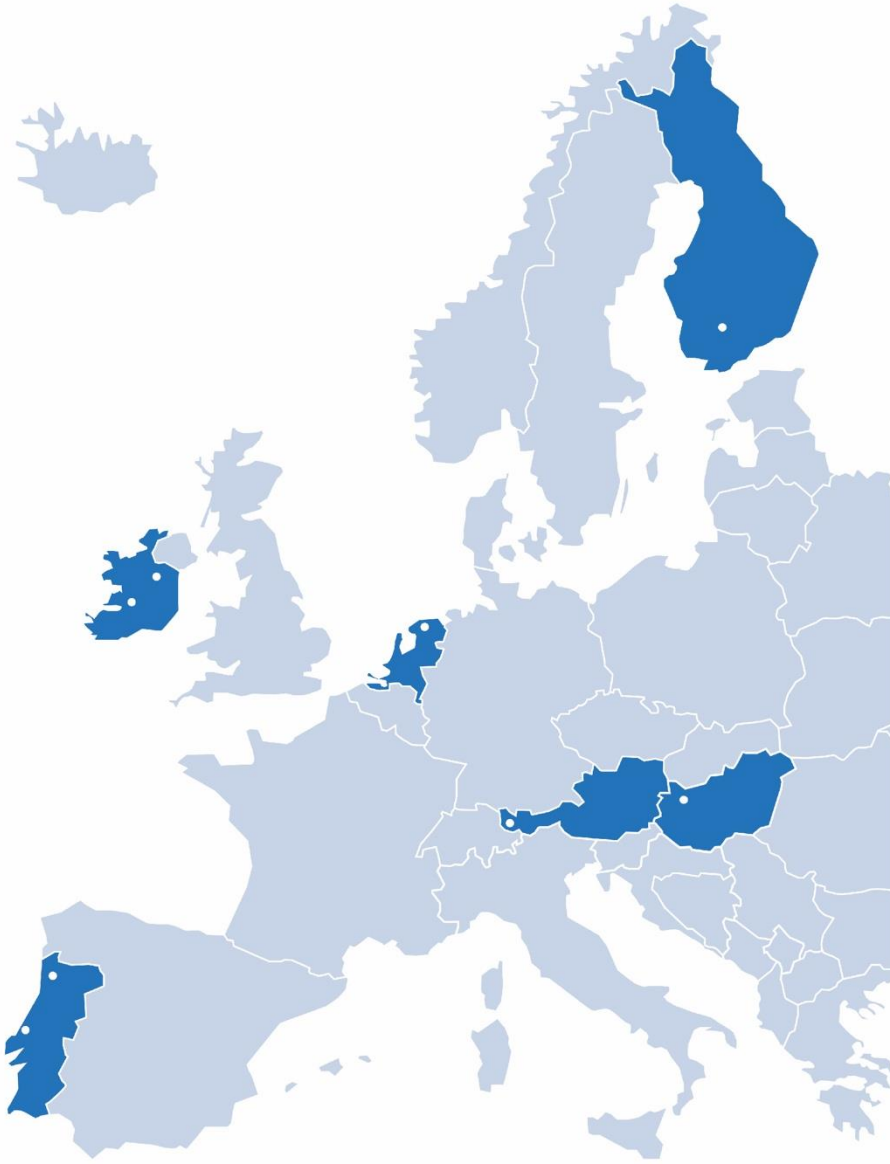

# D5.5 JOINT RESEARCH AND INNOVATION PROJECTS- 2ND REPORT

*(December 2023)*
*(Technological University of the Shannon (TUS, WPL)*
*(IPCA, WPCoL)*

# Abbreviations

| | |
|---|---|
| FHV | Vorarlberg University of Applied Sciences, Austria |
| HAMK | Häme University of Applied Sciences, Finland |
| Howest | Hogeschool West-Vlaanderen Howest, Belgium |
| IPCA | Polytechnic of Cávado and Ave, Portugal |
| IPL | Polytechnic of Leiria, Portugal |
| SZE | University of Györ – Széchenyi István University, Hungary |
| TUS | Technological University of the Shannon: Midlands Midwest, Ireland |
| UBU | Universidad of Burgos, Spain |

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# 1. Introduction

The European Union is facing enormous societal, ecological and economic challenges. Through the joint efforts of the established expert research area teams RUN-EU fosters closer collaboration to co-design and coordinate the implementation of research projects and proposals strengthening the overall RUN-EU Research Area actions. The adoption of joint projects is a step forward in our ambition to create a RUN-EU Research Area fit for the future driven by our common commitment to mobilise research and innovation activities with concrete actions towards the challenges of today. It will facilitate economies of excellence deepening our knowledge and increasing overall RUN-EU researcher participation in global research project areas enhancing access to research and innovation excellence and enhancing interconnections between innovation ecosystems across the RUN-EU. Coincident with RUN-EU, the RUN-EU PLUS science with and for society coordinated support action project advances concerted research and innovation investments in (https://research-andinnovation.ec.europa.eu/strategy/strategy-2020-2024/our-digitalfuture/european-research-area_en).

