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Resilience is Reshaping Academia:
Some EU Perspectives

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Munster Technological University

FOUNDATION Partner: P1 Munster Technological University

Online Webinar 21st May 2021

MTU
Ollscoil Teicneolaíochta na Mumhan
Munster Technological University

Oldham Council

UNIVERSITY OF OULU
KERTTU SAALASTI INSTITUTE

LIC>
LITHUANIAN INNOVATION CENTRE

RARR
RZESZOWSKA AGENCJA
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PBN
Pannon Business Network

Reggio Emilia
città delle persone
COMUNE DI
REGGIO NELL'EMILIA

CEEIC

business upper austria

Foundation Objectives
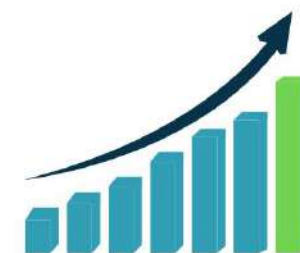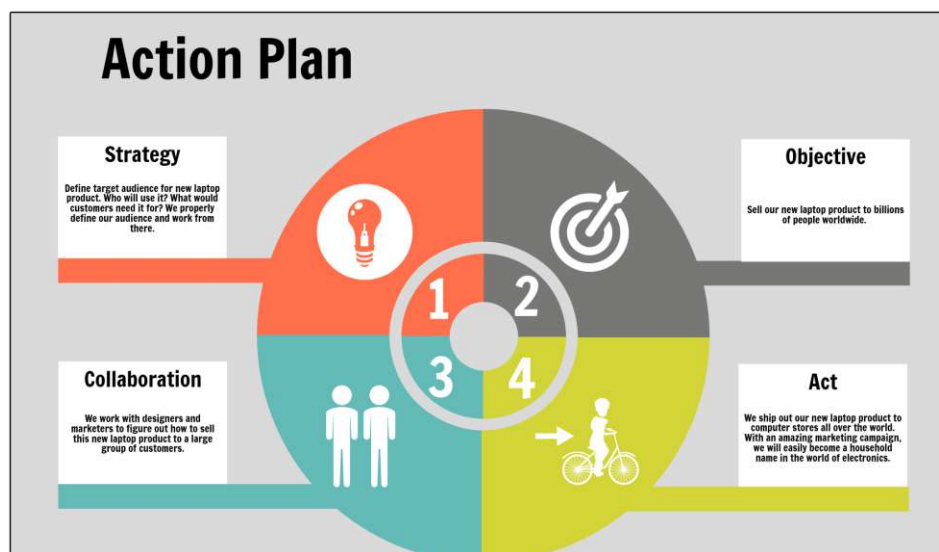
More than a year has passed since the World Health Organization declared Covid-19 a pandemic.

- Hundreds of millions of people have lived through lockdowns.
- Many have made the abrupt shift to working from home; millions have lost jobs.
- The future looks uncertain. We don't know when, or if, our societies might return to normal – or what kind of scars the pandemic will leave.

Resilience is Reshaping Academia

As the COVID-19 pandemic unfolded this year, necessitating a range of unprecedented social isolation and safety measures, barely any aspect of daily life was left unaffected.

One area which has certainly seen considerable changes as a result of COVID-19 is the education sector. When schools and universities around the world were forced to close their doors to prevent its spread, alternative methods and technologies had to be adopted almost overnight.

Academic Reaction Pre primary to Secondary

http://www.cit.ie

- 1.5 billion students from pre primary to secondary affected by closures (Unicef, 2020)

- 90% of ministries of education enacted some form of policy to provide digital and remote learning

Online Learning

TV Focused Learning

Radio Based Learning

Pre-pandemic- digital learning considered a bonus/exception, offering for part-time or foreign students. Education was relatively slow to adopt digital technologies.

So how did it react:

- Courses and content was delivered online using a wide range of platforms
- New protocols, methods of monitoring and forms of examination needed to be adopted
- Teaching staff internationally were forced – often with little warning – to familiarise themselves with the range of online platforms

Is traditional style of in-person education is gone for good?

Advantages of Digital Learning:

- Digital learning encourages students to learn independently at their own pace.

- There is the opportunity to make higher education available to previously-untapped demographics using digital technology. This means that universities could have a broader pool of prospective students to draw from in the future.

- The pandemic has led to a lot of new innovation and adaptation in education in terms of making it more suitable for the evolving needs of the modern world.

- Post-pandemic a hybrid model may be most attractive for educational institutions and students alike.

Disadvantages of Digital Learning:

- At least 463 million students (31%) worldwide cut off from education for over a year

- Students face obstacles in interacting / learning from one another's contributions
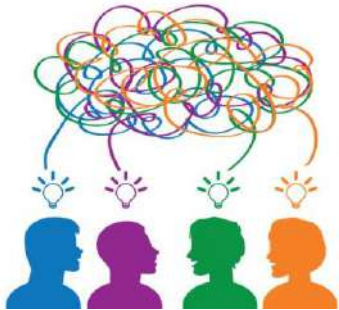
- Ability of digital education to meet the needs of learners who require additional support is also under question.

- For educational institutions that generate income – for example, from student accommodation – this has resulted in a financial loss. It has also had a knock on impact on jobs connected to campus services e.g. food service, retail, financial services etc. many of which have been closed due to the lack of students attending on campus

- Huge Changes to the student experience

Expectation   **vs**   **Reality**

Social Integration

Social Isolation

Positive Mental Health Development

Mental Health Issues

New Experiences and Marking life achievements

Lack of in-person recognition of achievements

Remote Working

For staff within academia

- Unknown, lasting change with opportunity to reimagine everything about how we do our jobs and run our institutes.

- Orthodoxy about 9 to 5
- Office-centric work
- Ineffective meetings
- Unnecessary Bureaucracy
- Time Vampires

- Retain best parts of office culture
- Opportunity for leaders to move better and faster
- New work/life balance
- Increased flexibility
- New life choices

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- Reduced commute time

- Development of hybrid model to balance efficiencies of remote working with benefit of social interaction and innovation generated by working with others

Economic Challenges of Remote Working

- Threat to low paid industries at risk of disappearing
        e.g. Retail and personal care industries

- Many industries depend on daily commuters and office workers
        e.g. transportation, food service, cleaning and maintenance,

We need to shore up the social safety net and invest in ways to further skills and increase access to education and training for our most vulnerable workers.

- Covid-19 has continued to highlighted the importance of education

- The work of scientists and academics in the field of medicine has serious relevance for all people

Although COVID-19 has thoroughly changed education, the relationship is not entirely one-sided. Ironically, the solution to the current situation lies in the very institutions that have been so transformed by its impact:

- Only the products of education can protect and equip the population to live safely and fully in the aftermath of the pandemic.
- Furthermore, we need to shore up the social safety net and invest in ways to further skills and increase access to education and training for our most vulnerable workers.

Looking forward to….

SAVERIO SERRI (ITALY)

Senior Innovation Manager - Reggiane Innovation Park, Municipality of Reggio Emilia

"Seeds of Resilience: Incubating Future Talents"

BENEDETTA MELLONI (ITALY)

Manager, International Research Strategy - Fondazione Reggio Children

"The right to a quality education for resilience, research and innovation"

VALERIA REGGI (ITALY)

ITS MAKER Marketing Communications, International Relations

Good Practice: "The ITS MAKER Foundation, an educational institution for resilience to change addressed to competency systems in manufacturing businesses"

COLUM GIBSON (IRELAND)

Clean Technology Centre - Munster Technological University

Good Practice: "Development and application of an app for tracking resource use within a local authority "

DAWN DUGGEN (UNITED KINGDOM)

Head of People, Skills & Talent - Manchester Growth Company
Good Practice: "Leadership Resilience"

PEKKA TERVONEN (FINLAND)

Research Director and Adjunct Professor - University of Oulu
Good Practice: "Oulu Innovation Alliance"

ADOMAS JELINSKAS (LITHUANIA)

Lithuanian Innovation Center

Good Practice: "The Path of CERN Technologies' Commercialization in Lithuania"

MACIEJ CHRZANOWSKI (POLAND)

Lecturer of Rzeszow University of Technology

Good Practice: "New quality - Integrated development program of the Rzeszów University of Technology "

MÁTYÁS ANDÓ (HUNGARY)

Associate Professor and Leader of the Computer Sciences MSc - ELTE-Eötvös Loránd University, Faculty of Informatics

Good Practice: "New higher education programs extended with dual education systems"

JOAQUÍN ROCA GONZÁLEZ (SPAIN)

Coordinator of Biomedical Engineering Studies - Polytechnic University of Cartagena (UPCT)

Good Practice: "ETSII – UPCT: 120 years of technology, innovation and service for citizens and enterprises"

MICHAEL AFFENZELLER (AUSTRIA)

Scientific Head of Softwarepark Hagenberg, Vice-Dean for R&D at the School of Informatics Hagenberg

Good Practice: "Softwarepark Hagenberg"

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Thanks

To all our presenters in advance and we hope you enjoy the webinar and made some valuable contacts.

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FOUNDATION Good Practice

Good Practice Owner: ITS MAKER Foundation – Reggio Emilia Headquarters
Presented by: Valeria Reggi, PhD - International Relations

FOUNDATION Partner: ITS MAKER Foundation

CORK INSTITUTE OF TECHNOLOGY
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LIC> LITHUANIAN INNOVATION CENTRE
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CEEIC
business upper austria

The ITS MAKER Foundation,
an educational institution for resilience to change
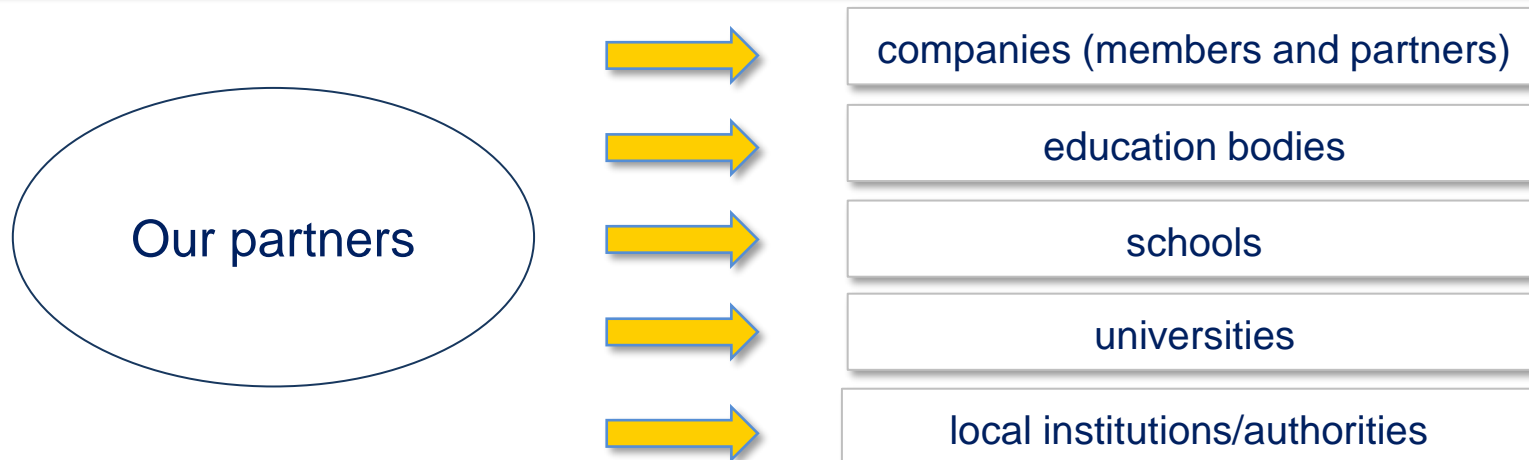addressed to competency systems in manufacturing businesses.

