Stairway to Excellence
Cohesion Policy and the Synergies with the Research and Innovation Funds

Example of Synergies

IT4Innovations

Czech Republic
Pavla Žížalová
Executive Summary

The aim of IT4Innovation Centre is to act as research provider in the fields of high performance computing and embedded systems. The research centre provides a state-of-the-art technology and expertise in high performance computing and embedded systems, and makes it available for Czech and international research teams from academia and industry.

The Infrastructure has been funded with structural funds through the operational programme R&D for Innovations. The Structural funds enabled to build a state of the art infrastructure that belongs to the best available ones in Europe. It also enabled to employ approximately 200 highly qualified researchers from the Czech Republic and abroad that will conduct work at the National Supercomputing Centre.

Thanks to such an infrastructure, the region became “visible” on the map of the European Research Area and new opportunities for projects and projects partners became available – this has brought the participation in several new FP/H2020 projects focused on various aspects of the research of the Centre.

Type of synergies
Parallel-Sequential funding – Upstream combination

S&T field targeted by the synergies
ICT

The views expressed are purely those of the author and may not in any circumstances be regarded as stating an official position of the European Commission
1. INTRODUCTION

The case presented in the following sections is one of the examples of synergies provided by the ‘Stairway to Excellence’ project in which different sources of funding have been combined to amplify the R&I investments and their impact on the economy and wider society.

As described in the guide ‘Enabling synergies between European Structural and Investment Funds, Horizon 2020 and other research, innovation and competitiveness-related Union programmes’\(^1\), synergies can be achieved through:

- Sequential (or successive) funding that use funds in separate projects built on each other;
- Parallel funding that use funds in separate projects complementing each other;
- Simultaneous/cumulative funding that brings together Horizon2020 and ESIF funds in the same project aimed at achieving greater impact;
- Alternative funding that reorients FP7/Horizon 2020 projects that were positively evaluated, shortlisted, but not funded given the limited budget, towards Structural Funds impact.

The combination of sources of funding is used to address two types of activities:

- Upstream activities build the appropriate capacities to perform research. They can be capacity building in physical capital (construction or improvement of research infrastructures, purchasing equipment, (including IT equipment and connections, data storage capacities), innovation infrastructures (LivingLabs, FabLabs, Design factories, etc.) and social capital (assistance for building networks, clusters and consortia);
- Downstream activities are focussed towards the market and the creation of economic value. They can be applied to research, development and demonstration activities, technology transfer and adoption; technology and innovation audits to identify potential demand for RDI results; proof-of-concept funding; pilot lines for first production; and pre-commercial procurement projects. There can also be activities to support the improvement of the innovation eco-system in a territory.

2. CONTEXT

The IT4Innovations Centre of Excellence’s vision is to become the Czech Republic’s national centre of research excellence in information technology with an emphasis on the development and application of supercomputing methods\(^2\).

The IT4Innovation Centre as a project was funded by OP R&D for Innovations. Partners of the project are VSB – Technical University of Ostrava, University of Ostrava, Brno University of Technology, Silesian University in Opava, and Institute of Geonics AS CR.

The aim of the project is to deliver scientifically excellent and industry relevant research in the fields of high performance computing and embedded systems. The new research centre provides a state-of-the-art technology and expertise in high performance computing and embedded systems and makes the research equipment available for Czech and international research teams from academia and industry.


\(^2\) [https://www.it4i.cz/what-is-it4innovations/?lang=en](https://www.it4i.cz/what-is-it4innovations/?lang=en)
Within the European research community, since 2011, the IT4Innovations National Supercomputing Centre has been part of the European network of the PRACE (Partnership For Advanced Computing in Europe – Research Infrastructure) supercomputing centres.

3. IMPLEMENTATION

The Structural funds enabled to build a state of the art infrastructure that belongs to the best available in Europe. It also enabled to employ approximately 200 highly qualified researchers from the Czech Republic and abroad that will conduct work at the National Supercomputing Centre.

Thanks to such an infrastructure, the research centre could become a national node of PRACE in Czech Republic and provider of Tier-1 system for PRACE (the centre plans to contribute with 10% of its computational resources). It became clearly “visible” on the map of the European Research Area and new opportunities for projects and projects partners became available – this has brought the participation in several new FP/H2020 projects focused on various aspects of the Centre’s research.

The Centre could not however become a partner for FP projects simply because of the infrastructure: Existing international research network and visibility were other key factors behind its success. It has built on previously gained partnerships, personal networks, R&D results and reputation. This previously gained network and international visibility of the teams behind the research centre has been the key facilitating mechanism enabling the synergies. There has not been any direct support (for instance from the national or other European programmes) for the participation in FP7, it has been the initiative and action of the Centre itself and its teams.

Figure 1 maps the project chronologically, the research activities of the organisation and the type of funding. It aims to give a picture of relations between projects revealing planned or unplanned dependencies (synergies) between projects and their source of funding.

Figure 1 Diagram of the synergies implemented
**Added value / complementarities created by the synergies**

A research infrastructure was a necessary condition to actually enter any other project – the Centre became a part of European / global infrastructure and thanks to that the research centre has been able to enter into discussion with other partners about other potential problems and projects to be carried out.

**Mechanisms facilitating the synergies**

- Fast track submission for projects creating synergies between ESIF and H2020 programme.
- Co-ordination of evaluation of proposals submitted under ESIF calls that aim of complementing FP projects (alignment of call deadlines, the eligibility, evaluation criteria etc.).
- Participation rules for ESIF should be more aligned with the other programmes. The projects funded by ESIF could trigger participation in other programmes.

