

# ROMOR National Roadmap

## A National Infrastructure for Research Output Management in Palestine

### 1 Abstract

The national roadmap is proposing sharing infrastructures collaboratively across individual institutions to promote the research output of partner higher education institutions as a whole, including agreements on metadata standards, services, and research output and open access policies. The partners will be collaborating to deploy a scalable shared platform for digital research output management, preservation, access, and discovery.

The national roadmap builds on the results and recommendations of Erasmus+ CBHE KA2 project titled ROMOR. ROMOR aims to improve the management, visibility, and accessibility of scientific research outputs in Palestinian HEIs by establishing new or enhancing existing Open Access Institutional Repositories in four universities, and improving institutional capacity for the management and sharing of research outputs held within the repositories. One main recommendation from ROMOR is to create a common national platform that supports all institutions and enables OA institutional repository at every institution for effective and reliable management of research output of different types.

The proposed platform has three main components that fill the gaps in the current existing Institutional Repositories and are intended to provide a framework that allows existing and future IRs to be federated within a coherent system: 1) a network of repositories that enables discovery, 2) two flexible central infrastructures for repositories for research publications with preservation service, and 3) a national center for research data management to address the need for publishing and preserving research data underlying research publications.

### 2 Background

#### 2.1 OA in Palestine

Promoting Open Access (OA) to the research results and to educational modules and resources has grown significantly in recent years. There is a positive response toward OA in Palestine. As of January 2019, there are 23 OA journals indexed in the Directory of Open Access Scholarly Resources (ROAD).

The Open Access initiative has further strengthened in Palestine through embarking digital projects funded by international entities. With the support of Open Access organizations, Palestinian Library and Information Consortium (PALICO), and partners like EIFL – an international not-for-profit organization based in Europe with a global network of partners to enable access to digital information in developing countries, academic and research libraries in Palestine have started to show interest in having their own institutional repositories. As of January 2019, there are 7 OAIRs indexed in the Directory of Open Access Repositories (OpenDOAR) or/and in Registry of Open Access Repositories (ROAR).

## 2.2 Institutional Repositories

Part of the emerging role of academic libraries is the implementation of institutional repositories (IRs), a digital archive of the intellectual product created by the faculty, research staff, and students of an institution and accessible to end-users both within and outside of the institution with few if any barriers to access. It is most essentially an organizational commitment to the stewardship of these digital materials, including long-term preservation where appropriate, as well as organization and access or distribution. Deposit within an IR is carried out in order to maximize the visibility and accessibility of comprehensive, local research. IRs are beneficial to both the researcher and the institution. Different software are used as platforms to deploy IRs. They are the programs that provide structured data-entry points for digital resources leading to semantic relationships. These software enhance the semantic relationships by the use of metadata, i.e. data about data, which increases the direct findability of resources, rather than mere accessibility.

## 2.3 Palestine and Institutional Repositories

However, until 2016 only a few institutions had a technical solution for archiving digital assets mainly based on Dspace software. Institutions and researchers need the technical tools, skills and support to enable effective management of their research assets. The limited implementation in IRs is due to the lack of the required technical skills, poor ICT infrastructure, and the lack of policy at institution level.

## 2.4 ROMOR

One recent, ongoing and important initiative for OA in Palestine is through a project titled “Research Output Management through Open Access Institutional Repositories in Palestinian Higher Education” ROMOR. ROMOR Project was kicked off in January 2017 by a group of four Palestinian universities and four EU universities with EU funding from Erasmus+ program. ROMOR aims to improve the management, visibility, and accessibility of scientific research outputs- research results, reports, publications, datasets, software, etc. - in Palestinian HEIs by establishing new or enhancing existing Open Access Institutional Repositories (OAIRs), improving institutional capacity for the management and sharing of research outputs held within the repositories, and developing and/or refining curricula to ensure that emerging researchers are better able to manage their work across the entire research lifecycle. ROMOR activities include reviewing the current status of research outputs management in the four Palestinian partner universities, assessing the drivers and barriers influencing PS staff and students with regards to sharing their research outputs, developing tailored training to increase capacity among PS research support staff for designing, implementing, operating, populating, and sustaining OAIRs , equipping PS research support staff to deliver training on research output management to researchers at their own institutions, implementing and/or optimizing 4 OAIRs in partner PS HEIs that can facilitate storage, visibility, and access to a range of research outputs including mainly theses and research publications, raising the awareness and promote the benefits of research output management and sharing to researchers, illustrating how better visibility and access to PS research outputs can benefit non-HEI stakeholders – specifically policy makers and industry, and most importantly providing a national focus into research output management and shaping the roadmap at a national level.

