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PRZETWARZANIA
INFORMACJI
PAŃSTWOWY INSTYTUT BADAWCZY

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Central systems for collecting data on science and higher education - role and evolution in the light of the Polish Legislation

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**NATIONAL
INFORMATION
PROCESSING**
INSTITUTE



**Ministry of Science
and Higher Education**
Republic of Poland



Warsaw

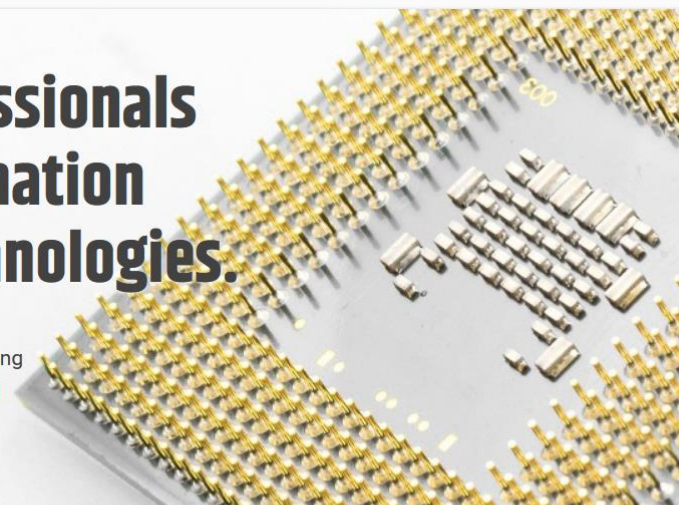


Poland



We are enthusiastic professionals focused on modern Information and Communications Technologies.

We design and develop advanced IT systems to support decision-making processes, conduct research in the fields of [machine learning](#), [artificial intelligence](#), [big data](#), and methods of [software production](#).



Big Data & Databases



We utilise databases as well as big data technologies to persist and process data

Intelligent Algorithms



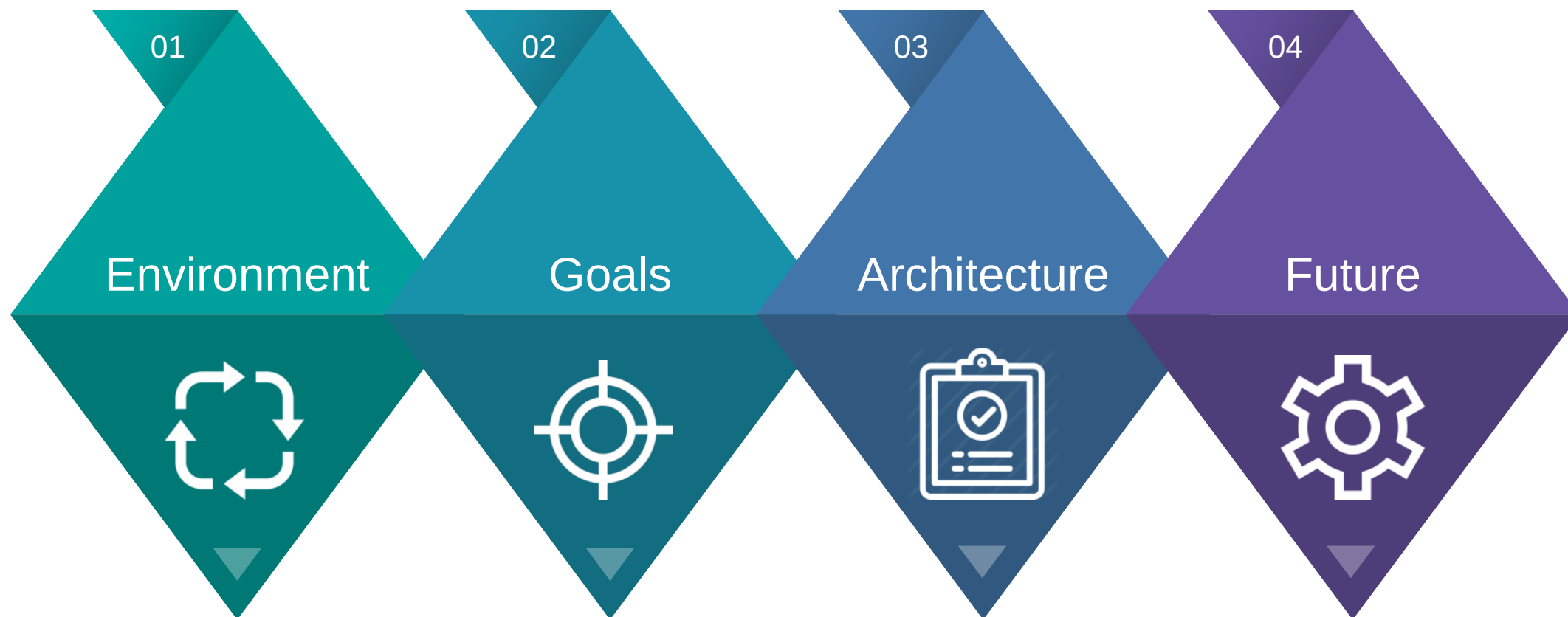
We utilise artificial intelligence to serve sophisticated solutions for our clients

Software as a Service



Our information systems offer services that suit to consumers needs

Throughout this presentation ...



CONDITIONS BEFORE CENTRAL SYSTEMS IN POLAND

CHANGING LAW

The critical issue is the high changeability of law in Poland. During the last five years there were three amendments of the bill about higher education and science in Poland.



