Co-funded by the Erasmus+ Programme of the European Union

PROJECT TITLE: *STIMULATING AND VALIDATING DIGITAL ENTREPRENEURSHIP AS THE BEST WAY TO INCREASING THE QUALITY OF START-UPS*

IO1 CURRICULUM FOR VET PROVIDERS

DIGITAL, MODERN ENTREPRENEURSHIP IT'S YOUR BEST CHANCE!

Programme: ***Erasmus+***

Key Action: Cooperation for innovation and the exchange of good practices

Action Type: Strategic Partnerships for vocational education and training

Project Number: ***2019-1-PL01-KA202-065209***

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INTRODUCTION

Project:
SAVE - STIMULATING AND VALIDATING DIGITAL ENTREPRENEURSHIP AS THE BEST WAY TO INCREASING THE QUALITY OF START-UPS

CONTEXT OF PROJECT

Industry 4.0 is expected to boost the productivity and value added of European industries and stimulate economic growth. As part of its new Digital Single Market Strategy, the European Commission wants to help all industrial sectors exploit new technologies and manage a transition to a smart, Industry 4.0 industrial system. The project aim is to strengthen the quality of start-uppers, young entrepreneurs and VET providers, and enhance their professional development through improving digital entrepreneurship competences, as well as give them the opportunity to validate these competences and adapt to VET environment. This project (unlike other projects) is focused not only on target groups that want to establish or develop their own start-up, but also on young entrepreneurs and their VET trainers or providers. This is an example of a systemic approach to the problem of start-ups staff education, as well as developing the Entrepreneurial Digital.

OVERALL PURPOSE OF THE CURRICULUM

The present Curriculum is the answer for the diagnosed problem of maladjustment of presented subjects to real needs of start-uppers, young entrepreneurs and VET providers. The start point of the diagnosis was the definition of skills and competences related with implementation of the Industry 4.0 idea in present business. The main questions related the detailed issues which could be important with the Industry 4.0, and ensuring the complexity of presented content. Most of the currently available VET programs do not foresee the development of the skills mentioned in previous point. Therefore, the project Consortium has identified the need to build on the content and resources within, for VET learners to acquire adequate competences to participate on the labour market in the Industry 4.0 sector.

OBJECTIVES

The main objectives of the Curriculum are:

- Develop the basic and specific competencies of start-uppers, young entrepreneurs and VET providers in the sphere of Industry 4.0;

- Provide necessary knowledge and information to mentioned groups on access to learning services enhancing the work ability in Industry 4.0 sectors.

SPECIFIC TARGET GROUPS
This Curriculum is dedicated especially for start-uppers [1], young entrepreneurs [2] and VET providers [3] who are the key actors of knowledge gaining process.

IMPACT
Due to its structure, the Curriculum allows to familiarize with the chosen topics, the structure of proposed courses and the methods used and supposed effects.
It could be used by the mentioned target groups, but due to its universality it could be the base for implementation in other courses, dedicated different groups.

STRUCTURE OF EACH MODULE

The training is organised as a distance education using mobile learning (m-learning) which enables learning across multiple contexts, through social and content interactions, using BYOD (Bring Your Own Device) approach. M-learners use mobile device educational technology at their convenient time.

Each module consists of 4 mutually interconnected parts:

1. m-learning training materials
2. m-learning tools
3. individual self-study
4. individual case study assignment

TEACHING METODS AND TOOLS USED

Student-centred learning: also known as learner-centred education, broadly encompasses methods of teaching that shift the focus of instruction from the teacher/trainer to the trainee/learner. This method improves the trainees' participation, helps them develop a critical thinking, and problem-solving skills, and importantly facilitates a more personalised learning approach.

Self-directed learning: this learning method encourage accelerated remote learning, which is the idea that learners will acquire essential theoretical knowledge and practical skills remotely, using digital means such as mobile

learning. It will promote independent learning, a more flexible way of learning that requires accountability and good time management – key skills for any start-upper. It also required learners to adapt quickly to new situations they may face in their development and professional paths. Learners are challenged to plan their learning path, and identify the tools, resources and strategies needed for one's own learning, developing their intrinsic motivation, agency, diligence and perseverance.

Project-based learning: this learning method, borrows real life problems and applies them to a learning context, thus the trainee/learner is requested to solve them utilising their existing and new knowledge. Project-based learning is one of the most highly efficient methods to learning units entailing realistic scenarios, helping to build immediate problem-solving & critical thinking skills.

Game-based Learning: this teaching approach to teaching, allows the trainees/learners explore relevant aspect of games in a learning context designed by teachers/trainers. Gamification takes game elements (such as points, badges, leaderboards, competition, etc.) and applies them to a non-game setting. In this manner, the experience of learning becomes more fun, engaging & interactive.

Training tools

Videos/Interactive presentations: the modules could include interactive presentations to keep participants engage. These presentations or where possible, videos, will be based on creative and innovative content to catch trainees'/learners' attention.

Interactive exercises/games: the chapters could contain from 3 to 5 pages of text that will be complemented with interactive exercises such as "Fill in the blanks", "drag the words" or "guess the answer" and games such as "find the Hotspot" (see below).

Assignment: Participant trainees/learners could be asked to complete the appropriate template related with the topic.

M-learning teaching tools used to create interactive digital exercises:

1) ***Single choice set*:** it will give to the learner a concept to select among 4 different answers which only one is the correct. This digital exercise will guide the learner to search for the answer in the theory-based part and review concepts.

2) ***Multiply choice set:*** it will allow to create simple and smooth quizzes consisting of multiply choice questions. It includes question sets with few correct answering alternatives per question. The end user gets immediate feedback after submitting each answer. It has sound effects for correct and wrong (sound effects may be turned off), fully responsive design and summary at the end showing the solution to all questions.
3) ***True/False questions:*** it will make available a question with yes/no option to answer. Every question has a visual add. This digital exercise will allow the learner to associate an image to a specific content, and check the accuracy of a given concept's definition.
4) ***Find the words:*** it will drive the learner into a search activity, to find and select the words in the grid. This digital exercise will allow the learner to recall keywords of this module.
5) ***Fill in the blanks:*** also known as cloze tests, it will challenge the learner to fill in the blanks with the correct word. Every challenge has a visual add, provides instant feedback filled words, allowing an option to auto-correct each challenge. This digital exercise will allow the learner to associate an image to a specific content, and strengthen overall comprehension of certain topics of this module.
6) ***Drag the words:*** it will give to the learner the task to drag words to complete a set of statements. Whenever necessary tips can be provided to help the learner. This digital exercise will allow learner to revised contents and consolidate learning.
7) ***Documentation Tool:*** it will allows the student to document how he/she work on project in a structured way. It's important that they take notes during actual project work. The documentation tool aims to make it easy to create assessment wizards for The end user will be taken through the steps of the wizard. On the last step of the wizard, the user can generate a document with all the input that has been submitted. This document can be downloaded. The Documentation tool is fully responsive and works great also on smaller screens.
8) ***Summary*****:** it will make available a set of statements so learner can choose between them the correct to build a summary of this module. This digital exercise will help the learner to synthesize the key contents of this module.

MODULE 1: DIGITAL START-UPS VS. DIGITAL SCALE-UPS

Programme: ***Erasmus+***

Key Action: Cooperation for innovation and the exchange of good practices

Action Type: Strategic Partnerships for vocational education and training

Project Number: ***2019-1-PL01-KA202-065209***

The aim of the Module:	
To strengthen the quality of start-uppers and entrepreneurs and enhance their professional development through improving digital entrepreneurship competences by a clear idea about what are digital start-ups and digital scale-ups companies, as well how and when to transit from one to another.	
Time duration:	4 weeks (6 hours of self-study per week; 24 hours in total)
ECVET:	1 point
Length of material:	• 20 pages of study materials divided into 3 chapters, • app. 7 pages per week, • the last week is devoted to preparation of individual assignment.
Assignment:	• at the end of study material which has to be sent to tutor/trainer for getting feedback, • the assignment will be prepared using m-learning Documentation tool.
Learning objectives of the Module:	
• to explain the start-up concept, • to understand what is needed to know before building a start-up, • to describe the different types of start-ups, • to explain the digital start-up concept, • to detail the difference between growing and scaling, • to provide the practical information on how to scale a business, • to analyse the concerns, challenges and opportunities in a scale-up, • to list the main differences between a digital start-up and a digital scale-up, • to analyse when is the time to make the transition between both stages of companies.	
Learning outcomes of the Module:	
• the participants will have increased knowledge about start-ups and how to build one, • the participants will understand how to identify the moment when a digital start-up turns into a digital scale-up, • the participants will also be able to understand the differences between both stages of a company, as well to identify the opportunities in scaling.	
Teaching methods of the Module:	• student-centred learning • self-directed learning
Teaching tools used:	• single choice set

	• true/false questions • find the words • fill in the blanks • drag the words • summary

Topics of the Module:

Chapter I. What is a digital start-up?		
Duration: 6 hours of self-study		
The effect after completion of Chapter I:		
Knowlegde	**Skills**	**Competences**
The participant has an integrated knowledge about start-up environment; start-up definition; what to know before building a start-up; different types of start-ups; specific definition of a digital start-up.	The participant names what is needed to build a digital start-up.	The participants realises the importance of founding a digital start-up and the continuation of growing business into scalable digital start-up.

Chapter II. What is a digital scale-up?		
Duration: 6 hours of self-study		
The effect after completion of Chapter II:		
Knowlegde	**Skills**	**Competences**
The participant has an integrated knowledge about digital scale-ups; the difference between growing and scaling; how to scale a business; concerns, challenges and opportunities in a digital scale-up.	The participant names the circumstances when a digital start-up becomes a digital scale-up.	The participant realises the benefit of scaling a digital start-up into a digital scale-up and the continuation of growing business in sustainability.

<table>
<tr><th colspan="3">Chapter III. Main differences between digital start-ups and digital scale-ups</th></tr>
<tr><td colspan="3">Duration: 6 hours of self-study</td></tr>
<tr><td colspan="3">The effect after completion of Chapter III:</td></tr>
<tr><th>Knowlegde</th><th>Skills</th><th>Competences</th></tr>
<tr><td>The participant has an integrated knowledge about the main differences between a digital start-up and a digital scale-up; how to identify the transition.</td><td>The participant names the differences between a digital start-up and a digital scale-up and the importance.</td><td>The participant realises the benefit of the transition between both stages and the pragmatic understanding regarding the differences.</td></tr>
<tr><th colspan="3">Chapter IV. Case study assignment & digital exercises</th></tr>
<tr><td colspan="3">Duration: 6 hours of own work</td></tr>
<tr><td colspan="3">The participant after completion of Chapter IV:
developed the solution of case study assignment
completed the digital exercises</td></tr>
<tr><th colspan="3">Requirements for obtaining a certificate of completion:</th></tr>
<tr><td colspan="3">The minimum requirements for Certificate of completion of Module: “Digital start-ups vs. digital scale-ups” are as follows:
Self-study of training materials provided in m-learning form of delivery
Submission of the case study assignment (individual analysis of 3 questions)
Completion of digital exercises: 6 exercises (minimum 4 correctly completed)</td></tr>
<tr><th colspan="3">Resources of the Module:</th></tr>
<tr><td colspan="3">Required Reading:
Chapter I. What is a digital start-up?
Mondher Khanfir 2018, The Digital startup: Implementation handbook, viewed 29 January 2021,
https://www.slideshare.net/MondherKhanfir/the-digital-startup-implementation-handbook-2018
Chapter II. What is a digital scale-up?
Bianca Miller Cole, 2019, When Does A Start-Up Become A Scale-Up?,</td></tr>
</table>

viewed 29 January 2021,
https://www.forbes.com/sites/biancamillercole/2019/02/27/when-does-a-start-up-become-a-scale-up/

3) *Chapter III. Main differences between digital start-ups and digital scale-ups*
RocketSpace, 2018, 7 Key Differences Between Startups and Scale-ups, viewed 29 January 2021, <https://www.rocketspace.com/tech-startups/7-key-differences-between-startups-and-scale-ups>

1) country specific

2) country specific

Recommended Reading:

1) EU Startup Monitor (2018). European Commission, Brussels, EU. [http://startupmonitor.eu/EU-Startup-Monitor-2018-Report-WEB.pdf]

The European Commission has adopted on 22 November 2016 an initiative to improve the economic and regulatory situation for start-ups and scale-ups. This research report analysis the European start-up environment and countries' specific and common challenges of the start-up and scale-up landscape.

