OPERAS PLUS

On the road to sustainability: paving the way for OPERAS as an efficient open Social Sciences and Humanities scholarly communication Research Infrastructure

Metrics Service

Deliverable 5.2

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On the road to sustainability: paving the way for OPERAS as an efficient open Social Sciences and Humanities scholarly communication Research Infrastructure

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Document Log

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Abstract

The OPERAS Metrics Service enables the gathering of open access book metrics into a central OPERAS database, and then the display of those metrics on a customer's site via a centrally-managed OPERAS widget. This document describes how the different parts of the metrics service interact, the work that was carried out during the OPERAS-PLUS project to add scalability by updating the underlying code and architecture, and provides information on the running costs along with suggestions on how these could be covered.

Contents

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Executive summary

OPERAS Metrics is a valuable service for Open Access publishers, university presses and libraries, which provides a community-run, open source alternative to the proprietary usage metrics services otherwise available. The service is further designed to better provide metrics for books in Social Sciences and Humanities (SSH) disciplines, and in a more transparent, comprehensive manner. It thus enables institutions and authors to better understand and articulate the use and impact of their work.

The OPERAS Metrics service is currently being used by 34 publishers in beta mode. Once the service is in full production mode, it should be possible to maintain the service and also to expand the number of customers to more than double this number with a staff of 1.25 FTE.

The OPERAS Metrics infrastructure is split into two parts, one hosted centrally by OPERAS, and then components which run on the customer's servers. Alternatively, a customer can also download and run the entire openly-licensed service themselves, if preferred. The platform collects data from a wide range of relevant sources, such as CrossRef, Google Books and JSTOR.

This work package is focused on bringing the service to an operational level. The work to do this, including refactoring code, improving the public view of the service, adding functionality and documentation has all progressed well and is nearing completion.

The project began 5 months later than planned, with a slower start due to uncertainty in funding from the UK government. We have managed to catch up by 3 months by using additional resources, but due to the complexity of the work the task will continue for an additional 2 months. With a month of contingency, we now expect the work to be complete by the end of November 2023. Despite the delay, the task will still be delivered within the timeframe of the larger project, and within budget. As this is the final deliverable of the task, any additional work will be described as part of the overall project activity reporting.

1. Introduction

This document provides an overview of the work carried out as part of Task 5.2 of the OPERAS-PLUS project, focusing on the evolution of Metrics service.

The overall structure of the document follows the standardised template that OPERAS uses as part of its Service Portfolio Management (SPM) process, which was originally based on the FitSM standard template called "Service Design and Transition Package"[1]. Each of the individual OPERAS services will follow a similar structure, which will enable all content generated to be directly used within the OPERAS service management system (SMS).

Therefore, this document is structured as follows:

- Section 1: introduces the document and its structure.
- Section 2: describes the background of the service, previous funding and relevant development activities as an orientation to the service status at the start of OPERAS-PLUS and thus objectives within it..
- Section 3: outlines the value proposition including customer and user profiles.
- Section 4: presents the business case including demand assessment, assumptions, costs and risks, among others.
- Section 5: moves into the service design including service requirements, high level technical architecture, order workflows, acceptance criteria, among others.
- Section 6: starts the transition phase to shift the service into a live environment and the related activities and timing required.
- Section 7: provides the current status of the service along with visualisations.
- Section 8: concludes the overall document.

[1] https://www.fitsm.eu/downloads/#toggle-id-5

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2. Background

OPERAS Metrics[2] is a service that provides a comprehensive and transparent mechanism to collect, aggregate and present usage metrics, specifically for open access books, but with a broader potential application across all scholarship.

The service was originally developed as part of the HIRMEOS project[3], which received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 731102.

Following the HIRMEOS project, the service was maintained for a small number of stakeholders including Ubiquity. OPERAS-PLUS now allows to take things a step further, bringing the service to an operational, production level.

[2] https://metrics.operas-eu.org
[3] https://www.hirmeos.eu

3. Value Proposition

User Profile	Description
(Potential) Customer of the service	Open Access publishers, university presses, university libraries.
(Potential) User of the service	Authors and readers of academic publications, managers of presses, librarians, managers of Higher Education Institutions. Essentially anyone interested in the usage and impact of published academic outputs.
User profile (pains/gains)	There are multiple issues with the legacy services available that OPERAS Metrics improves upon: ● The legacy services are proprietary, non-Open Source, often expensive to use, and are controlled by a few major publishers. ○ OPERAS Metrics is community-run, Open Source, and designed to be run sustainably yet affordably. ● The legacy services are focused predominantly on STEM content, making them less suitable for SSH. ○ OPERAS Metrics collect their content from a wider range of sources including those more suitable for SSH. ● The legacy services do not disclose all of their sources, and the methods and algorithms used to process the data and present the metrics are opaque. Often metrics for multiple different usages of a publication are combined into one number, producing metrics that look good but which are not statistically meaningful. ○ OPERAS Metrics presents all of the usage data for a publication as individual metrics, with a clear explanation of where the data was collected from, and what it means. This gives users a richer understanding of the exact way in which the