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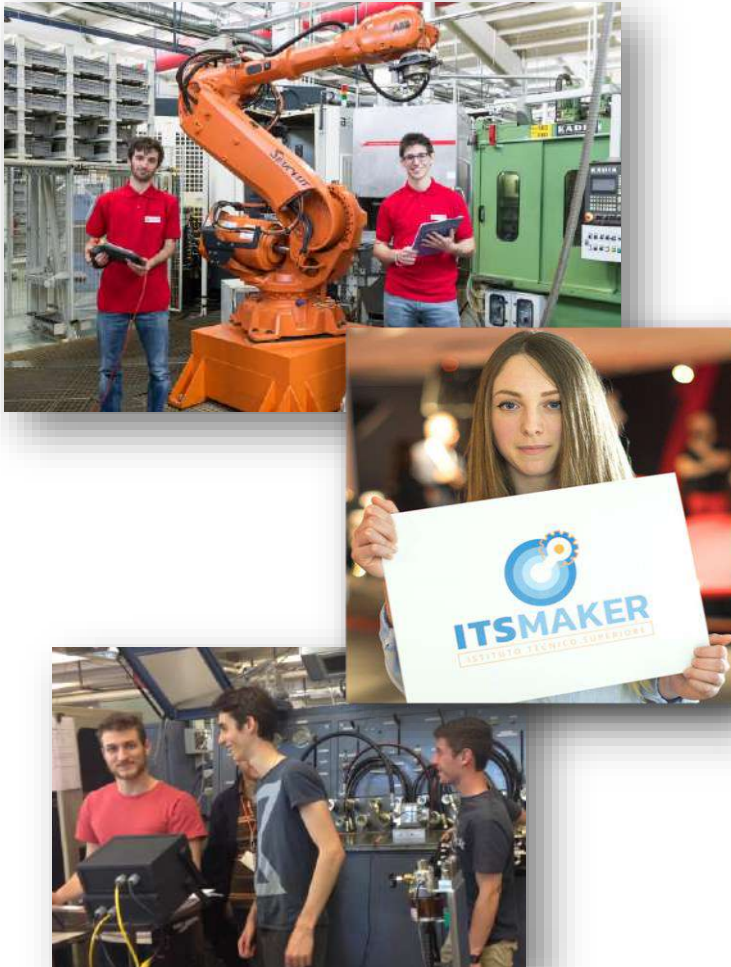
ITS MAKER: the Foundation in a nutshell

ITS are **technology schools** created by the Ministry of Education in 2008 for offering **highly professionalizing training courses** to **secondary-school graduates**.

- ► 2011: opening of the course of Mechatronics in Reggio Emilia;
- ► 2013: ITS Maker is established by merging the ITS Foundations of Bologna, Modena, Reggio Emilia;
- ► 2015 -2019: opening of Fornovo di Taro (Parma), Forlì and Rimini;
- ► 2018: opening of the course of Industrial Processes in Reggio Emilia;
- ► Autumn 2021: expected opening of the *Advanced technician for digital automation* course in Reggio Emilia.

Our partners

companies (members and partners)

education bodies

schools

universities

local institutions/authorities

ITS MAKER, the Academy of Advanced Mechanics in Emilia-Romagna

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- **Mechatronic systems**
- **Integrated management of industrial processes**
- *Advanced technician for digital automation*

- **Endothermic, hybrid and electric motors**
- **Mechnical design and materials**
- **International commercial management of products and services**

Fornovo T.

Reggio Emilia

Modena

Bologna

- **Composite Materials and 3D Printing**

- **Automation and mechatronic systems**

Forlì

Rimini

- **Digitalization of manufacturing companies**
- **Automation and packaging**

- **Management of technological innovation of industrial processes**

ITS MAKER
the Academy of Advanced Mechanics in Emilia-Romagna

ADVANCED TECHNICIAN FOR
COMPOSITE MATERIALS AND
3D PRINTING

FORNOVO DI TARO (PR)

ADVANCED TECHNICIAN FOR
INTEGRATED MANAGEMENT
OF INDUSTRIAL PROCESSES

REGGIO EMILIA

ADVANCED TECHNICIAN FOR
MECHATRONIC SYSTEMS

REGGIO EMILIA

ADVANCED TECHNICIAN FOR
INTERNATIONAL COMMERCIAL
MANAGEMENT OF PRODUCTS
AND SERVICES

MODENA

ADVANCED TECHNICIAN FOR
MECHANICAL DESIGN AND
MATERIALS

MODENA

ADVANCED TECHNICIAN FOR
ENDOTHERMIC, HYBRID AND
ELECTRIC MOTORS

MODENA

ADVANCED TECHNICIAN FOR
AUTOMATION AND
PACKAGING

BOLOGNA

ADVANCED TECHNICIAN FOR
THE DIGITALIZATION OF
MANUFACTURING COMPANIES

BOLOGNA

ADVANCED TECHNICIAN FOR
THE MANAGEMENT OF THE
TECHNOLOGICAL INNOVATION
OF INDUSTRIAL PROCESSES

FORLÌ

ADVANCED TECHNICIAN FOR
AUTOMATION AND
MECHATRONIC SYSTEMS

RIMINI

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ITS MAKER: Reggio Emilia

Professional Profile: Mechatronic Systems Technician

Design, industrialization, programming, production and quality management for product manufacturing in the mechanical, mechatronic, automation and robot sector.

Areas of mechatronics, automation, hydraulic, mechanics and electronics.

Professional Profile: Industrial Processes Technician

• production process management, applying digital technologies of Industry 4.0 and continuous improvement (lean production) to integrate internal production lines with materials from suppliers;

• operational processes of production, handling, storage and distribution of materials;

• management of information flow to/from the supply chain.

And one more to come…

Education and resilience

The challenges for the Reggio Emilia area:
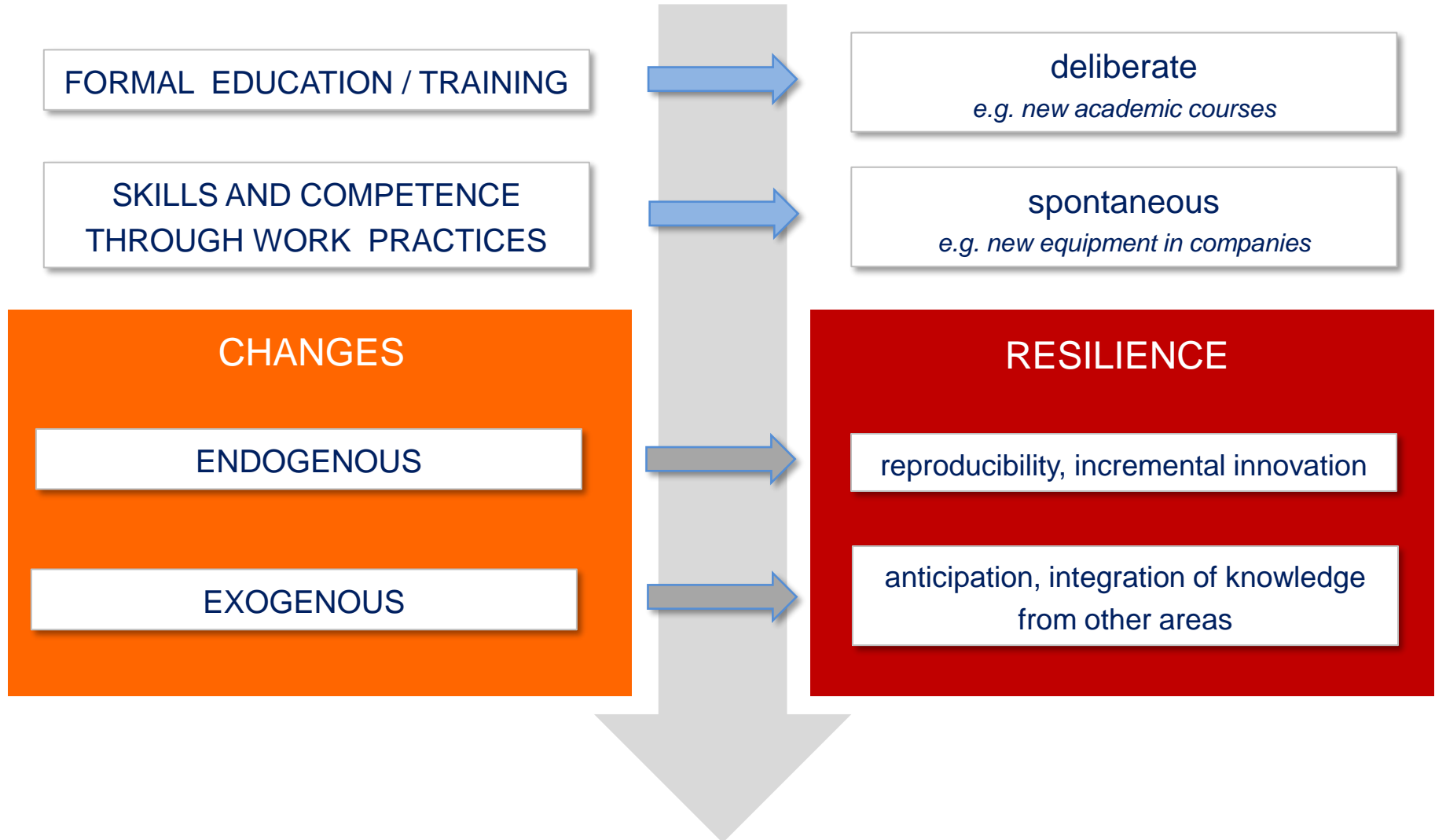
► Digital transformation;

► Environmental challenges;

► Production globalization;

► Technological evolution;

► Covid-19 pandemic;

► Population decline/lack of young competencies.

need of the local competency system to improve resilience

The resilience of local competency systems

LOCAL COMPETENCY SYSTEMS

| FORMAL EDUCATION / TRAINING | → | deliberate
e.g. new academic courses |
| SKILLS AND COMPETENCE THROUGH WORK PRACTICES | → | spontaneous
e.g. new equipment in companies |

CHANGES

- ENDOGENOUS
- EXOGENOUS

RESILIENCE

- reproducibility, incremental innovation
- anticipation, integration of knowledge from other areas

increase of awareness and knowledge of technical culture

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Co-designing competency systems

To meet societal and economic challenges, ITS Maker cooperates with educational institutions and companies to co-design courses and training. This process involves

► contribution from the **Executive Board, local councils and Technical Scientific Committee** of the Foundation;

► collecting **emerging needs from partner companies** on a regular basis;

► **co-designing** professional profiles;

► **sharing educational responsibilities** with partner companies (on-site teaching, company case studies, guided visits);

► **co-designing tailor-made internships** for individual students (skills and talents are matched with specific professional profiles that companies request);

► final **shared evaluation of results** based on how the professional profile fits the job market.

