Coordinated Research Infrastructures Building Enduring Life-science services
- CORBEL -

Deliverable D5.1

Report on existing user access models and regulatory access policies identifying common elements

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Content

Executive Summary

The ESFRI landscape includes fourteen infrastructures and several e-infrastructures in the health and food area. These cover vastly different structures and capabilities, but all provide access of some type to the biomedical sciences communities in Europe and, increasingly, globally.
A major objective for the ESFRI Roadmap is to identify synergies between their infrastructures as well as any related regional and national facilities that integrate their services. This raises a major challenge to identify mechanisms that enable integration for user access, for service provision, for implementation of standards, for common practises and regulatory processes.
The e-infrastructures bring existing ICT services that are used by research infrastructures and related projects and their integration relies on the co-design and development of new horizontal solutions that enable cross-disciplinary sharing.
The aim of WP5 is to develop a common access framework that facilitates user access to services and resources across the RIs in the biomedical fields.

Project objectives

With this deliverable, the project has contributed to the following objectives:

a) Identified existing user access models and documented them
b) Identified common elements of the access models
c) Implementation of a pilot common access solution trialled in the CORBEL WP4 Open Call for cross-RI projects

Detailed report on the deliverable

Background

This report follows a survey done with the objective of collating different user access models and service provisions provided by the participant research infrastructures of CORBEL. The objective of this report is to identify the diversity of access methods and ascertain the commonalities among different research infrastructures. This will help in creating a shared user access model enabling cross-ESFRI biomedical research.

Description of Work

The survey

The first task was to understand the service workflow for each of the research infrastructures involved. A survey was commissioned in 2015 and responses collected from

ten participating infrastructures (see Appendix A). Three infrastructures did not complete the survey.

Survey results

Data from the survey responses identified areas where the functions of the different RIs overlap. Figure 1 indicates the number of research infrastructures registering each function. All responding infrastructures provide the key services related to the provision of access: to instruments, data/metadata, software/tools, expertise.

The data show significant overlap between RI functions, although some are unique to certain RIs. We suggest that functions that are performed by more than 7 RIs could be modelled into a common user access framework. Elements falling above this threshold occur in all four function groups and provide some expectation that a common shared user model is possible. However, while some elements indicate a common process step, the scores mask significant differences in procedure. For example, Ethical review is undertaken by most RIs, but while this is a key service by EATRIS and ECRIN, other RIs expect the applicant to have already obtained ethical clearance for work proposed.

