



THE EIT ICT LABS BUDAPEST ASSOCIATE PARTNER GROUP

**Education
Research
Business**





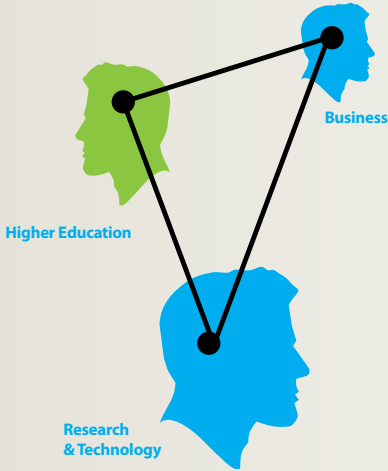
Knowledge &
Innovation
Community

eit

EIT ICT Labs

European Institute of Innovation and Technology (EIT):

- it has set the goal to foster sustainable growth and competitiveness across Europe by reinforcing the innovation capacity of the EU;
- its basic principle is to apply the knowledge triangle model, and thus harmonize the R&D practices of universities, research laboratories and enterprises;
- it was set up in 2009 in Budapest and has an EUR 300 million budget.

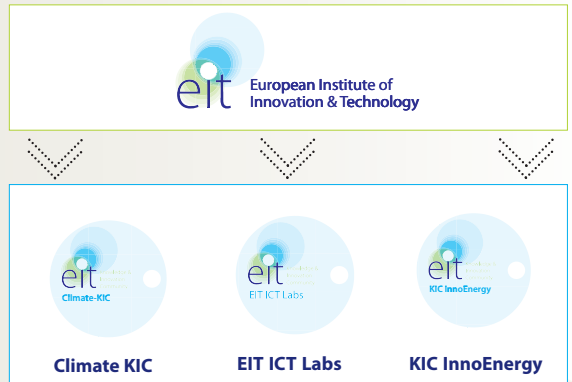


Knowledge and Innovation Communities (KICs):

- based on the strategic partnerships of the representatives of the academia and industry;
- in 2009, EIT set up three knowledge and innovation communities:
 - Climate-KIC: *climate change*;
 - KIC InnoEnergy: *sustainable energy*;
 - EIT ICT Labs: *information and communications technology (ICT)*.

The knowledge triangle model in practice:

- higher education institutions, research laboratories and businesses brought together in networks of excellence, at both national and European level.



EIT in figures:



- 17 co-location centres across Europe;
- more than 280 partners from across the fields of industry, research and education;
- approximately EUR 170 million EIT-funding, complemented by EUR 600 million non-EIT funding (the ratio of EIT-funding to non-EIT funding is 1:4);
- more than 1000 students in 20 different majors across the various universities;
- approximately 100 running projects, 27 start-up companies, 35 new patents, and 100 new services and products.

Nodes:

- national centres or networks of excellence;
- the smallest units of the Knowledge and Innovation Communities;
- integrated into a Europe-wide network of excellence.

- The mission of EIT ICT Labs is to drive European leadership in ICT innovation for economic growth and quality of life.
- It is a network of 8 national consortiums, each with a national centre, or so-called node.



 EIT ICT Labs Nodes  Associate Partners

- Following the knowledge triangle model, the EIT ICT Labs performs state-of-the-art educational, research and business activities.

1 Education:

- the EIT ICT Labs Master School offers 7 Master Programs at 19 top universities across Europe;
- the EIT ICT Labs Doctoral School complements the doctoral programs of the partner universities;
- both programs offer business knowledge and entrepreneurial skills and involve institutional as well as geographical mobility.

2 Research:

- geared towards the development of new products, solutions and applications for the market.

3 Business:

- the ultimate goal is to set up innovative new enterprises, start-ups and spin-off companies.

- In its investment model geared towards innovation, the EIT ICT Labs applies a **catalyst-carrier model**:

- the value-adding actions (the catalysts) are applied on complementary activities, business programs; each catalyst is aimed to produce a specific innovation (a service or product) as its output on top of the carriers, which are typically research, educational, or business programs;
- EIT funding (necessarily the catalyst) is made available in a ratio of 1:4 (EIT funding 25%, non-EIT funding 75%);
- the non-EIT funding may come from different sources, e.g. KIC partners' own resources, other EU funding, national/regional funding, and private funding (e.g. donations).