=

intensive collaboration with partner companies

&

educational offer that matches the needs of local enterprises

Competency system networking

To foster the evolution of local competency systems in response to challenges and changes, ITS Maker focuses on networking in terms of:

► **developing curricula in cooperation with the schools, universities and educational institutions** that are members of ITS Maker's Technical Scientific Committee;

► **sharing teaching, laboratories and premises**;

► participating in **regional and national networks** operating in the same/similar areas (e.g. ITS Mechatronics National Network);

► **Erasmus+** exchanges and staff mobility;

► **collaborating with governmental institutions and local associations** to define educational policies (e.g. ITS Regional Association).

=

network of education networks

Facts and figures

Implementation costs:

► approximate **cost of a two-year course**: **€ 300,000** – including teaching, services, staff, laboratories, advertising, internship and placement, etc.;

► **cost per student**: **€ 12,000** (public national and regional funding, obtained only upon successful completion of the course);

► **cost per hour: € 150**;

► expense covered by **each company**: **€ 0** (possible occasional contribution to teaching activities or other: **< 5,000 €/year**)

► student **fees**: approx. **€ 250** (enrolment and exam fees).

Challenges and issues of implementation:

► **variety of educational culture**;

► **precariousness of funding** and consequent difficulties in long-term planning;

► **lack of dedicated headquarters** (compensated by sharing the premises of other schools);

► the mechatronic sector involves a **wide range of core businesses**; pros: variety and cross-collaboration – cons: **course designing is complex**.)

ITS Maker's competency system: a success story

Reasons for the success of ITS Maker's competency system:

► mechatronics is a strong sector in the area and its **wide range of core-businesses** fosters **cross-collaboration**;

► the system acts on a **specific geographic area** on the grounds of its characteristics.

Evidence of success:

► **very high level of employment (95%)**;

► **professional growth** of ex-students within the companies;

► internships may be involved in **process/product innovation**.

Good practice means that results are transferrable.
Potential for learning or transfer:

► **synergy** among different subjects involved in education;

► regular **analysis modelling of educational needs**;

► **learning-by-doing** practice;

► extensive, tailor-made **internships** in local companies.

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Thank you.

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**Valeria
Reggi**, International
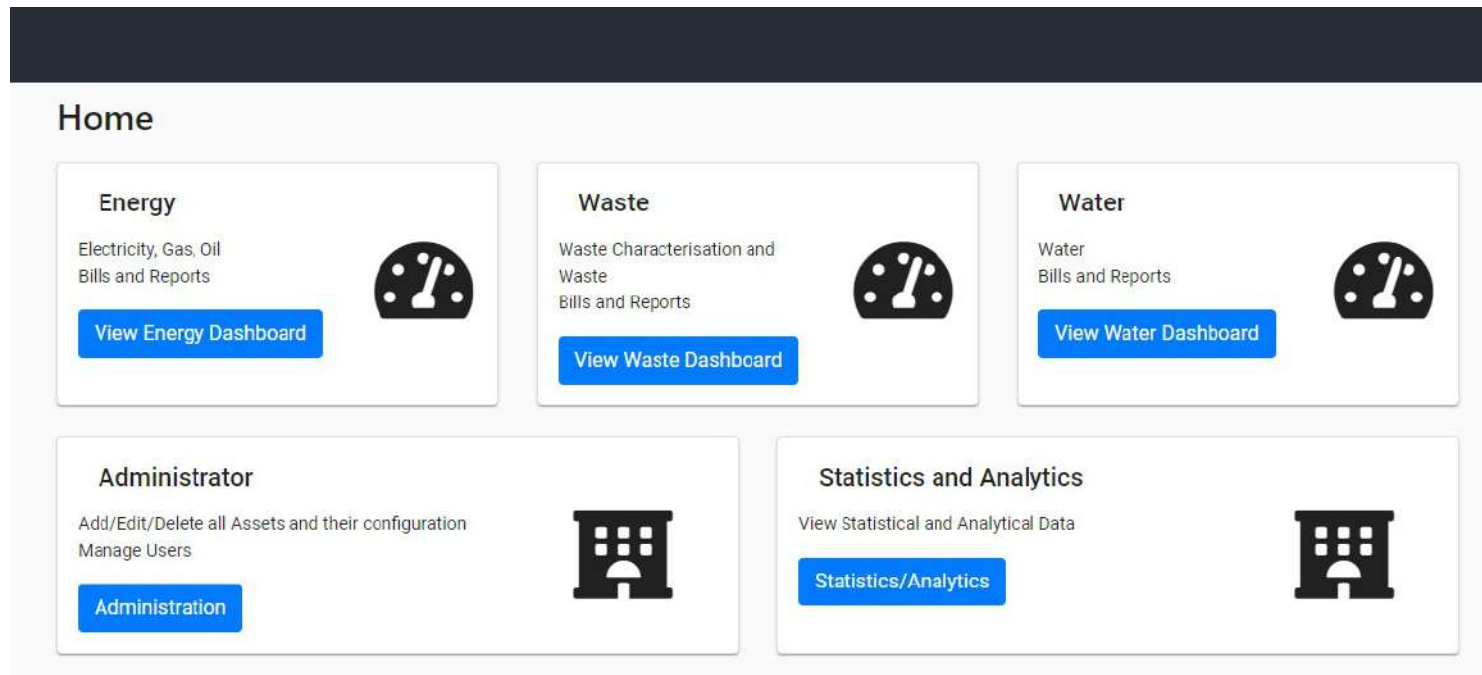Relations

Development of an App for Tracking Resource Use

Developing an app to track energy, waste and water for all local authority buildings and using this to track, benchmark and target improvement areas in the different buildings.

App for Tracking Resource Use

Problem Addressed:

- Local authorities, government departments and national agencies manage a large number of buildings
- The environmental impact associated with these is significant and, as leaders, these institutional actors are expected to lead by example
- As with any resource related initiative: to manage it, you must measure it
- However, across the different buildings there can be different service providers involved in the provision of energy and waste services
- The bills for these typically go to the individual buildings or regional head office.
- Consequently, gathering environmental resource related data for prevention and minimisation purposes is challenging and time consuming.

Action:

Through the development of an online app that collates all the relevant resource data Cork County Council have streamlined the measurement process. Through added functionality, benchmarking of performance as well as targeting of improvement areas has been included.

Stakeholders: Cork County Council, NIMBUS (MTU), the Clean Technology Centre (MTU), the Environmental Protection Agency

App for Tracking Resource Use

How Objectives are reached:

- The app was initially developed to take energy related data directly from service providers, link it to the appropriate site and allow easy access to all energy related information across the council and for individual sites.

- This has been very successful and has allowed the different sites to be compared and high users targeted.

- At the same time, a separate project on waste and water was running in the Council with the aim of doing the same thing – an online monitoring and tracking system

- Once this was realised the app was expanded to include waste and water data

- This was facilitated by the fact that Nimbus and CTC are both part of MTU and had worked together previously

App for Tracking Resource Use

Challenges:

- Once the app was developed the electricity and gas data gathering was relatively straight forward – one main contracted supplier

- Other energy data (e.g. oil) was more challenging as there were different suppliers

- For waste and water initially identified 4 largest sites
    - Waste: different waste contractors and billing systems
    - Water: Bills from one supplier (Irish Water) but these are sporadic

- Some sites have dedicated facilities management staff, others don't – who has the data on bills etc.?

- Baseline data gathering was time consuming - but important information once finally gathered

- To supplement these, on-site waste and water survey were conducted to provide a deeper understanding of the reasons for the use of water and the generation of wastes.

- This has allowed specific waste streams to be targeted as well as high water using devices to be identified for retro fit. All of these actions are contributing to the local authority addressing its commitments to the UN SDGs

App for Tracking Resource Use

38,000 Cups Annually

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Regional Enterprise Plans (REPs)

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Resources Needed:

- Concept Development and Preliminary Software - €25k
- Software Development and Interface Trial - €30k
- Expansion of App to include waste and water - €10k
- Additional Costs (time, conducting surveys and production of annual reports) - €10k+ (estimate, includes internal County Council time and external assistance)

Evidence of Success:

Concrete outcomes include:

This project is very much in its infancy but the project team have applied for funding to test drive it with a number of other national actors including:

- Other local authorities
- Government departments
- National agencies

The level of interest in participating reflects the appetite for a single system that can gather, track and monitor resource use across multiple buildings.

Timeline:

2019	2020	2021
App Development	Waste & Water	Action Plan

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Potential for Learning or Transfer:

- With the reporting requirements that will come as we near 2030 there will be an increased need to report in a consistent manner at all levels of society.

- The institutional bodies involved in supporting government (both local and national) will need to lead by example. This is reflected in the Irish Governments requirement for departments to develop Resource Efficiency Action Plans (REAPs)

- For time efficiency and consistency of reporting, using a consistent and well researched app based system such as this will allow those using it to track and report on progress in an easy and transparent manner.

- This is reflected by the interest of a number of different institutional actors in the 4th phase of its development (2021).

Challenges Encountered:

Institutional: convincing management in the local authority of the need for this central system was initially challenging. However, with increased demand for resource reporting across multiple buildings its potential was quickly realised.

Technical: while the development of the app was relatively straightforward, linking in with different service providers systems and getting all buildings up on the system required a lot of internal work within the local authority.

Practical: for the waste and water, where bills from different providers so to different locations there was a lot of following up and tracking of information. This took significant time to achieve

Further Information:

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Thank you!

