, but they are increasingly vulnerable and possibly naive to the risks to them and through them to the wider ecosystem of academic publishing through malign actors and actions.

It is therefore worth considering the distinguishing features of Trustworthiness in academic publishing. Trust is developed over time through multiple interactions between people and organisations, and academic outputs are continuously tested in real life interactions. Individuals, institutions, organisations and governments will pay well for trustworthy content, and the academic publisher is the filter through which trust in academia is generated.

Trustworthy publishers must now go to considerable lengths and costs to secure trust and to stand out from the crowd. Methods include formal and transparent manuscript processing systems, peer review processes, investment in editorial and publication management teams, and rigour in responding to concerns when they arise, such as those relating to plagiarism, citation and authorship malpractice.

Trustworthy publishers are usually based in trusted jurisdictions, and they make clear their commercial and operational models. They can be readily searched and validated on the internet. They deliver high quality websites with readily traceable contact details for key departments and personnel. Fundamentally, trustworthiness is profitable.

Characteristics which are common to ethical and trustworthy publishing, and for which ethical publishers will always be able and willing to provide evidence, include:
- The Governance Structure of the organisation;
- The Accountability of the Publisher to its various stakeholders in a responsible Jurisdiction;
- Mechanisms and evidence for the adherence to ethical standards.

The Governance Structure and Accountability of Trustworthy Academic Publishers

Governance is the structure through which any organisation is controlled and operates, and the mechanisms by which it, and its people, and in which jurisdiction, are held to account. Ethics, risk management, compliance and administration are all elements of governance. Whether explicitly defined or note, governance is central to the existence of every organisation, from the most ethical to the most overtly criminal, and whether the publisher is an incorporated company, an institution or an individual.

Accountability describes the acceptance of responsibility for honest and ethical conduct toward others. Accountability will be to the laws in the countries of registration and operation, and also:
- to the directors and shareholders of a publicly owned company, and/or;
- to the directors and academic leads of an Institution as publisher, and/or;
- to the executives of the Society or Association which owns or partners with the publisher;
- to all individuals who work for or with the publisher;

- and to the entire community which it serves, including authors, readers, funders and society in general, given that published outputs may have global consequences.

Jurisdiction is the legal authority in the country in which the publisher trades as a legal entity. Jurisdiction extends beyond local laws to the ethical framework of rules and codes in which society operates. It also recognises international laws, practices, conventions and treaties, to ensure common standards in global publishing activities.

Ethical publishers will have no problem in declaring their ownership and the organisational structure through which all aspects of the operation are organised, from the chief executive to the most junior intern. They will make public the operational framework and funding arrangements for any publications which are issued in their name. They will also acknowledge and publicise to the organisational responsibilities which arise in respect of the management of publication malpractice, which now affects all journals and publishers.

Countries vary considerably in the application of the rule of law in respect of publishing practice and in the tolerance of corruption and attitudes to it. Some publishers seek to disguise their true country of domicile through registration of the business in a well regulated country, using an address of convenience which may map to a domestic residence or to a poste restante mail address in a multi-occupancy office.

The Pursuit of Trust, Quality and Ethical Standards in Academic Publishing

High quality academic publication is demanding in many dimensions. It requires:

- Trust and validation of the authors and the source institutions that supply the publisher's content. This increasingly requires operational intelligence to identify citation and authorship fraud and content fakery, whether from Paper Mills or through the misuse of generative artificial intelligence tools (GenAI).
- A trained editorial team with effective leadership and focus from the Editor(s) in Chief and from the publishing editors and managers.
- Investment in training programmes and incentive systems.
- Methodologies and values to sustain high standards and for dealing with problems, including identifiable fraud.

Observations on Income and Profit from Academic Publication

The honest pursuit of income and profit in itself is not a factor in the judgement of trustworthiness. Cash flow is fundamental for sustainable and high quality academic publication. Income is necessary to fund the infrastructure of the publishing operation, and to attract and retain high quality employees and editorial teams. It underwrites the quality assurance and review processes. It permits the education and development of editors and the investment in fraud detection skills and resources.

Indeed, publishers who offer free publication without clarity as to their funding must be regarded with circumspection. They are unlikely to be able to fund the quality assurance systems to ensure the integrity and sustainability of their product in the long term.

Towards a Practical Classification of Academic Publishers

From the forgoing, it is clear that publishers can be classified in two particular ways:

- by their trustworthiness; and
- by the practicalities of their organisational structure and publishing business strategy

In this section, I propose a pragmatic classification which is based upon the public facing organisational structure, within which trustworthiness may be a significant variable.

The Long Established (pre-2000) large Commercial Publishers

The long established large commercial publishers are generally characterised by public ownership and registration in Europe and the US. They have a traceable history which is often through serial amalgamations of smaller publishers over many decades. Their trustworthiness has survived the test of time and is generally accepted as a core element of their business models, even if there have been challenges to address in moving from traditional subscription- and paper-based publishing to digital and open access models.

The newer (post 2000) large Commercial e-Publishers

A number of globally influential publishers entered the industry in the early 2000s to take "disruptive" advantage of the transformed economics and the simplified practicalities of global internet publishing. Some of these publishers have since scaled up from a low cost base to become publishers of large portfolios of journals.

