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Making an impact: an innovative solution to strengthen strategic publishing decisions

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Research impact is at the heart of institutional performance and reputation and is increasingly gaining prominence in academic library services. University of Wollongong (UOW) Library implemented a Research Impact Analysis Service (RIAS) in 2011 to help researchers, research centres and the University strengthen their impact by providing detailed, strategic reports based on citations analysis drawn from numerous datasets. As demand intensified, consideration needed to be given to issues of scalability and capacity to sustain and grow the service. An opportunity for collaboration arose, connecting the Library's business need with the software development skills of JoindUp, a local start-up company under the umbrella of UOW's iAccelerate business incubator program. The vision: to introduce efficiencies and innovation in the production of our Journal Impact Reports. The project brief: develop an application that draws journal metrics together to empower academics in their strategic publishing decisions. The Library's foray into innovative product development had begun. A project team was established to drive this opportunity forward. Key requirements were outlined in terms of data elements, data sources and functionality. These criteria were based on data points from our existing Journal Impact Reports in response to researchers' articulated needs. The product development process also offered the opportunity to introduce new service elements to provide synergy with UOW's Research Active and Open Access policies. A prototype of the app was developed and extensive User Acceptance Testing took place to address data integrity and functionality issues. The Publish for Impact app has been released and allows researchers to access a range of journal indicators in a user-friendly interface, providing simple, yet efficient comparison of relevant titles. A year on, we will evaluate the success of the project and explore the tangible outcomes the release of Publish For Impact has delivered to the Library business need and the strategic benefits it has brought to the academic community. The Publish for Impact app has demonstrated the capability of academic libraries to embrace the development of new technologies to bring strategic benefits and add value to Library services. The result is a product that introduces workload efficiencies and flexibility and provides a leading edge resource enabling academics to make informed decisions when choosing where to publish.

Keywords

uowlibrary, impact, innovative, solution, making, strengthen, decisions, strategic, publishing

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Research impact is at the heart of institutional performance and reputation and is increasingly gaining prominence in academic library services. The University of Wollongong (UOW) Library implemented a Research Impact Analysis Service (RIAS) in 2011 to help researchers, research centres and the University strengthen their impact by providing detailed, strategic reports based on citations analysis drawn from numerous datasets. As demand intensified, consideration needed to be given to issues of scalability and capacity to sustain and grow the service. An opportunity for collaboration arose, connecting the Library's business need with the software development skills of JoindUp, a local start-up company under the umbrella of UOW's iAccelerate business incubator program. The vision: *to introduce efficiencies and innovation in the production of our Journal Impact Reports*. The project brief: *develop an application that draws journal metrics together to empower academics in their strategic publishing decisions*. The Library's foray into innovative product development had begun.

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The Publish for Impact app has demonstrated the capability of academic libraries to embrace the development of new technologies to bring strategic benefits and add value to Library services. The result is a product that introduces workload efficiencies and flexibility and provides a leading edge resource enabling academics to make informed decisions when choosing where to publish.

This paper will explore the capacity of academic librarians to participate in creating an app which brings together key journal information in a user-friendly interface that assists academics with maximising their research impact.

Keywords: Library and information science (LIS), research impact, journal ranking, scholarly publishing, university libraries

Introduction

The higher education landscape is continually changing and there is ever-increasing pressure on governments, institutions and researchers to provide evidence of research impact. Knowing how to publish strategically is critical to the success of not only the researcher themselves in terms of career and funding opportunities, but of the institution as a whole, where global university rankings and national research assessment exercises such as Excellence in Research for Australia (ERA) measure research performance. The scholarly communication landscape can be a difficult one to navigate due to the sheer magnitude of titles published, the advent of Open Access and the emergence of predatory publishers. Libraries have seized the opportunity to combine their knowledge of bibliographic databases and scholarly publishing practices with their service development skills to provide support to the academic community, guiding them to identify quality publication outlets suitable for their needs.

