



Platform development and maintenance

Report of the efficiency evaluation of the platform

D6.5

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Background

About EnTIRE

The areas of Research Ethics and Research Integrity (RE+RI) are rapidly evolving. In the EU and internationally, new legislation, codes of conduct and good practices are constantly being developed. New technologies, complex statistical methods, pressure to publish and obtain grants, and growing emphasis on stakeholder driven science increase the complexity of conducting science. In this complex and dynamic environment, it is not easy to identify the correct rules and best tools for responsible conduct of research.

The EnTIRE project aims to create an online platform (The Embassy of Good Science) that makes RE+RI information easily accessible to the research community. The platform will foster uptake of ethical standards and responsible conduct of research, and ultimately support research excellence and strengthen society's confidence in research and its findings. Our vision is to create a dynamic online Wiki-platform, owned by the RE+RI community, that will make the normative framework governing RE+RI accessible. The platform will adopt open source and open data approaches. By applying novel techniques for data collection, presentation, and comparison, users will navigate quickly and intuitively to appropriate content.

The Wiki approach for the platform software

The Wikimedia Foundation, Inc. (WMF) is a non-profit organization founded in 2003 by Jimmy Wales. It hosts sites such as Wikipedia. Wikipedia is an international online project which attempts to create free encyclopedias in multiple languages. The operation of Wikimedia depends on MediaWiki, a free and open-source wiki software platform.

Semantic MediaWiki (SMW) is a free, open-source extension to MediaWiki. Semantic MediaWiki can turn a wiki into a powerful and flexible knowledge management system. All data created within SMW can easily be published via the Semantic Web, allowing other systems to use this data seamlessly¹. Adapting the Semantic MediaWiki platform using expertise of the stakeholders will result in a dynamic platform which will contain numerous resources for the RE+RI community. The ability of linking related articles together will allow the novice to quickly find key information with minimal effort – including information which he might not have been aware of to be of relevance in the first place.

¹ https://www.semantic-mediawiki.org/wiki/Semantic_MediaWiki

About Work Package 6 “Platform development and maintenance”

Work package 6 is responsible for meeting overall objective 3: to develop a user-friendly platform, including a website and online resources, to facilitate access to RE+RI knowledge and experience and support application in research and evaluation, thus fostering uptake of ethical standards and responsible conduct of research.

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WP sub-objectives include to:

1. Develop and employ the platform.
2. Evaluate and adapt the platform together with stakeholders.
3. Develop the tools for performing data mining and semantic analysis on the full information content.

List of Deliverables

	Title	Due date	Delivery date
D6.1	EnTIRE platform <i>The creation of the software stack for the back-end of the platform.</i>	M12	2018-04-30
D6.2	Publication of the adapted platform software in a public open source software repository <i>The publication of the software stack for the back-end of the platform. The software stack is available via https://github.com/the-embassy-of-good-science.</i>	M12	2018-04-30
D6.3	Report of the evaluation and graphical user interface of the platform <i>Report of the evaluation and graphical user interface of the platform making use of an evaluation of all WPs.</i>	M23	2020-09-30
D6.4	Publication of the extensions to the platform in a public open source software repository <i>Publication of the extensions to the platform in a public open source software repository.</i>	M40	2021-01-20
D6.5	Report of the efficiency evaluation of the platform <i>Report of the efficiency evaluation of the platform. *Extended</i>	M53*	2021-10-31



