

Modernising the Infrastructure of the Catalan Research Portal

Ricard de la Vega

with Albert Martínez, Laia García, Sandra Reoyo and Natalia Torres,
Consorci de Serveis Universitaris de Catalunya (CSUC)

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Who we are

CSUC is a public consortium that provides shared services across the Catalan research system

Digital infrastructure

Computing, applications, operations and cybersecurity

Research and open science services

Electronic resources, repositories and open science support

Coordination across institutions

Joint procurement, common initiatives and interinstitutional collaboration



Generalitat de Catalunya
**Departament de Recerca
i Universitats**



UNIVERSITAT DE
BARCELONA

UAB
Universitat Autònoma
de Barcelona



UNIVERSITAT POLITÈCNICA
DE CATALUNYA
BARCELONATECH



Universitat
Pompeu Fabra
Barcelona

Universitat
de Girona



Universitat
de Lleida



UNIVERSITAT
ROVIRA I VIRGILI
Fundació URV



Universitat
Oberta
de Catalunya



UNIVERSITAT DE VIC
UNIVERSITAT CENTRAL
DE CATALUNYA



UNIVERSITAT
**RAMON
LLULL**

UIC
barcelona

CEU Universitat
Abat Oliba

CSUC

Consorti de
Serveis Universitaris
de Catalunya

Catalan Open Science

The screenshot shows the CORA Catalan Open Research Area website. At the top, there are logos for the Unió Europea, Fons Europeu de Desenvolupament Regional, Next Generation Catalunya, and Departament de Recerca i Universitats. The main header features the CORA logo and navigation links for OPEN SCIENCE, OPEN ACCESS, PRC, and FAIR DATA. The central text reads "Catalan Open Research Area" and "CORA contributes to Open Science by making the research done in Catalonia more visible, accessible and reusable". Below this, there are four circular icons representing different research areas: RESEARCH (Research Portal of Catalonia (PRC)), DATASETS (Research Data Repository (RDR)), DATA MANAGEMENT PLANS (eDNA DMP), and THESES (Theses and Dissertations Online (TDX)). At the bottom, there are two sections: "Open Science at universities and research centers in Catalonia" and "What is Open Access?".

<https://cora.csuc.cat>

The screenshot shows the CORA Portal de la Recerca de Catalunya website. At the top, there are logos for the Unió Europea, Fons Europeu de Desenvolupament Regional, Next Generation Catalunya, and Departament de Recerca i Universitats. The main header features the CORA logo and navigation links for Home, About PRC, FAQ, Stats, Contact us, and Language. The central text reads "La química de lo bello: un relato científico sobre el arte y las bellezas cotidianas". Below this, there are two sections: "Last Publications & theses" and "Open and closed access scholarly publications". The "Open and closed access scholarly publications" section includes a bar chart showing the average of open access publications between 2014 and 2021 is 38.9%.