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	publication is being used, and enables use of the metrics for purposes of comparison and evaluation.
Service Description	OPERAS Metrics provides a comprehensive and transparent mechanism to collect, aggregate and present usage metrics, specifically for open access publications in the arts and humanities, but with a broader potential application across all scholarship.
Service Area	Analytics
Service tags	Open Access, Academic impact, Metrics
Value Proposition (pain relievers / gain creators)	• Authors can understand exactly where and how their work is being accessed and consumed, and can thus create accurate accounts of the work's impact. • The work of researchers in SSH disciplines (as well as STEM) can be better assessed in terms of usage and impact. • Publishers can understand how well and where published content is being consumed, and the value of distributing it to diverse locations for users to access. • University administrators can compile more comprehensive and statistically valid reports on the impact of work published by faculty.
Tagline	Collects usage and impact metrics related to published Open Access content from many different sources and allows for their access, display and analysis from a single access point.
Service Criticality	Mission critical for OPERAS
EOSC Marketplace	https://marketplace.eosc-portal.eu/services/eosc.operas.operas_metrics_service

Table 1: Value Proposition Design

4. Business Case Design

	Best Case	Average Case	Worst Case
Demand assessment	75+ publishers (ability to add 2 per month)	50 publishers (ability to add 1 per month)	33 publishers (current, no growth)
Assumptions (about uptake)	• There are 45 members of the Association of European University Presses, plus many more libraries active in open access publishing. Our assumption at the moment is that the service is targeted at institutional and non-profit publishers, mainly in Europe. • While the majority of current customers are on the Ubiquity platform (with associated efficiency), we assume that the most new customers will be independent presses. • We assume that the allocated staff member(s) will be able to maintain the number of presses on the platform, plus add one new customer per month. • We assume that the service will continue to be hosted within the Google Cloud environment. The hosting of the service within the EGI environment was investigated, but this was found to add cost, complexity and risk (documentation will still be provided to enable independent hosting in other environments including EGI however).		
Expected organisational impact	Crossover benefits to other OPERAS and European services (e.g. GoTriple). Significantly more customers outside of the EU/UK.	Crossover benefits to other OPERAS and European services (e.g. GoTriple). Potentially more customers outside of the EU/UK.	Crossover benefits to other OPERAS and European services (e.g. GoTriple).

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Expected Cost	1.25 FTE (€115,988 annually) Infrastructure: €57,840 annually	0.5 FTE (€57,994 annually) Infrastructure: €26,520 annually	0.25 FTE (€28,997 annually) Infrastr: Infrastructure: €16,320 annually
Expected Revenue / Cost Recovery	No plans have currently been made for revenue other than to cover costs. At this stage, we propose either splitting the costs among all customers, using central funding via OPERAS if possible, or a combination of the two.		
Risks	**Med:** variation in independent customer platforms is higher than expected (additional time/cost to set up, additional cost to maintain) **High:** Lack of customer willingness to pay or of funding to cover costs	**Med:** variation in independent customer platforms is higher than expected (additional time/cost to set up, additional cost to maintain) **High:** Lack of customer willingness to pay or of funding to cover costs	**Low:** currently operating.
Supplier Evaluation	**Infrastructure:** we believe that Google Cloud is currently the most performant, secure and cost-efficient supplier. During the project, we explored using EGI servers instead, but determined that this would result in higher cost due to a need for DevOps activity, and decreased performance as this could not be guaranteed to the same level. **Maintenance:** Ubiquity is happy to continue maintaining and operating the service and contributing to the open source code base, in particular because a large portion of the customers are on its platform, and it therefore has a strong interest in ensuring a high quality of service.		

Constraints / limiting factors	• Infrastructure: no constraints • Market size: limits total possible size • Income: this report assumes that customers will pay for the service at a break-even level. While at a relatively affordable price point, this could prevent some presses from participating. • Staffing: A minimum staffing level as described above will necessarily rate-limit the onboarding of new customers.
Competitors and/or similar services	• Plum Metrics (Elsevier) • Altmetric (Digital Science / SpringerNature) • Other proprietary systems used by large scientific, technical and medical (STM) publishers • Google Scholar for authors, Google Analytics for publishers (Google)
Pricing and/or Access Policy	**Pricing:** At this point we are suggesting, if no central funding is available, that pricing initially be set according to the total cost divided by the number of customers. See section 5.7.2 for more details. **Access:** We feel that the service should be supported only for open access publishers, and while promoted specifically for SSH books, it need not be limited to this niche. In line with this, we believe that the supported service should not be available to non-open access publishers. We believe that access to the source code, API and data should be unrestricted.

