Università di Camerino

OPEN SCIENCE POLICY

2024 - 2028

"Open Science is a system change allowing for better science through open and collaborative ways of producing and sharing knowledge and data, as early as possible in the research process, and for communicating and sharing results"

(EC rtd factsheet open science 2019)

HUMAN RESOURCES STRATEGY FOR RESEARCHERS IMPLEMENTATION UNIT

HR EXCELLENCE IN RESEARCH

Università di Camerino

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WHAT IS OPEN SCIENCE?

The term *Open Science* refers to an inclusive construct based on the principles of openness and transparency of the entire research cycle, capable of promoting full enjoyment of scientific knowledge and the benefits of science to all citizens, removing any barrier that may hinder the access.
Encouraging open and transparent scientific practices strengthens academic values such as the integrity, sustainability and inclusiveness of research, cooperation and knowledge sharing. In this way, Open Science is capable of producing new forms of scientific interaction, determining a significant impact on fundamental academic processes such as research, training, and innovation.
Open Science is, therefore, an umbrella term that brings together various practices, including ***Open Data***, ***Open Access***, ***Open Educational Resources***, and ***Citizen Science***.

At European level, Open Science is a political priority of the European Commission and a standard working method within its research and innovation funding programmes, as it leads to an improved quality, reduces the need for unnecessary duplication of research activities, accelerates scientific progress, contributes to the fight against scientific fraud, and can generally foster economic growth and innovation.
The UNESCO Recommendation on Open Science adopted in 2021 (https://www.unesco.it/wp-content/uploads/2023/11/RECOMMENDATION-ON-OPEN-SCIENCE-2021-Certified.pdf) has allowed us to arrive at a universal definition of Open Science. In adopting the recommendation, 193 countries agreed to comply with the common standards for *Open Science*.

For more than twenty years, the University of Camerino has embraced the principles of Open Science, as a form of sharing and participation of knowledge.
In 2004, the University signed the *Messina Declaration Italian Universities for Open Access: towards open access to research literature, aimed at promoting open access to scientific literature in Italy*, and in 2005 it signed the *Berlin Declaration on open access to scientific literature* of October 2003.
On the occasion of the tenth anniversary of the Messina Declaration, the University of Camerino signed the **Messina *Open Access Road Map* 2014-2018**, confirming its adherence to the principles of the Berlin Declaration, committing to "support the implementation of institutional policies aimed at consolidating the development of open access and encouraging opportunities for the internationalisation of research, with a view to ensuring broad visibility for Italian scientific production".

In light of the EU Commission Recommendation of 17 July 2012 on access to and preservation of scientific information (2012/417/EU), which urges, through the Member States, academic institutions to define and implement policies for the dissemination and long-term preservation of scientific publications and for open access to the same, and of article 4 of Law No. 112 of 7 October 2013, which establishes that public entities that finance scientific research adopt measures to promote open access, the University of Camerino promotes Open Science, the accessibility of data and research results with the aim of making science increasingly transparent and usable. UNICAM intends to encourage new approaches to the research and innovation process, joining structured networks, in particular the Italian *Open Science Association* (AISA), which allow the sharing of tools, processes, and good practices with other universities and research bodies in the field of promoting Open Science policies and the publication of research products and data in *Open Access*.