List of Tasks

	Title	Timeline	
T6.1	Development of the platform	M1	M12
	<ol style="list-style-type: none"> 1. Initiate a non-profit organisation and register the applicable domain name (<i>OpenEthics.eu</i>) in its name. 2. Host and deploy the adapted Wiki-platform once the project starts. 3. Provide documentation of the hosting, deployment and software development to ensure transferability. 4. Develop a custom graphical user interface aimed at maximizing ease of use. 5. Adapt the platform to allow for online focus groups on the platform. 		
T6.2	Content structure and organisation of the platform	M12	M48
	<ol style="list-style-type: none"> 6. Support the consultation of stakeholders in achieving the appropriate information content structure (e.g. database and data models) for the website. 7. Design the platform structure in line with the normative framework developed as developed in WP 2. 8. Make the platform the primary place to create, edit and review the content on the platform. 9. Establish a system where different types of users gain appropriate types of permissions (to create, to edit, to review and to curate information content) on the platform. 10. EUREC will find assist in finding a way for the ENTIRE platform to be technologically linked with the ENERI platform 		
T6.3	Publish open source software modification on online repositories	M12	M48
	<ol style="list-style-type: none"> 11. Publish and make freely available all adaptations and developments made to the platform freely available, in an open source repository, for future (e.g. EU funded) projects to benefit from. Push back all relevant modifications to the platform to (Semantic) MediaWiki. 		
T6.4	Platform adaptation to the feedback	M30	M36
	<ol style="list-style-type: none"> 12. Adapt the custom graphical user interface to maximize ease of use based upon the evaluation from stakeholders. 		
T6.5	Develop and employ a tool to search in and compare relevant topics across countries on the platform	M30	M48
	<ol style="list-style-type: none"> 13. Develop an extension to the platform to search through all content available on the platform. 14. Develop an extension to the platform to perform data mining and/or semantic analysis on the content of the platform. 15. Develop a 'bird's-eye view' styled dashboard where relevant RE+RI topics can be compared across Europe and where content can easily be extracted by users live on the platform. This ensures open access to data. 		

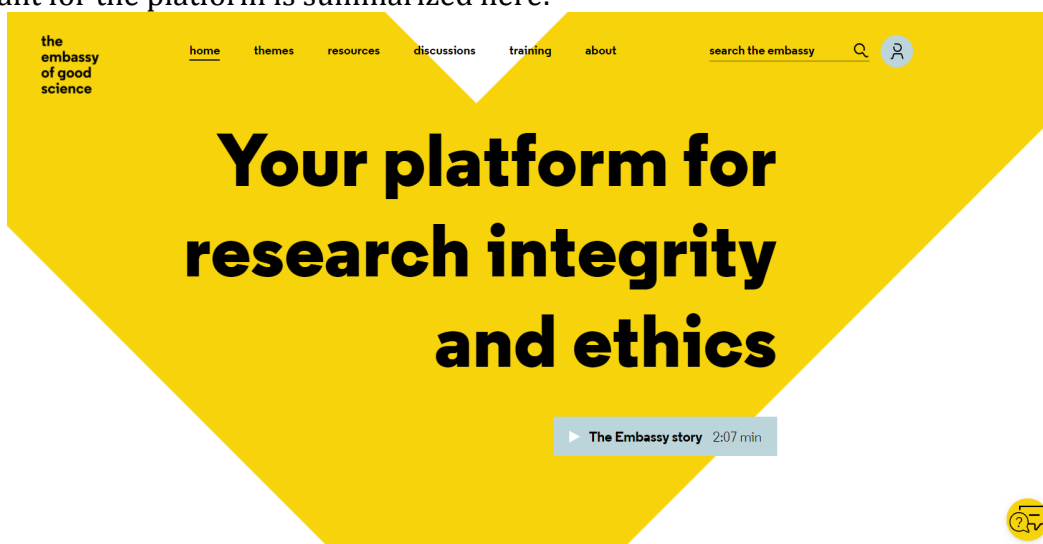
Platform adaptation to feedback

Evaluation of the platform

We have evaluated the platform using data which has been gathered on the servers. We do not actively track our users and rely on user reports (user-initiated feedback) and data from outside providers (such as Google) on the use of the platform.

