

The ICT Engineer of the 21st Century: Mastering Technical Competencies, Management Skills, and Societal Responsibilities (TeamSoc21)

An overview of the Erasmus+ Key Action 2 project

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Introduction

What, why and how?

Background and Motivation

- **IDEA:**
 - Extreme demand in EU for highly skilled engineers
- **IMPACT:**
 - **Multinational companies** (100 000+ employees)
 - 100 000+ new **start-up companies**
- **CHALLENGE:**
 - (Re-)define the **ICT engineer**
 - Define and execute education in the form of an intensive study program

TeamSoc21 ICT Engineer



Our approach

- PROPOSAL:

"The ICT Engineer of the 21st Century: Mastering Technical Competencies, Management Skills, and Societal Responsibilities (TeamSoc21)"

- Erasmus+ Key Action 2 project
- 1/9/2017-31/8/2019
- Budget: 224,137.00 EUR

- GOAL:

“set up a *transnational multidisciplinary intensive study program in the field of ICT-based entrepreneurship*”

Specific Croatian higher education objectives

- internationalization of higher education
- enhance mobility rates
- better link of education with the labour market



TeamSoc21 Consortium

Still going strong after 15 years...

Consortium

- **11+1** universities from 8 EU countries
 - **Bulgaria** (Sofia UTP, Sofia TU)
 - **Croatia** (Zagreb, **Osijek**)
 - **France** (Brest)
 - **Germany** (Leipzig)
 - **Hungary** (Gyor, Debrecen)
 - **Romania** (Oradea)
 - **Slovakia** (Kosice, Zilina)
 - **Spain** (Valencia)



TeamSoc21 Consortium Structure



TeamSoc21 Curricula

The key ingredients for crafting the modern ICT engineer...

TeamSoc21 Curricula

- Entrepreneurship
- Intercultural topics
- ICT topics
- Student start-up projects



Entrepreneurship - multidisciplinary approach

- Technology innovation processes
- Business and management development
- Intellectual property
- Technology policy issues



Designed by Freepik

Intercultural topics – interactive approach

- Multicultural teams
- Exchange of practices from different cultures
- Analysing societal challenges from local, regional and global perspectives



ICT topics - entrepreneurship based on ICT

- ICT part explains why ICT is one of Key Enabling Technologies
- Practical examples providing knowledge/insights into hot ICT topics
 - “Entrepreneurship in ICT” (e.g. start-up developing a new type of mobile phones)
 - “Entrepreneurship with ICT” (e.g. doctoral-images analysis start-up, UBER, ...)
- **EXPECTED OUTCOME:** Potential solutions for some of the biggest societal challenges