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FOUNDATION Good Practice

Good Practice Owner: Oulu Innovation Alliance
Presented by: Pekka Tervonen

FOUNDATION Partner: P3 University of Oulu

WS 10 May 2021

Evolution of Oulu Innovation Alliance
Examples
Results and effectiveness
Lessons learned

Tar trade brought Oulu to world

Nokia brought again Oulu to world

Oulu Innovation Alliance will bring Oulu to world in future

Oulu Innovation Alliance

In recent years, an efficient and tight-knit cooperation network of innovative operators has been built in Oulu. The main purpose of the Oulu Innovation Alliance (OIA) is to continue the long tradition of cooperation involving education, research, business and trade, and the public sector.
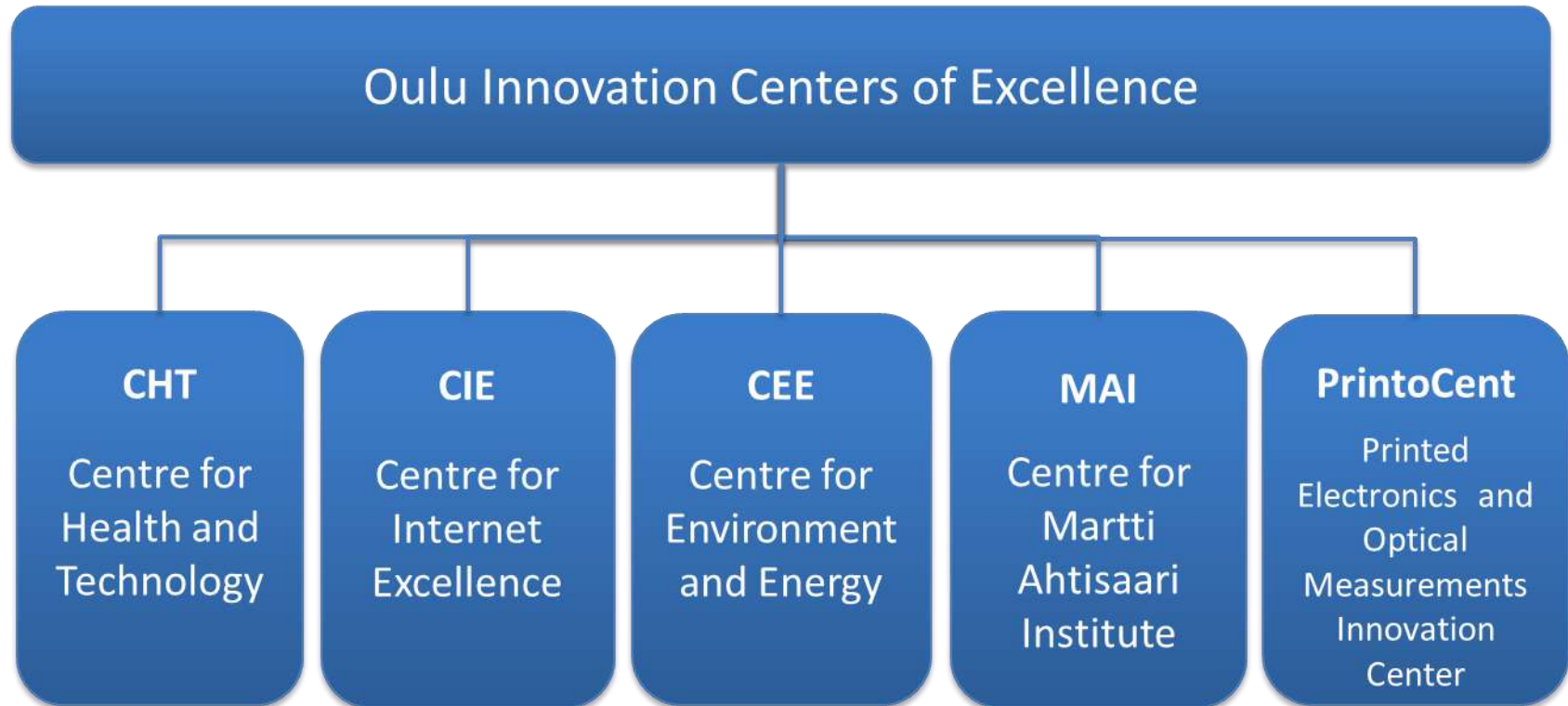
www.ouluinnovationalliance.fi

Citizens
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ATTRACTIVE NORTHERN CITY
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OULU HEALTH
Small companies
Micro-enterprises
Customers
Start-ups
Researchers
ICT AND DIGITALIZATION
COMMERCIALIZATION
Customers
Public sector
Students
SME-companies

" Cooperation in research is instrumental in creating new business operations. The OIA is an expert in quickly connecting sector-specific business expertise and the latest research. The OIA clusters allow each operator to concentrate on what it does best, without having to spend time searching for the right partners amongst endless alternatives. "

Jouko Niinimäki
Rector
University of Oulu

Background of Oulu Innovation Alliance

❑ Oulu has a long tradition in co-operation between education and research institutes, companies and public sector.

❑ Oulu's high-tech image was built on this co-operation in 1980´s.

❑ As a collaborative continuation, the city of Oulu established a taskforce to work on suggestions for the renewal of Oulu's innovation environment in 2007.

❑ As a result of the Oulu Triple Helix report, a strategic innovation alliance agreement was undersigned in February 2009.

❑ The Oulu Innovation Alliance was formed between the City of Oulu, University of Oulu, Oulu University of Applied Sciences, VTT Technical Research Centre of Finland and Technopolis limited company.

❑ The ultimate strategic focus and target of the Oulu Innovation Alliance agreement was to keep Oulu as an internationally acknowledged center for innovation.

OIA contract period one 2009-2015

Oulu Innovation Centers of Excellence

CHT	CIE	CEE	MAI	PrintoCent
Centre for Health and Technology	Centre for Internet Excellence	Centre for Environment and Energy	Centre for Martti Ahtisaari Institute	Printed Electronics and Optical Measurements Innovation Center

- ☐ **CEE was established 2012**
- ☐ **MEI – Centre for Metal and Engineering Industries was established 2014**
- ☐ **MEI integrated into CEE 2015**
- ☐ **CEE was integrated into Smarter and Greener Industry Ecosystem 2016**

Centre for Environment and Energy

MISSION:
The mission of CEE is branding Oulu with eco-innovations and green economy. By the year 2017, Oulu is a recognized research and business expert in the field of green economy.
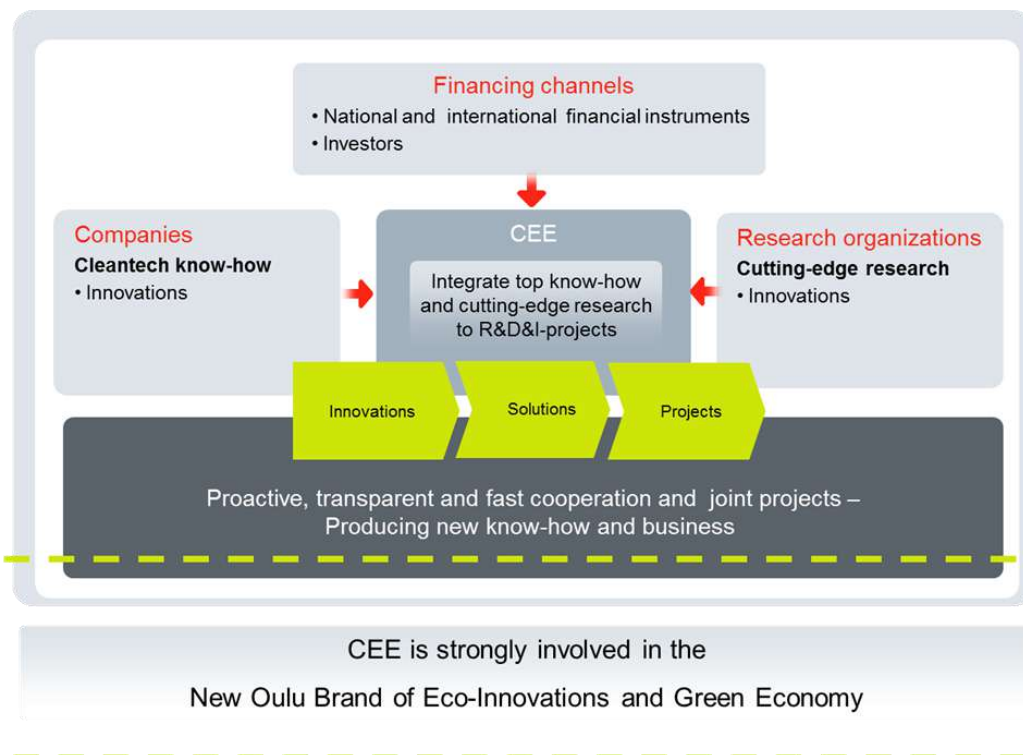
VISION:
The vision of CEE is to be the most wanted partner in eco-innovation solutions. By the year 2017, CEE is a recognized research and business expert in the field of green economy.

Results and effectiveness 2012-2015

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Wild green visions

The value of the RDI projects coordinated by the CEE in the past three years is around EUR 8 million. This portfolio of projects has provided employment for more than 150 people locally and generated more than EUR 1.6 million tax revenue in the area. The CEE is also actively involved in direct business projects, valued over 1 million euro, and the OIA contracting parties' strategic projects. CEE has also contributed to the creation of new spin-off companies. By the year 2015, 8 companies have been established. The total turnover of those companies is around EUR 2 million and they employ more than 20 people.

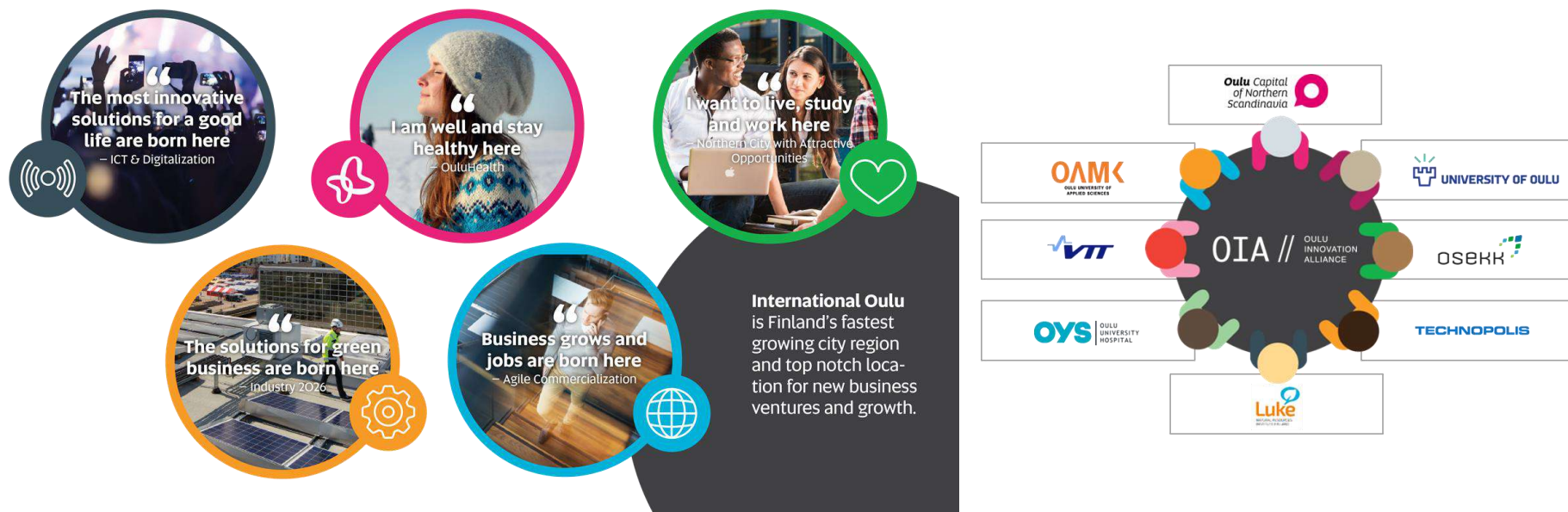CEE projects are crossing geographical and scientific boundaries.

