



PUBLISHING SCIENTIFIC JOURNALS IN THE DIGITAL AGE: OPPORTUNITIES FOR SMALL SCHOLARLY JOURNALS

Ana Marušić

Department of Research in Biomedicine and Health, University of Split School of Medicine, Split, Croatia

Corresponding Author: Prof. Dr. Ana Marušić, Editor in Chief, Journal of Global Health. Head, Department of Research in Biomedicine and Health, University of Split School of Medicine, Čoltanska 2, 21000 Split, Croatia; Phone +385 (2)1 55 78 12; E-mail: ana.marusic@mefst.hr

Abstract

Scientific publishing is rapidly developing from print-only to digital journals and extensive use of social media. This essay presents our experience in developing a small and scholarly journal from the so-called scientific semi-periphery and using the advantages of digital publishing to increase the visibility of the journal in international indexing and citation databases, and ensure greater visibility in the global scientific community. An editor of a scientific journal does not need to master all details of different digital publishing tools, but needs to follow the developments so that they can be best implemented in the journal.

Key words: Scientific journals; digital age, publishing; research and publication ethics, fraud.

Introduction

In 2006, when we started delivering bibliographical information about the journal, we edited Croatian Medical Journal (CMJ) to MEDLINE/PubMed in an electronic format. We also introduced the online manuscript submission system and XML output for archiving full text data in PubMed Central, and we wrote an editorial about the future of journal publishing [1]. At that time, the scientific publishing world was split between two futures directions: one that was the continuation of the print form of journals (the print elegantly replaced by the PDF format online) and the other one digital, with online-only journals and change in publishing from set volumes, issues and pages to continual publishing, different indicators of the size of a publication, and online supplementary information. In 2006, it seemed that the digital word would completely replace the paper journal [2]. We predicted that paper editions of journals will serve as archival issues that will be kept for the future, as paper is a more stable form of archiving than the fluid and ever-

changing digital world (the digital form of the first issues of the journal that we started in 1991 is probably not readable on today's computers if we still have it on large 5.25" floppy discs!). We also argued that digital publishing is a challenge for small and scholarly journals, which never have enough resources anyway, but also a great opportunity to increase journals' visibility. Online publishing and archiving journal issues in digital repositories, bibliographical databases and libraries, coupled with open access to journal content are important tools for small journals to achieve higher visibility and recognition in the scientific community [3].

Transition of small journals from paper to online publishing experience

This essay is a personal tale of how an editor from a small and scholarly journal experienced the transition from a paper to predominantly online journal. My experience spans two journals and more than twenty years of editing. I am not an expert in digital publishing or information technology in general, but I learned

from my experience that an editor in chief needs to know basic principles so that he or she can understand when experts working on the journal come with problems that need to be solved or with new ideas and tools for the journal.

When we started sending bibliographical information from the Croatian Medical Journal (CMJ) to the PubMed, I first had to learn about XML. I knew that there was HTML – a special "computer language" called markup language which is used to create web pages. I learned – thanks to information available on the Internet and professional education at editorial conferences such as European Association of Science Editors (EASE) and Council of Science Editors (CSE) – that XML is a different markup language which is designed to describe data. This is particularly important for scientific publishing, as XML-tagged manuscripts can be searched and linked to other information from the article and other published material.

It was relatively easy to prepare XML-tagged bibliographical data for PubMed. We did it by hand, in a Word template. However, our aim was to deposit the whole content of the journal to the PubMed Central – a free full text digital archive linked to PubMed [4] – and thus increase the visibility and access to the CMJ. But how to translate the full journal content into XML? When we started exploring options for the CMJ, we first learned that most of the journals and publishers at that time (mid-2000) outsourced manuscripts for manual XML tagging. That option was too complicated and too expensive for us and we needed to look for other options. We found the solution in the software called eXtyle [5], which can be integrated into Word to produce an XML output validated and accepted by PubMed Central. It was an expensive acquisition for a small journal, but it was the best investment for the CMJ because it increased the journal's visibility and impact and brought us to a higher technological level of editing [3]. We also became members of CrossRef [6], which enabled us to create a persistent to the online location of the published journal content using the digital object identifiers (DOI). The logical step from CrossRef was membership in CrossCheck, which enabled us to introduce text-similarity checks for all submitted manuscripts – we turned it into a research exercise, which resulted in important findings about

the prevalence of plagiarism in submitted manuscripts in a small academic journal and establishment of editorial procedures to ensure the integrity of the published scientific record [7].

