

Deliverable D1.2

Repository

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EBRAINS



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Executive summary

This deliverable presents the approach for addressing Task 1.2 of the CSA Brain-Health: to “create and sustain a repository, with the following objectives: making available to all stakeholders the relevant information about brain-related research and policy priorities nationally and at the EU level; providing an information base about ongoing initiatives and funding; and overview of scientific input available at the EU level and nationally”.

Following consultations, we propose a staged approach starting with a focused effort to update the existing Catalogue of Services for Life Sciences Research Infrastructures (LS RIs) that was developed within the CORBEL project. This initial phase will concentrate specifically on integrating brain health-related services into the catalogue. This pragmatic approach establishes a foundation that the future European Partnership for Brain Health can build upon, ensuring both immediate utility within the CSA and sustainable development going forward.

1 Introduction

1.1 Context

The CSA BrainHealth aims to lay the groundwork for an envisaged European Partnership on Brain Health. As part of this preparation, Task 1.2 requires the creation of a repository to facilitate information exchange about research infrastructures, services, policies, and initiatives relevant to brain health research.

1.2 Purpose of the repository

Within the scope of the CSA, the repository will initially focus on:

- Providing an information base about research services relevant to brain health
- Creating a foundation that can be expanded upon in the European Partnership phase
- Facilitating connections between brain health researchers and relevant services

In the subsequent European Partnership for Brain Health phase, the repository will be expanded to:

- Make available to all stakeholders relevant information about brain-related research and policy priorities at the EU and national levels
- Provide comprehensive information about ongoing initiatives and funding
- Offer a broader overview of scientific input available at the EU and national levels
- Further develop the LLM-based search tool for enhanced discoverability of resources

2 Proposed approach

2.1 Collaboration with life sciences research infrastructures

After careful consideration, we propose to update the existing Catalogue of Services for Life Sciences Research Infrastructures (LS RIs)¹. This catalogue was originally developed within the CORBEL project² and currently consolidates services from 15 European Life Science Research Infrastructures. It is currently maintained by BBMRI (Biobanking and Biomolecular Resources Research Infrastructure) and provides an established foundation that can be extended to include and clearly showcase brain health-specific services.

The LS RIs Catalogue of Services is particularly suitable because it:

- Helps researchers identify single research infrastructures for their work
- Enables the creation of service pipelines using several RIs simultaneously
- Includes information on free-to-use services available to institutions in member states
- Already contains a structured presentation of services within distinct thematic fields

¹ <https://lifescience-ri.eu/catalogue-of-services.html>

² <https://www.corbel-project.eu/home.html>



Figure 1. Screenshot of the Life Science RI Catalogue of Services

This approach offers several key advantages:

- Building on an established catalogue rather than creating a new repository from scratch
- Leveraging the existing expertise in maintaining and developing such a catalogue
- Ensuring compatibility with existing European research services
- Providing immediate value to stakeholders through integration with an operational system

2.2 Implementation plan for CSA BrainHealth

The implementation within the CSA timeframe will focus on:

2.2.1 Phase 1: Initial collaboration (April-May 2025)

- Continue ongoing discussions with BBMRI

- Agree on modalities for integrating brain health-related services and highlight also the existing brain health-related services already in the catalogue
- Develop a common understanding of technical requirements

2.2.2 Phase 2: Integration of services (June-September 2025)

- Add EBRAINS services to the LS RIs Catalogue of Services
- Identify and add other brain-related services from additional national and European RIs
- Define brain health-specific service categories
- Begin development of a proof-of-concept LLM-based search tool for brain-related services

This phase will create a working foundation that the European Partnership for Brain Health can build on and expand later.

3 Technical approach for initial implementation

3.1 Leveraging existing infrastructure

For the CSA BrainHealth repository, we will update the existing LS RIs Catalogue of Services infrastructure. This pragmatic approach will allow us to:

1. **Use established systems** - Leverage the existing catalogue framework without investing in new development
2. **Focus on content** - Concentrate our efforts on adding relevant brain health services rather than technical development
3. **Ensure sustainability** - Build on a maintained system with established support processes

3.2 Service information structure

We will ensure consistent documentation for all brain health services added to the catalogue, including:

- **Service description** - Clear explanation of the service's purpose and capabilities
- **Access information** - Guidelines on how researchers can access the service
- **Technical requirements** - Any prerequisites for using the service
- **Use cases** - Brief examples of how the service can support brain health research
- **Contact details** - Information on whom to contact for support

3.3 Integration process

The integration of brain health services will follow established processes for adding new services to the LS RIs catalogue:

1. Service identification and documentation
2. Mapping to the service categorisation scheme
3. Content creation following the catalogue templates
4. Review and quality assurance
5. Publication in the catalogue

This initial integration will focus on establishing the process and adding a core set of services, while the comprehensive integration of the full range of brain health services across Europe will be a task for the European Partnership for Brain Health.

