EU CONEXUS
European University for Smart Urban Coastal Sustainability

Co-funded by the European Union

Report on the development of the collaborative platform

D9.2

WP9 – Support Joint Research Structures

Contractual due date (from GA): M48 – 31 October 2026 Final delivery date: M48 – 31 October 2026
WP leader: Agricultural University of Athens Contributors: LRUniv, AUA, UCV, KU, UNIZD, UTCB, SETU, UROS, FredU, EU-CONEXA
Dissemination level : Public

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1. Executive summary/abstract:

This deliverable reports on the development of the EU-CONEXUS Collaborative Platform under WP9, Task T9.2. The solution was designed to respond to the needs expressed by the Alliance research community, with a focus on making it easier to identify relevant colleagues, share research opportunities and initiate new collaborations. It builds on the Research and Innovation Information System (RIIS*), which already provides a common Alliance-wide data model for researchers, research units and equipment, and extends it with a lightweight marketplace for research opportunities connected to a bespoke matchmaking service developed by Agricultural University of Athens (AUA). By reinforcing an existing shared service rather than introducing an additional standalone platform, the Collaborative Platform contributes to a more coherent and sustainable EU-CONEXUS IT ecosystem. At the date of this report, the marketplace and matchmaking components are developed, with final integration, production deployment and validation planned before the end of 2026.

*Terms marked with a * are defined in Appendix B - Glossary*

2. Description:

2.1 Purpose of the deliverable

This deliverable documents the development of the EU-CONEXUS Collaborative Platform under Work Package 9, Task T9.2. The overall objective of WP9 is to strengthen the Joint Research Institutes (JRIs*) and promote networking and multi-disciplinary interaction between researchers across the Alliance. Within this framework, Task T9.2 foresees a Collaborative Platform designed to facilitate communication and scientific interaction between JRI* members by building on existing EU-CONEXUS research information resources and introducing AI-supported functionalities.

The Collaborative Platform builds on the Research and Innovation Information System (RIIS*), developed during the previous EU-CONEXUS RFS* project. The former Research Portal was progressively consolidated into RIIS*, which now constitutes the main common information source for research-related data within the Alliance. RIIS* provides a harmonised data model for researchers, research units and facilities/equipment across partner universities. Its main contribution has therefore been to establish a common and structured representation of research capacities at Alliance level.

The development of the Collaborative Platform aims to complement this information layer with more actionable services. While RIIS* enables users to identify researchers, structures and resources, the Collaborative Platform is intended to facilitate the transition from information discovery to actual cooperation. Its core functions therefore focus on the publication of research opportunities, the identification of potentially relevant collaborators and the initiation of contacts between researchers.

The final solution combines two complementary components. A research-opportunities marketplace is integrated into RIIS*, allowing researchers to publish cooperation opportunities. This marketplace is connected to a bespoke matchmaking service developed by AUA, which analyses the opportunity against researcher profiles available in RIIS* and returns a ranked list of potentially relevant collaborators.

The purpose of this report is to describe the successive steps that led to this architecture, the stakeholder consultation that informed its design, the development of the marketplace and matchmaking components, the principal implementation constraints encountered, and the current status of the Collaborative Platform.

2.2 Approach

The development of the Collaborative Platform followed an iterative approach combining functional analysis, stakeholder consultation, technical exploration and progressive implementation.

The initial work focused on identifying an appropriate technical solution capable of combining collaboration functionalities with access to the research data already available in RIIS* and with the matchmaking algorithm developed by AUA. Several implementation approaches were explored, including the possible use of an external commercial platform.

In parallel with this technical exploration, particular attention was given to the expectations of the research community. A survey involving 419 respondents from across the EU-CONEXUS partner institutions was conducted to assess awareness and use of RIIS*, researchers' expectations regarding Alliance-level research services, the type of information they considered useful about potential collaborators, and the functionalities they expected from a Collaborative Platform.

The survey showed that the principal expectations concerned the ability to identify relevant researchers and research opportunities, while demand for additional communication and collaboration tools was comparatively limited. These results were used to refine the functional scope of the platform and contributed to the decision to extend RIIS* rather than introduce an additional standalone collaboration environment. Existing EU-CONEXUS services, particularly Whaller, continue to provide broader communication and collaboration functionalities such as videoconferencing and file sharing.

The resulting architecture therefore concentrates the Collaborative Platform on three complementary functions: opportunity publication, researcher discovery and matchmaking. The marketplace component was developed as an extension of RIIS* by Studio Juillet, while AUA developed the matchmaking methodology and associated API service. Integration between these components enables a research opportunity created in RIIS* to serve directly as input to the matchmaking process.

At the date of this report, the marketplace and matchmaking components have been developed. The remaining work mainly concerns their final integration within the production environment, technical validation and deployment.

3. Discussion/content:

3.1 From the initial concept to a stakeholder-driven solution

The initial concept of the Collaborative Platform reflected the broad ambition described in Task T9.2 of the Grant Agreement. The platform was envisaged as a unified environment bringing together existing research information resources and supporting scientific interaction between JRI* members through AI-based functionalities. The task description included analysis of scientific and project databases, an AI-guided system, registration of research ideas and projects, live-streaming and communication-related services, and support for the promotion of JRI* activities.

During the first phase of the project, the implementation approach was based on the identification of a dedicated collaborative solution able to provide the user-facing environment while interfacing with the EU-CONEXUS research data and with the matchmaking algorithm developed by AUA. In this context, discussions were initiated with b2match. The company showed interest in developing a highly customised solution for EU-CONEXUS, including the possibility of integrating the Alliance-developed matchmaking approach in the commercial product of this Austrian company. This option was explored until early 2024, when b2match ultimately decided not to pursue the development.