EIT ICT LABS BUDAPEST ASSOCIATE PARTNER GROUP



Prof. Dr. Zoltán Horváth, dean of the Faculty of Informatics, University ELTE, and director of the EIT ICT Labs Budapest Associate Partner Group

- Out of the three EIT KICs, Hungary first gained admission to the EIT ICT Labs KIC.
- Currently it maintains an associate partner group status.
- The Hungarian consortium is based on the partnership of two local universities – namely, the **Eötvös Loránd University (ELTE)** and the **Budapest University of Technology and Economics (BME)** – and their leading industrial partners in informatics and telecommunications – namely, the Cisco Systems Hungary, the Nokia Siemens Networks, the General Electric Healthcare and the Ericsson Hungary. The consortium is led by the University ELTE.
- The two partner universities have a **two-decade best practice of applying the knowledge triangle model** (i.e. the students have long worked on research projects initiated by the industrial partners of the universities).
- It focuses on **communication software and system performance**, its special field of expertise.
- It is in the process of establishing best practices for **integrating Hungarian small and medium size companies, spin-offs and start-ups in a network**.
- In 2012 **the Hungarian State** – more particularly, the National Development Agency and the Research and Technology Innovation Fund – **issued a call for proposals for the promotion of Hungary's participation in the EIT KICs**.
- In the call for proposals, the EIT ICT Labs Budapest Associate Partner Group received **HUF 1 billion funding from the State**. The funding has been used to set up the local CLC and serves as a **catalyst for the research projects** complementing the EIT funded projects.

The CLC of the EIT ICT Labs Budapest Associate Partner Group is located in the Infopark, in the vicinity of some of the biggest telecommunication and ICT companies in Budapest, the Faculty of Informatics, University ELTE, and the Faculty of Electrical Engineering, University BME.





R&D&I PROJECTS IN BUDAPEST

- In line with the main goals of the EIT ICT Labs, the Budapest Associate Partner Group aims to foster **innovation** in the domain of ICT by generating results easily transformed into **wealth-generating products and services ready for the market**.
 - On top of the R&D&I activities financed by the State, EIT money is spent on bringing the results to the market, thus realizing the **innovation cycle**.
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- **The projects, which are funded by the Hungarian Government, managed by the National Development Agency, and financed by the Research and Technology Innovation Fund, build around four main areas:**



1. Solutions for complex infocommunication networks

The benefits we gain from the digital world are based on services supported by a carefully built network. Networks are best rooted in internet infrastructures whose system components are continuously adjusted to the needs of the market. Research and development in this area requires an experimental environment where the applicability of the results may be effectively tested. Research and development further needs a consideration of the medical services. Earlier medical services were provided by a separate network; now we need to integrate them into the more general infocommunication networks. The services of the present day require greater data transfer and data load, which pose further challenges for the networks of the future.

This research area corresponds to three EIT ICT Labs thematic action lines – namely, the Networking Solutions for Future Media, Health & Wellbeing and Internet Technologies and Architecture.



2. Mobility and the digital cities of the future

In the area of ICT applications and services, social media, in its many different forms, represents the most dominant trend. The concept of digital cities is an expansion of the concept “social media”: it implies a virtual community defined by its geographic boundaries. The digital city implies virtual skills and services which improve the inhabitants' quality of life. To access the inhabitants individually, we also need to reconsider the concept of mobility. Intelligent mobility implies context-dependent services. Individuals need different services depending on their specific location, e.g. the type of building they are in. Therefore, in providing the right service, it is crucial to identify their location with great precision. The “smart space” concept points at solutions based on near field communication (NFC) technologies.

This research area corresponds to three EIT ICT Labs thematic action lines – namely, Smart Spaces, Digital Cities of the Future and Intelligent Mobility and Transportation Systems.