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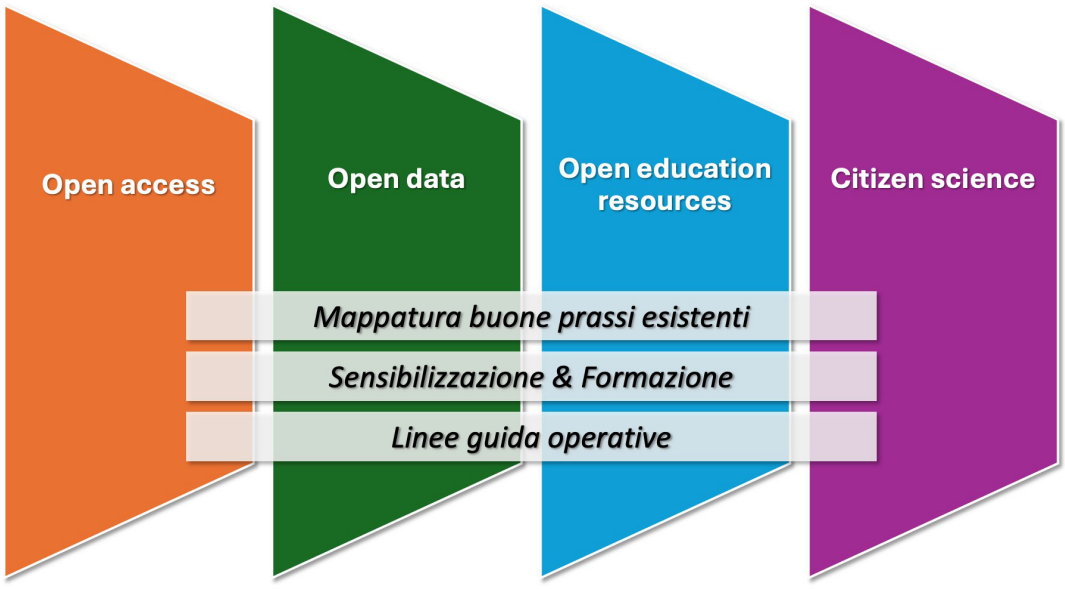
UNICAM OPEN SCIENCE POLICY 2024 - 2028

This *University Policy* aims to promote full and open access to scientific literature, free dissemination of research results, valorisation of scientific production and an active participation of society in research processes.
In order to determine adherence more concretely to the concepts and principles of *Open Science*, the policy identifies four lines of interconnected priorities - pillars - and three horizontal activities. The four pillars are: *Open access*, *Open Data*, *Open Educational Resources* and *Citizen Science*. Mapping, awareness-raising, and training activities are of horizontal character.
The activities described in this policy will be collected in a dedicated web page in order to guarantee their monitoring and maximum use.



OPEN ACCESS

What is *Open Access*?

Open Access (OA), refers to **public**, **free**, **immediate access** to a text in digital format via the Internet, **at no cost to the user and in a format that allows reuse**, without prejudice to the responsibility for authentic attribution of intellectual authorship.

It is a movement born in the academic world with the aim of encouraging the growth and sharing of knowledge, recognised as a common good, through free and free access to scientific publications and research results.

There are many ways to make scientific publications open and accessible: each author must carefully evaluate which form is most suitable for their research, and choose the best strategy to increase its impact, evaluation and dissemination.

The two main routes for open access sharing of research products are the *Green Road* and the *Gold Road*.

The *Green Open Access* consists of *self-archiving* the *re-print* or *post-print* version of the publication in institutional or thematic archives, in accordance with the publishers' copyright policies on licenses and any embargo periods.

The *Gold Open Access* consists of publication in journals in which all contents are accessible in open access without subscriptions, prior to payment of the *Article Processing Charge* (APC) by the authors.

UNICAM for*Open Access*

UNICAM promotes Open Access by encouraging *self-archiving* in institutional or thematic repositories (*Green Road*) and encourages UNICAM authors to publish in open access journals (*Gold* and *Diamond Road*).

As regards the *Green Road* and *Self Archiving*, UNICAM has made available, starting from 2016, IRIS CamPuS, the institutional Open Access Repository of the scientific publications of the University of Camerino, and the public registry of the University's research. It is an open, public and interoperable system that collects, stores and displays data relating to the University's research activities and products with the aim of improving its visibility and promoting its impact at a national and international level.

CamPuS contains both the descriptive metadata of the research works accompanied by abstracts, and the deposit of the full text of the research products where permitted by editorial policies and compatibly with any embargo needs.

Roles and Responsibilities within the University

The **Libraries and Higher Education Area** is responsible

- for promoting tools and practices that guarantee an ever-increasing awareness of the opportunities that Open Access publishing offers to teaching staff and researchers, as well as to postdocs and PhD students.
  Through help desk and validation activities, UNICAM library staff guarantee the completeness of the metadata on the research products deposited in IRIS CamPuS, promoting the development of the *Green Road* in the University.