2) The Global Startup Ecosystem Report 2020 (GSER2020). Startup Genome LLC, San Francisco, USA [https://startupgenome.com/reports/gser2020]

The GSER is the world's most comprehensive and widely read research on start-ups with 250 ecosystems studied and a top 100 ranking of emerging ecosystems. The 2020 report shows how governments can support and leverage tech ecosystems to restart stalling economies that are recovering from COVID-19 lockdowns — as four out of every 10 start-ups globally have only three months or fewer of cash runway in the wake of the pandemic.

3) country specific

4) country specific

Terms related with the Module:

business angel	growing	scale-up
digital start-up	outsourcing	scaling
entrepreneur	product/market fit	start-up

1.a. Description of the Module: "Digital start-ups vs. Digital scale-ups"

In a fast pace world, digital technology takes space and time more than ever before. We see and use technology more than we realise, in simple tasks like

organising the “to do lists” of our lives, buying online things that we do not find it in the traditional commerce, or just because we choose to spend exercising and staying healthy with an app synchronising with another that states our health condition.

The majority of these solutions are created in an experimental environment, testing, improving and tuning what has relevance for users/clients. These creative ecosystems are start-up companies taking risks and growing along with the developments made, where the aim is, indeed, to grow into a higher scale and turn into a scale-up company.

The two distinct phases of company growth, start-up and scale-up, have differences that are clear and complement the description of each one. The most obvious difference between a digital start-up and digital scale-up is product-market fit: scale-ups have perfected it, while are still experimenting with things like customer segmentation, customer acquisition costs, and product features. Scale-ups on the other hand, have already validated their assumptions by proving their units are economically sustainable.

In this context, the purpose of this module is to strengthen the quality of start-uppers and entrepreneurs and enhance their professional development through improving digital entrepreneurship competences by a clear idea about what are digital start-ups and digital scale-ups companies, as well how and when to transit from one to another.

This is why it is of major importance and relevance to understand in a clear and objective way the concept of start-up, per se, and the definition of start-ups in the digital and tech context, as well the description of scale-up companies and the main differences between both.

1.I. Summary of the syllabus for the Module: “Digital start-ups vs. digital scale-ups”

Providing solutions to a problem takes creativity, risks, testing and implementation in a technological and digital world we live in. Start-ups do it due the entrepreneurship spirit of some. Digital start-ups have revealed to be huge boost for the economy when growing in a sustainable and scalable business. The confirmation of this are several examples of digital big companies today that started as start-ups. The proposed training module outlines learning objectives,

topics to cover and exercises to help learners to know about the differences between a digital start-up and a digital scale-up.

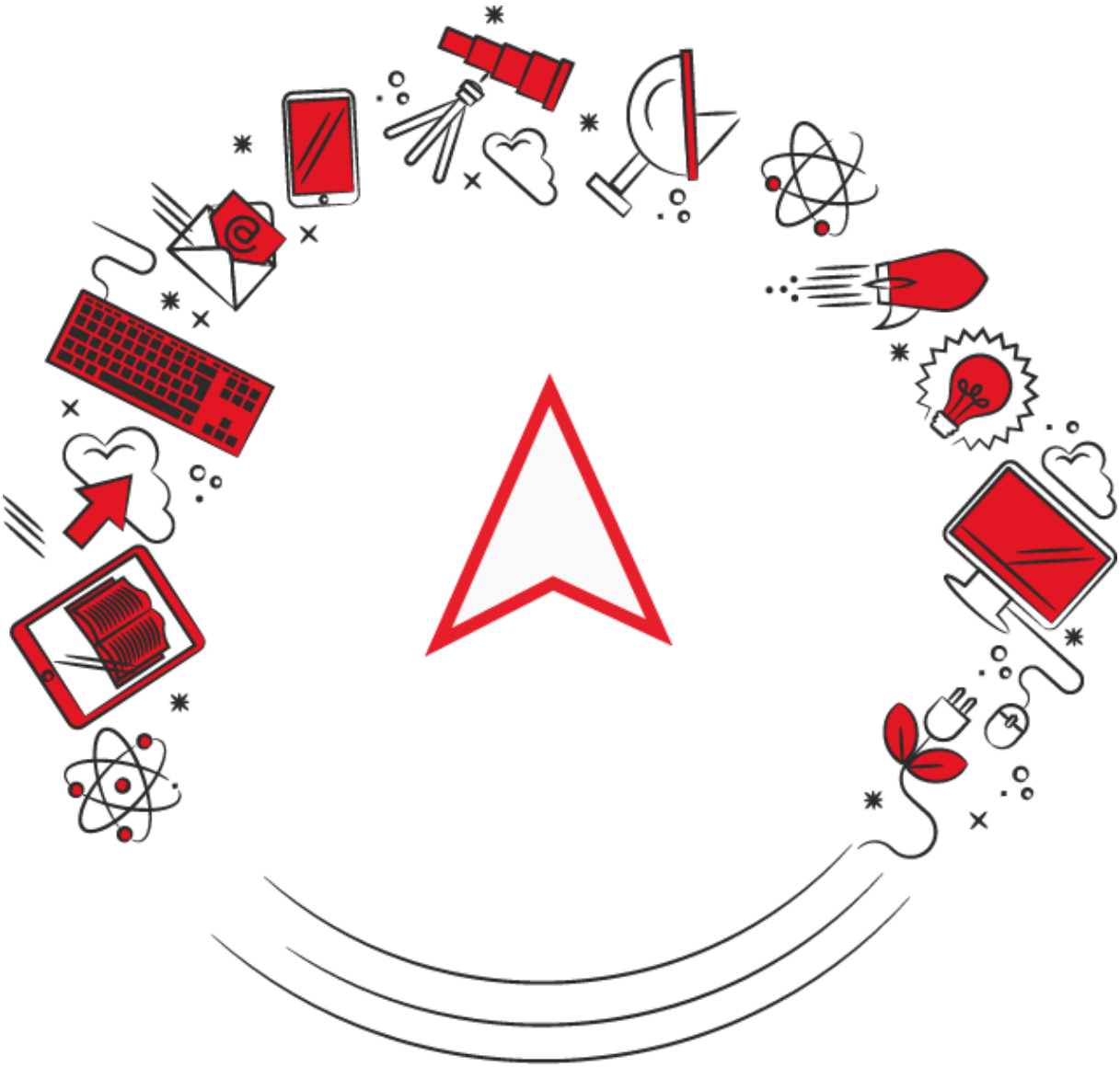
This module is designed for a remote learning platform, encouraging BYOD (Bring Your Own Device) practice, which promotes self-directed learning and enables learning across multiple contexts, through online social and content interactions. Learners engage with 4.0 education and benefit from self-centred learning pedagogies.

The Module is recommended for 4 weeks training. Overall study effort for 4 weeks represents 25 hours of self-study. The last week is devoted to preparation of individual assignment and completion of digital exercises.

The self-study material is divided into 3 Chapters. By the end of the Training Module "Digital start-ups vs. digital scale-ups" participants will have enhanced their professional development through improving digital entrepreneurship competences by a clear idea about what are digital start-ups and digital scale-ups companies, as well how and when to transit from one to another.

After the successful completion of Module: "Digital start-ups vs. digital scale-ups" the participants will gain Certificate of completion.

MODULE 2: CIRCULAR ECONOMY IN YOUR START-UP



The aim of the Module:

The aim of the "Circular Economy in your start-up" module is to explain the concept of Circular Economy (CE), and illustrate through real cases how it can be further embraced as a sustainable way of thinking and operating, for the EU start-ups operating in the era of Industry 4.0.	
Time duration:	3 weeks (8 hours of self-study per week; 24 hours in total)
ECVET:	1 point
Length of material:	• 20 pages of study materials divided into 3 chapters • app. 1 chapter per week • after completion of Chapter 3 the participant will be asked to go over some digital exercises
Learning objectives of the Module:	
• to understand the overall concept of Circular Economy • to link the Circular Economy concept with the Circular start-up operations • to help start-uppers adopt a more circular approach in their operations • to illustrate how sustainable development of start-ups makes business sense • to provide successful case studies of applied Circular approaches on an EU level	
Learning outcomes of the Module:	
• to gain a fundamental understanding of the concept of Circular Economy • to understand how Circular Economy relates to the start-up operations • to realise the strategic importance of adopting a more circular approach to their current & future operations • to recognise the tremendous opportunities offered when adopting this circular approach for business development and job creation • to review existing examples of circular economy case studies • to frame the current EU background on Circular Economy status	
Teaching methods of the Module:	• student-centred learning • self-directed learning
Teaching tools used:	• single choice set • true/false questions • fill in the blanks • drag the words • summary
Topics of the Module:	
Chapter I. What is Circular Economy?	
Duration: 8 hours of self-study	

The effect after completion of Chapter I:		
Knowlegde	**Skills**	**Competences**
The participant understands the concept of Circular Economy. The participant comprehends the Circular Economy approach benefits.	The participant reviews the Circular approach on an EU level. The participant identifies the Circular Economy approach benefits for their own start-up.	The participant is aware of the benefits of using the circular approach.The participant can map the benefits, and the opportunities of adopting the Circular Economy model.
Chapter II. How Circular start-ups can accelerate the circular economic transition		
Duration: 8 hours of self-study		
The effect after completion of Chapter II:		
Knowlegde	**Skills**	**Competences**
The participant gains a holistic understanding of the "5R model". The participant gains an understanding of the circular start-approach. The participant understands the role of policymakers.	The participant applies the "5R model" on an economic, social & tech level. The participant is able to develop an initial business plan based on the principles of the model.	The participant is able to critically assess the importance of circular start-ups, and how they can drive the transition towards a more sustainable EU economy.
Chapter III. Circular economy successful start-ups from around the EU		
Duration: 8 hours of self-study		
The effect after completion of Chapter III:		
Knowlegde	**Skills**	**Competences**
The participant reviews successful EU examples applying the	The participant understands in more practical terms the	The participant is able to develop an innovative business idea based on the Circular

Circular approach.	concept of Circular Economy.	Economy approach.

