

UNIVERSITY OF RIJEKA INSPIRING AND SUPPORTING THE DEVELOPMENT OF REGIONAL INNOVATION ECOSYSTEMS

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Abstract: Reflecting its mission to create societal and economic impact by fostering innovation and knowledge valorisation, UNIRI is not just part of the regional innovation ecosystems – it is actively shaping them by turning academic excellence into solutions that benefit local community and economy. UNIRI's efforts are anchored in incentivising interdisciplinary collaboration with all relevant stakeholder by synergistically joining resources and know-how in the pentahelix system. Strategic initiatives such as the UNIRI-INOVA projects encourage interdisciplinary research with practical applications, while the advanced AI-based RIMAP innovation matchmaking platform, recognised as an EU best practice, facilitate circular knowledge transfer and open innovations. Profiting also from its association in the YUFE European University alliance and the YERUN network, UNIRI leverages funding from major EU financial instruments, and participates in strategic projects as the INNO2MARE Excellence Hub, the EDIH Adria digital hub, or the North Adriatic Hydrogen Valley, all targeting deep tech digital and green technologies.

Keywords: innovation ecosystem; innovation hubs; interdisciplinarity; knowledge valorisation; pentahelix model; research excellence

1 INTRODUCTION

The University of Rijeka (UNIRI) [1], with its vision of being a European university of the future [2], serves as the main driving force for the development of the innovation ecosystems in its region, reflecting its mission to create societal and economic impact by fostering innovation and knowledge valorisation (KV) [3]. UNIRI's efforts are anchored in incentivising interdisciplinary collaboration with all the relevant regional stakeholders. Through key institutional units such as the University Centre for Research and Innovation (UCR&I) and its Department for Innovation and Knowledge Valorisation (DIKV), the University synergistically joins the resources and know-how of academia, industry, government, civil society, and lay audience, creating a factual pentahelix innovation system.

UNIRI has hence implemented strategic initiatives to address challenges in Croatia's R&I landscape, particularly the gap in transforming knowledge into market-ready solutions. Tools such as the UNIRI-INOVA collaborative projects encourage interdisciplinary research with practical applications, while the advanced AI-based digital tool – the Regional Innovation Matchmaking Platform (RIMAP), which has been recognised as a best practice example at the EU level, facilitate circular knowledge transfer and open innovations between all the involved societal and business actors (SBAs).

Motivated by the need to enhance the impact and societal relevance of its research, UNIRI leverages funding from Horizon Europe and other major EU financial instruments, and participates in strategic projects, including the INNO2MARE Excellence Hub, the EDIH Adria European digital hub, or the North Adriatic Hydrogen Valley, all targeting deep tech digital and green technologies. By profiting also from its association in the Young Universities for the Future of Europe (YUFE) European University

alliance [4] and the collaborative Young European Research University Network (YERUN) [5], UNIRI is particularly committed in this framework at developing talent, offering diverse training and intersectoral career pathways for researchers. Through a number of evidence-based policies and community-centred projects, the UNIRI practices aim, thus, at promoting research valorisation, talent development, and societal progress.

UNIRI is not just part of the regional innovation ecosystems – it is actively shaping them by turning academic excellence into solutions that benefit both the local community and the broader economy.

The herein presented initiatives highlight how universities can be the catalyst for innovation in evolving ecosystems, fostering tangible impact and benefits.

2 UNIRI KNOWLEDGE VALORISATION FRAMEWORK

UNIRI established a comprehensive set of support mechanisms to drive innovation, foster KV, and strengthen collaboration among internal resources and external societal and business actors (SBAs). Central to these efforts are the University Centre for Research and Innovation (UCR&I) and its Department for Innovation and Knowledge Valorisation (DIKV) [6], that help formulating, implementing and fostering UNIRI's innovation activities by monitoring the available capacities, proposing improvements, and engaging in EU projects focused on KV. As part of UNIRI's governance model of nurturing KV principles, DIKV aims at creating a seamless framework for the creation of increased societal value that spans from initial research to commercialisation phases.

To incentivise collaborative innovations and interdisciplinary research, UNIRI introduced the UNIRI-INOVA project calls [7] that fund or co-fund initiatives engaging UNIRI researchers in developing collaborative

knowledge-based solutions with stakeholders from industry, the local government bodies, and civil society. By supporting practical applications and encouraging researchers to actively participate in knowledge transfer activities via an administratively simple scheme and a fast-granting period, the scheme has supported not only tangible innovations in the engineering, assistive technologies, medical, linguistic and other scientific disciplines, resulting already in first patents, but also a cultural shift towards recognising the value of research in addressing societal challenges.

On the other hand, the usage of the instruments of the European Digital Innovation Hub EDIH Adria [8], such as bootcamps, test-before-invest (TBI) and educational activities, allowed contributing towards raising the digital readiness levels of regional SMEs and local government bodies, but also developing microservice building blocks that can be assembled to adapt to the needs of a broad set of SBAs. These activities led also to the establishment of a UNIRI spin-off Syntagent [9] that promotes the usage of AI-based virtual assistants as well AI educational modules for a broad range of SBAs.