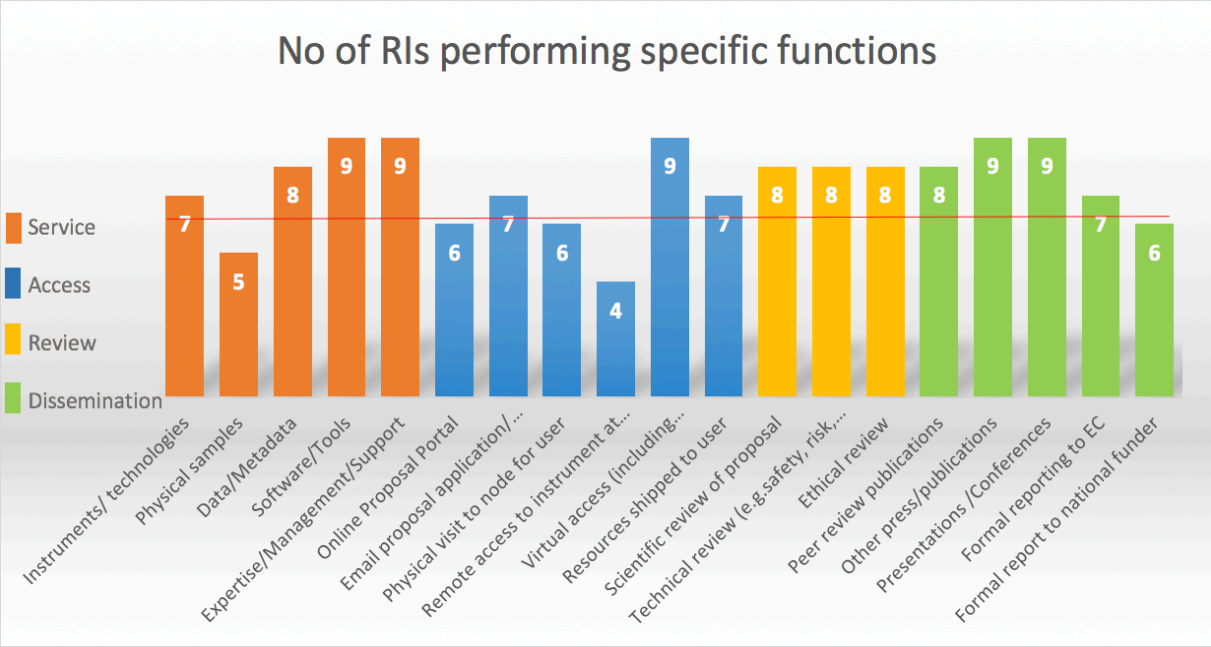

Figure 1: Functions provided by RIs versus the number of RIs providing them. The red line denotes the line above which the function is denoted as common between RIs

RI infrastructure: mode of access

The BMS Research Infrastructure landscape represented in CORBEL is a varied one ranging from Clinical studies to in-silico modelling and the resources provided range from bio-banking samples to consultation and regulatory guidance.

All research infrastructures in CORBEL provide access to instruments/technologies through their partner nodes. ELIXIR and ECRIN are focussed on data technology and clinical trials regulatory support respectively. Physical sample access is provided by BBMRI, INFRAFRONTIER, EMBRC and MIRRI (samples include microorganisms, mouse models, marine model organisms and human bio banking samples) to approved researchers. Almost all RIs provide access to software or tools and expertise or advice. Access to specialist expertise is a cornerstone of access provision that is largely implemented through the RI nodes but can be managed in some cases via the Hub (Figure 2).

Most RIs provide physical access to the node (or facility/platform) for users. Four of nine infrastructures provide remote access to instruments, although all provide data or software resources via a virtual route. This is slightly at odds with the outcome reported from the Workshop "Future perspectives for research infrastructures advanced communities" (European Commission Research and Innovation Report, 27 Jan 2017) that reported that 30% of infrastructures found virtual access provision not relevant. However, the EC report covered infrastructures in all sectors, so our data indicate the specific value of virtual access to the biomedical science sector, also recognising that this is very common practise in this sector.