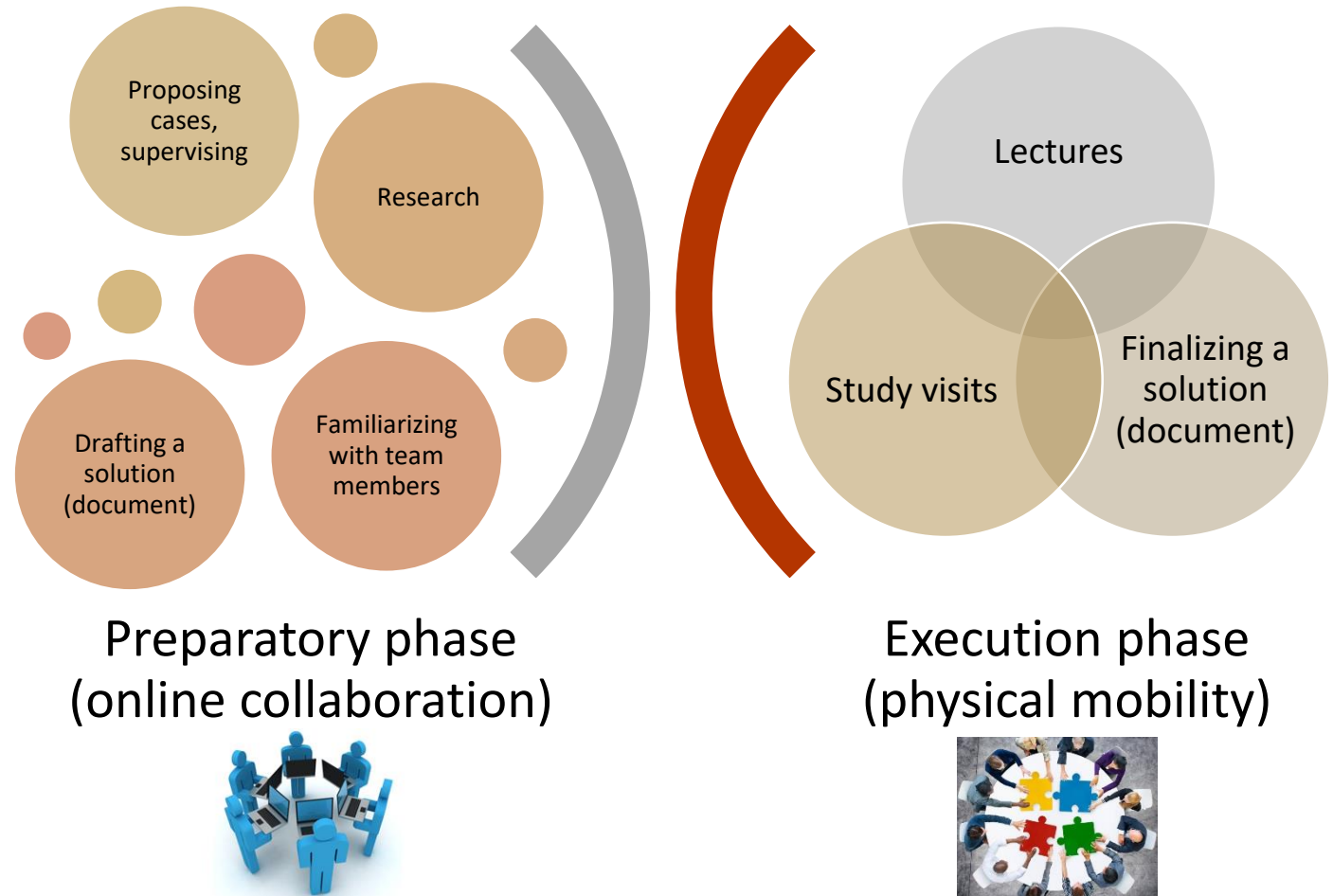
Fairphone

Student start-up projects

- Entrepreneurial cases

“How ICT can contribute to innovative societal development?”

- “Blended” mobility approach



ERASMUS+ „blended mobility”

- Student projects will be based on “blended” mobility approach and organized in two phases
 - Preparatory (virtual mobility)
 - 2 months of e-collaboration
 - Execution phase (physical mobility)
 - 2-week workshops hosted by partner universities
 - 2018: Zagreb
 - 2019: Valencia



Blended mobility phase 1: virtual mobility

- 3 parallel activities
 - Entrepreneurial case development
 - 3 experts + 4 students
 - Communication skills
 - Multicultural teamwork
- TeamSoc21 2018 virtual mobility
 - Starts today and last until 15 April



Blended mobility phase 2: physical mobility

- 4 parallel activities
 - Lectures
 - Teamwork
 - Visit to companies
 - Exchange of multicultural experiences
 - Evenings and weekends



- TeamSoc21 2018 physical mobility
 - 16-28 April
 - Zagreb, Croatia



Project Outputs

Intellectual outputs, multiplier events and learning/teaching/training activities

Project Outputs (1): Intellectual Outputs

- (O1) Entrepreneurial cases: "entrepreneurship in ICT" and "entrepreneurship with ICT"
- (O2) TEAMSOC21 lectures
- All intellectual outputs (O1)-(O2) have 2 editions
 - (Ox).2017-2018
 - (Ox).2018-2019