- Open science
- Researcher careers
- Research infrastructures
- Gender equality, equal opportunities for all and inclusiveness
- Careers and mobility of researchers and research assessment and reward system
- Knowledge valorisation
- Scientific leadership
- Synergies with education and the EU Skills Agenda
- Synergies with sectorial policies and industrial policies, in order to boost innovation ecosystems

- An active citizen and societal engagement in research and innovation
- Synergies between Union, national and regional funding programmes
- Coordination of research and innovation investments


**Figure 1- Values and Principles for Research and Innovation (From 'A Pact for Research and Innovation in Europe' (https://research-and innovation.ec.europa.eu/strategy/strategy-2020-2024/our-digital-future/european-research-area_en ).**

Throughout the WP5 Discovery Programme, we constructed a new shared interdisciplinary innovation ecosystem (eight research areas) which to facilitate the creation of a research-driven inter-university RUN-EU campus, embedded in all the regions, and in collaboration will all the relevant stakeholders, incentivising high-quality researchers and innovators to work together to transform the innovation landscape.

To deliver on our shared vision to become a global innovation leader RUN-EU has initiated the RUN-EU research mobility programme across the network supporting the development of key enabling activities facilitating the preparation and submission of research projects and proposals while and strengthening the eight RDI research teams. The international internship programme for the mobility of researchers is also a key driver of mobilizing and internationalizing our research capabilities. Within the project

we were committed to preparation of at least fifteen joint research and innovation projects involving members of our international future looking RDI teams across a broad range of common research areas over the three years period. It is evident that the project has exceeded this goal as can be seen in the catalogue of case studies of successful joint research and innovation projects developed by RUN-EU and the summaries of collaborative project submissions.


**Figure 2- RUN-EU Research Area Clusters.**

This is the second and final report summarising our joint collaborative projects since submission of the initial report at M24. This updated report includes a selection of the additional successful projects as well as those that were submitted and under review.

**Table 1- RUN EU Summary Project Submissions**

| No. | Partners | Research Project Title | Funding Body/Call | Award | Status |
|---|---|---|---|---|---|
| **1** | TUS, IPL, IPCA, FHV, SZE, NHL Steden & HAMK, UBU & Howest | Regional University Network – European University | European Universities (ERASMUS-EDU-2023-EUR-UNIV) | €14,398,685 | Approved |
| **2** | IPL & IPCA | O Link Me Up - 1000 ideias, Sistema de Apoio à co-criação de inovação, criatividade e empreendedorismo | PT2020 - POCI - Programa Operacional de Competitividade e Internacionalização | €5,973,237.09 | Approved |
| **3** | TUS & NHL Stenden | EPICSTAYS: Entrepreneurial oPportunitIes in alternative aCcomodation | Erasmus+:KA220-VET - Cooperation partnerships in vocational education and training | €250,000 | Approved |
| **4** | HAMK, NHL Stenden, TUS & IPCA | Hi-RAIN | Erasmus+ alliance for innovation | €1,499,644 | Not approved |
| **5** | TUS & HAMK | Biogas and value added components from industrial waste waters | ERDF, National Finland | €271, 883 | Approved |
| **6** | NHL Stenden, HAMK, IPCA, TUS, FHV & SZE | Culture Cares | Creative Europe | €1,435,719 | Not approved |
| **7** | TUS & IPL | EcoFILM: Ecologically Oriented Film Tourism for Communities | Erasmus+ | €250,000 | Not approved |
| **8** | NHL Stenden, HAMK, IPCA, TUS & FHV | Integrated Connected Health and Care Services for Vulnerable Minority Groups (InterConCare) | Horizon Europe | €6,000,000 | Under review |

| | | | | | |
|---|---|---|---|---|---|
| **9** | TUS, IPL, IPCA, FHV,NHL Stenden, HAMK, UBU & Howest | Decentralised and distributed OT & IIoT Automated Privacy and Security Support | CHIST-ERA Call 2022 (SPiDDS) | €449,861 | Not approved |
| **10** | TUS & IPCA | OncoNavigator: Development of a Novel Breast Cancer Navigation Framework involving collaboration between a Medical Robot and Medical Imaging and Magnetic Lesion Tracker Information | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |
| **11** | IPCA, UBU, NHL Stenden | Smart Health Hubs | HORIZON-RIA | €11,200,000 | Under review |
| **12** | TUS & IPCA | MA in Design Futures | EIT Culture and Creative Programa Action Programme 1: Talent Scaler (Call 1) | €1,369,900 | Not approved |
| **13** | HAMK & TUS | Domestic bio-based raw materials in health and wellbeing products | ERDF, National Finland | €228, 658 | Approved |
| **14** | NHL Stenden, IPCA, TUS & HAMK | AIMLearning | HORIZON-CL2-2021-TRANSFORMATIONS-01 | €2,895,625 | Not approved |
| **15** | TUS & IPCA | InterConCare | HORIZON-HLTH-2024-CARE-04-two-stage | Unavailable | Under review |
| **16** | TUS & IPCA | Design contribution in medical device embodiment | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |
| **17** | TUS & IPCA | Contribution of design in digital manufacturing technologies for fashion and textile design | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |

| | | | | | |
|---|---|---|---|---|---|
| **18** | TUS & IPCA | The Development of a Rehabilitation Framework using Intelligent and Autonomous Processes to Support the Self-Monitoring of Recovery Procedures | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |
| **19** | IPL & IPCA | Embalagem do Futuro \| + ECOLÓGICA + DIGITAL + INCLUSIVA | PRR IAPMEI – 2022 - C05i0102-02 - Agendas Verdes para a Inovação Empresarial | €104,800,337.87 | Approved |
| **20** | TUS & IPCA | HydruFlow: Application of Wireless Smart Sensing to the Accurate Measurement of Urinary Flow and Colour. | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |
| **21** | TUS & IPCA | Personalised learning platform for the footwear industry | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |
| **22** | IPL & IPCA | Programa UPskill - Digital SKILLS & JOBS Formação em "Programação em java/mambu" | IEFP | €128,841,60 | Approved |
| **23** | TUS & IPCA | RL - Optimization of mapping and navigation tasks with surface perception for efficient mobile robot behaviour in multi-surface conditions | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |
| **24** | IPL & IPCA | Transição para a fábrica do futuro (Transition to the Factory of the Future) | PRR - Plano de Recuperação e Resiliência (Recovery and Resilience Plan) | €123.924.655,88 | Approved |
| **25** | TUS & IPCA | Development of a Smart Framework to Improve Standard Urological Procedures | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |
| **26** | TUS & IPCA | Smart Breast Screening: Development of a Deep Learning Framework for | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |

| | | | | | |
|---|---|---|---|---|---|
| | | Multimodal Breast Evaluation and Clinical Validation of the Proposed Technological Solution | | | |
| **27** | TUS & IPCA | Green tax benefits disclosure: the role of higher education institutions | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |
| **28** | TUS & IPCA | Interdepencies and multidimensional approaches in Management Accounting Research | RUN EU PhD scholarship-IPCA/FCT funding | €80,000 | Approved |

# 2. Catalogue of selected case studies of successful joint research and innovation projects developed by RUN-EU

| Research & Innovation Project Case Study 1 | |
|---|---|
| **Project Title** | EPICSTAYS: Entrepreneurial oPportunitIes in alternative aCcomodation |
| **Project Acronym** | EPICSTAYS |
| **Funding Call** | KA220-VET - Cooperation partnerships in vocational education and training |
| **Award Value** | €250,000 |
| **Grant Agreement Number** | KA220-VET-B1F8F9DF |

| | |
|---|---|
| **Start Date** | 01/01/2024 |
| **Term** | 2 years |
| **RUN-EU Principal Contact Person** | Tony Johnston,TUS |
| **RUN-EU Participants** | TUS & NHL Stenden |
| **RUN-EU Research Area Cluster** | Tourism |

**Brief Description of the Research Project:**

EPIC STAYS will develop a new VET offering and upskill European tourism businesses leading to the development of new, alternative tourism accommodation (ATA) in Iceland, Ireland, Netherlands, Italy and Slovenia and thereafter across Europe. By 2025, we will upskill 50+ VET educators and 500+ VET learners with knowledge, current facts and best practices regarding ATA and its potential to address the EU accommodation crisis, climate change, changing consumer trends as well as market opportunities.

EPIC STAYS will design and implement an alternative tourism accommodation VET programme for first use by partners and associate partners. Key activities will include researching the benefits, challenges and drivers of ATA across Europe, developing a niche VET teaching and learning materials for classroom and online use, initiating capacity building and sustainability actions to ensure wider European use. Other key activities will include project evaluation and promotion.

EPIC STAYS will innovate the work of the partners and our associates by introducing a new VET tourism training offering to their work and help them become Europe's first experts in this field. The alternative tourism accommodation market is poised for growth, making EPIC STAYS of high value to European tourism SME's, particularly those in remote, rural regions in Europe.

| |
|---|
| Ultimately, the project will help refocus European tourism VET for a more sustainable, resilient and prosperous future. |

## Research & Innovation Project Case Study 2

| | |
|---|---|
| Project Title | Biogas and value-added components from industrial waste waters |
| Project Acronym | VESITAR |
| Funding Call | ERDF, National Finland |
| Award Value | €271,883 |
| Grant Agreement Number | 2021/600177/09 02 01<br>01/2023/ESAELY |
| Start Date | 01/08/2023 |
| Term | 01/08/2023 – 31/12/2025 |
| RUN-EU Principal Contact Person | Ulla Moilanen,HAMK |
| RUN-EU Participants | TUS & HAMK |
| RUN-EU Research Area Cluster | Food and Biotechnology |

**Brief Description of the Research Project:**

The VESITAR project focuses on various waters from the food, mining, and forest industries. The aim is to recover and recycle valuable fractions, such as metals and nutrients, and utilize organic matter into biogas and nutrients into microalgae. Industrial activities generate significant amounts of various wastewater and side streams. These industrial waters are very variable in quality and composition, depending on the industry sector and production process. The aim of the project is to determine the treatment methods suitable for selected industrial waters and a comprehensive solution that promotes the circular economy, in cooperation with companies. The aim is to recover and recycle valuable fractions, such as metals and nutrients, from water, utilize organic matter into biogas, nutrients into microalgae, and produce value components (pigments, fatty acids, proteins) for various applications. The aim is to provide sustainable, cost- and energy-efficient technical solutions, taking into account the differences in industrial waters. With the treatment solutions tested in the project, the goal is to purify the water either for reuse, or discharging back into nature or with less burden to the municipal wastewater treatment plant.