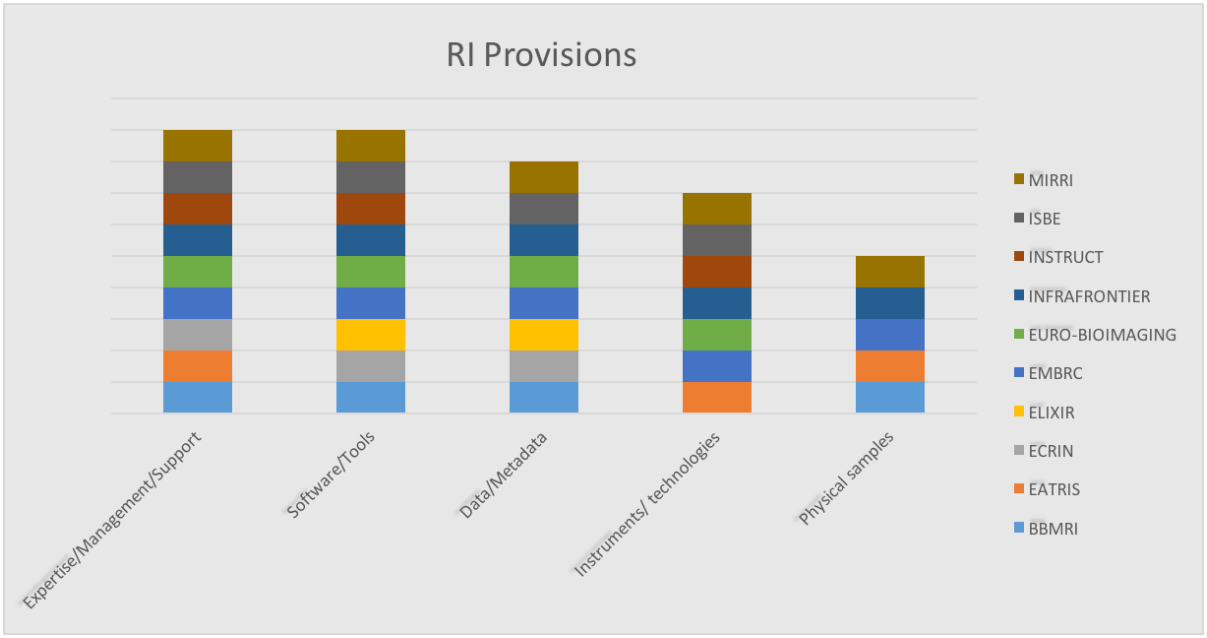

Figure 2: Types of resources provided by research infrastructures. Overwhelmingly, most RIs provide expertise, software tools and access to data, to their users

Virtual access is enabled through the public domain or after an authentication step. Through virtual access, the research infrastructures provide data sets, software tools, enable access to cloud compute capacity, online catalogues etc. Movement of data is unrestricted in the case of ELIXIR, but storage and movement of sensitive data e.g. for (BBMRI or ECRIN) are closely regulated through non-disclosure and material/data transfer agreements (MTAs/DTAs).

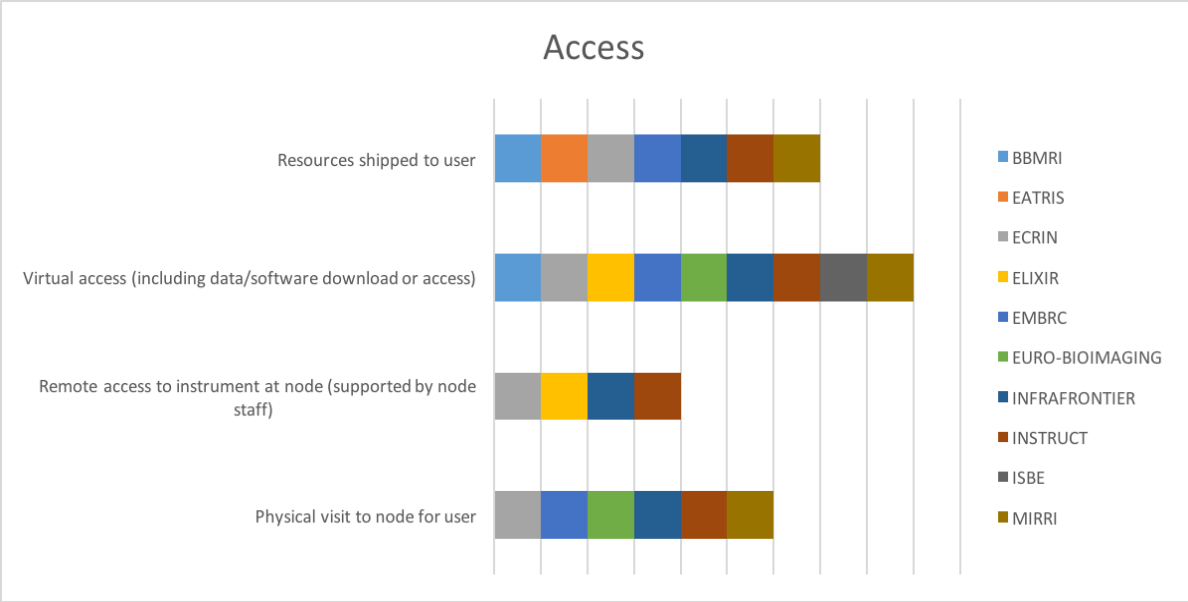

Figure 3: Alignment of access models across the different RIs. Note that Virtual access to research infrastructure is provided by most RIs

The CORBEL MIUF Survey was undertaken as part of CORBEL WP3 to survey medical user communities and users of RIs about the services available through research infrastructures, their quality and communication strategies.