TeamSoc21 2018 Report

- Report on Entrepreneurial cases 2018: "entrepreneurship in ICT" and "entrepreneuership with ICT"



<https://goo.gl/KzV9dV>

INNOSOC 2016 & 2017 Reports

- Joint reports on:
Analysis of emerging ICT trends in 2016/7: "innovation in ICT" and "innovation with ICT"
- Analysis of major societal challenges in 2016/7



<http://goo.gl/IM6Gcs>

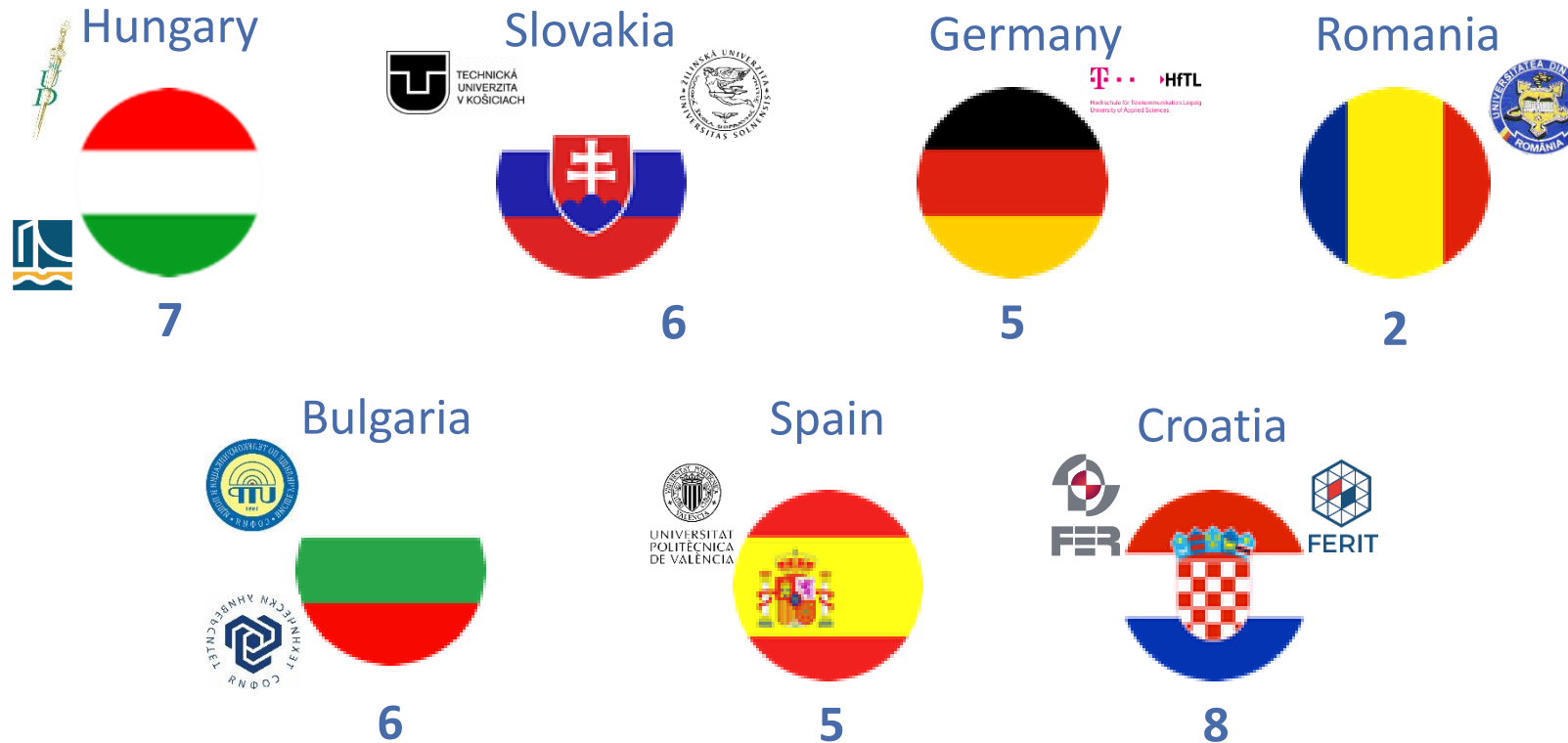
<https://goo.gl/oGz95B>

Zagreb 2018 Entrepreneurial Cases: 2+ lecturers and 3-4 students develop entrepreneurial cases