## Research & Innovation Project Case Study 3

| | |
|---|---|
| Project Title | Regional University Network – European University |
| Project Acronym | RUN-EU 2.0 |
| Funding Call | European Universities (ERASMUS-EDU-2023-EUR-UNIV) |
| Award Value | €14,398,685.00 |
| Grant Agreement Number | 101124674 |

| | |
|---|---|
| Start Date | 01/01/2024 |
| Term | 4 years |
| RUN-EU Principal Contact Person | Patrick Murray, TUS |
| RUN-EU Participants | TUS, IPL, IPCA, FHV, NHL Stenden, HAMK, UBU & Howest |
| RUN-EU Research Area Cluster | Education and Social Sciences |

**Brief Description of the Research Project:**

The Regional University Network-European University (RUN-EU) strives to secure the sustainable economic, social, cultural, and environmental progress of its regions and stakeholders. RUN-EU implements this mission by jointly delivering on the future and advanced skills necessary for its students and stakeholders to meet the challenges of the future and engage in societal transformation thereby leading to the creation of a new type of multinational interregional alliance, a European Zone for Interregional Development. RUN-EU mobilises all four missions of a university including education, research, innovation, and service to society and is responsive to the digital and green transition agendas and socio-economic challenges of the EU. RUN-EU has a common vision and shared values and fosters at its core EU principles and values including multiculturalism & inclusiveness.

Through RUN-EU 2.0 we will reinforce our European inter-university campus and bring it to the next level by:

- Enhancing our joint management and governance model, shared operating systems and seeking legal status.
- Developing key shared entities including a:

European Programmes Academy which develops joint student-centred, challenge and work-based flexible learning activities, including Short Programmes and European Degrees, through pedagogically innovative, inter-university & interregional approaches to higher education

European Research Area which stimulates and creates joint interregional research & innovation activities across RUN-EU and supports the development of our research community European Stakeholder Engagement Centre which stimulates systemic engagement with regional stakeholders through student-centred collaborative initiatives across all our campuses.

European Mobility Innovation Centre which promotes mobility across RUN-EU; builds, and shares expertise in mobility initiatives, promotes EU values and identity and assesses the quality of mobility activities across RUN-EU.

## Research & Innovation Project Case Study 4

| | |
|---|---|
| Project Title | OncoNavigator: Development of a Novel Breast Cancer Navigation Framework involving collaboration between a Medical Robot and Medical Imaging and Magnetic Lesion Tracker Information |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |

| | |
|---|---|
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |
| Term | 4 years |
| RUN-EU Principal Contact Person | John Cosgrove, TUS<br>João Vilaça/Pedro Morais, IPCA |
| RUN-EU Participants | IPCA & TUS |
| RUN-EU Research Area Cluster | Smart, Sustainable and Advanced Manufacturing |

**Brief Description of the Research Project:**

Breast cancer is one of the most prevalent cancers worldwide and one of the most dreadful diseases that affect women. Each year, 2.1M women have breast cancer and in 2018, 15% of all deaths from cancer in women were caused by breast cancer, corresponding to 627,000 deaths. Moreover, the prevalence of breast cancer is expected to increase during the next years. Thus, early diagnosis of breast lesions and the treatment of breast cancer is paramount to reduce mortality. The current diagnosis of breast cancer is performed using medical imaging to detect the lesions, being later performed a biopsy to understand the malignity of the lesion if one is detected. This procedure is performed usually using ultrasound guidance, which is challenging once these images present poor image quality that can hamper the correct visualization and localization of the target injury. For this reason, a precise needle insertion can be a challenging task for the surgeons, requiring high expertise and being a tiring procedure.

In this project, named OncoNavigator, we propose a novel navigation framework that combines for the first time the information from real-time medical imaging (US) and collaborative medical robotic to improve the precision of breast biopsies, while guaranteeing a safe, faster and easier treatment. In particular, the candidate will be responsible to study different strategy to accurately track the needle position throughout the biopsies (e.g., image-based units, sensorial units), as well as, it will focus on the creation of an interventional framework based on collaborative robotics, to guide the operator during all stages of the procedure (e.g. location of the lesion, 3D reconstruction, optimal track until the target site, safety measures, strategies to monitor repeated punctures). Finally, experimental validation of all proposed modules using realistic breast phantom models will be researched.

## Research & Innovation Project Case Study 5

| | |
|---|---|
| Project Title | Design contribution in medical device embodiment |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |
| Term | 4 years |
| RUN-EU Principal Contact Person | Adam de Eyto, TUS<br>Demétrio Matos/Nuno Martins, IPCA |
| RUN-EU Participants | IPCA & TUS |
| RUN-EU Research Area Cluster | Creative Art, Design and Materials Thinking |

**Brief Description of the Research Project:**

This PhD work is intended to integrate and continue the exploratory research project (2022.09053.PTDC) funded by FCT, entitled Design and incorporation of wearable prostheses. This project consists in exploring a new paradigm related to the use of upper limb prostheses, combining the technical specifications of the prosthetic element with the amputee's design and experience.

Specifically in the doctoral work, it is intended, on the one hand, to consolidate the knowledge acquired, and on the other hand, to improve and continue the development of the prototypes, obtaining a set of products that are more effective for their users. The study also includes a component of evaluation study of digital solutions in the area of Health, in line with the research project HERIC 2D (2022.06008.PTDC) also funded by FCT.