Many of these publishers started with operational centres of gravity outside Europe and the US, including Egypt, India and China. They were created specifically to take advantage of new on-line publishing technologies and the Article Processing Charge (APC) funding model, using standard web interfaces and processes to minimise costs. The business models are further underpinned by aggressive online marketing, which includes the use of high volume email and invitations both to submit papers and to join editorial boards. They also make substantial use of special issues and guest editorships.

These new businesses did not have the benefit of long established trust. They have adapted to the rules of trustworthy publishing, but with various degrees of success. The headlong rush for expansion and content capture has made them particularly vulnerable to exploitation, the consequences of which are now being played out in high numbers of article retractions and concerns about special issues. Examples of such publishers include:
- **Frontiers Media SA**, whose journals are characterised by "Frontiers in (Subject)" titles, and which are each characterised by very large associate editorial boards.

- **MDPI (Multidisciplinary Digital Publishing Institute)**, whose journals are often characterised by single word titles, such as "Acoustics", Actuators" and so on to Zoology.

Both publishers enjoyed explosive or "turbocharged" early growth, both in the number of titles and the number of articles, and they were examined in detail by Christos Petrou, writing in The Scholarly Kitchen in 2023 (Petrou 2023a, 2023b). Petrou showed how this growth was driven in particular by Special Issues which were developed around a Guest Editor model. He noted that:
"At one point, powered by the Guest Editor model, the two publishers combined for about 500,000 papers (annualised), which translated into nearly USD $1,000,000,000 annual revenue. Their growth was extraordinary, but so has been their contraction. MDPI has declined by 27% and Frontiers by 36% in comparison to their peak"...

"Despite their slowdown, MDPI and Frontiers have become an integral part of the modern publishing establishment. Their success reveals that their novel offering resonates with

thousands of researchers. Their turbulent performance, however, shows that their publishing model is subject to risk, and its implementation should acknowledge and mitigate such risk.

The reputations of two other new entrant high volume publishers did not fare so well. The portfolio of the Egyptian publisher **Hindawi** expanded rapidly from 1997 onwards to 250 journals, to the point at which it was taken over by John Wiley and Sons in January 2021. The brand was subsequently dropped over the belated discovery of malpractice issues around guest editorships and paper mills.

Institutional Academic Publishers

Many individual Universities, University Faculties, Departments and University Hospitals around the world, have entered publishing on the back of the open access and internet publishing movements, and now publish one or more journals. There are a number of long established and trusted University publishers, including the Oxford, Cambridge, University College London, and Harvard University Presses, which own large and respected portfolios of journals and textbooks. Such publishers are well resourced, professionally run and regarded as highly reputable.

These many other institutions create their journals to provide an entry level outlet for the publication of locally generated content, and for purposes of prestige. Such journals very widely in quality, and they reflect both the ambitions of the Institutions and of influential individuals within them. Some institutional journals are very focussed and they carry specific titles which clearly specify the institution and/or the department and the purpose of the journal, as for example, the Alexandria Journal of Veterinary Sciences from Egypt.

Unfortunately, other institutions are less focussed on their immediate academic hinterland. Generic and “international” titles are adopted which do not reflect the available local publishing resources or expertise to run a trustworthy international journal. Such journals are particularly vulnerable to malign exploitation.

In such circumstances, the rapid growth in papers and citation activity of a SCOPUS- or Web of Science listed institutional journal can be very misleading. Inflated bibliometrics can easily

be mistaken by naive publishers for success rather than evidence of infiltration by "bad actors". Worse, when fraud is detected or alleged, the institutional instinct may be to close ranks to conceal wrongdoing and to protect the institutional reputation, rather than to respond effectively to concerns.

Institutional publishers seemingly proliferate competitively in countries where the publication of one or more journals in the same or similar subject areas is seen as reputational hallmark for each and every university. Such duplicative competition may well be counterproductive to the wider national interest. It dilutes the quality and impact which is achievable from the greater academic mass at national or regional level specialisation through inter-institutional team-working and collaboration. Iran and Turkey are noteworthy as countries with multiple university publishers.

Societies and Professional Associations as Publishers

Most academic societies and associations now partner with established publishers, either on subscription based models through their membership, or in various forms of profit sharing agreement with the publisher. However, some of the larger US societies act as their own publishers of journals which are directly related to the purposes of the society. For example:

- the American College of Chest Physicians publishes a portfolio of journals under the CHEST brand.
- The American College of Physicians similarly publishes under the ACP brand.
- The American Society for Clinical Oncology, ASCO, publishes a portfolio of journals under the common Journal of Clinical Oncology (JCO) brand.

The publication of a trustworthy portfolio of society journals remains an expensive proposition, and only the largest and best funded societies can sustain an independent publishing operation to high professional standards. In other cases, an Association or Society may partner with an established commercial publisher. For example, the European Journal of Surgical Oncology (EJSO) is published by Elsevier BV but is a jointly owned with the British Association for Surgical Oncology (BASO) and the European Society for Surgical Oncology (ESSO).