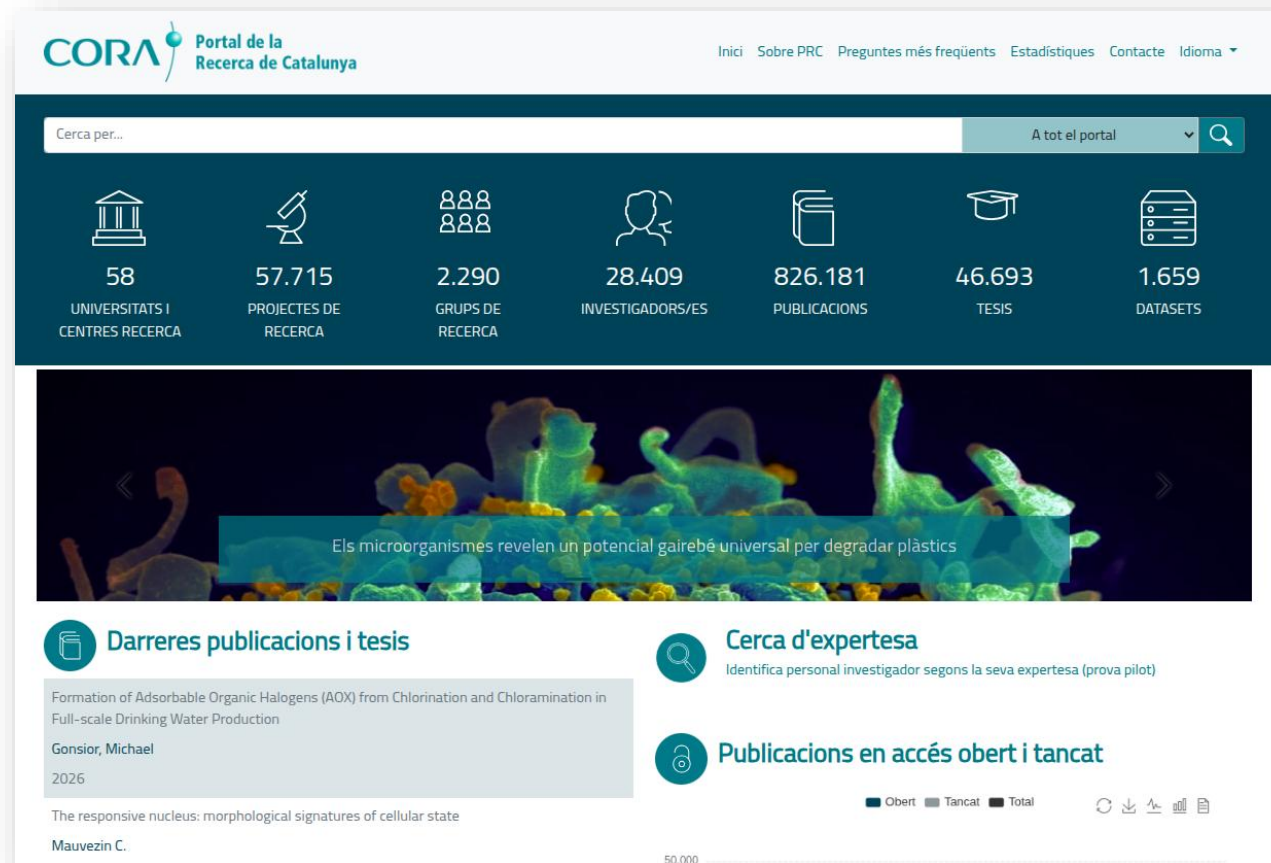
<https://portalrecerca.csuc.cat>

The screenshot shows the CORA Repositori de Dades de Recerca website. At the top, there are logos for the Unió Europea, Fons Europeu de Desenvolupament Regional, Next Generation Catalunya, and Departament de Recerca i Universitats. The main header features the CORA logo and navigation links for Home, About, Search, User Guide, Metrics, Contact, English, and Log in. The central text reads "Search this dataverse...". Below this, there are four sections: "Universities & CERCA Centers", "Datasets", "Files", and "Downloads". The "Files" section shows a list of files with their titles, authors, and publication years. The "Downloads" section shows a list of downloads with their titles, authors, and publication years.

<https://dataverse.csuc.cat>

Catalan Research Portal (PRC)

Gather in one place all the scientific production of the Catalan research system



Agenda

1. Evolution
2. Functional improvements
3. Architectural and technological improvements
4. Roadmap

Catalan Research Portal evolution



Restricted opening

10 institutions integrated
28k research projects
1,5k research groups
7,5k research staff
380k publications & thesis



Growing more (information) & more (services)

57 institutions integrated
49k research projects
2,3k research groups
24k research staff
780k publications & thesis
425 datasets published



Modernising the Infrastructure

58 institutions integrated
58k research projects
2,3k research groups
29k research staff
880k publications & thesis
1,7k datasets published



Strategic Membership
Meeting 2015
at Barcelona



Strategic Membership
Meeting 2023
at Pamplona



17th International
Conference on CRIS
2026
at Azores

What has remained since 2012

- The Portal continues to be based on the premise of building on the work already carried out by universities and research centres in their research information management systems (CRIS). The aim is for the work done for the Portal to also contribute to improving information management within each institution.
- Among the first decisions made when building the Portal:
 - ✓ Use of **ORCID** as the identifier for research staff
 - ✗ Use of DSpace CRIS software
 - ✓ Data flows from the CRIS systems to the Portal
 - ✓ **CERIF** as the data exchange format

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Functional improvements



For researchers and end users

- Modernized graphical interface.
- More contextual information for selected items, such as OpenAlex.
- Improved unified global search across all identity types, with infinite scrolling and progressive result loading.
- Enhanced statistical information.



For institutions staff

- Dedicated management area for content upload and validation, integrated into the portal.
- Integrated PRE and PRO environments for easier viewing of indexed data.
- Institutional autonomy to update basic customizations: logos, text, etc.
- Institution-specific data loads instead of a global update every two months (gradual rollout)



For CSUC

- Centralization of the different processes in a single tool.
- Simpler operational management and monitoring from one shared environment.
- A more scalable basis for future functional and technical improvements.

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ENJO



 The gateway to knowledge

Catalonia Research Portal

The portal contributes to open science by making Catalan research more visible, accessible and reusable

Search researchers, publications, projects...



 Over 945 k updated records



Universities and research centers

61

Research centers



Research staff

28.098

Scientists and researchers



Departments

533

Academic units



Research groups

2.291

Research groups



Projects

57.450

Research projects



Publications

810.686

Articles and books



Datasets

1.647

Data sets



Doctoral Theses

44.657

Defended theses



Universities and research centers

Discover the institutions that are part of the Catalonia Research Portal

Search institutions by name or ROR code



All 61



University 12



CERCA Centers 42



Research Center 4



External data 2



Upcoming additions 1

University



Universitat de Barcelona

University



Universitat Autònoma de Barcelona

University



Universitat Politècnica de Catalunya

University



Universitat Pompeu Fabra

University



Universitat de Girona

University



Universitat de Lleida

University



Universitat Rovira i Virgili

University



Universitat Oberta de Catalunya

University



Universitat Ramon Llull

University



Universitat de Vic -
Universitat Central de...