4 Initial content for CSA phase

4.1 Expanding brain health service coverage

For the CSA phase, we will focus on a comprehensive approach to brain health services:

- **Identify existing brain health services** - Review and tag existing services in the catalogue that are relevant to brain health research
- **Add EBRAINS services** - Integrate key services from EBRAINS including:
 - Data and Knowledge Services for sharing and discovering brain data
 - Simulation Services for computational modelling of brain function
 - Brain Atlas Services for exploring multi-scale brain atlases
 - Medical Informatics Platform for collaborative brain data analysis
- **Incorporate services from other RIs** - Identify and integrate other specialised brain research services from various national and European RIs that are not currently mentioned in the catalogue

This comprehensive approach ensures we deliver a useful resource that reflects the diversity of services available to brain health researchers across Europe.

4.2 Developing LLM-based search functionality

We will develop a constrained, targeted proof-of-concept search capability based on Large Language Models (LLMs) to improve the discoverability of brain health services within the catalogue. This approach has been scoped to be achievable within the remaining CSA timeframe.

4.2.1 Technical implementation approach

The LLM-based search functionality will be implemented with the following considerations:

- **Technology Selection** - We will utilise a pre-trained, publicly available language model rather than developing a custom LLM from scratch. This may involve open-source variants of transformer-based architectures that can be deployed within our technical constraints.
- **Limited Scope** - The proof-of-concept will focus exclusively on searching and retrieving services from the catalogue, and not on generating new content. The tool will be intentionally restricted to specific service discovery tasks.
- **Controlled Training Approach** - We will fine-tune the model using:
 - Catalogue descriptions of brain health services
 - A curated set of example queries related to brain health research
 - Appropriate mappings between research needs and available services
- **Integration Method** - The search tool will be implemented as a separate component that interfaces with the existing catalogue through a defined API, avoiding complex modifications to the core catalogue infrastructure.
- **Data Privacy** - The tool will be designed with GDPR compliance in mind, processing queries without storing personal data, and providing clear privacy notices to users.

4.2.2 User experience design

The search tool will provide researchers with:

- Simple natural language query capability (e.g., "I need neuroimaging data analysis tools")
- Basic contextual understanding of brain health terminology
- Direct links to relevant services in the catalogue
- Explanations of why specific services were recommended

4.3 Documentation for handover to European Partnership for Brain Health

As part of this deliverable, we will create comprehensive documentation to hand over to the European Partnership for Brain Health, including:

- The process used to integrate brain health services
- Templates and guidelines for adding additional services
- Recommendations for expanding the repository in the EP phase
- Technical specifications and development roadmap for the LLM-based search functionality
- Lessons learned and best practices from the CSA phase

This documentation will ensure a smooth transition and enable the European Partnership for Brain Health to effectively build upon the foundation established during the CSA phase.

5 Transition to European Partnership for Brain Health – outlook

The CSA phase will establish the groundwork for the more comprehensive Knowledge Hub to be developed in the European Partnership for Brain Health phase. During this transition:

- The updated LS RIs catalogue will serve as a foundation for further development
- The initial approach establishes the basic technical framework and collaboration model
- Documentation created during the CSA phase will facilitate expansion in the European Partnership for Brain Health
- The LLM-based search proof-of-concept will provide insights for enhanced capabilities

In the European Partnership for Brain Health phase, the repository is expected to be significantly expanded to fulfill the broader objectives outlined in Section 1.2.

This includes making available to all stakeholders relevant information about brain-related research and policy priorities at the EU and national levels, providing comprehensive information about ongoing initiatives and funding opportunities, and offering a broader overview of scientific input available across Europe. The European Partnership for Brain Health will also further develop the LLM-based search tool for enhanced discoverability of resources.

6 Timeline for CSA phase

Table 1. Timeline for CSA phase

Description	Timing
Initial discussions with LS RIs stakeholders (already started)	April-May 2025
Integration of first EBRAINS services into catalogue	June 2025
Integration of brain-related services from other RIs	July-August 2025
Development and testing of LLM-based search tool (proof of concept)	July-September 2025
Documentation for handover to European Partnership for Brain Health completed	October 2025
CSA conclusion and handover to European Partnership for Brain Health (starting Q1 2026)	31 October 2025

7 Conclusion

The proposed approach for the CSA BrainHealth repository represents a pragmatic and achievable solution that:

- Updates an established catalogue rather than creating a new repository from scratch
- Avoids duplication of efforts
- Creates a solid foundation for expansion in the European Partnership for Brain Health phase (starting Q1 2026)

By updating the Catalogue of Services for Life Sciences Research Infrastructures and integrating EBRAINS service documentation along with other brain-related services from relevant national and European RIs, we can deliver immediate value while establishing the processes needed for future expansion.

The repository will serve as an important stepping stone toward the more comprehensive work planned in the European Partnership for Brain Health. By establishing this foundation now, we ensure continuity between the CSA and European Partnership for Brain Health phases and provide a practical path forward for developing this valuable resource for the brain health research community.

The development of a proof-of-concept LLM-based search tool offers exciting potential for making brain health services more discoverable and accessible to researchers. This targeted capability will be tested throughout the remainder of the CSA phase, with comprehensive documentation provided to enable the European Partnership for Brain Health to further develop and expand these capabilities. The structured handover process will ensure a smooth transition to the European Partnership phase and support continued progress in building this vital knowledge hub for the brain health research community.