The end of this first implementation avenue coincided with a broader reflection on the methodology used to introduce new digital services within the Alliance. Feedback received from the European Commission stressed the importance of grounding new services in the actual expectations of their intended users. Rather than immediately selecting another technical solution, the project team therefore decided to reassess the Collaborative Platform from the perspective of the research community and to identify which functionalities would provide the greatest practical value.

A survey of researchers across the Alliance was consequently prepared during 2024. At the same time, several existing commercial solutions were identified as potential candidates for a future implementation. These included Whaller with its Arena module, Crowdhelix and Agora, developed by aUPaEU. The initial intention was to compare them against criteria such as functional coverage, usability, interoperability with external systems, data protection and cost. However, this comparison never developed into a formal procurement benchmark. As the stakeholder analysis progressed, it became increasingly clear that the expected scope of the Collaborative Platform was significantly more focused than the broader collaboration environments initially considered.

The survey results showed that researchers primarily expected EU-CONEXUS to help them identify relevant colleagues and cooperation opportunities. Conversely, additional communication and workspace functionalities generated comparatively limited interest. This finding was particularly important because EU-CONEXUS already provides broader communication and collaboration services through Whaller, including videoconferencing, communication spaces and file sharing. Developing similar functionality again inside the Collaborative Platform would therefore have introduced unnecessary duplication.

The project consequently shifted from the selection of a new standalone platform towards the extension of an existing EU-CONEXUS service. In early October 2025, the project team agreed to develop the Collaborative Platform directly around the Research and Innovation Information System. This approach offered several advantages. RIIS* had already established a common data model across partner universities and had been identified from the beginning as the main source of researcher information required by the matchmaking process. Extending it also avoided the need to maintain a second researcher directory or to synchronise equivalent profile information between independent platforms.

The resulting implementation therefore represents a refinement of the original concept rather than a change in its underlying objective. The Collaborative Platform remains intended to facilitate networking and scientific interaction across the Alliance, but development has been concentrated on the functions for which a clear unmet need was identified: opportunity publication, researcher discovery and matchmaking.

3.2 Consultation of the research community

The survey conducted among the EU-CONEXUS research community provided the main evidence base for refining the functional scope of the Collaborative Platform. A total of 419 responses were collected across the partner institutions, with respondents distributed across the different researcher career stages as well as research-support profiles. This broad participation made it possible to examine both awareness of the existing research information environment and expectations regarding future Alliance-level services.

The survey demonstrated that researchers' interest in EU-CONEXUS research services extends beyond funding opportunities. Across career levels, respondents expressed strong interest in finding research projects, identifying fellow researchers and locating laboratories with which to collaborate. These results support the broader WP9 objective of facilitating networking and multidisciplinary interaction across institutional boundaries.

When respondents were asked what information they considered useful about another researcher, the highest levels of interest concerned contact information, research domains, institutional information and involvement in projects. More detailed elements such as full curricula or biographies attracted less interest. This suggests that the main purpose of the researcher directory is not to reproduce a complete academic profile, but to provide sufficient information for a user to determine whether another researcher may be relevant and to establish contact.

The feature-related responses further clarified this expectation. Search functionalities and opportunities for research cooperation received strong support, whereas communication tools scored comparatively lower. Interest in AI-assisted matchmaking was present, but it complemented rather than replaced the more fundamental need for simple researcher and opportunity discovery.

Taken together, these findings led to several design principles for the Collaborative Platform. The solution should minimise the effort required from researchers, provide efficient search and discovery mechanisms, make research opportunities easy to publish and identify, and use the existing RIIS* data wherever possible rather than ask users to recreate information in another system. More elaborate collaboration functionality could remain within the Alliance's existing communication environment.

The survey therefore played a direct role in the architectural decision taken in 2025. What had initially been considered as a potentially broad collaborative environment was progressively refocused into a targeted service connecting three elements: the existing researcher information base, a marketplace for research opportunities, and an AI-supported matchmaking function.

3.3 Final Collaborative Platform design

3.3.1 RIIS* as the common data foundation

RIIS* forms the information backbone of the final Collaborative Platform architecture. Its original purpose is to provide a common directory of researchers, research units and research equipment across the EU-CONEXUS partner universities. Its main added value lies in the harmonisation achieved at Alliance level: partner institutions agreed on a common structure for describing these research-related entities, making information originating from different universities searchable and comparable within a single system.

The former EU-CONEXUS Research Portal was progressively consolidated into RIIS*. This evolution is consistent with the intention expressed in the Grant Agreement to provide a unified interface incorporating the Research Portal and RIIS* resources. By the time the Collaborative Platform architecture was refined, RIIS* had therefore become the natural common source for researcher-related information.

However, RIIS* was essentially designed as an information system: it enables the Alliance to describe and expose its research capacities, but provides relatively few mechanisms through which this information can directly generate new cooperation. The Collaborative Platform addresses this gap by adding an actionable layer above the existing data foundation.

In this sense, the respective roles of the two developments are complementary: RIIS* provides harmonised information about research capacities, while the Collaborative Platform enables users to act on this information by publishing opportunities and identifying potential collaborators.

3.3.2 Research opportunities marketplace

The first major extension of RIIS* consists of a marketplace where researchers can publish opportunities for cooperation. These may originate, for example, from a research idea, an emerging project, a teaching-related initiative or an external funding opportunity for which the researcher wishes to identify additional partners.

