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Researcher and Author Profiles: Opportunities, Advantages, and Limitations

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Currently available online profiling platforms offer various services for researchers and authors. Opening an individual account and filling it with scholarly contents increase visibility of research output and boost its impact. This article overviews some of the widely used and emerging profiling platforms, highlighting their tools for sharing scholarly items, crediting individuals, and facilitating networking. Global bibliographic databases and search platforms, such as Scopus, Web of Science, PubMed, and Google Scholar, are widely used for profiling authors with indexed publications. Scholarly networking websites, such as ResearchGate and Academia.edu, provide indispensable services for researchers poorly visible elsewhere on the Internet. Several specialized platforms are designed to offer profiling along with their main functionalities, such as reference management and archiving. The Open Researcher and Contributor Identification (ORCID) project has offered a solution to the author name disambiguation. It has been integrated with numerous bibliographic databases, platforms, and manuscript submission systems to help research managers and journal editors select and credit the best reviewers, and other scholarly contributors. Individuals with verifiable reviewer and editorial accomplishments are also covered by Publons, which is an increasingly recognized service for publicizing and awarding reviewer comments. Currently available profiling formats have numerous advantages and some limitations. The advantages are related to their openness and chances of boosting the researcher impact. Some of the profiling websites are complementary to each other. The underutilization of various profiling websites and their inappropriate uses for promotion of 'predatory' journals are among reported limitations. A combined approach to the profiling systems is advocated in this article.

Keywords: Bibliography as Topic; Performance; Profile; Researcher; Author; Scholarly Journal; Information Retrieval

INTRODUCTION

Comprehensive evaluation of research performance is an increasingly important task for the research and publishing enterprise in the era of digitization, open access, and diversification of social networking (1). A wide variety of individual and institutional websites is now available to keep the global scientific community abreast of ongoing research projects, published articles, conferences, and opportunities for collaboration. The digitization of the individual curriculum vitae has advanced the archiving of scholarly articles, books, presentations, and audio and video materials in specifically designed websites, which were not available even a decade ago (2). The accuracy, transparency, and completeness of information on such platforms mark the professionalism and scientific prestige of the creators and moderators.

Online profiles are increasingly employed for evaluating prospective academic mentors, authors, reviewers and journal editors, for sharing and commenting on scholarly articles, and establishing scholarly networks. For the global scientific community, one of the most important components of such profiles is the article in English (3,4). Subsequently, simultaneous searches through the global databases and platforms, such as MEDLINE, Scopus, Web of Science, and Google Scholar, increase chances of retrieving relevant items and navigating through the authors' profiles for their comprehensive evaluation (5). The journal editors often refer to profiles of their contributors in their editorial management systems, linked to bibliographic databases and search platforms, for improving their quality checks and promoting the best contributors. Publishers and editors are strongly encouraged to evaluate academic profiles and online identifiers of their contributors to avoid 'fake' reviewer commenting and other forms misconduct (6). Several search platforms, scholarly networking websites, and bibliographic databases have adjusted their online tools to offer regularly updated information on researchers and authors for ad-

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Table 1. Examples of websites for creating scholarly profile

Website	Uniform resource locator	Year launched	Main functionality	Users
ResearcherID	http://www.researcherid.com	2008	Issuing unique identifiers for authors	Any specialists
Google Scholar Citations	https://scholar.google.com/citations	2012	Aggregating links to publications visible on Google, tracking citations, navigating to co-authors' profiles	Any specialists
ORCID	https://orcid.org	2012	Issuing unique identifiers for author and contributor name disambiguation	Any specialists
Kudos	https://www.growkudos.com	2013	Sharing publications, explaining their importance, measuring their citation-based and alternative impact, and managing scholarly reputation	Any specialists
ScienceOpen	https://www.scienceopen.com	2013	Scholarly social networking, gold open-access publishing, and post-publication peer review	Any specialists
Publons	https://publons.com	2012	Crediting peer review and editorial contributions	Any specialists
arXiv	https://arxiv.org	1991	Repository of electronic preprints	Physicists, mathematicians, computer scientists
Ideas	https://ideas.repec.org	2013	A service of the RePEc database for creating profiles and sharing links to articles	Economists
ResearchGate	https://www.researchgate.net	2008	Scholarly social networking, discussing and sharing publications	Any specialists
Academia.edu	http://www.academia.edu	2008	Scholarly social networking, discussing and sharing publications	Any specialists (linguists and sociologists preferentially rely on this website)
Mendeley	http://www.mendeley.com	2008	Reference management	Any specialists
Zotero	http://www.zotero.com	2006	Reference management	Any specialists
CiteULike	http://www.citeulike.org	2004	Reference management	Any specialists
Wikipedia	https://en.wikipedia.org	2001	Showcasing achievements and awards of eminent scholars	Anyone