University of Wollongong (UOW) Library's Research Impact Analysis Service (RIAS) was introduced in 2011 to support researchers in substantiating their impact through analysis of publications and citations. One of the primary service elements is the Journal Impact Report (JIR) designed to assist researchers in identifying quality journals in which to target their research. As demand for these reports grew, UOW Library sought innovative solutions to address the need for service sustainability and introduce workload efficiencies into practice. Collaboration with Joindup, a start-up company established under UOW's business incubator program iAccelerate, has propelled UOW

Library on a product development journey, eventuating in the creation of the 'Publish for Impact' (PFI) application. This innovative PFI solution is an amalgamation of software development skills and Library expertise in navigating the complex scholarly publishing environment. The result is a simple, easy-to-use interface that can quickly and efficiently extract journal metrics from a range of sources to help empower researchers in their publication decisions. This paper will outline the higher education environment and scholarly communication landscape in general then focus on institutional context before describing UOW Library's journey in developing an innovative solution to address researcher needs, thus transforming engagement with information and enabling informed publication choice.

Higher education context

The tertiary education sector is a highly competitive environment where the race to attract students, researchers and funding is hotly contested. Global university rankings exert a strong influence regarding institutional research reputation as a mechanism for assessing and comparing research quality. Simplistically, they provide a proxy indicator, a seemingly objective and quantifiable measure of research performance, using bibliometric indicators based on publication and citation analysis. While a number of papers have indicated methodological flaws (Marginson 2007; Steele, Butler and Kingsley 2006), rankings continue to have enormous currency and influence, especially in the absence of a perfect measure, giving rise to the 'publish or perish' mantra to stimulate research productivity and output and thus enhance research reputation. (Linton, Tierney and Walsh 2011). This, in turn, places

pressure on researchers, not only to publish but to choose high-impact outlets.

At a national level, research assessment exercises such as Excellence in Research for Australia (ERA) have been established to evaluate research performance and show return on investment of publicly funded research. Given that the underlying methodology is based on publication and citation analysis, the presence of these frameworks has no doubt influenced researcher behaviour, especially with regard to their publication practices, distorting motivations behind publishing and driving them to particular journal outlets. It is not the purpose of this paper to discuss perceived flaws in this methodology as argued elsewhere (Smith, Crookes and Crookes 2013) but rather to focus on its impact on researchers' support needs in identifying where to publish.

Scholarly communication landscape

The scale of journal publishing has seen extraordinary increases. According to the STM Report, in 2014 there were over 28,000 active scholarly journals, based on peer-reviewed and English language titles alone. As well as the large number of existing journals, the growth rate is posited as 3.5% additional titles per year. The publishing landscape has been transformed with the emergence of web publishing and open access which allows researchers to communicate their ideas more freely and easily. The rise of green and gold open access models provide further publication options for authors and the Australasian Open Access Strategy Group (AOASG) sets out the differences

between these models on their website. In addition, requirements from funding bodies such as Australian Research Council (ARC) and National Health and Medical Research Council (NHMRC) outline the need for freely available access to outputs derived from their research funding within a year of publication.

With increased pressure to publish, we have also seen the emergence of predatory publishing, disreputable publishers who primarily prey on less-experienced researchers, lured by the promise of quick publication. They offer seemingly legitimate publishing outlets that end up lacking scholarly rigour, and charge article-processing fees for the privilege.

A number of papers have further outlined the details of these practices (Moher and Srivastava 2015; Zhao 2014), suggesting that early career researchers are especially susceptible to these approaches, driven by the 'publish or perish' imperative that underpins academic promotion systems. Now, more than ever, "elevated publication expectations are a core part of this new landscape and there is no reversal in sight" (Bartkowski, Deem and Ellison 2015, p.114).

Jeffrey Beall has established a website to help identify these unethical publishers more easily, listing titles and publishers as well as outlining journal selection criteria for consideration, advocating the increasing need for "scholarly publishing literacy" (Beall 2012). It is not enough for researchers to just be experts in their discipline, it is important that they are aware of the various facets of the scholarly communication environment and understand its

complexity so that they can make informed choices and feel empowered to make the right decision when it comes to where their research is published. When so much time and effort is invested in the production of a research paper, it is critical that the research is disseminated through quality vehicles. A number of frameworks have been proposed to guide researchers through this maze. (Klingner, Scanlon and Pressley 2005; Walters 2016; West and Rich 2012). They articulate various factors for consideration when choosing where to publish, not only impact factor but also peer-reviewed status, indexing in reputable databases, publication frequency, acceptance rate and review time. West and Rich advocate that “no single metric should be used in isolation, but rather ought to be used in connection with other metrics to give a more holistic understanding...” (West and Rich 2012 p.364)

