Research Consulting

Defining and Prototyping an Open Access Dashboard

"Defining and Prototyping an Open Access Dashboard"

A report commissioned by:

Jisc

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Executive Summary

Introduction

- **Why develop an OA Dashboard?** Higher education institutions have access to a vast amount of information on their OA outputs, from Jisc services and other sources. However, this information is held in different systems, which are often incompatible with one another. This presents an opportunity for Jisc to support them by creating a dashboard to combine and visualise data in an easy-to-understand way. The rationale for this would be to improve institutional workflows by providing easier access to information on OA.
- **We followed a three-step approach to scope the creation of an OA dashboard:** We analysed five alternative dashboard options, created a prototype for one of these, and considered the business case for further development. The project was split into three phases:
    - Phase 1 involved the definition and prioritisation of a series of use cases, based on inputs from (i) a workshop with representatives of UK institutions and (ii) additional stakeholder interviews.
    - Phase 2 focused on the development of a prototype of Dashboard A and its testing by institutional users through online demonstrations.
    - Phase 3 investigated the business case for further development of the dashboard prototype, taking account of feedback from institutions and research funders.

Phase 1 - User requirements of a Jisc OA dashboard

- **An exploratory study led to the development of five possible dashboards/use cases along with possible data sources:**
    - **Dashboard A)** Informing OA policy effects by monitoring the authors' uptake of OA options
    - **Dashboard B)** Informing Green and Gold OA policy effectiveness by monitoring the usage, citations, and altmetrics of OA articles in comparison with non-OA articles.
    - **Dashboard C)** Informing article publication charge (APC) financial implications and offsetting deals
    - **Dashboard D)** Reporting on/accounting for OA policy compliance
    - **Dashboard E)** Repository management by combining institutional repository statistics, subject repository statistics and cost information on running the repository.
- **Input from institutional representatives helped us select two preferred dashboards/use cases:** Discussing the possible use cases with institutional representatives led to the prioritisation of Dashboard A (monitoring OA articles) and Dashboard B (effectiveness of OA policy).

Phase 2 - Technical features of a dashboard prototype and user testing

- **Constraints in the data sources led to the disqualification of Dashboard B:** When looking at the data needed for Dashboards A and B, it became clear that Dashboard B depends on the information gathered for Dashboard A. However, Dashboard B also relies on a further set of data sources, which previous work (as part of the Library Data Labs project) indicates are very difficult to combine. In consequence phase 2 involved work on a prototype of Dashboard A only.

- **Three data sources were selected to build a Dashboard A prototype:** Although no options were ideal for this purpose, we chose Crossref, oaDOI, and Sherpa/RoMEO to obtain data on the universe of publications, licence information and OA status, and publishers' policies on copyright and self-archiving, respectively.

- **Important issues in the data sources were highlighted:** Our investigation showed that delivering both Dashboards A and B would require significant effort, with the need to obtain and normalise a large amount of information. Other key issues identified included:
  - The 'universe of publications' for UK HEIs is very difficult to source from open data sources, which affects the completeness of the dashboard.
  - None of the data sources selected were fully fit for use in a dashboard, due to intrinsic limitations. These arose from issues with their APIs, incompleteness of the information provided, and data quality.

- **Other limitations in data models and UX design arose:** A custom data model was created to support the prototype as no data model within existing services fully addressed the requirements. The use of Tableau as the visualisation software proved challenging, as this does not offer responsive design. The use of more flexible web technologies, such as HTML, CSS, or JavaScript, might be more effective and ensure compliance with Jisc UX guidelines.

- **Prospective institutional users appreciated the Dashboard A prototype but highlighted possible issues with data:** While the dashboard prototype was seen as attractive and intuitive, concerns were raised over data quality and coverage. Profiling against other institutions was considered the most important feature of the prototype, followed by the availability of DOIs and the chance to measure the citation advantage of OA.

Phase 3 - Business case development

- **We asked stakeholders to identify the value proposition of the Dashboard prototype:** The most valuable use cases highlighted were support with monitoring REF compliance, profiling against other institutions, and identifying items which 'could have been green OA'.

- **Interviewees struggled to quantify the dashboard's contributions to streamlining workflows:** Institutional users noted that the data shown in the Dashboard A prototype provide additional insights rather than replacing existing activities, thus, they felt that time savings would likely be limited.

- **Building the foundations for a business case proved challenging:** In addition to the limited efficiency added to institutional workflows highlighted above, the following observations were raised:

- o Data would need to be more comprehensive and should be more robust, which indicates that proprietary sources might be required.
- o Usage of the dashboard would likely be ad-hoc, rather than regular.
- o The dashboard has limited value as a standalone service and could be better marketed if it were embedded with other Jisc services.
- o Funders have existing mechanisms to obtain some of the information presented in the prototype dashboard, and are pursuing other developments (e.g. via EuropePMC, Researchfish) to address known gaps.

Conclusions and recommendations

- **We reached the conclusion that a full business case cannot be built at this time:** The strength of the available evidence is, on average, low, and does not enable a strong case for further investment to be made.
- **Although there is a gap in terms of analysing data on OA, open data sources are not mature enough to power a dashboard:** Institutions wish to have better data on OA and its benefits, however, a dashboard with the features discussed in this report would not provide robust enough evidence. The low quality and maturity of existing data sources is likely to undermine the validity of dashboard outputs.
- **Evidence indicates that an OA dashboard should not be pursued at the present time. We recommend that this is put on hold and re-evaluated in the future. Meanwhile, Jisc could seek to improve the quality and availability of data sources to enable future efforts, by:**
  - o Developing a comprehensive, open-source record of UK HEIs' publication output;
  - o Ensuring that the terms and conditions for existing Jisc services permit re-use of relevant data in future services;
  - o Promoting greater uptake of institutional identifiers within key data sources;
  - o Continuing its support for ORCID;
  - o Improving internal consistency of Jisc data sources;
  - o Extending the Research Data Shared Service (RDSS) data model to include a Resource Type profile for a journal article; and
  - o Rebuilding the data model and API for SHERPA services.

Contents

1. Introduction

1.1   Background

Higher Education Institutions (HEIs) manage a wealth of data about their open access (OA) outputs at each stage of publication and this is partially supported by a range of Jisc services, including Sherpa, Monitor UK and Monitor Local, Publications Router, CORE, IRUS-UK and RIOXX. However, it is difficult to fully understand and leverage this information, as it is stored across disconnected systems, each with different baselines and scope.

An OA dashboard would address this by drawing from the above systems, and other sources, to present and visualise data in an easy-to-understand way. A Jisc OA dashboard could, potentially:

- Help HEIs ensure they comply with REF and other funders' OA policies
- Support research funders with the modelling of the transition to OA
- Improve advocacy efforts and encourage the uptake of OA, as it would provide a national picture of the OA economy and penetration
- Create intelligence on trends and developments to inform negotiations and the development of future services (or the refinement of existing ones).

The present report is the final output of this project (Phase 3 report), which summarises our efforts to (i) define the requirements of a possible Jisc OA dashboard, (ii) develop the dashboard, and (iii) investigate the market's appetite for such a solution.

1.2   Terms of Reference

The goals of this project were to assess the feasibility of an OA dashboard and to deliver the following:

1. A report, providing the evidence and information needed to build a full business case (if the dashboard is deemed viable)
2. Technical prototypes.

It should be noted that we did not find sufficient, robust evidence to build a full business case. The challenges encountered are summarised in this document and were further explored in our Phase 2 interim report, previously supplied to Jisc. This interim report, together with our technical prototypes and the related data, data model, algorithms, and user interface were handed over to Jisc and are currently not available for public use.

1.3   Methodology

The feasibility of a Jisc OA dashboard was assessed through three consecutive phases:

- **Phase 1:** Dashboard options were created and use cases prioritised based on feedback from prospective users and other stakeholders in the OA environment. Feedback was sought via workshops and telephone interviews. These led to the selection of two dashboard options for consideration in Phase 2.