DIVERSITY

heterogeneous information environment. Most universities and institutes have their own unique information systems in various technologies and architectures (ERP, antiplagiarism systems, repositories, and alike)



DOMINATION OF AD-HOC ANALYZES

difficulties in making long-term comparisons based on consistent data and criteria. Problem with data reliability



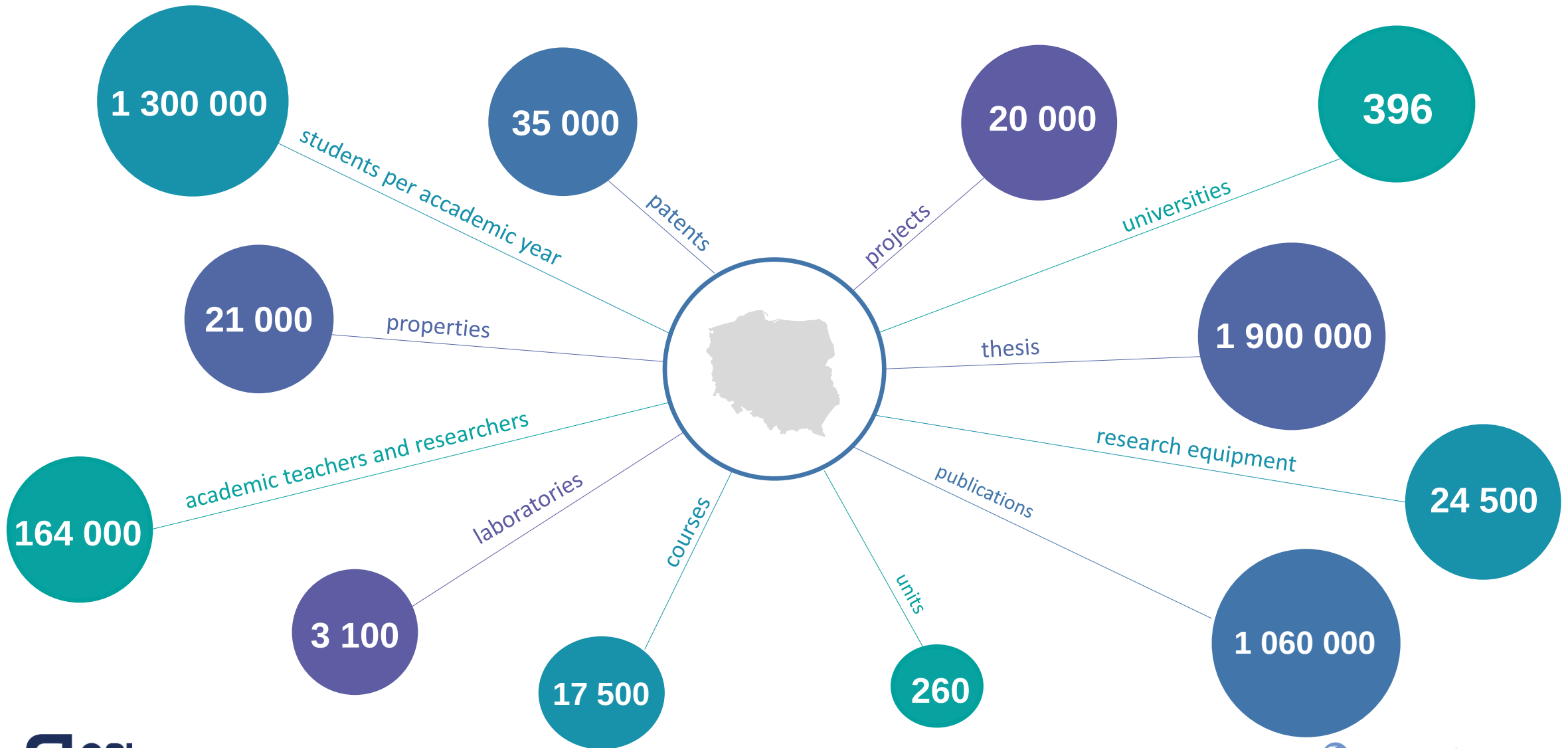
ADMINISTRATIVE BURDEN

distributed reporting obligations in order to obtain similar data by universities and scientific institutes in the form of surveys, reporting forms and similar



HIGHER EDUCATION AND SCIENCE IN POLAND

Data collected since 2011 in central repositories:



CENTRAL SYSTEMS OF SCIENCE AND HIGHER EDUCATION IN POLAND



supporting applications for research grants



collecting a wide range of data on science and higher education



PBN



collecting detailed data on scientific publications

ORPPD



collecting full texts of thesis



ELA³



tracking the economic fate of university graduates

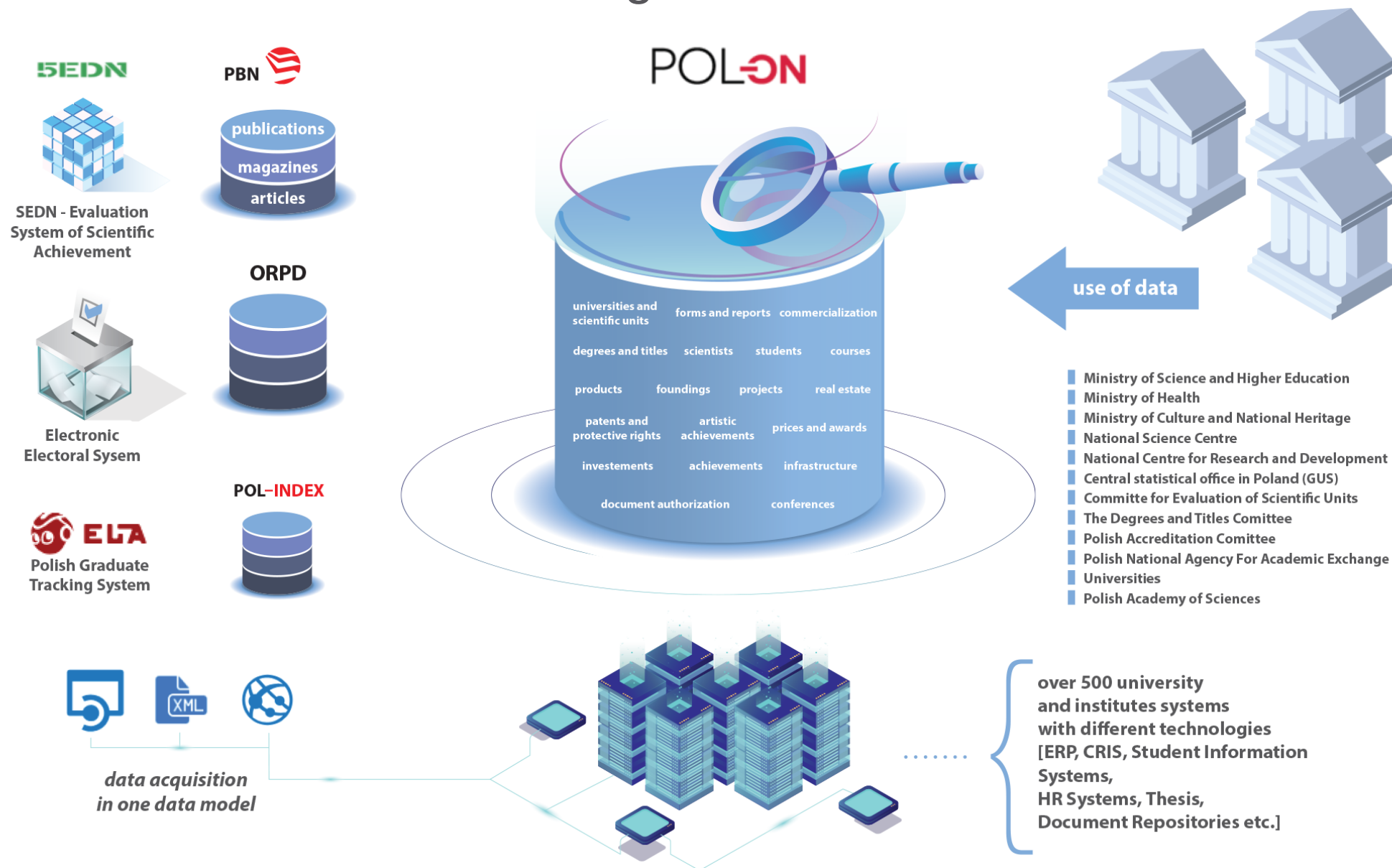


JSA



supporting universities with antiplagiarism

Integrated Information System on Science and Higher Education in Poland



POLISH SCIENTIFIC BIBLIOGRAPHY



PBN
Polska Bibliografia Naukowa

Original plan:

- Unbreakably part of the POL-on
- Independent system with a separate domain

publications

1 060 000

POLISH SCIENTIFIC BIBLIOGRAPHY – WHY SEPARATE PUBLICATIONS FROM OTHER DOMAINS? → **SYSTEM HISTORY**

Original plan:

- Personal accounts as a base for repository
- Author showing their achievements



Current purpose of the system:

- Gathering official data on publications from scientific institutions
- Source of information for evaluation

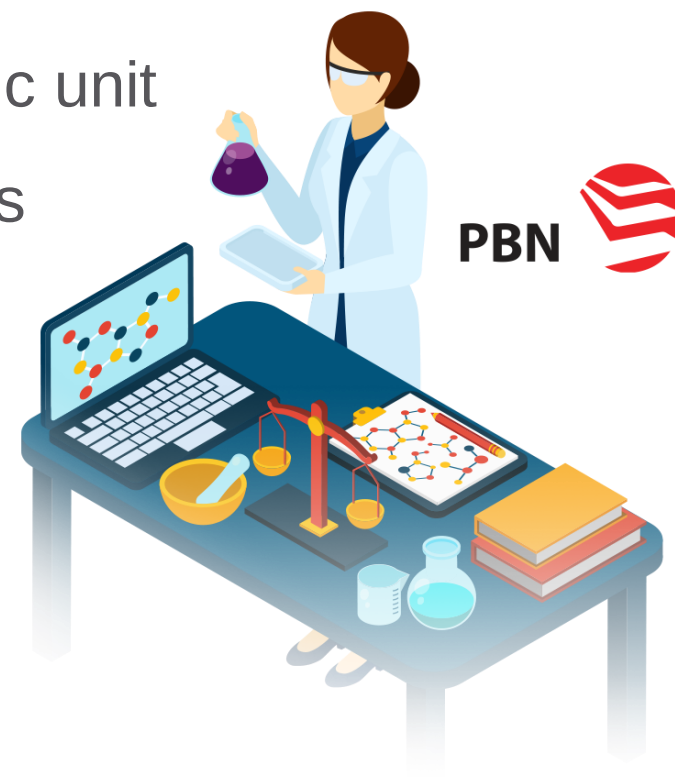
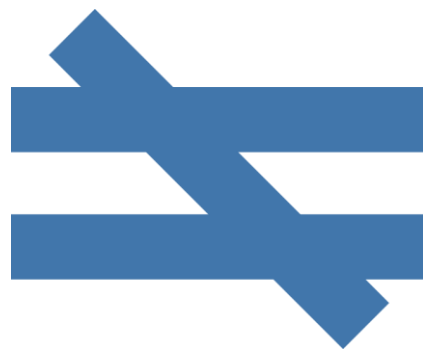
From social to social + institutional