Goals

In consideration of the multiplicity of activities connected to the development of *Open Access* publication practices in Gold journals, and for the improvement of the quality of the data contained in the IRIS CamPuS institutional repository, in relation to the transversal activities identified in this Policy, the following is expected:

- Inclusion of PhD students and postdocs within IRIS CamPuS as autonomous users, in such a way as to guarantee the correct public exposure and promotion of their research work, on a par with UNICAM teachers and researchers;
- Drafting and approval of guidelines for archiving research products in the UNICAM institutional repository which provides, in addition to indications on tools and opportunities available to teachers and researchers, the mandatory filing of the full text;
- Establishment of a University fund dedicated to financing the publication of articles and other research products in *Gold Open Access* journals;
- Organisation of annual information and update events on Open Access publishing practices, on open review processes, on the types of files available for deposit and publication, on publishers' distribution policies, and on publication licenses;
- Promotion of the full use of ORCID-ID for each researcher, in its functions of enabling and connecting services also through the acquisition and implementation of the IRIS API relating to ORCID-ID.

OPEN DATA

The European Commission states that data is an essential element of modern societies and that we are constantly producing more of it. For these reasons, there is a growing emphasis on managing and sharing the data produced in research.

RESEARCH DATA refers to the evidence that supports the answer to the targeted research question and that can be used to validate the results regardless of their form (paper, digital, or physical). This is all the information produced and collected by researchers during the conduct of their research project. These data may be quantitative information or qualitative statements collected during research, through experimentation, observation, modelling, interviews or other methods, or derived information.

The concept of data openness goes beyond the concept of transparency. Research data has enormous potential, but it cannot be fully expressed if the data is not truly open (*full open data*). Correct data management is the basis for the implementation of good scientific research. In particular, data from publicly funded research are to be considered a public good and should therefore be made openly available and with as few restrictions as possible.

In 2014, some principles for sharing scientific data were developed. They have been called with the acronym ***FAIR*** (*Findable, Accessible, Interoperable, Re-Usable*), to optimise the reusability of data and research results. According to the *European University Association* (EUA), *FAIR Data Principles* offer a set of guidelines to ensure that research results are findable, accessible, interoperable and reusable and apply to data, protocols, algorithms and software that underpin publications or have future value and potential for reuse. However, *FAIR* does not mean "Open": these two concepts are complementary and not synonymous.

Horizon Europe specifies that making data FAIR means making them adhere to good sharing practices, respecting any ethical, legal or contractual restriction. By creating and sharing a description of the data, other researchers can contact the author requesting permission for access and reuse. All relevant research data should, therefore, adhere to the FAIR principles, because their application ensures reproducibility and improves the visibility of research results. For this reason, all those involved in the research process are recommended to efficiently manage the materials produced, preparing a management plan (***Data Management Plan***, better known by its acronym **DMP**) which includes a comprehensive description, metadating, and short- and long-term preservation of the data produced. DMP therefore refers to a written document that outlines how you intend to manage research data both during and after the research project. DMP should indicate what types of data will be collected, and how the data will be documented, stored, shared, and preserved. In the case of research funded under Horizon Europe, it should be noted that DMP is a deliverable of the project and must be delivered within the first six months of the project itself.

The term **METADATA** refers to information that describe significant aspects of a data set. This may include for exam-

ple authors, title, publication date, unique identifier, a description of what the dataset contains, and license; Metadata provides other researchers with the information needed to understand and reuse the dataset, as well as making it more easily findable.

UNICAM for *Open Data*

UNICAM, with this Policy, intends to guide researchers on the best practices for managing and sharing research data to maximize the research potential produced, promoting the open and free exchange of data and information to support research, decision-making, education, and other possible applications.
UNICAM is committed to disseminating the results of its research as widely as possible. In line with this commitment, UNICAM supports the principle that research results should be freely accessible, where possible and appropriate, and supports researchers and students in making research data available.
Directive (EU) 2019/1024 on open data and the re-use of public sector information ((implemented by Legislative Decree 200/2021) further underlines that issues related to intellectual property rights, protection of personal data and confidentiality, security, and legitimate commercial interests must be taken into account in accordance with the principle of 'as open as possible, as closed as necessary'.

Roles and Responsibilities within the University

Researchers (R1-R4)[1] have the following responsibilities:

- To ensure that each research project begins with a data management plan (DMP), which must be regularly updated and respected by all project members and deposited upon completion in an appropriate archive.
- To guarantee the production and *FAIRification* of the data produced by the research, accompanied by appropriate metadata.
- To ensure that research data records are retained in appropriate archives for as long as the data are useful to those who generated them or others; or for as long as required by the funder or other regulatory requirements.
- To ensure that legal, ethical, and commercial constraints on the release of research data are taken into consideration; both in the design and implementation phases of the research project.
- To assign adequate resources to data management for the entire duration of the project and its closure.
- In collaborative projects, to agree on issues related to intellectual property and data from the beginning, and ensure that those are managed in line with institutional policies, with consultancy from the research area where necessary.