- **Phase 2:** The technical feasibility of two dashboard options was studied, leading to the exclusion of one of these due to issues with data sources and the limited timeframe for this study. The creation of the remaining dashboard option was pursued and the required data model and user interface were created. Relevant challenges were identified and recommendations were made for future work.
- **Phase 3:** The information gathered through the previous phases of the project was summarised to provide insights for future work on a Jisc OA dashboard. Feedback on the dashboard prototype was sought via online demonstrations, a Jisc OA Community Workshop (held on July 18th, 2017 in Birmingham) and a brief demonstration to funder representatives (held July 2nd, 2017 in London). Comments on the strengths and weaknesses of the system built in Phase 2 were gathered and coded. Institutional stakeholders and prospective users were interviewed to seek information on the appetite for such a dashboard and provide insights on a possible business case.

Further details on the methodology followed in Phases 1 and 2 are available in the interim reports we delivered to Jisc throughout the project. These interim outputs were prepared solely for internal use by Jisc, and so have not been made publicly available.

1.4   Limitations of the study

This scoping study assessed the feasibility of a Jisc OA dashboard starting from a set of five options and use cases. Initial feedback was gathered through a workshop involving a limited number of stakeholders chosen on a voluntary basis. Thus, it is possible that other use cases might have arisen or that different priorities could have been identified with a different sample. Furthermore, insights on the dashboard prototype created were sought in a similar way (voluntary participation), which might have skewed our conclusion towards the point of view of the stakeholders interviewed.

While all efforts were made to follow the recommendations of the stakeholders we consulted, technical challenges limited the choice of use cases, and ultimately, of the dashboard prototype that was created. We note that the prototype built and tested through demonstrations included a limited dataset of articles and HEIs and is not representative of the UK as a whole.

Finally, it was not possible to build a strong business case for a Jisc OA dashboard. HEIs were not able to estimate time and efficiency savings of the dashboard prototype they were shown, due in part to limitations in the available data sources. A dashboard could provide additional information to HEIs (as opposed to providing information they already have and need, with reduced effort), but HEI representatives found it difficult to ascribe a value to this information. While these qualitative insights are sufficient to provide guidance for future developments, they cannot form the basis of a definitive business case.

1.5   Report structure

This report is divided into three main parts:

- **Part A: User requirements and technical features of a Jisc OA dashboard**, including the scoping of dashboard options and use cases (Section 2).

- **Part B: Technical features of a dashboard prototype and user testing**, discussing the creation of a dashboard prototype (Section 3) and the findings of the user feedback gathering process (Section 4).
- **Part C: Business case development**, discussing the implications of the user feedback gathered for the creation of a business case (Section 5).

1.6 Acknowledgements

We would like to thank Jisc, and particularly Sarah Fahmy and Katie Shamash for their support throughout this project, as well as the stakeholders listed in Appendix A (see Tables A1, A2, A3, and A4) for their inputs and insight.

Part A: User requirements of a Jisc OA dashboard

2. Requirements and use cases

During Phase 1 of the project, we explored possible dashboard options with prospective users and other stakeholders in the field of OA. Based on the feedback received on a series of use cases, we identified two dashboard options for development in Phase 2. In addition, we highlight possible competitors for a Jisc OA dashboard.

2.1 Phase 1 of the project

The first phase of this project aimed to:

- Explore existing OA dashboards (see Annex 1)
- Develop a selection of five options and related use cases for the Jisc Dashboard (see Table 1 for a summary and Annex 2 for full details)
- Select dashboard options and features for development in the subsequent phases of the project through workshops and interviews with institutional representatives.

The dashboard options developed as a result of the above process, and the related use cases, are summarised in our Phase 1 report delivered as an interim output of this project.

Table 1 Dashboard options developed, with use cases and possible indicators.

Possible Dashboard	Use Case(s)	Sample Indicators
A. Informing OA policy effects	Authors' take-up of OA options	• % Green OA articles • % Pure Gold OA articles • % Hybrid Gold OA articles
B. Informing Green and Gold OA policy effectiveness	Usage of OA and non-OA articles Citations and altmetrics of OA and non-OA articles	• # downloads articles in repositories in comparison with publishers' platforms • Average citation rate of APC OA Gold articles
C. Informing APC financial implications and offsetting deals	Financial sustainability of OA approaches Budgeting and financial management	• £ Average price APC OA Gold journals • % articles with APC compensated by APC-fund(s) • % articles with APC compensated by author discretionary funds
D. Reporting of/accounting for OA policy compliance	Level of compliance with funder policies from Research Councils UK (RCUK), the Charities Open	• Overall % compliance with RCUK policy

		Access Fund (COAF) and the Open Access Policy for the Research Excellence Framework (REF)	• % compliance with REF • % of articles subject to exceptions under REF
E.	**Repository management**	Institutional repository statistics Statistics of Subject repositories with Green OA articles by institutional authors Efficiency and automation	• # OA fulltext research output in institutional repository • # OA fulltext research output in subject repositories • £ cost of running repository

2.2   The choice of Dashboards A and B

During Phase 1 of the project, we discussed the dashboard options prepared with a number of stakeholders (see Table A1 Appendix A). These highlighted the advantages and drawbacks of each of them, leading us to the selection of Dashboards A and B for the reasons highlighted in Table 2. A series of user stories related to these dashboard options are available in Appendix B.

Table 2 Possible advantages of the chosen dashboards.[a]

Dashboard A - Informing OA policy effects	Dashboard B - Informing Green and Gold OA policy effectiveness
• It could position Jisc as an authoritative source on OA	• It would serve multiple purposes and multiple audiences:
• It could help institutions to identify OA articles that are currently 'not counted' in their own repositories	Academics: it would show the benefits of Green and Gold OA in terms of additional citations, additional downloads (also outside the academic world) and additional altmetrics (which serves as a way to indicate societal impact)
• It would link up with Sherpa data to identify non-OA articles that have been published in hybrid or subscription only journals that allow Green OA	Libraries: it would assist with advocacy efforts, help with cost/benefit analysis, and support negotiations with publishers
• It could identify those non-OA articles that have been published in journals that do not allow the Green route	Funders: the data would be very helpful in formulating and evaluating funders' OA policies
• It could assist compliance reporting by the individual institutions	
• It would highlight trends over time	

[a] For an in-depth discussion of the information found in this table, please see our Phase 1 report.

Based on our consultation, we note the following additional observations supporting either Dashboard A or B:

- **A significant amount of manual work is currently needed to determine OA status:** Dashboard A could help HEI staff address this gap in part, as determining articles' OA status is essential for compliance reporting to RCUK and COAF and for REF compliance. A dashboard could also help to avoid duplication of effort between institutions.
- **There is a need for data on the effectiveness of OA:** Dashboard B would help with this, as good and timely data on the effectiveness of OA policies are lacking and are needed urgently. Particularly, stakeholders highlighted that Dashboard B would provide new evidence they could use to make the case for OA. This was considered a priority when compared with the time savings offered by Dashboard A.
- **While Dashboard B seemed more attractive to prospective users, they agreed that Dashboard A would help them more in their day-to-day roles:** At a workshop held in Edinburgh on May 17th, 2017, 17 attendees from Scottish HEIs were shown the dashboards selected at the London workshop. More than half indicated that Dashboard B would provide more useful information, however, they agreed that Dashboard A would be more helpful in supporting them in assessing compliance with the HEFCE OA policy.

Although REF compliance was recognised as a key issue, Dashboard D, which addressed the topic explicitly, was not selected as a candidate for further development. This was due to two main issues:

- RCUK and HEFCE policies are subject to change and a hypothetical dashboard would need to be updated accordingly, which is a significant obstacle to development.
- The data in a dashboard would need to be very accurate and reliable for HEIs to trust it when it comes to compliance, which might not be technically achievable at the moment.

2.3   Desirable features for an OA dashboard

The stakeholders consulted stated that, ideally, they wished to have access to all five dashboard options developed in Phase 1 of this project. Nonetheless, it must be recognised that this is not feasible at this stage, particularly in light of the challenges highlighted in our Phase 2 report and summarised in Section 3.