- Smart Agriculture based on Internet of Things: Watering and Fertilization Management
- Data Analytics for Healthy Food in the Cloud
- Smart Automotive Systems in Urban Areas: Parking for Big Cultural and Sports Events
- 3D Printing as a Tool in Environment Protection
- Real-Time ICT-based Security Solutions for European Borders Protection

Student participants

- 39 students from 7 countries and 11 partner institutions



Student participants by entrepreneurial cases

- 5 entrepreneurial cases:
 - Smart Agriculture based on Internet of Things: Watering and Fertilization Management
 - Team 1: 4 students (DE, SK, BG, HR), Team 2: 4 students(SK, ES, HR, BG)
 - Data Analytics for Healthy Food in the Cloud
 - Team 1: 4 students (HR, SK, BG, HR), Team 2: 4 students(SK, ES, HU, DE)
 - Smart Automotive Systems in Urban Areas: Parking for Big Cultural and Sports Events
 - Team 1: 4 students (SK, DE, ES, HR), Team 2: 3 students(BG, SK, HU)
 - 3D Printing as a Tool in Environment Protection
 - Team 1: 4 students (HU, ES, HR, SK), Team 2: 4 students(SK, ES, HU, DE)
 - Real-Time ICT-based Security Solutions for European Borders Protection
 - Team 1: 4 students (BG, DE, HR, HR), Team 2: 4 students(RO, ES, HU, SK)

Zagreb 2018 Entrepreneurial Cases

Descriptions on website and in TeamSoc21 2018

Smart Agriculture based on Internet of Things: Watering and Fertilization Management

Case study URL: <https://goo.gl/qcqnRG>

Authors: Birgit Graf, Dominik Schneider, and Franziska Plate

Keywords: smart agriculture; Internet of Things; (sensor) technology; qualitative benefits; work conditions

H2020 challenge addressed by the Entrepreneurial Case: Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy

Description of Entrepreneurial Case:

You are an Entrepreneur and you believe in the idea of connected agricultural areas. With your idea agriculture shall be optimized regarding watering and fertilization. To realize the idea, hardware like sensors or actuators and new connectivity variants like NB-IoT or 5G can be used. Connected sensors can measure soil conditions and send the information to farmers, fertilizer manufacturers or other interested parties. With the sale of sensors or the sale of the whole smart agriculture solution, direct business models can be achieved. Based on data about soil conditions, indirect business models can be achieved. In example, data analytics can be used to generate data insights, which can be valuable in various use cases. Furthermore, the idea of Smart Agriculture can be adopted with other technologies like Virtual Reality to further optimize farming.

Description

Keywords: smart agriculture; Internet of Things; (sensor) technology; qualitative benefits; work conditions

H2020 challenge: Food security, sustainable agriculture and forestry, marine and maritime and inland water research, and the Bioeconomy

Knowledge and skills (P; prerequisite: D; desirable, but not necessary): state-of-the-art technologies, e.g. network trends like "5G" as well as IT trends like "Narrowband-Internet of Things, Virtual Reality" (P); automation and optimization possibilities enabled by Business Intelligence and Data Analytics (D); industry insights and market needs of "agriculture" (P); biological and geographical backgrounds (D); entrepreneurship and foundation of start-ups (P); marketing and distribution concepts (D); people, resource and change management (D); environmental law and compliance (D); research and analytical skills (P); economic skills for the identification of value streams, creation of business models and development of business cases (P); conceptual thinking and ability to transfer business requirements into technical implementation details (P); commitment, determination and ability to work in a team (P); independent and conscientious work in distributed teams (P); creativity and innovative thinking (P); visualization and presentation skills (P)