Our focus is on the bio-economy, utilization of by-products and waste, energy efficiency and carbon neutrality.

Our projects, aiming to make our society greener, are built around these themes. For example, we deal with the exploitation of the Arctic potential, we improve the value networks of by-products, we create entirely new products from waste, we investigate the potential of solar energy in the North and we study locally produced smart food and its business potential.

We create prosperity and can-do spirit through innovation!

LUMIPOWER

nbtec

oulu water alliance Ltd.

macon   Aldapro   SAPOTECH   LUXMET   SFTec Service & Foundry Technologies

OIA contract period two 2016-2020

Main goals:

- High quality research and ideas in addition to potential new products and services must be commercialized, meaning that they are marketed, sold and capitalized in a way that they will reach Finnish and global customers

- Innovation should lead to the birth and growth of new businesses and services, whether they are start-ups, new endeavors of existing SME's or opportunities created by big, leading companies

- Customers and residents should be substantially more active as proponents in the OIA-network as testers, product and service developers and makers.

Industry 2026

INDUSTRY 2026

Coordinating Northern Innovation

Industry 2026 – A part of Oulu Innovation Alliance

In recent years Oulu has grown a tight and effective network for innovative cooperation. The main purpose of Oulu Innovation Alliance (OIA) is to continue the tradition of cooperation between education, research, business and the public sector in Oulu. In its new operating period Oulu Innovation Alliance will be realized as innovation ecosystems. One of them is Industry 2026.

Mission

The international Oulu is the fastest growing urban area in Finland, and a leading location for business growth and new endeavors.

Open Innovation Ecosystem

The ecosystems research, innovate, experiment, market and create services and products in cooperation with various different partners. Industry 2026 acts as a network of businesses, researchers, public organisations, clients and residents.

Organizations that show interest and commitment to the Industry 2026 ecosystem are free to apply to join.

Contact

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ICT and digitalization in a resource efficient circular economy

The fields of focus in the ecosystem are a *strong value chain in metal and machinery industries, high value creating bioeconomy products and resource efficiency in environment and energy.*

The strategic goals of these fields of focus are to connect high class research and expertise transparently in Oulu, and also nationally and internationally through cooperation networks. This cooperation and joint projects will bring new eco-innovative expertise and business to global markets.

Withdrawals from years 2016-2020

FOSTERING RESEARCH-BASED INNOVATION CULTURE – INNOVATION REVOLUTION
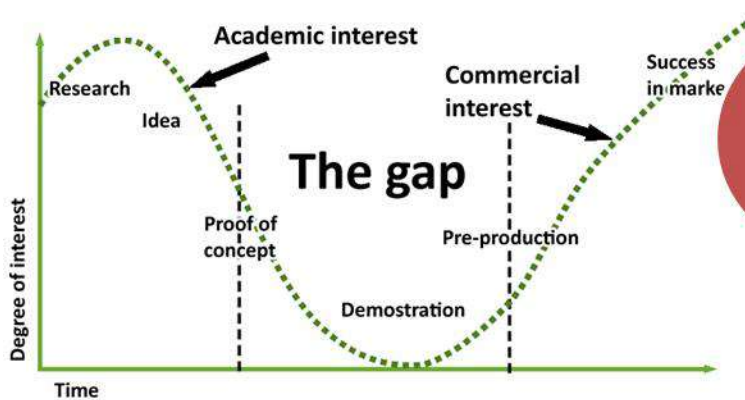
FOSTER A CULTURE OF INNOVATION AND CURIOSITY
REVISE, IMPLEMENT AND IMPROVE INNOVATION POLICIES
ESTABLISH AGILE AND RESPONSIVE BUSINESS STRUCTURES AND PROCESSES
ENSURE FIT-FOR-PURPOSE OVERSIGHT, GUIDANCE AND METRICS OF
INNOVATIVE STRUCTURES AND PROCESSES
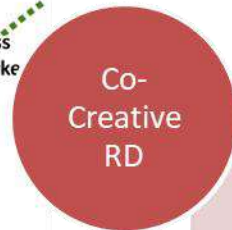
Co-Creative RD

CO-CREATIVE RD:
Building bridge between researchers and companies
- Identifing important research and business problems
- active interaction key client companies

Innovation capacity building

NEW INNOVATION MODELS
-Lean co-operation model for cluster formation
-Co-creating & accelerating research to business
-Access to international innovation hubs and partnerships
- New education needs for EU funding application and building innovation leaders

CO-CREATIVE INNOVATION MODEL
-Iteration of ideas
-Innovation competitions
-match-making
-From Lab-to business
-From Lab to service
- Strong support to Spin off actions
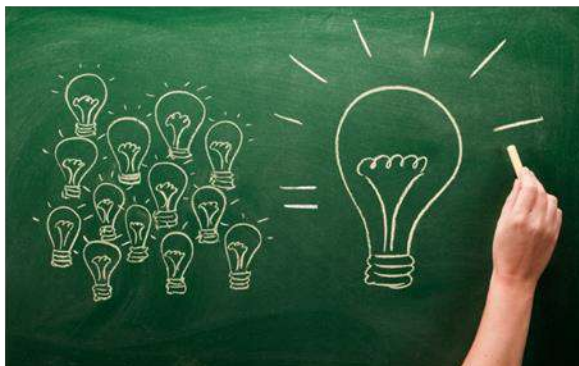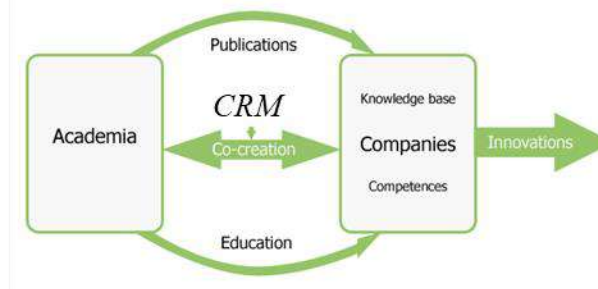
Good service is good business – Siebel Ad

Project example

Printed Applications in Solid-State Batteries (PASS) project in short

- PASS is a **research, development and promotion** project funded by
  - European Regional Development Fund
  - Council of Oulu Region
  - City of Oulu
  - PrintoCent

Duration:
1.8.2020 – 31.7.2022

Budget:
811 268 €

- Project's main objective is the production of a battery cell **prototype** with a solid electrolyte and the manufacturing of cell with printing technology

- In addition, the project supports **business development** in the area; What is needed to start manufacturing these batteries of the future in Oulu?

Coordinated by: **UNIVERSITY OF OULU**   Partners: **VTT**   **OAMK** OULU UNIVERSITY OF APPLIED SCIENCES

Programme for Sustainable Growth and Jobs

Leverage from
the EU
2014–2020

European Union
European Regional
Development Fund

2   Printed Solid-State Li-ion Batteries for the Future   21.4.2021

13

OIA contract period three 2021-2027

OIA vision 2027:

Europe's best ecosystem in adding value through digitalization

OIA main goals

- Business clusters create new businesses and growth for companies
- Spearheads combine, develop, and renew the know-how of clusters
- Region's attractiveness for new investments has been increased
- Research, development, and innovation funding has been increased
- Commitment of actors is strong on a practical level and network is compelling and agile for promising new ideas

OIA strategic target areas

EUROPE'S BEST ECOSYSTEM TO PRODUCE GLOBAL ADDED VALUE WITH DIGITALISATION

GOALS

The goal of operators in Oulu is to jointly solve global ecological, economical and social sustainability challenges through Europe's best ecosystem for producing global added value with digitalisation.

Digitalisation in the changing urban environment

OuluHealth ecosystem

Sustainable circular economy and clean solutions

TARGET FIELDS

Startup entrepreneurship, expertise and continuous learning plus the entity and support of business ecosystem

Smart City Oulu: the city, services and investments as development platforms

https://www.oulu.fi/ksi/foundation_webinar

Future information networks

Development platform for autonomous vehicles and devices

Data analytics

Data and solutions as a social resource and part of proactive and supportive health care

Better services for citizens through virtual service production

Development of innovation and testing facilities for social and health care service providers
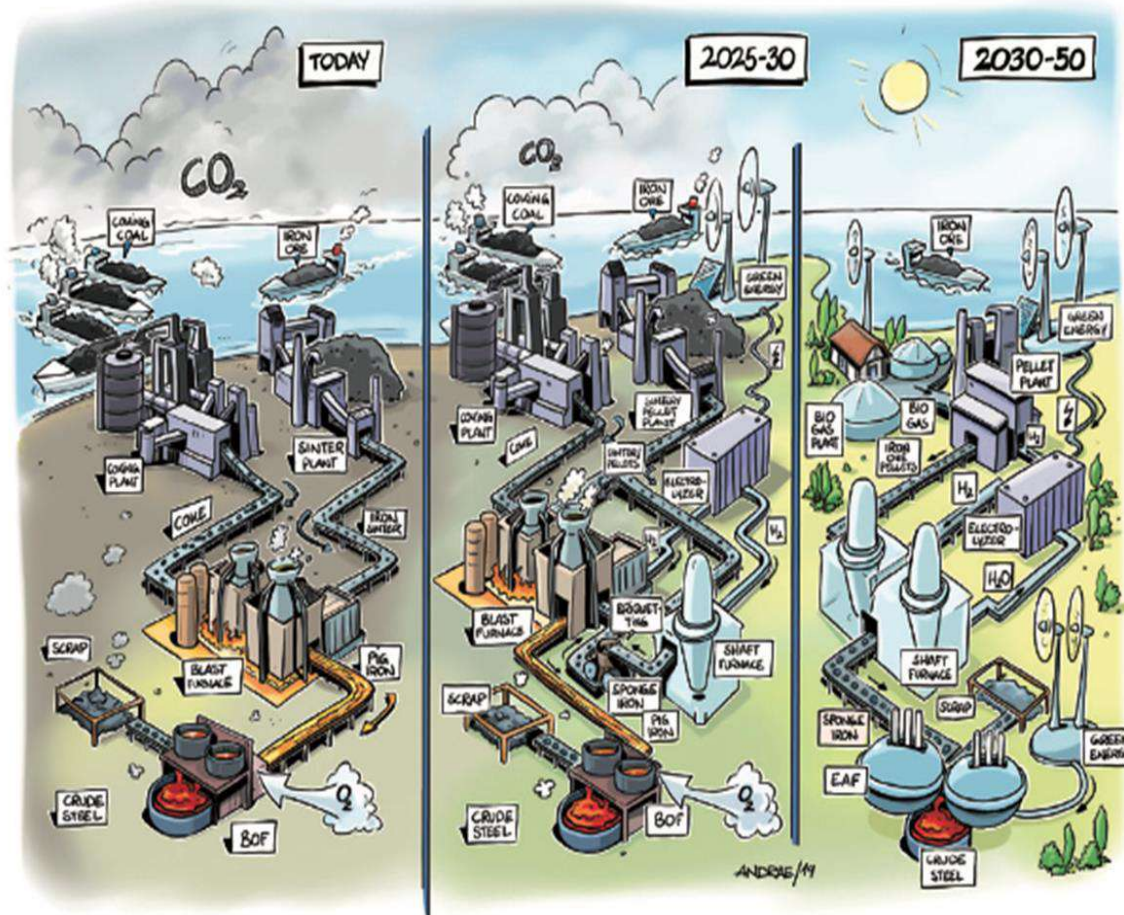
Kontinkangas Wellness Campus