ORCID = Open Researcher and Contributor Identification, RePEc = Research Paper in Economics.

vanced profiling and aggregating scholarly information.

This article provides an overview of some of the established and emerging profiling platforms (Table 1).

PROFILING PLATFORMS

Scopus author identifiers

Scopus author identifiers are unique digital links to research performance of individual scholars in any academic discipline. Such identifiers are automatically generated when the authors get at least one Scopus-indexed item, allowing them to track and analyse their citation data, and particularly the h-index values, display professional keywords, affiliations, and links to their co-authors' profiles. Advanced tools are now available to navigate through authors' list of publications, analyse their annual publication activity, highly-cited items, target journals, names of co-authors, article types, and subject areas. Scopus profiles may also include the Open Researcher and Contributor Identification (ORCID), which are now searchable through a separate browsing window at the Scopus interface. Such information is available for free previews and can be processed for ranking authors in certain fields and evaluating their impact over time (7).

The recent integration of PlumX Metrics with Scopus has added a new direction to the online profiling by aggregating information on article-level metrics, such as usage (downloads, HTML views), captures (bookmarks), mentions (blog posts, e-comments, Wikipedia references), social media attention, and citation counts beyond Scopus (8). Comparisons with other altmetrics tools, such as ImpactStory, proved that PlumX has the most comprehensive coverage of social resonance of scholarly information (9). Subscribing institutions can now open individual accounts on the PlumX dashboard to comprehensively track their researchers' impact (10).

Although Scopus author identifiers are linked to records of the largest abstract and citation database, limited timeline of the contents coverage (mostly back to 1996) may distort profiles of scholars with longer academic career and higher citations of their initial works, which are not yet covered by this database. Scopus profiles may also contain technical mistakes due to the automatic processing of data and generating more than one identifier for the same author. Such a limitation can be overcome by regularly monitoring updates and merging two or more profiles at the request of the users.

ResearcherID

In contrast to Scopus, Web of Science does not automatically generate author identifiers, which is viewed by some as a limitation in terms of comprehensive evaluation of an individual's publication activity and related metrics (11). In 2008, Thomson Reuters launched ResearcherID as a multidisciplinary service, which was integrated with the Web of Science platform. The website was specifically designed to disambiguate authors by creating unique profiling web pages and showcasing individual scholars' publications and citations from Web of Science.

The authors with access to Web of Science can create the ResearcherID profile, present and regularly update their biographic notes and indexed articles, track citations and h-index values, provide links to their ORCID IDs, and find collaborators. Although this profiling system does not provide comprehensive coverage of all authors with Web of Science-indexed items, it is of-

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ten employed for distinguishing the most prolific and influential researchers globally (12).

Despite the fact that there are more than 270,000 registered IDs on Web of Science (13), their distribution is disproportionate across academic disciplines and countries, and quantitative comparisons with other profiling systems are not in favor of ResearcherID. In fact, an analysis of 4,307 Norwegian researchers' profiles revealed that ResearcherID was the least popular platform, with only 130 ID holders (3%) (14). The same study reported that there were 1,307 scholars with ResearchGate (30%) and 333 with Google Scholar (8%) profiles.