Publications

Scientific articles and academic publications

All types

Research staff

Publications

Theses

Research projects

Departments

Research groups

Datasets

Search publications by title, author, journal...

Search

Universitat (12)

- ☐ Universitat de Barcelona 194.5K
- ☐ Universitat Autònoma de ... 156.0K
- ☐ Universitat Politècnica de ... 119.2K
- ☐ Universitat Pompeu Fabra 70.4K
- ☐ Universitat Rovira i Virgili 56.5K
- ☐ Universitat de Girona 34.0K
- ☐ Universitat de Lleida 22.6K
- ☐ Universitat Ramon Llull 14.9K

Centres CERCA (41)

810.686 resultats
Mostrant 20 de 810.686



Viral Characteristics Associated with the Clinical Nonprogressor Phenotype Are Inherited by Viruses from a Cluster of HIV-1 Elite Controllers

Publication

Journal Article

* MARFIL VERCHILI, SILVIA, BLANCO ARBUÉS, JULIÀ

Date: 2018-03-01

10.1128/mBio.02338-17 2150-7511



Preparative Scale Production of Recombinant Human Transthyretin for Biophysical Studies of Protein-Ligand and Protein-Protein Interactions

Publication

Journal Article

* Planas Sauter, Antoni, Planas Obradors, Anna Maria, Arsequell Ruiz, Gemma

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of Catalonia

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Research Groups

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Theses

Datasets

Accessibility

Legal notice

Privacy & cookies

Internal use

Collaborations

Quick search...

Ctrl+K

ENG

Iniciar Sessió

57 k
PROJECTS

2,3 k
RESEARCH GROUPS

28 k
RESEARCHERS

811 k
PUBLICATIONS

45 k
THESES

1,6 k
DATASETS

All types

Research staff

Publications

Theses

Research projects

Departments

Research groups

Datasets

Search...

Search

Tipus d'element (7)

☐ publicacions

810.7K

☐ projectes

57.5K

☐ tesis

44.7K

☐ investigadors

28.1K

☐ grups

2.3K

☐ datasets

1.6K

☐ departaments

533

Universitat (12)

945.362 resultats

Mostrant 20 de 945.362

Replication data for "Subcutaneous administration of an endocrine-mimetic platform allows for prolonged tumor-uptake of a tumor-targeted protein"

Experimental data

• Creators: Mangues, Ramon, López Laguna, Héctor and 4 more

10.34810/data2656

Replication Data for: G-protein activation of the dark-state visual G protein-coupled receptor rhodopsin by releasing critical structural constraints

Experimental data

• Creators: Cordoní, Arnau, Garriga Sole, Pere and 1 more

All types

Research staff

Publications

Theses

Research projects

Departments

Research groups

Datasets

Search researchers by name, ORCID, email...

Search

Tip: Prova amb el cognom seguit del nom

TRY WITH

NOM Casós Vázquez, Kelly

NOM FERNANDEZ SANCHEZ, ANA

ORCID 0000-0001-5000-0007

NOM ABAD CAPA, JORGE

Prem

Enter

per cercar

ersitat (12)

itat Autònoma de Ba... 3.6K

itat de Barcelona 3.3K

itat Politècnica de C... 2.6K

itat de Girona 1.1K

All types

Research staff

Publications

Theses

Research projects

Departments

Research groups

Datasets

Search publications by title, author, journal...

Search

Tip: Utilitza el DOI per trobar una publicació exacta

TRY WITH

EDITORIAL GBI598830

TÍTOL Presentació

DOI 10.1007/978-3-030-65421-4

TÍTOL Introducció

Prem

Enter

per cercar

cat (12)

e Barcelona 194.5K

utònoma de ... 156.0K

olitécnica de ... 119.2K

ompeu Fabra 70.4K

progressor Phenotype Are Inherited by

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Iniciar Sessió

Portal de la Recerca de Catalunya

Correu electrònic



uab@uab.cat

Contrasenya

[Has oblidat la contrasenya?](#)



.....

→] Iniciar Sessió

En iniciar sessió, acceptes els nostres [Termes i Condicions](#) i la [Política de Privacitat](#)



Universitat Autònoma de Barcelona

052g81q84



Export



Search



Analytics



Entities in the repository

178,871

Total records



Validated entities

0

Total validated entities

100.0%



Publications

156,005

Research output



Researchers

3,648

177 research groups



Institutional content

All data loaded in the Research Portal



Impact



Publications

156,005

19.2% of total

810,686



Theses

11,909

26.7% of total

44,657



Research projects

7K



Research staff

3.6K



Research groups

177



Validator

Validations

Upload file

Filters

Search by file name...