It was reported that Dashboard A and Dashboard B would both have a greater added value if they could be connected to financial data about OA. The financial data could be drawn from Monitor UK, as many institutions are in the process of implementing Monitor Local.[b] With regard to the cost of Green OA, participants pointed out that there is no consensus about a mechanism for measuring these costs.

Finally, workshop participants and interviewees underlined how a "live" dashboard with continually-updated data (as opposed to snapshots) would be useful, as it would reflect the dynamism of the OA environment. The feasibility of such an approach will be determined by the data sources and their APIs (see Section 3) and on the case made by the users to support the implementation of this solution.

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[b] For further information on the Jisc Monitor services see https://www.jisc.ac.uk/monitor-uk and https://www.jisc.ac.uk/monitor-local

2.4   Competing products in the existing landscape

In the context of Phase 1, we explored and analysed existing dashboards on OA. Based on our assessment, the main competitors to a Jisc OA dashboard would be the following:

- **Open Science Monitor:** This service was developed for the European Commission and includes three dashboards, showing data on:
    - The percentage of OA publications that are OA each year
    - The percentage of publications made available by OA journals
    - The rate of Green OA publications compared to journal publications.

    These dashboards provide limited drill-down options (by EU country and discipline) and the underlying data is sourced from Web Of Science, DOAJ, and OpenAIRE. We note that the approach chosen by the Open Science Monitor is not driven solely by use cases and requirements, but rather by the data that is available, drawn in part from proprietary sources.[c]

- **Library Data Labs dashboard:** This dashboard was developed during the Jisc and HESA Library Data Labs project in 2016 to present usage figures of journals and journal articles on publisher platforms and in repositories. The Dashboard primarily used a combination of JUSP and IRUS-UK data. The main drawback of this dashboard is that it does not allow profiling against other institutions, as they can only see their own data due to confidentiality clauses within the agreements with publishers that supply data to JUSP.[d] Furthermore, there are compatibility issues between JUSP (journal-level usage by UK users) and IRUS-UK (article-level usage by worldwide users), making any comparison or aggregation of the two particularly challenging.

- **CHORUS:** CHOR, Inc. is a US non-profit organisation established to enable funding agencies and publishers to deliver public access to published articles reporting on funded research. CHORUS, the organisation's first initiative, was developed to allow US federal agencies to monitor compliance with their public access policies. We understand that CHORUS has already developed prototype dashboards for Wellcome and Research Councils UK, and there are preliminary discussions ongoing between CHOR, Inc. and Jisc Collections about potential UK applications for the platform.[e]

In addition, a number of other software solutions and projects seek to address some of the same use cases, including:

- Development of Researchfish with information on OA status of RCUK-funded articles[f]
- The Universities UK OA monitoring project[g]
- Symplectic OA Monitor, a module for Elements designed to simplify OA policy compliance for research institutions.[h]

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[c] Please see http://ec.europa.eu/research/openscience/index.cfm?pg=home&section=monitor for more information

[d] Please see https://www.jisc.ac.uk/rd/projects/business-intelligence-project for more information

[e] Please see https://www.chorusaccess.org for more information

[f] Please see https://www.researchfish.net/

[g] Please see http://www.universitiesuk.ac.uk/policy-and-analysis/research-policy/open-science/Pages/uuk-open-access-coordination-group.aspx

[h] Please see http://symplectic.co.uk/elements-updates/introducing-open-access-monitor/ for more information

Part B: Technical features of a dashboard prototype and user testing

3. Technical features

In Phase 2 of the project, we developed a prototype of Dashboard A, including a data model and a series of appropriate data sources. We evaluated and ranked data sources based on their perceived ease of use, APIs, and suitability for the purposes identified in Phase 1. We developed an interface for the dashboard and assessed the implications of using Tableau as the visualisation software.

3.1 Phase 2 of the project

During Phase 2 of the project, Digirati worked on the development of the Dashboard A prototype (see Table 3) that was delivered to Jisc (see Figure 1 on following page).

Table 3 Original specification of Dashboard A.

A. Informing OA policy effects	Relevant for national policymakers, research funders, and institutions
Use-case	Authors' take-up of open access options
Possible indicators	- Total number of articles/publication in journals or proceedings with ISSN % green OA articles (AAM) % green OA articles with embargo (AAM) % articles in Gold OA journals % articles in APC-free OA journals % OA articles in hybrid journals % OA articles in hybrid or subscription-only journals that are not Green OA but could have been as the journal policy would have allowed it % articles in hybrid or subscription-only journals that do not allow Green OA *Drilling down options:* - Per institute (per faculty) - Per funder - Per discipline - Per publisher - Per type of license - Benchmarking with national average - Profiling against institutions of choice - Drilling down options at article level (?)

Figure 1 Jisc OA Dashboard main screen in Tableau.
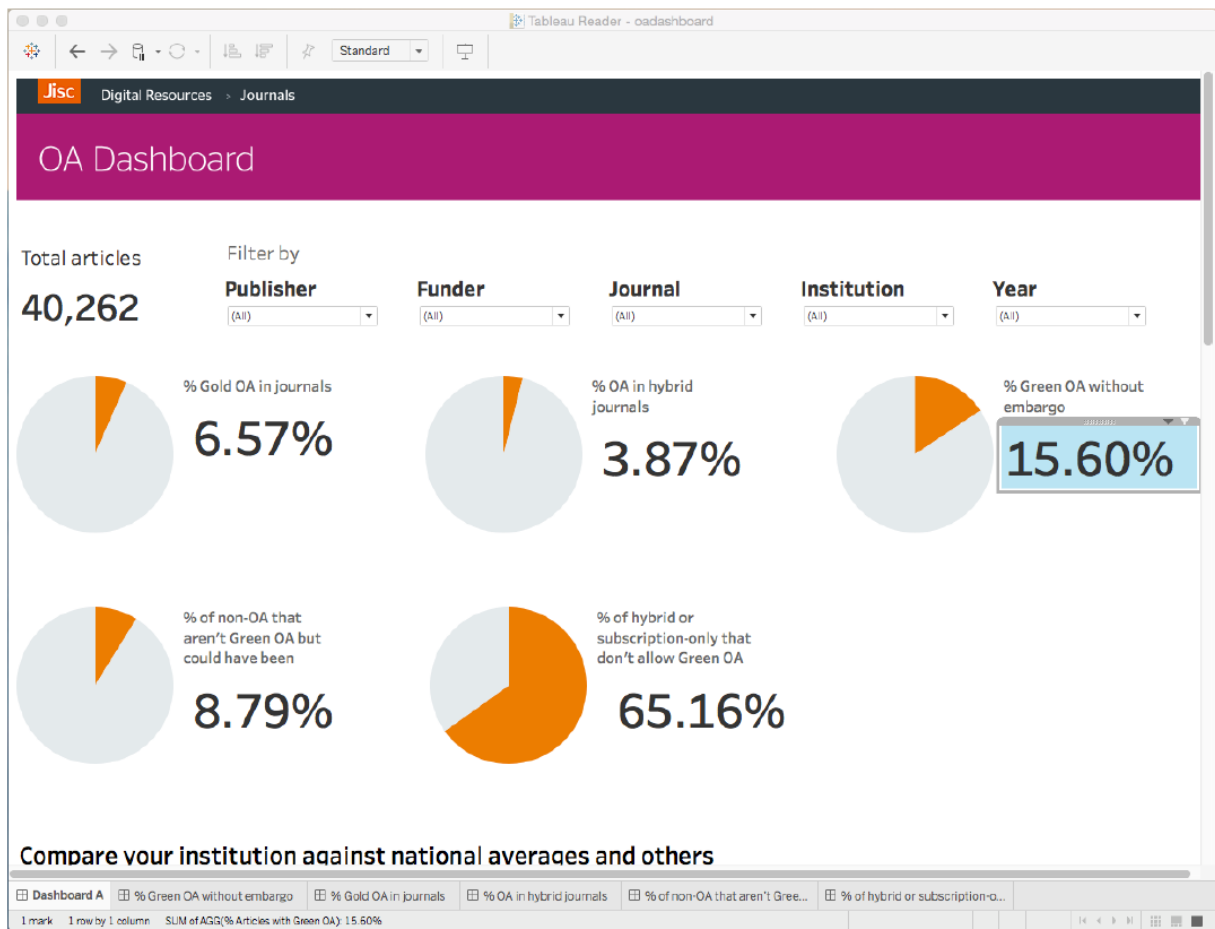
As highlighted in our Phase 2 report, we were not able to reach definitive conclusions on a potential production architecture supporting the technical delivery of the chosen dashboard. The incomplete status of other related projects within Jisc, which would need to be leveraged to improve the prototype dashboard in the future, was another key challenge.[i]