Requirements for obtaining a certificate of completion:

The minimum requirements for Certificate of completion of Module: "Circular Economy in your start-up" are as follows:

4. Self-study of training materials provided in m-learning form of delivery
5. Completion of **digital exercises**: 12 exercises (minimum 9 correctly completed)

Resources of the Module:

Required Reading:

https://www.ellenmacarthurfoundation.org/explore/the-circular-economy-in-detail - Principles of Circular Economy

https://www.mckinsey.com/business-functions/sustainability/our-insights/mapping-the-benefits-of-a-circular-economy - Benefits of Circular Economy

https://youmatter.world/en/definition/definitions-circular-economy-meaning-definition-benefits-barriers/ - Principles of Circular Economy

https://ec.europa.eu/environment/circular-economy/ - EU Circular Economy Action Plan

https://knowledge4policy.ec.europa.eu/foresight/topic/changing-nature-work/impact-shift-circular-economy_en - Impact shift of Circular Economy

https://www.circle-economy.com/resources/disruptors-how-circular-start-ups-can-accelerate-the-circular-economy-transition - Report by University of Utrecht (2019), "Disruptors: How can circular start-ups accelerate the circular economy transition"

Circle Economy. The Circularity Gap Report: An analysis of the circular state of the global economy. (2018)

Recommended Reading:

1) Circle Economy. The Circularity Gap Report: An analysis of the circular state of the global economy. (2018)

2) The Circular Economy: a transformative Covid19 recovery strategy. Available at: https://www.ellenmacarthurfoundation.org/assets/downloads/The-circular-economy-a-transformative-Covid19-recovery-strategy.pdf

3) country specific

4) country specific

Terms related with the Module:

Industry 4.0 Circular Economy Circular Start-ups	R-strategies CE Action Plan Start-up	Sustainability Linear Economy Take-Make-Waste

1.a. Description of the Module: "Circular Economy in your start-up"

This Module will focus on explaining the concept of Circular Economy (CE), and how it can be further embraced as a sustainable way of thinking and operating, for the EU start-ups of the 21st century. The model of CE is highly beneficial, and can positively affect all the economy, the environment and the citizens of the European Union. When correctly applied, CE can become a crucial parameter for economic growth, create new jobs, encourage innovation and build economic and environmental resilience.

Once adopted in a coordinated manner by all EU member states, the CE model could act as the catalyst, and hence transforming the European economy, to a more competitive and sustainable one.

Learning and absorbing the basics of the CE model, is very important for startuppers and young entrepreneurs, because the European Commission has set out a vision to complete all structural and technological changes in order to upgrade the EU economic into a sustainable one by 2050. In this view, the current "linear economic model" should slowly and steadily abandon the scene of industry operations; instead, the CE model is slowly creating a new shift in the existing paradigm, where the value of products, materials and resources is maintained in the economy for as long as possible, and the generation of waste is minimised.

In order to successfully achieve this transition into a more sustainable future, the CE model needs to be disseminated, understood and put into practice. Start-ups are by far quicker to adjust their busines models (due to their size & efficient management systems) into this resource-efficient way of thinking, thus they can become leaders in this transition.

1.l. Summary of the syllabus for the Module: "Circular Economy in your start-up"

The Module is recommended for 3 weeks training. Overall study effort for 3 weeks represents 24 hours of self-study, 8 hours per each chapter. After having completed all chapters the participant can test knowledge thanks to the interactive exercises.

By the end of the Training Module participants will have available a basic guideline which will help them differentiate from competition, and invest in a more circular approach. There are tremendous opportunities for business development and job creation in a circular economy, and this module will help startuppers realise their existence and importance. A number of EU cases are provided, to help the learner understand the business models adopted by circular start-ups. These cases can help startuppers create new innovative business ideas based on the concept and model of Circular Economy.

After the successful completion of Module: "Circular Economy in your start-up" the participants will be awarded a Certificate of completion.

MODULE 3: "DIGITAL LIFESTYLE ENTREPRENEURSHIP"

The aim of the Module:	
The aim of the Module: "Digital Lifestyle entrepreneurship" is to provide the knowledge required to understand what is digital lifestyle entrepreneurship and provide practical information, materials and exercises on the development of the most important soft skills for the digital lifestyle entrepreneur as well as business development tools that will help start-uppers to successfully establish and develop their own business.	
Time duration:	4 weeks (6 hours of self-study per week; 24 hours in total)
ECVET:	1 point
Length of material:	• 29 pages of study materials divided into 4 chapters, • app. 1 chapter per week, • after completion of Chapter IV participant will be asked to do digital exercises
Learning objectives of the Module:	
• To provide the knowledge required to understand what is: digital lifestyle, lifestyle entrepreneurship, start-up; • To introduce the concept of the digital lifestyle entrepreneurship; • To explain the importance of the soft skills that are needed to become a successful digital lifestyle entrepreneur; • To provide the practical information, learning materials and exercises on the development of the most important soft skills for the digital lifestyle entrepreneur; • To provide practical information, learning materials and exercises on the most important business development issues.	
Learning outcomes of the Module:	
• increased knowledge about the digital lifestyle and digital lifestyle entrepreneurship; • understanding what competences and skills are the most important for the digital lifestyle entrepreneurs; • developed and/or improved soft skills indispensable for the successful digital lifestyle business; • increased knowledge on the business structure, planning and marketing activities; • increased knowledge on how to use different tools and support for further business development and growth.	
Teaching methods of the	• student-centred learning

<table>
<tr><td>Module:</td><td colspan="3">• self-directed learning</td></tr>
<tr><td>Teaching tools used:</td><td colspan="3">• True/False Question
• Single Choice Set
• Multiple Choice Set
• Drag the Words
• Documentation Tool</td></tr>
<tr><td colspan="4">Topics of the Module:</td></tr>
<tr><td colspan="4">Chapter I. What is a digital lifestyle and lifestyle entrepreneurship?</td></tr>
<tr><td colspan="4">Duration: 6 hours of self-study</td></tr>
<tr><td colspan="4">The effect after completion of Chapter I:</td></tr>
<tr><td>Knowlegde</td><td colspan="2">Skills</td><td>Competences</td></tr>
<tr><td>The participant has an integrated knowledge about the basic terms on the digital lifestyle, lifestyle entrepreneurship and digital lifestyle entrepreneurship as the way to self-employment, possible activity areas, some statistics on the start-ups.</td><td colspan="2">The participant names the main features of the digital lifestyle entrepreneurship and the most important conditions for the establishment of a start-up.</td><td>The participant understands how to evaluate feasibility of establishing a digital lifestyle entrepreneurship venture.</td></tr>
<tr><td colspan="4">Chapter II. Competences and soft skills needed to become a successful digital lifestyle entrepreneur</td></tr>
<tr><td colspan="4">Duration: 6 hours of self-study</td></tr>
<tr><td colspan="4">The effect after completion of Chapter II:</td></tr>
<tr><td>Knowlegde</td><td colspan="2">Skills</td><td>Competences</td></tr>
<tr><td>The participant has an integrated knowledge of the main competences and softs skills and especially</td><td colspan="2">The participant names the competences and soft skills, their importance for the business development.</td><td>The participant realises the soft skills development tools and methods, knows how to use them for growing his competences and becoming a</td></tr>
</table>

those needed to become a successful digital lifestyle entrepreneur.		successful digital lifestyle entrepreneur
Chapter III. Business principles and marketing strategies for digital lifestyle entrepreneurship		
Duration: 6 hours of self-study		
The effect after completion of Chapter III:		
Knowlegde	**Skills**	**Competences**
The participant has an integrated knowledge about main business establishment and development principles including marketing activities.	The participant names the importance of coherent marketing strategies for successful business take-off and growth.	The participant realises the benefit of start-up risk management approach into everyday life.
Chapter IV. Continuous development of your digital start-up		
Duration: 6 hours of self-study and work with digital exercises		
The effect after completion of Chapter IV:		
Knowlegde	**Skills**	**Competences**
The participant has an integrated knowledge about the steps to continuous development and growth of the digital lifestyle enterprise.	The participant names the importance of continuous growth strategies in the business development.	The participant realises the benefit of various support actions and programmes to successfully grow digital lifestyle enterprise.
Requirements for obtaining a certificate of completion:		
The minimum requirements for Certificate of completion of Module: "INTERNET OF THING IN ENTREPRENEURIAL PRACTICE" are as follows: 6. Self-study of training materials provided in m-learning form of delivery 7. Completion of **digital exercises**: 12 exercises (minimum 9 correctly		

completed)

Resources of the Module:

Required Reading:

1) country specific

2) country specific

1) Living a Digital Lifestyle
https://www.buhlebenkosiconsulting.com/post/2017/08/02/living-digital-lifestyle

2) What Is the Digital Lifestyle?

https://swomibuzz.com/en/what-is-the-digital-lifestyle

The articles provide comprehensible information on what we can call digital lifestyle and its main features, advantages and possibilities that we can get from it.

3) What is a Lifestyle Entrepreneur and How to Become One?

https://www.universitylabpartners.org/blog/lifestyle-entrepreneur-how-to-become-one

The article gives an insight into the idea of lifestyle entrepreneurship and what it takes to become the lifestyle entrepreneur.

4) 5 Perks of Starting a Digital Lifestyle Business

https://www.elizabethpottsweinstein.com/digital-lifestyle-business/

Wondering why to become a digital lifestyle entrepreneur? Just read this article and decide for yourself!

5) KEY COMPETENCES FOR LIFELONG LEARNING, © European Union, 2019, PDF ISBN 978-92-76-00476-9 doi:10.2766/569540 NC-02-19-150-EN-N, https://op.europa.eu/en/publication-detail/-/publication/297a33c8-a1f3-11e9-9d01-01aa75ed71a1/language-en

Information on the key competences: what are they, main definitions of the most important points to learn and take into consideration.

6) What Entrepreneurship Is: Competencies and Development

https://baseread.com/what-entrepreneurship-is-competencies-and-development/

7) Open Educational Resources: Sense of initiative and entrepreneurship

http://job-yes.eu/en-gb/oers-view-en

Useful exercises on development of the entrepreneurship competence on making entrepreneurial decisions, what It Takes to Be an Entrepreneur? and more

8) Set of practical exercises – OERs on LIFE-STYLE ENTREPRENEURSHIP

http://self-e.lpf.lt/pathway-category.html?lang=en&category=2

9) Open Educational Resources “The Basics of Lifestyle Entrepreneurship”

http://www.ace-erasmusplus.eu/study-material/index.php?lang=en

This material covers the topics of Entrepreneurship and LSE, explains the benefits of LSE and potential barriers that LSE may face, explains types of LSE; introduces the main principles of effective business management, provides suggestions on how to make market research, draw up a marketing and financial plan, how to make a SWOT analysis, also how to create and run the e-shop.