Not-for-Profit Publishers

There are a large number of "not-for-profit" publishers worldwide. **The Association of Learned and Professional Society Publishers** (ALPSP) is an international trade association which supports and represents not-for-profit organizations that publish scholarly and professional content, and those that work with them. It claims 350 member organisations across 35 countries.

However, on closer examination, the "not-for-profit" moniker is often a misnomer. It applies to the business model of the publisher. For example, the Public Library of Science publisher PLOS, is a non-profit organisation, but it was founded with a very substantial charitable grant, and it has since been sustained on article processing charges.

"Not-for-profit" publishing must therefore be distinguished from **"free-to-publish"** publishing, where the publisher imposes no charges on the author. The "free-to-publish" must nevertheless be supported in some way by funds on some scale from an institution, personal resources or benefaction, otherwise the publishing operation and its journals will not be sustainable if the donor funding is reduced or withdrawn.

State and Government Departmental Publishers

A number of responsible public bodies publish reports, data sets and public sector statistics, for example in areas of public health, population and disease censuses, which are listed in citation systems. For example, the US Centre for Disease Control produces a series of Mortality and Morbidity Weekly Reports (MMWR), Summaries and Supplements for health professionals under the MMWR brand.

The publicly funded UK National Institute for Health Research (NIHR) publishes accounts of its funded research within its own portfolio of journals, which include the Journal **Health Technology Assessment** [ISSN: 2046-4924 (Online)] and the journal **Global Health Research**, which publishes research on the health needs of people in low-and middle-income countries.

Governments may also play a strategic role in shaping the direction of national academic publishing policy. One example of this process at scale is the role of the Chinese Government in setting out a national policy, as described by Alexis Brown and Leina Shi in a pamphlet from the British Council and Universities UK international on the Chinese Research Landscape, published in June 2025. The authors note that:

"*In 2023, China's portion of global research increased to 27% of the world's total, and China now leads the world in several fields, most recently overtaking the USA in the natural sciences, according to the Nature index (Brown and Shi 2023).*

"Control over Chinese R&D is becoming increasingly centralised and streamlined, in line with Government ambitions towards self-sufficiency across key emerging technologies. This was particularly evidenced in reforms to the Ministry of Science and Technology (MoST) in March 2023 and the introduction of the Central Science and Technology Commission."

"2020 reforms to Chinese Ministry of Education guidelines surrounding academic evaluation have reduced the emphasis on the number of publications in favour of a smaller number of representative journal articles in journals of international influence, one third of which must be in Chinese journals".

These directives have been associated with a strong focus on the improvement of Chinese academic journals and the moderation of widespread malpractice. One example of this process has been the creation of a Chinese subsidiary board to work in partnership with the SCOPUS Content Selection Advisory Board on the improvement of Chinese journals.

Trade Publishers and Trade Journals

Trade publishers and journals provide material for a particular business, corporate or professional audience. They carry news, advertising and informative articles which may or may not be written in an academic format, and which may or may not be formally enhanced with citable references. For the literal minded, trade journals are NOT academic journals on the subject of trade, such as *The Journal of International Logistics and Trade* (JILT) (Emerald Publishing) and *The Journal of Shipping and Trade* (JST) (Springer Open)

Trade journals are often published by general commercial and magazine publishers with no specific expertise or interest in the academic marketplace, and relatively few trade journals are listed in bibliometric systems. However, some mainstream academic journals might also be regarded as trade journals. For example, in my own professional domain, the British Medical Journal (BMJ) publishes a high volume of bona fide academic content. However, it is also the house journal of the British Medical Association, which is a recognised trade union, about which it carries news and administrative content. The BMJ also publishes a portfolio of BMJ- branded speciality journals. The Journal of the American Medical Association (JAMA) has a similar function and portfolio of partner journals.

Patents Publications

Patents are publications which also confer ownership rights on an idea. They are usually processed and published on proprietary databases by National or Regional Governmental Patent Offices, such as the United States Patent and Trademark Office. The Intellectual Property Office is responsible for patents, trademarks, designs and copyright in the UK. The **World Intellectual Property Organization (WIPO)** is a United Nations agency which has similar responsibilities on a global basis.

Patent Examiners play an important role in the evaluation and mediation of patent applications. To be effective, they need access to reliable search system to assess and report upon the originality of a patent and of the history of the encapsulated ideas. Patents are of particular interest to the major bibliometric systems because references and citations are often a key component of patent applications, wherein they serve a number of purposes, including references to other patents, which relate the invention to other inventions; to other scientific publications, to establish the history of an idea; and to other supporting and technical documents.

They are also important because they help to demonstrate the impact of academic outputs, and hence to validate evidence about the career impact of individuals and teams. As of 2024, SCOPUS contained ~43.7 million patents from five patent offices, vis the World Intellectual Property Organisation, the European Patent Office, the US Patent Office, the Japanese Patent Office, and the UK Intellectual Property Office.

The Web of Science incorporates information from the Derwent World Patents Index, which contained 128M patent documents in 66M patent families from 60 patent issuing authorities in 2025, with records dating back to 1963.