User initiated feedback

In Deliverable D6.3, we elaborated on how changes were made in response to feedback. Since the third quarter of 2021, a new option on the platform became available for *continuous evaluation* of both the content itself, and the platform. By pressing a small button, users can leave feedback on their own initiative. It's a relative new feature and so far, not many users have used it (4). Due to the small sample size, no conclusions can be drawn. So far, positive reviews were acquired. The data of the evaluation which is relevant for the platform is summarized here:



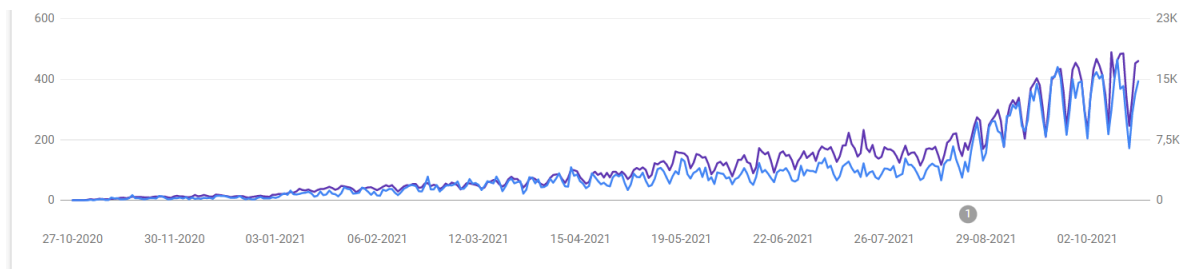
Users can evaluate the platform by pressing the yellow button in the bottom right corner.

The platform is easy to use and navigate.
1 (completely disagree) to 5 (completely agree)

	Frequency	Percent	Valid Percent	Cumulative Percent
neutral	1	25.0	25.0	25.0
agree	1	25.0	25.0	50.0
completely agree	2	50.0	50.0	100.0
Total	4	100.0	100.0	

Visibility, Analyses and Traffic from a common Search Engine

Since the switch to our wiki-enabled Semantic MediaWiki platform in October 2020, almost 34 thousand users found The Embassy through Google. Currently, around 375 people visit the Embassy on a daily basis (View in Purple, Clicks in Blue, Figure below). In total, The Embassy has had an appearance in over 1.5 million searches of people, worldwide. This number was reached after a year with continuous growth. This signifies that The Embassy is indexed properly in Search Engines.