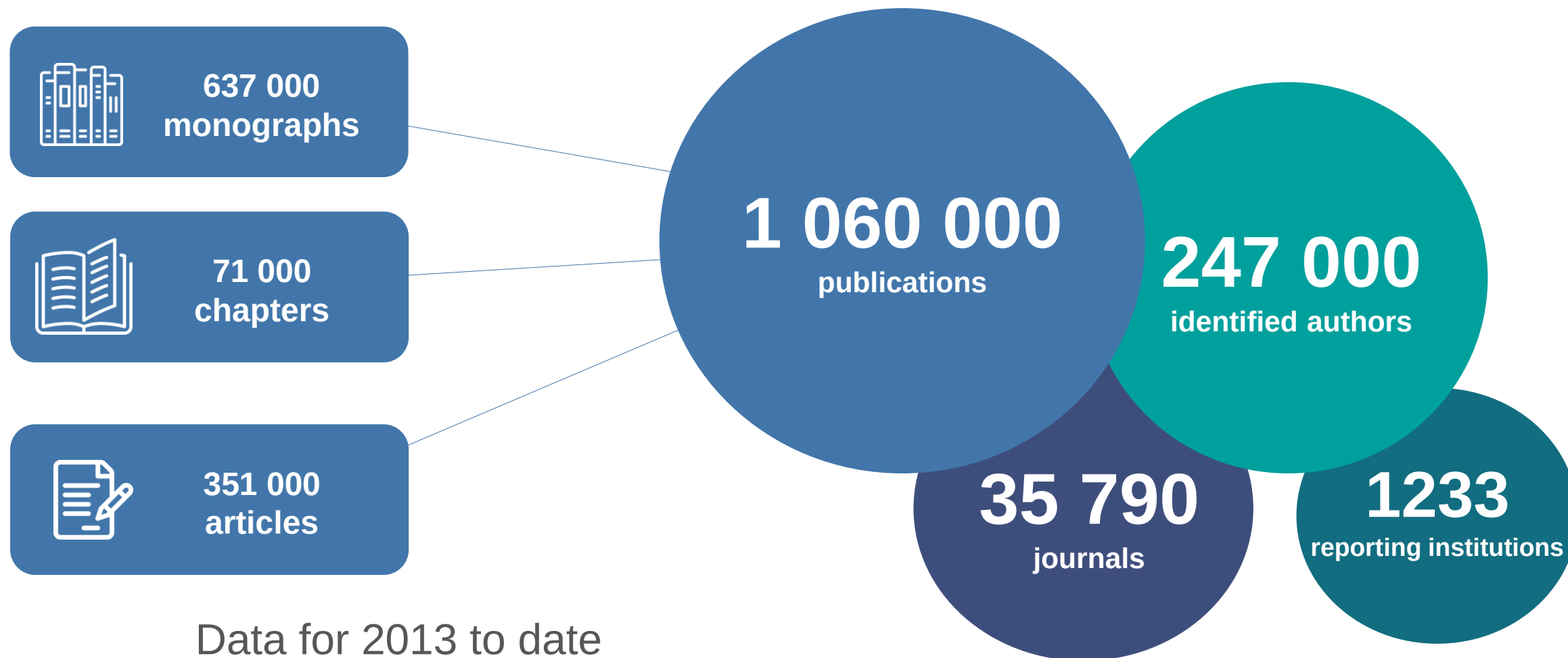
POLISH SCIENTIFIC BIBLIOGRAPHY – WHY SEPARATE PUBLICATIONS FROM OTHER DOMAINS? → ACCESS RESTRICTIONS