All statuses (4)

All tags (4)

All dates

4 of 4 validations

Newest



20260507_1226_XML_CERIF_UAB.xml
1012.2 MB · Uploaded 7 days ago · 052g8jq94 · 3m 27s

PRC

Completat



20260312_1150_XML_CERIF_UAB.xml
1013.87 MB · Uploaded about 2 months ago · 052g8jq94 · 8m 40s

Completat



gen_2026.xml
990.69 MB · Uploaded 2 months ago · 052g8jq94 · 8m 37s

Completat



20260312_1150_XML_CERIF_UAB.xml
1013.87 MB · Uploaded 2 months ago · 052g8jq94 · 22s

Fallat



Completed



73 errors · 1,474 warnings · 0 Info · 609,934 entities

Uploaded 7 days ago · Processed in 3m 28s · 1012.2 MB

Pipeline

Summary

Logs 5

Metadata

Storage

Validation pipeline

5/5 passos

3m 27s



Start Completat

13/05 09:40:24

Validation started for Institution 052g8jq94 (type: university)



XSD validation Completat

16s

13/05 09:41:05

XSD validation passed (16274 ms)



Entity processing Completat

2m

13/05 09:43:06

Processed 609934 entities (120866 ms): Researcher: 435170, Department: 85, Group: 177, Project: 7064, Publication: 155566, Dataset: 0, Thesis: 11872

609,934 entitats

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of Catalonia

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Internal use

Quick search...

Ctrl+K

Producció

ENG

UA

← Home > Validator > 20260507_1226_XML_CERIF_UAB.xml > Publications

Publications

155,566

Share

TOTAL

156.311

WITH MANDATORY ERRORS

0

WITH WARNINGS

745

WITH INFO

0

WITHOUT MANDATORY ERRORS

155.566

Search by title, authors, DOI, ISBN...

All

Table view

Cards view

Items per page 50

IDENTIFIER	TITLE	DATE	ERRORS
00005d3d-9e30-4f2b-9d40-47871ff50539	El context social del sistema educatiu a Catalunya: reptes en un escenari de crisi	2013-01-01	-
000085ad-e4dc-4218-ae18-8960e438b3f1	A novel FIA configuration for the simultaneous determination of nitrate and nitrite and its use for monitoring an urban waste water treatment plant based on N/D criteria	1998-02-19	-
0000b1fd-6b7a-43d4-88cc-090aac3d1b05	Matemática inclusiva. Propuestas para una educación matemática accesible	2008-01-01	-
0001ccb7-ef7a-4d21-b024-117e966f6dfb	El Empresariado inmigrante en España	2007-01-01	-
0001eaeef-79a0-4722-bda4-cfb1ce7c303d	The case-population study design: An analysis of its application in pharmacovigilance	2011-09-07	-

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Quick search...