Publishers of Conference Proceedings

Academic Conferences are a huge global business, with estimates that in excess of 10,000 such events of varying quality and scale may be held per annum. Crossref has a reference database of the titles of more than 13M conferences (https://www.crossref.org/titleList/) They are a key forum for professional discourse and for primary publication in various STEM subjects, as in the Physics, Chemistry, Engineering and Computer Sciences fields.

Conference proceedings are collections of academic papers which are published in the context of a particular academic conference or workshop. The term Proceedings (aka Transactions, or Acta) is also used in the title of some well established academic journals, as for example the Proceedings of the National Academy of Sciences (of the USA). In principle, Conference Proceedings are edited to similar standards as academic journals.

However, conference manuscripts may be edited and peer reviewed sub-optimally, given that content is determined specifically by the contributors to the conference and to particular themes, and that manuscripts are often submitted as fully formatted “camera ready” papers. Conference papers are generally submitted to deadlines which reduce the time for formal review, such that the proceedings are published in advance of the conference itself.

Conference Proceedings are often published by specialist conference publishers, including the Association for Computing Machinery (ACM) and The Institute of Electrical and Electronics Engineers (IEEE). IEEE also publishes content in partnership with John Wiley and Sons. Other Proceedings may be published as books or book series by generalist publishers such as Springer, whose Lecture Notes in Computer Science book series which has been running since the 1970s. Some conference publishers also act as organisers or conferences.

The Cambridge University Chemistry Library website notes that *"There is no standard way of publishing or indexing conference proceedings. They might be published as online conference papers, as articles within a journal, or as books of conference proceedings. Sometimes the proceedings are not published and may only be available from the authors.*
They may also be called meetings, symposia, seminars, colloquia, congresses, workshops, or conventions." (https://library.ch.cam.ac.uk/conference-proceedings).

The identification and classification of conferences and conference series themselves can Be challenging, as names, organisers, locations and publishers change frequently. Julian Franken and colleagues addressed this problem in a paper in 2022 (Franken et al 2022) with a proposal for the creation of a Persistent Identifier (PID) for the systematic characterisation and recording of conferences. They recognised the need to distinguish single conference events, conference series, conference outputs and conference references, and to define the entire event cycle of a conference from inception to post-event activities.

Aliaksandr Birukou provided a broad overview of Conference proceedings in The Scholarly Kitchen Blog in 2020 with a paper titled: "Everything You Ever Wanted to Know about Conference Proceedings But Were Afraid to Ask".

He notes that for historical reasons, some publishers and some disciplines publish conference proceedings in journals (*BMC Proceedings*, *Elsevier Procedia CS)*, while others (IOS Press), publish them as books.

The Web of Science and SCOPUS list conference proceedings selectively, and SCOPUS now lists almost 10M conference papers in various categories. The *British Library conference index* contains the records of more than 400,000 conference proceedings held in stock, with some 16,000 new records added each year. Records can also be tracked down through the Centre for Open Science (COS) Conference Index, and through the major search engines, including Google and Google Scholar.

Aspirational Publishers and the Owner-Editor as Owner-Publisher

Self publishing is another form of journal publication, where the editor is both the owner and the publisher. Such journals are likely to have weak governance and sustainability, as they are tied to the health, wealth, wellbeing and motivations of one individual. Moreover, they may prove primarily to be intended as personal vehicles for the views of the editor.

Indeed, it is reasonable to question the motivations of an individual who would wish to subsume both roles. The Committee on Publication Ethics issues self guidelines on self publishing for editors, but there is very little published guidance specifically on editors as the controlling owners of the journals which they publish.

"Pseudo-Associations"

Some journals claim affiliation with societies and associations which appear to be artificial constructs to lend legitimacy to the publisher and the title. A pseudo-society or pseudo-association may provide very limited information, and it may provide a range of clues which point to a suspicious provenance. For example, the editor in chief of the journal may also be cast as the president or chairperson of the association.

Preprint Servers as Academic Publishers

Preprints servers are on line publishing systems that post articles which have not (yet) been peer reviewed or accepted by journals. They offer the advantages of wide distribution, speed to publication, absent publication charges, and freedom from peer review. They also expose content to commentaries, to employers and to funding bodies. However, not all content which is listed in Preprint Servers proceeds to publication elsewhere, and there is no obligation on authors to do so.

Preprint servers are owned and published by a variety of organisations, including academic institutions, commercial publishers and Charitable Foundations. For example:

- Arxiv was the first major preprint server, and it is supported by Cornell University;
- BioRxiv is supported by the Cold Spring Harbour Laboratory and the Chan-Zuckerberg Foundation;
- The University of Oxford promotes the Open Access Oxford preprint server;

- MedRxiv is co-published by the Cold Spring Harbour Laboratory, the BMJ Publishing Group and Yale University;
- The ASAPbio (Accelerating Science and Publication in biology) organisation maintains a list of current Arxiv systems at https://asapbio.org/.

The Validation of Pre-Print Publishing

The major preprint servers may now be regarded as publishers in their own right for papers which are not subsequently published in "mainstream" journals. However, there is considerable debate as to whether articles and journals which do not use peer review can be listed for citation purposes in the absence of such quality control. For example, the Web of Science recently delisted the journal eLife over such concerns (Kincoid 2024).