Table 2: Business Case Design

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5. Service Design

5.1. Service Requirements

Functional and technical	The OPERAS services are roughly split into two spheres. 1. Centrally-managed OPERAS Metrics Infrastructure (this can be housed/run by customers for a local implementation, if desired) - These services are housed/maintained by OPERAS, and are accessible by customers over an HTTP connection. • Customer infrastructure - This contains components which customers would need to install and run themselves. Architecture: • Python web frameworks: Flask applications and web.py • PostgreSQL Databases • RabbitMQ message broker, coupled with Celery for scheduling and executing asynchronous tasks • Redis is used for caching • Although not required, it is strongly advised that the applications are run in a Docker container • The OPERAS infrastructure is further managed using helm and kubernetes, on a Google Kubernetes Engine cluster • A ReactJS widget is also available to display metrics
Availability, continuity and performance-related	The OPERAS metrics services should be available 24/7. We aim for at least 99% availability.
Security and data protection-related	No specific sensitive data is used by the OPERAS metrics services. Information is stored securely by Google Cloud SQL, and the inter-service communication is done over an HTTPS connection using JSON Web Tokens for authentication.
Usability-related	The service must meet the requirements of the European Accessibility Act and WCAG standards, in line with requirements for the participating publishers' websites.

Organisational	The service requires a part-time FTE for operational maintenance, onboarding of new users and support.
Data sources	Access to the following data sources needs to be maintained. Some services are optional as a press may not distribute to them, or may want to limit the metrics reported for simplicity. • CrossRef Event Data API • CrossRef Cited-By API • Google Books • JSTOR (optional) • IRIS UK (optional) • World Reader (optional) • Unglue.it (optional) • OpenEdition (optional)

Table 3: Service Requirements

5.2. Service Architecture

High-level service architecture	Type	Service Components	Description	Suppliers	TRL
	Enabling	Altmetrics service	This service offers an API, which allows customers to deposit the book DOI identifier and book landing page URL, and will search for publicly accessible metrics that match these, and send the results to the Metrics-API. Metrics include tweets, Hypothes.is annotations, Wikipedia	Ubiquity	8

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			references and Wordpress references.		
	Enabling	Metrics-API	This service houses all metrics collected by both the metrics drivers and the altmetrics service. A publicly-accessible API is provided to allow customers to fetch metrics for their books.	Ubiquity	8
	Enabling	Identifier Translation Service	This service holds all the known identifiers for a book. It serves to both identify a book, based on e.g. the URL or ISBN, as well as provide a standardised identifier to save any metrics against (which is used when querying the Metrics-API for metrics of that book).	Ubiquity	8
	Enabling	Altmetrics DOI	This is a helper service which queries the	Ubiquity	8

		registration Service	Identifier Translation Service, and registers the known DOIs and URLs of a book with the Altmetrics service.		
	Enabling	Sub-import CSV registration service	This is a helper service, which allows customers to provide a CSV file containing the identifiers of their books, which it reads and registers these values in the Identifier Translation Service.	Ubiquity	7
	Enabling	Cloud Hosting	Hosted in Google Cloud and maintained by Ubiquity. Metrics-API and Altmetrics Service; the RabbitMQ instance used to scalably process asynchronous tasks (a required system component).	Google	9
	Enhancing	Metrics Driver Wrapper	This service is installed on the customer infrastructure. It	Ubiquity	8

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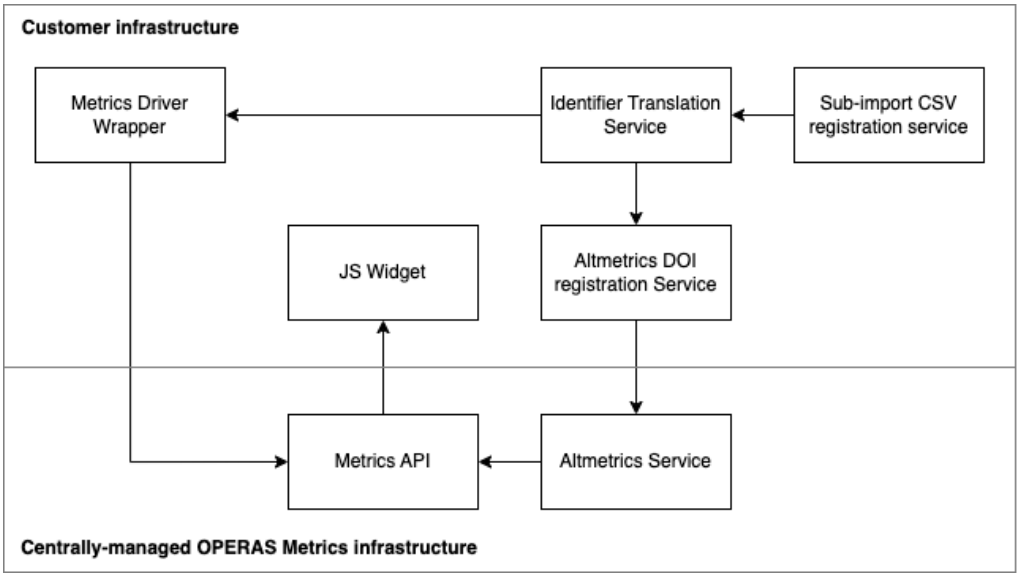
			houses the metrics drivers developed for the OPERAS Metrics project, and collects metrics for the customers' books, and sends these to the Metrics-API. Examples include usage metrics (views, downloads, etc) and CrossRef citations.		
	Enhancing	JS Widget	This widget can be installed on the customer's websites. It fetches metrics for a given book and graphs, and tabulates the results in a visually appealing way, with custom data representations for different metrics types - e.g. a map showing which countries different views and downloads are coming from.	Ubiquity	8