In contrast to the Scopus identification system, ResearcherID relies exclusively on the authors' self-identification (15), which may create inaccuracies and errors in their publication lists by aggregating non-indexed and other authors' Web of Science-indexed items. Finally, concerns have been raised that the ResearcherID platform, which was initially designed for individuals, is now abused and filled with numerous 'predatory' journal profiles. Such profiles are created to mislead the readership and claim that these journals are visible on Web of Science (16).

PubMed

PubMed does not issue unique author identifiers, but biomedical and allied specialists often rely on this free and rapidly updated platform for literature searches and evaluations of individual profiles linked to MEDLINE-indexed and PubMed Central-archived articles (17). It is rightly credited as the primary research tool for biomedical specialists (18).

The accuracy of profiling on PubMed depends on the use of correct author names and their affiliations. Manual corrections of the retrieved records are sometimes required (19).

The main advantage of the PubMed/MEDLINE profile is its integration with the Medical Subject Headings (MeSH) specialist keywords vocabulary and scientific prestige of the indexed items (17).

Importantly, a web server called Peer2ref is designed to pick expert reviewers and editors by evaluating profiles of authors with MEDLINE-indexed articles (20). More than 3,800 MEDLINE-indexed journals in the last ten years are searched through for the profiling. The programme automatically evaluates and disambiguates profiles by analysing authors' bibliographies, co-authors, and keywords in their MEDLINE abstracts.

An important recent development for name disambiguation in PubMed was its integration with ORCID, enabling the transfer of bibliographic records from PubMed Central to ORCID IDs (21).

Researchers who apply for or receive grants from the US National Institutes of Health can now create their Science Experts Network Curriculum Vitae (SciENcv) profile, which is a service of The National Center for Biotechnology Information (NCBI) (22). This service is available to all researchers who hold personal accounts at NCBI. The SciENcv service is also compliant with ORCID (23). It allows them to showcase their research and academic accomplishments, previous grants, awards, and bibliographies.

Google Scholar Citations

Google Scholar Citations was launched in 2012 as a free online platform, and was viewed by some as an alternative to other global citation-tracking services (24). It now functions as a basic tool for promoting authors from any scholarly discipline with at least one published item in an indexed journal, book, conference proceedings, and non-reviewed sources, which are tracked by Google. The authors with a few or no indexed articles, poorly visible on Scopus and Web of Science, and particularly those from the Social Sciences and Humanities, can benefit from managing their Google Scholar Citations profile. Such a profile is also useful for promoting early career researchers and preserving information about eminent and deceased scholars.

The author profiles can be filled with photographs, links to similar profiles of co-authors, manually added or retrieved from Google articles, books, dissertations, presentations, and any other published items. Citations to these items, which are processed for calculating the individuals' h-index, are also collected from a wide variety of automatically identifiable sources. Evidence from the field of information science suggests that article downloads and captures (bookmarkings) increase Google Scholar Citations (25).

The lack of filtering poor quality and irrelevant items and the absence of an organized thesaurus for systematizing searches are the main limitations of Google Scholar. The platform is not protected from manipulations and citation boosting by uploading apparently fake citing sources on the Internet (26). It is also filled with articles from numerous 'predatory' journals, polluting science and damaging reputation of Google Scholar as a reliable source for evaluating research performance (27). At the same time, attempts have been made to introduce validation tools for improving the reliability of the Google Scholar Citations profiles (28).

ResearchGate

ResearchGate is one of the largest social networking sites for researchers with more than 4.5 million registered users (29). It was launched in 2008 as a multidisciplinary hub of researchers, a platform for sharing articles and interacting with potential collaborators, and a scholarly discussion forum.

To create the profile page, a researcher should have at least one publication, which is identifiable by the system, or an email account from a recognized institution. Other tools have also been introduced to create verifiable profiles. The ResearchGate profiles incorporate photographs, keywords of professional interests, links to published articles, and other scholarly items. The

users can follow publication activity of other registered researchers, send online messages, discuss research issues, and get notifications when their articles are viewed, downloaded, or cited.