The **Research and Technology Transfer Area** is responsible for:

- Providing guidance and indications on the management of research data to all researchers and UNICAM research support staff for the purpose of satisfying the specific requirements of each financier, regarding data management (DMP).
- Promoting information and training actions in favour of researchers regarding the production and transformation of FAIR and DMP data, both during the writing phase of the project proposal and during the management phase of a project, in particular with respect to the contractual obligations of the *Grant Agreement*.
- Providing advice on issues related to good data management, such as data protection, research integrity, and intellectual property rights.

1. EUROPEAN COUNCIL RECOMMENDATION of 18 December 2023 on a European framework for attracting and retaining research, innovation and entrepreneurial talent in Europe (C/2023/1640):
   R1 - Junior researcher (First Stage Researcher): researchers carrying out supervised research until they have obtained a PhD or an equivalent level of competence and experience.
   R2 - Recognised Researcher: researchers with a PhD or an equivalent level of expertise and experience who have not yet achieved a significant level of autonomy in developing their own research, finding funding or leading a research group.
   R3 - Established Researcher: researchers with a PhD or an equivalent level of expertise and experience who are able to independently develop their research, raise funding and lead a research group.
   R4 - Leading Researcher: Researchers with a PhD or equivalent level of expertise and experience recognised by their peers as leaders in their research field.

The **Libraries and Higher Education Area** is responsible for:

- Monitoring and managing the archiving of research data and products within the institutional repository, guaranteeing the quality of the metadata collected through the product validation activity in IRIS CamPuS and for technical support to research staff in the self-archiving process and monitoring integration and dialogue activities with other national and international databases.

The **International Advanced Studies School (SAS)** is responsible for:

- Designing training activities for PhD students, framed in the plan of transversal activities, on open science topics including the production and transformation of FAIR and DMP data.

Goals

In relation to the transversal activities identified in this *Policy*, the following is expected:

- Creation of a training event dedicated to the drafting of the DMP and the facilitation of practical tools for writing a DMP as a deliverable within the Horizon projects (Research Area).
- Creation of annual information and update events on obligations and rights of sharing research data, on data and software deposit tools, on the use of databases (Libraries Area).
- Creation of an access point to the repositories from UNICAM in such a way as to have visibility with the creation of a small *proxy* service, which makes the activity within UNICAM visible and communicable (ICT Area).
- Creation of a robust and harmonized structure for data management and analysis; development of guidelines for the organisation of easily accessible and readable metadata, repositories and software for data analysis and management; development of Apps (ICT Area).

OPEN EDUCATIONAL RESOURCES

The term "*Open Educational Resources*" (OER) was adopted for the first time in 2002 at the UNESCO Forum, organized to examine the impact of Open Courseware, i.e. open access online teaching material (initiative of the *Massachusetts Institute of Technology*) on higher education in developing countries.
The first definition of OER was developed on this occasion:
"*The open provision of educational resources, enabled by information and communication technologies, for consultation, use and adaptation by a community of users for non-commercial purposes*."
Despite the variety of promoters, types of content, and objectives, OER have always been characterised by:

- openness: access is guaranteed to everyone free of charge;
- network technologies: resources are offered via the web;
- use and reuse: resources tend to be adaptable to different contexts and therefore modifiable;
- non-commercial purposes: the intent is always to offer free resources, as opposed to the traditional economic model based on commercial publishing.

In the following years, new attempts at definitions were discussed and in 2007 at the Cape Town Open Education Declaration, promoted by the Open Society, the following was reached:
"*Open education is not limited to just open educational resources. It also draws upon open technologies that facilitate collaborative, flexible learning and the open sharing of teaching practices that empower educators to benefit from the best ideas of their colleagues. It may also grow to include new approaches to assessment, accreditation and collaborative learning*."
The concept of OER proposed by the Cape Town Declaration is decidedly broader than the previous one and includes educational processes, especially collaborative ones, technologies, methodologies, and evaluation [4].
The OER Movement has now developed internationally, becoming an important tool for developing and disseminating educational resources throughout the world, thus guaranteeing freedom of information through the promotion of the culture of open science.
Open Educational Resources (OER) are therefore all those educational resources, mainly in digital format, whose fundamental characteristics are being "open", freely usable, and "educational", designed to meet the teaching, learning, and research needs of students and training professionals. Educational resources are made available free of charge for use, sharing and adaptation (use, reuse, modification and re-distribution) by users such as teachers, students, and educational institutions. OER can include textbooks, video lessons, collections of exercises or tests, entire courses, lesson plan simulations, software and, more generally, any material or technique that facilitates and supports access to knowledge.