The marketplace deliberately uses a lightweight data model. In the current implementation, an opportunity is primarily described through a title, a textual description, relevant research areas and keywords. No complex project classification or mandatory project-management information is required.

This simplicity is intentional. The primary objective is to make opportunities discoverable and to provide sufficient information for the matchmaking process. Requiring researchers to complete a substantially more detailed form would increase the effort associated with publishing an opportunity without necessarily improving the quality of the resulting match to the same extent. The design therefore prioritises ease of use and low publication barriers.

The marketplace should consequently not be understood as a research project-management system. Its role is situated at an earlier stage of collaboration: allowing a researcher to expose an idea or opportunity to the EU-CONEXUS community and helping that researcher identify colleagues with potentially relevant expertise. Once contact has been established, subsequent cooperation can take place through the appropriate existing collaboration and institutional tools.

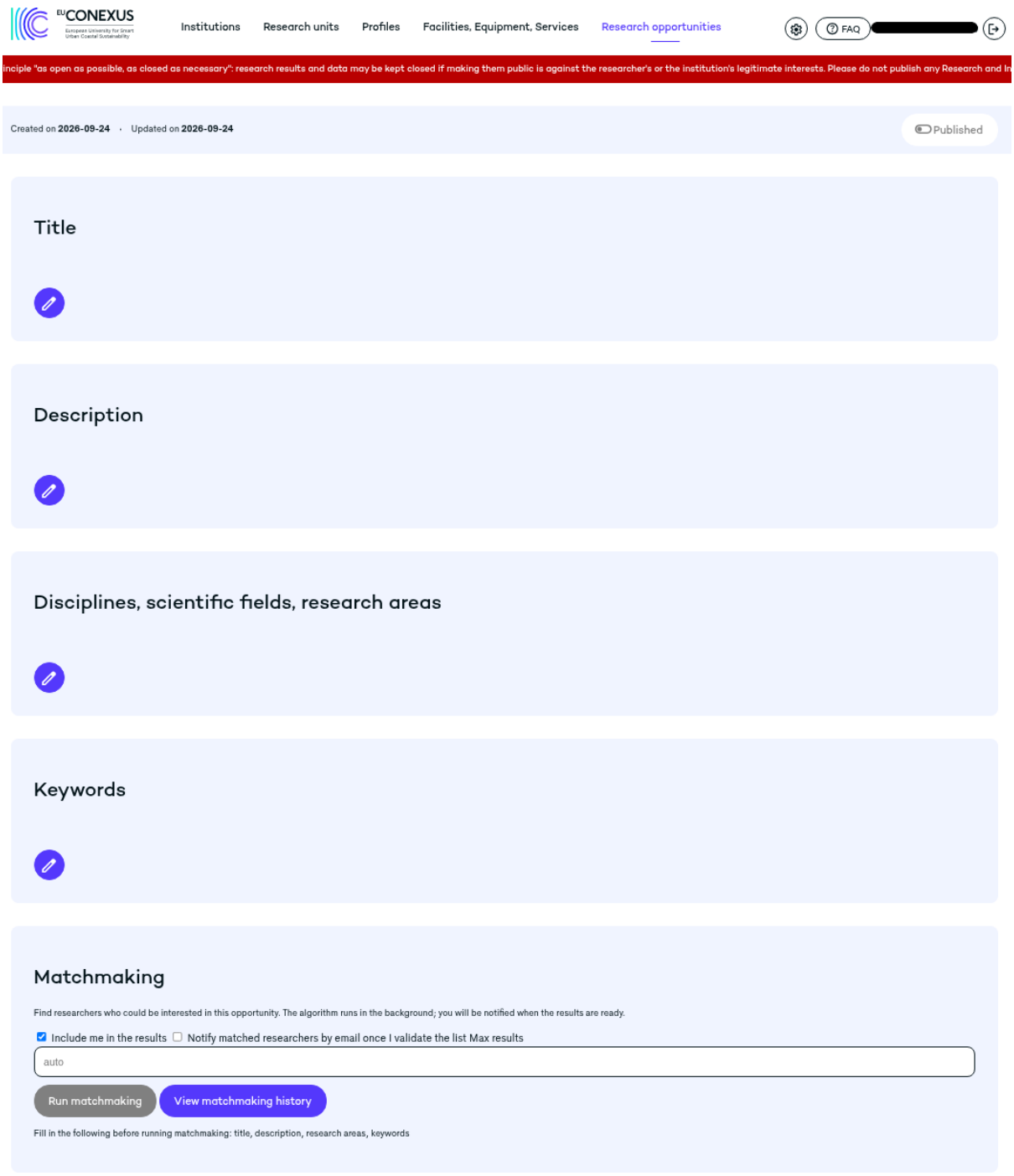


Figure 1. Research opportunity creation and matchmaking interface in the RIIS Collaborative Platform staging environment.*

The interface also provides direct access to the matchmaking functionality. From an opportunity, the user can specify whether the requesting researcher should be included in the search. The user can also access previous matchmaking requests and their status. This keeps the publication and researcher-discovery workflows closely connected within the same environment.

3.3.3 Matchmaking workflow and system integration

The second major component of the Collaborative Platform is the matchmaking service developed by AUA. Its purpose is to use the content of a marketplace opportunity as input and identify researchers whose RIIS* profiles show relevant correspondence with that opportunity.