Technical service architecture



Service Dependencies

Service	Description	Organisation	Component Criticality	TRL
Crossref Citations API	Crossref provides detailed information about any works that have cited a book belonging to a customer's Crossref account - these are used to fetch citation metrics.	Crossref	High	9
Metrics driver	(example: the Crossref Citations API,	Various	High	7

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	sources (many)	described above) Each driver fetches metrics information from a data source specific to the driver and metrics type. The customer will generally need to house this data source (e.g. server access logs) or have an account with the service in question (e.g. Google Books).			
	Crossref Event Data API	This is an openly accessible API containing events recorded for works with a Crossref DOI, and is used	Crossref	High	9

		to fetch metrics information required by the altmetrics service.			
Monitoring	A combination of Google Cloud Logging and Monitoring is used to monitor different infrastructure components: • PostgreSQL DB memory, CPU and storage • Services and software components: CPU and memory • Load balancer: total number of API requests per minute • RabbitMQ: CPU, memory, storage				

Table 4: Service Architecture

5.3. Service Order Workflow

Step	Role	Description
1	Customer	Requests to join
2	Service Provider	Provides links to open source code repository, which includes Docker images, and documentation on how to install and configure all customer-side packages (e.g. Metrics Driver Wrapper)
3	Customer	Instals and configures customer-side packages
4	Customer system	Populates sub-import CSV to register new works in Metrics-API service
5	OPERAS Metrics system	Registers work, checks for Altmetrics via Crossref EventData, and posts these to Metrics-API
6	Customer system	Checks for metrics in external systems, checks for metrics in local system, packages and posts these to Metrics-API

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7	OPERAS Metrics system	Registers metrics against the work, exposes these via Metrics-API
8	Reader	Opens HTML page with book on Customer page
9	Customer system	HTML page includes JS metrics Widget, makes call to Metrics-API for metrics
10	OPERAS Metrics system	Provides metrics to JS Widget
11	Customer system	Renders metrics within widget
12	Reader	Sees metrics

Table 5: Service Order Workflow

5.4. Service Acceptance Criteria

Category	Acceptance Criteria	Critical	Achieved	Instructions
Functional and technical acceptance	Testing continues throughout the development process (Feb 2023-Oct/Nov 2023)	Yes	Yes	
	Initial releases of improvements are tested in Ubiquity's live environment (Feb 2023-Oct/Nov 2023)	Yes	Yes	
Service Level and Reporting	Report submitted in August 2023, updates in Oct/Nov 2023 on full completion.	No	Partially	
Customer and supplier related	Roll out updated drivers and widget to existing customers. From Oct/Nov 2023	Yes	Planned	

	Bring the OPERAS Metrics Service from beta to a full production service. From Oct/Nov 2023	Yes	Planned	

Table 6: Service Acceptance Criteria

5.5. Service Options

#	Name	Description
1	Full service	Customers supply data on all of their content and display metrics on their website.
2	Data analysis	Any user can query the API and access usage metrics for a given DOI or DOIs.

Table 7: Service Options

5.6. Service Requests

#	Name	Description
1	Metrics service	A publisher can request that the service be set up to collect data on their publications, and present this through the metrics widget on their website.
2	General information	Anyone can request further information on how the metrics are gathered and processed.

Table 8: Service Requests

5.7. Financial Structure

5.7.1. Costs

The following financial information is based on best estimates at this point in time. Ubiquity is able to continue maintaining the Metrics service for existing customers and its own users at no additional cost, but adding new customers will require an additional revenue mechanism.

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Item	Cost (PM or €)
Service Engineer	0.25 - 1.25 FTE (up to €115,988 annually)
Infrastructure	€41,520 annually

Table 9: Service Costs

5.7.2. Pricing Scheme

The below is a suggestion of how the service could be charged to customers, if centralised funding was not available. Ubiquity is happy to cover its own costs as an 'in-kind' expense.

