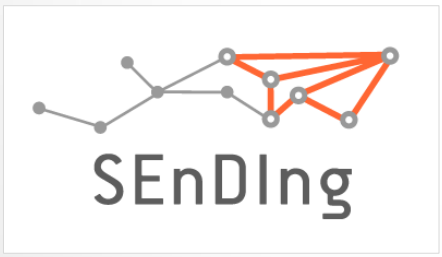

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SEnDIng

D7.2

DISSEMINATION AND PROMOTIONAL MATERIAL

Editor(s):	Ioannis Voyiatzis, Vasileios Gkamas
Responsible Organisation(s):	Greek Computer Society, University of Patras
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Deliverable factsheet

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Reviewer(s):	Maria Rigou (UPATRAS)
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Delivery Slip

	Name	Partner	Date
From	Ioannis Voyiatzis, Vasileios Gkamas	GCS, UPATRAS	11/01/2021
Reviewed by	Maria Rigou	UPATRAS	12/01/2021
Approved by	Maria Rigou	UPATRAS	12/01/2021

PROJECT SUMMARY

SEnDIng project aims to address the skills' gap of Data Scientists and Internet of Things engineers that has been identified at the ICT and other sectors (e.g. banking and energy) at which Data Science and Internet of Things have broad applications. To achieve this goal, SEnDIng will develop and deliver to the two aforementioned ICT-related occupational profiles two learning outcome-oriented modular VET programmes using innovative teaching and training delivery methodologies.

Each VET program will be provided to employed ICT professionals into three phases that include: (a) 100 hours of on-line asynchronous training, (b) 20 hours of face-to-face training and (c) 4 months of work-based learning. A certification mechanism will be designed and used for the certification of the skills provided to the trainees of the two vocational programs, while recommendations will be outlined for validation, certification & accreditation of provided VET programs.

Furthermore, SEnDIng will define a reference model for the vocational skills, e-competences and qualifications of the targeted occupational profiles that will be compliant with the European eCompetence Framework (eCF) and the ESCO IT occupations, ensuring transparency, comparability and transferability between European countries.

Various dissemination activities will be performed – including the organization of one workshop at Greece, Bulgaria and Cyprus and one additional conference at Greece at the last month of the project – in order to effectively disseminate project's activities and outcomes to the target groups and all stakeholders. Finally, a set of exploitation tools will be developed, giving guides to stakeholders and especially companies and VET providers, on how they can exploit project's results.

TABLE OF CONTENTS

1 Introduction

This deliverable presents the main dissemination material developed during the project for dissemination purposes aiming to increase the visibility of the project among its target groups. This dissemination material is:

- A project tri-fold in English, Greek and Bulgarian.
- A project flyer in English, Greek and Bulgarian.
- 2 promotional flyers for the 2 VET programs in English, one addressing companies and another IT professionals.
- 2 press releases in English, one published at the beginning and another at the end of the project.

The aforementioned material has been uploaded at the project website:

http://sending-project.eu/index.php/en/dissemination/other-public

In addition, 6 newsletters have been published. For more information, please refer to the deliverable "D7.5: SEnDIng Newsletters".

2 Annexes

The following annexes are attached at this document:

- Annex 1: Project tri-fold in English, Greek and Bulgarian
- Annex 2: Project flyer in English, Greek and Bulgarian
- Annex 3: Promotional flyers for the 2 VET programs
- Annex 4: Press Releases

Annex 1

Project tri-fold in English, Greek and Bulgarian

- Delivery of **vocational trainings** to address the skills gap of Data Scientists and IoT engineers employed in the ICT and other economic sectors with increased demands for these occupational profiles. Trainings will be delivered into three phases: e-learning, face-to-face and work-based learning.
- Design of a mechanism that will be used for the **certification** of skills and competences acquired and provision of recommendations for the validation, certification & accreditation of provided VET programs, as well as NQFs, EQF and ECVET alignment.
- Production of a set of toolkits, guiding stakeholders and especially companies and VET providers on how to exploit project's results.
- Organization of three **workshops** (in Greece, Bulgaria and Cyprus) and a **final conference** (in Greece during the last month of the project) to effectively disseminate project's activities and outcomes to target groups and all related stakeholders.