The integration follows an API-based architecture. When a user launches matchmaking from a marketplace item, the opportunity attributes are transmitted to the AUA service. The matchmaking application then queries the researcher profiles available in RIIS* and calculates a ranked set of potential collaborators. When processing is complete, the results are returned to the marketplace using researcher identifiers and associated scores and explanations.

The process is asynchronous. Users therefore do not need to remain on the opportunity screen while the calculation is performed. The design includes a history of matchmaking requests with processing states, and users can be notified when results become available.

The resulting list is intended to support rather than replace human decision-making. Before finalisation, the requesting user can review the proposed researchers, remove candidates or manually add other researchers. The matching engine therefore acts as a discovery and decision-support mechanism, while the researcher retains control over the composition of the final contact list.

Only researchers whose profiles are explicitly registered and published in RIIS* are eligible for matchmaking. The RIIS* database remains the authoritative source of profile information and is queried by the AUA service for the matching operation rather than being reproduced as a separate researcher database on AUA infrastructure. This architecture reduces unnecessary duplication of data while ensuring that the matchmaking engine works from the same structured information presented through RIIS*.

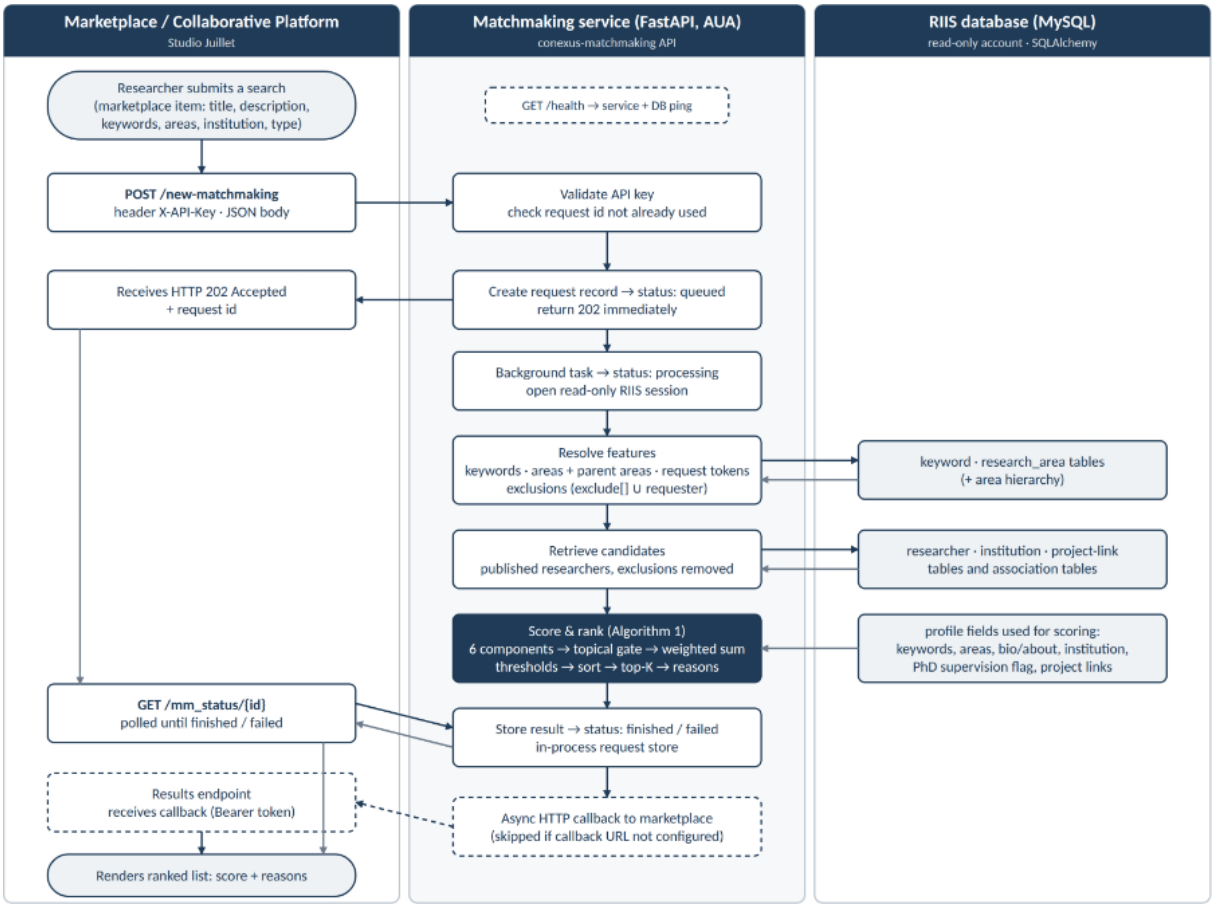


Figure 2. Technical pipeline connecting the RIIS* marketplace, the AUA matchmaking service and the RIIS* researcher data source.

The integration of the marketplace and matchmaking service therefore creates a continuous functional workflow: a researcher publishes an opportunity, requests assistance in identifying relevant collaborators, receives ranked recommendations based on Alliance-wide researcher data, reviews the proposed list and can subsequently initiate contact with selected researchers.

This workflow directly addresses the central need identified through the stakeholder consultation: reducing the effort required to move from having a research idea or cooperation opportunity to identifying relevant colleagues elsewhere in the Alliance.

3.4 Development of the matchmaking algorithm

3.4.1 Evolution and scientific basis

The matchmaking component was developed by AUA as the specialised analytical layer of the Collaborative Platform. Its purpose is to support the identification of researchers whose expertise is relevant to a research, teaching or funding opportunity

published through the marketplace. The problem is therefore approached as a ranking task: for a given opportunity, eligible RIIS* researcher profiles are evaluated and ordered according to their relevance.