Institutional drivers

University of Wollongong (UOW) is not immune to influences operating in the broader higher education context, nor changes occurring in the scholarly communication environment. In 2011, the incoming Vice Chancellor Professor Paul Wellings set the aspirational objective of placing UOW in the top 1% of universities worldwide, measured by global institutional rankings such as those compiled by Quacquarelli Symonds (QS), Times Higher Education (THE) and Shanghai Jiao Tong University, a target which still remains in place and drives the agenda to increase research productivity and performance. Both policy and practice have been transformed by this strategic objective. UOW's Research Active Policy was introduced in 2013 to outline minimum research requirements expected of staff, with a focus on productivity and

quality of output. This has helped shape changes in the academic community's publishing behaviours as even disciplines whose research outputs have been conference-focussed are increasingly interested in quality journal publication. As Bartkowski et al suggest, "articles in peer-reviewed journals are the primary currency" (Bartkowski, Deem and Ellison 2015 p.102).

In addition, UOW's Open Access Policy released in 2014 reflects the changes occurring in the scholarly communication landscape, emphasising the importance of making research discoverable through open access in general and UOW's institutional repository Research Online in particular. Finally, shifts in UOW's research culture towards multidisciplinary and interdisciplinary research have also impacted on publishing literacy needs, with researchers seeking guidance in identifying relevant quality journals outside of their primary discipline area.

UOW Library and bibliometric services

The coalescence of higher education context, scholarly communication transformations and changes to institutional drivers as articulated above prompted a strategic realignment of UOW Library's research support services to match emerging needs. In 2011, the Research Impact Analysis Service (RIAS) was launched, providing publication and citation analysis reports to maximise the impact of research. It leveraged Library expertise both in harvesting database intelligence and in knowledge of scholarly communication practices, a suitable fit whose various merits have been widely

discussed in terms of Library provision of bibliometrics services (Bladek 2014; Corral, Kennan and Afzal 2013; Drummond 2014; Kennan, Corral and Afzal 2014; Zhao 2014). Increasingly, libraries are reframing themselves in response to external drivers such as national research impact assessments and institutional objectives, with the need to add value in the current scholarly landscape.

Chief among the RIAS service offerings is the Journal Impact Report (JIR) that identifies publication outlets tailored to the academic's topic area. It is designed to give comparative journal metrics data for a range of titles, across multiple parameters to help inform scholarly publishing decisions faced by many researchers. Drummond provides insight into the need for services supporting strategic publication choice. Researchers often lack a plan when making publication decisions, resulting in reduced confidence in choice of suitable journals (Drummond 2014).

Increased appetite for Journal Impact Reports saw demand across the research community rise, prompting questions of scalability and sustainability. By 2014, over 150 Journal Impact Reports were produced on average per year, with each report taking more than an hour to complete. UOW Library introduced systems to interrogate multiple journal data sources efficiently and effectively which was key in further reducing the time taken to put the data together, however additional workload efficiencies were sought to maximise capacity.

Development of 'Publish for Impact'

'Publish for Impact' is an app that draws together key journal information to assist researchers in their strategic publishing decisions. The genesis of this innovative solution originated from the confluence of software concept and UOW Library's business need for process improvement stemming from the time-consuming collation of Journal Impact Reports. The opportunity to partner with a software development start-up company presented itself at a showcase of UOW's 'iAccelerate' business incubator program. The Joindup enterprise demonstrated their application software which integrated multiple datasets and presented query results quickly and efficiently. The application's capability to interrogate various data sources with great speed marked it as a potentially valuable solution to Journal Impact Report production issues. Additional benefits were seen in its ability to present information in a user-friendly IOS interface, making data easily accessible to time-pressured researchers.

In March 2014, a core project team comprising Joindup and Library staff was established and the creative partnership commenced. The initial brief was to collaborate on a design that would reflect the data, layout and functionality of the existing Journal impact Reports. Scoping was conducted to outline requirements of the product, as well as identify the various data sources to be incorporated. Once the product requirements, data sources and output designs were provided to Joindup, they developed a prototype in close consultation with key Library staff and delivered it in mid-2014 for initial testing.