PROJECT INFO

Program: Erasmus+ KA2: Cooperation for innovation and the exchange of good practices - Sector Skills Alliances

Call ID: EACEA-04-2017

Coordinator: University of Patras

Duration: 36 months

Start Date: 1st December 2017

End Date: 30th November 2020

Number of Partners: 12, from 4 countries

Online: www.sending-project.eu

PROJECT PARTNERS

The consortium consists of higher education institutions (University of Patras, University of Cyprus), VET providers (Olympic Training and Consulting, ESI Center Eastern Europe, University of Cyprus), private-sector companies (Universal Learning Systems, Yodiwo, Mixanografiki, Code Runners, Nemetschek), associations of IT companies and IT scientists (Greek Computer Society, Bulgarian Association of Software Companies), as well as a certification organization (Unicert). Higher educational institutions involved in the project provide the European ICT-related sectors with research results and highly qualified IT graduates, while VET providers offer vocational training, lifelong learning, studies, seminars, training material and community initiatives. Participating companies are active at the areas of Data Science and/or Internet of Things and associations materialize their efforts to support the establishment of a well-developed system of formal and informal education in the field of ICT. The certification organization will undertake the design of the skills certification mechanism aligned with EU standards.

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SEnDIng

Sector Skills Alliance for the design and delivery of innovative VET programmes to Data Science and Internet of Things professionals

(591848-EPP-1-2017-1-EL-EPPKA2-SSA)

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AIM

The SEnDIng project aims to address the skills' gap of Data Scientists and Internet of Things engineers identified at the ICT and other sectors (e.g. banking and energy) where Data Science and Internet of Things have broad applications.

SEnDIng is targeted at developing and delivering outcome-oriented, modular VET programmes using innovative delivery methodologies. The project consortium will work on the design and application of a trainees' certification mechanism for the accreditation of acquired skills of the vocational programs.

RATIONALE

Competitiveness, innovation and job creation in European industry are increasingly being driven by new Information and Communication Technologies (ICTs) and the availability of highly skilled and qualified workers in line with rapidly evolving market trends. The ICT sector is rapidly changing, has a strong momentum and an important contribution to the growth of economy. According to the EC, during 2010, the ICT contribution to Europe's growth represented 5% of GDP and ICT drove 20% of Europe's overall productivity growth. Furthermore, despite the uncertainty seen on global labor markets during and after the economic crisis, the employment of ICT specialists has been largely unaffected, as at European level the employment growth rate for ICT specialists has remained on an upwards path averaging 3% growth per annum since 2006 (i.e. it was more than eight times higher than the average growth rate of total employment over the same period).

Changes and disruptions in the economy can have significant influence on the future skill demands for ICT professionals. Data Science (DS) and Internet of Things (IoT) are among the key drivers of change with regard to the skills required by the ICT professionals. Furthermore, Big Data and Data Science are foreseen to contribute more than €206 billion to the EU economy by 2020 since, according to estimations, there will be a 160% increase in demand for Data Scientists from 2013 to 2020 with more than 300.000 new jobs. This forecast raises the need to constantly update the skills required by related occupational profiles (Data Scientists and IoT Engineers).

Therefore, SEnDIng aims to:

- Address the skills' gap of Data Scientists and IoT engineers, by developing curricula for the delivery of outcome-oriented modular VET programmes using innovative teaching and training delivery methodologies.
- Provide to Data Scientists and IoT engineers skills and competences that are transferable and recognized among EU countries according to European established frameworks and standards.
- Contribute to the increased demand of industry sectors other than the ICT sector (e.g. banking, energy, logistics) for highly-qualified Data Scientists and IoT Engineers equipped with the required e-skills and competences.
- Make the provided training more relevant to the actual needs of the labor market, by focusing on outcome-oriented programs that include strong work-based learning components and combine knowledge and skills with personal and sociocultural competences (soft skills).