POLON

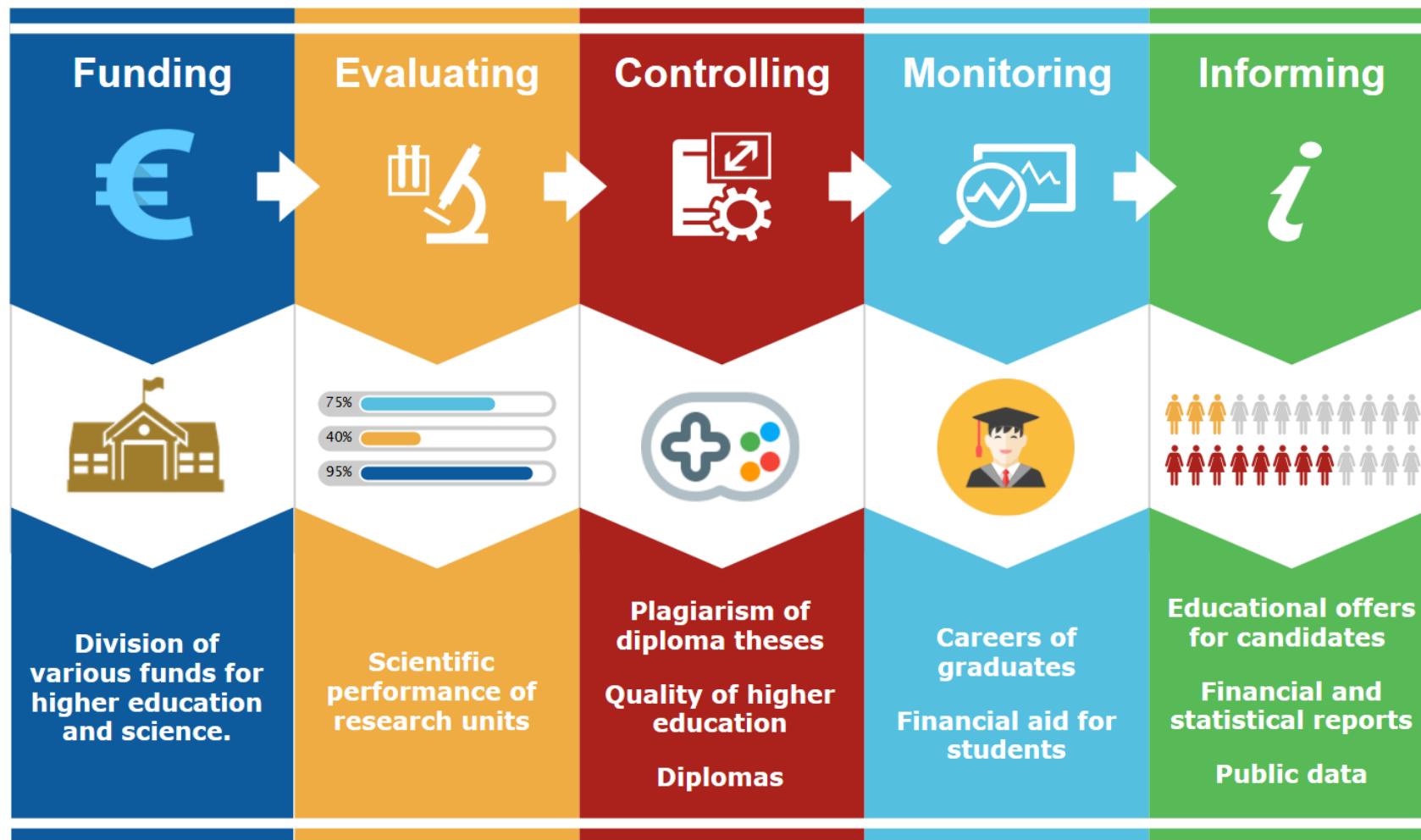
- Can be access strictly by authorized employees of scientific unit
- Data in the system are specified very precisely in legal acts