In the last three years, ROMOR managed to establish four searchable and accessible institutional repositories in the partner universities of diverse range of outputs including full-text theses, academic publications, learning materials, and research data. It has also achieved reasonably aligned policies. ROMOR has also managed to raise the awareness of other non-partner universities who have, more or less, competed among themselves to have higher ranking in the web metrics ranking of world universities. This has been a healthy competition because more and more of the institutions have been devising creative means of increasing their digital contents in the public domain, resulting in more Palestinian content on the Internet, and, particularly, more openness and share-ability of institutional resources.

## 2.5 Needs Assessment studies within ROMOR

Within ROMOR project, a survey study<sup>1</sup> has been conducted January 1-15 2018 and targeted the head of the units in the Ministry of Higher Education (MoHE) and its Accreditation and Quality Assurance Commission (AQAC). The main objectives of the survey was to:

- evaluate the ministry awareness and interest of the Palestinian universities research output
- evaluate the capacity of the ministry in research output management
- determine the ministry needs with this respect

All heads of the main units in the MoHE provided their responses to the survey. Overall, the results<sup>2</sup> showed the ministry real interest in being aware of the details of the outputs of the scientific research of the Palestinian universities such as statistics on the volume of research outputs, and detailed information on titles of research publications, authors, disciplines, publishers, how to access publications, etc.. The survey participants mentioned that that Ministry has a central electronic database, but not fully operational. They all agree that the ministry needs better electronic programs that enable it to know and obtain updated and accurate information about the size and quality of research outputs of Palestinian universities as well as access to these outputs. The participants indicated that the AQAC relies on the research production of Palestinian universities when adopting academic programs, and also the Ministry relies on the research volume and quality of Palestinian universities when evaluating the quality of academic programs. However the Ministry indicated that they do not have up-to-date and accurate information and statistics research outputs of Palestinian universities. The Ministry makes a direct communication with universities when they need statistics and information about their research activities. The Ministry itself also provides OA to electronic documents and publications however they do not have electronic programs that enable it to archive and manage these publications.

Three workshops were also organized within ROMOR Project and included members from the different stakeholders such as the institutions' libraries, research centers, MoHE, AQAC, and

<sup>1</sup> <http://researchforms.iugaza.edu.ps/view.php?id=59238>

<sup>2</sup> [https://drive.google.com/file/d/1\\_3hV0wWpPyjePJ7Zy3k0\\_f1BXSU\\_4\\_6/view?usp=sharing](https://drive.google.com/file/d/1_3hV0wWpPyjePJ7Zy3k0_f1BXSU_4_6/view?usp=sharing)

numerous higher education institutions. These workshops have managed to engage the different stakeholders in discussions with the MoHE and the AQAC on how to manage the Palestinian research output and expand access to it by the wider community beyond the ROMOR partner universities. Some Palestinian universities embarked on similar project of digitizing their local content one of which is Al-Quds University and Palestine University. The idea of having a national roadmap for research output management and a national repository in Palestine were also among the main topics in these workshops, and were welcomed by the MoHE, the AQAC, and by all the participants from the higher education institutions. Furthermore, the AQAC has announced in the last workshop November 2018, their willingness to consider the IR one of the main referenced resources when accrediting a new educational program in any higher education institution in Palestine. During this workshop, and as having recognized the Palestine academic and research community's need and aiming to enable it to fulfil its legal obligation, ROMOR project initiated a working group of numerous experts and scientists that were interested in IRs or had already been working on archiving digital assets for their institutions. Furthermore the working group established contact with research institute libraries through PALICO, MoHE, AQAC and numerous research and higher education institutions.