TARGET GROUPS

- IT professionals and associations
- VET providers
- Certification bodies
- Higher Education Institutions
- Companies & SMEs
- Policy-makers

WORKPLAN AND OUTCOMES

The SEnDIng consortium will join its efforts to reach the following outcomes:

- Definition of the targeted **learning outcomes** of the provided vocational trainings in terms of knowledge, skills and competences for the occupational profiles of engineers working in the DS and the IoT domains.
- Design of **a common reference scheme** of competences, skills, knowledge and proficiency levels, in compliance with the European eCompetence Framework (eCF) and the ESCO IT occupations ensuring transparency, comparability and transferability between European countries.
- Design of **two modular outcome-oriented curricula**, one targeting DS and another targeting IoT, taking into consideration EQAVET.

- Παροχή των **προγραμμάτων ΕΕΚ** σε τρεις φάσεις -online, δια ζώσης και σε πραγματικό εργασιακό περιβάλλον- με σκοπό την κάλυψη της έλλειψης δεξιοτήτων των Επαγγελματιών Πληροφορικής που δραστηριοποιούνται στις περιοχές της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων.
- Σχεδιασμός μηχανισμού **πιστοποίησης** των γνώσεων, δεξιοτήτων και ικανοτήτων που αποκτήθηκαν, καθώς και παροχή συστάσεων για την επικύρωση, πιστοποίηση και διαπίστευση των παρεχόμενων προγραμμάτων ΕΕΚ σε συμφωνία με τα Εθνικά Πλαίσια Προσόντων, το Ευρωπαϊκό Πλαίσιο Προσόντων και το ECVET.
- Σχεδιασμός εργαλείων αξιοποίησης των αποτελεσμάτων του έργου, με σκοπό την καθοδήγηση των ενδιαφερόμενων και ιδιαίτερα των εταιρειών και παρόχων ΕΕΚ.
- Διοργάνωση τριών **σεμιναρίων** (σε Ελλάδα, Βουλγαρία και Κύπρο) και ενός **συνεδρίου** (στην Ελλάδα τον τελευταίο μήνα του έργου) για την διάχυση των δραστηριοτήτων και των αποτελεσμάτων του έργου σε στοχευμένες ομάδες και ενδιαφερόμενους.

ΠΛΗΡΟΦΟΡΙΕΣ ΕΡΓΟΥ

Πρόγραμμα: Erasmus+ KA2: Cooperation for innovation and the exchange of good practices - Sector Skills Alliances

Πρόσκληση: EACEA-04-2017

Συντονιστής: Πανεπιστήμιο Πατρών

Διάρκεια: 36 μήνες

Έναρξη: 1 Δεκεμβρίου 2017

Λήξη: 30 Νοεμβρίου 2020

Πλήθος εταίρων: 12 από 4 χώρες

Δικτυακός τόπος: www.sending-project.eu

ΕΤΑΙΡΟΙ ΕΡΓΟΥ

Η κοινοπραξία αποτελείται από ιδρύματα Ανώτατης Εκπαίδευσης (Πανεπιστήμιο Πατρών, Πανεπιστήμιο Κύπρου), παρόχους ΕΕΚ (Ολυμπιακή Εκπαιδευτική & Συμβουλευτική, ESI Κέντρο Ανατολικής Ευρώπης, Πανεπιστήμιο Κύπρου), ιδιωτικές εταιρείες (Universal Learning Systems, Yodiwo, Μιχανογραφική, Code Runners, Nemetschek), Ενώσεις εταιρειών και επιστημόνων πληροφορικής (Ελληνική Εταιρία Πληροφορικής & Επικοινωνιών, BASSCOM) καθώς και έναν οργανισμό πιστοποίησης (Unicert). Τα Ανώτατα Εκπαιδευτικά Ιδρύματα που συμμετέχουν στο έργο SEnDIng έχουν ερευνητική δραστηριότητα στην περιοχή των ΤΠΕ και τροφοδοτούν την ευρωπαϊκή αγορά εργασίας με απόφοιτους ΤΠΕ υψηλής εξειδίκευσης, ενώ οι πάροχοι ΕΕΚ προσφέρουν επαγγελματική κατάρτιση, υλοποιώντας προγράμματα διά βίου μάθησης, σεμινάρια, συμμετοχικές δράσεις, μελέτες και εκπαιδευτικό υλικό. Οι ιδιωτικές εταιρείες που συμμετέχουν στο έργο SEnDIng δραστηριοποιούνται στους τομείς της Επιστήμης των Δεδομένων και του Διαδικτύου των Πραγμάτων, ενώ οι Επιστημονικές Ενώσεις επικεντρώνουν τις προσπάθειές τους για την υποστήριξη της δημιουργίας ενός συνεκτικού πλαισίου επίσημης και άτυπης εκπαίδευσης στον τομέα των ΤΠΕ. Ο οργανισμός πιστοποίησης θα αναλάβει τη σχεδίαση του μηχανισμού πιστοποίησης των δεξιοτήτων σε πλήρη συμμόρφωση με Ευρωπαϊκά πρότυπα.