Item	Price
Per customer	We propose initially splitting the costing evenly across all customers. This can then be refined in a subsequent period as we gain a clearer understanding of the difference in costs depending on the relative sizes of customers. Customers would be charged a one-off setup-fee of €2,416, and an annual fee of €2,317 (€866 is contribution to web hosting costs, and €1,451 is contribution to salary cost for developer maintaining the infrastructure).

Table 10: Pricing Scheme

5.7.3. Revenue Streams and/or Cost Recovery Measures

Revenue Source	Expected revenue (if applicable) Amount or a % of costs	Additional Info
Customers	€2,416 per customer one-time set-up fee.	This fee covers the time required to understand customer requirements, work with them to implement the code on their servers, and to troubleshoot the collection of their metrics.
	€2,317 per customer annually. 100% of costs.	We propose initially splitting the costing evenly across all

		customers. This can then be refined in a subsequent period as we gain a clearer understanding of the difference in costs depending on the relative sizes of customers.
Central funding	1-100%	Alternatively if any central funding is available via OPERAS, then this can be used to fully or partly fund the service.

Table 11: Revenue Streams and/or Cost Recovery Measures

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6. Service Transition Plan

6.1. Transition Plan

	Activities and timing	Responsibilities (RACI)	Progress report
Specification, negotiation and agreement	Continuing from HIRMEOS project, done in the course of OPERAS-PLUS	T5.2/WP5	COMPLETE
Development and procurement	Continuing from HIRMEOS project, done in the course of OPERAS-PLUS (Feb 2023-Oct/Nov 2023)	Ubiquity	ONGOING
Initial Testing	Testing continues throughout development process (Feb 2023-Oct/Nov 2023)	Ubiquity	ONGOING
Operation with early life support	Initial releases of improvements are tested in Ubiquity's live environment (Feb 2023-Oct/Nov 2023)	Ubiquity	ONGOING
Regular operation	Roll out updated drivers and widget to existing customers From Oct/Nov 2023	Ubiquity / OPERAS members using the service	TO DO
Communication	From Oct/Nov 2023	Ubiquity / OPERAS Communication team	TO DO

Table 12: Transition Plan

6.2. Supporting Projects

Project name	Related task(s)	Activity Description	Period of activity	Effort (PMs)	Status
OPERAS-PLUS	T5.2	Bring the OPERAS Metrics Service from beta to a full production service.	Sep 2022 - Aug 2023	18	COMPLETE
BAD Project[4]	Production of a complementary service	Books Analytics Dashboard (BAD) project is producing a dashboarding service for publishers. The goal of OPERAS and Ubiquity is to coordinate and ensure the services are interoperable, with no duplicated functionality.	Apr 2022 - Apr 2025	Best effort basis, with periodic meetings to check on alignment.	ONGOING

Table 13: Supporting Projects

6.3. Final Service Phase Check-list

Service phase	Responsible	Description	Condition met[5]	Notes / Evidence	Verification
Alpha Min. maturity = TRL5	The Alpha and Beta phases of the service were attained during the HIRMEOS project.				

[4] https://openknowledge.community/projects/bad-project/
[5] At the time of writing, with the expectation that all are completed by task conclusion

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Beta Min. maturity = TRL7					
Production Min. maturity = TRL8	Ubiquity	Code refactoring	90% complete	Upgrade from Python 3.5 to 3.10 nearly complete - Python 3.5 was past 'end of life' and no longer officially supported, so 3.10 adds stability, security, and makes it easier to develop on. There were lots of code libraries that needed to be updated, some of them relied on further open source libraries (not managed by OPERAS/Ubiquity) that did not natively support Python 3.10	All code is available on Github[6]

[6] https://github.com/hirmeos

				and required some re-writing of code to replace those libraries.	
	Ubiquity	Identification of additional drivers	75% complete	Direct requests for new drivers have been received. A community consultation for any further requirements is currently underway.	
	Ubiquity	Development of additional drivers	66% complete	Work has started on incorporating the metrics drivers into the 'metrics driver wrapper' - this allows the drivers to be managed and run as a single service, instead of multiple separate disjointed services; code	

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				running across all drivers is abstracted into a single library, rather than being duplicated in each driver, making the code easier to maintain; data handling is improved (using local database, rather than multiple CSV files); the simpler packaging and configuration means setup and installation is far more scalable (e.g. will not require direct in-person support from OPERAS). We have also created a new metrics driver for interpreting	

				server logs in the Google Cloud / Kubernetes environment.	
	Ubiquity	Production of documentation	50% complete	Documentation is being prepared, but is yet to be collated and finalised.	
	Ubiquity	Development of improved display widget	95% complete	The Metrics display widget has been significantly improved. It is now more adaptable and can be embedded on any HTML web page with ease. Styling options have been expanded, giving as much control over CSS as needed, along with more detailed customisation options for	

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				each graph on a per-graph basis. The widget has been upgraded to support multiple languages, which works great with its additional accessibility improvements. Multiple metrics can also be combined into either a single cumulative graph, or a stacked graph. A final design update will be carried out to present metrics from any new drivers appropriately.	
	Ubiquity	Improved public metrics descriptions	Not yet started	This final step will be completed along with the	

				documentation.	