Introduction

Sources

You are an Entrepreneur and you believe in the idea of connected agricultural areas. With your idea agriculture shall be optimized regarding watering and fertilization. To realize the idea, hardware like sensors or actuators and new connectivity variants like NB-IoT or 5G can be used. Connected sensors can measure soil conditions and send the information to farmers, fertilizer manufacturers or other interested parties. With the sale of sensors or the sale of the whole smart agriculture solution, direct business models can be achieved. Based on data about soil conditions, indirect business models can be achieved. In example, data analytics can be used to generate data insights, which can be valuable in various use cases. Furthermore, the idea of Smart Agriculture can be adopted with other technologies like Virtual Reality to further optimize farming.

In this case study students can elaborate...

- an assessment/evaluation of suitable technologies
- direct and indirect business models
- the end to end value chain and essential stakeholders/partners
- a detailed business case
- a market analysis
- a distribution concept
- societal topics regarding Smart Agriculture
- other technical, business and societal topics.

<http://sociallab.fer.hr/teamsoc21/zagreb-2018-entrepreneurial-cases/>

Project Outputs (2): Multiplier Events

- (E1) Pre-TEAMSOC21 2018 conference (TODAY)
- (E2) Pre-TEAMSOC21 2019 conference

Project Outputs (3): Learning/Teaching/Training Activities

Activity type	Number of participants	Duration (days)
Blended mobility of higher education students	33 (+domestic) + 33 (+domestic)	14 + 14
Intensive programmes for teaching staff	18 (+domestic) + 19 (domestic)	5 + 5

- Students (11 partners x 3 students + domestic students)
- Teaching staff – lecturers/experts
- **TeamSoc21 2018 Intensive Programme workshop: 16-27/4/2018 in Zagreb, Croatia**

Activity plan

Activity plan (project year 1)

		9-17	10-17	11-17	12-17	1-18	2-18	3-18	4-18	5-18	6-18	7-18	8-18	9-18
	MONTHS	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	M11	M12	M13
Project activity*														
<i>TEAMSOC21 2018 preparation</i>														
O1/A1: Entrepreneurial cases 2018														
M1: Steering Committee kick-off meeting (Leipzig)														
<i>TEAMSOC21 2018 implementation</i>														
M2: TEAMSOC21 2018 Steering Committee preparation meeting (Zagreb)														
E1: Pre-TEAMSOC21 2018 conference (Zagreb)														
O2/A1: Creation of TEAMSOC21 2018 lectures														
C1: TEAMSOC21 2018 blended mobility														
C2: TEAMSOC21 2018 Intensive Programme Workshop (Zagreb)														
<i>TEAMSOC21 2018 follow-up</i>														
M3: TEAMSOC21 2018 follow up Steering Committee meeting (TBD)														

Activity plan (project year 2)

PROJECT TIMETABLE													
		9-18	10-18	11-18	12-18	1-19	2-19	3-19	4-19	5-19	6-19	7-19	8-19
	MONTHS	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
Project activity*													
<i>TEAMSOC21 2019 preparation</i>													
O1/A2: Entrepreneurial cases 2019													
<i>TEAMSOC21 2019 implementation</i>													
M4: TEAMSOC21 2019 Steering Committee preparation meeting (Valencia)													
E2: Pre-TEAMSOC21 2019 conference (Valencia)													
O2/A2: Creation of TEAMSOC21 2019 lectures													
C3: TEAMSOC21 2019 blended mobility													
C4: TEAMSOC21 2019 Intensive Programme Workshop (Valencia)													
<i>TEAMSOC21 2019 follow-up</i>													
M5: TEAMSOC21 closing Plenary meeting (TBD)													
O3/A1: Project visibility infrastructure: web page set-up and maintenance													
O3/A2: Project visibility infrastructure: administering social media sites													
A: Project management													

Activity plan (visibility & management)