## Research & Innovation Project Case Study 6

| | |
|---|---|
| Project Title | Contribution of design in digital manufacturing technologies for fashion and textile design |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |

| | |
|---|---|
| Term | 4 years |
| RUN-EU Principal Contact Person | Adam de Eyto, TUS<br>Demétrio Matos/Paula Tavares, IPCA |
| RUN-EU Participants | IPCA & TUS |
| RUN-EU Research Area Cluster | Creative Art, Design and Materials Thinking |

**Brief Description of the Research Project:**

The FUSION Project - Fashion Up-Skilling Innovation Open Network (https://cefusion.com), was developed under the Creative Europe program by researchers from four partners: ID+ IPCA of the School of Design, Limerick School of Art & Design TUS (which leads), UK Crafts Council and the Fondazione Santagata per la Economia e la Cultura, between 2019 and 2022. An application for FUSION 2.0 is in

preparation to continue processes of co-creation, empowerment and digitalisation in the area of Design in Europe.

This project is inserted in the area of Design in a broad way and in the area of Fashion Design in a specific way, being our intention to develop applied research for the empowerment and internationalisation of designers and companies in the co-design process between producers and users to give continuity to what has been done, but broadening the issues of sustainability, reviewing manufacturing and digital transition broadly in Europe—analysing productive systems and anticipating the future with synergies between digital and handmade.

| Research & Innovation Project Case Study 7 | |
|---|---|
| Project Title | The Development of a Rehabilitation Framework using Intelligent and Autonomous Processes to Support the Self-Monitoring of Recovery Procedures |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |
| Term | 4 years |
| RUN-EU Principal Contact Person | Patrick Murray, TUS<br>João Vilaça/Pedro Morais, IPCA |
| RUN-EU Participants | IPCA & TUS |
| RUN-EU Research Area Cluster | Smart, Sustainable and Advanced Manufacturing |
| **Brief Description of the Research Project:** | |

This work plan aims to improve home-based rehabilitation for the estimated 16% of the European population with shoulder pain, a condition that can significantly impact their quality of life, ability to work, and participation in social activities. The plan aligns with the European Joint Action on Chronic Diseases and Promoting Healthy Ageing across the Life Cycle (JA-CHRODIS) and the European Union of Medical Specialists (UEMS) recommendations for best practice in shoulder pain management.

Although wearable sensors, tele-rehabilitation, mobile applications, serious games, and robotics have shown promise in improving patient outcomes, there are still limitations to their implementation and effectiveness. This work plan proposes a technology-enabled rehabilitation framework for shoulder pain that addresses these limitations, such as the cost, limited access to technology, limited evidence, and lack of human interaction.

The proposed framework combines clinic-based and home-based rehabilitation using virtual reality, robotics, and smart virtual assistants. VR can create immersive environments that simulate real-life scenarios and provide patients with feedback on their movements, while robotics can assist patients with movements and exercises, providing them with personalized feedback and support. Smart virtual assistants can provide patients with reminders and educational resources, and all of these technologies can be used for remote monitoring of patients' progress.

By providing patients with personalized and engaging treatment plans, the proposed framework has the potential to improve patient outcomes, increase access to care, and transform rehabilitation for people with shoulder pain in Europe.

## Research & Innovation Project Case Study 8

| | |
|---|---|
| Project Title | HydruFlow: Application of Wireless Smart Sensing to the Accurate Measurement of Urinary Flow and Colour. |

| | |
|---|---|
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |
| Term | 4 years |
| RUN-EU Principal Contact Person | Patrick Murray, TUS<br>João Vilaça/Pedro Morais, IPCA |
| RUN-EU Participants | TUS & IPCA |
| RUN-EU Research Area Cluster | Smart, Sustainable and Advanced Manufacturing |

**Brief Description of the Research Project:**

Urologic pathologies are common health conditions that affect millions of people worldwide. The impact of urologic pathologies on quality of life, work productivity, and healthcare costs can be significant. Many urologic pathologies, such as urinary tract infections, kidney stones, and prostate cancer, can go undetected for a long time, leading to serious complications and reduced quality of life for patients. Early diagnosis

and treatment of these conditions can improve patient outcomes, reduce healthcare costs, and enhance quality of life.

Technologies that are used to evaluate urological conditions include urodynamic testing, ultrasound, cystoscopy, MRI and CT scans. These tests can provide important information about bladder and kidney function, as well as any abnormalities in the urinary tract.

However, there are some limitations to these technologies, including cost, invasiveness, and limited availability in some areas. Given the limitations of traditional diagnostic techniques, there is a need for new and innovative technologies to improve the diagnosis and management of urological conditions.

This work plan proposes a home-based Technology-Enabled Diagnosis tool for early detection of Urologic Pathologies. The use of self-care and home-measure systems in urologic pathologies is crucial for the early detection and prevention of serious conditions. By utilizing self-care and home-measure systems, patients can monitor their symptoms and track changes over time, enabling them to detect any abnormalities or changes in their condition early on. This can lead to earlier interventions and treatments, which can greatly improve patient outcomes and reduce the risk of complications.

Furthermore, the use of self-care and home-measure systems can empower patients to take an active role in their own healthcare and improve their overall well-being. Patients can monitor their symptoms in real-time, learn more about their condition, and make informed decisions about their healthcare. This can improve patient satisfaction and increase patient engagement with their healthcare provider.

In summary, a Technology-Enabled Diagnosis tool for early detection of Urologic Pathologies can greatly improve patient outcomes and reduce healthcare costs, while also empowering patients to take an active role in their healthcare. This work plan will

explore the development and implementation of such a tool, including research questions, proposed methodology, and expected results.