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

SEnDIng

Sector Skills Alliance for the design and delivery of innovative VET programmes to Data Science and Internet of Things professionals

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ΣΤΟΧΟΣ

Το έργο SEnDIng στοχεύει στην κάλυψη της έλλειψης δεξιοτήτων των Επαγγελματιών Πληροφορικής που δραστηριοποιούνται στις περιοχές της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων σε διάφορους τομείς της αγοράς εργασίας (π.χ., ΤΠΕ, τραπεζικό, ενεργειακό κλπ.) όπου οι ανωτέρω επιστήμες και τεχνολογίες έχουν ευρεία εφαρμογή.

Επιπρόσθετα, το έργο SEnDIng στοχεύει στην ανάπτυξη και υλοποίηση δύο αρθρωτών προγραμμάτων Επαγγελματικής Εκπαίδευσης και Κατάρτισης (ΕΕΚ) χρησιμοποιώντας καινοτόμες μεθοδολογίες διδασκαλίας και εκπαίδευσης. Η κοινοπραξία του έργου θα σχεδιάσει και θα εφαρμόσει έναν μηχανισμό πιστοποίησης των δεξιοτήτων των εκπαιδευομένων που αποκτήθηκαν στο πλαίσιο υλοποίησης των προγραμμάτων ΕΕΚ.

ΠΡΟΒΛΗΜΑ

Η ανταγωνιστικότητα, η καινοτομία και η δημιουργία νέων θέσεων εργασίας στην Ευρώπη καθορίζονται όλο και περισσότερο από τις ΤΠΕ, καθώς και τη διαθεσιμότητα εργαζομένων υψηλής ειδίκευσης, οι οποίοι μπορούν να ανταποκριθούν στις ταχέως εξελισσόμενες τάσεις της αγοράς. Ο τομέας των ΤΠΕ μεταβάλλεται ταχύτατα έχοντας σημαντικό αντίκτυπο στην ανάπτυξη της οικονομίας. Σύμφωνα με την Ευρωπαϊκή Ένωση, κατά τη διάρκεια του 2010 η συμβολή των ΤΠΕ στην ανάπτυξη της Ευρώπης αντιπροσώπευε το 5% του ΑΕΠ, ενώ οι ΤΠΕ συνέβαλαν κατά 20% στη συνολική αύξηση της παραγωγικότητας. Επιπρόσθετα, παρά την αβεβαιότητα που παρατηρείται στην παγκόσμια αγορά εργασίας (τόσο κατά τη διάρκεια αλλά και μετά την οικονομική κρίση), η απασχόληση των επαγγελματιών στις ΤΠΕ έχει μείνει ανεπηρέαστη σε σημαντικό βαθμό, καθώς σε ευρωπαϊκό επίπεδο ο ρυθμός αύξησης της απασχόλησής τους παρέμεινε ανοδικός, με μέσο ετήσιο ρυθμό αύξησης 3% από το 2006 (δηλ. ήταν περισσότερο από οκτώ φορές υψηλότερος από τον μέσο ρυθμό αύξησης της συνολικής απασχόλησης κατά την ίδια περίοδο).