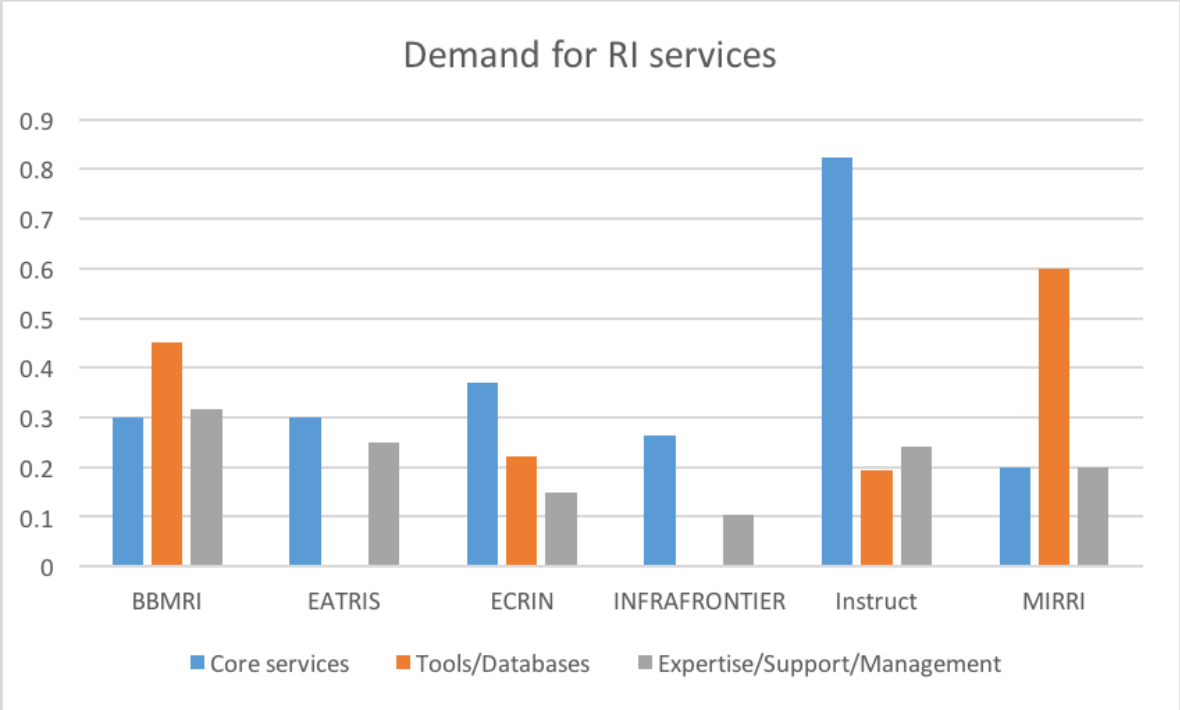

Figure 4: Demand for research infrastructure services as identified by the WP3 MIUF Survey done in June/July 2016 among mostly European biomedical scientists. Note: the only RIs with at least 5 individual respondents per RI represented (taken with permission from the WP3 survey data)

The survey had 535 respondents, 88% of which were academics from different areas of biomedical sciences. The survey responses confirmed the substantial demand in the medical/scientific community for expertise, management and support, training, consultancy, software and tools provided by different RIs. These results are very much indicative of good uptake of the types of resources provided
by research infrastructures identified by the current survey and confirm the need for a common access model that will facilitate integrative use of RI services.
Further, the survey established that technical competence and expertise and the access to instruments, technologies, samples and materials were the key drivers for the model.

Existing systems in use by RIs:

Online access proposal management

Most research infrastructures manage proposals online. Project proposals submitted to the research infrastructures includes requests to access physical machines and resources, access data/software and computing resources or receive physical samples. The types of proposal systems in use and the degree of manual handling vary amongst the RIs. Most RIs also use email applications or direct interactions with nodes/hubs as a communication channel with users and for special applications. ECRIN and ISBE do not use an online proposal system, neither does MIRRI.

