National Smart Specialisation Strategy

Consultation Paper

Lero Submission

Date: 9th August, 2021

Feedback on Consultation Questions

Q1: Do you agree with the suggested areas of strength for the three regions as set out above? Are there other areas of strength in the three regions to be highlighted?

While Lero is in broad agreement with the suggested areas of strength outlined for the three regions, we believe that **'Software'** should be added to the list of the Southern Sectoral Strengths. Software is now the sole key enabling technology transversal to all technical innovations, being embedded in solutions and services or providing smart tools for other key application domains. This is clearly evidenced by the fact that the amount of software in a car today has increased 100-fold in the past 25 years.[1] Similar patterns occur in a host of industry domains.

Q2: What, in your opinion, are the key sectors in your region? What are the skills, assets and capabilities within your region?

Software: As the world's second largest software exporter, Ireland is recognised internationally as a leading location for companies in the software sector. New innovations in software methods and techniques are needed to reach the vision of the digital transformation of society, and in a national context – Lero is key to realising this vision. Headquartered at the University of Limerick in the NUTS 2 Southern Regional Assembly, Lero, the SFI Research

[1] Jutta Schneider (2015) Software-innovations as a key driver for green, connected, autonomous mobility, ARTEMIS-IA/ITEA Co-Summit, Berlin, March 2015

Centre for Software is home to over 300 researchers across its distributed network of higher education, industry and enterprise partners throughout Ireland. As a key source of high calibre research graduates for industry and a provider of collaborative research both nationally and internationally, its expertise is helping to attract new FDI into Ireland meeting regularly with IDA clients considering investment in Ireland.

An Economic Impact Study[2] carried out by Kemmy Business School at University of Limerick found that every €1 invested by the State and industry in Lero between 2005 and 2018 contributed more than €5 to the economy. Part of Lero's vision is to foster critical skills and talent and train the software practitioners of the future. Since 2015, 30% of trainees have their first departure in industry.

Over the past 10 years, the amount of industry-funded research in Lero has also increased 100-fold. This is clear evidence of the world's leading software companies seeking to collaborate with Lero on leading-edge research, which heretofore was being conducted in other countries. Lero is currently actively engaged in industry projects with over 50 enterprise partners. Lero seeks to establish a software ecosystem in Ireland that can create wealth and jobs, and has broadened its focus beyond software engineering to embrace a more holistic software research agenda reflecting the needs of our industry partners. Lero's **Responsible Software Engineering** agenda underpins our strategic research areas and ensures that software delivers values such as privacy, security, trust and inclusion; key topics for companies now and in the future. Software also underpins AI technologies of various kinds, and the development of responsible AI is a key challenge of our time - and one that Ireland is already well placed to address and provide international leadership. In a recent influential article[3] by distinguished University of Maryland Professor Ben Shneiderman enumerating recommendations for advancing responsible AI, at least 5 of the 15 recommendations are explicitly around more effective software engineering - an area in which Lero leads internationally. Six key application domains: Connected and Autonomous Vehicles (CAV), Health, Wellbeing & Human Performance, Smart Communities/Cities, GovTech, FinTech, and AgriTech & Food define the R, D & I activities in Lero's research programme. Lero has been instrumental in helping to define the policy and direction of Connected and Autonomous Vehicles (CAV) in Ireland and is a member of the national CAV steering group established to explore the business opportunities of this technology for Ireland.

[2] https://lero.ie/sites/default/files/FINAL%20Econ%20impact%20Lero%20v%2027_11_2018.pdf

[3] Ben Shneiderman (2021) Responsible AI: Bridging From Ethics to Practice, Communications of the ACM, August 2021, Vol. 64 No. 8, Pages 32-35.