In addition to these general insights, the following observations were made:

- **Delivering both Dashboards A and B would require significant effort:** a large number of data sources would have to be harvested, and the information would have to be normalised and de-duplicated.[j]

- **The universe of publications is difficult to source:** a comprehensive dataset of publications from researchers at UK HEIs is essential to build reliable statistics, however, the project highlighted that this 'universe of publications' is very difficult to identify through open data

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[i] Such projects include Data orchestration (https://libraryservices.jiscinvolve.org/wp/data-orchestration/), RDSS (https://www.jisc.ac.uk/rd/projects/research-data-shared-service), Monitor (https://monitor.jisc.ac.uk/), and Sherpa RoMEO (http://www.sherpa.ac.uk/romeo/index.php).
[j] For a more detailed description of Dashboard B, please see Annex 2

sources. For example, CrossRef[k] provides a comprehensive picture of articles, but lacks robust data on institutional affiliations, while PubMed[l] covers only biomedical literature. Figure 2 provides a comparison of the number of articles with UK affiliations identifiable from these sources vs proprietary sources such as Web of Science and Scopus.

- **Dashboard B requires data from Dashboard A:** should Jisc wish to deliver both dashboards, it should be noted that there exists a dependency between them and, thus, Dashboard A (or, at least, the underlying data) would need to be prepared before Dashboard B.

Figure 2 Universe of publications for articles with UK affiliations (2014)
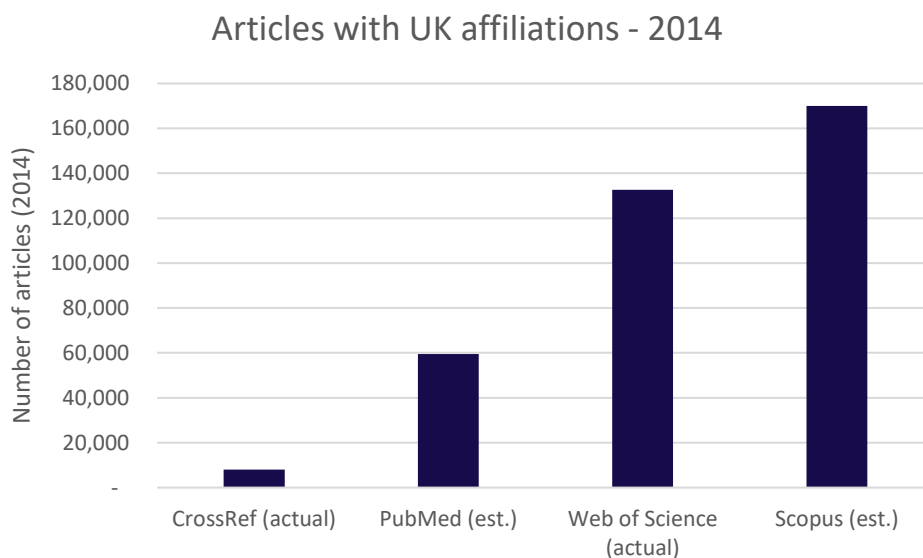
3.2 Data sources

Data sources were initially discussed through a technical assessment workshop. The data sources used to build the Dashboard A prototype are listed in Table 4. It should be noted that the project aimed to include only open data sources, thus, paid services such as Web of Science[m] and Scopus[n] were excluded.

The grading included in Table 4 aims to represent the reliability and fitness of the data source through a green/amber/red scale. No data sources were rated 'green' in this report, as all of them posed some challenges to the creation of a full and comprehensive version of Dashboard A.

Some of the data sources that were initially identified as suitable for Dashboard A were, eventually, discarded due to technical issues (see Table 5). These are summarised below and a full account of the decisions made is available in the Phase 2 report by Digirati.

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[k] See https://www.crossref.org/
[l] See https://www.ncbi.nlm.nih.gov/pubmed/
[m] See https://clarivate.com/products/web-of-science/
[n] https://www.elsevier.com/solutions/scopus

Table 4 Data sources for Dashboard A.

Data source	Used to identify…	Benefits	Challenges (sorted by relative importance)	Reasons for selection
Crossref[o]	Universe of publications	Wide range of disciplines Robust data on publishers and journals Comprehensive record of new scholarly articles	The API is not suitable for regularly harvesting millions of records due to its upper limit of 1000 records per query and the response time of 10-15s Inconsistent use of unique identifiers for authors, publishers, etc. Very incomplete information on author affiliation	Disciplinary coverage
oaDOI	Licence information OA status	Gathers data from DOAJ, Crossref, DataCite, BASE OA search engine, repositories, and journal webpages to find OA copies of articles and their licence information Handles 1 million calls per week Has a high level of accuracy (i.e., 96.6% of the time that oaDOI reports an article is OA, it really is)[p]	The API is not suitable for regularly harvesting millions of records due to its upper limit of 1 record per query. This can be worked around but an alternative more scalable approach would be required for a production service. It does not retrieve Green OA articles that are under embargo It does not make distinctions between APC-Gold and APC-free Gold articles Not all OA articles are identified by oaDOI (77% of truly OA articles are correctly identified as open)[q]	Inclusion of all the licence information plus data from other sources to determine the OA status of research outputs

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[o] Note that Katie Shamash (Jisc) previously investigated Crossref as a data source for Jisc services, see: http://nbviewer.jupyter.org/gist/kshamash/c132e61888371506447f2f9142fab7ad

[p] Piwowar, H., Priem, J., Larivi ère, V., Alperin, J.P., Matthias, L., Norlander, B., Farley, A., West, J. & Haustein, S. (2017). The State of OA: A large-scale analysis of the prevalence and impact of Open Access articles

[q] Ibid.

Data source	Used to identify...	Benefits	Challenges (sorted by relative importance)	Reasons for selection
			Licence information is available on a small portion of OA articles[r]	
Sherpa/RoMEO	Publishers' policies on copyright and self-archiving	No performance issues with the API, as the journal universe is relatively small A separate project is underway to address some of the shortcomings of the API (by the end of 2017) Extensive coverage of publisher policies	Data quality: a large number of journal which allow Green OA with additional conditions are classified as if they didn't, which produces misleading results for the number of articles that do not permit Green OA Due to limitations of the API, it is impossible to determine licencing information for journals to which multiple publishers are associated With a larger number of journals the scalability of the API may pose some issues	Provision of good, though not perfect, coverage, and no viable alternative

Table 5 Data sources discarded for Dashboard A.

Data source	Could be used to identify...	Benefits	Challenges (sorted by relative importance)	Reason for exclusion
PubMed	Universe of publications	High-quality information on publications in the biomedical sciences, including author affiliation	Limited disciplinary coverage	Limited disciplinary coverage
ORCID	Universe of publications	Unique author identifier Growing importance Links to existing Jisc ORCID consortium	Uptake by UK authors remains limited, though growing Institutional affiliation data not robust Data quality issues are likely given much of the data entered by users	Insufficient coverage, potential concerns over data quality

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[r] Ibid.

| OA Button | OA status | Existing partner on Jisc projects

Provides similar service to OADOI | This data source queries OADOI and other sources but does not currently gather licence information, making it difficult to identify hybrid OA articles | Absence of licence information, meaning OADOI offers a more comprehensive solution |
|---|---|---|---|---|
| Lantern | Licence information

OA status | Provides similar service to OADOI | Proprietary service, could require paid-for access to the API if used at scale | Proprietary service, could require paid-for access to the API |

During the course of this project, Impactstory, the not-for-profit backing the development of oaDOI, and Clarivate Analytics announced a new public/private partnership that aims to connect researchers to verified versions of about 18 million OA articles from Web of Science.[s] We highlight this as a possible source of information for further work on a Jisc OA dashboard, although it should be noted that no further investigation on this has been performed as a part of this project.