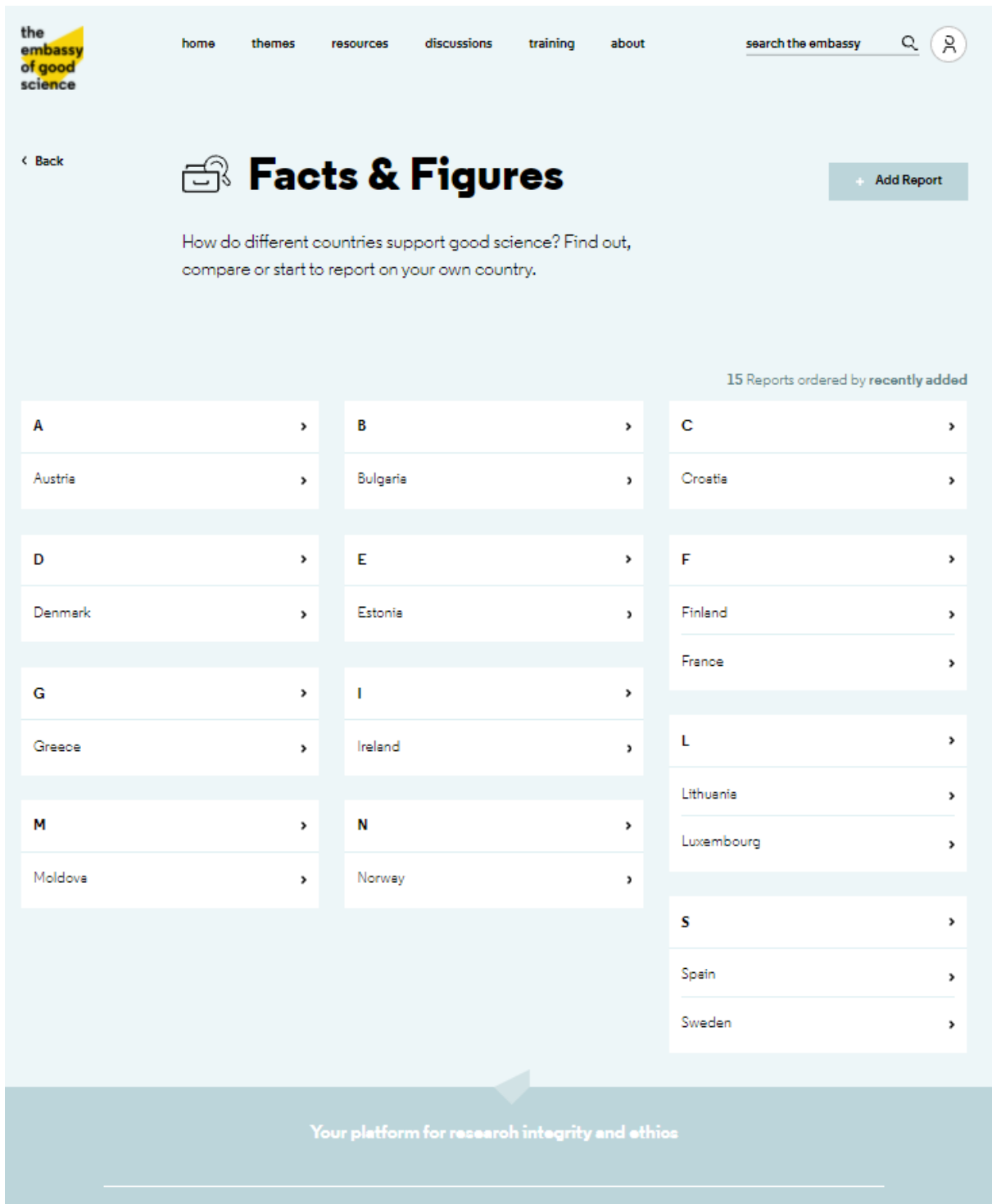
Points to improve were identified by The Google Search Console. The Google analyses shows that on Mobile the 'Instruction pages' feature text sizes that are too small for mobile, have clickable elements too close together and have content that is broader than the screen size.

Develop and employ a tool to search in and compare relevant topics across countries on the platform

Development of Country Report Cards

Overview

Country report cards were developed to report on the status of science in countries. In order to quickly get an overview of different countries, a new overview page was developed inline with the rest of the platform (see Figure below). A filter function makes it possible to arrange countries on regions (e.g. only select countries within Europe).



the embassy of good science

home themes resources discussions training about search the embassy

< Back

Facts & Figures

+ Add Report

How do different countries support good science? Find out, compare or start to report on your own country.

15 Reports ordered by recently added

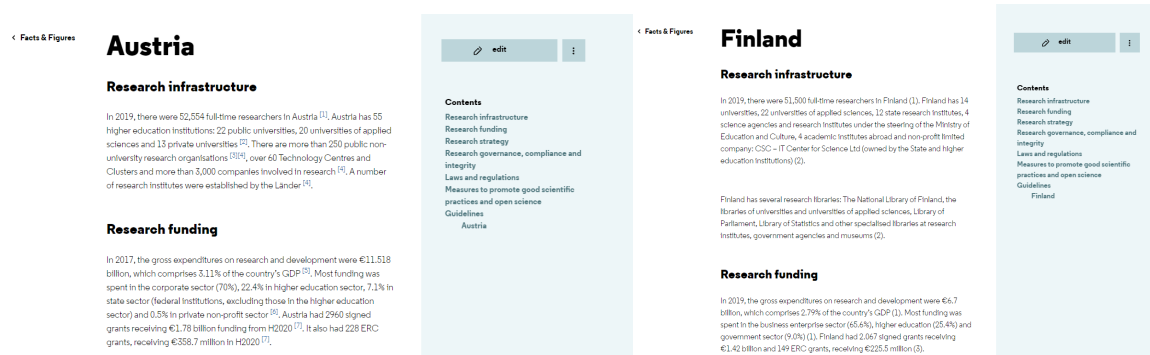
A	B	C
Austria	Bulgaria	Croatia
D	E	F
Denmark	Estonia	Finland
		France
G	I	L
Greece	Ireland	Lithuania
		Luxembourg
M	N	S
Moldova	Norway	Spain
		Sweden

Your platform for research integrity and ethics



Compare individual countries

The reporting on every country follows the same structure. This allows everyone to compare important facts and figures across countries. Because all data is tabulated, using The Embassy's API, researchers can also automatically retrieve parts of the page of multiple countries at the same time, to support an in-depth review.