Moreover, preprint servers present complications in the matter of citations, and in versions of record. Preprint articles are citable, and it is a matter of choice for the authors as to whether they proceed to republish the article in a journal of record, where the citation is more likely to be picked up by the core collections of SCOPUS and Web of Science. However, there is no onus on the authors to go down this route, and their articles will remain searchable across the internet on the preprint server.

E-Print Servers

Many institutions now use locally controlled ePrint servers for the compilation and internet accessibility of locally produced content. Given the rising cost of open access publication, we may anticipate that ePrint servers will progressively become formal publishing vehicles. Some governments have also developed national academic e-Print repositories for content, as for example the HRCAK repository in Croatia.

The Bad Actors: Criminal and Fraudulent Publishers

There are reportedly few legitimate businesses which are as consistently profitable as academic publication. It is therefore of little surprise that academic publishing has attracted the attentions of the creative and agile criminal mind in many jurisdictions. Profitable publishing fraud takes many forms for low entry costs and few or none of the legal and law enforcement costs and societal antipathy that accompanies the drug trade.

The Characteristics of Untrustworthy Publishers

In clear contrast to trustworthy publishers, untrustworthy publishers place the pursuit of short term profit over the long term development of trust. They may nevertheless be very adept at mimicry of trusted organisations. Their business model is founded in the wish for authors to secure publications "at any cost" for career purposes. There are a number of features which may raise suspicions of untrustworthiness, in that:

- They may be based in untrustworthy or immature jurisdictions where criminal activities are less likely to be exposed or acted upon;
- they may seek to disguise their origins using post restante addresses and registrations of convenience;
- It can be difficult to identify the origins and the key personnel in the organisation;
- Communications are often through remote submission interfaces;
- Internet searches may reveal little about the publisher, or reveal consistent adverse commentaries in social media and on trusted industry blogs such as The Scholarly Kitchen and Retraction Watch;
- Their publishing businesses will be based upon the Article Processing Charge (APC) model;
- their APCs will be very competitively priced vis a vis the publishing majors, because they do not carry the business overheads which underwrite Trust or Quality;
- They often offer very fast publication with implausibly fast peer review times.

The Value to Bad Actors of SCOPUS and Web of Science listings

The value of such businesses escalates substantially if they can secure a listing in the SCOPUS and/or Web of Science (WoS) bibliometric systems. These systems are used as a proxy for academic quality by degree awarding universities and government agencies in many countries.

SCOPUS and WoS therefore invest considerable resources in the defences against the accession of content from such publishers, including the appointment of advisory boards and technical systems to filter content and to debate changes in industry practices and behaviours and to develop credible and defensible selection criteria. However, such defences cannot be watertight.

Fraudulent and "Predatory" Behaviour among Publishers

The task is of evaluating publishers for the unsuspecting publishing outsider is difficult. There is a continuum of presentational quality, and publishers evolve, change, adapt, merge and dissolve. The internet is a great leveller, in which attractive screen and website design can conceal the true nature of the operation behind the interface.

Characteristics which are common to "predatory" companies include:

- Claiming a business a false country of business domicile
- Contacts with the publisher are invited through an anonymous contact link
- Generic titles in the portfolio of journals, commonly with "International" or "World" in the titles, and generic "catch all" Aims and Scope" in any subject or cross-disciplinary field;
-Titles which mimic or are easily confused with reputable and trusted journals.
- The generic wording of the aims and scope of journals within the publisher's portfolio.
- The lack of any affiliation to an institution, or an academic society or institution, or reference to a pseudo-Association which solely exists to support the title.

Other agents are evidently criminal in the pursuit of publishing profit, for example in hijacking or mimicking legitimate journal websites to capture their business.

The Exposure and Sanctioning of Fraudulent Publishers

Further problems lie in the lack of agreement and interest across national jurisdictions as to the merit and importance of dealing with publishing malpractice at the publisher level. There is also considerable obfuscation as to the ownership of many publishers and as to the geographic jurisdictions in which they fall.

Vit Macháček and Martin Srholec noted in 2022 that:

"Predatory or fraudulent scholarly journals exploit the paid open-access publication model: The publisher receives money directly from the author... this creates a conflict of interests. - Authors are motivated to pay to have their work published for the sake of career progression.

- In return, predatory publishers turn a blind eye to any limitations of paper... the worst of them fake the peer-review process and print almost anything for money".

They concluded that:

"The open-access model is a defining element of predatory journals, but it is not at fault per se. The inherent conflict of interest does not have to be exploited. There are effective means to ensure the quality of the editorial practices of journals... including open peer review".

To date, fraudulent publishers have not generally been censured in the same way that individual fraudulent articles may be redacted and individual journals may be delisted from SCOPUS or WoS.

One noteworthy exception to the general direct lack of censure of fraudulent publishers was the action of the US Federal Trade Commission against the company **Omics Group** from Hyderabad in India in 2019. Omics was sued in 2016 in the United States by the Federal Trade Commission for deceptive practices, including falsely claiming peer review activity, fees revealed only after acceptance and falsely claiming Journal Impact Factors.