The next major step in my learning course in digital publishing happened in 2011, when I moved from the CMJ to become the editor in chief of a new journal – Journal of Global Health, which I started together with my two colleagues – Prof. Harry Campbell and Prof. Igor Rudan, experts in global health from the University of Edinburgh in UK. We decided that our journal should be an independent academic voice for research in global health [8]. Financial independence meant also that we would not take the journal to a commercial publisher, but rather chose the open access publishing model, where the authors keep the ownership of the article by paying a small article processing fee (when they can afford it). When I edited the CMJ, we did not really think about open access because the journal could afford to publish all its articles in what we called "free access" because it received substantial financial support from the Croatian Ministry of Science, like many other Croatian science journals [9]. Also, Croatia had a digital repository of full text articles in PDF (<http://hrcak.hr>) where all journals receiving public funding had to deposit their content [10]. In our new journal, we had no external financial support so we started as an open-access journal without article processing charges, which we introduced only when we built up the reputation of the journal [8]. We knew about open access from our experience as researchers publishing with open-access journals like PLoS and BioMed Central journals. But how do you choose the publishing license so that the authors preserve the ownership of the article and at the same time allow widest dissemination and use of the published information? For this, we turned to Creative Commons publishing licenses [11], used by many excellent journals, such as the BMJ and BioMed Central and PLoS journals. We opted for the license with the widest freedom of use, the so-called "Attribution CC BY" (Table 1), used also by PLoS journals. Table 1 provides the description of the licenses offered by Creative Commons – there are many choices and most journals, particularly academic and scholarly journals, can find the license that is most suitable for their authors and readers [11].

Table 1

Types of Creative Commons copyright licenses

License	Description by Creative Commons*
Attribution CC BY	This license lets others distribute, remix, tweak, and build upon your work, even commercially, as long as they credit you for the original creation. This is the most accommodating of licenses offered. Recommended for maximum dissemination and use of licensed materials.
Attribution-ShareAlike CC BY-SA	This license lets others remix, tweak, and build upon your work even for commercial purposes, as long as they credit you and license their new creations under the identical terms. This license is often compared to "copyleft" free and open source software licenses. All new works based on yours will carry the same license, so any derivatives will also allow commercial use. This is the license used by Wikipedia, and is recommended for materials that would benefit from incorporating content from Wikipedia and similarly licensed projects.
Attribution-NoDerivs CC BY-ND	This license allows for redistribution, commercial and non-commercial, as long as it is passed along unchanged and in whole, with credit to you.
Attribution-NonCommercial CC BY-NC	This license lets others remix, tweak, and build upon your work non-commercially, and although their new works must also acknowledge you and be non-commercial, they don't have to license their derivative works on the same terms.
Attribution-NonCommercial-ShareAlike CC BY-NC-SA	This license lets others remix, tweak, and build upon your work non-commercially, as long as they credit you and license their new creations under the identical terms.
Attribution-NonCommercial-NoDerivs CC BY-NC-ND	This license is the most restrictive of our six main licenses, only allowing others to download your works and share them with others as long as they credit you, but they can't change them in any way or use them commercially.

Source: Creative Commons [11]

When we solved the question of publishing license, we were faced with another problem. As all three of us were accustomed to printed version of a journal – defined issues within a volume and pagination starting at the beginning of each volume, we were soon faced with problems of publishing in a digital environment. PDF of the printed page was for us still the main form of published units in the journal and this created a problem in generating individual issues: we had to wait for the whole issue to be completed in order to provide correct pagination for articles. This meant that articles which were ready for publication could not be published immediately on the web –

which the authors rightfully expected. At that point, we realized that we have to stop thinking in "print" terms and look for other solutions. For us, the report of The National Federation of Advanced Information Services (NFAIS) from the USA on best practices for publishing journal articles [12] provided the best guidance for us. We chose to use article identifiers instead of traditional sequential pagination – instead of page numbers each article gets a numeric code and is posted online as soon as it passes editorial processing after manuscript acceptance. Table 2 provides definitions of other terms related to online publishing, as provided by the NFAIS [12].

Table 2

*Definitions of digital publishing terminology according to The National Federation of Advanced Information Services**

Term	Definition by NFAIS
Article Identifier	Article identifiers serve as surrogates for pagination in journals that either do not include pagination at all or number each article 1–n. They are most frequently used in journals that publish article-by-article.
DOI	Digital Object Identifier: A unique identifier for content that offers a persistent link to a piece of scholarly content in the online environment. For scholarly and technical publications, CrossRef is the major Registration Agency of the International DOI Foundation.
HTML	HyperText Markup Language: A language used to describe a text document for placement on the web. HTML uses tags enclosed in angle brackets to establish the desired appearance of the document.
PDF	Portable Document Format: A file format Adobe Systems created in 1993. PDFs represent documents that independent from software, hardware, and operating systems. The International Standards Organization (ISO) published it as an open standard in July 2008. In practice, the PDF generally replicates the printed page.
RSS Feeds	Really Simple Syndication: a web feed used to provide users with frequently updated content, such as tables of contents for a journal. The publisher syndicates the feed so that users can subscribe to it and receive notification automatically.
URL	Uniform Resource Locator: Essentially an address on the Internet, the URL specifies where an identified resource is located and the protocol for retrieving it.