**Main problems encountered in implementing the synergies**

The rigid regulations for structural funds are that limiting the possibility to create synergies with the FP/H2020.

**Suggestions to improve the synergies**

- Higher flexibility of the funds and rules how the R&D projects are assessed.
- Project preparation / capacity building for participation in H2020 programme.

**Main motivations in implementing the synergies**

- Sustainability – need to finance the team that has been created when SF provide only about 50% of the costs and national funds are limited.
- Fulfilment of the research centre mission – as a new infrastructure, the research centre saw its mission in its use for the purpose for which it was build and the FP / H2020 represent the best source to finance it.
- New partners, new project opportunities.

**Facilitating mechanisms for the take up of the scientific results**

- VSB-TUO has a projects (grant) office together with Technology transfer office that supports part of the activities of the research centre as well.
- IPR regulations are satisfactory and they do not represent a specific barrier for public-private co-operation.

Figure 2 aims to position projects according to the activities they cover; from upstream (infrastructures, equipment, research activities) to downstream related activities (innovation, knowledge transfer, access to market).
4. RELATED PROJECTS

ERDF funded project: IT4Innovations, Priority axe 1 of the European Centre of Excellence

- Budget: 58.2 M€ (ERDF: 49.4 M€)
- Time frame of the funded project: 2009-2015
- Project reference: [http://www.it4i.cz/][1]  [http://www.it4i.eu/][2]

Main objectives and type of costs covered:
The global objective of the IT4Innovations CE project is to build up the research capacity that is needed for achieving research excellence in the field of supercomputing and information technology. In this context, the project will include acquiring adequate research infrastructure and creating a research environment focusing on the development of both computational methods as such (IT as the subject of research) and, above all, the tools for their effective use (IT as a tool for further research and applied use).
FP7 PROJECT 1: EXascale Algorithms and Advanced Computational Techniques

- funding scheme: ICT-2013.12.1 - Exascale computing platforms, software and applications
- Budget: Total cost: 4.5 M€ - Total FP7 contribution: 3.4 M€
- Time frame of the project: 2013 - 2016

Project reference: [http://www.exa2ct.eu/content/about-project.html](http://www.exa2ct.eu/content/about-project.html)  

- Main objectives and type of costs covered:

  Numerical simulation is a crucial part of science and industry in Europe. The advancement of simulation as a discipline relies on increasingly compute intensive models that require more computational resources to run. This is the driver for the evolution to exascale. Due to limits in the increase in single processor performance, exascale machines will rely on massive parallelism on and off chip, with a complex hierarchy of resources. The large number of components and the machine complexity introduce severe problems for reliability and programmability. The former of these will require novel fault-aware algorithms and support software. In addition, the scale of the numerical models exacerbates the difficulties by making the use of more complex simulation algorithms necessary, for numerical stability reasons.

- Beneficiaries: VYSOKA SKOLA BANSKA - TECHNICKA UNIVERZITA OSTRAVA Project
  coordinator: INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM VZW

FP7 PROJECT 2: HARPA

- funding scheme: ICT-2013.3.4 - Advanced computing, embedded and control systems
- Budget: Total cost: 3.9 M€ - Total FP7 contribution: 2.8 M€
- Time frame of the project: 2013-2016

Project reference: [http://www.harpa-project.eu/](http://www.harpa-project.eu/)  

- Main objectives and type of costs covered:

  The overall goal of our project is to provide architectures (both Embedded Systems (ES) and High Performance Computing (HPC)-oriented) with efficient mechanisms to offer performance dependability guarantees in the presence of unreliable time-dependent variations and aging throughout the lifetime of the system. This will be done by utilizing both proactive (in the absence of hard failures) and reactive (in the presence of hard failures) techniques

- Beneficiaries: VYSOKA SKOLA BANSKA - TECHNICKA UNIVERZITA OSTRAVA Project
  coordinator: Politecnico di Milano (POLIMI), Italy

FP7 PROJECT 3: PRACE - Second Implementation Phase Project

- funding scheme: PRACE - Second Implementation Phase Project
- Budget: Total cost: 35.2 M€ - Total FP7 contribution: 18 M€
- Time frame of the project: 2011-2014


- Main objectives and type of costs covered:

  PRACE-2IP supports the accelerated implementation of the pan-European HPC Research Infrastructure created in April 2010 as the result of the preparatory phase PRACE project. It complements and extends the work of the PRACE-1IP project that was started in July 2010 and
addresses the computational and simulation needs of European scientific communities to keep them at the forefront of discovery.

- Beneficiaries: VYSOKA SKOLA BANSKA - TECHNICKA UNIVERZITA OSTRAVA Project coordinator: UNIVERSITAT LINZ, Austria

**FP7 PROJECT 4: PRACE – Third Implementation Phase Project**
- funding scheme: PRACE - Third Implementation Phase Project; FP7-INFRASTRUCTURES-2012-1
- Budget: Total cost: 26.6 M€; Total FP7 contribution: 19 M€
- Time frame of the project: 2012-2016

- Main objectives and type of costs covered:

PRACE-3IP supports the accelerated implementation of the pan-European HPC Research Infrastructure (RI) created in April 2010. It continues, complements, and extends the work of the PRACE-1IP and -2IP projects. PRACE-3IP addresses the computational and simulation needs of European scientific communities and of industry to keep them at the forefront of discovery. Our vision is the formation of an integrated HPC ecosystem of facilities and services enabling researchers to realise the full potential of computational science within the supportive environment of the ERA.

- Beneficiaries: VYSOKA SKOLA BANSKA - TECHNICKA UNIVERZITA OSTRAVA Project coordinator: UNIVERSITAT LINZ, Austria