Reviewing procedures

All RIs, excluding ISBE and ELIXIR, undertake a review of proposals submitted for access, using internal and external reviewers for both scientific and technical reviews. At ELIXIR, most resources are free to access and do not require prior review unless sensitive data is involved or there is request for access to hardware, nodes or data. In these cases, an Access committee reviews the proposal. ECRIN and Instruct have independent portal based applications that handle the process of multiple reviews, but at the time of undertaking this survey, most RIs were reliant on email and other communication methods for reviews and their coordination. BBMRI reviews are handled by the individual biobanks. Since the completion of this survey, EMBRC has both implemented tailored versions of the Instruct ARIA proposal system to manage their access application and review process, and Euro-BioImaging has made a decision to do the same. The CORBEL WP4 Open Call also implemented the ARIA system to manage the proposal process.

Dissemination and reporting

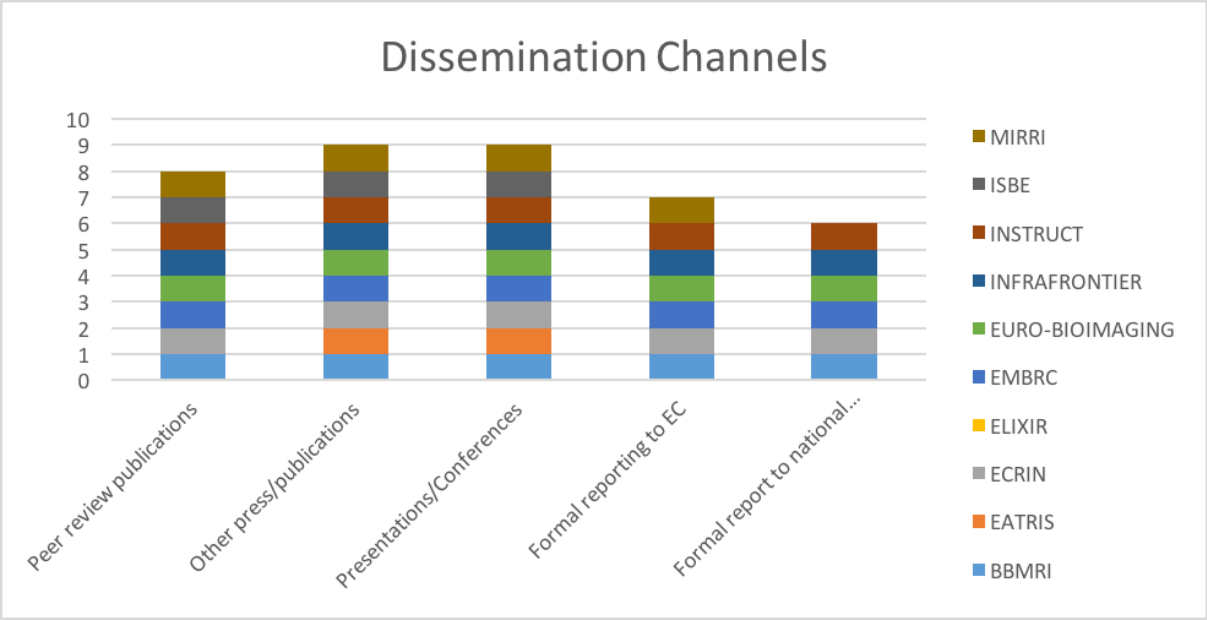

Figure 5: Dissemination channels encouraged by RIs to acknowledge and report access

Dissemination of access information is essential to maintain demand for the services provided through research infrastructures and also for reporting to the funding agencies. Most use the conventional methods of presenting information at conferences, on websites and in publications. All RIs require users to acknowledge their RI affiliations in publications as part of the access criteria. However, it is difficult to ensure 100% observance of this requirement. Most RIs also report to funding agencies, sponsors, institutional bodies and other stakeholders. Of the RIs involved in CORBEL, Instruct has online systems that facilitate the generation of reports.

Data collected by the WP3 survey identified that the best means of dissemination and communication of RI information is via participation at scientific conferences and publication in the scientific literature.