Owen Dyer reported in 2019 in the BMJ that: *"OMICS is a publisher of "predatory" academic journals that earn revenue by charging fees to authors. It must pay $50.1m (£38m; €45m) to the US government after a federal court in Nevada found that its "unfair and deceptive practices" had breached the Federal Trade Commission Act. The company deceived thousands of authors and scientists who attended conferences organised by its de facto subsidiaries, the court found. It also misled authors about peer review, publishing fees, journal impact factors, and indexing of journals in public libraries".*

The company continues to operate under other names, including Allied Academies, Hilaris, Prime Scholars, Pulsus Group, TradeScience and Insight Medical Publishing (Donner 2025). As of May 2025, the OpenAlex indexing system (formerly Microsoft Academic Graph) still included 215,000 papers which had been published in OMICS journals.

Paper Mills

In a comprehensive critique in the German Labor Journal publication in July 2025, Anna Abalkina & Jana Christopher noted that:

"Paper Mills are a new form of publication fraud that produce large volumes of counterfeit research, and which offer scientists the opportunity to acquire co-authorship on scientific articles and/or to manipulate the peer review process and/or editors.

- Co-authorships may be sold via websites or social media such as Facebook, WhatsApp or Telegram channels.

- They may employ Ghostwriters to create content.

- Paper mills often resemble reputable service providers, which offer, for example, language corrections, formatting of tables and illustrations or the selection of suitable trade journals.

- Paper Mills guarantee publication, while reputable providers do not.

- Such articles also often involve plagiarism, data falsification and manipulation, image manipulation, citation manipulation, and synonymisation of plagiarised texts."

<u>The authors further noted that:</u>

- Paper Mills represent a fundamental change in scientific fraud and in the manipulation of authorships... A lucrative, commercialized industry has developed. Some Paper Mills offer services to increase in the h index of authors, the increase in the frequency of citations, the communication of editor positions and the support of journals in indexing in Scopus and/or Web of Science.

- They are often officially registered companies. Our knowledge of Paper Mills remains fragmented, with regard to the scope of their activities in different disciplines, and the countries in which they operate.

- They may plagiarise texts from articles in languages which may not be recognized by the publishers' screening tools.

- They may automatically replace words with synonyms to bypass plagiarism. Articles then often contain "tortured phrases", a term coined by Guillaume Cabanac, Cyril Labbé and Alexander Magazinov in 2021 [Ref], which describes unusual or meaningless phrases as substitutes for established formulations and technical terms.

- They often contain image duplication and counterfeiting, including AI-generated images. Their images may look odd and stereotypical.

The authors observed that:

- There are no universal methods for detecting Paper Mills. "Red Flags" include particular submission patterns, suspicious e-mail addresses and similar text templates, fonts, and design of images or tables, which only become apparent in comparisons when manuscripts with similarities have been analysed on a large scale.

- Machine learning algorithms represent a particular challenge to the integrity of the scientific literature, as their outputs are difficult to detect. Paper Mills actively use generative AI tools to create false statistics tables, research results, convincing images, abstracts, manuscripts and fake references in huge numbers.

- The current measures against Paper Mills are fragmented;l

- Scientific publishers differ significantly in their commitment to the identification of Paper Mills and in their efforts and pace to correct the literature;

- Most fraudulent articles remain in the literature despite identification;

- Paper Mill outputs may be growing faster than the legitimate corpus of literature;

- Some publishers cooperate with Paper Mills and accept bribes;

- Paper Mills are constantly evolving and adapting their tactics and publication methods, which make cleaning up the problem more difficult.

They offered possible solutions, in that:

The awareness of the problem must be raised among doctoral candidates, faculty members, and journal editors;

- Universities should invest in appropriate training programs;

- Known cases of collaboration with Paper Mills should be rigorously addressed;

- There is an urgent need for further research and funding to understand the phenomenon of commercialized scientific deception;

- The STM Integrity Hub offers various tools for identifying Paper Mills;

- United2Act is another collaborative initiative to meet the challenges of Paper Mills.

Anna Abalkina & Jana Christopher concluded that:

- Paper Mills flood journals with misleading studies that resemble legitimate research, undermining scientific integrity;

- They contaminate the scientific literature, waste resources and may lead to false conclusions and harmful applications in medicine;

- They undermine public trust and fuel skepticism towards science;

- Researchers who fraudulently promote their careers through Paper Mills corrupt performance-based systems in science and undermine those who do legitimate work;

- They place an enormous burden on the peer review system and can overwhelm journals with the number of submissions;

"A fundamental reform of scientific performance assessment and incentive systems is ultimately necessary. The publish-or-perish driver promotes dishonest behaviour and may be considered to be the main cause of increasingly fraudulent business in science".

The Growth in Paper Mill Fraud

An anonymous observer wrote in a Retraction Watch blog on August 5th 2025, that *"The entities enabling scientific fraud at scale are large, resilient, and growing rapidly: Fighting coordinated publication fraud is like 'emptying an overflowing bathtub with a spoon.'"*

In another paper, Reese Richardson et al (2025a) identified the massive global scale of publication fraud, (Figure 2). They demonstrated through case studies:

- Patterns of fraudulent collaboration between authors;
- Fraudulent brokers who are targetting journals at scale, and
- Strategies that enable the entities promoting scientific fraud to evade interventions.