Development progressed through several stages. Initial work explored a broad range of matchmaking approaches, including scoring and ranking methods, probabilistic models, graph theory, optimisation techniques, machine learning, network analysis and geometric distance methods. Particular attention was given to Hamming-distance approaches and genetic algorithms. Hamming distance provided a conceptual basis for comparing structured characteristics between an opportunity and individual researcher profiles, whereas genetic algorithms were considered in relation to the more complex problem of assembling an entire complementary team.

A proof of concept was subsequently developed in 2025 as a standalone web application with the following pipeline:

- Collection of a researcher's profile through a short input form (research fields, keywords, academic level)
- Addition of publicly available publication-profile data (Scopus)
- Ranking of candidate collaborators using set-overlap (Jaccard) scoring.

The final operational implementation evolved towards a deterministic weighted-ranking engine directly using RIIS* data. This choice provides two advantages in the current environment: it does not depend on the availability of a large labelled training dataset, and the contribution of individual profile attributes to each recommendation remains interpretable.

The current implementation should therefore be understood as an explainable matchmaking service rather than a black-box prediction mechanism. More advanced approaches based on semantic representations, graph recommendations or optimisation remain possible areas for future development, but are not required for the current operational workflow.

3.4.2 Representation of opportunities and researcher profiles

The algorithm receives the characteristics of a marketplace item created by a researcher. The information available to the matching service includes the opportunity title and description, scientific keywords and research areas, together with additional parameters required to execute the request. Research-area and keyword information can be resolved against the corresponding RIIS* records so that the marketplace and researcher profiles use the same reference data.

Researcher information is obtained from RIIS*. The matchmaking process can use structured attributes such as scientific keywords, research areas, institutional affiliation, doctoral-supervision capacity and links to research projects, as well as textual information contained in researcher profiles. Only researcher records marked as published are eligible for matching.

The algorithm also takes account of the hierarchical structure of research areas. A direct correspondence with a requested area is treated as stronger evidence of relevance, while a correspondence at parent-area level may still contribute partially to the match. This enables the service to recognise related expertise without considering a broader disciplinary relationship equivalent to an exact match.

Free-text information complements the structured attributes. The opportunity title and description are processed together with the names of relevant keywords and research areas, while the same textual processing is applied to researcher profile information. This provides an additional way to identify relevant expertise where structured profile fields alone may not fully describe a researcher's activities.

3.4.3 Scoring, filtering and ranking

The operational matchmaking score combines six components: keyword correspondence, research-area correspondence, textual correspondence, institutional correspondence, doctoral-supervision status and participation in research projects. Each component is normalised before being combined through weights that vary according to the type of request.

Keyword correspondence measures the extent to which the keywords associated with the opportunity are present in the researcher profile. Research-area correspondence considers both exact matches and broader hierarchical relationships. Textual correspondence evaluates overlap between the textual representation of the opportunity and the information available in the researcher profile. Additional components allow institutional affiliation, doctoral-supervision capacity and previous project participation to contribute where relevant.

Different weighting configurations are used for research, teaching and funding-related requests. Teaching matchmaking, for example, can give specific importance to doctoral-supervision status, whereas research and funding requests rely more strongly on scientific-topic and project-related information. The detailed weights used by the current implementation are defined within the matchmaking service and can therefore be refined as experience with the platform grows.

A topical-relevance condition is applied before supporting characteristics are allowed to generate a recommendation. This prevents a researcher from being proposed solely because of generic characteristics such as project participation or doctoral-supervision capacity when there is no detectable relationship with the topic of the opportunity. Eligible researchers are then ranked by their total score and the requested number of results is returned.

Algorithm 1 — MatchmakingRank weighted, explainable ranking of RIIS researchers for a marketplace item

```
INPUT   item = (id, title, description, keywords, areas, institution?, exclude[], requester, include_requester?)
        type ∈ {research, teaching, funding};  K = requested number of results (default 50)
OUTPUT  ranked list of (researcher_id, score, reasons)
PARAMS  W[type] = component weights (Σ = 1);  τ_topical = 0.02;  τ_min = 0.02

Step 1 — Feature resolution (request side)

 1  KW        ← resolveKeywords(item.keywords)                    // ids or names → RIIS keyword ids + names
 2  A_direct  ← resolveAreas(item.areas)                          // explicitly requested research areas
 3  A_parent  ← parents(A_direct)                                 // one level up the RIIS hierarchy
 4  T_req     ← tokenize(title ⊕ description ⊕ names(KW) ⊕ names(A_direct))
 5  X         ← item.exclude ∪ ( {requester} if not include_requester )
 6  W         ← WEIGHTS[type]

Step 2 — Candidate retrieval (read-only RIIS session)

 7  R ← { r ∈ Researchers : r.published = true  and  r.id ∉ X }

Step 3 — Component scoring (each component ∈ [0, 1])

 8  for each r in R:
 9      s_kw    ← |KW ∩ KW(r)| / |KW|                             // keyword coverage (0 if KW = ∅)
10      s_area  ← min(1, (|A_direct ∩ A(r)| + 0.5·|A_parent ∩ A(r)|) / |A_direct|)
11      T_r     ← tokenize(bio(r) ⊕ about(r))
12      s_txt   ← |T_req ∩ T_r| / |T_req|                         // free-text coverage
13      s_inst  ← 1 if item.institution ≠ ∅ and r ∈ item.institution else 0
14      s_phd   ← 1 if r.can_supervise_phd else 0
15      s_proj  ← 1 if |projects(r)| ≥ 1 else 0

Step 4 — Topical gate, weighted sum, thresholds

16      topical ← W.kw·s_kw + W.area·s_area + W.txt·s_txt + W.inst·s_inst
17      support ← W.phd·s_phd + W.proj·s_proj
18      if topical < τ_topical:  continue                         // no detectable relation to the item
19      score   ← round(topical + support, 4)
20      if score < τ_min:  continue
21      reasons ← explain(s_kw, s_area, s_txt > 0.10, s_inst, s_phd, s_proj)
22      results ← results ∪ {(r.id, score, reasons)}

Step 5 — Ranking

23  sort results by score descending
24  return results[1..K]

where  tokenize(s): lowercase → keep alphabetic / accented-Latin / numeric tokens
                    → drop tokens with ≤ 2 characters and stop-words → return as a set
       WEIGHTS (kw, area, txt, inst, phd, proj):  research (.30, .20, .30, .05, –, .15)
                    teaching (.20, .25, .25, .05, .15, .10)   funding (.25, .20, .25, .15, –, .15)
```