Το ευμετάβλητο οικονομικό περιβάλλον μπορεί να έχει σημαντικό αντίκτυπο στις επιθυμητές μελλοντικές δεξιότητες των επαγγελματιών ΤΠΕ. Η Επιστήμη Δεδομένων και το Διαδίκτυο των Πραγμάτων συγκαταλέγονται μεταξύ εκείνων των τεχνολογιών που επηρεάζουν τις δεξιότητες και ικανότητες που η αγορά εργασίας απαιτεί από τους επαγγελματίες ΤΠΕ. Επιπλέον, προβλέπεται ότι τα Μεγάλα Δεδομένα και η Επιστήμη των Δεδομένων θα συμβάλουν στην οικονομία της Ευρωπαϊκής Ένωσης με περισσότερο από 206 δισεκατομμύρια ευρώ έως το 2020. Σύμφωνα με εκτιμήσεις, από το 2013 έως το 2020 θα αυξηθεί κατά 160% η ζήτηση για επαγγελματίες στην Επιστήμη των Δεδομένων, ενώ θα δημιουργηθούν περισσότερες από 300.000 νέες θέσεις εργασίας. Αυτή η πρόβλεψη δημιουργεί την ανάγκη συνεχούς ενημέρωσης και επικαιροποίησης των απαιτούμενων δεξιοτήτων από τα συγκεκριμένα επαγγελματικά προφίλ (Επιστήμονες Δεδομένων και Μηχανικούς ειδικευμένους στο Διαδίκτυο των Πραγμάτων).
Συνεπώς το έργο SEnDIng επιδιώκει:

- Την αντιμετώπιση της έλλειψης δεξιοτήτων των επαγγελματιών πληροφορικής που δραστηριοποιούνται στην περιοχή της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων, μέσω της παροχής προγραμμάτων ΕΕΚ προσανατολισμένων σε μαθησιακά αποτελέσματα, κάνοντας χρήση καινοτόμων μεθοδολογιών διδασκαλίας και κατάρτισης.
- Την παροχή στους Επιστήμονες Δεδομένων και στους Μηχανικούς Διαδικτύου των Πραγμάτων, δεξιοτήτων και ικανοτήτων, σύμφωνα με Ευρωπαϊκά πλαίσια αναφοράς και πρότυπα.
- Την αντιμετώπιση της αυξημένης ζήτησης για επαγγελματίες πληροφορικής που δραστηριοποιούνται στην περιοχή της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων από άλλους τομείς πέραν του ΤΠΕ (π.χ. τραπεζική, ενέργεια, εφοδιαστική αλυσίδα, κλπ.).
- Την παροχή εκπαιδεύσεων οι οποίες καλύπτουν τις πραγματικές ανάγκες της αγοράς εργασίας, εστιάζοντας σε προγράμματα κατάρτισης προσανατολισμένα σε μαθησιακά αποτέλεσμα, τα οποία ενσωματώνουν την μάθηση σε πραγματικά εργασιακά περιβάλλονται και συνδυάζουν τις γνώσεις και τις ικανότητες με τις προσωπικές δεξιότητες.

ΟΜΑΔΕΣ ΣΤΟΧΟΙ ΕΡΓΟΥ

- Επαγγελματίες και Επιμελητήρια Πληροφορικής
- Κέντρα ΕΕΚ
- Φορείς Πιστοποίησης
- Ανώτατα Εκπαιδευτικά Ιδρύματα
- Εταιρίες και Μικρομεσαίες Επιχειρήσεις
- Φορείς χάραξης πολιτικών

ΠΛΑΝΟ ΔΡΑΣΗΣ ΚΑΙ ΑΠΟΤΕΛΕΣΜΑΤΑ

Η κοινοπραξία SEnDIng στοχευμένα θα επιδιώξει την επίτευξη των ακόλουθων αποτελεσμάτων:

- Καθορισμός των **μαθησιακών αποτελεσμάτων** (γνώσεις, δεξιότητες και ικανότητες) των προγραμμάτων ΕΕΚ για επαγγελματίες που δραστηριοποιούνται στους τομείς της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων.
- Σχεδιασμός ενός **κοινού πλαισίου αναφοράς γνώσεων**, δεξιοτήτων και ικανοτήτων, σε συμφωνία με Ευρωπαϊκά Πλαίσια Αναφοράς και Πρότυπα (eCF και ESCO) υποστηρίζοντας την συγκρισιμότητα και κινητικότητα μεταξύ των ευρωπαϊκών χωρών.
- Σχεδιασμός **δύο αρθρωτών προγραμμάτων σπουδών** για τις περιοχές της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων σύμφωνα με το πλαίσιο EQAVET.

- Организиране и провеждане на **професионални обучения** за преодоляване на констатираните несъответствия в уменията на инженери, заети в областите DS и IoT в ИКТ сектора, както и в други икономически сфери, на три фази: асинхронно онлайн обучение, присъствено обучение и практическо обучение на работното място;
- Разработване на механизъм, който да бъде използван за **сертификация** на придобитите умения и компетентности, както и предоставяне на препоръки за валидиране, сертификация и акредитация на предоставяните професионални обучителни и образователни програми, гарантирайки тяхното съответствие с националните квалификационни рамки (НКР), Европейската квалификационна рамка (ЕКР) и Европейската система за трансфер на кредити в професионалното образование и обучение (ECVET);
- Създаване на инструментариум, който да подпомага заинтересованите страни и най-вече компаниите и центровете за професионално образование и обучение, в процеса на последващо прилагане на резултатите по проекта;
- Организиране на три **семинара** (в Гърция, България и Кипър) и **финална конференция** (в Гърция, през последния месец от изпълнението на проекта) за ефективно популяризиране на дейностите и резултатите по проекта сред целевите групи и заинтересованите страни.

ИНФОРМАЦИЯ ЗА ПРОЕКТА

Финансираща програма:
Erasmus+ KA2: Cooperation for innovation and the exchange of good practices - Sector Skills Alliances

Номер на процедурата за безвъзмездна финансова помощ: EACEA-04-2017

Координатор: University of Patras

Продължителност: 36 месеца

Начало на проекта: 1 декември 2017 г.

Край на проекта: 30 ноември 2020 г.

Брой партньори: 12 от 4 държави

Интернет страница: www.sending-project.eu

ПАРТНЬОРИ ПО ПРОЕКТА

Консорциумът се състои от висши училища (University of Patras, University of Cyprus), центрове за професионално образование и обучение (Olympic Training and Consulting, ESI Center Eastern Europe, University of Cyprus), компании от частния сектор (Universal Learning Systems, Yodiwo, Mixanografiki, Code Runners, Nemetschek), асоциации на ИТ компании и учени от ИТ сектора (Greek Computer Society, Bulgarian Association of Software Companies), както и сертифицираща организация (Unicert).

Висшите училища, партньори по проекта, предоставят на европейските икономически сектори, свързани с ИКТ, резултати от научноизследователската си дейност, както и висококвалифицирани ИТ дипломанти, докато центровете за професионално образование и обучение предлагат професионално обучение, продължаващо обучение, проучвания, семинари, обучителни материали и инициативи в рамките на общността. Участващите компании активно оперират в областите на DS и/или IoT, а асоциациите полагат целенасочени усилия за подпомагане създаването на добре развита система за формално и неформално образование и обучение в сферата на ИКТ. Сертифициращата организация ще разработи сертифициращ придобитите умения механизъм в съответствие с европейските стандарти.

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

SEnDIng

Секторен алианс на уменията за разработване и предоставяне на иновативни програми за професионално образование и обучение, насочено към специалисти в областите Наука за данните (Data Science - DS) и Интернет на нещата (Internet of Things - IoT)

(591848-EPP-1-2017-1-EL-EPPKA2-SSA)

www.sending-project.eu

ЦЕЛИ

Проектът SEnDIng си поставя за цел да преодолее несъответствията в уменията на специалистите в областите на DS и IoT, като се таргетира не само ИКТ секторът, но и други икономически сфери (например банковото дело и енергетиката), в които DS и IoT намират широко приложение.