Ctrl+K

Producció

ENG

UA

Mode de visualització

● Producció

☉ Índexs de Preview

● Març v2
prc_11032026

● Març v1
prc_09032026

↓

⋮

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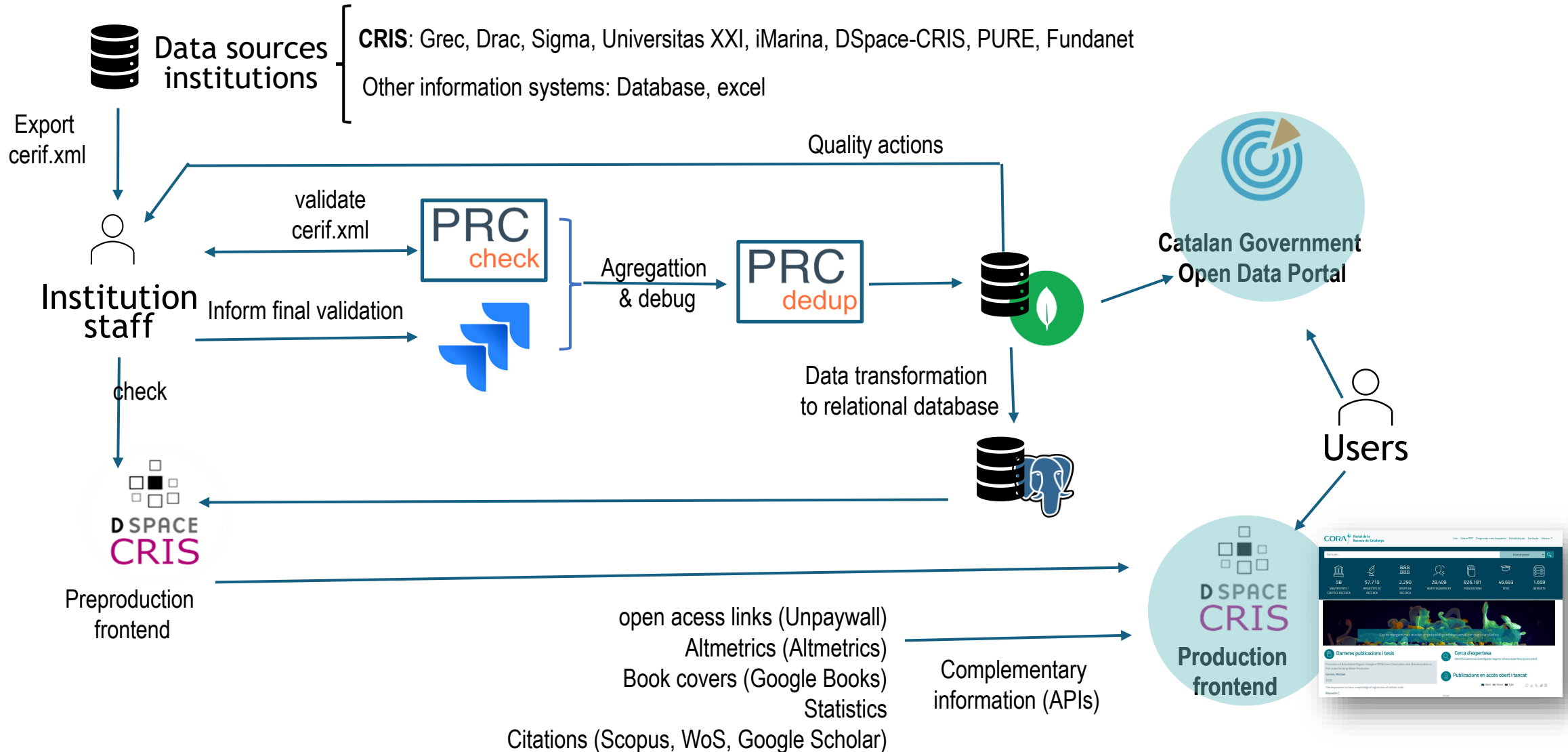
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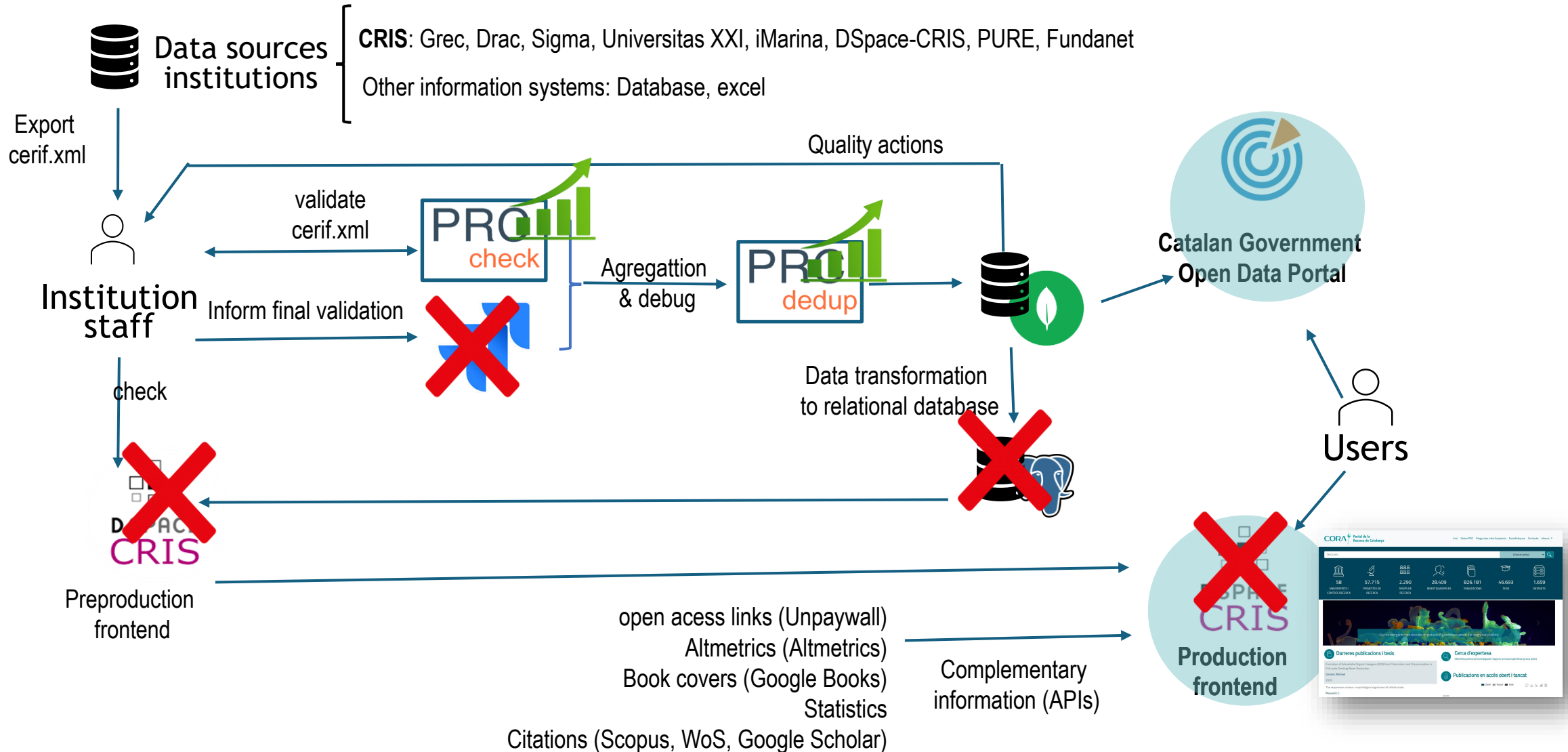
Agenda