Figure 3. Simplified pseudocode of the operational matchmaking and ranking process developed by AUA.

3.4.4 Explainability and human validation

Explainability was retained as an important characteristic of the final implementation. In addition to a numerical score, the matchmaking service can provide information explaining the evidence behind a recommendation, such as shared keywords, matching research areas, textual correspondence or other applicable profile attributes. These explanations are generated from the same components used in the scoring process and can therefore be traced back to the underlying RIIS* information.

The output is nevertheless intended to support human judgement rather than automate partner selection. The requesting researcher receives a proposed list of candidates that can be reviewed and modified before any subsequent contact is initiated. The system therefore reduces the effort required to identify potentially relevant researchers while leaving the final decision with the user.

This design is particularly appropriate for cross-disciplinary collaboration, where a numerical similarity score cannot fully represent the strategic, scientific or interpersonal considerations involved in establishing a new partnership.

3.5 Implementation and current status

Implementation of the final architecture was divided between complementary technical responsibilities.

Studio Juillet, the web agency already responsible for the development of RIIS*, developed the marketplace extension and its associated user interface. AUA developed the matchmaking engine as a separate service and exposed the interfaces required for submitting matchmaking requests and retrieving results. Integration between these components relies on APIs rather than on the creation of a second copy of the RIIS* researcher database.

The marketplace component and the AUA matchmaking service have both reached an advanced implementation stage. AUA's service is able to receive a matchmaking request, query RIIS* researcher information, score eligible profiles and return ranked recommendations with explanatory information. The service has been demonstrated using an anonymised copy of the RIIS* database.

The production architecture requires connectivity between the AUA service and the RIIS* database hosted by Studio Juillet. This access is required so that matchmaking can operate on the current RIIS* researcher information rather than on a separately maintained dataset.

At the date of this report, development of the two principal software components is completed. The remaining activities mainly concern final system integration, configuration of the production environment, end-to-end validation and deployment. Coordination also involves the infrastructure supporting the wider EU-CONEXUS web environment, which is operated by La Rochelle Université.

The Collaborative Platform is therefore not yet available as a production service at the date of submission of this deliverable. Deployment is planned before the end of 2026.

3.6 Evolution from the initial Description of Action

The implementation of Task T9.2 evolved during the project as the technical environment and stakeholder requirements became clearer. The underlying objective, however, remained unchanged: to facilitate networking and scientific interaction between researchers across the Joint Research Institutes.

The original Description of Action envisaged a broad Collaborative Platform combining the Research Portal and RIIS* resources and progressively introducing an AI-guided system, registration of research ideas and projects, live-streaming, feedback and evaluation services, and mechanisms supporting the history and promotion of JRI* activities.

The final architecture implements these objectives through a more distributed use of the Alliance's existing digital ecosystem rather than by reproducing all envisaged functions within a single new application.

The analysis of scientific and researcher data and the AI-supported dimension are addressed through the combination of the RIIS* data model and the AUA matchmaking service. Registration of research ideas and projects is addressed through the research-opportunities marketplace integrated into RIIS*. An opportunity originating from a funding call can therefore be published as a project or cooperation proposal and used directly as input to the matchmaking process.

More general communication functionality was not duplicated within the RIIS* extension. EU-CONEXUS already operates Whaller as an Alliance collaboration environment, providing communication spaces, file sharing and embedded videoconferencing capabilities, including the functionality required for online interaction and live events. The project therefore progressively concentrated the dedicated Collaborative Platform development on the unmet needs identified by the research community: opportunity publication, researcher discovery and matchmaking.

The broad reference in the Description of Action to feedback and evaluation services was not translated into a separate dedicated module. The task description did not define a specific evaluation object or associated workflow, while the stakeholder consultation identified discovery and matchmaking as more immediate user priorities. Similarly, promotion and broader communication of JRI* activities can be supported through the existing EU-CONEXUS communication environment rather than requiring duplication inside the marketplace.

The consolidation of the former Research Portal into RIIS* also simplified the architecture originally described in the Grant Agreement. Rather than integrating two parallel information sources into a third application, RIIS* became the common research information foundation on which the Collaborative Platform could directly build.

Overall, these adaptations reduced functional duplication and strengthened integration with the wider EU-CONEXUS IT ecosystem. The final approach concentrates bespoke development on functionality that was not already provided elsewhere while reusing established Alliance services for complementary needs.