10) Set of practical exercises – BUSINESS PRINCIPLES AND MARKETING IN LIFESTYLE ENTREPRENEURSHIP

http://self-e.lpf.lt/pathway-category.html?lang=en&category=3

11) How To Start A Blog & Make Money Blogging Fast

https://dopedollar.com/make-money-blogging/

12) 17 Sustainable Business Growth Strategies: Ideas and Examples

13) 7 important steps to sustainable business growth, Hung Le, 22 June, 2018

Terms related with the Module:		
Algorithm Bitcoin Blogger Coding Competence	Digital lifestyle Digital lifestyle **entrepreneurship** Influencer Lifestyle entrepreneur Marketing	Self-employment Soft skills Unicorn Web hosting

1.a. Description of the Module: Description of the Module: "Digital Lifestyle entrepreneurship"

Digital Lifestyle entrepreneurship derives from a symbiosis of two main components: striving to start your own business and being very much engaged in various digital ventures (starting from coding and programming basic algorithms to professional gaming, building systems of web-hosting, bit-coin digging or being an influencer and many more) that can be led by self-taught 21st-century genius. Young people have innovative ideas in the digital field and often dream to establish their own business as modern digital era revolutionists from Apple Inc. and Microsoft did a few decades ago.

Very often young business founders in the digital and other areas lack entrepreneurial skills and business making fundamentals what leads to financial difficulties and short business life span.

Module 3 combines provision of the basic knowledge in the development of the main entrepreneurial competences indispensable to run successful modern business and as well it helps start-uppers to embed their lifestyle into their own entrepreneurship adventure.

The Module can be studied by those who want to establish and/or develop enterprise in the ICT sector or any other lifestyle business venture.

It is very important to mention that successful business venture consists of many different components as understanding business principles and the marketing strategy. And all of them should be taken into consideration by the start-uppers.

You will be introduced to the main competences and skills required to run a successful business and will be able to develop them along with the acquisition of much more useful information and knowledge.

The module consists of four thematic sections:

- What are a digital lifestyle and lifestyle entrepreneurship?
- Competences and soft skills needed to become a successful digital lifestyle entrepreneur
- Business principles and marketing strategies for digital lifestyle entrepreneurship
- Continuous development of your digital start-up

The sections consist of comprehensive and concentrated information on the topic of Digital Lifestyle entrepreneurship.

“What is a digital lifestyle and lifestyle entrepreneurship?” In this chapter digital lifestyle is presented and listed some of the most recent digital lifestyle players and circumstances as well as possibilities that current virtual reality can offer in terms of building your own workplace based on the lifestyle experience

In the chapter “Competences and soft skills needed to become a successful digital lifestyle entrepreneur” you will learn what are competences and soft skills and which of them are most important to become an entrepreneur, how to develop them during your lifetime to stay on track as a successful business owner or executive.

The next chapter, “Business principles and marketing strategies for digital lifestyle entrepreneurship”, focuses on business principles, processes, planning and one of the most important business development areas - marketing. You will understand what are the main components of the successful business, learn how to plan your business activities and principles of creating a winning marketing strategy.

The last chapter is “Continuous development of your digital start-up”, which talks about the further development of your new business, the constraints and challenges and how to overcome them, you will learn about sustainable business growth strategies and will receive practical recommendations, will be able to analyse examples of the good practises on the start-ups development up to becoming Unicorns.

The module will end with a quiz and interactive exercises that will verify the acquired knowledge.

1.b. Summary of the syllabus for the Module: “Digital Lifestyle entrepreneurship”

Digital lifestyle entrepreneurship is a relatively new phenomenon in the business universe, but it is becoming more and more popular because of the attractive way to become independent and self-sufficient and use all advantages of the digital lifestyle and entrepreneurship, as well as to offer new services and jobs for the changing business and social environment. Participants of the Module: “Digital Lifestyle entrepreneurship” will explore the most important elements of the virtual entrepreneurship reality. The proposed training curriculum outlines learning objectives, topics to cover and exercises to help start-uppers to establish their own digital lifestyle business venture and to grow it in the future.
The training is organised as a distance education using mobile learning (m-learning) which enables learning across multiple contexts, through social and content interactions, using personal electronic devices. M-learners use mobile device educational technology at a convenient time.
The Module is recommended for 4 weeks of training. Overall study effort for 4 weeks represents 24 hours of self-study. The Module includes 21 pages of study materials which require to study 3 weeks app. 7 pages per week. The last week is devoted to the preparation of the individual assignment.
The study material is divided into 4 Chapters. By the end of the Training Module “Digital Lifestyle entrepreneurship” participants will have increased knowledge about the digital lifestyle entrepreneurship and business building principles as well as what are the most important competences and skills of the successful

entrepreneur and how to maintain and grow their business overcoming challenges and making a bold statement on the market.
After the successful completion of Module: “Digital Lifestyle entrepreneurship” the participants will gain Certificate of completion.

MODULE 4: INTERNET OF THING IN ENTREPRENEURIAL PRACTICE

The aim of the Module:	
The aim of the "Internet of Things in entrepreneurial practice" module is to provide entrepreneurs with knowledge of this technology, which will allow them to become more interested in the solutions that are possible thanks to it and which may ultimately affect the way in which their business will develop.	
Time duration:	4 weeks (6 hours of self-study per week; 24 hours in total)
ECVET:	1 point
Length of material:	• 20 pages of study materials divided into 4 chapters, • app. 1 chapter per week, • after completion of Chapter IV participant will be asked to do digital exercises
Learning objectives of the Module:	
• The participant will understand what the Internet of Things is and how this technology is already affecting our lives; • The participant will understand the role of IoT in shaping the solutions of the future; • The participant will understand what is role of IoT in Smart Cities • The participant will learn about the impact of this technology on how businesses can create value and how they can benefit from IoT; • The participant will understand how different Industry 4.0 technologies (such as Big Data or Edge Computing) support and influence each other's development.	
Learning outcomes of the Module:	
• to understand what is IoT; • to understand the IoT infrastructure; • to understand the influences of IoT on everyday life; • to learn about the different devices that use IoT; • to gain knowledge about future areas of possible application; • to recognise of what technologies support IoT; • to understand the benefits and risks of using IoT; • to learn how IoT can support Start-ups; • to gain knowledge about the barriers to IoT implementation; • to gain knowledge about the future trends in IoT.	
Teaching methods of the Module:	• student-centred learning • self-directed learning
Teaching tools used:	• single choice set • true/false questions • fill in the blanks • drag the words

<table>
<tr><td colspan="2"></td><td>• summary</td></tr>
<tr><td colspan="3">Topics of the Module:</td></tr>
<tr><td colspan="3">Chapter I. What is the IoT?</td></tr>
<tr><td colspan="3">Duration: 6 hours of self-study</td></tr>
<tr><td colspan="3">The effect after completion of Chapter I:</td></tr>
<tr><td>Knowlegde</td><td>Skills</td><td>Competences</td></tr>
<tr><td>The participant has an knowledge about what is the IoT and how it works; know the example of IoT usuge; know the possibility of the future usage; know the devices and technology needed for IoT; understand the IoT market; know the biggest IoT providers;</td><td>The participant now how IoT devices work; understand what technology is needed for devices; can name examples of IoT devices and technology; can recognise IoT devices; can name examples of use IoT in todays life</td><td>The participant understands the development of IoT and how it will affect our future. The participant is able to notice the IoT solutions around him and sees the potential that this concept brings.</td></tr>
<tr><td colspan="3">Chapter II. Impact of Internet of Things</td></tr>
<tr><td colspan="3">Duration: 6 hours of self-study</td></tr>
<tr><td colspan="3">The effect after completion of Chapter II:</td></tr>
<tr><td>Knowlegde</td><td>Skills</td><td>Competences</td></tr>
<tr><td>The participant has an knowledge about existing applications of IoT solutions; understands how other elements of Industry 4.0 influence IoT development; knows the terms: Big Data, Edge Computing, Machine Learning, Smart Grid; understand</td><td>The participant can recognise smart devices; can find smart solutions for his/her company; can name IoT-related technologies and knows how they work.</td><td>The participant perceives surrounding IoT solutions and knows the impact of this technology on people and the environment.</td></tr>
</table>

what smart home is and know the example of IoT solution in it; understand the possibility impact of the IoT on the community and Earth		
Chapter III. The future of IoT		
Duration: 6 hours of self-study		
The effect after completion of Chapter III:		
Knowlegde	**Skills**	**Competences**
has knowledge of the Smart City and this concept and its elements and sees the application of IoT and its impact on its development; knows ways to measure how smart a city is.	The participant is able to name Smart City solutions and find examples of their application in practice. He can search for the solution he would like to see in his own town.	The participant realises the benefit of IoT in Smart City and see how this technology can improve peoples lifes.
Chapter IV. IoT and start-ups		
Duration: 6 hours of self-study and work with digital exercises		
The effect after completion of Chapter III:		
Knowlegde	**Skills**	**Competences**
The participant has knowledge about different possibility to implement IoT solutions. Know where to look for the funds and know good practices related to IoT in start-ups	The participant different IIoT and IoT; can find best solution to implement IoT for his/her company; can name the object, transmitters, technology and can find use for them; can name the good	The participant understands IoT deployment models and the devices needed to make it work.

	practices; can find a funds	

Requirements for obtaining a certificate of completion:

The minimum requirements for Certificate of completion of Module: "INTERNET OF THING IN ENTREPRENEURIAL PRACTICE" are as follows:

8. Self-study of training materials provided in m-learning form of delivery
9. Completion of **digital exercises**: 12 exercises (minimum 9 correctly completed)

Resources of the Module:

Required Reading:

1) country specific

2) country specific

Recommended Reading:

1) The Internet of Things (IoT) – essential IoT business guide (n.d.). i-SCOOP. Startup Monitor (2018). European Commission, Brussels, EU. [http://tiny.cc/qd48tz]

The Internet of Things (IoT), an essential IoT business guide, allows you to learn about the most important issues related to IoT from a business perspective. The text also includes a description of various subsets of IoT such as: IIoT, CIoT, IoE, IoRT. Nevertheless, one of the most important advantages of this text is the presentation of different IoT solutions, for example in manufacturing or retail business.

2) The European market potential for integrated internet of things and big data services. CBI. (2020) [https://www.cbi.eu/market-information/outsourcing-itobpo/intergrated-internet-things/market-potential]

The CBI (Centre for the Promotion of Imports) has issued a document on IoT and big data, which presents the potential of the European market. It is particularly useful for entrepreneurs who want to know what the state of readiness and absorption of IOT solutions in Europe looks like. An interesting technique used in the text is to leave short notes in the form of "Tips", which will help to show some hints and instructions.

3) country specific

4) country specific

Terms related with the Module:

Industry 4.0 Smart Home Smart City	Smart Cars Beacons Start-up	Machine Learning Big Data

1.a. Description of the Module: "Internet of Things in entrepreneurial practice"

The Internet of Things is a very broad and quite complicated concept, which is increasingly widespread in the media. The concept itself is part of Industry 4.0 and is intended to improve the functionality of businesses through better acquisition and exchange of data and information from various devices.

The scale on which this and other technologies of Industry 4.0 are developing sends out a signal that attention should be paid to them as future drivers of business innovation. In order to be able to deal effectively with the subject of the Internet of Things, it is necessary to know its assumptions and how it affects the world around us and what are the forecasts for the development of this technology.

The Internet of Things is developing in a way that is closely linked to other components of Industry 4.0 such as Big Data and machine learning. It is thanks to these connections that we hear more and more about solution like Smart City, Smart Cars or Smart Home. Many of them are already adapt on the market like for example Beacons technology.

This module was created to introduce the concept of the Internet of Things and to present both its technical assumptions and its impact on individuals and their lives and on businesses and start-ups.