1. Evolution
2. Functional improvements
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4. Roadmap

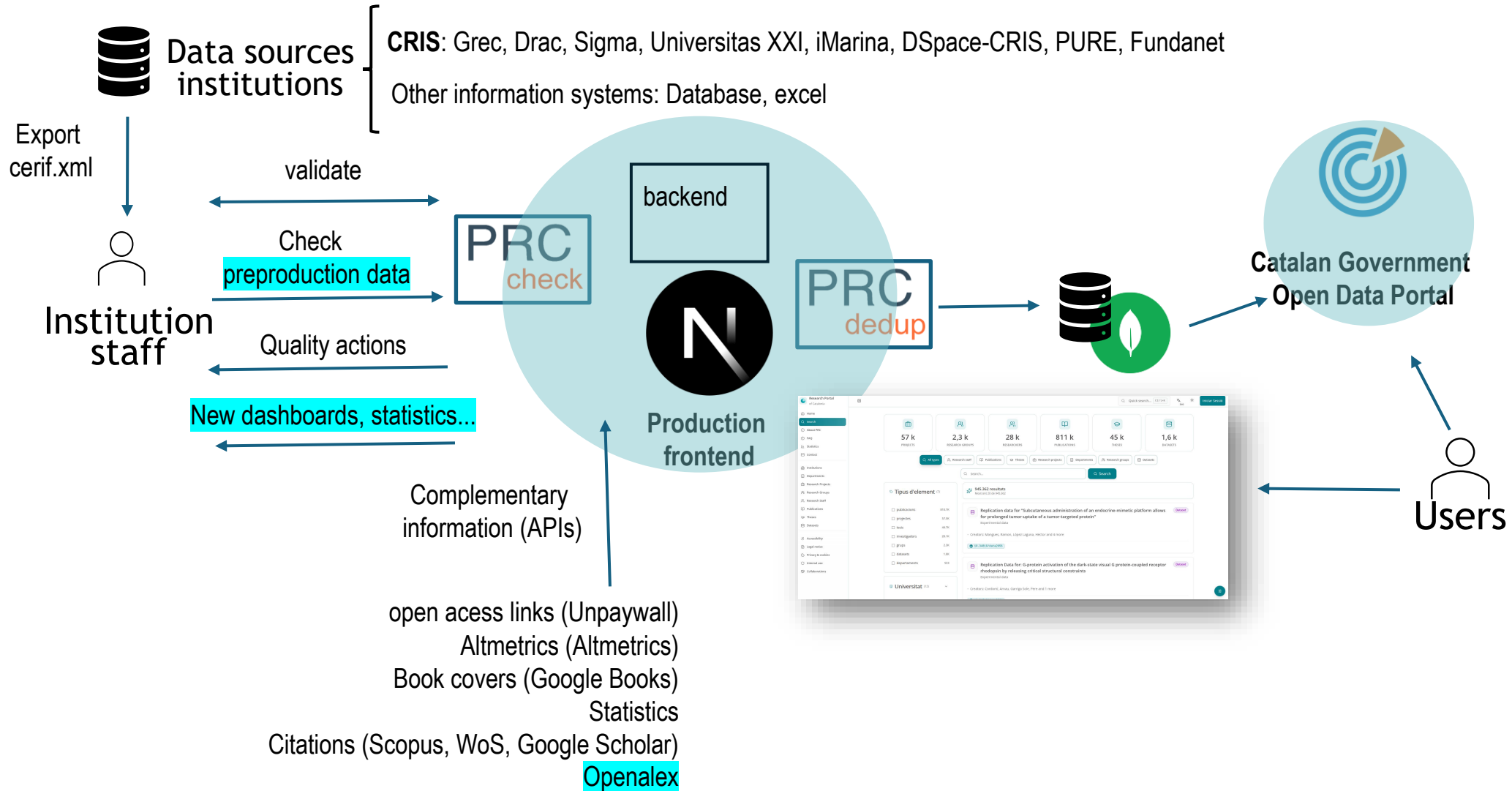
From data ingestion to publication



Simplification & integration



Simplification & integration



Performance improvements

Depends on the workflow, from hours/days to minutes

- **Deduplication** process: from 2h to 30 min, ~4,2x faster (update to the latest spark version and some optimization changes)
- Transform and **ingest data** from MongoDB to DSpaceCRIS: From 5h to 0 min (now the data goes directly from deduplication to the indexation process)
- The **indexation** process: From 24h to 10 min, ~144x faster (changing the dspace-SolR indexation for directly the json from deduplication to opensearch)

In validation there are no absolute times, but there is an observed trend: **the larger the XML, the more noticeable the improvement.**