Table 14: Supporting Projects

7. Current Service Overview

The Metrics service currently serves a total of 34 publishers. As many of these publishers are on the Ubiquity platform at this point in time, there is a unique economy of scale where Ubiquity is managing these in bulk.

Europe and UK	Rest of World

• EKT
• OAPEN
• Open Book Publishers
• Open Edition
• Quae (in setup)
• Ubiquity platform:
  ○ Aberdeen University Press
  ○ Cardiff University Press
  ○ De Montfort University Press
  ○ Finnish Literature Society
  ○ Helsinki University Press
  ○ HumanitiesConnect
  ○ KIT Scientific Publishing
  ○ Kriterium
  ○ LSE Press
  ○ LSHTM Press
  ○ Medizinisch Wissenschaftliche Verlagsgesellschaft
  ○ Modern Academic Publishing
  ○ Radboud University Press
  ○ Scandinavian Military Studies
  ○ Stockholm University Press
  ○ Ubiquity Press
  ○ Universitetskanslersämbetets publikationer
  ○ University of Westminster Press
  ○ White Rose University Press
  ○ Winchester University Press
	• Ubiquity platform:
	  ○ Aperio
	  ○ Gonzaga Library Publishing
	  ○ Indian Institute of Technology - Knowledge Sharing in Publishing
	  ○ Latin America Research Commons
	  ○ Levy Library Press
	  ○ Penn State University Press
	  ○ University of California Press
	  ○ UTS ePress
	  ○ VT Publishing

The current Metrics service on Google Cloud infrastructure, and has been fully refactored to Python version 3.10. This ensures the fully scalable, performant and secure operation of the service.

The Metrics service collects usage data through a series of source-specific drivers, which run as independent modules either locally in the customer environment or

centally, and submit their data to the central metrics database via API. The metrics and the sources they are obtained from are:

Metric	Source(s)
Customer environment	
Abstract views	• Server Access Logs (non-Google Cloud) • Server Access Logs (Google Cloud) • MATOMO
Book or chapter reads	• Server Access Logs (non-Google Cloud) • Server Access Logs (Google Cloud) • MATOMO • Google Books • JSTOR • World Reader • Open Edition
Book or chapter downloads	• Server Access Logs (non-Google Cloud) • Server Access Logs (Google Cloud) • MATOMO • JSTOR • World Reader • IRUS UK • Open Edition • Unglue.it
Citations	• Crossref cited-by
Central OPERAS environment:	
Annotations	• hypothes.is
Wikipedia references	• Crossref Event Data