The Regional Innovation Matchmaking Platform RIMAP [10], established in collaboration with the local Regional Development Agency PRIGODA [11] as an AI-based online digital tool that connects ca. 25% of all UNIRI researchers, with their expertise and research infrastructure portfolios, with numerous SBAs, provides a list of project proposals as well as news about potential financial instruments for their realisation. RIMAP has been recently extended to a European University alliance-wide YUFE Innovation Platform [12], used also as a collaboration tool in the EDIH Adria project, and recognised at the EU level as a best-practice example during the Knowledge Valorisation Week 2023 [13], the meeting of the Committee of the Regions in 2024 [14] and in the EC Mutual Learning Exercise on KV document [15].

In the framework of the YUFE-based H2020 project YUFE Transforming R&I Through Europe-Wide Knowledge Transfer (YUFERING), capacity building measures aimed at fostering the flipped (demand driven) knowledge transfer model were developed, as were educational modules aimed at the YUFE-wide Knowledge Valorisation Network [16, 17]. Via the H2020 project Developing and Implementing hands-on training on Open Science and Open Innovation for Early Career Researchers (DIOSI), open innovation practices have been structured as transferable skills modules for early career researchers (ECRs) [18]. Mutual learning among KV professionals is taking place also via the YERUN network group on KV.

All these instruments clearly show UNIRI's commitment to inspire and support the development of thriving regional innovation ecosystems.

3 ACTIVITIES

UNIRI is proactive in implementing a variety of activities to drive its mission of fostering KV, talent development, open innovations, and partnerships. At the core of these activities is the University's commitment towards

creating dynamic and interconnected innovation ecosystems that engage internal and external stakeholders, ensuring impactful outcomes.

UNIRI strongly prioritizes talent development in KV through targeted career support programmes. It promotes holistic research careers' development through initiatives such as the instruments of the Human Resources Strategy for Researchers (HRS4R) [19] and of the Coalition for Advancing Research Assessment (CoARA) [20], aligning with EU efforts to enhance employability and economic growth. UNIRI also supports non-academic careers, particularly for research managers, through networks such as the European Association of Research Managers and Administrators (EARMA) [21]. Within the YUFERING project, UNIRI contributed, in turn, to developing an Interdisciplinary Profile and Career Development Path for Knowledge Transfer Professionals [17]. UNIRI also provides mentorship opportunities and entrepreneurial training for students and researchers, encouraging them to engage in open innovation processes and become active contributors to the knowledge economy.

One key initiative undertaken by UNIRI is also the establishment of interdisciplinary research and development (R&D) centres [22]. These centres foster collaboration among researchers from diverse fields promoting inter- and transdisciplinary collaboration and facilitating innovative problem-solving. These efforts rely also on top-notch research infrastructure, enabling researchers to transition from theoretical work to practical applications.

UNIRI's focuses also on the development of innovation hubs strongly boosting innovation spill-over effects. Major EU projects such as the Strengthening the capacity for excellence of Slovenian and Croatian innovation ecosystems to support the digital and green transitions of maritime regions (INNO2MARE) Excellence Hub (focusing on the green and digital transformation of maritime industries) [23] as well as the EDIH Adria hub (promoting digital innovations in key sectors such as healthcare, transportation, and energy) [8] are instrumental in boosting regional cooperation and shaping the regional innovation ecosystems with strong international impact. The same is true also for the North Adriatic Hydrogen Valley (NAHV), where a quadruple helix model is used to collaboratively develop testbeds covering the whole hydrogen value chain in the broader region [24].

Through these diverse and interconnected activities, UNIRI is reimagining the role of universities in driving regional innovation and societal impact in a collaborative, interdisciplinary environment, while providing intersectoral career development opportunities for researchers.

4 IMPACT

UNIRI practices created a lasting impact through their innovative approaches. UNIRI's focus on interdisciplinary collaboration has led to tangible innovations, patented solutions and spin-off creation, especially in sectors such as digital technologies and environmental sustainability. Facilitating the matchmaking processes within the ecosystem, the RIMAP platform [10] has directly contributed

to accelerating the time-to-market for innovative products, enhancing productivity and boosting the competitiveness of local companies, which was recognised as an EU-level best-practice example. What is more, UNIRI's impact measurement, via not only the University's yearly analysis of the its strategic KPIs, but also by the monitoring the results of the UNIRI-INOVA project outcomes, the number of collaborations, joint projects, and commercial partnerships formed via the RIMAP platform, and the number of KV-related EU projects and collaborations, allow all a continuous benchmarking, enabling UNIRI to measure its progress and identify areas for further improvement.

In the longer term, the above outcomes are poised to have a transformative effect by integrating University's partnerships with a broad set of SBAs. This has attracted external funding and increased participation in regional, national, and especially EU projects, ensuring sustainable support for ongoing innovation activities. The UNIRI role in international consortia, such as the North Adriatic Hydrogen Valley [24] and INNO2MARE [23], underscores its growing influence on both regional and international levels, particularly in green and digital technologies.