Next-generation energy products and services

New solutions for inorganic side flows

Environment-friendly steel and related value chains

Development and commercialisation of water know-how

SPEARHEAD PROGRAMMES

OULU

OSAO

OAMK

OULUN YLIOPISTO

Luke

VTT

TECHNOPOLIS

PPSHP

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European Union
European Regional
Development Fund

Spearhead program:
Environmental friendly steel and related chains

On year 2035, the Finnish metals industry intends to reduce greenhouse gas emissions by nearly 70 % from the level of 2008. In addition, it is estimated that the use of ultrahigh-strength steels in vehicles will decrease greenhouse gas emissions by at least the same amount.

So, even 20 % reduction in Finland's CO_2 emissions is possible, with enormous potential on a global scale.

Research and business ecosystem

Program-based ecosystem model

The other actors in ecosystem – public sector, organisations, citisens, students, and the other active stakeholders

OIA Strategic management group

Sources of funding

OIA Operative management group

Companies – Business expertise in the field
- Business clusters and networks

Spearhead program: Environmental friendly steel and related value chains
- Combining excellence into RDI projects

Research organisations – Industry-leading research
- Research communities and the other innovation communities

Needs → **Solutions** → **Projects**

Proactive, transparent, and agile cooperation and joint projects – generating new competence and business

Vision – *World-class program in renewing carbon neutral value chain*

Target and performance indicators

Targets	Performance indicators
Facilitation and operating spearhead program through contract partners	Activity of business interface - Service events, participated companies
Incubation, priorisation, facilitation, and grow of RDI project portfolio based on vision and strategy	Project activities - RDI project portfolio based on common strategic innovation agenda - Common projects - Facilitated projects in company interface
Incubation, priorisation, and facilitation of new value chains of spearhead program, and consolidation of activities	Activation and development of new value chains, and success stories - Efficiency and performance of the activities - Ecosystem cohesion: developing of innovation process and frame of reference through best practices
Priorisation and activity of communication by utilising operating model of OIA and communication of contract partners	Communication and events - Activity in chosen channels and target groups

World-class program in renewing value chain of carbon neutral steel
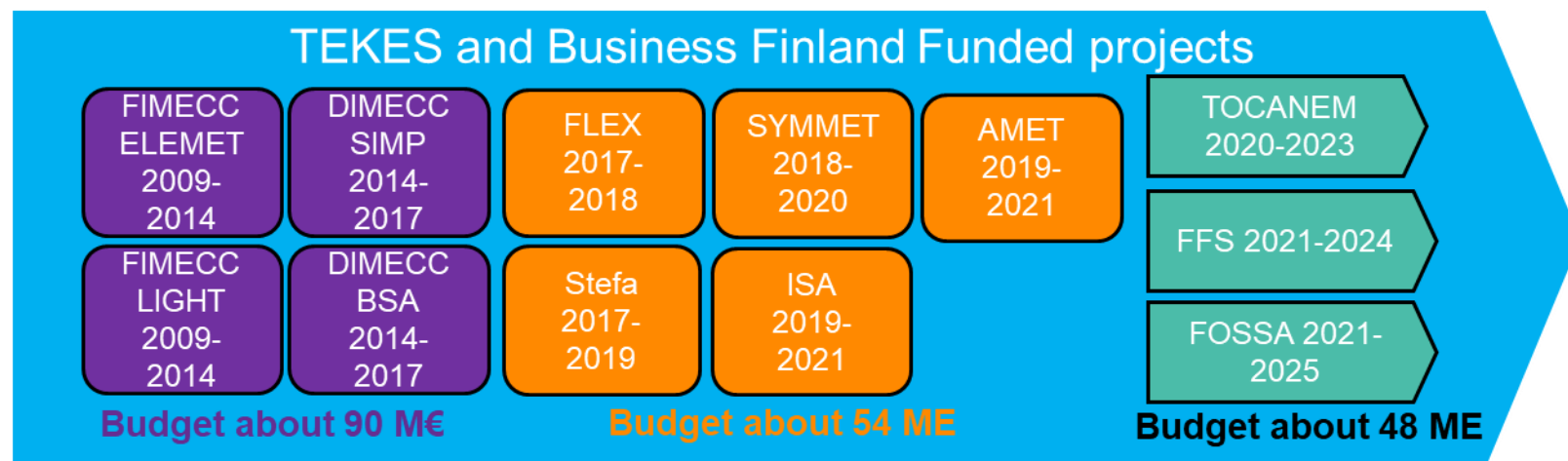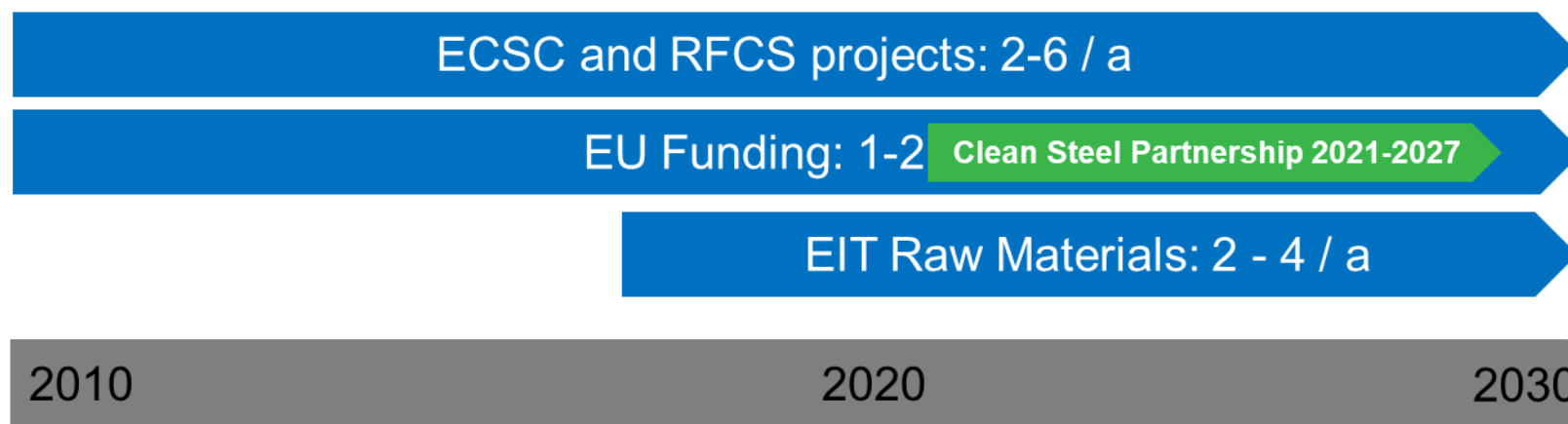
Lessons learned –
Citius, altius, fortius in Oulu innovation business

- Open innovation ecosystem

- Will and commitment of parties

- Innovation revolution and increasing the maturity of innovation culture

- Resource management

- High goals - World-Class & ecosystem cohesion – internal and external metrics

- Roles and responsibilities, efficient practices and policies

- A shared strategic RDI-project portfolio

- Taking commercialization into consideration as a part of RDI-activities

- Focus on today and tomorrow- yesterday is gone!

- Build a strong foundation – commitment and a common goal!

- Be ready for changes – do things differently!

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Thank you!

Pekka Tervonen
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Oulu (Industrial Engineering and
Management)
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The Role of the Academia in Economic Resilience

The Path of CERN Technologies' Commercialization in Lithuania

Good Practice Owner: Lithuanian Innovation Centre
Presented by: Project Consultant Adomas Jelinskas

FOUNDATION Partner: P4 Lithuanian Innovation Centre

WS 4 Online Webinar
19th May 2021

CORK INSTITUTE OF TECHNOLOGY · Oldham Council · UNIVERSITY OF OULU KERTTU SAALASTI INSTITUTE · LITHUANIAN INNOVATION CENTRE · RARR RZESZOWSKA AGENCJA ROZWOJU REGIONALNEGO · Pannon Business Network PBN · Reggio Emilia città delle persone · CEEIC · business upper austria

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Interreg Europe

The Path of CERN Technologies' Commercialization in Lithuania

(the European Organization for Nuclear Research – CERN – is the largest particle physics laboratory in the world.)

- WHAT - *Lithuanian Business Incubation Centre of CERN Technologies* was established and became part of the CERN BIC Network of 9 incubators.

- WHO – National and political initiative: President, the Ministry of Economy and Innovation, Lithuanian Innovation Centre, Scientific and business community.

- WHY - CERN Knowledge transfer initiative and Strong start-up ecosystem in LT.

LITHUANIAN BIC OF CERN TECHNOLOGIES

The Path of CERN Technologies' Commercialization in Lithuania

Problem Addressed:

Innovative, enabling and disruptive technologies developed by CERN, adaptive in economy and society: technology push from CERN.

Lithuanian start-up ecosystem rich in entrepreneurs, infrastructure, R&D services, business support, etc.

How Objectives are reached:

National Science, technology and innovation policy, supportive and open start-up ecosystem;

Demonstrated that CERN technologies are transferable to LT industry.

Attracted CERN BIC.

Business and R&D support network: Universities, Science and Technology parks, etc.

Stakeholders:

Lithuanian Innovation Centre, CERN, Sunrise Valley Science and Technology Park, Kauno Science and Technology Park, the Ministry of Economy and Innovation.

The Path of CERN Technologies' Commercialization in Lithuania

Resources Needed:

40 000 EUR per start-up;

3 people team and growing;

Maintaining strong and broad network of R&D and business support services.