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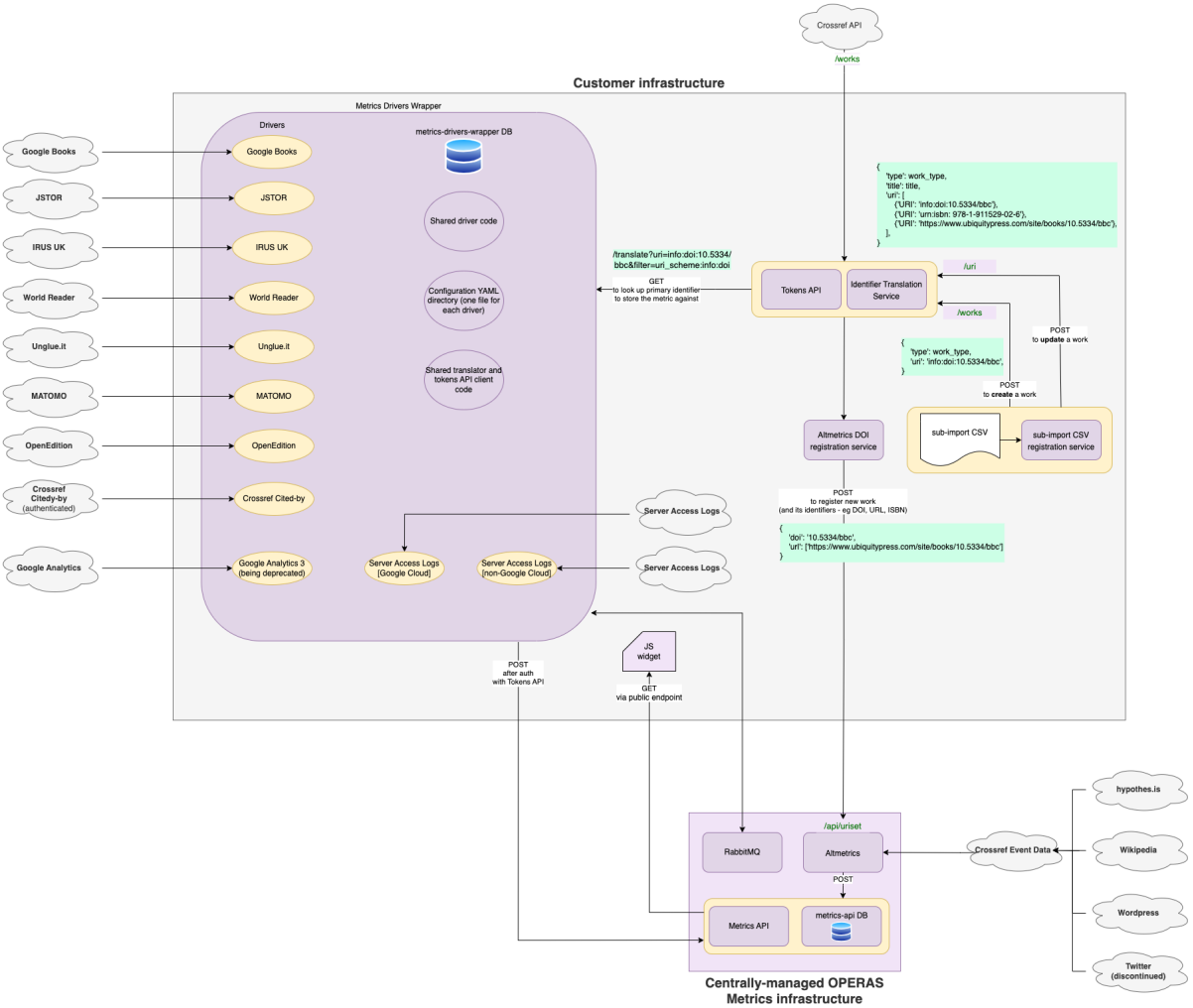
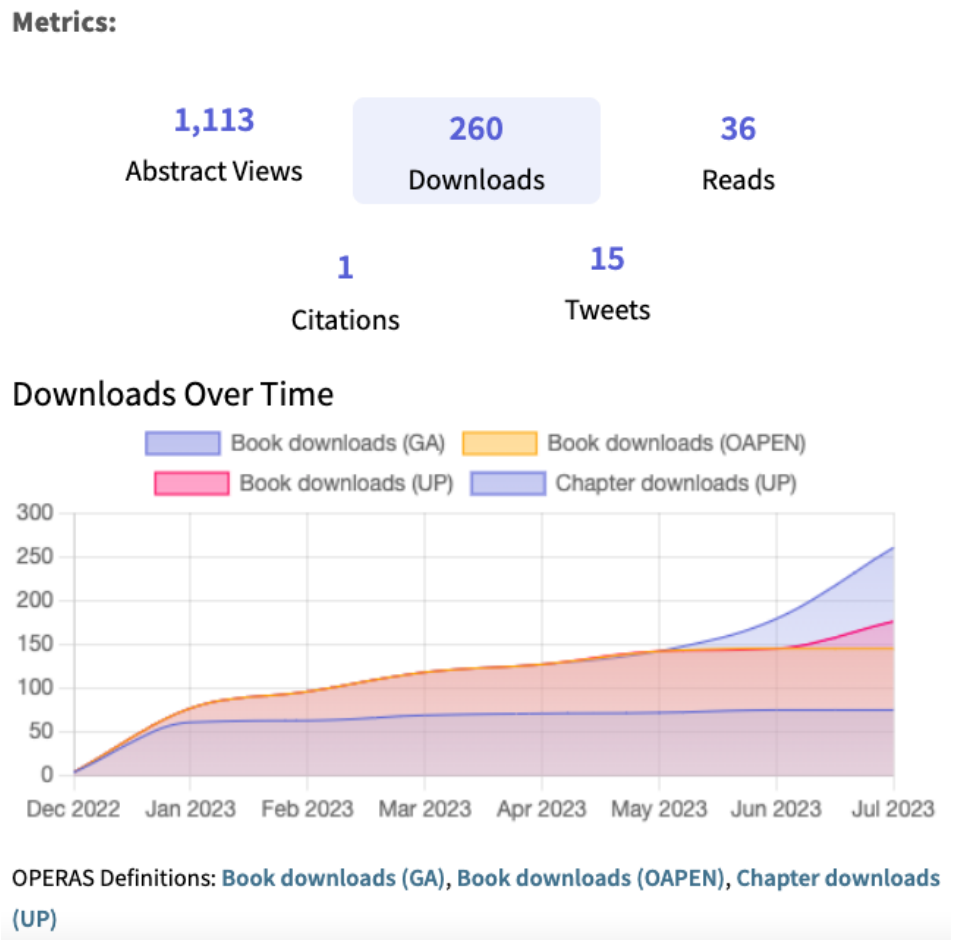
Wordpress references	• Crossref Event Data
Tweets	• Crossref Event Data (historic only, deprecated due to loss of Twitter/X API access)

The metrics are then presented on the publisher website using a javascript widget. The widget is also used by the GoTriple content aggregation service, displaying metrics for items from all of the above publishers. Such content aggregators are a potential additional key user of the service, in addition to publishers.