An example on how different countries can be compared.

Automatic linking of relevant data

Data which lives elsewhere on The Embassy can be automatically retrieved in these report pages. To improve the amount of guidelines, users can also add a new guideline within this page by clicking 'Add a Guideline'.

Guidelines

Finland

A total of 3 guidelines were found. [Add a Guideline.](#)

- ▶ Declaration of Helsinki (July 2021)
- ▶ Finnish Guidelines on Doctoral Supervision and Review (October 2020)
- ▶ Finnish Guidance on the Responsible Conduct of Research and Procedures for Handling Allegations of Misconduct (October 2020)

Andrijana Perković Paloš contributed to this report. Latest contribution was **Oct 15, 2021**

Example of guidelines which have been uploaded separately on The Embassy but were linked automatically.

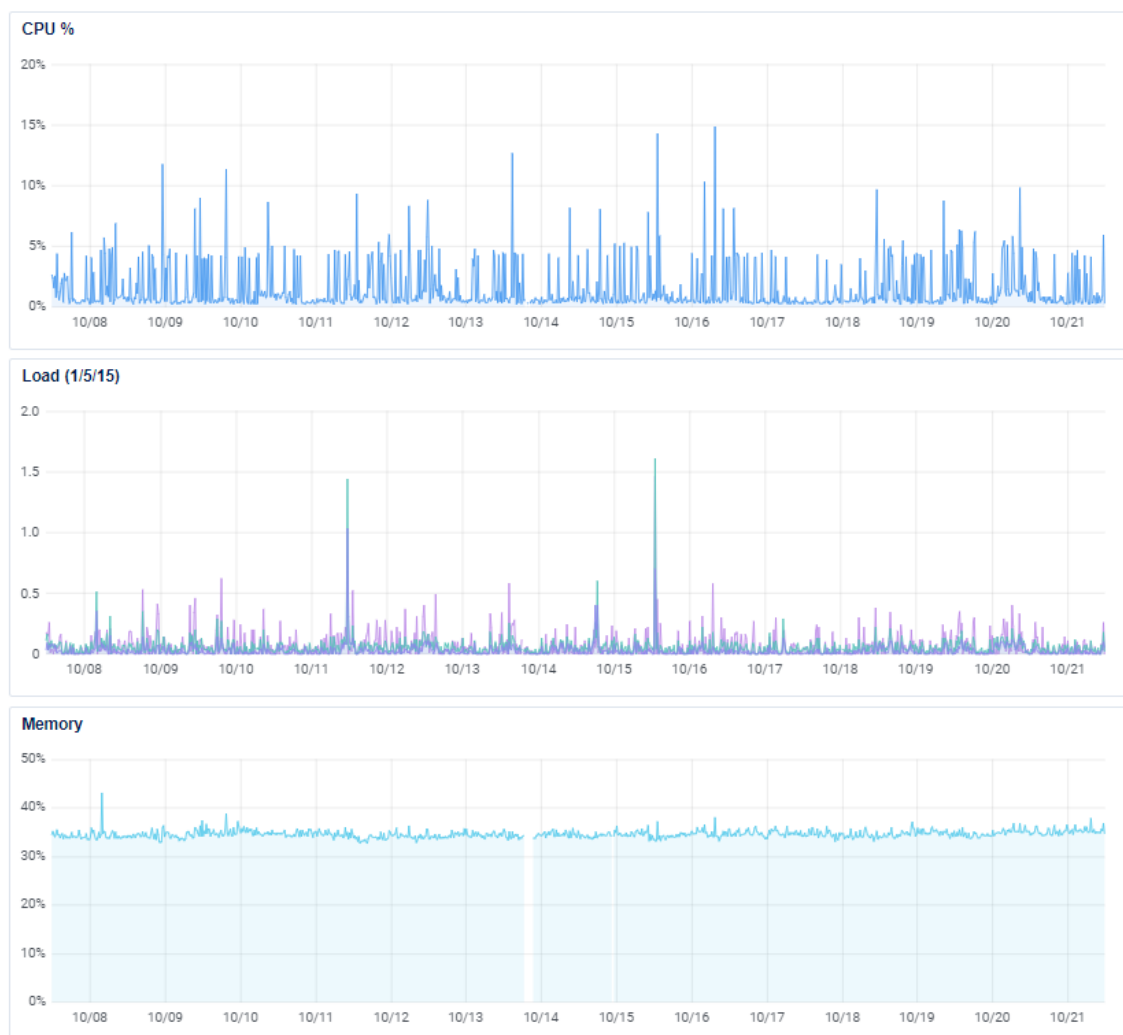


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Platform performance

Server performance, stability and downtime

The server performed well since it has been started. Two short down-time incidents have been reported due to the overconsumption of memory. These were fixed within 48 hours. No security breaches have been found. As can be seen in the Figure below, the server's CPU is mostly loaded between 1% and 8%, and the memory consumption has stabilized to around 35% - indicating it is safe and effective.



The CPU usage, Server Load and Memory consumption from 10/08 to 10/21.

Speed of platform access, filtering & data retrieval

Speed of platform access and rendering

Visiting most page on The Embassy is very fast (server time < 50ms). In cases of large dataset filtering, for example by filtering 400 Cases, the server response is slowed down. Even in these cases, the response typically is around a tenth of a second. In comparison, the time it takes for the user to build up the page is longer. The server does not impede the user experience. Rendering the page on the browser is typically also fast, between 0.6 and 1.4 seconds.

Action	Server time	User time
Visit homepage	34 ms	620 ms