1.l. Summary of the syllabus for the Module: "Internet of Thing in entrepreneurial practice"

The Internet of Things is a solution that has conquered the world and although we use it we are not all even aware of it. This module aims to change that.

The Module is recommended for 4 weeks training. Overall study effort for 4 weeks represents 26 hours of self-study, 6 hours per each chapter. After completed all chapter the participant can test knowledge thanks to the interactive exercises.

The self-study material is divided into 4 Chapters. By the end of the Training Module "Internet of Things in entrepreneurial practice" participants will increase their theoretical knowledge of the Internet of Things, which they will eventually be able to translate into their future/present start-up ideas. This will allow them to gain a competitive advantage, better understand the future direction of the

technology development and improve the running of their business and products/services.

After the successful completion of Module: “Internet of Things in entrepreneurial practice” the participants will gain Certificate of completion.

MODULE 5: INFRASTRUCTURES OF SENSORS IN DAILY BUSINESS USAGE

Programme: ***Erasmus+***

Key Action: Cooperation for innovation and the exchange of good practices

Action Type: Strategic Partnerships for vocational education and training

Project Number: ***2019-1-PL01-KA202-065209***

The aim of the Module:	
To strengthen the quality of start-uppers and entrepreneurs and enhance their professional development through improving digital entrepreneurship competences by a clear idea about what is infrastructure of sensors in daily business usage, digital start-ups and digital scale-ups companies, as a key element of knowledge that should be available for start-ups.	
Time duration:	3 weeks (8 hours of self-study per week; 24 hours in total)
ECVET:	1 point
Length of material:	• 20 pages of study materials divided into 3 chapters, • app. 6-7 pages per week, • the last week is devoted to preparation of individual assignment.
Assignment:	• at the end of study material which has to be sent to tutor/trainer for getting feedback, • the assignment will be prepared using m-learning Documentation tool.
Learning objectives of the Module:	
• to provide knowledge required to understand basic sensor-using terms in start-ups, • to introduce the concept of using of sensors, • to explain how sensors are important in start-ups daily business, • to provide the practical information in what areas sensors can be used in start-ups daily business.	
Learning outcomes of the Module:	
• the participants will have increased knowledge about applying and using the sensors, • the participants will understand how the sensors can be implemented in daily business usage in start-ups, • the participants will also be able to to analyse own start-up and develop plan for implementation of sensors.	
Teaching methods of the Module:	• student-centred learning • M-learning teaching methods
Teaching tools used:	• True/False questions • Single choice set

	• Drag the words • Documentation Tool

Topics of the Module:

Chapter I. How sensors work. Use of sensors in the server room.

Duration: 8 hours of self-study

The effect after completion of Chapter I:

Knowlegde	Skills	Competences
The participant has an integrated knowledge about the basic terms on sensors: (Sensor, Measuring system, Input signal, Sensor range, Sensor resolution, Sensor sensitivity, Cognitive sensor technology), and about using the sensors in server rooms in start-ups.	The participant names the important elements of sensors infrastructure in server rooms.	The participant realises the possible ways and benefits of using the sensors in server rooms in start-ups.

Chapter II. Use of sensors in the Closed Circuit Television Camera (CCTV)

Duration: 8 hours of self-study

The effect after completion of Chapter II:

Knowlegde	Skills	Competences
The participant has an integrated knowledge about Closed Circuit Television Camera.	The participant names the important elements of Closed Circuit Television Camer's infrastructure and know how to use it in start-up.	The participant realises the possible ways and benefits of using the Closed Circuit Television Camera in start-up.

Chapter III. Use of sensors in drones.

Duration: 8 hours of self-study

The participant after completion of Chapter II and self-study of Chapter III:

- developed the plan how to implement sensors' infrastructure in student's own start-up
- completed the digital exercises.

The effect after completion of Chapter III:

Knowlegde	Skills	Competences
The participant has an integrated knowledge about drones.	The participant names the important elements of drones and know how to use it in start-up.	The participant realises the possible ways and benefits of using drones in daily business.

Requirements for obtaining a certificate of completion:

The minimum requirements for Certificate of completion of Module: "Infrastructures of sensors in daily business usage" are as follows:

10. Self-study of training materials provided in m-learning form of delivery
11. Completion of online test: 10 questions (minimum 5 correct answers)
12. Submission of the independent work on topic: How can I use the sensors in my start-up (plan how to implement sensors' infrastructure in student's own start-up: WORD, min. 2.000 –max. 4.000 characters with spaces).

Resources of the Module:

Required Reading:

1) Gill, M., Spriggs, A. (2005). Assessing the impact of CCTV, Home Office Research Study 292, Home Office Research, Development and Statistics Directorate.2) country specific.

2) The History Of Drones (Drone History Timeline From 1849 To 2019) (on-line: https://www.dronethusiast.com/history-of-drones/).

3) Klonowski, A. Zastosowanie kamer termowizyjnych w pomiarze temperatury i wykrywania gorączki u ludzi, 29.04.2020 (on-line: https://www.merserwis.pl/m-blog/item/339-kamery-termowizyjne-temperatura-ludzi.html).

4) Monitoring serwerowni – poznaj najważniejsze informacje na temat bezpieczeństwa tego pomieszczenia, „Chipelectronics" 08.07.2019 (on-line: https://chipelectronics.com/monitoring-serwerowni-poznaj-najwazniejsze-

informacje-na-temat-bezpieczenstwa-tego-pomieszczenia).
Recommended Reading: 1) Skoczyński, W. (2018) Sensory w obrabiarkach CNC, Wydawnictwo Naukowe PWN, 2018 ISBN: 978-83-01-19948-7 The book provides an easy insight into the essentials of sensors. This publication presents a practical implementation of this kind solution based on example of CNC machine tools. You may be an admin of IT network in a firm or an IT specialist looking to update your knowledge. 2) Głowacz, M., Burczyk, A., Hartung M., Integracja sensorów analogowych w systemach monitoringu wizyjnego, „Telekomunikacja cyfrowa – komunikacja i usługi" 2010, Vol. 10, pg. 59-65. (in Polish language) The paper addresses an issue of integration of analog sensors within modern visual surveillance systems that include network cameras. It hepls to understand how to operate with these systems.

Terms related with the Module:		
Closed Circuit Television Camera drone	IP cameras Sensor server room	Video surveilliance systems

1.a. Description of the Module: "Infrastructures of sensors in daily business usage"

Industrial revolution - the so-called Industry 4.0 - made that the business now use a variety of technical infrastructure, especially electronic in applications that were not mentioned 10 years ago. Sensors, whose main task is to capture signals from the environment, their recognition and recording, have become widely used in practically all elements of social and economic life. Often we do not even know that they surround us, let alone what we could do more efficiently, faster and at a lower cost.

The sensor infrastructure in daily business usage seems to be the key element of knowledge that should be available for start-ups. These types of projects, which evolve into companies, most often function in high-risk sectors, where access to modern technologies is key and is the element that provides a competitive advantage. Quick access to data, their often automatic analysis and low costs of obtaining information are the factors that make running a business run by a start-up successful. The turbulence of the changing environment, not only the external one, but also the internal conditions of the start-up's functioning, requires the

speed of making various decisions. Some of them are repetitive, schematic, and the knowledge provided based on sensor data is standard. However, some of them are based on non-standard data, access to which requires first consideration of the necessity to collect them. It is from this moment that it will depend on whether the sensors will help in running the business or whether their potential will be unused. The measurement method itself and the devices used must also be properly selected in terms of what data we want to obtain.

1.l. Summary of the syllabus for the Module: "Infrastructures of sensors in daily business usage"

Industrial revolution - the so-called Industry 4.0 - made that the business now use a variety of technical infrastructure, especially electronic in applications that were not mentioned 10 years ago. Sensors, whose main task is to capture signals from the environment, their recognition and recording, have become widely used in practically all elements of social and economic life. The sensor infrastructure in everyday business use seems to be the key element of knowledge that should be available for start-ups. Participants of the Module: "Infrastructures of sensors in daily business usage" will explore the most important elements related with sensors' infrastructure and practical information how to implement it into start-up daily usage. The proposed training curriculum outlines learning objectives, topics to cover and exercises to help start-ups with implementation of sensors infrastructure.

The training will be conducted in accordance with the methodology of remote training, taking place asynchronously. In order to use the course materials, you must ensure access to a computer or mobile device.

The Module is recommended for 3 weeks training. Overall study effort for 3 weeks represents 24 hours of self-study. The Module includes 20 pages of study materials which requires to study 3 weeks app. 6-7 pages per week, with preparation of individual assignment.

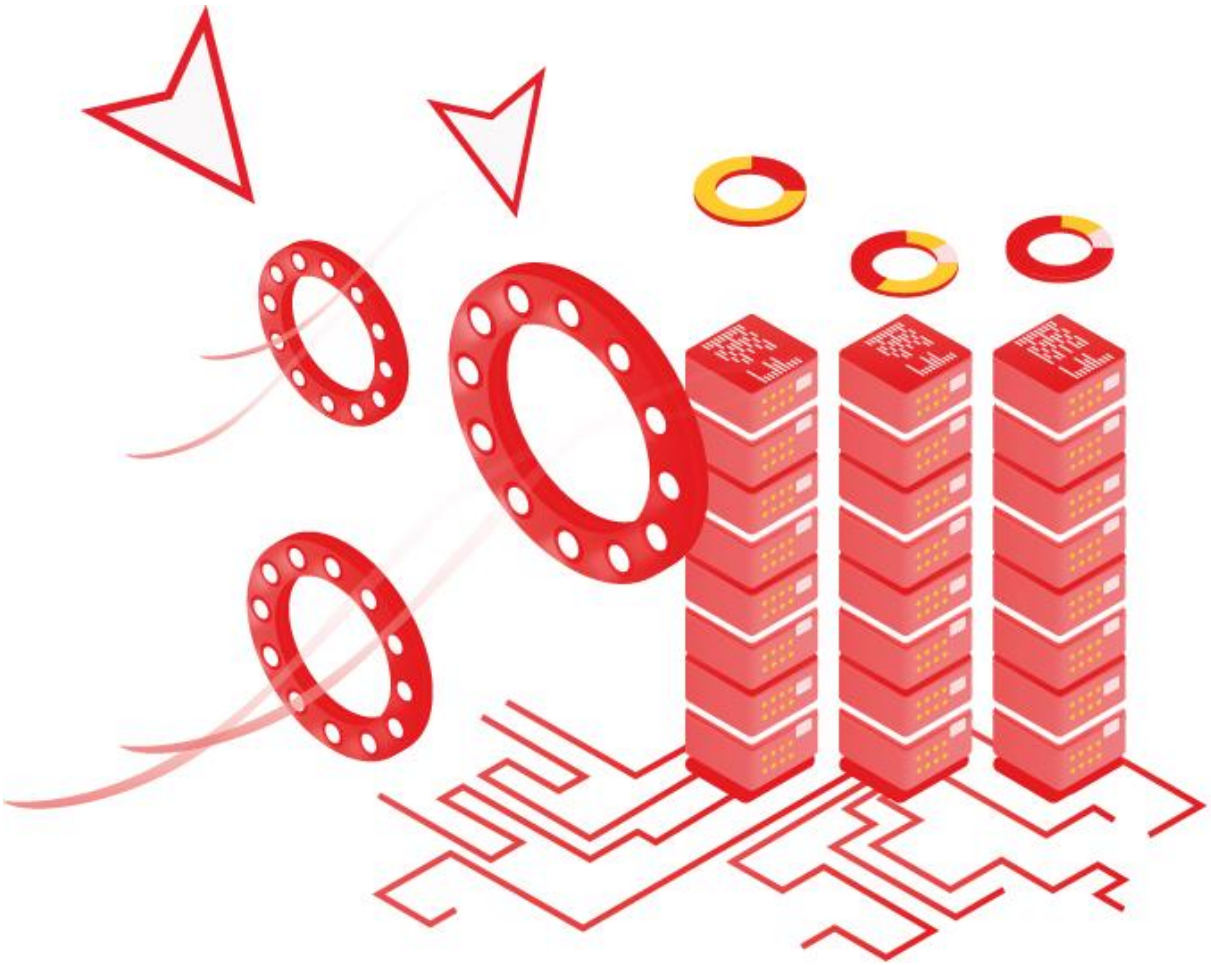
The study material is divided into 3 Chapters. By the end of the Training Module "Infrastructures of sensors in daily business usage" participants will have increased knowledge about IT using devices based on sensors technology into their own start-ups. The participants will understand how to use drones or CCTV and how use the senosors in server rooms. Participants will also be able to analyse using sensors in own start-up and develop plan for its implementation.