The architecture of the service can be depicted as follows:



Example of OPERAS Metrics Widget on a book page on Ubiquity Press[7]; showing total numbers of each metric, and a stacked graph of the total downloads on the publisher website and the number of downloads of one of the mirror indexes (OAPEN):



Note that the website user can toggle-off the chapter downloads by clicking on them in the OPERAS Metrics Widget, so that they only see the stacked graph of full-book downloads:

[7] https://doi.org/10.5334/bct

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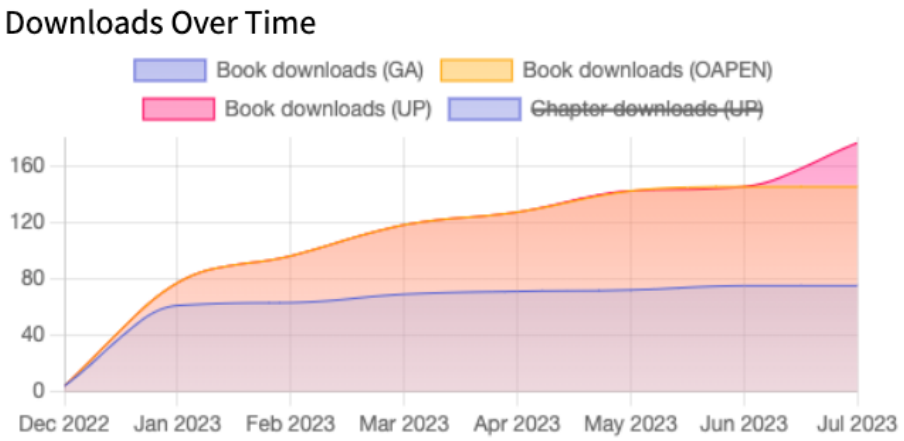
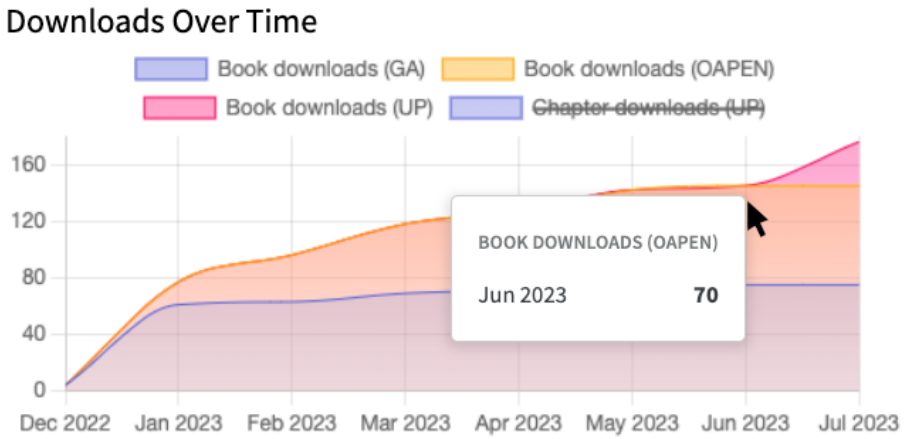


As can be seen, there are a significant proportion of downloads on each platform, which shows the benefit of indexing and distributing content widely.

A user can hover-over the graph to see the numbers for that date and metric in a pop-over - eg here the user is hovering over 'Book downloads (OAPEN)' in November 2021:



Note how the OPERAS Metrics Widget enables a user to get a more complete picture of the total number of book downloads, because there were a similar number of downloads on the publisher platform as there were on OAPEN (ie a user getting information from just one of those platforms would only have half the picture).

8. Conclusions

With OPERAS-PLUS Deliverable 5.2, the operationalisation of the service is nearing completion. The service will provide improved metrics for open access publications, to the benefit of authors and publishers, particularly in SSH disciplines, as well as university administrators (see section 3).

While work on refactoring code, improving the public view of the service, adding functionality and documentation has all progressed well and is nearing completion with a projected 2-3 month overrun. It is still fully expected that the work package will still be delivered within the timeframe of the larger project, and within budget.

With 34 customers using the platform, including several high-profile presses, we believe that the service is well tested, and this work will result in robust, scalable and sustainable service, which can be delivered at an affordable price for customers in the SSH sector and beyond.

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