## Research & Innovation Project Case Study 9

| | |
|---|---|
| Project Title | Personalised learning platform for the footwear industry |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |
| Term | 4 years |
| RUN-EU Principal Contact Person | Siobhan Moane, TUS<br>Duarte Filipe Oliveira Duque/Joao Vilaca, IPCA |
| RUN-EU Participants | IPCA & TUS |
| RUN-EU Research Area Cluster | N/A |

**Brief Description of the Research Project:**

The proposed doctoral research project aims to develop a platform for professional training and new digital content to address competency gaps among users of new technologies in the footwear industry. The project will utilize cutting-edge gamification techniques, artificial intelligence, and virtual reality (VR) technology to provide an immersive and engaging learning experience, tailored to the unique demands of the industry. The project seeks to enhance the skills and knowledge of individuals in the footwear industry, promoting innovation and driving growth in this vital sector. Through the development of personalized training paths and peer evaluation of new content, the research will contribute to the development of a highly skilled and adaptable workforce, better prepared to meet the challenges of a rapidly evolving industry. The project will also investigate the effectiveness of gamification and VR technology in enhancing learning outcomes in the industry, contributing to the growing body of literature on the use of immersive technology in education and training. Overall, the proposed research has the potential to have a significant impact on the footwear industry, enhancing the skills and competencies of its workforce and promoting its growth and innovation.

## Research & Innovation Project Case Study 10

| | |
|---|---|
| Project Title | Domestic bio-based raw materials in health and wellbeing products |
| Project Acronym | FARKOS |
| Funding Call | ERDF, National Finland |

| | |
|---|---|
| Award Value | €228, 658 |
| Grant Agreement Number | 2021/400313/09 02 01 01/2022/UML |
| Start Date | 01.01.2023 |
| Term | 1.1.2023–30.6.2025 |
| RUN-EU Principal Contact Person | Marika Tossavainen,HAMK |
| RUN-EU Participants | TUS & HAMK |
| RUN-EU Research Area Cluster | Food and Biotechnology |

**Brief Description of the Research Project:**

In the FarKos project, we develop and research methods for processing domestic side streams and for the production and processing of bioraw materials, such as cultivated plants, fungi and algae. We research and utilise these raw materials in the development of cosmetics and pharmaceutical products.

In our research, we utilise advanced technologies, such as bioreactor production, layered cultivation and 3D printing.

One result of our research activities is a network, an innovation ecosystem, with which we strengthen regional competence, business life and internationalisation.

| |
|---|
| We work together with the University of Helsinki and Laurea University of Applied Sciences. Several companies are already involved in the project. We also welcome new business partners. |

## Research & Innovation Project Case Study 11

| | |
|---|---|
| Project Title | RL - Optimization of mapping and navigation tasks with surface perception for efficient mobile robot behaviour in multi-surface conditions |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |
| Term | 4 years |
| RUN-EU Principal Contact Person | John Cosgrove, TUS<br>Antonio Moreira/Joao Borges Silva, IPCA |
| RUN-EU Participants | IPCA & TUS |

| | |
|---|---|
| RUN-EU Research Area Cluster | Smart, Sustainable and Advanced Manufacturing |

**Brief Description of the Research Project:**

The proposed research degree program in Research in Engineering for Industrial Smart Robotics aims to provide participants with advanced knowledge and skills in the field of industrial robotics engineering, while also fostering collaborations between academia and industry, in this case within Portuguese Mobilizing Agenda for business innovation in the Two-Wheel Sector. The program seeks to produce graduates who can apply their knowledge and skills to solve complex problems in the field of industrial smart robotics, RFID and factory digitalization.

To achieve this aim, the program has several objectives. Firstly, it aims to provide participants with a strong foundation in the principles and concepts of industrial robotics engineering. This will involve in-depth study of topics such as robot kinematics and dynamics, control, perception, navigation, Ai and human-robot interaction. Participants will also be exposed to cutting-edge research in the field, including the latest advances in robot design and development.

Secondly, the program aims to equip participants with advanced skills and knowledge in industrial robotics engineering. This will involve hands-on experience with state-of-the-art robotics equipment, as well as exposure to real-world challenges faced by the Portuguese industry. Participants will learn how to design, develop, and test robotic systems, and how to apply this knowledge to solve complex problems.

Thirdly, the program aims to develop participants' research skills through supervised research projects. Participants will work on research projects that address real-world problems in the field of industrial robotics, RFID and Artificial Intelligence, under the guidance of experienced researchers. They will learn how to design experiments, collect and analyse data, and present their findings in a clear and concise manner.

Fourthly, the program aims to encourage participants to publish their research in high-quality academic journals and present their work at national and international conferences. This will enable them to share their findings with the wider research community, and to contribute to the advancement of knowledge in the field of industrial robotics.

Fifthly, the program aims to provide participants with opportunities to collaborate with industry partners, members of our consortium. Participants will work closely with industry partners to develop solutions to real-world problems faced by the industry, gaining practical experience and building strong relationships with potential employers.

Finally, the program aims to produce graduates who can work effectively as researchers in the field of industrial robotics. PhD graduates will be equipped with the knowledge, skills, and experience necessary to contribute to the development of new technologies and applications that enhance productivity, quality, and safety in various industries. They will be able to work effectively as part of interdisciplinary teams, and to communicate their findings and ideas.