Evidence of Success:

- First call resulted in 3 deep-tech start-ups working with CERN

VOLATILE ai

Paulai TECH

CYBER POD

Digital olfaction	
AR-based STEM EdTech App	
3D electronics printing	

Timeline:

2018 Lithuania becomes CERN Associated Memer State
2019 CERN incubator is established in Lithuania
2020 first call resulted in three deep-tech start-ups
2021 ongoing second call received many applications

The Path of CERN Technologies' Commercialization in Lithuania

Potential for Learning or Transfer:

Right times for deep-tech entrepreneurship;

Build it and they will come: suitable infrastructure, contact network and innovation policy attract entrepreneurs.

Challenges Encountered:

Ecosystem was there – show that it is receptive of CERN technologies;

Set-up new operational processes for the Incubator;

Communicating opportunities to entrepreneurs and scientists because strong association of CERN with fundamental science.

Further Information:

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Web: www.cern.lt/en

www.lic.lt/en

@FOUNDATION_EU

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Thank you!

Presented By

Adomas Jelinskas,
Project consultant at Lithuanian Innovation Centre

Mobile: +37065519090
Email: a.Jelinskas@lic.lt

FOUNDATION Good Practice

New Quality
Rzeszow University of Technology, POLAND

Good Practice Owner: Rzeszow University of Technology
FOUNDATION Partner: Rzeszow Regional Development Agency

RTU – short description

Number of students: 12k (11 259) - 2021

Number of scientific Staff: 878 - 2021
(55 full proffessors, 220 assistant professors)

Faculties:
- The Faculty of Chemistry
- The Faculty of Civil and Environmental Engineering and Architecture
- The Faculty of Electrical and Computer Engineering
- The Faculty of Management
- The Faculty of Mathematics and Applied Physics
- The Faculty of Mechanical Engineering and Aeronautics
- The Faculty of Mechanics and Technology

New Quality - indicators

Problem Addressed (goal of the project):

The main goal of the project is to improve the effectiveness of the Rzeszów University of Technology in its key areas, i.e. teaching and resource management, in line with the expectations of the socio-economic environment. The implementation of the main goal will be possible thanks to the planning of activities aimed at increasing the key competences among 2,136 students.

How Objectives are reached:

Free of charge specialized workshops for students and academic Staff, paid internships

Stakeholders: Rzeszow University of Technology, Podkaprpackie SME's, students, scientist (academic teachers), academic staff

New Quality - indicators

- **Number of university employees** who, thanks to the ESF support, increased their teaching competences: **53**

- **Number of students who raised their competences** as part of the university's activities: **2072**

- **Number of students who participated in internships**: **1003**

- **Percentage of university graduates who continued their education or took up employment** within 6 months of completing their education: **30 %**

New higher education programs extended with dual education systems

Objective:

- new BSc and MSc programs which support the Industries,

- extended to dual education system,

- strength the cooperation between
  engineers and software engineers (I4.0).

Problem Addressed:
- there was no higher education program in the technical filed in this region,
- average salary is low, but it is increasing,
- speed-it-up the automatization → need of higher knowledge employees.

New higher education programs extended with dual education systems

How Objectives are reached: <u>Cooperation</u> (Stakeholders)

City of Szombathely

ELTE – Eötvös Loránd University
Faculty of Informatics

Industrial partners

New higher education programs extended with dual education systems
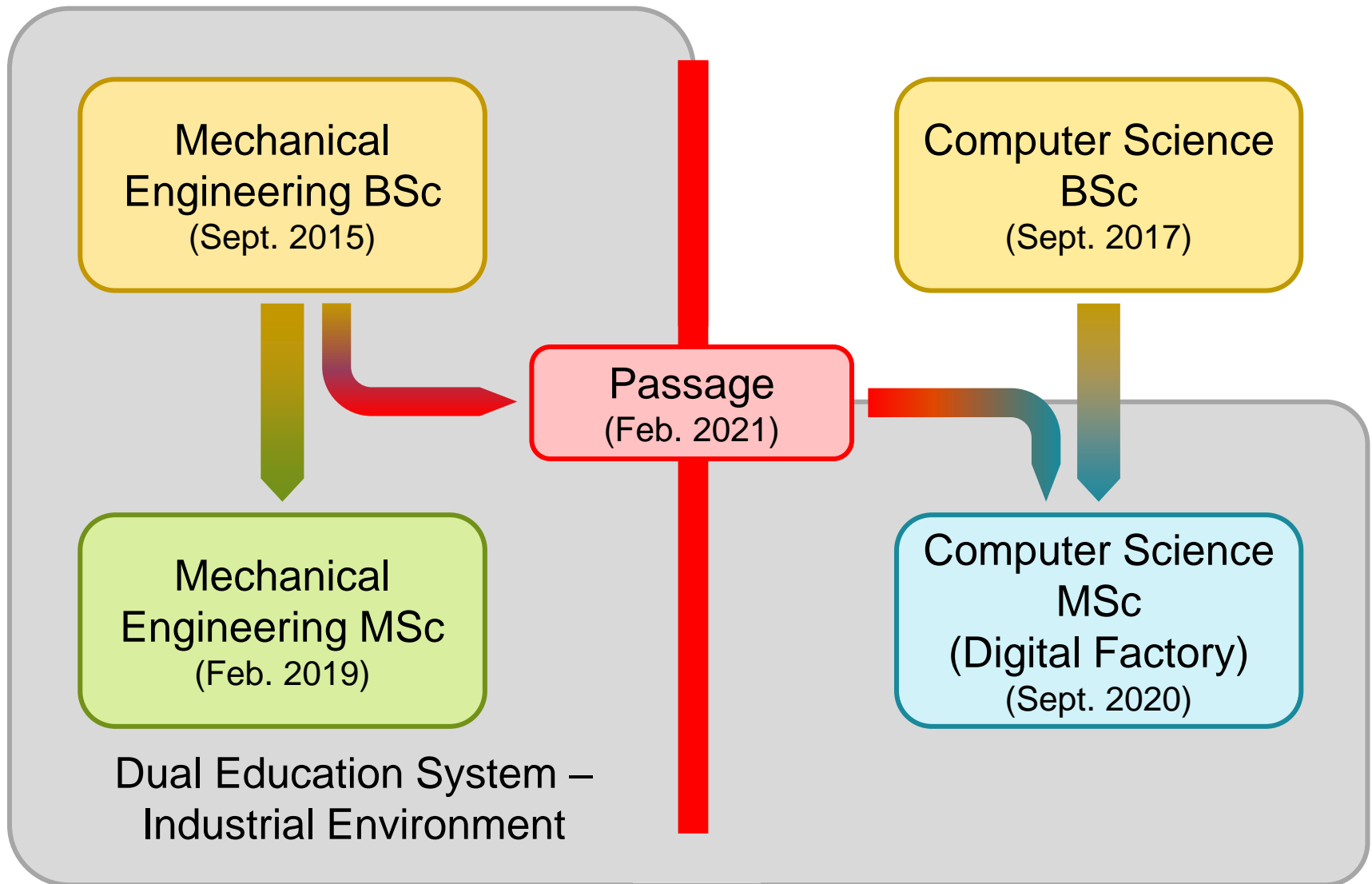
New higher education programs extended with dual education systems

Resources Needed:

- Building, laboratories, equipment related to the education fields – 3.000.000 EUR

- Continuous support from City od Szombathely – 360.000 EUR/Year

- From the companies: scholarship and engineers who deal with the students from the companies – around 300.000 EUR/Year

- University employees – 40 person

Evidence of Success:

- Mechanical Engineering BSc, Mechanical Engineering MSc, Computer Science BSc, Computer Science MSc

- Students become employees

- More than 90% of the student employed by partner companies

Timeline:

July 2014 → Sept. 2015 → Sept. 2017 → Feb. 2019 → Sept. 2020 → Feb. 2021

New higher education programs extended with dual education systems

Challenges Encountered:

- society changes and secondary education do not support the orientation of the students to the technical field,
- today it is to late to establish higher education in the technical field.

Potential for Learning or Transfer:

- university, City and Industrial Companies together can establish the future economic growth,
- complex system with lot of changing,
- the partners should make short and long term efforts
- education is expensive,
- the delay time is 4-5 years, and it cannot be shorter.

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European Union
European Regional
Development Fund

Thank you!

Presented By

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position: accociate professor
organisation: Eötvös Loránd University, Faculty of Informatics
Mobile: +36-30-5932590
**Email: am@inf.elte.hu**

Educating engineers for the industry since 1901

- Created in 1901 by order form Ministry of Public Education and Fine Arts

  Madrid, Alcoy, Béjar, Cartagena, Gijón, Las Palmas, Tarrasa, Vigo y Villanueva y La Geltrú.

- Train technicians as required by industries adopting new technologies

  Electricity, steel construction, thermal engines, etc.

1902: Ahlemeyer Power Plant
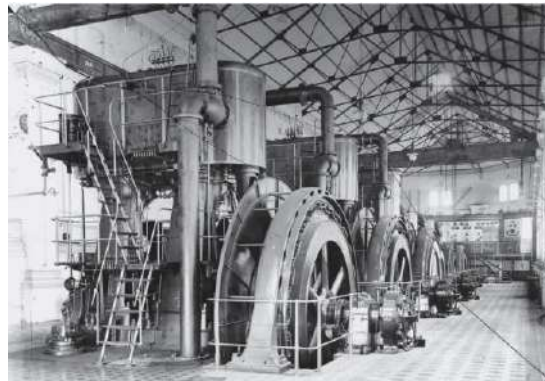
1902: 6 x 5.000 HP Power turbines

1902: First ETSII building

1950: Repsol Oil Refinery

1950: 30,000 barrels/day

1964: Second ETSII building

Educating engineers for the 21st century

- Train technicians as required by industries adopting new technologies
- Improve SME's technical and business skills and certifications
- Boost Research, Development, innovation and entrepreneurship
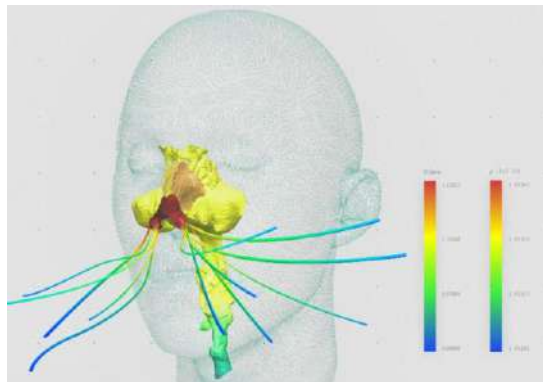
1994: SABIC
Former GE – Plastics plant

1996: HEFAME
Santomera robotized center

2017: Mecánicas Bolea
Dublin Airport Fuel Tanks

2017: Nido Robotics
Underwater ROV

2019: Flowgy
Virtual Functional Surgery

2021: Navantia
S-80 Fuel-Cell Submarine

Educating businesses for the 21st century

What Role do Academics Play?

