# Building Ukrainian Research Information System

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## Background

Ukraine is home to 619 higher education institutions (including 281 universities) and National Academy of Science which is an umbrella organization that consists of 160 research institutions. In sum, nearly 1000  organizations and about 80,000 researchers perform scientific activities on a daily basis. Besides,  nearly 4,000 applications for inventions, 9,000 applications for useful models and 2,500 applications for industrial patterns are submitted annually. At the same time, metadata that accompanies various research activities as well as information that describes the research output is fragmented and resides in different, heterogeneous systems or in some cases is absent in machine readable format. Such a situation makes the reporting process tiring and highly time consuming as institutional research offices have to search in several different systems, including commercial, subscription based databases like Web of Science and Scopus. Moreover,  lack of state-of-the-art research information is one of the deficiencies of the scientific landscape, which negatively impact funding allocation.

## Building Ukrainian Research Information System

Ukrainian Research Information System (URIS) is a service that collects, manages, stores and analyzes information about research being carried out by Ukrainian researchers. The ultimate goal of the URIS is to enhance the location of information and experts on research and boost visibility of national research. In the future, the system will become a booking gate for technological services and research infrastructures and will allow access to key government services related to the scientific domain.

Implementing URIS will bring many benefits to the various set of stakeholders: it will help researchers with quicker access to information and avoid duplication of effort, enable funding agencies easily track the result and return on the work they have supported, assist businesses in finding a new perspective technologies, enhance decision-making process of officials and lastly, raise awareness among citizens in regard to national science. The development of the  system started in April, 2020 and

continues in phases. The system is expected to go operational in 2023. Below we describe data sources that will form a base of URIS and what have been done so far.

## Information providers about persons

The only existing database on researchers in Ukraine called *Scientists of Ukraine* developed and maintained by Vernadsky National Library of Ukraine does not have an API for information retrieval. Therefore, it was decided to use the ORCID registry as a core source of information about persons. In May 2021, 35 885 records were extracted from the ORCID registry. The results were narrowed down to those that mention Ukraine or were affiliated with Ukrainian Institutions. After refining 854 incomplete and 1181 records identified as those that belong to foreign researchers were excluded. 33 820 records will be used as seed data for URIS.

## Information providers for research infrastructure

Currently, there is no database that lists scientific equipment and sets of instruments for research communities to conduct research. Usually, this information can be found on institutions' websites where it is very often incomplete and outdated. Partial information on research infrastructure is reflected in two official registries - *the State Register of Scientific Objects Constituting National Heritage* - that collects unique objects that cannot be reproduced, and *the State Register of Scientific Institutions Supported by the State* - that lists research performing organizations and higher education institutions whose activities are of crucial importance for science, economy and innovations. Both registries are potential data sources for URIS and are planned to be integrated with the system in the second quarter of 2022.

Simultaneously, a survey, tailored to collect data on scientific equipment was conducted in April 2021. As a result, we received up to date information on research equipment from 88 institutions (1100 - subdivisions, 6074 items of equipment, 4250 research services and 6070 contact persons).

## Information providers about Institutions

The Ministry of Education and Science of Ukraine maintains the State Electronic Database on Education which collects, stores and protects information about the national educational system. The registry contains comprehensive information on 887 HEI and will become the main source of information for the URIS Institution module.

## Information providers for projects

In 2023 URIS will be integrated with the internal system of the National Research Foundation (NRF), which  has been the main funding body in Ukraine since 2018. In 2021 NRF joined the Crossfer Funding Registry which eases the mechanism for ensuring that references to the NRFU's project are available in scientific publications that contain information on the results of research conducted with grant support from the Foundation. Apart from that, integration is also planned with the internal system of the Ministry of Education and Science as institutions also receive funding from the state. National Repository of Academic Texts is among potential data sources for projects as well.

## Information providers for publications

Semi-structured nationwide survey on research information  management practices  in Ukraine revealed that the Publication module is the most desired one. Due to the fact that the national portal of scholarly  publications *Scientific Periodicals of Ukraine*, which currently lists 1260203 papers and 2855 journal titles does not offer API, the main source for the module will be the Crossref registry and Open Ukrainian Citation Index. In the future, after the newly established  *National Repository of Academic Texts* develops capabilities of the Open Archives Initiative Protocol for Metadata Harvesting (OAI-PMH) and SWORD, the source will be used as well.