## Research & Innovation Project Case Study 12

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|---|---|
| Project Title | Development of a Smart Framework to Improve Standard Urological Procedures |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |

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|---|---|
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |
| Term | 4 years |
| RUN-EU Principal Contact Person | Siobhan Moane, TUS<br>Pedro Morais/Joao Vilaca, IPCA |
| RUN-EU Participants | IPCA & TUS |
| RUN-EU Research Area Cluster | Smart, Sustainable and Advanced Manufacturing |

**Brief Description of the Research Project:**

Percutaneous access (PA) is a key aspect of minimally invasive interventions, which are daily performed to treat a multitude of diseases, affecting millions of people worldwide. The identification of the optimal PA is challenging, requiring accurate anatomical evaluation and guidance of surgical tools throughout the percutaneous route. These interventions are divided into (i) pre-procedural planning, where high-detailed images are used to evaluate the anatomy; and (ii) intra-procedural guidance using real-time images to visualize the surgical tools and the PA. However, both stages are dependent on the operator's expertise, requiring extremely trained teams and long interventional times. While the former focus on the manual evaluation of pre-operative images, which is time-consuming and variable between observers, the later uses 2D images to guide the needle through the 3D-spatial PA, being mentally exhaustive, time demanding and frequently resulting in complications.

Considering PA limitations, enhanced 2D image-guided techniques and electromagnetic tracking navigation systems were described. The first relies on image segmentation to facilitate anatomical evaluation. However, since it is 2D, the percutaneous instruments' navigation still challenging.

As such, this project aims to develop and validate in laboratory and clinically 3D image-based technologies to assist the physician in PA.

## Research & Innovation Project Case Study 13

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| Project Title | Smart Breast Screening: Development of a Deep Learning Framework for Multimodal Breast Evaluation and Clinical Validation of the Proposed Technological Solution |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |
| Term | 4 years |

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|---|---|
| RUN-EU Principal Contact Person | Siobhan Moane, TUS<br>Pedro Morais/Joao Vilaca, IPCA |
| RUN-EU Participants | IPL/TUS |
| RUN-EU Research Area Cluster | Smart, Sustainable and Advanced Manufacturing |

**Brief Description of the Research Project:**

Smart Breast Screening: Development of a deep learning framework for multimodal breast evaluation and clinical validation of the proposed technological solution.

## Research & Innovation Project Case Study 14

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| Project Title | Green tax benefits disclosure: the role of higher education institutions |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |

| | |
|---|---|
| Term | 4 years |
| RUN-EU Principal Contact Person | Shane O'Sullivan, TUS<br>Ana Dinis/Liliana Pereira, IPCA |
| RUN-EU Participants | IPCA & TUS |
| RUN-EU Research Area Cluster | N/A |

**Brief Description of the Research Project:**

Environmental issues have entered the global agenda forcing governments to direct attention to the importance of sustainability in the economy and business. The term "sustainability" is commonly associated with companies' care for the environment, although companies should also be sustainable on a social and economic level. The current challenges regarding negative environmental impacts require a change in educational standards to align with sustainability guidelines, in line with the Sustainable Development Goals (SDGs). To bring about behavioural changes towards more sustainable action, it is necessary to provide businesses and citizens with the necessary tools to equip them with strategic knowledge to become more sustainable and to increase their capacity to make green investments and developments. Sustainability has a transdisciplinary character, so its approach is possible and should be faced in all areas of education and professional life. Higher education institutions (HEI) have, therefore, a fundamental and privileged role, through the insertion of the sustainability theme in educational curricula and the adoption of strategies that promote the construction of environmental literacy that brings young students closer to environmental problems and develops in them a sense of responsibility for the common good, so the integration of sustainable development in higher education has been gaining increasing attention. In this project, we propose an HEI case study of the taxation course units. In specific, the candidate

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| will be responsible to research educational curricula on environmental taxation using international comparative analysis. |

## Research & Innovation Project Case Study 15

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| Project Title | Interdependencies and multidimensional approaches in Management Accounting Research |
| Project Acronym | N/A |
| Funding Call | RUN EU PhD scholarship- IPCA/FCT funding |
| Award Value | €80,000 |
| Grant Agreement Number | N/A |
| Start Date | 04/09/2023 |
| Term | 4 years |
| RUN-EU Principal Contact Person | Shane O'Sullivan, TUS<br>Patricia Gomes, IPCA |
| RUN-EU Participants | IPCA & TUS |
| RUN-EU Research Area Cluster | N/A |

**Brief Description of the Research Project:**

Nowadays society has the idea that accountants can save the world. Organizations are facing new challenges to balance the economic objectives with the environment, social and governance (ESG) dimensions and accountants are challenged to help them in this way. The market, dominated by a grow in demand, internationalization and globalization, innovation, crises and changes, has meant a new framework of action for organizations, demanding new organizational forms and structures and new decision-making methods and processes that promote permanent learning and the continuous adjustment of the organization to its environment. Traditionally, organizations have given little importance to the objectives linked to the so-called key success factors of a non-financial nature. However, the highly competitive, uncertain and dynamic context in which they operate has revealed that key elements such as quality, the value added by products/services to customers, innovation, time, business culture and corporate image, are elements that condition strategic execution.

This context of change is a reality not only in private sector but also in public and hybrid organizations. In the current context of greater responsibility and transparency in public management, public sector organizations are also aware of the need to improve efficiency in the application of resources, the provision of services with high quality, compliance with government plans and the quality of life of the community as a whole. At the same time, one of the greatest difficulties of these organizations is the clear definition of their strategy and the measurement of results that are intended to be achieved (outputs and outcomes), together with the inability to link the operational performance indicators to the strategy.