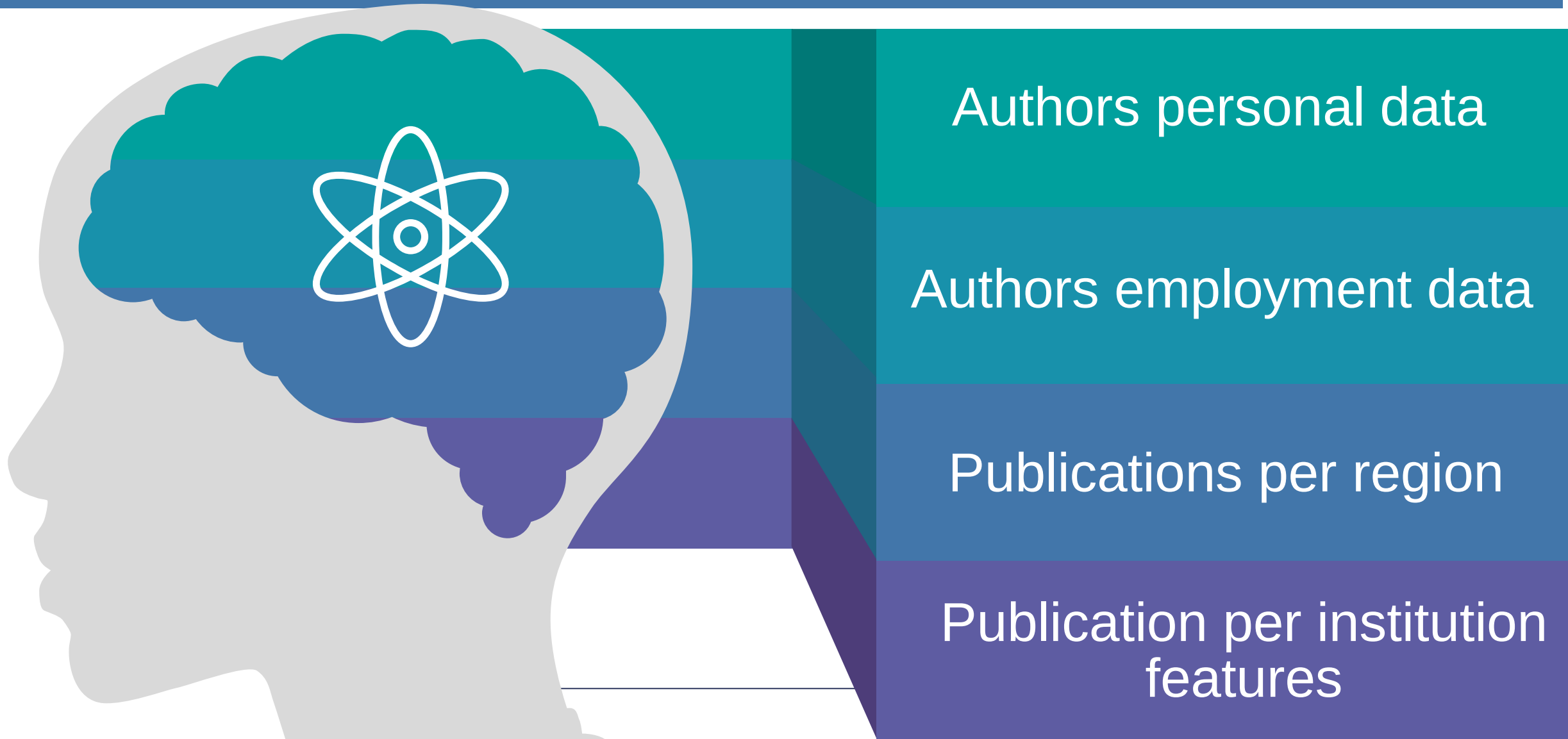
POLISH SCIENTIFIC BIBLIOGRAPHY – SOME NUMBERS



MAIN GOALS

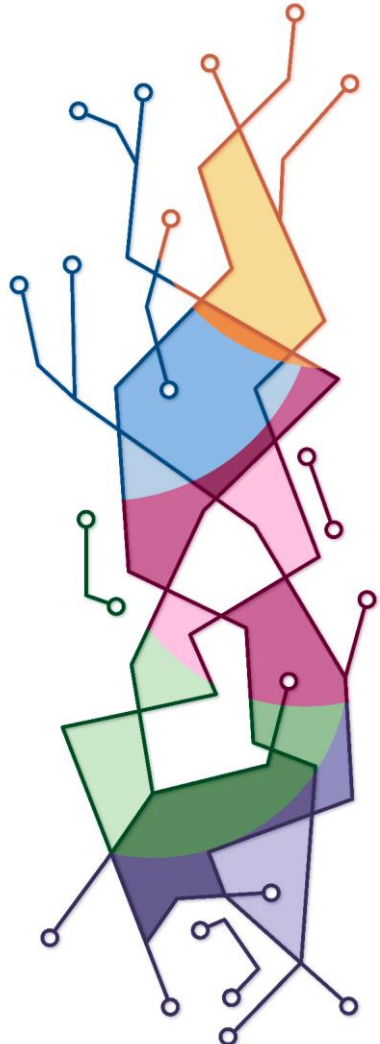


INFORMING – ANALYTICAL POSSIBILITIES



MAIN FACTS ABOUT POL-on THE INTEGRATED SYSTEM OF INFORMATION ON SCIENCE AND HIGHER EDUCATION

- A centralized databases of highly structured data
- Data model and responsibilities defined on the basis of legal acts
- The system entirely took over the reporting processes of universities and research institutes for the needs of central / government units, including statistics for the Central Statistical Office and financial reporting as well
- Most of the data is calculated automatically
- And we are appreciated



EUNIS 2018 Elite Award for Excellence



2018 EUNIS Elite Award Winners

12 Jun 2018

No comment

Anna Pacholak

Eunis congress, Featured

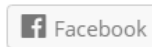
2018 EUNIS Elite Award for excellence in implementing Information Systems for Higher Education winner is the project: **POL-on: The Information System of Science and Higher Education in Poland**.

The award was handed at the **EUNIS 2018 Congress** Gala Dinner to Marek Michajłowicz, Marta Niemczyk, Jarosław Protasiewicz and Karolina Mroczkowska from the **National Information Processing Institute (OPI)** in Poland.

The main purpose of the EUNIS Elite Award is to recognize and promote best practice in some aspect of the use of information systems in higher education in Europe. The competition recognizes excellence, encourages best practice and stimulates wider awareness and use of information systems in research, administration and community service in institutions.

Read more on the Elite Award [here](#).

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main features of the current architecture



It has achieved their goal but costs too much effort

Rather silos monolithic architecture
Low interoperability

Wider range of data

Very specific, local data model
which was changed to often by the
legal acts

Lack of data warehouse – transactional
system for all the usage

Unscalable

New law : “The Constitution for Science and Higher education”



Main features in relation to central systems:

- Colloquially referred to as Act 2.0
- Contains paragraphs about the use of ORCID numbers of Polish scientists
- It simplifies and reduces the scope of data needed in the evaluation process of science
- Increases responsibilities regarding the frequency of data updates in central repositories

With new act come opportunities →

OPPORTUNITY: INCREASING INTEROPERABILITY

- Deep integration with ORCID
- Managing Web of Science and Scopus data
- Integrating with Polish National Library
- Using data from the Polish Patent Office