3.3   Data model

Phase 2 of this project investigated the possible options available in terms of data models. Ideally, the use of an existing data model should be pursued, however, we found that Jisc services use different data models at this moment. The RDSS data model is expected to become more broadly used in the future, thanks to its flexibility and adaptability.[t] Nonetheless, it was not immediately suitable for our purposes, as:

- It does not have the exact structure that could be used as-is for the use cases identified in this project
- It lacks OA status for any given article and, instead, it includes a general licence statement.

These issues led to the creation of a dedicated data model, which was then used to organise the harvested information prior to showing it through the dashboard prototype.

3.4   UX Design

While preliminary testing (see Section 4) showed that users were satisfied with the appearance of the Dashboard A prototype, we highlight that Tableau has some limitations compared to more flexible web technologies such as HTML, CSS, or JavaScript. Tableau does not allow the creation of responsive interfaces, which could pose challenges in the case of mobile users: the only approach possible in

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[s] Please see http://www.prnewswire.com/news-releases/clarivate-analytics-announces-landmark-partnership-with-impactstory-to-make-open-access-content-easier-for-researchers-to-use-300478715.html   for   more information

[t] Please see https://www.jisc.ac.uk/rd/projects/research-data-shared-service for more information on the Research Data Shared Service (RDSS)

Tableau is the use of a fixed width for the dashboard and this might be a problem for desktop users, too. Furthermore, we note that the rigidity of a Tableau dashboard might lead the system not to comply with Jisc UX guidelines.[u]

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[u] Please see https://uxd.jisc.ac.uk/about/ for more information

4. User testing and initial feedback

Prospective institutional users were asked to comment on the prototype dashboard during demonstrations. They agreed that the dashboard had a good interface and appeared easy-to-use, with the key features being drill-down options and profiling. However, concerns were raised over the quality of the underlying data sources and the robustness of the results.

4.1 Reactions to the prototype demo

The prototype demo was approached via conference calls with screen sharing and an in-person workshop. A total of 28 representatives from HEIs (see Table A3 in Appendix A) completed a short survey including questions on the usefulness and ease of use of the dashboard (see Figure 3 and Figure 4).

Most participants agreed that the dashboard would be useful and, to some extent, simplify their job. However, it appears that the dashboard would only be partially effective in improving the participants' speed, productivity, and performance.

The dashboard was rated easy-to-operate by all participants and learning how to use it and interacting with it effectively to achieve desired objectives does not seem to be a challenge. However, the participants cast doubts over the flexibility of the platform.

4.2 Strengths of the dashboard

During demos, the dashboard was perceived as having a clear presentation and interface (n=16),[v] which allowed effective comparisons and profiling against other institutions and national averages (n=13). The ease of filtering (through the dropdown menus) was appreciated by the participants (n=5), who recognised that the platform allowed quick access to information (n=3) and the creation of useful snapshots of their OA performance (n=3). Other strengths (n=2) of the dashboard prototype include the following:

- The dashboard aggregates data from different sources
- Links to articles are available (DOIs)
- It may enable us to measure the citation advantage of OA in future
- The data is helpful to inform senior management.

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[v] *n* indicates the number of people providing this feedback.

4.3 Weaknesses of the dashboard

The main issue with the dashboard was undoubtedly the perceived lack of accuracy and reliability of the underlying data (n=12).[w] The demo participants highlighted that data sources must be clearly identifiable and periodically reviewed (n=7) and that calculations must be fully explained to improve the platform's credibility (n=5). Further weaknesses (n=2) were identified as follows:

- Funder information needs deduplication or is inaccurate
- An export function is currently missing
- The data is not updated in real time and no longitudinal representations over time are available.[x]

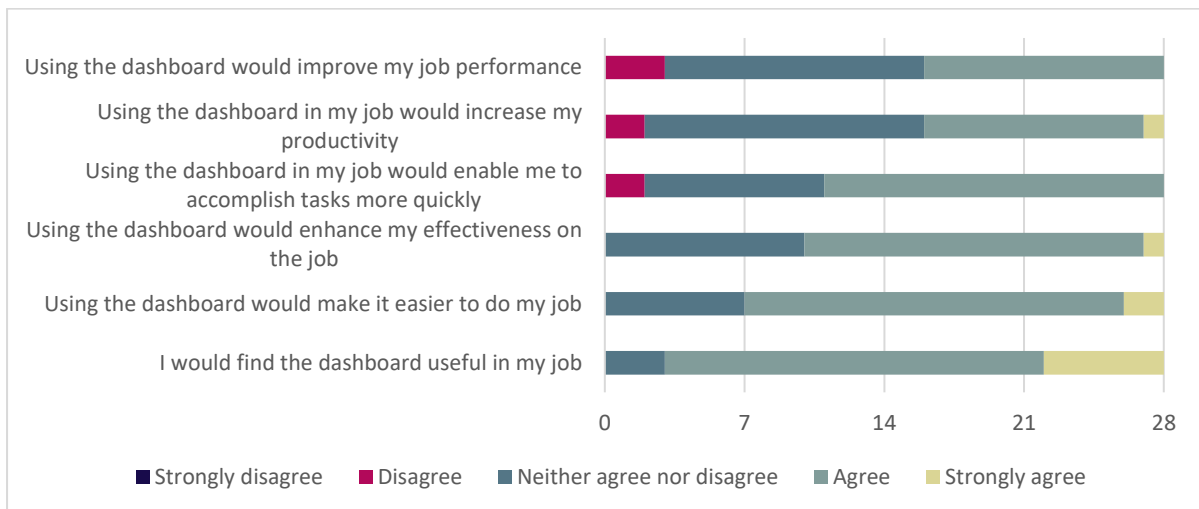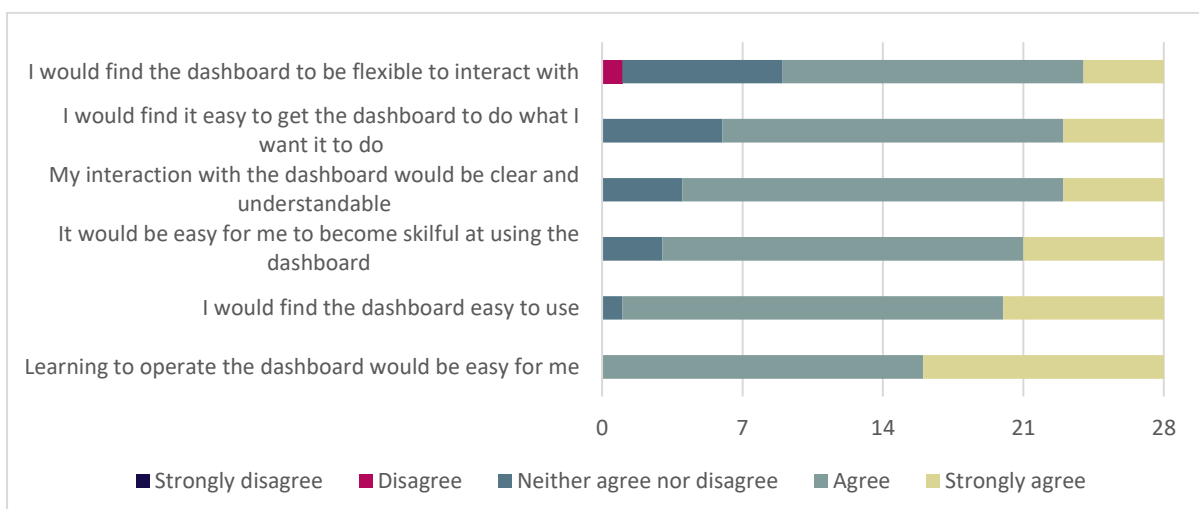**Figure 3 Perceived usefulness of the dashboard (n=28).**

Figure 4 Perceived ease of use of the dashboard (n=28).