3. Human and computer cooperation

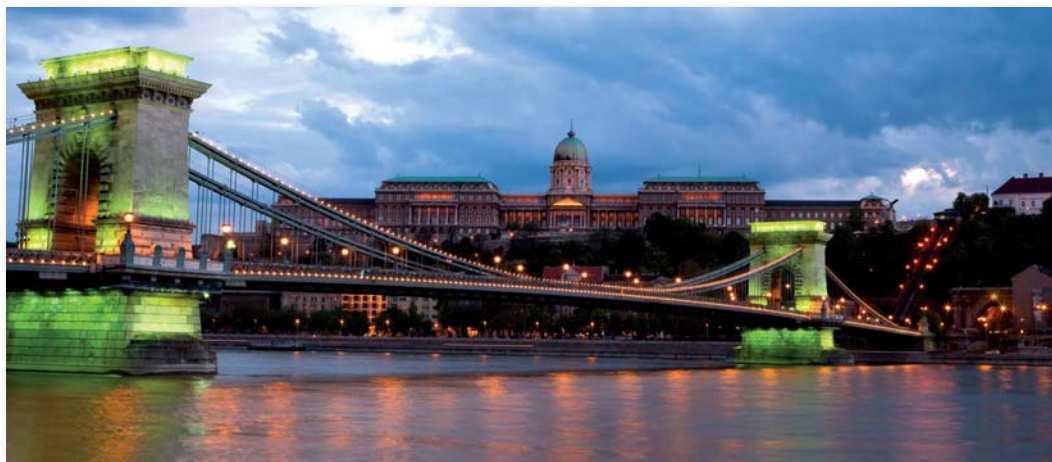
Infocommunication technologies play an important role in all spheres of life. We use mobile devices, equipped with a large number of sensors, to network with other people and to generate Petabytes of data. As a result, the methods of teaching and learning have diversified and life-long learning, on-the-job training and the integration of marginal social groups have emerged as new opportunities. The aim of the related projects is to bridge the gap between the physical and virtual worlds. This requires ground-breaking human-computer cooperation based on artificial intelligence results, as well as new approaches in handling web, mobility and navigational data, and new approaches to handling individuals and the society work. To reach the above goals, computing in the cloud provides scalable algorithm techniques, and new approaches to connecting the human with the computer.

This research area corresponds to two EIT ICT Labs thematic action lines – namely, ICT-mediated Human Activity and Computing in the Cloud.



4. The security of critical systems

As services based on the continuous monitoring the private spheres of our lives have become wide-spread, issues of security have come to the fore. Safety and privacy laws require technologies where digital devices may effectively detect, record and monitor the individuals' movements in the digital space or digital cities. Apart from the individuals, critical networks, such as the ones providing energy services, present further challenges. To preserve their security, we need an effective framework for safety, which effectively detects targeted ICT attacks against critical infrastructures, handles the problems that emerge from the attacks, and supports follow-up analysis. This research area corresponds to two EIT ICT Labs thematic action lines – namely, Smart Energy Systems and Privacy, Security & Trust in Information Society.



EIT ICT LABS MASTER SCHOOL

The **EIT ICT Labs Master School** offers a two-year program in which students choose two universities in two different European countries to build a curriculum of their choice. There are **seven majors available**, from which the students choose one based on their skills and interests. The objective behind it is twofold. On the one hand, it aims to provide the students with **sound technical knowledge**; on the other hand, it seeks to equip them with **valuable research and business skills**. The students are expected to use their technical knowledge to generate **breakthrough innovations** on the global markets.

Unique features of the EIT ICT Labs Master School:

- 1 a two-year program at 2 different universities from 8 countries;
- 2 19 top universities across Europe to choose from;
- 3 7 Technical Majors in the most innovative research fields in ICT;
- 4 the high level technical training combined with an **Innovation & Entrepreneurship Minor**;
- 5 research and work experience at **leading industrial partners**;
- 6 **double degrees** and a **Business and Innovation Certificate** issued by the EIT.

The Seven Technical Majors

Digital Media Technology (DMT)
Distributed Systems and Services (DSS)
Embedded Systems (ES)
Human Computer Interaction and Design (HCID)
Internet Technology and Architecture (ITA)
Security and Privacy (SaP)
Service Design and Engineering (SDE)

The Innovation and Entrepreneurship Minor

Besides fundamental knowledge on the topics, students learn how to drive innovations to the market. Their Master's Thesis, which they prepare in collaboration with a company, includes creating a business plan for the commercial exploitation of their project. A basic course in Innovation and Entrepreneurship and the Business Development Labs Course are vital parts of this module.