- Basic research
    - Knowledge generation

- Development
    - Technology development

- Innovation
    - Technology transfer
    - Counselling

- Education
    - Technical
    - Entrepreneurship

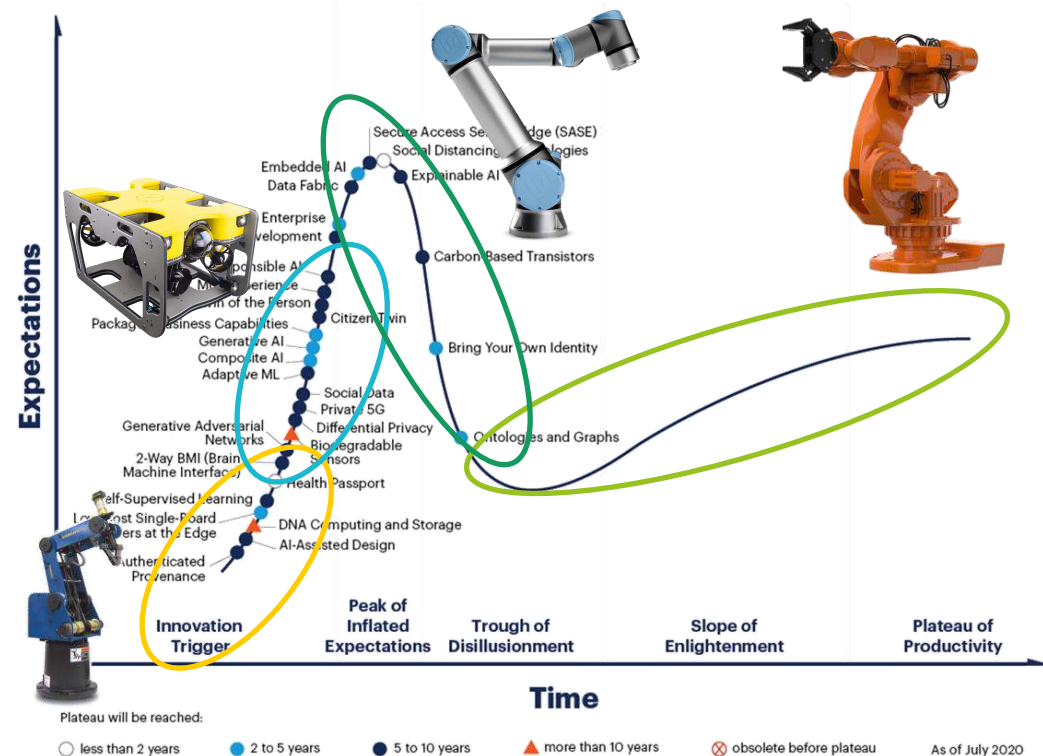

Hype Cycle for Emerging Technologies, 2020

4

Educating businesses for the 21st century

What Role do Academics Play?

- Basic research
  - Knowledge generation

- Development
  - Technology development

- Innovation
  - Technology transfer
  - Counselling

- Education
  - Technical
  - Entrepreneurship

Educating engineers for the 21st century

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Problem Addressed:

- Technological transformation of classical companies is not just digitalization
- Industrial hardware and machinery integration are not fully covered by digital solutions providers
- Emerging technology facilitators are required
- Companies and facilitators need to speak the same language

- **Three fulcrums**
    - Industry 4.0 Facilitators (IDEA, etc.)
    - Local companies (SME's and others)
    - Academia (ETSII – UPCT)

ARTIFICIAL INTELLIGENCE	ADDITIVE MANUFACTURING
BIG DATA	INTERNET OF THINGS (IOT)
SMART FACTORY	COLLABORATIVE ROBOTICS
VERT/HORZ. INTEGRATION	CLOUD COMPUTING
BIM MODELING	AUGMENTED AND VIRTUAL REALITY
CYBERSECURITY	

120 Aniversario
industriales etsii UPCT   1901 - 2021

MÁSTER **INDUSTRIA 4.0**
PRESENTACIÓN
30 MAYO
9:00 AM PARANINFO UPCT (CAMPUS DE LA MURALLA)
TAMBIÉN EN STREAMING

How Objectives were reached:

- 2018: First Master in Industry 4.0 (IDEA + UPCT)

- 2020: First Official Master's degree in Industry 4.0 (UPCT)
    20 students

- 2021: Integration of Industry 4.0 key technologies in other university degrees - microcertifications
    - Bachelor's degree in Biomedical Engineering (40 students)
    - Bachelor's degree in Industrial Design and Product Development (40 students)
    - Master's degree in Industrial Engineering / Industrial Management (80 + 20 students)

6

Educating businesses for the 21st century

Challenges Encountered:

- Technology grows exponentially
- SME's should adopt new technologies as soon as possible in order to keep being competitive
- Cost and lack of knowledge regarding benefits slow decision making processes
- Solution providers do not offer full integration
- Companies lack of human resources specialized in digital transformation

How Objectives were reached:

- 2022+: Official Master on Industry 4.0 in **dual training modality** (UPCT) https://www.upct.es/estudios/master/2491

    - Students enrolled in these studies carry out an **internship within a company** for the whole duration of the study program.

    - Studies are carried out in **sequential order** rather than in a classical parallel schedule in order to intensify program immersion.

    - **Project-based courses** are evaluated **with real-life projects** related to digital transformation requirements of the company hosting the interns.

    - **Distant learning methods** adopted after the pandemic are used, so that students can follow courses from their workplaces.

    - Companies may then hire students as **technological mediators with technology facilitators**.

Resources Needed:

Modification of the previously verified university degree (MODIFICA)

- Standard elective procedure intended to update course contents and methods (done every 2-3 years)
- National Agency for Quality Assessment and Accreditation of Spain, ANECA

Teachers´ engagement

- Adapt course contents and evaluation methodology for dual/distant learning (full/partial)
- Define evaluation projects at company site along designed employees
- Evaluate students´academic progression, project skills and performance

Agent Identification, Recruitment and Involvement

- Teacher's, Students, SME's and 4.0 Technology Facilitators
- University, Business Innovation Centers (CEEIC), Official economic development agencies (INFO), etc.
- 3 x meetings (Introduction, project definition, final assessment of results)

SME's Commitment

- Select student candidates for internship (3 months prior to start of course – 3 students)
- Grant scholarship/s covering the fees of the official master for selected student/s (2.160 €/student)
- Remuneration for interns is advised (~ minimum wage 1.050,00 €/month full-time)
- Total Cost (2 x 1.050 € x 3 months + 1 x 1.050 € x 12 months + 2.160 € Master fees) = 21.060 €

Evidence of ~~Success~~ Interest:

- 4 companies involved ~ 12 students recruited
- 4 months for program registration deadline

April	October	11 COURSES + PROJECT 60 ECTS	July
REGISTRATION		**COURSE**	

Educating University for the 22nd century
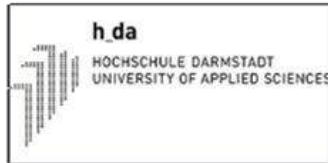
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ACADEMIA AND ECONOMIC RESILIENCE – What Role do Academics play?

Softwarepark Hagenberg

Good Practice Owner & Speaker: Michael Affenzeller, Softwarepark Hagenberg & School of Informatics Hagenberg

FOUNDATION Partner: P9 Business Upper Austria – OÖ Wirtschaftsagentur GmbH

softwarepark
hagenberg
upper austria

WS 4 Online Webinar
19th May 2021

CORK INSTITUTE OF TECHNOLOGY
INSTITIÚID TEICNEOLAÍOCHTA CHORCAÍ

Oldham Council

UNIVERSITY OF OULU
KERTTU SAALASTI INSTITUTE

LIC> LITHUANIAN INNOVATION CENTRE

RARR RZESZOWSKA AGENCJA ROZWOJU REGIONALNEGO

PBN Pannon Business Network

Reggio Emilia città delle persone

CEEIC

business upper austria

SOFTWAREPARK HAGENBERG (SWPH)

Where ideas turn into success

RESEARCH - EDUCATION - BUSINESS
FOUND - GROW - EXPAND

Founded in 1989 by **Bruno Buchberger** as a **spin-off** of **Johannes Kepler University Linz**
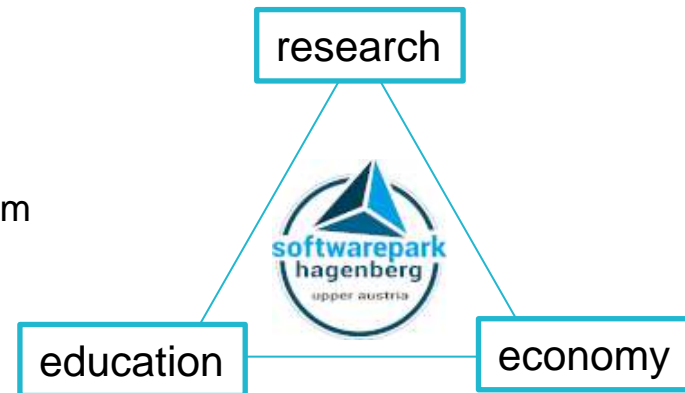
Softwarepark Hagenberg

Problem Addressed:

- Weak rural region
- Searching for a solution of lack of professionals

How Objectives are reached:

- Networks / cooperation beyond the own ecosystem
(companies/stakeholders as well as
University of Applied Scienes)

Stakeholders:

- Entrepreneurs
- Academic community/ academia (driving force)
- Economy
- Province of Upper Austria / community / district

Softwarepark Hagenberg

Resources Needed:

- Human resources at all levels of expertise
    - For business: IT professionals (from implementers to software architects to project managers)
    - For education and research: PostDocs and professors
- Financial resources (without risk / liability)

Evidence of Success:

…the synergy of research, education and business

- Courage to design / to give free space
- "Hip-shot mentality" by the driving forces
- Quick decisions (without perfect information)
- Willingness for risk-taking
- Attractiveness for students

Timeline:
1989

Softwarepark Hagenberg

Potential for Learning or Transfer:

- Synergetic interaction (research, economy and education)
- Currently driving force:
    - High-quality graduates are entering in high quantity
      → Attracts renowned software houses & research institutions
      → Strengthens attractiveness of the location for very good students
- Many years of experience → deep synergy & fusion
- Graduates become experts → pass on their experience as part-time teachers
- Students are involved in research & business projects → stay at SWPH
- Importance of media appearance

Challenges Encountered:

- "Culture Crash"
- Infrastructure (attractiveness of living space for students)
- Internationalization (language barrier, lack of skilled workers)

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Thank you!

Presented By

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Pannon Business Network
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Reggio Emilia
città delle persone

CEEIC

business
upper
austria