More technical improvements

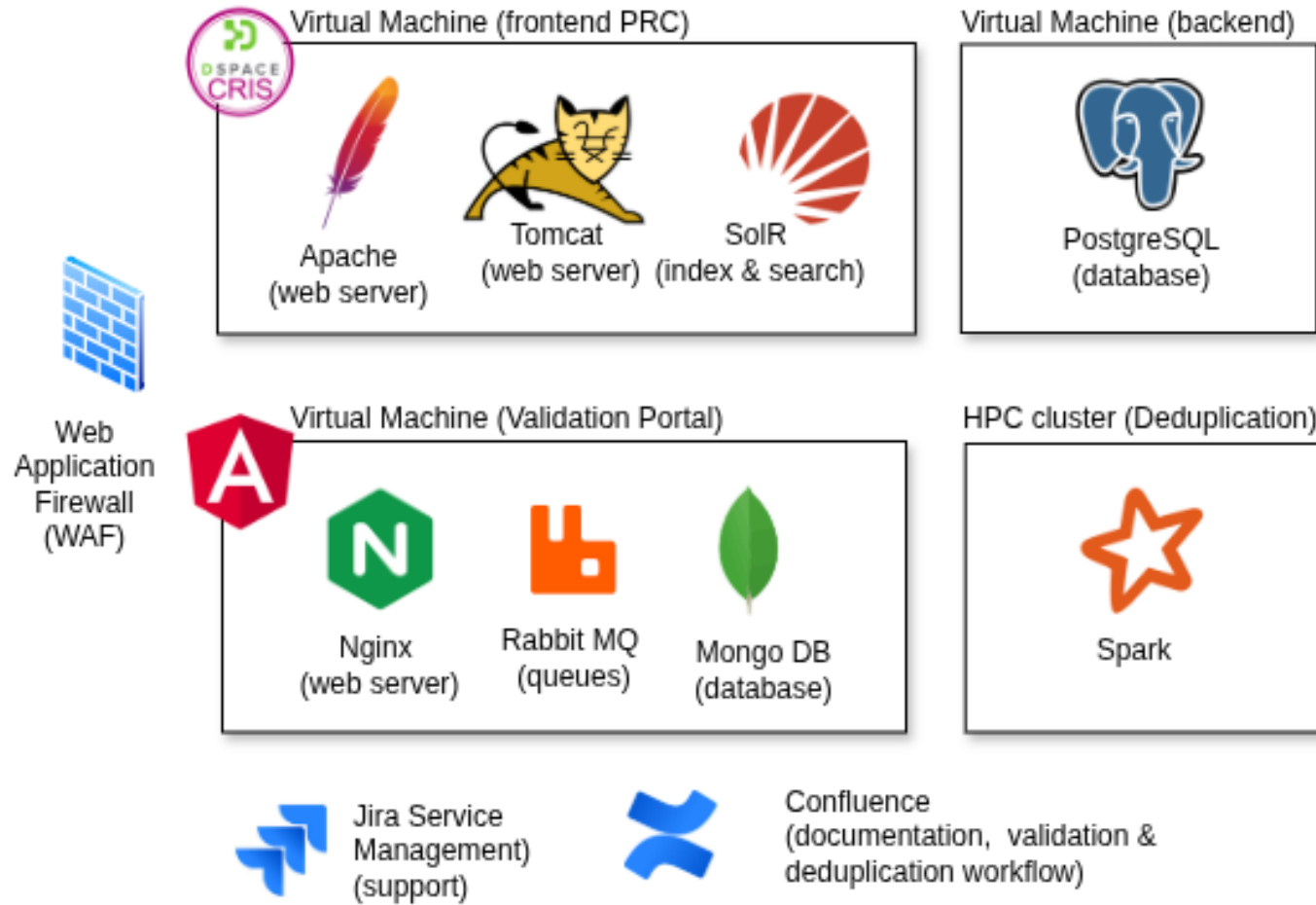
Software

- Performance improvements
 - **Use** of caching (Redis)
 - Use of infinite scrolling instead of pagination (offset)
 - Backend changes are updated in real time in the relevant part of the frontend without reloading the entire page (SSE + webhooks)
- Notification management
- User paths and click flow (Jitsu) to monitor user behavior and provide it to institutions through dashboards.
- Incorporation of mechanisms to control AI bots (WAF, Anubis).