After the successful completion of Module: “Infrastructures of sensors in daily business usage” the participants will gain Certificate of completion.The self-study material is divided into 3 Chapters. By the end of the Training Module “Digital start-ups vs. digital scale-ups” participants will have enhanced their professional development through improving digital entrepreneurship competences by a clear idea about what are digital start-ups and digital scale-ups companies, as well how and when to transit from one to another.

After the successful completion of Module: “Digital start-ups vs. digital scale-ups” the participants will gain Certificate of completion.

Co-funded by the
Erasmus+ Programme
of the European Union

MODULE 6: ANALYTICS ALGORITHMS FOR CUSTOMERS BIG DATA



Programme: ***Erasmus+***

Key Action: Cooperation for innovation and the exchange of good practices

Action Type: Strategic Partnerships for vocational education and training
Project Number: ***2019-1-PL01-KA202-065209***

The aim of the Module:	
The aim of the "Analytics Algorithms for Customers Big Data" module is to provide start-uppers with knowledge about the process of examining large and varied data sets (Big Data), to uncover information that can help their organizations make informed business decisions through the use of Analytics and Search Engines.	
Time duration:	5 weeks (5 hours of self-study per week; 25 hours in total)
ECVET:	1 point
Length of material:	• 20 pages of study materials divided into 6 chapters, • after completion of each chapter, the participant will be asked to complete different exercises.
Learning objectives of the Module:	
• To provide knowledge of Big Data and Customer Analytics. • To understand how this data can inform business decisions. • To describe the main tools used to predict customer behaviour. • To understand how this data can inform business decisions. • To offer explanation on the latest best practices at other start-ups. • to develop knowledge and skills through engaging a project set around challenges and problems they may face in the real world.	
Learning outcomes of the Module:	
• to understand the term Big Data and its different sources; • to gain knowledge of Customer Analytics and the various terms and concepts involved. • to learn about the different types of Customer Analytics and insights; • to understand the Data Cycle • to learn how Search Engines work; • to gain knowledge about SEO and SEM; • to be competent in using analytics tools; • to be competent in Search Engine tools; • to be competent in creating a Data Analytics Framework.	
Teaching methods of the Module:	• Game-based learning • Student-centre learning • Project based learning
Teaching tools used:	• Videos • Quizzes and online test • Interactive exercises

<table>
<tr><td colspan="2"></td><td>• Assignment</td></tr>
<tr><td colspan="3">Topics of the Module:</td></tr>
<tr><td colspan="3">Chapter I. What is Big Data?</td></tr>
<tr><td colspan="3">Duration: 5 hours of self-study and digital exercises</td></tr>
<tr><td colspan="3">The effect after completion of Chapter I:</td></tr>
<tr><td>Knowlegde</td><td>Skills</td><td>Competences</td></tr>
<tr><td>The participant has integrated knowledge of the concept of Big Data and Analytics; types; and identifies different examples.</td><td>The participant differentiates the various Big Data sources including, Enterprise Data, VoIP, Social Media, Sensors and Devices.</td><td>The participant understands Big Data Analytics and is aware of the benefits of it for Start-Up purposes.</td></tr>
<tr><td colspan="3">Chapter II. Understanding Customer Data Analytics</td></tr>
<tr><td colspan="3">Duration: 5 hours of self-study and digital exercises</td></tr>
<tr><td colspan="3">The effect after completion of Chapter II:</td></tr>
<tr><td>Knowlegde</td><td>Skills</td><td>Competences</td></tr>
<tr><td>The participant knows what is Data Analytics, types and insights and is familiar with the main types of Customer data: Ads, web traffic, e-commerce, CRM and Net Promoter Score.</td><td>The participant comprehences the Data Cycle: Plan-Do-Check-Act.</td><td>The partipant has deeper knowledge of Insights of data: Regular and actionable.</td></tr>
<tr><td colspan="3">Chapter III. Track and Measure Analytics</td></tr>
<tr><td colspan="3">Duration: 5 hours of self-study and digital exercises</td></tr>
<tr><td colspan="3">The effect after completion of Chapter III:</td></tr>
</table>

Knowlegde	Skills	Competences
The participant has knowledge about metrics and dimensions, and its different types.	The participant identifies the various acquisition-related metrics, Behaviour-related metrics, Conversion-related metrics and the various dimensions.	The participant understands and knows how to work with the various metrics and dimensions analytics provide.
Chapter IV. Search Engines		
Duration: 4 hours of self-study and digital exercises		
The effect after completion of Chapter IV:		
Knowlegde	**Skills**	**Competences**
The participant has knowledge of the basics of Search Engines	The participant understand the difference bewteen organic search and paid search; understands how to get discovered by using search engines; and comprehends the SEO process.	The participant knows how to choose keywords and has deeper knowledge SEO and SEM.
Chapter V. Case Studies		
Duration: 1 hour of self-study		
The effect after completion of Chapter V:		
Knowlegde	**Knowlegde**	**Knowlegde**
The participant has knowledge of how Big Data analytics is used in	The participant has knowledge of how Big Data analytics is used to	The participant has knowledge of how Big Data analytics is used in

Large, Medium and Small Enterprises.	reach more audiences In events.	Big Campaigns.
Chapter VI. Setting up your Data Analytics Framework		
Duration: 5 hours of practice		
The effect after completion of Chapter VI:		
Competences	**Competences**	**Competences**
The participant can set up an Analytics Framework for start-ups purposes.	The participant can apply the knowledge learnt during the module on the Analytics framework.	The participant can adapt the framework to use it on his/her own company.
Requirements for obtaining a certificate of completion:		
The minimum requirements for Certificate of completion of Module: "ANALYTICS ALGORITHMS FOR CUSTOMERS BIG DATA" are as follows: 13. Self-study of training materials provided in m-learning form of delivery 14. Completion of **digital exercises**: 12 exercises (minimum 9 correctly completed) 15. Submission and successfully completion of the Assignment: **Setting up your Analytics Framework.**		
Resources of the Module:		
Required Reading: 1) Brand, Wiley. (2013) Customer Analytics For Dummies, IBM Limited Edition. ISBN 978-1-118-67958-6 (pbk); ISBN 978-1-118-67979-1. 2) Clay B., Sparza, E. (2013) Search Engine Optimization for Dummies, IBM Limited Edition. ISBN: 978-0-470-37973-8 3) Chande, Suraj. (2015). Google Analytics -Case study. 4) Purcell, Bernice. (2012). Emergence of "Big Data" technology and analytics. Journal of Technology Research. 4. 5) Riahi, Youssra. (2018). Big Data and Big Data Analytics: Concepts, Types and Technologies. 5. 524-528. 10.21276/ijre.2018.5.9.5.		
Recommended Reading: 1) English: Bonacchi, Massimiliano & Perego, Paolo. (2019). Customer Analytics: Definitions, Measurement and Models: Creating Value with Customer Analytics. 10.1007/978-3-030-01971-6_2.		

2) Portuguese: Cabrera-Sánchez, Juan-Pedro & Villarejo-Ramos, Ángel. (2019). Factors affecting the adoption of Big Data analytics in companies. Revista de Administração de Empresas. 59. 413-427. 10.1590/S0034-759020190607.

3) Spanish: Pazmiño, José & Acurio, Mónica & Paredes, Adela. (2017). Big Data Analytics: Un aporte en las soluciones empresariales. Pro Sciences. 1. 21. 10.29018/issn.2588-1000vol1iss2.2017pp21-25.

Terms related with the Module:		
Big Data Analytics Insights	Keywords SEO SEM	Metrics Dimensions Search Engines

6.a. Description of the Module: "Analytics Algorithms for Customers Big Data

Nowadays Big Data is being used by companies to provide customer insights by analyzing and predicting customer behaviour through Analytics. Start-uppers are not an exception and should learn the process of examining large and varied data sets (big data), to uncover information that can help their organizations make informed business decisions.

For all these reasons participants will be introduced into Big Data and Specially Customer Analytics. On a first stage, the participant will learn and understand what Big Data and Customer Analytics are, the different categories of data, and sources. They will furthermore learn how to track, measure, and process this data. Special emphasis will be put on practical lessons as the subject requires applied methods.

The participant will also learn how to make their company more visible and successful by making an appropriate use of this data and getting introduced into Search Engines.

They will furthermore learn how Big Data Analytics are being used by companies at all levels: large enterprises and SMEs, and even by public authorities to build campaigns or organize big events.

In the last chapter of this module, participants will create a framework for data analytics to apply the knowledge and skills learned on this module and later use it on their own Start-ups.

Innovative teaching methods approaches, and activities will be used to catch the participants attention. These will include Game-based learning, hands-on approach, project-based learning and student-center learning. Exercises will be based on interactive HTML content that will be used on m-learning tools such as "Fill in the blanks", "drag the words" or "guess the answer" in order to make the learning process easier and enjoyable.

M-learning requires a tech device often connected to other apps that can cause distraction in the learning process. It is highly recommended to switch all these apps off while getting trained as Big Data Analytics is a process that requires concentration.

6.l. Summary of the syllabus for the Module: "Analytics Algorithms for Customers Big Data"

Big Data Analytics in today's business and technology world, is indispensable. The Big Data technologies and initiatives are rising to analyse this data for gaining insights that can help in making strategic decisions. Participants of the Module "Analytics algorithms for Customers big data" will be introduced into Big Data and Specially Customer Analytics and learn its benefits for their Start-ups after completing the module.
The training is organised as a distance education using mobile learning (m-learning) which enables learning across multiple contexts, through social and content interactions, using personal electronic devices. M-learners use mobile device educational technology at their convenient time.
The Module is recommended for 5 weeks training. The overall study effort for 5 weeks represents 25 hours of self-study and practice. The Module includes 20 pages of study materials which require to study of approx. 4 pages per week. During the last week, participants will prepare their individual assignment.