Through initiatives such as the mentioned YUFERING [16, 17], DIOSI [18] and EDIH Adria [8], which focus on training and developing intersectoral career pathways, UNIRI helped talent development, creating a skilled workforce ready to bridge the gap between academia and industry. These initiatives have led to increased employability, while enhancing UNIRI's reputation as a hub for innovation and entrepreneurial talent. The full deployment of the YUFE Innovation Platform [12] will further support the talent pool by providing international exposure and fostering an EU-wide collaboration.

The continuously measured and evaluated outcomes and impacts generated by UNIRI's innovation and KV efforts foster, therefore, the development of robust and sustainable regional ecosystems based on collaborative efforts with the SBAs, driving societal and economic prosperity.

5 TACKLING CHALLENGES

UNIRI has also faced challenges in its mission to promote innovation, KV and regional collaboration. In fact, past joint regional and national efforts by academia, industry, and local government were fragmented, relying on one-to-one project-based relationships. UNIRI's focus on strategic planning and support structures to establish robust, long-term partnerships with external stakeholders helped tackling this issue, while the RIMAP platform provides an efficient tool for knowledge transfer, co-creation, and cross-sectoral collaborations, aligning research with local economy needs.

Limited and unpredictable funding opportunities for R&I commercialisation also presented a major challenge, with Croatia's limited R&I funding creating barriers in turning knowledge into market-ready solutions. UNIRI launched, thus, internal funding schemes via the UNIRI-INOVA projects [7] to support interdisciplinary R&D. The initiative provided seed financing, raised researchers' awareness of other funding opportunities, and encouraged knowledge

transfer and commercialisation. Also, UNIRI's active participation in EU projects as well as in the YUFE [4] and YERUN [5] associations have been instrumental in fostering a collaborative spirit, securing vital resources for capacity building and strategic, high-impact projects, while aligning UNIRI's policies with global research trends, emphasising sustainability, diversity, and digital transformation.

Resistance to change, particularly among researchers accustomed to traditional career paths, posed yet another challenge. UNIRI targeted, therefore, many of its training and mentoring programs at ECRs, who are more open to adopt change. These programs, supported by the outcomes of the YUFERING [17] and DIOSI [18] projects, equipped researchers with skills needed to engage with industry and turn entrepreneurial ideas into reality, but also developed, e.g., an interdisciplinary career development pathway for knowledge transfer professionals, shifting the mindsets towards embedding KV as a valuable academic career path.

UNIRI's resulting success relies hence on a focused alignment of its policies, a clear strategic vision and strategic leadership. The University has positioned itself as a key player in the regional innovation ecosystems, persistently securing the necessary resources, establishing vital partnerships, and developing a framework for KV, ensuring long-term success and continuity in driving innovation and creating societal and economic impact.

6 CONCLUSIONS AND OUTLOOK

UNIRI has built a strong foundation for innovation as a key ecosystems' actor in the region and beyond, through initiatives like the RIMAP platform, the UNIRI-INOVA Call for Proposals, and developing the INNO2MARE and EDIH Adria hubs. These efforts enhanced research commercialisation, collaboration, and entrepreneurship.

UNIRI's experience shows, in fact, that the individual academic institutions profit significantly via greater involvement with industry partners. Enhanced collaboration allows in this framework for better alignment of research efforts with market needs, leading to increased research commercialization, new funding opportunities, and stronger intellectual property outputs. This alignment boosts the university reputation and attracts top-tier talent, reinforcing the position of the institution as a leader in innovation.

For industry players, closer ties with the academic community mean, in turn, a direct access to cutting-edge research, emerging technologies, and a skilled workforce. By participating in co-creation and knowledge transfer initiatives such as the RIMAP platform, businesses can reduce time-to-market for innovative products and services, improve productivity, and enhance competitiveness in local and international markets.

Local government and NGOs also stand to benefit significantly in a collaborative setting. In fact, enhanced collaboration within the ecosystem leads to developing evidence-based policies that address societal challenges such as climate change, digital transformation, and social inclusion. Additionally, joint projects between academia and NGOs deliver community-centric solutions and contribute to

the university's third mission.

Finally, at the ecosystem level increased collaboration significantly boosts the region's visibility and its positioning within the global R&I landscape.

By leveraging shared resources, aligning goals, and fostering inclusive innovation, the University of Rijeka and its partners have built, therefore, a dynamic, competitive, and sustainable R&I environment that benefits all stakeholders.

Looking ahead, UNIRI will scale-up its innovation activities regionally and internationally, with a focus on digital transformation and sustainability. By strengthening intersectoral and international partnerships, collaboration with SBAs and expanding funding opportunities, UNIRI is positioned to boost impact and contribute to EU's goals of economic growth and innovation. By promoting a higher level of interconnectedness, the UNIRI's ecosystem can unlock in this framework transformative benefits for all involved stakeholders and the region.

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