The website's functionality is similar to that of other profiling and social networking services, such as Academia.edu, Google Scholar, Facebook, and LinkedIn. However, ResearchGate is primarily designed for scholarly communication and data sharing between researchers, authors, and journal editors (30). It also stands out of numerous networking sites by archiving full-texts of pre-published and published items in line with the copyrights (31).

A study revealed that ResearchGate and Google Scholar cover almost the same scholarly items. However, early archiving of pre-published articles on ResearchGate increases their visibility and chances of getting cited (32). There is also evidence suggesting that readers who view articles on ResearchGate tend to cite them in their Scopus-indexed articles (33).

The platform tracks citations along with alternative metrics to calculate the ResearchGate Score, which is proved a reliable measure of individual research performance comparable to that of Scopus-based metrics (34).

Along with the advantages, ResearchGate has also limitations due to the lack of validation tools for preventing archiving of non-reviewed and 'predatory' items (32,35). Copyright violations are also common due to users' lack of awareness of the publishers' open archiving regulations. An analysis of randomly selected full-texts of 500 articles, which were posted on ResearchGate, demonstrated that only 108 (21.6%) of these items were from open access journals (36). The same study demonstrated that 201 (51.3%) of 392 non-open-access items were not eligible for posting on ResearchGate, and in most cases it was possible to avoid the copyright violations by repositing pre-published manuscripts instead of published PDF versions of articles. Finally, concerns have also been raised over the abuses of ResearchGate, leading to cyber-bulling and breaches of privacy (37).

Academia.edu

About 11 million users have accounts on Academia.edu (29). This website shares some features with ResearchGate (38). However, Academia.edu is more tailored to the academic needs. It generates personalized lists of recommended references for its users, saving time for related literature searches (39). Although Academia.edu is a multidisciplinary hub, one study found that linguists and sociologists keen to preferentially use this website for profiling in their field of professional interests (40). Based on an analysis of a sample of 31,216 articles, it was found that an article posted on Academia.edu attracts 69% more citations after 5 years than a comparable article not available online (41). Widely known limitations of this website are related to inappropriate use of its domain name (edu) and scarce tools for the quality scholarly communication.

ORCID

Researchers who wish to interact and cooperate with their colleagues worldwide, and especially those at early stages of their career, should correctly and consistently list their names in all publications. Creating a unique digital identifier is critically important for them and for authors with common, identical, and variably recorded names (42). Getting an ORCID identifier allows recording variably listed or common names under a unique digital link and overcoming the author name ambiguity.

Launched in 2012, the ORCID initiative is now the main multidisciplinary hub of researchers, authors, reviewers, mentors, and other academic contributors with permanent identifiers (43). The number of registered ORCID account holders has grown rapidly over the past 5 years and reached 3,742,608 (as of August 21, 2017). Many leading publishing houses, grant funding agencies, and libraries have endorsed this initiative and provided funding for its development (44).

The ORCID profiles can be filled with manually added or transferred from CrossRef, Scopus, ResearcherID (Web of Science), Europe PubMed Central, KoreaMed, and other online platforms records of published journal articles, book chapters, and dissertations. Unpublished scholarly works can also be presented on the users' profiles to share preliminary research data. Additionally, the account holders can populate their ORCID profiles with links to their presentations, datasets, images, video files on Figshare, and automatically feed their integrated profiles on ScienceOpen for promoting research and attracting post-publication comments (45-47). Finally, scholars with Publons accounts acquire a peer review section on their ORCID profiles to fill it with exported information about verified reviewer assignments (48).

The list of keywords and biographical sketches at the ORCID interface can be edited by the account holders to highlight their scope of professional interests and main achievements, which are required for grant applications, academic promotions, and research collaborations. The ORCID platform has also tools to secure privacy of the users.