They concluded that *"Our final analysis suggests that this ability to evade interventions is enabling the number of fraudulent publications to grow at a rate that far outpaces that of legitimate science".*

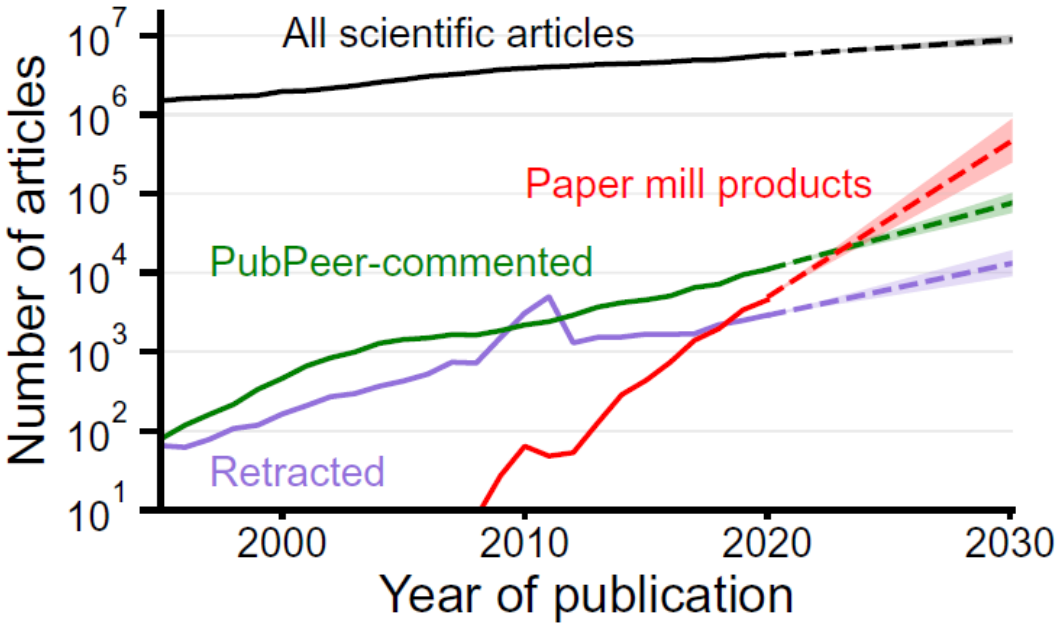

Figure 2 The growth of paper mill based fraud (after Richardson et al 2025 b)

Patent Mills and Citation Fraud

Patent references fraud is another form of contamination of the academic literature. Writing in Le Point, Loni Besancon (2025) recently highlighted the work of Reese Richardson and colleagues on the "Exploitation of intellectual property systems for the manipulation of academic reputations" (Richardson et al 2025b). She noted how patent mills sell rights of co-inventors to bogus patents to embellish academic and CVs. for example:

In India, a patent can yield more "points" in career evaluation than a publication in a peer-reviewed journal. They studied Design Registration in the United Kingdom (UK) through eight firms that seemed to be involved in the sale of thousands of UK registered designs (advertised as "UK design patents") to Indian academics for reputation manipulation.

Unlike patents, UK design registration applications are not examined for originality or innovation. These registrations are generally issued rapidly. They recommended that the exploitation of intellectual property systems should be considered to be an important element in the global enterprise of education fraud, alongside essay mills, diploma mills and research paper mills.

They observed that:

"In late 2022, advertisements for authorship slots on pre-written "UK design patents" and "India design patents" began appearing in Facebook, WhatsApp and Telegram channels These advertisements would often include information such as the title of the patent; the cost of each remaining authorship slot; and the expected time from filing to acceptance. They were couched in language which emphasised the value of these patents for individual and institutional reputations in Indian academic assessment systems".

They concluded that "***Education Fraud*** *is therefore a global business enterprise. This form of malpractice differs from the sale of essays, articles, diplomas, qualifications and other embellishments in that IP rights are genuinely granted and protected. This opens new, unanticipated frontiers in the fight against education fraud."*

A Framework Classification for Academic Publishers

Based upon the forgoing in this Essay, it is fairly straightforward to propose a structural framework for the classification of publishers along the following lines, comprising:

A. The long established (pre-2000) large Commercial Publishers:
B. The New Entrant (post 2000) "Online only" large Commercial Publishers;
C. Institutional Publishers, including Universities, Faculties and Health Care Providers;
D. Bona Fide Societies and Professional Associations as Publishers;
E. Government and Departments of State Publishers;
F. Trade Publishers;
G. Patents Publishers;
H. Publishers of Conference Proceedings;
I. The Owner-Editor as self-publisher;
J. Preprint Servers as Publishers;
K. Eprint Servers as Publishers;

To this list I would now add:

L. Malign content producers, including Paper, Citation and Authorship mills can also be considered as publishing businesses, all be it that their primary business model is founded in fraud and fabrication.

A "Confidence Index" for Academic Publishers

This generalised classification of publishers provides a framework for the subsidiary classification of journals, but it does not address the fundamental issue of Trustworthiness. Individual authors, content users, evaluators and legislators must make choices based on informed research in the process of building a of publishers.