The study material of the Module is divided into 6 Chapters. By the end of the entire Training Module "Analytics Algorithms for Customers Big Data", participants will have an increased knowledge about the subject of Big Data and Customer Analytics and the various terms and concepts involved. The participants will be familiar with the different types of Customer Analytics and Insights and will understand the Data Cycle. Participants will furthermore have learned how Search Engines work and they will be able to create their own Data Analytics framework which they will later use on their own Start-ups.
After the successful completion of Module: "Analytics Algorithms for Customers Big Data" the participants will gain Certificate of Completion.

MODULE 7: CYBERSECURITY -PROTECT YOUR START-UP

Programme: ***Erasmus+***

Key Action: Cooperation for innovation and the exchange of good practices

Action Type: Strategic Partnerships for vocational education and training

Project Number: ***2019-1-PL01-KA202-065209***

The aim of the Module:	
The aim of the "CYBERSECURITY –PROTECT YOUR START-UP" module is to provide entrepreneurs with knowledge on cybersecurity and ways how to protect their start-up.	
Time duration:	4 weeks (6 hours of self-study per week; 24 hours in total)
ECVET:	1 point
Length of material:	• 20 pages of study materials divided into 4 chapters, • app. 1 chapter per week,
Learning objectives of the Module:	
• To provide knowledge required to understand basic cybersecurity terms in start-ups. • To introduce the concept of the Security policy, including threat identification, their mitigation, incident response plans and recovery plans. • To explain management related issues in the start-up security. • To explain technology related issues in the start-up security and to provide the practical information how to mitigate them.	
Learning outcomes of the Module:	
• knowledge in the area of cybersecurity in the context of start-up company • how to create Security policy, • what are main managerial security issues, • what are main technological issues. • how to develop Security policy based on knowledge about managerial and technological issues • how to protect some sensitive company assets • how to mitigate risks and consequences of the most frequent security incidents • to analyse own start-up and develop first version of Security policy for their companies	
Teaching methods of the Module:	• student-centred learning • self-directed learning
Teaching tools used:	• single choice set • true/false questions • drag the words • documentation tool
Topics of the Module:	

Chapter I. Security policy		
Duration: 6 hours of self-study		
The effect after completion of Chapter I:		
Knowledge	**Skills**	**Competences**
The participant has an integrated knowledge about Security policy, understand its purpose as a whole, structure and purpose of particular parts in the context of start-up company.	The participant names security threats stem from the various activities carried out by start-up and can propose some measure to mitigate identified threats.	The participant realises the benefit of formalising/documenting Security policy, including incident response plan and recovery plan for the start-up company.
Chapter II. Common threats		
Duration: 6 hours of self-study		
The effect after completion of Chapter II:		
Knowledge	**Skills**	**Competences**
The participant has an integrated knowledge about various type of threats start-up is exposed to.	The participant names the main categories of threats and its subcategories.	The participant realises the benefits of threat categorization and can benefits from the step by step study of particular threat category.
Chapter III. Management security issues		
Duration: 6 hours of self-study		
The effect after completion of Chapter III:		
Knowledge	**Skills**	**Competences**
The participant has an integrated knowledge about management of	The participant names the importance of managerial issues in	The participant realises the benefit of start-up managerial risk assessment into everyday

security, risk assessment and security Control.	the start-up security, including physical and infrastructure issues, human resource issues and legal aspect issues.	start-up life.
Chapter IV. Technological security issues		
Duration: 6 hours of self-study and work with digital exercises		
The effect after completion of Chapter IV:		
Knowledge	**Skills**	**Competences**
The participant has an integrated knowledge about technological aspects of security and issues stem from them.	The participant names the technological issues and can explain their basic principles. practices; can find a funds	The participant realises the benefits of understanding basics of technological security issues and can benefit from their understanding.
Requirements for obtaining a certificate of completion:		
The minimum requirements for Certificate of completion of Module: "Cybersecurity –protect your start-up" are as follows: 16. Self-study of training materials provided in m-learning form of delivery 17. Completion of online test: 10 questions (minimum 5 correct answers) 18. Submission of the independent work on topic: Steps to effective cybersecurity for my start-up (plan how to assure cybersecurity of student own start-up: WORD, min. 2.000 –max. 4.000 characters with spaces)		
Resources of the Module:		
Required Reading: 1) "Site Security Handbook," RFC 2196, https://tools.ietf.org/html/rfc2196, 1997. Publication from the Internet Society (ISOC) and its associated bodies about how to create Security policy. Briefly and clearly specifies steps required to create Security policy 2) W. Stalling and . L. Brown, Computer security : principles and practice, Hoboken, New Jersey: Pearson Education, Inc, 2018.		
Recommended Reading: 1) P. Bowen, J. Hash and M. Wilson, Information Security Handbook: A Guide		

for Managers, NIST Special Publication 800-100, 2006. Available at https://nvlpubs.nist.gov/nistpubs/Legacy/SP/nistspecialpublication800-100.pdf Document published by American National Institute of Standards and Technology 2) Vacca, John R. Computer and information security handbook. Cambridge, MA: Morgan Kaufmann Publishers, 2017 Alternative to Stalling's book. 3) M. Tumbarello, Mastering windows security and hardening: protect your windows server and system from intruders,... malware attacks, and other cyber threats, Packt Publishing, Limited, 2020. MS Windows specific recommendation for improving operating systems security 4) D. A. Tevault, Mastering Linux Security and Hardening : Protect Your Linux Systems from Intruders, Malware Attacks, and Other Cyber Threats, 2nd Edition., Birmingham: Packt Publishing, Limited, 2020. Linux{UNIX specific recommendation for improving operating systems security.3) country specific

Terms related with the Module:		
Cybersecurity	Start-up	Mitigation

1.a. Description of the Module: "CYBERSECURITY -PROTECT YOUR START-UP"

Many, especially young people have a new innovative idea. They create an innovative start-up which is finally starting to generate some business. Small in size and usually not having enough resources and expertise of all kind, start-up has to learn that, out of nowhere, they can have a major security breach. It may happen that everything they have been pursuing and striving for will come to naught. Start-up might think that small businesses are unlikely targets for cybercriminals but, sadly, this is not the case. Each year, thousands of small companies are victims of phishing, malware, hacking, and other types of cyberattacks.

Cyberattacks are on the rise, specifically targeting highly regulated industries like healthcare, financial services and legal. Educating start-ups on cybersecurity, what to watch for and how to detect attacks has never been more important. To help them get started, the proposed training curriculum outlines learning objectives, topics to cover and exercises to help keep start-ups safe from cybersecurity attacks. It is critical that start-uppers understand the risks of cyberattacks, how to combat cybersecurity at an organization-level and how to protect start-ups from attacks.

It is especially important as cyberattacks against big companies are well-publicized by the news media, while attacks against small firms generate little attention. This can give small businesses a false sense of security. Yet, small firms are generally more vulnerable than large ones because they have fewer resources to devote to security.

It means that cybersecurity training is crucial to keep start-ups educated on the latest cybersecurity threats and prevention methods. Furthermore, the knowledge gained during the training will be a big help also for those start-ups which needs to choose third party provider for start-up security even if do not have any education, knowledge and skills to protect company.

1.l. Summary of the syllabus for the Module: "CYBERSECURITY –PROTECT YOUR START-UP"

Cybersecurity has become instrumental to economic activity and human rights alike. But as digital technologies penetrate deeply into almost every aspect of human experience, a broad range of social-political-economic-legal-ethical-military and other considerations have come to envelop the cybersecurity landscape. Participants of the Module: "Cybersecurity –protect your start-up" will explore the most important elements that shape the playing field on which cybersecurity problems emerge and are managed. The proposed training curriculum outlines learning objectives, topics to cover and exercises to help keep start-ups safe from cybersecurity attacks.
The training is organised as a distance education using mobile learning (m-learning) which enables learning across multiple contexts, through social and content interactions, using personal electronic devices. M-learners use mobile device educational technology at their convenient time.
The Module is recommended for 4 weeks training. Overall study effort for 4 weeks represents 24 hours of self-study. The Module includes 21 pages of study materials which requires to study 3 weeks app. 7 pages per week. The last week is devoted to preparation of individual assignment.
The study material is divided into 4 Chapters. By the end of the Training Module "Cybersecurity –protect your start-up" participants will have increased knowledge about Computer security including security threats, their mitigation and recovery from the security incidents. The participants will understand what to do to protect their infrastructure (physical assets, computer systems, data etc.) and how to

minimize risks and consequences of security incidents. Participants will also be able to develop and maintain Security plan for their start-ups.
After the successful completion of Module: "Cybersecurity –protect your start-up" the participants will gain Certificate of completion.

AUTHORS:

Module 1 - Mindshift Talent Advisory (Portugal)

Module 2 - GRANTXPERT CONSULTING LIMITED (Cyprus)

Module 3 - SOCIAL INNOVATION FUND SIF (Lithuania)

Module 4 - Danmar Computers (Poland)

Module 5 - Rzeszow Regional Development Agency (Poland)

Module 6 - Sea Teach S.L. (Spain)

Module 7 - TECHNICAL UNIVERSITY OF KOSICE (Slovakia)

APPENDIX - GLOSSARY

Module 1: "Digital start-ups vs. digital scale-up"	
Business angel	Is a person of high-net-worth who invests their personal wealth in early-stage businesses.
Digital start-up	When the main assets of a start-up are linked to technological investments.
Entrepreneur	A person who sets up a business or businesses, taking on financial risks in the hope of profit.
Growing	Adding resources at the same rate that is adding revenue.
Product/market fit	Means being in a good market with a product that can satisfy that market.
Scale-up	Is a company at a distinct phase of growth. The company has now outgrown the early start-up years, and is demonstrating high-growth and big potential. These are the companies that investors are looking to invest in, and that can go on to create a lot of jobs. The OECD defines high-growth as a company that has achieved growth of 20% or more in either employment or turnover year-on-year for at least two years, and have a minimum employee count of 10 at the start of the observation period.
Scaling	Adding revenue at an exponential rate while only adding resources at an incremental rate.
Start-up	A young business venture, under about 5 years old, with innovation at the core of their product or service offering, and plans to rapidly scale. Their business model often aims to be disruptive to incumbent sectors. Start-ups often share cultural similarities in working practices, conventions and ambition.
Module 2: "Circular Economy in your start-up"	
Anaerobic digestion	Breaking down biological material in an environment without oxygen. This process is used to generate biogas, which is used

	as a fossil fuel replacement for electricity and heat generation as well as conversion into gas.
Bio-based material	A material that is partially, or entirely made of biomass.
Biodegradable materials	A material which microorganisms can break down into natural elements (i.e. water, biomass, etc.).
Blue economy	Movement for solutions being determined by their local environment characteristics, emphasizing gravity as the primary source of energy.
By-product	A material or substance created when processing or manufacturing something else.
Circular economy	A perspective in which the economic value of materials is optimized over time. This calls for minimal raw material extraction, reintroduction of materials already in the economy and no waste.
Compostable materials	Materials that can be disposed with biological materials and decay into nutrient-rich material.
Composting	Treatment process that decomposes organic matter in an oxygenated environment. The result is nutrient-rich fertilizer or soil amendment.
Critical raw materials	Raw materials that are essential to the economy and have high supply risk due to limited quantities, suppliers and access.
Dematerialization	Delivering a product using a percentage or none of the mass compared to the conventional product.
Design for recyclability	Design principle that calls for the end-of-life accounting of how the product will be collected and recycled.
Design for repairability	Design principle that calls for products to be manufactured using fasteners, materials and processes that allow them to be easily be fixed.
Design for sustainability	Design principle that calls for the optimization of environmental and social benefits across a product or service's life cycle.
Digitization	Conversion of analog or physical products to digital resources.

