

# Beyond CRIS: A research and higher education information system in Poland







Reports, Analyses and Data on the science and higher education system in Poland – RAD-on

The National Information Processing Institute and the Ministry of Education and Science in Poland



# Project goals

## Goal 1. Open access to data on science and higher education



Since 2011, OPI PIB has been engaged in the development of various data collection systems, which operate according to official legal regulations.

Due to the majority of research institutions being obligated to upload data to the systems on a regular basis, the information stored by such systems is the most up-to-date and reliable.



Goal 2. To support decision-making processes by providing IT tools

# Open government data

# Data-driven policy making



FAIR data (findable, accessible, interoperable, reusable)



# Public system



#### REPORTS

Reports are based on data imported, among other sources, from the POL-on System of Information on Science and Higher Education as well as from databases, studies and publications put out by the National Information Processing Institute (OPI-PIB).

The user gains access to:

- data on Polish science and results of research in the area of new technologies conducted at OPI-PIB
- interactive maps and charts
- tools which can be used to create their own data summaries

#### GO TO REPORTS











# BI tools for institutions



Business Intelligence Tools for users with additional credentials

Governmental organizations (ministries, national scientific councils, research funding organizations) who can access non-public data benefit from more advanced dashboards created using the BI tool.



# Technology

Overall schema of internal architecture RAD-on



# Technologies used

Technology	Main task	Justification of the chosen technology			
Java Enterprise Edition	Programming tools	A classic tech stack for developing enterprise-class			
JDK8		systems			
Spring					
Hibernate					
Oracle Enterprise Edition database	Data gathering, aggregating, and	A reliable dataset technology in enterprise-class			
	sharing	systems used by the key OPI PIB systems to facilitate			
		data integration			
Oracle Data Integrator	Data integration	ETL process management			
Oracle Golden Gate		Real-mode data replication from source systems			
		(Oracle)			
Oracle Analytics Server	BI tool	Information desktops, self-service reporting, email			
		report distribution			
Oracle APEX	Low-code platform	Fast implementation of web applications and RestAPI			
		interfaces			
Apache Kafka	Message broker	A free, extremely efficient, and distributed platform			
		to manage the exchange of messages between systems.			
Elasticsearch	Data indexing and searching	Implementation of full-text search			
Tomcat	Application server	A free application server			
Graylog	Application monitoring	A free system that analyses application logs			
Swagger	Documentation	Self-documenting Rest API services			
Kubernetes	Orchestration	The most popular tool that manages, automates, and			
		scales container applications			

# Project impact





# Statistics 2022–2023: public system

### 11.45 TB of data from

**9** systems on science and higher education were integrated and shared

# **150 million**

downloads of documents (five-fold increase between 2020 and 2021)

**API** was most commonly used to download data on:

- research institutions (105,004,023 downloads)
- scholars' publications (455,962 downloads)
- scholarly staff (193,142 downloads)
- university programmes (106,414 downloads)

# Statistics 2022–2023: Internal BI tools 2.2 TB

of data stored in the data warehouse

**255 million** 

lines of text in reports downloaded

**61 thousand** 

reports generated

**191** REST API interfaces shared

**104** users from **8** public institutions (10 unique users every day)

**24** 

unique ETL processes that power the data warehouses

82

thematic dashboards

# Open Data: API



### Application Programming Interface

A uniform programming interface – REST API enables free and public access to the RAD-on databases.



	REPORTS	ANALYSES DATA	USER ACCOUNT			HELP	EN Č
GET /pold	n/institutions Metoda zwracająca	istę instytucji systemu szkolnictwa	a wyższego i nauki / Returns a li	ist of institutions.			
Metoda zwraca l	istę instytucji systemu szkolnictv	va wyższego i nauki z system	u POL-on.				
Returns the colle	ection of publicly available POL-c	n data on entities in the hig	her education and scienc	e system in Pol	and		
Przykładowe w	ykorzystania / Sample API req	uests:					
Pobierz dane dzi	ałających uczelni publicznych o	az niepublicznych.					
Get the data of o	perating public and private univ	ersities.					
GET /polon/i	nstitutions?resultNumbers=	=10&iKindCd=13&iKindCd	=10&statusCode=1				
Pobierz dane ins	tytucji o nazwie = Politechnika V	/arszawska.					
Get the institutio	on's data by name = Politechnika	Warszawska					
GET /polon/i	nstitutions?resultNumbers	=10&name=Politechnika%	20Warszawska				
Pobierz dane ins	tytucji o uuid z systemu POL-on	2.0 = 521ce6da-8ebb-47a5-9	0fe-3832685b75f9.				
Get the institutio	on's data by POL-on 2.0 system u	uid = 521ce6da-8ebb-47a5-9	0fe-3832685b75f9				
GET /polon/i	nstitutions?resultNumbers	10&institutionUuid=52	lce6da-8ebb-47a5-90f	e-3832685b75	if9		
Pobieranie <b>kolej</b>	<b>nej strony z wynikami</b> na przyl	<ładzie powyższego zapytan	ia / Get the next page of r	results			
Każda poprawna tokenu, który zo	a odpowiedź usługi zawiera toke stał zwrócony w poprzedniej odp	n, który umożliwia pobranie powiedzi (parametr token )	kolejnej partii danych. Al	by pobrać kolej	ną stronę z wynika	mi, w następnym zap	bytaniu należy użyć
The token is gen	erated after first search. It must b	e forwarded to QueryParan	neters ( token parameter	r) to take next p	age of results.		
GET /polon/i 3832685b75f9	nstitutions?resultNumbers=	10&token=MWE40GIyYWQt	ZjZmZC00ZTVhLWI1MTQt	Mjc3NjZhMjE1	LOTRk&instituti	onUuid=521ce6da-8	8ebb-47a5-90fe-
Parameters							TRY IT OUT

### Application Programming Interface

REST API allows users to quickly and efficiently download data that is useful in conducting analyses and in creating statistics, reports and summaries.



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Ð	» API » Data sharing catalogue » POL-on data » Metadane na temat serwisów z kategorii Dane POL-on
Ν	IETADATA SERVICE FOR POL-ON DATA
h	:tps://radon-dev2.opi.org.pl/opendata/polon/metadata/reports_meta/swagger
T	nis is a sample REST API serving metadata information about available entities (services).
	GET /polon/metadata Get list of available entities.
	GET /polon/metadata/{entity}/description Get description about entity.
	GET /polon/metadata/{entity}/changelog Get change history for specified entity.
	GET /polon/metadata/{entity}/swagger Get open api json by entity name.
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	Schemas V
	DocEntry >
	Description >
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### Application Programming Interface

Users can develop original solutions and applications that require access to data on higher education.







RAD-on offers the most up-todate and credible information, as scientists or students can correct their own data through a single point-of-entry.

Journalists and the general public can download comprehensive analyses with in-depth interpretation of data.

Decision-makers who can access non-public data benefit from more advanced dashboards created using the BI tool.





RAD-on is the first fully integrated system for science and higher education that enables access to governmental and other data from multiple databases.

Users can interact with data in a variety of ways, depending on their analytical skills and level of authorisation.

Programmers and data scientists benefit from an integrated API; whereas researchers prefer to download pre-defined tables and visualisations.





### More about RAD-on

in a book available at: www.opi.org.pl/wydawnictwo



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