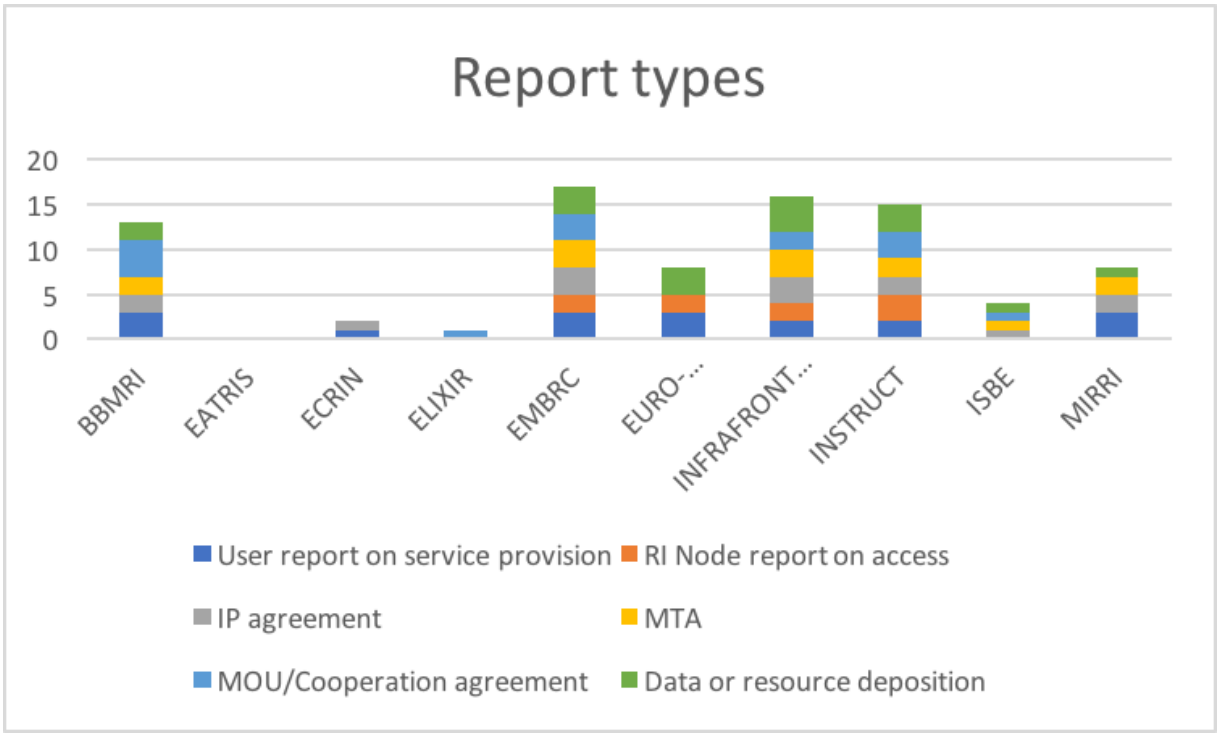

Figure 6: Different report types produced by RIs post access. Note that some RIs do not need any reports (EATRIS, ELIXIR) and some require only on a case by case basis (ECRIN)