Despite its advantages in terms of openness, increased visibility for early career researchers and experts from developing countries, improved management of grant applications and journal submissions, there are some limitations of the system. Approximately 20% of the registered ORCID accounts are now inactive (49). Some of the scholarly works listed on the users' profiles are poorly validated and apparently incorrect (44). Although enormous efforts have been made to cover a large number of researchers and contributors, roughly only 10% of the world's researchers are currently represented on the ORCID platform, their distribution across countries is not proportional, and not all research funding agencies and academic institutions mandate opening and maintaining ORCID IDs (50). Concerns have also been raised over the eventual monopolization of the scholarly communication through the digital identifiers (49).

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Publons

A more specialized approach to evaluating academic activities is offered by Publons, which is an increasingly reputable platform for peer reviewers. It was recently acquired by Clarivate Analytics, recognizing this platform as an essential tool for evaluating research performance (51). Publons also partners with the ScholarOne editorial management system to aid editors in evaluating potential reviewers (52).

This initiative was launched in 2013 to freely register and credit reviewer and editorial contributions, and rapidly became the only online platform for crediting reviewers and allowing them to claim publication activity by getting digital identifiers from CrossRef for the best reviewer comments (53).

Unique Publons identifiers are issued to all registered users, who may fill their profiles with photographs and biographic notes, list journals assigning them reviewer and editorial duties, integrate with their ORCID IDs and other academic profiles, and transfer their reviewer comments for open access with the publishers' permission (54). Publons supports all models of peer review, ranging from double-blind to post-publication review, and is compliant with their users' privacy requirements in terms of listing any reviewer and editorial assignments (55).

A recent study comparing research performance on Google Scholar and Publons demonstrated that the latter serves a unique purpose, allowing journal editors to pick the best reviewers for future services regardless of their author activities tracked by Google (56).

Publishers endorsing the initiative and allowing their reviewers to record related information on Publons increase not only the reviewers' but also their own visibility. This is why some non-Anglophone publishers have also joined the initiative and encouraged their contributors to showcase their reviewer and editorial accomplishments on Publons (57).

DIFFERENCES IN THE USE OF SCHOLARLY PROFILES

For comprehensive evaluation of any individual research profile, no single bibliographic database or scholarly networking platform is currently sufficient. In fact, empiric analyses of information scientists' profiles on Scopus, Web of Science, Google Scholar, ResearchGate, specialist databases, and social networking websites revealed that each of these services covered less than 50% of the authors' publication activity (58).

An analysis of 6,132 profiles on Google Scholar, Academia.edu, ResearchGate, and Mendeley demonstrated that specialists in the Social Sciences and Humanities mostly rely on Academia.edu while biologists prefer ResearchGate for scholarly networking (59). A survey of 296 faculty members of one of the major New York research and academic institutions pointed to a surprisingly low awareness of the author identifiers among them (n = 95, 32%), with physicists, biologists, and health scientists being relatively better informed than other specialists and mathematicians, who were least informed (60). The surveyed faculty members mostly used ORCID IDs (n = 49, 15%), followed by Scopus author ID (n = 29, 9%), ResearcherID (n = 25, 7%), and arXiv ID (n = 20, 6%).

The use of online profiles differs substantially across countries. Scholars from Brazil and India are well represented on ResearchGate while their Chinese, Russian, and Korean colleagues rarely use this platform for showcasing their publication activity and interacting with potential collaborators (37,61).

Functionalities and content coverage of scholarly networking and profiling websites also differ substantially. ResearchGate predominantly archives recent articles of the profile holders while historic papers remain poorly visible on this platform, and particularly in the Social Sciences, Arts and Humanities (62). A recent analysis of search, navigation, analytics, privacy, filtering, and other features of ResearchGate, Academia.edu, Mendeley, and Zotero proved that none of these services has advanced operational functions (63). The same study scored 'above average' and ranked first ResearchGate based on an analysis of its information retrieval and management functions.

PERSPECTIVES OF PROFILING INDIVIDUAL SCHOLARS

Online researcher and author profile is a recognized tool for self-promotion, scholarly networking, sharing publications, and making an impact (64,65). Global visibility of research output and availability of complementary platforms for aggregating massive volumes of scholarly items and tracking citations and alternative metrics add to the research management and ranking of scholars. Advanced searches through ResearchGate and Academia.edu are increasingly employed for systematic analyses of literature, and particularly in non-mainstream science countries (66-68).