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[w] Inaccuracy might have been a consequence of the limited data considered for the dashboard prototype
[x] It should be noted that real-time updates might not be technically feasible

Part C: Business case development

5. Business case development

We evaluated the potential to develop a full business case for the OA dashboard and we found that there are significant constraints to this. Particularly, the data sources and the operational costs would require more careful evaluation, and evidence that HEIs and funders would be willing to pay for such a service is limited.

5.1 Business case - institutions

We undertook interviews with representatives of five institutions to assess the potential business case for development of Dashboard A, as follows:

- Bournemouth University
- Imperial College
- Liverpool School of Tropical Medicine
- University of Bath
- University of Sheffield

Full details of the interviewees can be found in Appendix A. All comments have been anonymised for reporting purposes.

5.1.1 Identifying the value proposition

All of the interviewees responded positively to the demonstration of the dashboard, and commented favourably on the presentation, ease of use, and the range of filters available. One interviewee's immediate response was as follows:

> "I think it looks marvellous, it has so much potential! I like the fact it has a very simple and clear interface."

While another observed:

> "Having something that is this gold standard, and where people can understand what's behind it, how it's being calculated, I think that will be helpful."

The most valuable use cases considered by the interviewees were:

- Monitoring compliance with REF requirements (n=5) [not directly addressed in the prototype]
- Profiling performance against other institutions (n=4) [addressed]
- Identifying items which 'could have been green' (n=3) [addressed, but subject to significant limitations in the quality of data available]
- Adding usage data to help make the case for open access [not addressed within the prototype]
- Providing a 'single source of truth' for different stakeholders (n=2) [addressed]

However, as currently constituted, most interviewees considered that the dashboard would be a 'nice-to-have' rather than a critical service for their institutions. When asked how they might make a case to their institutions for subscribing or contributing to the dashboard, they found it difficult to pinpoint a compelling value proposition. Typical comments included:

> "The dashboard looks great, but I don't know how useful it would be in practice."

> "I'm struggling to really define the value proposition – I really like the idea, and I like the presentation, but it doesn't immediately add value."

> "We'd need to say 'this is going to add value to the OA reporting' [to secure funding]. I don't know how it would do so at the moment - it's not something that jumps out at me."

5.1.2 Preconditions for adoption

We sought feedback from the institutions on the preconditions for adoption of the dashboard, centring on the *completeness* and *accuracy* of the data presented.

With regard to completeness, it was clear that the dashboard would need to offer reasonably comprehensive coverage of an institution's articles – at least 75% or 80%:

> "Indicatively maybe the 80:20 rule is something to aim for, so if you could cover 80% of our output that would be really valuable."

> "Inevitably [the coverage needs to be] as close as possible to 100%... I'm fairly confident that we know within our CRIS what our authors have published, and then we want to know the OA status of all of those. 50% coverage is probably not helpful."

> "It would have to be 75% coverage of our outputs or more for it have any sort of credibility."

This represents a significant obstacle to successful development and uptake of the dashboard. At the present time, the only way to achieve this level of coverage would be:

1. To use data from a proprietary, licensed solution such as Scopus or Web of Science; or
2. To source data from institutions themselves.

In terms of the accuracy of the dashboard's results, institutions noted that this would depend on the use cases involved:

> "For the REF we would want it to be as accurate as we can get it. We've got a lot of measures and processes in place using tools in Symplectic and we need to be incredibly accurate on that. We could deal with a lesser degree of accuracy if talking about OA culture generally"

> "We'd know there is a margin of error, it would just be about the way that we presented it to the institution."

Supporting REF compliance was seen as a particularly important use case, but it is unlikely that the level of accuracy required for this use case can be delivered via the dashboard. Institutions would be willing to accept a lower level of accuracy for high-level profiling purposes, but also attach less value to this use case.

Institutions also commented on other factors, such as the ability to analyse data at department-level, or to integrate data from the dashboard into local systems. Both of these were considered desirable but non-essential features.

5.1.3   Delivering efficiency gains

The institutional representatives found it difficult to identify areas where the dashboard could save them time or deliver significant efficiencies. In most cases the dashboard would be providing new or additional information to institutions, rather than simplifying or replacing existing reporting processes. The ability to profile against other institutions was seen as particularly attractive, but there were few areas where the dashboard was expected to save staff time:

> "I don't think it would give us enough efficiencies. It would help with the job, but for me specifically the amount of my time that would be saved by looking at this is probably a very low proportion."

> "It wouldn't save us much time unless we were doing something big like business cases or a landscape analysis."

> "There would be some efficiencies, but I don't think it would be massive. For the use cases [addressed by the dashboard], we're currently preparing reports ourselves, so this might save a bit of time."

> "I can see there would be some areas where I could demonstrate that I could give the institution more information, but it would be harder to demonstrate the cost savings as we're not doing this anyway."

Furthermore, large HEIs reported that they had already collected the data on the OA status of publications pertaining to themselves, while smaller ones do not attach sufficient value to the data to allocate significant resource for this purpose. Thus, the Dashboard A prototype would not deliver efficiency gains in these cases and its main added value would be the profiling function.

5.1.4   Frequency of anticipated usage

An important point that arose from the interviews was the likely frequency with which individuals might use the dashboard. In one or two cases, such as identifying non-compliant articles, institutions could envisage embedding the dashboard in regular workflows. In most cases, though, they anticipated that usage would be more ad-hoc:

> "…We often get asked can you just produce an infographic for Executive Board tomorrow – by the Library Director or Head of Research Office. Having a sort of 'at our fingertips' dashboard with easily downloaded info, might be a clever use for strategic leads at the uni."

> "If the dashboard could include information on usage, I can certainly see that as being a strong bargaining point [but] I was trying to rationally think through how often you'd want to demonstrate that. It's kind of a one-off thing, and you just want a snapshot of information to demonstrate the benefit of OA."

> "Obviously we would want to filter on the institution itself and have the benchmarking information – but I can't see that we'd be doing this every day of the week."

5.1.5   Estimating levels of uptake

All five institutions interviewed were ambivalent as to whether they would want to adopt the dashboard as a service. Their feedback provided indicates that, as a standalone service, the dashboard has only limited value, but it might be more useful as part of a package of services:

> "We'd consider it, that's about the best I can say."

> "If it was incorporated in the Jisc subscription in some way and it went up a fraction that would be fine, but if you were going to come along and ask us to pay for an extra service you would need a very, very strong business case."

> "If embedded with other Jisc services, or combined [with them], that might be good."

5.1.6   Other use cases

The institutions consulted suggested that smaller institutions without current research information systems (CRIS) might find more use for a dashboard, and that it might also offer value to funders in some circumstances.

5.2   Business case - funders

We held informal discussions with a small number of representatives of UK research funders to gauge their interest in the dashboard. This indicated that funders would have only limited interest in a dashboard. The key points raised were:

- Limited coverage of the 'universe of articles' would render the dashboard of little value to funders unless this could be addressed
- Some funders are already involved in further development of the Researchfish system to identify OA content. This is expected to meet some of the same use cases as the Jisc dashboard.[y]
- High quality data available within EuropePMC and PubMed means that others already have access to some of the data needed from other, more robust sources.
- The prototype dashboard could not be used to monitor compliance with the specific funder open access policies, as the relevant use cases were not prioritised by institutions, and would be difficult to deliver. As a result, its value to funders would be diminished.

This feedback is qualitative and based on only a short demonstration of the Dashboard A prototype, followed by a discussion. Nevertheless, it suggests that securing concrete support from funders for the dashboard is likely to be difficult, should the project progress further.