The basis of the application is a master journal list comprised of over 30,000 titles derived from the ERA journal list as well as active titles from Web of Science and Scopus as identified in their source lists. The software underpinning the application provides a filtering capability which allows this large dataset to be filtered to more relevant and manageable results. Filters were designed to match titles on various criteria such as ERA Field of Research (FoR) codes, Journal Citation Reports data including categories and quartile rankings, SCImago Journal Rankings categories and quartile rankings, Australian Business Deans Council (ABDC) rankings, and open access archiving status as derived from SHERPA/ROMEEO.

As well as filtering on these broad categories, the app includes a Title search so that users can find specific titles. In addition to built-in filters, a keyword search capability was introduced to extract relevant journal titles and associated data based on subject or topic keywords. A Scopus API is used to retrieve journal titles based on relevance and citation count. This powerful search capability is a key feature that sets this innovative product apart, providing a level of customisation where results can be specifically tailored to a researcher's topics of interest, rather than relying on prescribed journal list subject category schema.

The unique power of the app lies in its ability to retrieve lists of journal titles that match on various combinations of filtering criteria, not restricted to only matching within an individual data source. Figure 1 shows Publish for Impact's capability to mesh disparate data points to provide a robust and relevant

selection of titles. In this example, a shortlist of journal titles has been compiled by choosing FoR Code 0102 Applied Mathematics and further filtered to top high-impact journals in JCR. Similarly, the 'Match Any' functionality allows retrieval of titles from similar subject categories but belonging to different subject schema, in order to cast a wider net e.g. titles from FoR category Education or JCR Category Education.

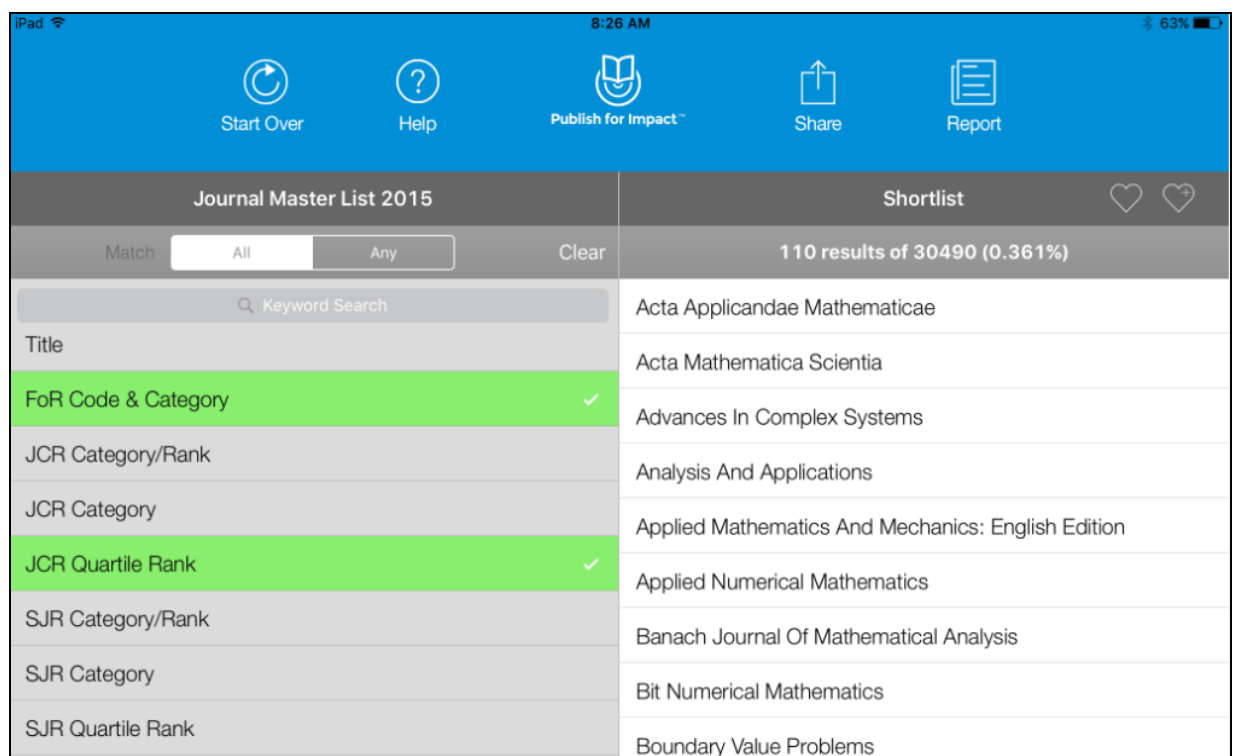


Figure 1. List of journals for Field of Research (FoR) code 0102 Applied Mathematics that also belong to top quartile Impact Factor ranking in Journal Citation Reports (JCR)

Once titles are retrieved, results are displayed on screen, providing key information for each journal as shown in Figure 2.