PROJECT TIMETABLE													
		9-18	10-18	11-18	12-18	1-19	2-19	3-19	4-19	5-19	6-19	7-19	8-19
	MONTHS	M13	M14	M15	M16	M17	M18	M19	M20	M21	M22	M23	M24
Project activity*													
O3/A1: Project visibility infrastructure: web page set-up and maintenance													
O3/A2: Project visibility infrastructure: administering social media sites													
A: Project management													

Project visibility: Internet presence

Website

sociallab.fer.hr/teamsoc21



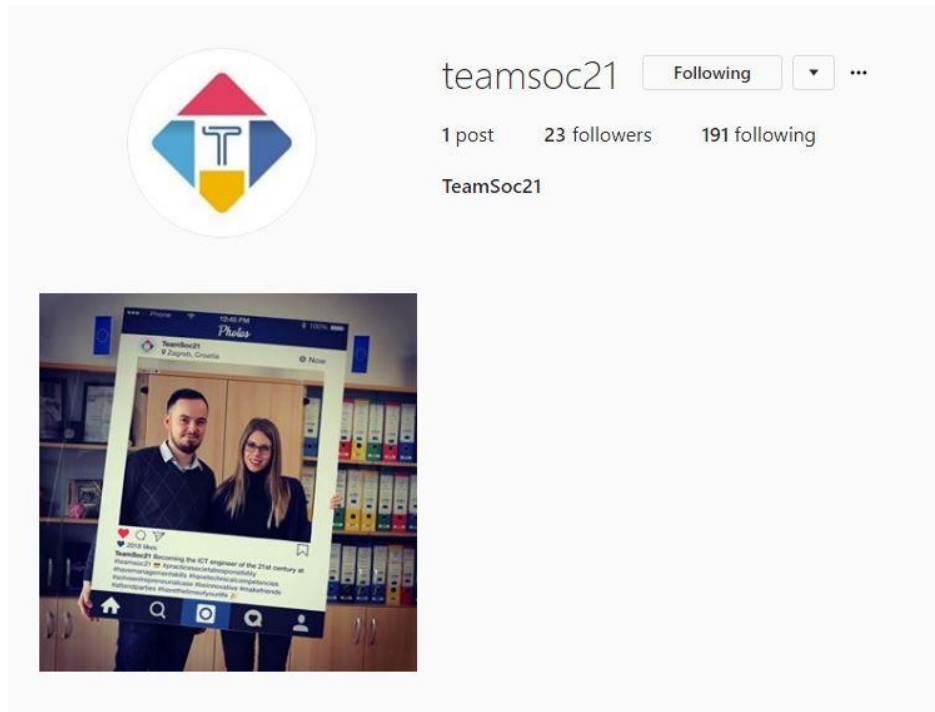
Project visibility: Social media

Instagram (name: teamsoc21)

[instagram.com/teamsoc21](https://www.instagram.com/teamsoc21)

Facebook (name: teamsoc21)

facebook.com/teamsoc21



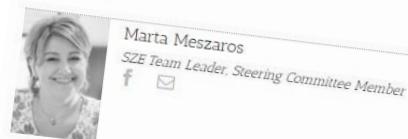
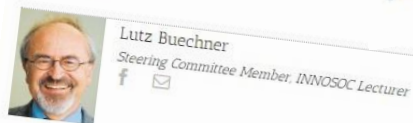
TeamSoc21 team

It's all about people

<http://sociallab.fer.hr/teamsoc21/team>



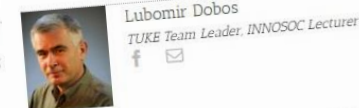
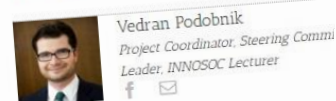
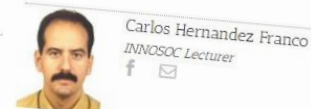
Steering Committee



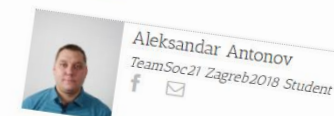
Administrators



Lecturers



Students



Spread the word about the modern ICT engineer!

Make sure you like us on Facebook 😊

Post a photo on Instagram with #teamsoc21



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