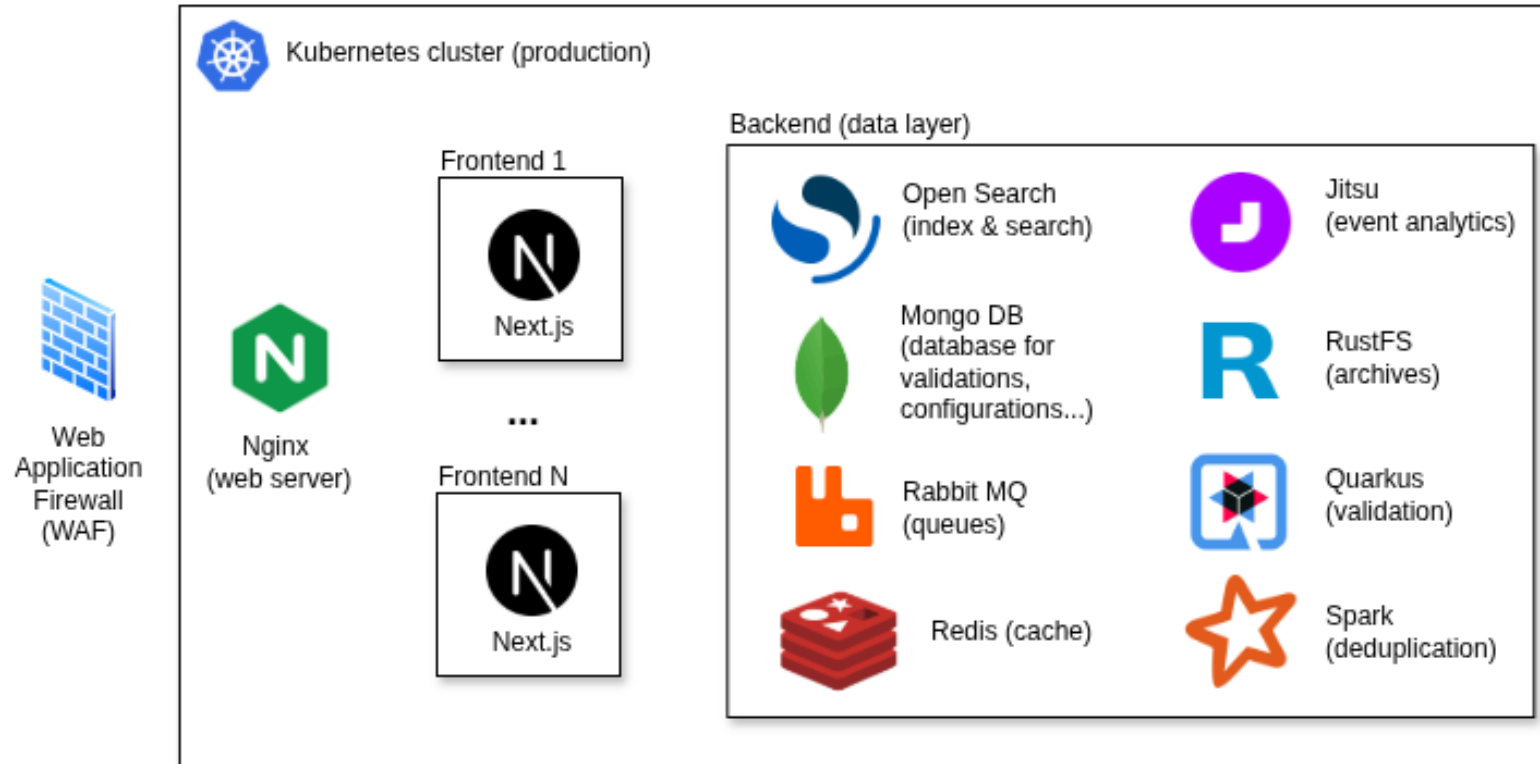
Hardware

- Kubernetes cluster with autoscaling and HA measures.
- Improved CI/CD mechanisms.

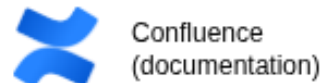
Architecture



New architecture



Escalat per peticions (de 2 a 10 instàncies) del frontend
Replicació (escriu a 1, lectura a N) de l'Open Search (a 3) i Mongo (a 3)
Escalat per events al Rabbit



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Roadmap

- v0.1 - Dec 2025 - Fully functional **new architectural developed** & tested
- v0.2 - Jan 2026 - Start of the portal **update process in parallel**, with both the current and the new infrastructure, to evaluate the results and perform benchmarking
- v0.7 - Jan-May 2026 - **Internal evaluation** by CSUC functional staff and implementation of feedback & improvements
- v0.8 - Jun - Sep? 2026 - Open the new portal with restricted access to **community evaluation**. A collaborative tool will be provided to the institutions for managing, collecting and sharing feedback.
- V1.0 - Dec 2026? - Deployment to **production of the new architecture** with (some) community feedback incorporated.

Roadmap

- v1.1 - 1Q? 2027 - Update with **more functional improvements**, like
 - Incorporate of a universities local SSO called unificat
 - More content types, such as grants or patents
 - Incorporate search & facets with the Openalex information (not only in profile pages)
 - Incorporate SDG to the profiles, seach & facet (AI)
 - More notifications could be added
 - Dashboard with visualizations of user paths and click flows, redis cache performance, trends (data from Jitsu)
 - ...
- v1.2 - 3Q? 2027
 - From CERIF XML to **CERIF RDF**
 - New graph search capabilities

The CSUC staff

Open Science team



Laia García

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Sandra Reoyo

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IT team



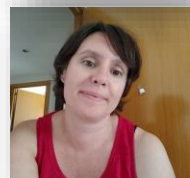
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And special thanks to





Consorci de
Serveis Universitaris
de Catalunya

OBRIGADO
THANK YOU
GRÀCIES!