Visit Themes overview	37 ms	1024 ms
Apply a Theme filter	37 ms	676 ms
Visit Resources (Cases)	77 ms	1173 ms
Apply a Cases filter	103 ms	1468 ms

The [Largest Contentful Paint \(LCP\)](#) metric reports the render time of the largest image or text block visible within the viewport, relative to when the page first started loading. As indicated by Google, The Embassy's LCP can be improved to further improve the user experience. The LCP for Resources on The Embassy was 3.3 seconds, and 3.8 seconds for Themes. Ideally, for optimal mobile experiences, these should be improved to 2.5 seconds.

Latency

The server is located in Europe and its latency is typically around 11 ms from within The Netherlands – which is normal. So far, no Denial of Service Attacks have been known to limit its response time.

```
-- PING embassy.science (134.209.89.100) 56(84) bytes of data. ---
64 bytes from 134.209.89.100: icmp_seq=1 ttl=54 time=11.0 ms
64 bytes from 134.209.89.100: icmp_seq=2 ttl=54 time=11.0 ms
64 bytes from 134.209.89.100: icmp_seq=3 ttl=54 time=10.9 ms
64 bytes from 134.209.89.100: icmp_seq=4 ttl=54 time=10.7 ms
```

A server latency speed test

Speed of external data retrieval via the API

All the data on The Embassy can be retrieved using a standard API. Retrieving the 500 latest entries ([JSON export](#)), takes the server 33ms. More than 7000 edits have been made, and over 750 content pages are available and the response time remains sufficient.





Further future improvements

Extending the amount of semantic data

At the moment the Semantic MediaWiki stack is used to catalogue, edit and connect different types of content on the platform. Automatic listings are created and changes in one part of the platform automatically change related content elsewhere. Extending this feature further on The Platform would decrease the maintenance of content further. Initial sketches have been made to allow users to annotate data semantically, in the visual editor of Semantic MediaWiki. Future developments are needed to implement these plans.