## 2.6 Challenges

While institutions and their libraries are moving ahead to establish repositories in order to maximize the visibility of their academic output, and make it as widely available as possible, there are still considerable obstacles that inhibit academic community from participating in this initiative. The discussions with the stakeholders have revealed the challenges that face the local higher education institutions in establishing their IRs. Among these challenges are low bandwidth, technophobia, technical support and security, finance and legal aspects, lack of skilled personnel to manage the repository, and lack of adequate power supply (as the electricity power sector of Gaza is poor and it really affects the servers that houses the repository). In addition to the financial and technical challenges in establishing digital repositories, research and higher education institutions were faced with organizational challenges in adopting internal policies and documents that entitle them not only to publish digital material created by their students and staff, but also to publish it according to the principles of OA and copyright Issues.

On the other hand, the institutions that already have IRs stress the need to identify ways to automatically ingest objects into repository to minimize the workload on researchers and supporting services. They also mentioned the need to have a better external visibility (through integration with hubs like OpenAIRE, etc.), and to support research data that include types beyond theses and publications (such as Databases, datasets, source code, etc.). However, research data requires special policies and procedures that go beyond the capabilities of current IRs. Research data comes in different formats that require special metadata for interpretation, and demand distinct formats and description as required by different research communities. In addition, special solutions for sustainable digital preservation are required as research data are often stored in formats that rapidly become technologically obsolete. The sensitivity of research data may also influence the security needs that require special consideration in RDM policies. IRs implemented within ROMOR are not relevant for handling research data because they rely

on text-based repository platforms that lack support for effective preprocessing and visualization of research data. Then naturally, there will be a need to support research data publishing and to evolve the policies that have been aligned in ROMOR towards the new requirements.

The workshops participants have also discussed the fragmented environment of IRs, in which effort and costs are duplicated, numerous software platforms and versions are managed individually by each institution, metadata are applied inconsistently, users are served poorly, and the ministry and the universities are unable to take advantage of collective data about content and users. Besides, digital works come with preservation and storage issues that are only just being realized in Palestine. Institutions need to begin tackling the preservation of digitally produced and recorded material. But the enormity of the task is only just beyond the capacity of many institutions.

As individual institutional solutions for preserving and curation of digital assets are organizationally, financially and technically challenging, the working group recognized the importance and advantages of building a national infrastructure for digital repositories. The vision of a national solution was welcomed not only by institutions that were under a legal obligation to establish digital repositories, but also by other institutions that see the opportunity to collect and preserve their digital assets in one place.

Out of ROMOR working group, a committee was established that comprises representatives from ROMOR EU partners, the PS MoHE, the AQAC, and two Palestinian higher education institutions within the ROMOR project: The Islamic University of Gaza, and Birzeit University.

The proposed shared infrastructure is an output of the collaboration of the ROMOR committee members and their efforts in shaping the national roadmap with inputs from the discussions within ROMOR working groups and workshops. The committee hope by this to foster future efforts towards the organizational, informational and technical development of the national infrastructure similar to the experience of other national jurisdictions that are working on similar initiatives like for example EOSC, JISC, FOSTER, OpenAire, and DCC.

### 3 Relevance

Open Access to scientific literature through repositories has grown significantly in recent years, increasingly favoring the creation of federated networks at national, regional, or international level.

The goal of the proposed national infrastructure is to enable sharing infrastructures collaboratively across individual institutions to promote the research output of partner higher education institutions as a whole, including agreements on metadata standards, services, and research output and open access policies.

The partners will be collaborating to deploy a scalable shared platform. The shared platform will be built for digital research output management, preservation, access, and discovery. Using best EU and ROMOR practices and recommendations, research output will be transferred, ingested,

curated, preserved, discovered, and shared through this platform. The proposed platform and the community gathered around it will actively promote OA to the outputs of research. This is enabled through collaboratively providing tools and services to support researchers in a range of disciplines to have improved access and control of large amounts of research outputs which are real challenges for many universities and research institutions. This is also facilitated through building collaboratively a center for questions connected to these new services, identifying processes and responsibilities, and developing training material and training data stewards who will be the first point of contact for researchers.

Such a shared platform not only will enable PS partners to interconnect research output infrastructures, but will also allow all projects members to identify ways for their systems and services to become interoperable given the European Open Science Cloud (EOSC) requirements.

The proposed platform has three main components that fill the gaps in the current existing IRs and are intended to provide a framework that allows existing and future IRs to be federated within a coherent system: 1) a network of repositories that enables discovery, 2) two flexible central infrastructures for repositories with preservation service, and 3) a national center for research data management to address the need for publishing and preserving research data underlying research publications.