Eco-efficiency	The economic value of a product or service compared to its natural capital costs.
Footprint	The impact of a product or service across its life cycle. One can calculate a product's carbon, water, energy and material footprints, for example. This is similar to an LCA except that footprints typically only evaluate one environmental issue.
Green engineering	Designing products and processes to minimize environmental impacts and protect human health without compromising economic value.
Horizontal recycling	Material recycling that allows for reuse in a comparable function.
Integrated waste management	Managing solid waste from the point of consumer disposal through collection, sorting, reuse and recycling.
Lean manufacturing	A manufacturing strategy that aims to minimize all waste (i.e. time, money, resources) through high quality processes.
Lock-in	Situation in which an established design or manufacturing process discourages innovation.
Recyclable materials	Materials that can be recycled.
Remanufacturing	Process of recovery, disassembly, repair and sanitizing components or parts for resale and reuse.
Sustainable consumption	The use of goods and services that address the requirements of today's population without compromising the needs of future generations to meet theirs.
Sustainable materials management	Management approach that calls for the the reduction of environmental impacts without compromising economic productivity or social equity.
Upcycle	Use of secondary products, components or materials that results a higher economic value of that material.
Module 3: "Digital Lifestyle entrepreneurship"	
Algorithm	A process or set of rules to be followed in calculations or other problem-solving operations, especially by a computer.
Bit-Coin	A type of digital currency in which a record of transactions is

	maintained and new units of currency are generated by the computational solution of mathematical problems, and which operates independently of a central bank.
Blogger	A person who regularly writes material for a blog.
Coding	Computer programming, process of designing and building an executable computer program to accomplish a specific computing result or to perform a specific task.
Competence	The ability to do something successfully or efficiently.
Digital lifestyle	Living attached to the digital devices and constantly connected. Digital intertwining will only continue to become more prominent in the future.
Digital lifestyle entrepreneurship	Combination of the digital lifestyle and lifestyle entrepreneurship when people passionate about their digital lifestyle turn it into the business.
Influencer	A person with the ability to influence potential buyers of a product or service by promoting or recommending the items on social media.
Lifestyle entrepreneur	An individual who creates a business for the purpose of changing their lifestyle instead of making profits. This type of entrepreneur usually wants to create a business because they are passionate about it and believe that it will be personally rewarding for them.
Marketing	The action or business of promoting and selling products or services, including market research and advertising.
Self - employment	The state of working for oneself as a freelance or the owner of a business rather than for an employer.
Soft skills	Soft skills are a combination of people skills, social skills, communication skills, character or personality traits, attitudes, career attributes, social intelligence and emotional intelligence quotients, among others, that enable people to navigate their environment, work well with others, perform well, and achieve their goals with complementing hard skills.
Unicorn	A unicorn is a term in business world to indicate a privately

	held startup company valued at over $1 billion. The term was coined in 2013 by venture capitalist Aileen Lee, choosing the mythical animal to represent the statistical rarity of such successful ventures.
Web hosting	Web hosting is a service that allows organizations and individuals to post a website or web page onto the Internet. A web host, or web hosting service provider, is a business that provides the technologies and services needed for the website or webpage to be viewed in the Internet.
Module 4: "Internet of Things in entrepreneurial practice"	
Beacons	It is a small device that uses Bluetooth technology to connect to mobile devices such as a tablet or smartphone. It is often used in closed spaces where it works well, for example in museums. When you approach an exhibition, the recorded guide in your headphones is automatically activated.
Industry 4.0	The fourth industrial revolution, which is based on technologies such as big data, IoT, cloud computing or, for example, 3D printing. Its aim is to automate work and create SMART factories.
Internet of Things	The concept that devices can exchange information between themselves without human integration.
Machine learning	This is an area of artificial intelligence which consists in the fact that, thanks to special algorithms, machines can learn by experience.
Smart Home	This is a concept in which the house is equipped with many devices and sensors that can be managed (for example, lighting, energy, etc.).
Smart City	This is a concept that says that a city makes strong use of ICT for management, which improves the efficiency of the city's infrastructure, greater security and a better quality of life for its residents.
Smart Cars	A concept whereby cars are strongly equipped with sensors and electrical devices to manage them, for example by using of mobile application. Smart Cars include autonomous cars or

	solutions such as mirrors that scan the retina of the eye detecting the owner.
Module 5: "Infrastructures of sensors in daily business usage"	
Closed Circuit Television Camera	An important crime prevention and security measure, which use of cameras that collect images, which are transferred to a monitor-recording device of some sort, where they are available to be watched, reviewed and/or stored.
Drone	Any unpiloted aircraft, sometimes referred to as "Unmanned Aerial Vehicles" (UAVs). Drones can carry out an various range of tasks: used for entertainment purposes by business to military.
IP cameras	A type of digital video camera that receives control data and sends image data via an IP network.
Sensor	An electronic or optic device (sometimes also a module, machine, or subsystem) whose purpose is to detect changes in the widely understood environment and send the information to other electronics, frequently a computer processor.
Server room	A separate room for computer servers, ususually air-conditioned.
Video surveilliance systems	A video systems that allows remote video monitoring, facility protection, monitor operations, loss prevention, vandalism deterrence, employee safety, parking lots, event video surveillance, public safety, traffic monitoring, outdoor perimeter security.
Module 6: "Analytics Algorithms for Customers Big Data"	
Analytics	Analytics is the scientific process of discovering and communicating the meaningful patterns which can be found in data. It is concerned with turning raw data into insight for making better decisions. Analytics relies on the application of statistics, computer programming, and operations research in order to quantify and gain insight to the meanings of data.
Big data	Big data refers to the large, diverse sets of information that

	grow at ever-increasing rates. It encompasses the volume of information, the velocity or speed at which it is created and collected, and the variety or scope of the data points being covered. Big data often comes from multiple sources and arrives in multiple formats.
Bounce rate	Bounce rate is the percentage of single page visits (or web sessions). It is the percentage of visits in which a person leaves a website from the landing page without browsing any further.
Conversion rate	Conversion rate is the percentage of visitors to a website that complete a desired goal (a conversion) out of the total number of visitors. A high conversion rate is indicative of successful marketing.
Cookies	Cookies are small files which are stored on a user's computer. They are designed to hold a modest amount of data specific to a particular client and website and can be accessed either by the web server or the client computer.
CRM	Customer relationship management (CRM) is a technology for managing all company's relationships and interactions with customers and potential customers. A CRM tool lets companies store customer and prospect contact information.
Customer Data	Customer data is the behavioural, demographic and personal information about customers collected by businesses and marketing companies to understand, communicate and engage with customers.
Data Cycle	The Data Cycle is a popular way to help companies make the most of the information collected from various online marketing activities. It is used to help companies prepare, action, and inform on business decisions online.
Dimension	A dimension is a descriptive attribute or characteristic of an object that can be given different values. For example, a geographic location could have dimensions called Latitude, Longitude, or City Name. Values for the City Name dimension could be San Francisco, Berlin, or Singapore.
e-commerce	Also known as electronic commerce or internet commerce,

	refers to the buying and selling of goods or services using the internet, and the transfer of money and data to execute these transactions.
Exit rate	Exit rate analysis is the percentage of visitors to a page on the website from which they exit the website to a different website. The visitors just exited from that specific page.
Insights	Insight is the value obtained through the use of analytics. The insights gained through analytics are incredible powerful and can be used to grow businesses while identifying areas of opportunity.
Keywords	A keyword is a term used in digital marketing to describe a word or a group of words an Internet user uses to perform a search in a search engine or search bar. In an SEO strategy, keywords are very important and should be the core of any copy written for the web (present in the content, titles and SEO elements).
Metric	A quantitative measurement of data. It is a Count (a total or a sum), an average, or a Ratio (one number divided by another number). Metrics are measurable.
Net Promoter Score	Is a management tool that can be used to gauge the loyalty of a firm's customer relationships. It serves as an alternative to traditional customer satisfaction research and is claimed to be correlated with revenue growth.
Population Segmentation	Utilizes data analytics to divide a heterogeneous population into parsimonious and relatively homogenous groups with similar healthcare characteristics.
Search Engines	A program that searches for and identifies items in a database that correspond to keywords or characters specified by the user, used especially for finding particular sites on the World Wide Web.
SEM	SEM is a form of Internet marketing that involves the promotion of websites by increasing their visibility in search engine results pages (SERPs) primarily through paid advertising.

SEO	SEO stands for Search Engine Optimization, which is the practice of increasing the quantity and quality of traffic to a website through organic search engine results.
Sessions	A session is defined as a group of interactions one user takes within a given time frame on a website.
Social media	Social media refers to websites and applications that are designed to allow people to share content quickly, efficiently, and in real-time.
Users	Is the number of new and returning people who visit a certain site during a set period of time.
VoIP	Voice over Internet Protocol is a category of hardware and software that enables people to use the Internet as the transmission medium for telephone calls by sending voice data in packets using IP.
Web traffic	Is the number of web users who travel to any given website.
Module 7: "Cybersecurity - protect your start-up"	
Cloud computing	A means to offer computing services to the public or for internal use through remote services. Most cloud computing systems are based on remote virtualization where the application or operating environment offered to customers is hosted on the cloud provider's computer hardware.
Cyberattack	Any attempt to violate the security perimeter of a logical environment. An attack can focus on gathering information, damaging business processes, exploiting flaws, monitoring targets, interrupting business tasks, extracting value, causing damage to logical or physical assets or using system resources to support attacks against other targets.
Cybersecurity	The efforts to design, implement, and maintain security for an organization's network, which is connected to the Internet. It is a combination of logical/technical-, physical- and personnel-focused countermeasures, safeguards and security controls.
Data breach	The occurrence of disclosure of confidential information, access to confidential information, destruction of data assets

	or abusive use of a private IT environment.
Firewall	A security tool, which may be a hardware or software solution that is used to filter network traffic.
Hacker	A person who has knowledge and skill in analyzing program code or a computer system, modifying its functions or operations and altering its abilities and capabilities.
Malware	Any code written for the specific purpose of causing harm, disclosing information or otherwise violating the security or stability of a system.
Outsider threat	The likelihood or potential that an outside entity, such as an ex-employee, competitor or even an unhappy customer, may pose a risk to the stability or security of an organization.
Outsourcing	The action of obtaining services from an external entity. Rather than performing certain tasks and internal functions, outsourcing enables an organization to take advantages of external entities that can provide services for a fee.
Phishing	A social engineering attack that attempts to collect information from victims. Phishing attacks can take place over e-mail, text messages, through social networks or via smart phone apps.
Risk management	The process of performing a risk assessment and evaluating the responses to risk in order to mitigate or otherwise handle the identified risks.
Threat assessment	The process of evaluating the actions, events and behaviors that can cause harm to an asset or organization.
Vulnerability	Any weakness in an asset or security protection which would allow for a threat to cause harm.