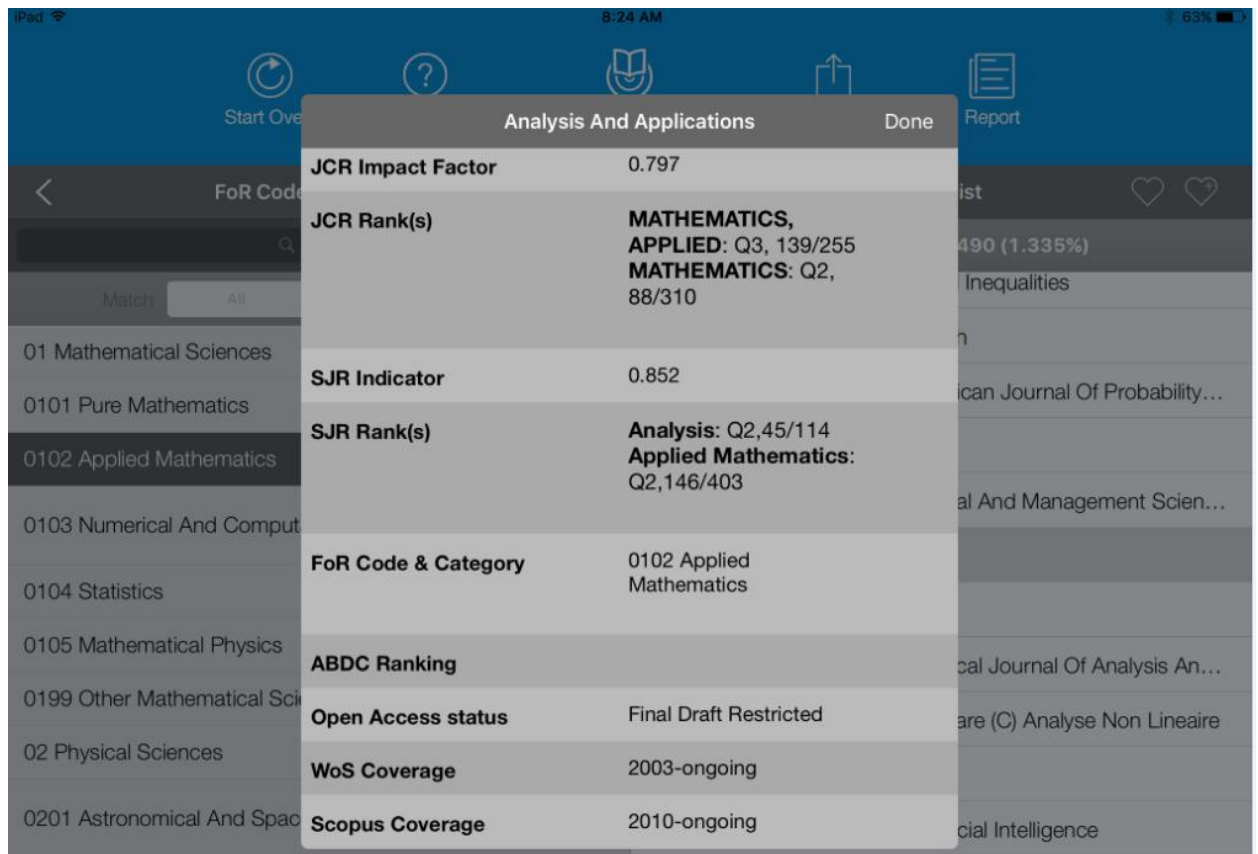



Figure 2. Detail of individual journal title record

A comparative report can also be generated, listing the shortlisted titles and their associated metrics (see Figure 3). Shortlist results can be saved for later retrieval and are shareable by email.