5.3   Additional remarks

While the findings discussed in section 5 arose during conversations that were specific to the Dashboard A prototype, they suggest that the creation of an OA dashboard in general would face some

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[y] Recently, Researchfish has integrated Europe PMC, as well as data from Crossref, ArXiv,OpenAIRE and the DOAJ. Researchfish are also looking at other sources, however, these are linked only if identifiable with a unique ID.

serious challenges. These would not be related solely to the use cases behind Dashboard A (see Appendix B) but more to the idea of an OA dashboard itself.

The projected infrequent usage would make it difficult to develop a strong business case. In addition, the low level of maturity of the data sources has been shown to be the most significant obstacle to the creation of a dashboard and it is unlikely that it would be overcome should another dashboard option be considered (this is particularly true when considering issues around the universe of publications). The unreliability of data, at least for the time being, also casts doubts on the usefulness of the information displayed through a hypothetical dashboard, as prospective users reported that they might wish to redo calculations manually to ensure their correctness. However, we recognise that this would only be the case should the dashboard be used to monitor compliance.

Finally, it should also be noted that Dashboard A is a foundational element to build the other dashboard options described in section 2. Thus, if users do not value and trust the data available in Dashboard A, this will also undermine the validity of the other dashboard options.

6. Conclusions

In this section, we consider the strength of the business case for further development of the dashboard, and summarise the lessons learned from our work. We conclude that further development of a full dashboard would be a high risk option, and instead propose a number of smaller-scale developments for further consideration.

6.1   Developing a full business case

Table 6, below, summarises the outcomes of our work against the relevant sections of Jisc's Business Case template, and provides an indication of the quality of evidence available to enable its completion. This shows that we have gathered good evidence of customer needs, in the form of use cases, and are able to demonstrate the strategic fit of a dashboard for Jisc. However, the potential to develop a compelling business case for development of the dashboard is constrained by the following factors:

- **Resources employed and operational costs** – There remains significant uncertainty over the resources which would be needed to develop a production dashboard, and the costs entailed. The prototype development identified a number of issues which would need to be overcome, and could not be resolved within this feasibility phase. Any development would also need to take appropriate account of significant ongoing developments within Jisc (e.g., the 'Data Orchestration project', which is designed to standardise data sources between services and eliminating unnecessary duplication of effort).

- **Operational considerations** - Deficiencies in the underlying data sources are likely to limit the dashboard's perceived value, compromising both the completeness and accuracy of the data presented. We were unable to make significant progress on the development of usage indicators within the scope of our work, but note there is significant uncertainty over the quality of information that a dashboard could provide in this area.

- **Proposal uptake forecast and revenues** – While institutions liked the look and feel of the dashboard, we found little evidence to suggest that large numbers of HEIs would be willing to adopt a dashboard, or that it could deliver significant efficiency savings across the sector.

Table 6 Evaluating the business case for further development

Business case element	Strength of evidence available	Description
Market/customer view - Need	Moderate	• We found moderate evidence of customer needs, and were able to work with sector

		representatives to identify and prioritise appropriate use cases for a dashboard.
Market/customer view – Strategic fit	**Good**	• An OA dashboard could combine data from Jisc services and other open sources. There is no competitor solution that offers comprehensive, reliable data at institutional level, either in the UK or internationally.
Resource-based view – Resources employed	**Moderate**	• Jisc staff already have good knowledge of some key data sources (e.g. CrossRef), and the dashboard could build in part on the existing data model developed for the Research Data Shared Service (RDSS). However, the ongoing developments mean the technical infrastructure for a dashboard remains unclear.
Resource-based view – Operational considerations	**Weak**	• Our feasibility study raised a number of challenges with regard to the scalability, speed and quality of a dashboard. While some may be surmountable, significant risks remain in this regard.
Options analysis	**Moderate**	• We considered a number of options for development of the dashboard in the course of our work, as outlined in sections 2 and 3.
Proposal uptake forecast	**Weak**	• Our work was limited in scope, and based on consultation with only a small sample of HEIs. However, it indicates that enthusiasm for adoption of the dashboard by HEIs is likely to be limited if any form of charge is made.
Financial analysis – Development and Implementation costs	**Weak**	• Our ability to estimate development implementation costs associated with dashboard development is constrained by significant uncertainties with regard to data sources and technical architecture.
Financial analysis – Operating costs	**Moderate**	• We anticipate that operational costs of maintaining the dashboard could be estimated with a reasonable degree of accuracy by reference to similar Jisc services.
Financial analysis – Revenue	**Weak**	• Consultation with HEIs indicate that any efficiency gains from adoption of the dashboard would be relatively small. There would be benefits in the form of improved

		management information, but institutions found it difficult to ascribe a value to this.
Risk assessment	**Moderate**	• Our work has highlighted a large number of risks to successful development of an OA dashboard, as outlined in Section 3. Other risks include significant uncertainty over levels of uptake within the sector.

6.2 Conclusions

There is a sound basis for investigating the feasibility of an open access dashboard. Jisc holds valuable data on open access which is not effectively aggregated at present. There is also rapid growth in the availability of external, open data sources, and institutions undoubtedly seek better quality management information on this important area.

We have been able to develop a proof of concept solution which demonstrates how data can be aggregated to determine and benchmark the proportion of open access content. We have also confirmed that there is demand from institutions for better data on the benefits of open access, in particular. The development of a dashboard is feasible from a technical standpoint, notwithstanding some questions over whether Tableau is the most appropriate platform for this purpose. Our prototype was also well-received by users, and considered to be visually attractive and easy-to-use.

However, this project finds that the maturity of internal and external data sources for open access has not reached a point where these can effectively support a robust dashboard. Further development of the dashboard would yield some benefits, but these would be limited by the following factors:

- comprehensive coverage of institutions' outputs could only be achieved through integration with proprietary data sources;
- some use cases cannot feasibly be delivered using current open data sources;
- there are questions marks over the reliability of some data sources, which could undermine the validity of dashboard outputs.

Furthermore, initial discussions indicate limited appetite for a dashboard service amongst HEIs, even were the above technical issues to be overcome, and low levels of interest from funders. It is also not clear how frequently a dashboard would be used by institutions, or what level of efficiency savings it could deliver.

On balance, therefore, we cannot recommend that a full business case be prepared to develop a production dashboard. There are significant uncertainties which would need to be factored into any costing assumptions, and the scope for the service to generate revenues and/or deliver efficiency savings appears limited.

6.3 Recommendations

Our work indicates that the fundamental building blocks required for a dashboard, in the form of comprehensive and robust data sources, are not yet in place. We therefore recommend that Jisc seeks

to further develop the technical architecture on which its services are based, and works with third parties to promote greater interoperability and uptake of persistent identifiers. Work in this area would also deliver benefits to other Jisc service such as Monitor, Publications Router and the Research Data Shared Service.

Specific developments which could underpin a dashboard in the medium-term include:

- **Developing a comprehensive, open-source record of UK HEIs' publication output** – We have identified a number of potential sources for such a record, including Crossref, ORCID, PubMed, and aggregation of data from individual HEIs. Further work could be undertaken to aggregate and de-duplicate information from these sources, and start to build a comprehensive, open record of UK researchers' publications. It is also expected that a mature version of Jisc Router would capture metadata about many UK outputs, which could help towards this objective.
- **Ensuring that data re-use is enabled -** We recommend that the terms and conditions of relevant Jisc services, such as Publications Router, are reviewed to enable data re-use for other purposes, including a future dashboard.
- **Promoting greater uptake of institutional identifiers within key data sources** – The absence of robust data on institutional affiliation is a significant impediment to the development of a dashboard, and other services such as Publications Router. Jisc should continue to engage and influence key data providers (most notably Crossref, ORCID and DataCite, via the Organisation Identifier Project[z]) to promote uptake of unique organisational identifiers.
- **Continuing support for ORCID –** Projects of this nature will be greatly facilitated if ORCIDs are widely adopted by UK researchers, and consistently available within external data sources. Jisc's support for the UK ORCID consortium represents a valuable initiative in this regard.[aa]
- **Improving internal consistency of Jisc data sources –** Our work illustrates the critical importance of ongoing work to standardise and orchestrate data sources within Jisc. This work should be taken to completion to increase interoperability between data sources.
- **Extension of the RDSS data model -** The prototype data model has been reviewed with the Jisc RDSS team who believe that what has been developed can serve as the basis for a Resource Type profile for a journal article, which can be added to the RDSS data model and augmented with potentially additional fields for other use cases
- **Rebuilding the data model for SHERPA services** – Our work highlighted some of the limitations of the existing SHERPA data model and API (see Table 4). The ongoing work to develop a new data model for SHERPA services should allow these issues to be addressed in the future.