Authors are now able to monitor daily interest of the global scientific community toward publications posted on their Google Scholar and ResearchGate profiles (69). Many other networking platforms are upgraded to accommodate digital profiles (resumes) for academic, research, or business purposes (70). All these developments suggest that profiling is there to stay.

Additionally, there are some national platforms, which are prioritized for profiling scholars in non-Anglophone countries (e.g., the Index Copernicus Scientists panel, the Science Index platform of the Russian Science Citation Index database). Although these websites promote publications of the account holders locally, their coverage and global visibility are still limited due to the language barrier and skewed impact metrics. The latter is a particularly big issue for the Index Copernicus database, which has been criticized for indexing numerous 'preda-

Table 2. Features of an optimal researcher and author profile

Feature
• Free, non-proprietary services compatible with the Open Access initiative
• Unique author identifiers
• User photographs and video materials
• Biographic notes, keywords, records of published items, peer reviewer activities, contributions at professional meetings, and other academic accomplishments
• Integration with multidisciplinary and specialist bibliographic databases
• Integration with social networking sites (Facebook, Twitter, LinkedIn)
• Archive of scholarly articles for Open Access
• Updates on citation-based and alternative metrics
• Validation tools for profiling, uploading quality articles, verifying copyrights, and filtering potentially damaging information
• Privacy tools for securing online profiling, commenting, and sharing messages

tory' journals and issuing questionable metrics (71).

New dimensions for profiling emerge to increase visibility and scholarly reputation of researchers at any stage of their career. The ScienceOpen platform with its unique model of profiling, open-access publishing, and post-publication commenting is a good example of the close relationship between online profiling and publishing (46). Kudos, a powerful toolkit for authors, is yet another innovative option for strengthening scholarly reputation and comprehensively measuring the impact of publications. This service is integrated with the Web of Science citation tracking and ScholarOne and Aries editorial management systems. Kudos allows sharing links to articles of the profile holders through social media and scholarly networks, thus increasing chances of their use (72). A recent study showed that authors discussing and sharing their articles via Kudos increase downloads of these items by 23% (73).

But advances in the digitization and social networking have also created challenges, which will prevail and grow in the coming years. Paradoxically, one of the pressing issues is the wide variety of online platforms offering diverse services for setting individual accounts. Not all researchers embrace the advantages of the available platforms and some of them question the quality and credibility of information provided on social networking channels (39). On the other hand, it is difficult for the individual researcher to discern the advantages and disadvantages of each platform, and continuing proliferation of such platforms is likely to make this problem even worse. There is a real risk that early career researchers aiming to enhance their profile and optimize their visibility may spend more time updating their profile in multiple networking platforms than continuing to be academically productive. Research and academic institutions, in turn, fail to incorporate relevant topics in the process of education and make online profiling mandatory. In the wake of proliferation of profiling platforms, ORCID is perhaps the only universal option which can become mandatory for early career researchers and senior scholars alike.

Research managers, journal editors, and publishers are in their position to make the use of reliable profiling platforms mandatory for ranking scholars. Given the preferential use of some websites for profiling authors in certain disciplines (e.g., PubMed for medicine, Academia.edu for social sciences and humanities), a combined approach can be viewed as an optimal solution (Table 2).

With the increasing use of various online tools for research, it is likely that new complementary profiling platforms will be offered and established ones will be upgraded to meet the growing needs of interdisciplinary research and scholarly publishing. It is much desirable to strengthen the complementarity ("cross-talk") of profiling platforms so that one could easily update, secure, validate, and populate each of them with information from a single source.

DISCLOSURE

The authors have no potential conflicts of interest to disclose. The views and opinions expressed in this article are those of the authors and do not necessarily reflect the official policy or position of any institution.

AUTHOR CONTRIBUTION

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