3.7 Constraints, delays and lessons learned

The development process encountered both technical and organisational constraints.

The first implementation avenue, based on a highly customised external collaborative solution, was discontinued when discussions with b2match ended in early 2024. This created a need to reassess the implementation approach, but also provided an opportunity to return to the underlying user requirements before committing to another technical solution.

The stakeholder consultation subsequently proved decisive. The results demonstrated that researchers did not primarily require another full collaboration environment. Instead, they expected simple mechanisms to find relevant colleagues and identify or publish opportunities for cooperation. This evidence enabled the project team to reduce unnecessary functional complexity and to build on RIIS* as the existing Alliance research-information foundation.

Following the decision in October 2025 to extend RIIS, implementation was affected by the procurement and contracting process required for the modification of the existing bespoke solution. These administrative steps took longer than initially anticipated and delayed final deployment. During this period, the functional and technical scope of the extension was thoroughly defined with Studio Juillet, allowing the subsequent development and integration phase to be kept as focused and efficient as possible.

Several lessons can be derived from this development process.

First, stakeholder consultation should precede final technology selection whenever a new shared service is introduced. The survey materially changed the understanding of what researchers considered valuable and prevented investment in functionality for which limited demand existed.

Second, integration of existing Alliance services should be preferred over unnecessary multiplication of platforms. RIIS* already contained the structured research information required by the Collaborative Platform, while Whaller already covered general-purpose communication and collaboration. Concentrating development on the missing functional layer resulted in a simpler and more coherent architecture.

Third, ease of use is particularly important where adoption depends on voluntary user contribution. The marketplace therefore deliberately limits the amount of information required to publish an opportunity, while RIIS* profile information is reused wherever possible.

Finally, the previous experience of RIIS* demonstrates that technical availability alone does not ensure adoption. The survey revealed limited awareness of RIIS* among the research community. Deployment of the Collaborative Platform should therefore be accompanied by targeted communication, user onboarding and contin-

ued promotion. Future monitoring of platform usage will also provide evidence for progressively refining both the marketplace and the matchmaking methodology.

Taken together, these lessons reinforce a broader principle for the EU-CONEXUS IT ecosystem: shared digital services are most sustainable when they respond to demonstrated user needs, reuse authoritative data and existing capabilities, and minimise the number of independent environments users are required to adopt.

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4. Conclusion:

The development of the EU-CONEXUS Collaborative Platform has progressively transformed the broad concept described in Task T9.2 into a focused service designed around the practical needs of the Alliance research community. While the original Description of Action envisaged a wide range of collaboration functionalities, the implementation process demonstrated the value of combining stakeholder consultation with reuse of existing Alliance services.

The resulting architecture builds on RIIS* as the common source of structured research information and complements it with two actionable functions: a lightweight marketplace for research opportunities and a matchmaking service capable of identifying potentially relevant collaborators across the Alliance. Broader communication and collaboration needs continue to be addressed through existing tools such as Whaller, avoiding unnecessary duplication within the EU-CONEXUS IT ecosystem.

The stakeholder survey played a central role in this evolution. It confirmed that researchers primarily expect support in discovering relevant colleagues and cooperation opportunities, while also highlighting the importance of simplicity, ergonomics, communication and user awareness for future adoption.

At the date of this report, the marketplace and matchmaking components have been developed. The remaining work concerns their final integration, production configuration, end-to-end validation and deployment, which is planned before the end of 2026.

Beyond the delivery of the platform itself, the development process provides useful lessons for the future evolution of EU-CONEXUS digital services. New shared tools should be grounded in demonstrated user needs, make maximum use of authoritative Alliance data and existing services, and minimise the number of separate environments users are required to adopt. Following deployment, particular attention should therefore be given to promotion and onboarding, monitoring actual use of the platform, improving the completeness of RIIS* researcher profiles, and progressively refining the matchmaking methodology on the basis of operational experience.

Appendix A – Technical specification of the matchmaking service

A.1 Overview

The matchmaking service developed by AUA implements the analytical component of the Collaborative Platform. It receives the description of a marketplace opportunity, retrieves eligible researcher profiles from RIIS*, calculates a relevance score for each profile and returns a ranked list of potential collaborators together with explanatory information.

The operational implementation is a deterministic weighted-ranking engine. Although several alternative approaches were investigated during development—including Hamming-distance methods, genetic algorithms, Jaccard similarity, machine-learning approaches, graph-based recommendation and semantic representations—the current production-oriented implementation uses interpretable component scores derived from structured and textual RIIS* information.

A.2 Opportunity and researcher representation

A matchmaking request may contain:

- a marketplace item identifier;
- title and description;
- keyword identifiers or names;
- research-area identifiers or names;
- a requested institution;
- researcher identifiers to exclude;
- the number of requested results;
- the initiating researcher;
- whether the initiating researcher may appear in the results;
- the matchmaking type: research, teaching or funding.

Researcher information is retrieved from RIIS* using read-only database access. Relevant information includes biography and profile text, scientific keywords, research areas, institutional affiliations, doctoral-supervision status and links to research projects. Only profiles marked as published are eligible for matching.

Research areas are also interpreted hierarchically. A direct match with a requested research area receives full credit, while correspondence only with its parent area can receive partial credit. This allows the system to account for broader disciplinary relationships without treating them as equivalent to exact matches.

A.3 Text preprocessing

The service builds a textual representation of the opportunity from its title, description, resolved keywords and research-area names. Researcher text is built from the available biography and “about me” information.