Publish for Impact™

Impact Report

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Title	JCR Impact Factor	JCR Rank(s)	SJR Indicator	SJR Rank(s)	ABDC Ranking	Acceptance Rate	Time to review	Present on ERA 2012	WoS Coverage
 Nexus Network Journal	0.143	HISTORY & PHILOSOPHY OF SCIENCE: Q4, 56/59	0.218	Architecture: Q2,22/83 Mathematics (miscellaneous): Q4,275/357 Visual Arts and Performing Arts: Q1,38/388		N/A	N/A	Yes	2008-ongoing
 Pure And Applied Mathematics Quarterly	0.175	MATHEMATICS, APPLIED: Q4, 255/255 MATHEMATICS: Q4, 308/310	0.648	Mathematics (miscellaneous): Q2, 129/357		N/A	N/A	Yes	2005-2013
 Studies In Nonlinear Dynamics And Econometrics	0.185	ECONOMICS: Q4, 305/333 SOCIAL SCIENCES, MATHEMATICAL METHODS: Q4, 46/46	0.217	Analysis: Q4, 103/114 Economics and Econometrics: Q3, 378/534 Social Sciences (miscellaneous): Q3, 230/400	A	21%	2-3 Months	Yes	1997-ongoing
 Indian Journal Of Pure And Applied Mathematics	0.224	MATHEMATICS: Q4, 299/310	0.173	Applied Mathematics: Q4, 366/403 Mathematics (miscellaneous): Q4, 299/357		N/A	N/A	Yes	1980-ongoing

Figure 3. example of report output

After delivery of the initial prototype in 2014, further testing revealed data integrity issues that needed to be resolved before the product was launched to the academic community. These issues stemmed from problems in reconciling title and ISSN variants for journals and led to the development of a more comprehensive journal master list to facilitate data integration. By June 2015, the Publish for Impact application was delivered to UOW Library for extensive User Acceptance Testing. As a phased approach, the application has initially been used by UOW Library's Liaison Services staff, in producing Journal Impact Reports on behalf of academics or in mediating use of the app by researchers. This allows for further field testing of the application as well as providing necessary contextual advice to help inform researchers of suitable publication outlets.

Initial response to the Publish for Impact solution has been very favourable, from Library staff as well as researchers. There was a significant 'wow!' moment when it was demonstrated to Library staff, in recognition of the speed at which various data points could be quickly and easily integrated, identifying journals for comparative assessment in publishing suitability. The application has also been demonstrated to a number of academics and research students and they have been similarly impressed, eagerly anticipating its wider release to the academic community hopefully later this year. Similarly, Joindup have been fielding queries from universities worldwide who are interested in the product.

The values and benefits of 'Publish for Impact' are many. The application has successfully fulfilled the primary objective of process efficiency, reducing the retrieval of multi-sourced journal data to minutes rather than hours. There are also strategic benefits in making this information quickly and easily accessible to time-pressured researchers, guiding them towards quality journal outlets and empowering them in their publication decisions by providing a spectrum of data by which to evaluate. In addition, 'Publish for Impact' situates journal data in the specific institutional context of UOW's 'Open Access' and 'Research Active' policies by including manuscript self-archiving information from SHERPA/ROMEIO and facilitating identification of titles indexed in Scopus and Web of Science. Lastly, the opportunity to collaborate with a start-up company has been enormously valuable in experiencing the product innovation journey and seeing an embryonic idea come to fruition. Libraries can benefit from methods employed by start-ups when developing innovative

services, becoming more agile and less risk-averse. (Bieraugel 2015). UOW Library fosters a culture of innovation and collaboration which has seen the development of this successful and creative product.

Conclusion

Changes in the higher education landscape and scholarly communication environment have seen researchers face enormous pressure to increase research productivity and demonstrate impact through publication in quality journals. It is evident that guidance and support is necessary to help navigate the scholarly publishing process and avoid pitfalls such as predatory publishers. More and more, academic libraries are leveraging their expertise to establish services that support these emerging needs and demonstrate value in the research context. University of Wollongong (UOW) Library's Research Impact Analysis Service is one such example. As the service has matured, issues of sustainability and scalability have arisen as demand grows. In seeking innovative solutions in process efficiency, an opportunity materialised to collaborate with Joindup, a UOW-affiliated start-up company. The result is the development of the 'Publish for Impact' app which provides powerful search and filter capability to drill down through large volumes of journal data and easily identify relevant quality publication outlets for consideration. This leading edge resource has made a significant impact, not only demonstrating alignment with institutional strategic objectives but alignment with UOW Library's business needs and values, transforming delivery of service and making complex information accessible.

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