OPPORTUNITY: INTERNATIONAL DATA MODELS

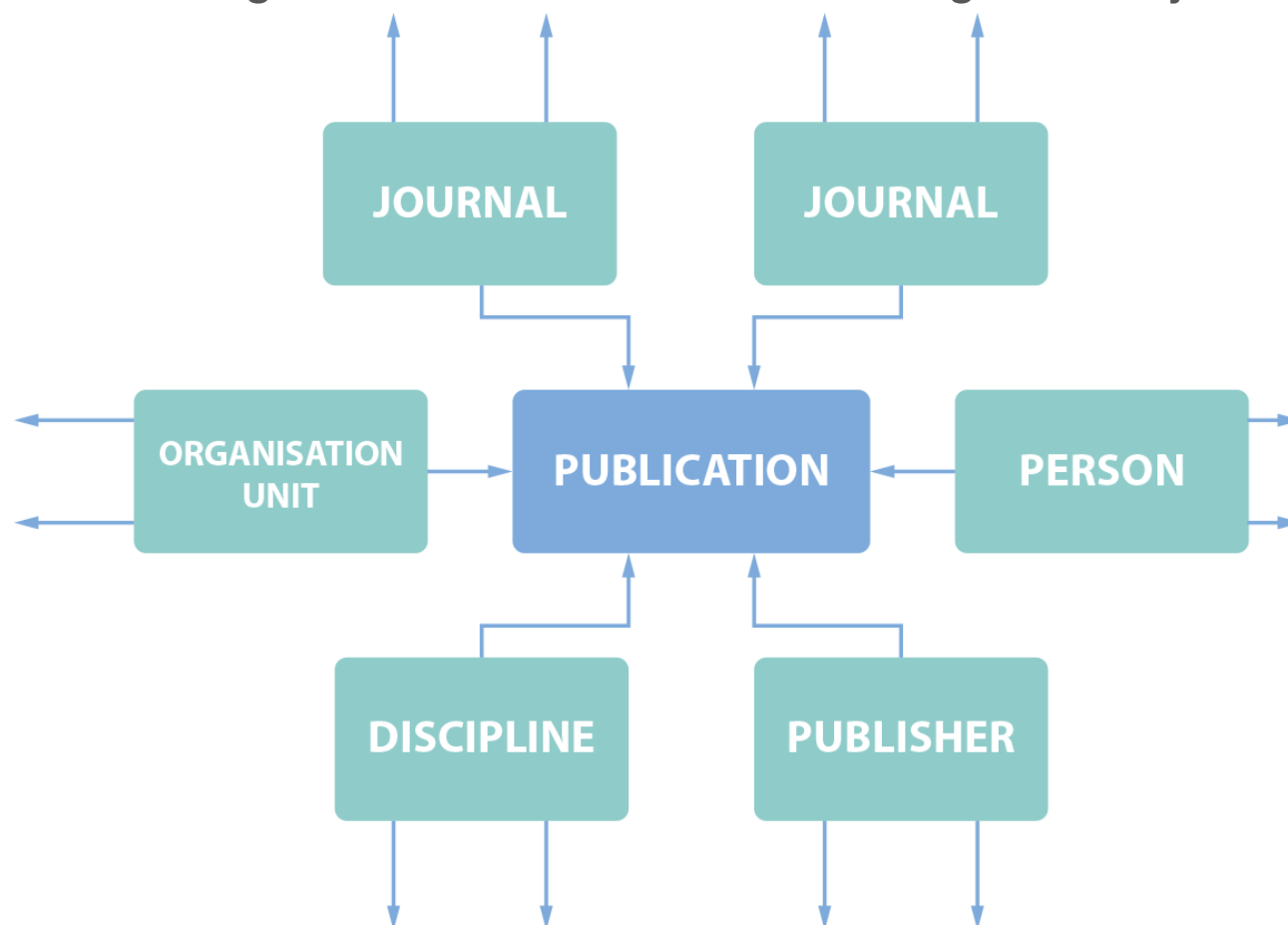
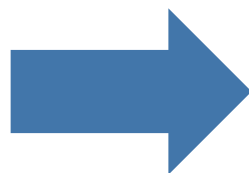