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[z] See https://www.crossref.org/blog/the-organization-identifier-project-a-way-forward/
[aa] See https://www.jisc.ac.uk/orcid

Appendix A Contributors

Table A1 Attendees of the London workshop (28/04/2017).

Name	Role	Organisation
Arthur Smith	Open Access Research Advisor	University of Cambridge
Beverley Jones	Research Repository & Information Officer	University of Lincoln
David Jenkins	Research Support Librarian	Open University
David Walters	Open Access Officer	Brunel University
Dawn Hibbert	Head of Research Support	University of Northampton
Helen Dobson	Scholarly Communications Manager	University of Manchester
Jane Belger	Research and Open Access Librarian	University of the West of England
Kirsty Taylor	Business Intelligence and Marketing Manager	University of Huddersfield
Louise Tripp	Academic Liaison Librarian (Research) and Open Access Manager	University of Lancaster
Matthew Herring	Library & Archives	University of York
Ray Kent	Director of Research Administration	Royal Veterinary College
Sally Rumsey	Digital Collections Development Manager	University of Oxford
Sarah Griffiths	Scholarly Publications Manager	King's College London
Sonja Haerkoenen	Scholarly Communications Manager	University of Cardiff
Stephen Gorman	Open Access Officer	Queen's University Belfast
Sue Starbuck	Research Facilitation and Engagement Manager	University of Surrey
Suzanne Atkins	Open Access and Research Publications Advisor	University of Birmingham

Table A2 Stakeholders interviewed via telephone or teleconference.

Name	Role	Organisation
Anne Horn	Library director	University of Sheffield
Chris Banks	Library director	Imperial College London
David Walters	Open Access Officer	Brunel University
Michael Eadie	Technical Coordinator (Research Data Management Service)	University of Glasgow
Valerie McCutcheon	Research Information Manager	University of Glasgow

Table A3 Stakeholders who provided feedback on the Dashboard A prototype (either via online demonstration or the Jisc OA Community Workshop in Birmingham).[bb]

Name	Role	Organisation
Angela Davies	Head of Research Services and Scholarly Communication	University of Sheffield
Chris Biggs	Research Support Librarian	Open University
David Young	Research Funding and Policy Manager	Northumbria University
Erica Wine	Repository Officer	Aston University
Helen Cooper	Repository Manager and University Archivist	University of Central Lancashire
Jenny Basford	Research publications librarian	Middlesex University London
John Murtagh	Open Access Support Manager	Imperial College London
Julia Martin	Head of Information Services	Liverpool School of Tropical Medicine
Kara Jones	Head of Library Research Services	University of Bath
Karen Rowlett	Research publications adviser	University of Reading
Mark Lester	Research Librarian	Cardiff Met
Phils Stocks	Faculty Librarian	Bournemouth University
Rebecca Staatz	Open Access Senior Supervisor	University of Bristol

[bb] Note that the information in table A3 is incomplete, as not all stakeholders wished to leave personal information in our feedback survey

Ruth Harrison	Head of Scholarly Communications Management	Imperial College London
Sally Rumsey	Head of Scholarly Communications & Research Data Management	University of Oxford
Suzanne Atkins	Open Access and Research Publications Advisor	University of Birmingham
Thom Blake	Research Support Librarian	University of York

Appendix B Use cases

Table B1 Use cases for Dashboard A.

Actor and action	Purpose
As an Institute / Librarian, I want to see the % of Green OA articles without embargo (AAM), so that	I can monitor the effects of the OA policies
As an Institute / Librarian, I want to see the % of Green OA articles with embargo (AAM), so that	I can monitor the effects of the OA policies
As an Institute / Librarian, I want to see the % of Gold OA articles in APC-Gold journals, so that	I can monitor the effects of the OA policies
As an Institute / Librarian, I want to see the % of articles in APC-free OA journals, so that	I can monitor the effects of the OA policies
As an Institute / Librarian, I want to see the % of OA articles in hybrid journals, so that	I can monitor the effects of the OA policies
As an Institute / Librarian, I want to see the % of non-OA articles in hybrid or subscription-only journals that aren't Green OA but could have been, as the journal policy would have allowed it, so that	I can monitor the effects of the OA policies and target the advocacy efforts on non-compliant researchers/research groups
As an Institute / Librarian, I want to see the % of articles in hybrid or subscription-only journals that do not allow Green OA, so that	I try to change these journal policies in subscription negotiations with the publishers of these journals
As an Institute / Librarian, I want to see how the percentages of the various types of OA articles compare to the national averages so that	I can influence the resources spent on OA within my institute
As an Institute / Librarian, I want to see how the percentages of the various types of OA articles compare to certain other institutions (that I select) so that	I can influence the resources spent on OA within my institute
As an Institute / Librarian, I want to see the number of articles in journals or proceedings with ISSN, so that	I can see the total population of publications for which my OA policies apply
As a Funder, I want to see the % of Green OA articles I fund without embargo (AAM), so that	I can determine the compliance with my OA policy
As a Funder, I want to see the % of Green OA articles I fund with embargo (AAM), so that	I can determine the compliance with my OA policy
As a Funder, I want to see the % of Gold OA articles I fund in journals, so that	I can determine the compliance with my OA policy

As a Funder, I want to see the % of articles I fund in APC-free OA journals, so that	I can determine the compliance with my OA policy
As a Funder, I want to see the % of OA articles I fund in hybrid journals, so that	I can determine the compliance with my OA policy
As a Funder, I want to see the % of OA articles I fund in hybrid or subscription-only journals that aren't Green OA but could have been, as the journal policy would have allowed it, so that	I can determine the compliance with my OA policy
As a Funder, I want to see the % of articles I fund in hybrid or subscription-only journals that do not allow Green OA, so that	I can determine the compliance with my OA policy
As a Funder, I want to see the number of articles I fund in journals or proceedings with ISSN, so that	I can see the total population of publications for which my OA policies apply

Table B2 Use cases for Dashboard B.

Actor and action	Purpose
As a Funder, I want to see the number of downloads per OA type, so that	I can evaluate my OA policy and monetary resources
As a Funder, I want to see the number of citations per OA type, so that	I can evaluate my OA policy and monetary resources
As a Funder, I want to see Altmetrics data per OA type, so that	I can evaluate my OA policy and monetary resources
As a Dean, I want to see the number of downloads per OA type, so that	I can influence the institutional OA policy and resources
As a Dean, I want to see the number of citations per OA type, so that	I can influence the institutional OA policy and resources
As a Dean, I want to see Altmetrics data per OA type, so that	I can influence the institutional OA policy and resources
As an Author / Dept. head I want to see the number of downloads per OA type, so that	I can see the size of the audience for my/our article(s)
As an Author / Dept. head I want to see the number of citations per OA type, so that	I can determine the impact of my/our article(s) in the scientific community
As an Author / Dept. head I want to see Altmetrics data per OA type, so that	I can determine the impact of my/our article(s) in society
As a Librarian, I want to see the number of downloads per OA type, so that	I can show the benefits of OA in the advocacy efforts of my library
As a Librarian, I want to see the number of citations per OA type, so that	I can show the benefits of OA in the advocacy efforts of my library

As a Librarian, I want to see Altmetrics data per OA type, so that	I can show the benefits of OA in the advocacy efforts of my library