To be considered OER, assets must have clear reuse terms, often in the public domain, or under an open license, for example a *Creative Commons* license, which grants access, reuse, redistribution and adaptation rights. An important aspect of a license of this type is the possibility of freely modifying the materials to adapt them to your needs and then making them available with a view to circularity.
Examples of OER are MOOCs (*Massive Open Online Courses*), free courses designed for distance learning involving a large number of users, offering self-learning opportunities not only for male and female students and professionals, but for all those who wish to deepen their knowledge and skills. Since these courses are produced in a top-down (institutional) manner, their quality is implicitly guaranteed by the institution that issues them (e.g., University).
The advantages of using OER are multiple and documented. Resources of this type make it possible to break down cost and access barriers, making updated and quality materials widely available for the benefit of teachers and students. As an expression of open philosophy and practices, OER are also a vehicle for teaching innovation [1, 2]. According to an OECD report, the OER community has grown significantly over the last 20 years, and the positive impact of OER has become an important element of education policies internationally [2].
In a 2019 recommendation [3], UNESCO calls on Member States to promote strategies for the dissemination, use, creation and sharing of OER at national level, involving all levels of education.

UNICAM for *Open Educational Resources*

Since 2004, the University of Camerino has been using the Open Source *Moodle* platform (acronym for *Modular Object-Oriented Dynamic Learning Environment*) for the management of online courses (in e-learning, blended learning or self-learning mode) aimed at internal subjects (teaching/research staff, students) and external subjects (professors and school students and professionals).
To disseminate its MOOCs, the University of Camerino has joined *Eduopen* since 2018, a project funded by the Ministry of Education, University and Research, aimed at creating a platform for the provision of MOOC courses by a network of Italian universities and a set of selected partners. *Eduopen* currently hosts 414 courses and 35 pathways.

Roles and Responsibilities within the University

In the belief that education is a common good, co-constructed and accessible to all, the University of Camerino intends to equip itself with a strategy that incorporates the UNESCO recommendation. To this end, a central role is played by the e-learning areas, libraries area and ICT area.

Goals

With the aim of encouraging the dissemination, use and, where possible, the creation of OER, the following will be promoted/developed:

- Events that promote awareness among teachers about the availability of OER, their characteristics, the possibilities of use, the impact on teaching;
- Communication tools and systematisation of centralised Helpdesk activities provided by the reference areas for teachers: training, copyright, IT, and editorial support (available platforms and open licenses);
- Support services for teachers who intend to create OER or convert existing materials;
- Design/creation of a University digital archive for OER, following recognition of the technical potential of the University's institutional archive Iris Campus;
- Development of a shared learning community that enhances OER use practices.

1 Lepore, V. e Vellani, S., Open Education in Italia: stato e prospettive [*Open Education in Italy: Status and Prospects*] Bibelot V. 23 No. 1 (2017): January-April
2 Orr, D., M. Rimini and D. Van Damme (2015), Open Educational Resources: A Catalyst for Innovation, Educational Research and Innovation, OECD Publishing, Paris, https://doi.org/10.1787/9789264247543-en
3 UNESCO Recommendation on Open Educational Resources (OER) - 25 November 2019. Italian translation: "*Raccomandazione dell'UNESCO sulle risorse educative aperte (OER)*"
4 Fini A. (2012). Risorse educative aperte. Principali orientamenti e prospettive di sviluppo. Risorse educative aperte e sperimentazione didattica [*Open educational resources. Main orientations and development prospects. Open educational resources and teaching experimentation*]. Edited by Maria Renieri. Firenze Unipress ISBN 978-88-6655-193-5

CITIZEN SCIENCE

The 2021 UNESCO recommendation attributes to Open Science collaborative and inclusive characteristics, that allow new social actors to engage in scientific processes through *Citizen Science* and participatory science, contributing to the democratization of knowledge, combating misinformation, and directing scientific research towards the solution of problems of social importance. These are some of the objectives of the European Citizen Science Association (ECSA), founded in 2014, whose mission is to make science and research open, accessible and for the benefit of all.