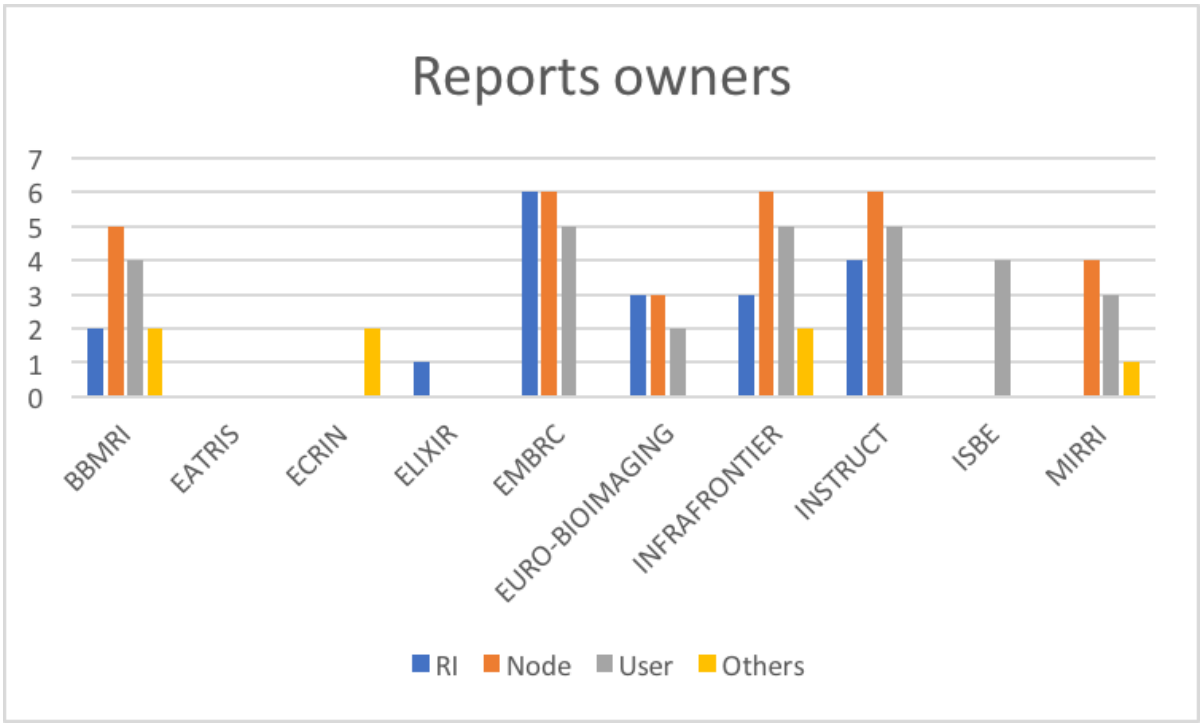

Figure 7: Detailed information on who produces reports. Note that some RIs do not need any reports (EATRIS, ELIXIR) and some require only on a case by case basis (ECRIN)

Cost of accessing research infrastructures

The survey collected information on which RIs contributed to the costs of providing access to researchers. Most RIs charge users (full, partial or capped costs) for access to the RI nodes. BBMRI, INFRAFRONTIER and Instruct nodes pay for the node infrastructure and additionally, INFRAFRONTIER nodes also pay for experimental service costs such as consumable materials. Only INFRAFRONTIER and Instruct pay for part of the access costs from central funds. Instruct provides capped costs for travel/accommodation and consumable materials per access visit. In certain circumstances, free access to RI services may be governed by national support for the infrastructure: in these cases, national users are entitled to free access to services provided by a node in their own country, but transnational users will pay a fee for the service.

Unified user access to RI resources using AAI

CORBEL is coordinating with AARC (and AARC2 – its successor project) a federated access solution for RIs, working together with national identity federations, research infrastructures, e-infrastructures and libraries to establish the best practices and policies needed to implement inter-operable authentication and authorisation for infrastructures (AAIs). CORBEL is represented in AARC2 through the ELIXIR-hub, BBMRI-ERIC, Instruct and INFRAFRONTIER.

We have collected a number of use cases from different RIs to identify and test the requirements for a Life Sciences AAI, which will be made available to AARC2.

1. Registering and authenticating to Life Sciences ID
   Use cases will define the process flow of a researcher signing up to a Life Sciences ID. The Life Sciences ID does not carry a stored password. Instead, the researcher uses their authentication provider of choice (including home organisation credentials, research infrastructure credentials, public/commercial identity like Google or ORCID). The researcher can then link multiple accounts to the single consistent Life Sciences ID they have acquired.
2. Attributes and authorisation
   When an organisation obtains the Life Sciences ID of a researcher, their AAI infrastructure should be able to identify the home institution of the researcher and certain attributes (including institutional affiliation, group membership, dataset authorisation) relating to their identity. Use cases will track this convergence.
3. Technical interfaces
   The Life Sciences AAI will provide an Identity/Service provider proxy for federated authentication and attribute sharing and will be able to synchronise identities of the researchers to services hosted by the organisation.