The current implementation:

- converts text to lowercase;
- tokenises alphabetic characters, accented Latin characters and numbers;
- removes tokens of two characters or fewer;
- removes a predefined set of common English stop words;
- uses sets of tokens, meaning that repeated occurrences of a word do not increase its contribution.

The current application does not use TF–IDF, transformer embeddings or publication abstracts in the live matching calculation.

A.4 Component scores

Six scoring components are implemented.

Component	Principle
Keyword correspondence	Share of requested keywords also present in the researcher profile
Research-area correspondence	Full credit for direct matches and partial credit for parent-area matches
Text correspondence	Coverage of opportunity tokens by tokens found in the researcher profile text
Institution correspondence	Binary score when the researcher belongs to a requested institution
Doctoral-supervision status	Binary score indicating whether the researcher may supervise doctoral candidates
Project participation	Binary score indicating whether the researcher has at least one research-project association

The keyword and textual calculations are coverage measures rather than symmetric similarity measures. A researcher is therefore not penalised for having additional keywords or profile terms that are unrelated to the current opportunity.

The project-participation component indicates the existence of at least one project association in RIIS*; it should not be interpreted as evidence that the researcher is necessarily involved in a currently active project.

A.5 Weighting by matchmaking type

The six components are combined through a weighted sum. The weights currently implemented are as follows.

Component	Research	Teaching	Funding
Keywords	0.30	0.20	0.25
Research areas	0.20	0.25	0.20
Text	0.30	0.25	0.25
Institution	0.05	0.05	0.15
Doctoral supervision	0.00	0.15	0.00
Project participation	0.15	0.10	0.15
Total	**1.00**	**1.00**	**1.00**

The differentiation allows the system to reflect different use cases. In particular, doctoral-supervision status contributes specifically to teaching matchmaking, while institutional correspondence has a greater weight for funding-related requests.

In the current implementation, missing components receive a score of zero and the weights are not renormalised. Consequently, incomplete RIIS* profiles may receive lower scores even where the researcher's actual expertise could be relevant. Profile completeness is therefore an important factor in matchmaking quality.

A.6 Relevance filtering and ranking

Before supporting characteristics such as doctoral-supervision status or project participation are allowed to influence a recommendation, the service requires evidence of topical relevance.

The topical contribution consists of the weighted keyword, research-area, text and institution components. If this contribution falls below the configured threshold, the researcher is excluded from the results. This prevents a researcher from being recommended solely because of generic characteristics unrelated to the subject of the opportunity.

Eligible profiles are subsequently ranked in descending order of their total score and the requested number of results is returned. Researchers explicitly listed for exclusion are removed before scoring, and the initiating researcher can also be excluded according to the request parameters.

A.7 Explainability

For every returned researcher, the service can generate a short explanation derived directly from the scoring evidence. Depending on the result, this can include:

- number of shared keywords;
- direct or parent-level research-area correspondence;
- relevant textual overlap;
- correspondence with a requested institution;
- doctoral-supervision capability;
- existence of linked research projects.

These explanations are intended to make the ranking transparent and reproducible. They also support the user in interpreting the recommendations before deciding which researchers should ultimately be contacted.

A.8 Application architecture and execution

The matchmaking application is implemented as a FastAPI service using SQLAlchemy to access the required subset of the RIIS* database through a configured read-only connection.

The processing workflow is asynchronous:

1. the RIIS* marketplace submits a matchmaking request;
2. the service creates the request and returns an accepted status;
3. the matchmaking process resolves the marketplace attributes and retrieves eligible RIIS* researchers;
4. profiles are scored and ranked;

5. results are made available for retrieval;
6. the AUA service sends the resulting researcher identifiers, scores and explanations back to the Studio Juillet interface.

The integration principle agreed between the development teams is that the marketplace transmits the attributes of the opportunity to the AUA service, while AUA queries RIIS* directly and subsequently returns the identifiers of the matching researcher profiles.

A.9 Current limitations and possible future developments

Several limitations of the current implementation have been identified.

The quality of the results depends directly on the completeness and consistency of researcher information available in RIIS*. Missing keywords, research areas or profile text can therefore reduce the score obtained by otherwise relevant researchers.

The current matching methodology deliberately favours transparency and interpretability over more complex predictive techniques. Approaches such as transformer-based semantic representations, graph-based recommendation, probabilistic models, matrix factorisation or genetic optimisation were considered during development but are not part of the present implementation.

The current application version also uses an in-process store for matchmaking request status and results. This implementation is suitable for demonstration or single-instance operation; a future multi-instance deployment would require a shared persistent mechanism for request state and results.

These elements provide potential directions for future refinement once the platform is deployed and sufficient operational experience and usage data have been collected.

Appendix B – Glossary

Acronym	Full name	Definition
RFS	**Research for Society**	EU-CONEXUS project aimed at strengthening, modernising and internationalising the Alliance's research and innovation dimension, with a focus on Smart Urban Coastal Sustainability (SUCS).
JRI	**Joint Research Institute**	EU-CONEXUS structure bringing together researchers and research activities across partner universities around shared research themes and interdisciplinary collaboration.
RIIS	**Research & Innovation Information System**	EU-CONEXUS information system providing a common directory of researchers, research units and research infrastructure across the Alliance.
DoA	**Description of Action**	Part of the Grant Agreement describing the project's objectives, activities, work packages, tasks, deliverables and implementation arrangements.
GA	**Grant Agreement**	Contractual agreement between the European Commission and the project beneficiaries defining the funded action and the rights, obligations and conditions governing its implementation.