The discovery service (the network) will be hosted and managed by the MoHE and will facilitate the discovery of existing IRs across all the IRs available in Palestine. A website will be created to host the search engine that is the main front-end for the service. At the back-end there is a harvester that collects records from the different repositories and an indexer that indexes the results for searching.

The proposed platform will also provide research and higher education institutions with common infrastructures necessary to manage their digital assets without the need to deal with technical issues related to the implementation, maintenance, and preservation of digital repositories. It will build two central infrastructures for repositories with preservation service for the institutions that do not have an existing solution. One infrastructure will be maintained and managed by a University in Gaza to serve the researchers and the institutions in Gaza, and another infrastructure will be maintained and managed by a University in West bank to serve the Palestinian researchers and institutions in West Bank.

The rationale behind establishing two infrastructures is driven by the current political situation which imposes a complete separation between the Gaza Strip and the West Bank. For decades now, this separation has inhabited the free movement of staff and students between Universities on both sides, and has prevented effective collaboration and sharing of intellectual resources between Palestinian universities. Therefore, the infrastructure on each side will act as a hub for universities within that side to benefit from the provided preservation and discovery services. By linking the two infrastructures electronically, higher educational institutions across the Palestinian territories will become interlinked regardless of the geographical separation, and the collective research outputs from all institutions will become discoverable and accessible through a single discovery service that will hide the reality on the ground.

To address the emerging need to share research data associated with academic publications, the proposed platform aims to establish a national center for research data at a Palestinian University to act as a focal point for long-term archiving and preservation of research data. The proposed center will host a national data repository into which researchers from all PS HEIs can publish data that supplement their research. It will maintain and preserve the collective research data related to research papers stored into other IRs. The proposed repository will be also part of the federated network of University repositories, and will maintain the linkages between academic articles and associated research data. Besides the data repository, the center will serve PS HEIs and the overall research community in Palestine by providing consultancy and training services for publishing, describing, accessing and visualizing research data of different types.

At the long-term, the foreseen center for research data management will empower the proposed platform through:

- increasing the discoverability and visibility of PS research outputs by federating with text-based university repositories.
- supporting the academic integrity and the growing interest by the global research communities in replication of research findings.
- allowing examination, proof, review, transparency, and validation of a researchers' results by other experts.
- Improve decision-making and business opportunities by enabling decision makers, aid agencies and business investors, from inside or outside Palestine, to validate the PS research results and to reuse published data volumes to make business analysis and take effective decisions.

The ROMOR team and the EU partners are consulted on metadata standards, national policies, and digital curation and preservation. They will assist with the requirements for the design of the national platform, its deployment and testing. They will be sharing experiences in running and operating the deployed services by providing the required technical training for operating the technological platform for these services, providing consultation on software development expertise and the required computational power. They also share information on researchers needs, and provide the training for data stewardship, and data workflow solutions.

## 4 Aims and Objectives

The national Roadmap aims to facilitate OA to research output from all Palestinian higher education institutions, and increase their visibility. The main project objective is to enable sharing infrastructures collaboratively across individual institutions. That would enable IRs for every higher education institution in Palestine, and would allow the research communities to access the collective research output from these repositories. The outcomes of the project not only will enable PS partners to develop a national roadmap that interconnects RDM infrastructures, but will also allow all projects members to identify ways for their systems and services to become interoperable given the EOSC/PlanS requirements.

The proposed platform objectives are:

- identify the needs to integrate scholarly publishing and dissemination in partner universities building upon the needs assessment studies conducted in ROMOR
- identify the requirements to build the shared platform for research outputs management adapting the training materials for building capacity in implementing OAIR developed for ROMOR to meet the new requirements and to be used and shared by the new stakeholders
- build capacity needed for building, managing and sustaining the shared platform
- adopt common metadata schemas making use of the recommendations provided by ROMOR which would be essential to the development of central infrastructures for repositories to collect and compare data across institutions
- establish, maintain and manage a national network of repositories to allow discovery and reuse
- establish, maintain and manage central infrastructures to enable reliable and interoperable IRs
- establish a national center for research data management that will provide infrastructure and services for archiving and sharing research data of different types
- develop research output management and OA policies controlling the shared platform
- deploy preservation technology framework
- promote collaboration and partnerships among a large number of institutions and individuals from the academic community in Palestine and in the world