*Source: The National Federation of Advanced Information Services. Best practices for publishing journal articles [12]

It seems to me that the digital publishing is a sort of life-long continuing educations for editors. I did not touch on our experiences in the online submission and manuscript tracking solutions which are suitable (and affordable) for a small academic journal – this is an ongoing frustration, at least for me. We do not have enough resources to buy a standard, expensive online system from commercial vendors and we likewise do not have enough information technology resources to adapt freely available systems, like Open Journal System (OJS) to our needs [13]. I am not sure what the best solution is, and I may be wiser in a few years. In those few years, my colleague editors and I will also need to learn more about social media and how they can help increase journal's visibility and prestige. Some studies have shown positive associations between tweets on social networks and citations to the published journal articles [14], as well as possible influence of social media on article citations and impact factor [15]. This all sounds very promising but very expensive. My consolation at the moment is that scientists – authors of articles we publish in scientific jour-

nals, still value the classical peer review system of communicating research results to the scientific community [16].

Conclusion

Editors of small and scholarly journals need to follow the developments in digital publishing in order to ensure the quality of their journals and increase their visibility and impact in global scientific community.

REFERENCES

1. Marušić A, Marušić M. Double life of medical journals: Dr Paper and Mr Web. *Croat Med J.* 2006; 47: 4–6.
2. LaPorte RE, Marler E, Akazawa S, Sauer F, Gamboa C, Shenton C, Glosser C, Villasenor A, Maclure M. The death of biomedical journals. *BMJ.* 1995; 310: 1387–90.
3. Marušić A, Marušić M. Can small journals provide leadership? *Lancet.* 2012; 379: 1361–3.
4. US National Library of Medicine. PubMed Central. Available at: <http://www.ncbi.nlm.nih.gov/pmc/>. Accessed: June 25, 2014.

5. Fenner M. eXtyle: Interview with Elizabeth Blake and Bruce Rosenblum. PLoS Blogs. Posted May 1, 2009. Available at: http://blogs.plos.org/mfenner/2009/05/01/extyle_interview_with_elizabeth_blake_and_bruce_rosenblum/ Accessed: June 25, 2014.
6. CrossRef. About CrossRef. Available at: <http://www.crossref.org/>. Accessed: June 25, 2014.
7. Baždarić K, Bilić-Zulle L, Brumini G, Petrovečki M. Prevalence of plagiarism in recent submissions to the Croatian Medical Journal. Sci Eng Ethics. 2012; 18: 223–39.
8. Rudan I, Campbell H, Marušić A. The first three years of the Journal of Global Health: Assessing the impact. J Glob Health. 2014; 4: 010101.
9. Marušić M, Marušić A. Mogućnosti državnog poticaja izvrsnosti znanstvenih časopisa u Hrvatskoj. Acta Medica Croat. 2005; 59: 285–96.
10. Stojanovski J, Petrak J, Macan B. The Croatian national open access journal platform. Learn Publ. 2009; 22: 263–73.
11. Creative Commons. About the licenses. Available at: <http://creativecommons.org/licenses/>. Accessed: June 25, 2014.
12. The National Federation of Advanced Information Services. Best practices for publishing journal articles. Philadelphia, PA: NFAIS, 2009. Available at: <http://www.accessinn.com/wp-content/uploads/2013/11/NFAIS-Best-Practices-final-public.pdf>. Accessed: June 30, 2014.
13. Public Knowledge Project. Open Journal Systems. Available at: <https://pkp.sfu.ca/ojs/>. Accessed: June 30, 2014.
14. Eysenbach G. Can tweets predict citations? Metrics of social impact based on twitter and correlation with traditional metrics of scientific impact. J Med Internet Res. 2011; 4: e123.
15. Lozano GA, Lariviere C, Gingras Y. The weakening relationship between the impact factor and papers' citations in the digital age. J Am Soc Inf Sci Technol. 2012; 63: 2140–5.
16. Nicholas D, Watkinson A, Volentine R, Allard S, Levine K, Tenopir C, Herman E. Trust and authority in

scholarly communications in the light of the digital transition: setting the scene for a major study. Learned Publishing. 2014; 27: 121–34.

Резиме

ОБЈАВУВАЊЕ НАУЧНИ СПИСАНИЈА ВО ДИГИТАЛНАТА ЕРА: МОЖНОСТИ ЗА МАЛИТЕ НАУЧНИ СПИСАНИЈА

Ана Марушиќ

Оддел за истражување во биомедицината и здравството, Медицински факултет, Универзитет во Сплит, Сплит, Р. Хрватска

Научната издавачка дејност се развива многу брзо од само печатена форма кон дигитална форма на списанија и широка употреба на социјалните медиуми. Овој есеј го прикажува нашето искуство во развојот на малите научни и академски списанија од т.н. научна полупериферија и користењето на предностите на дигиталното издаваштво да ја зголеми видливоста на списанието во меѓународните индексирачки и цитирачки бази на податоци, и да се обезбеди поголема видливост во глобалната научна заедница. Уредникот на научното списание не е обврзан да ги совлада сите детали на различните алатки за дигитално издаваштво, но треба да ги следи случувањата и достигнувањата, така што тие можат да бидат најдобро имплементирани во списанието.

Клучни зборови: научни списанија, дигитална ера, објавување, истражувачка и објавувачка етика, измама.