**Turning to CERIF as a recognized
European standard.**

OPPORTUNITY: BREAKING THE MONOLITH

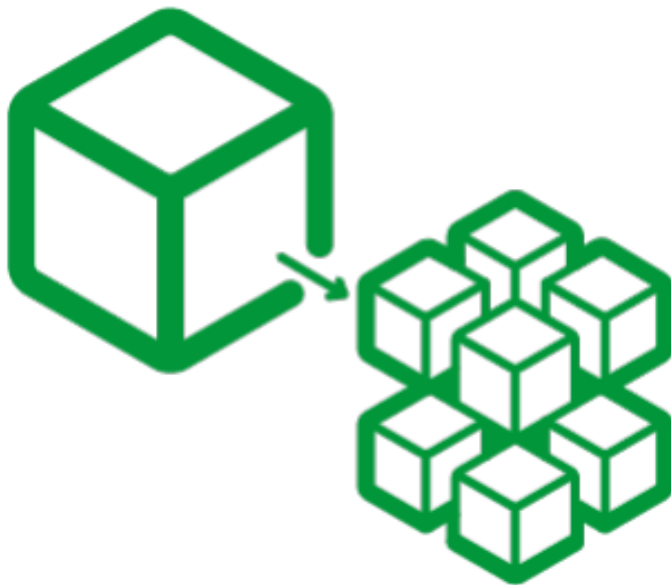


Turning endless documents into integrated objects



OPPORTUNITY: BREAKING THE MONOLITH

POL-ON 2.0

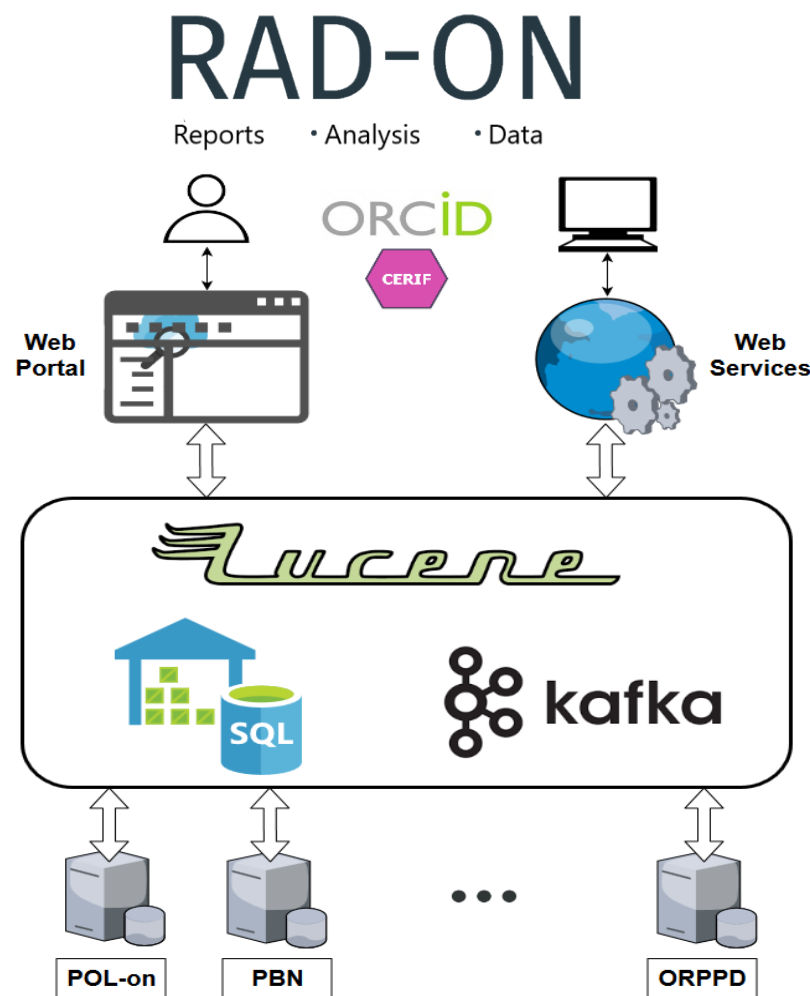


POL-on 2.0

- Many separated autonomous microservices
- Separated domains (Students, Employees, Financial Data, Scientific Achievements)
- Domain Driven Design approach
- Communication and access mainly through the API REST
- Division of the application structure into a write and readable part (CQRS + Event sourcing)

Separation of the analytical and integration layer.....

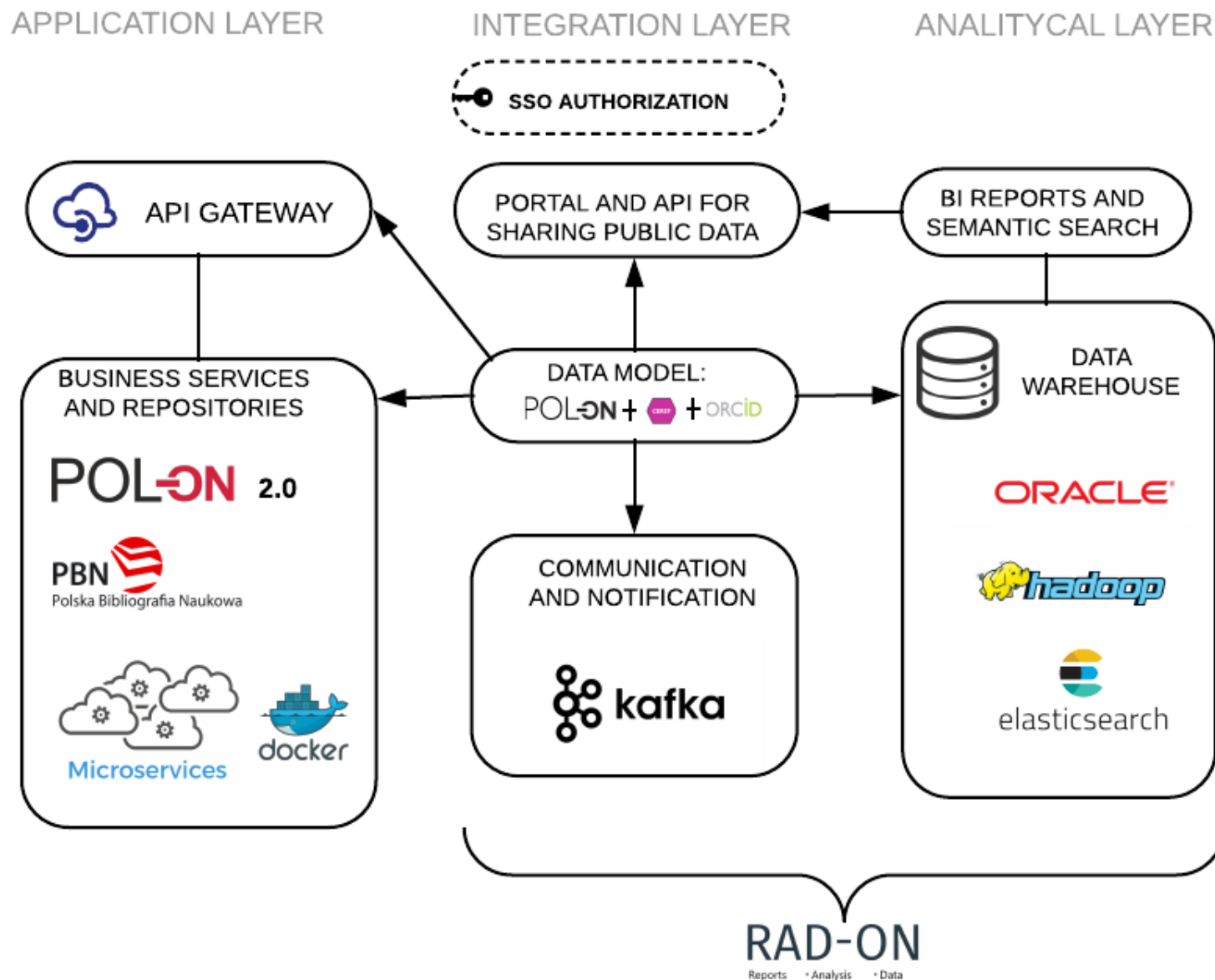
OPPORTUNITY: AN INTEGRATED SYSTEM OF SERVICES FOR SCIENCE



An integrated system of services for science

- Project launched in 2017 by Ministry of Science and Higher Education and National Information Processing Institute
- The main goals:
 - to increase the dissemination of information
 - to produce sophisticated analyses (a warehouse)
 - to increase the interoperability

VISION OF THE FUTURE ARCHITECTURE





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Thank you for your attention!

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