"Open scientific knowledge"

The adoption of new scientific research models, from the perspective of Citizen Science, allows non-professionals to carry out research activities following scientifically valid methodologies, and within funded research programmes: web-based platforms and social media, as well as open source hardware and software (in particular Apps) represent agile interaction tools.

"Open research data"

For the effective reuse of citizen science results by other actors, including scientists, these products require adequate methods of analysis, standardisation, and conservation, necessary to ensure maximum benefit for all. Open research data means making it available in a fast and easy-to-use, human- and machine-readable and usable format, in accordance with the principles of good data governance and management, in particular with the FAIR (Findable, Accessible, Interoperable and Reusable) principles, supported by regular care in management and maintenance. Computing infrastructures dedicated to data analysis and to support the reproducibility of the analysis itself are of obvious fundamental importance, as are guidelines for FAIR data, specific for the different disciplines.

UNICAM for *Citizen Science*

The University of Camerino intends to accept the UNESCO recommendation on *Citizen Science* by promoting collaborative activities and research projects in a participatory and open science perspective.

Tools and resources implemented/available for carrying out *Citizen Science*

UNICAM provides researchers with a network of skills related to: *Communication*, *Public Engagement*, *Data Management Resources* (*Data Repository*, e-learning platforms, OER), Skills in the research and technology transfer area (intellectual property, contacts with local companies), and international mobility programmes, which allow researchers to participate in regional, national, European, and non-European calls for the financing of Citizen Science projects in col-

laboration with national and international partners.

Roles and Responsibilities within the University

With a view to encouraging active participation of UNICAM in Citizen Science projects, key roles will be established within the University, with well-defined skills and responsibilities. A crucial space will be dedicated to training and raising awareness of teachers and administrative support staff on the importance of open and participatory science.

Communication, Academic Bodies and Public Engagement Area:

- management of digital platforms and social media that allow the publication and dissemination of research results with a rigorous language understandable to the community (podcasts, videos, e-books, OER); organisation of public speaking courses aimed at researchers; organisation of events;

ICT:

- providing a robust and harmonized structure for data management and analysis (see Open Data section); App development;

Libraries and Higher Education Area:

- monitoring of open research products and linking to open access licenses, training of teachers on OER and new tools for sharing scientific results; creation of services that allow external staff to access the academy;

Research and Technology Transfer Area:

- orienting and guiding researchers on opportunities to network and enter partnerships dedicated to Citizen Science at a national and international level; support for the active involvement of citizens in the research process from its conception; creation of spaces for open and shared research (Hubs).

Goals

- Monitoring and analysis of existing projects and research activities in the University that involve good *Citizen Science* practices, so as to act as a '*Blueprint*' to undertake new participatory science projects.
- Organisation of specific communication activities for individual Citizen Science projects, using valid and rigorous tools that increase the level of collaboration and trust towards science.
- Creation of tools that facilitate the *Open Engagement* of social actors and that encourage extended collaboration between scientists and citizens outside the scientific community, making the practices and tools that constitute the research phases open and making the scientific process more inclusive and accessible to a society eager to trust in knowledge. In this perspective, transdisciplinary research methods and new forms of collaboration are necessary (crowdfunding, crowdsourcing and scientific volunteering).

TRANSVERSAL ASPECTS

Open Innovation

UNICAM promotes collaboration, knowledge exchange, and value creation with external actors such as businesses, governments, non-profit organizations, and other academic institutions through the development of joint research projects and participation in international research networks.

Through sharing knowledge and skills with different stakeholders, UNICAM promotes innovation and accelerates the development of new technologies and knowledge.

Academic Open Innovation supports the development and commercialisation of academic discoveries by providing universities with access to external resources such as fundings entrepreneurial expertise and networks on one hand and offering stakeholders access to innovations generated by excellent academic research on the other.

UNICAM makes the innovation generated by institutional research accessible through Open Innovation portals, and for several years has made its patents available on the portal https://www.knowledge-share.eu/it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