Within each category, public and professional trustworthiness may vary considerably from one publisher to another, for a variety of reasons. However, given the scale of global publication fraud and the varying vulnerabilities of publishers from the well defended to the fraudulently complicit publishers against and for publication malpractice, it is necessary to create a subsidiary **Confidence Index of Trust** for each and every publisher.

This cannot be an exact science. Publishers evolve their business practices, their resources, their portfolios, their geographical locations and their leadership philosophies over time and in response to prevailing commercial, economic, coal, professional, political and legal pressures.

Nevertheless, it will prompt debate and help us collectively and professionally to identify good and bad practices and to discriminate between ethical, high quality academic content and lesser quality and predatory content. I believe that only a robust collaborative and global approach to the support of publishers who seek to resist fraud, and publishers who are complicit by omission or commission in the conduct of publication fraud, will stem the tide of fraud.

Factors which will score the publisher highly in our putative Confidence Index include:

- Clear Information and Transparency about the publisher, its history, its geographic base
- The true national jurisdiction to which it is answerable:
- The Financial Model and the sources of financial transparency of the business
- The scope of the publisher's academic portfolio.
- Details on the resources that it has put in place, to which it has access, and or which it uses, to counter all forms of publication malpractice

-Verifiable and granular details of all members of its editorial board, their contracts and their terms of service;
- Verifiable evidence of cases of publication malpractice with which they have dealt, for example article retractions;
- Active and verifiable memberships of trustworthy agencies such as the Open Access Scholarly Publishers Association (OASPA), the Directory of Open Access Journals (DOAJ) and the Committee on Publication Ethics (COPE).

Clearly, a self reporting system is itself subject to deceit and fraud, so the trustworthy publishers should consider overt promotion of those organisations which focus on the discovery and alerts for publication malpractice. These include blog based information systems such as Retraction Watch and the Scholarly Kitchen.

There is a rich global resource of Open Source Intelligence (OSINT) and skilled investigators, but their knowledge, insights and research should be made more readily available and consolidated into searchable systems for the ease of cross-checking each and every publisher. Examination in public view is a very powerful stimulus to change.

For smaller publishers who lack the depth of resources to investigate and counter fraud, a number of the large established publishers now offer “hosting services” to small and under-resourced regional, national, institutional or a society journals. A commercial expansion of this process to include counter fraud processes and defence and help to nurture and develop them with corporate culture, branding, expertise and resources.

Bona Fide academic publishers will seek to secure standards in all aspects of the publishing practices of its journals and book editors. Support mechanisms will include:
- Oversight of the appointment of editors and editorial board members, and support for their career development;
- Support for the indexing of their publications in quality assured abstract and citation databases such as SCOPUS and Web of Science, and their journals will have validated citation metrics;

- The provision of long term document archiving and retrieval systems, whether through internal systems or third party archiving systems such as JSTOR, CLOCKSS and LOCKSS.
- Provision for Copyright arrangements and Creative Commons rights;
- Clarity in all matters relating to publication fees.

A logical development would also be the integration of counter-fraud and alerting systems into the widely used manuscript management system, such as The Elsevier Editorial Manager, or the ScholarOne Journal Workflow Management System (Clarivate Analytics). Artificial intelligence algorithms, linked to a richer and dynamic information ecosystem, may do much to improve ethical defences and to alert unsuspecting authors, editors and publishers on particular forms of fraud in particular their publishing environment.

Professional Education on Publication Fraud.

Journal editors sit at the heart of the academic publishing process. There are substantial expectations upon the editors of trustworthy journals, for which high quality training and preparation are necessary but often hard to find.

There are no hard figures on the number of editors who are active at any one time across the globe. On the basis of some 75,000 journals, of which ~30,000 are listed each in SCOPUS and WoS, we can infer that there are of the order of 75,000 Editors in chief, each of whom are supported by a variable number of Associate Editors, of whom there may be around 10 on average per journal. It is easy to see how there are likely to be well in excess of one million individuals with editorial responsibilities who are active in the publishing industry.

There is no professional accreditation system for editors, and professional training courses are few and far between. Robust, ethical and accessible specialist education for editors is therefore the exception rather than the rule. The major publishers of necessity provide educational and financial support for their editors, but there is no discernible career structure and the duration of tenure of editors in post is very variable. It is reasonable to infer that most individuals who edit journals do soon an ad hoc basis, and that many are only marginally aware of the challenges and mitigation of publication malpractice.

It is likely that the same constraints apply to many of the owners and business managers of academic publishers.

In Conclusion

Trust is central to academic publishing, and academic publishers across the global academic ecosystem are the gatekeepers to that trust. The behaviours of authors, editors, institutions, journals, and publishers are closely interlinked in the creation or destruction of trust.

The academic community and bibliometric systems pay close attention to the performance indicators of authors, institutions and, journals. However, as yet there is no accepted and systematic measurement and classification of publishers and of their behaviours and performance.

A formal classification system for academic publishers which was underpinned by clear and measurable criteria would present no threat to ethical and trustworthy publishers. It would help to provide focus and to benchmark the contrary behaviour of the many disreputable agents across the globe whose cynical pursuit of profit through fakery and forgery is serious threat to the entire academic publishing ecosystem.

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