Although the growing trend of research in the last 20 years, there is a need to develop multidimensional information based on timely and properly management accounting systems (combining financial and non-financial information) that reflect the evolution of the key success factors of a non-financial and/or qualitative nature, not limiting the

information to past actions but providing information related to future challenges and the ESG dimensions.

This project intends to promote the development of new research in the topic of management accounting looking to the contextual and institutional interdependencies (structures, context, practices, strategies) and multidimensional approaches (financial and non-financial information, the ESG dimensions…), identifying evolutionary trends, approaches, and future research opportunities.

## Research & Innovation Project Case Study 16

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|---|---|
| Project Title | Embalagem do Futuro \| + ECOLÓGICA + DIGITAL + INCLUSIVA |
| Project Acronym | N/A |
| Funding Call | PRR IAPMEI – 2022 - C05i0102-02 - Agendas Verdes para a Inovação Empresarial |
| Award Value | €104,800,337.87 |
| Grant Agreement Number | C644931699-00000042 |
| Start Date | 2022 |
| Term | 4 years |
| RUN-EU Principal Contact Person | N/A |

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| RUN-EU Participants | IPL & IPCA |
| RUN-EU Research Area Cluster | Food and Biotechnology |

**Brief Description of the Research Project:**

The "PACKAGING OF THE FUTURE" project stems from the initiatives started by GESRL, CIMRL, Polytechnic Institute of Leiria, and NERLEI, bringing together a multidisciplinary and complementary consortium of 89 entities (52 SMEs, 21 NPMEs, 12 ENESIIs) from the North, Center, and Alentejo regions. The project aims at research and development (I&D), global-scale production/manufacturing, and commercialization of more ecological, digital, and inclusive packaging solutions. This endeavour intends to materialize in at least 20 new products/services resulting from R&D activities and over a dozen new production lines that combine innovative technologies for the production of sustainable packaging. It also involves the adoption of new processes in the value chain of the Packaging sector, encompassing raw materials, product design engineering, moulds and tools, processing and manufacturing, information systems and digital transition, social marketing, collection, and recycling.

## Research & Innovation Project Case Study 17

| | |
|---|---|
| Project Title | O Link Me Up - 1000 ideias, Sistema de Apoio à co-criação de inovação, criatividade e empreendedorismo |
| Project Acronym | N/A |

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| Funding Call | PT2020 - POCI - Programa Operacional de Competitividade e Internacionalização |
| Award Value | €5, 973 237.09 |
| Grant Agreement Number | N/A |
| Start Date | 12/02/2021 |
| Term | 12/02/2021- 30/06/2023 |
| RUN-EU Principal Contact Person | Susana Rodrigues, IPL |
| RUN-EU Participants | IPL & IPCA |
| RUN-EU Research Area Cluster | All |

**Brief Description of the Research Project:**

The "Link Me Up - 1000 Ideas" project, a Support System for the co-creation of innovation, creativity, and entrepreneurship, aims to foster entrepreneurial spirit by empowering young students and/or entrepreneurs. The goal is to enhance the quality of employment and stimulate the creation of innovative companies.

## Research & Innovation Project Case Study 18

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|---|---|
| Project Title | Programa UPskill - Digital SKILLS & JOBS Formação em "Programação em java/mambu" |
| Project Acronym | UPskill |
| Funding Call | IEFP |
| Award Value | €128, 841,60 |
| Grant Agreement Number | N/A |
| Start Date | 11/07/2022 |
| Term | 11/07/2022- 16/12/2022 |
| RUN-EU Principal Contact Person | Vitor Távora, IPL |
| RUN-EU Participants | IPL & IPCA |
| RUN-EU Research Area Cluster | IOT and Cybersecurity |

**Brief Description of the Research Project:**

(Re)qualification of assets for the digital field through the design of intensive and highly specialized training offerings, involving higher education institutions and companies. These offerings directly address the skill needs identified by companies in the sector.

| Research & Innovation Project Case Study 19 | |
|---|---|
| Project Title | Transição para a fábrica do futuro (Transition to the Factory of the Future) |
| Project Acronym | N/A |
| Funding Call | PRR - Plano de Recuperação e Resiliência (Recovery and Resilience Plan) |
| Award Value | €123.924.655,88 |
| Grant Agreement Number | N/A |
| Start Date | 01/01/2023 |
| Term | 01/01/2023- 31/12/2025 |
| RUN-EU Principal Contact Person | Nuno Martinho, IPL |
| RUN-EU Participants | IPL & IPCA |
| RUN-EU Research Area Cluster | Smart, Sustainable and Advanced Manufacturing |

**Brief Description of the Research Project:**

The Drivolution Agenda aims to promote the creation of a Future Factory model, based on actions capable of addressing the challenges associated with energy transition and digital transformation in the automotive sector. This initiative seeks to establish the foundations for intelligent, sustainable, inclusive, and resilient growth.

To create the desired factory model, the agenda has been designed around five fundamental action lines: 1) Digitalization, 2) Industry 5.0, 3) Safety and Ergonomics, 4) Materials, and 5) Specialized Digital Training. The 20 sub-projects within this agenda are intended to drive innovation in each action line, fostering the development of new processes and products that will have a significant impact on the national economy.

For the advancement of these objectives, the agenda involves a total of 40 entities, comprising 20 companies and 20 entities from the national scientific and technological system, bringing their knowledge and expertise in the automotive sector to the table.

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