EIT ICT Labs
MASTER SCHOOL
Master's Programme in Information
and Communication Technologies

1. Service Design and Engineering (SDE)

Goals of the program:

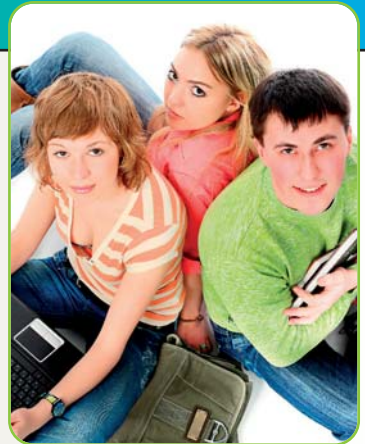
- to develop the multidisciplinary technical skills that are needed for the designing and building of digital, software intensive services based on service-oriented architectures;
- to develop an understanding of and the ability to analyse the organizational settings and the user and business requirements in which the service-based systems are deployed and used;
- to bridge the gap between Computer Science and Software Engineering, and between Information Technology and Information Systems.

Structure of the Technical Major:

1st year: Common base

2nd year in Budapest: Specialization in Distributed Software Systems

It supports the design, analysis and development of complex distributed telecommunication services.



2. Security and Privacy (SaP)

Goals of the program:

- to develop an understanding of the concepts and technologies for achieving confidentiality, integrity, authenticity, and privacy protection for information processed across networks;
- to provide competences in communication, knowledge integration, open innovation and technology management, from the viewpoints of both business and technology.

Structure of the Technical Major:

1st year: Common base

2nd year in Budapest: Specialization in Advanced Cryptography

It focuses on the general ideas, techniques and methods of Applied Cryptography as well as on theoretical background and solid knowledge, putting security in a wider context.



3. Digital Media Technology (DMT)

Goals of the program:

- to blend media technologies with man-machine interaction, artificial intelligence techniques and the underlying internet and hardware layers;
- to develop the skills to analyze 3D data in real time (from cameras and other scanning techniques such as radar, lidar, remote sensing, etc.) and to merge it with scientific computation and simulation;
- to predict possible outcomes in real time, likely on GPUs.

Structure of the Technical Major:

1st year: Common base

2nd year in Budapest: Specialization in Media Communications Services

It focuses on communications and delivery networks, systems, enabling technologies and platforms for providing media services.



Innovation Entrepreneurship Mobility Business Development Experience

Opportunity Recognition Modeling Business

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EIT ICT Labs

It fosters innovation with business skills and an entrepreneurial mindset by encouraging students to pursue research topics with a market potential.

Unique features of the EIT ICT Labs Doctoral Training Centre:

- regular PhD training at one of the universities of the network;
- an additional Innovation and Entrepreneurship training (Business Competence and Business Development Experience phases);
- research topics in harmony with the market needs;
- research projects in cooperation with the industrial partners;
- two supervisors: one from the academia and one from the industry;
- geographic and organisational mobility;
- networking opportunities;
- a PhD diploma and an Innovation and Entrepreneurship certificate issued by the EIT.

The special focus of the Budapest DTC: “Excellence in communication software and system performance”



The students of the Budapest Doctoral Training Centre

1. Joint education and research programs with leading companies in informatics and telecommunication:

- decade long partnerships between the universities ELTE and BME and some of the big local companies;
- Master and PhD students working on projects initiated by the companies;
- research laboratories jointly managed by the companies and the universities;
- a number of patents, open source software solutions and publications on technology improvement.



2. A platform of innovative SMEs:

- several Hungarian medium size enterprises have become successful players in the international ICT sector;
- it integrates the Hungarian ICT companies in a network of dynamically developing SMEs;
- it encourages new collaboration partnerships, knowledge transfer and joint R&D activities;
- the number of SMEs joining the platform is continuously growing.

3. Empowering entrepreneurship for the students:



- Individual mentoring to support students' start-up enterprises:
 - awareness-raising programs;
 - innovation and entrepreneurship workshops organized by the Universities ELTE and BME;
 - legal/IPR support and involvement of coaches/business mentors.
- A network of early stage investors and venture funds to be formed.
- Some examples of successful start-ups from the Universities ELTE and BME:
 - Tresorit received a HUF 380 million investment from Euroventures IV venture capital investment fund and nine private investors – Tresorit develops a cloud based, secure file synchronising software, specifically designed to share the business users' confidential data;
 - The Turtle Games team won the third prize at the Imagine Cup, Sydney, Australia.



The EIT ICT Labs Budapest Associate Partner Group

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