4. Use cases will test the ability of the AAI to support logging and reporting of anonymised statistics to research infrastructures. Data to be collected would include the number of services using the AAI, number of identities supported and number of logins. These statistics will provide metrics to understand the take up of AAI and use profile by the RIs.

Preliminary report on use of ARIA for CORBEL WP4 Open Call

A primary test case for managing integrated access was designed and implemented by CORBEL WP4 through an Open Call for European researchers. The call invited pilot proposals that integrated research infrastructure services in the life sciences sector to enable transnational user access (http://www.corbel-project.eu/1st-open-call.html). To facilitate a shared access model, the Open Call implemented the ARIA cloud based management system developed by Instruct. The system was heavily customised for CORBEL including branding and building the process template around the four use case pipelines in the pilot.
ARIA is a collection of cloud services that helps facility and research infrastructure managers to navigate through the management of applications, user access, machine and data and has been in operation for more than 18 months. Facility management includes facilitating remote access, user training, machine booking and external visits to the facility. In the WP4 call, ARIA was used as a model to test the ability to manage interdisciplinary access, obtaining feedback from all parties throughout the process. The results of this will be reported separately (WP5 deliverable D5.2, Report on common access framework concept) and will be made available to WP5 to help refine the process steps within the proposal system and management of calls where improvements can be made.

Next steps

- Obtain feedback responses arising from the WP4 Open Call;
- Draft schema to converge top level entry for all BMS RIs and e-Infrastructures with AAI implementation;
- Continue to work closely with AARC2 project, by helping to draft a requirements specification document on AAI solutions that will be compatible with the requirements of the BMS RIs in CORBEL.

Publications

N/A

References

Work done as part of CORBEL Work Package 3 Deliverable D3.1 and D3.2: Medical Infrastructure user forum reporting
Work done as part of CORBEL Work Package 4 Milestone MS4.2: First proof-of-concept use cases of shared services between participating RIs take place

Abbreviations

Abbreviation	Expansion
ESFRI	European Strategy Forum on Research Infrastructures
ICT	Information and Communications Technologies
RI	Research Infrastructure
MIUF	Medical Infrastructure/Users Forum
AARC	Authentication and Authorisation for Research and Collaboration
AAI	Authentication and Authorisation Infrastructure

Delivery and schedule

The delivery is not delayed.

Adjustments made

None

Appendices

Appendix A

RI Function	BBMRI	EATRIS	ECRIN	ELIXIR	EMBRC	EURO-BIOIMAGING	INFRAFRONTIER	INSTRUCT	ISBE	MIRRI
Service: Instruments/ technologies	No	Yes	No	No	Yes	Yes	Yes	Yes	Yes	Yes
Service: Physical samples	Yes	Yes	No	No	Yes	No	Yes	No	No	Yes
Service: Data/Metadata	Yes	No	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes
Service: Software/Tools	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Service: Expertise/Management/Support	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Proposal: Online Portal	Yes	Yes	No	No	Yes	Yes	Yes	Yes	No	No
Proposal: Email application/ interaction with Hub and/or nodes	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes
Scientific review of proposal	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Technical review (e.g.safety, risk, feasibility)	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Ethical review	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes
Access: Physical visit to node for user	No	No	Yes	No	Yes	Yes	Yes	Yes	No	Yes
Access: Remote access to instrument at node (supported by node staff)	No	No	Yes	Yes	No	No	Yes	Yes	No	No
Access: Virtual access (including data/software download or access)	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Access: Resources shipped to user	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes
Dissemination: Peer review publications	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Dissemination: Other press/publications	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Dissemination: Presentations/Conferences	Yes	Yes	Yes	N/A	Yes	Yes	Yes	Yes	Yes	Yes
Dissemination: Formal reporting to EC	Yes	No	Yes	N/A	Yes	Yes	Yes	Yes	No	Yes
Dissemination: Formal report to national funder	Yes	N/A	Yes	N/A	Yes	Yes	Yes	Yes	No	No

Summary matrix of Research Infrastructure user access and dissemination modalities