Проектът се фокусира върху разработването и предоставянето на резултатно-ориентирани модулни учебни програми, прилагайки иновативни обучителни методики. Консорциумът по проекта ще работи по създаването и прилагането на механизъм за сертификация на обучаващите се специалисти и за акредитация на придобитите умения, предоставяни в рамките на обучителните програми.

ОБОСНОВКА

Конкурентоспособността, иновациите и разкриването на работни места в европейската индустрия все повече се определя от новите информационни и комуникационни технологии (ИКТ), както и от наличието на висококвалифицирани специалисти, в синхрон с бързо променящите се пазарни тенденции. ИКТ секторът се развива бързо, като самият той е един от основните двигатели на промяната и допринася в значителна степен за икономическия растеж. Съгласно данни на Европейската комисия, през 2010 г. приносът на ИКТ към икономическия ръст на Европейския съюз съставлява 5 % от БВП, като ИКТ секторът обуславя 20 % от общия ръст на производителността в Съюза. Следва да се отбележи, че въпреки несигурността, обхванала глобалните трудови пазари по време на икономическата криза и след нея, заетостта на ИКТ специалистите остава в голяма степен незасегната, като на европейско равнище ръстът на заетите в сектора отбелязва възходяща тенденция в размер на 3 % годишно от 2006 г. насам (следователно той е над осем пъти по-висок от ръста на общата заетост за същия период).

Промените и сътресенията в икономиката могат да окажат съществено влияние върху уменията, които ИКТ специалистите се очаква да притежават в бъдеще. DS и IoT са сред ключовите двигатели на промяната по отношение на квалификацията, изисквана от професионалистите в ИКТ сектора. Съгласно прогнозни данни, приносът на DS и IoT към европейската икономика ще надмине 206 млрд. евро до 2020 г., като се очаква и 160 % нарастване на търсенето на специалисти по DS за периода 2013-2020 г., с разкриването на повече от 300 000 нови работни места. Посочените прогнози подчертават необходимостта от постоянно повишаване на квалификацията на специалистите със съответните професионални профили в областта на DS и IoT.

В тази връзка, проектът SEnDIng си поставя за цел да:

- Преодолее несъответствията в уменията на специалистите в областите на DS и IoT, чрез разработване на резултатно-ориентирани модулни учебни програми за професионално образование и обучение, прилагайки иновативни преподавателски и обучителни методики;
- Предостави на DS и IoT специалистите умения и компетентности, които са приложими и признати сред другите европейските държави, съобразно установените в ЕС класификационни рамки и стандарти;
- Отговори на нарастващото търсене на висококвалифицирани специалисти в областите на DS и IoT, притежаващи необходимите е-умения и компетентности, от страна на сектори, различни от ИКТ;
- Организира и проведе обучения по начин, съответстващ на реалните потребности на трудовия пазар чрез фокусиране върху резултатно-ориентирани програми, включващи силно застъпен практически компонент, комбиниращи изграждането на знания и умения с развитие на личностни и социокултурни компетентности (т.н. „меки умения“).

ЦЕЛЕВИ ГРУПИ

- ИТ специалисти и асоциации;
- Центрове за професионално образование и обучение;
- Сертифициращи организации;
- Висши училища;
- Компании и малки и средни предприятия (МСП);
- Институции, разработващи политики в сектора.

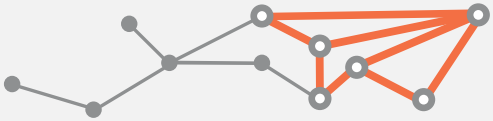
ПЛАН НА ДЕЙНОСТИТЕ И РЕЗУЛТАТИ

Консорциумът SEnDIng ще обедини усилия за постигане на следните резултати:

- Дефиниране на целеви учебни резултати по отношение на знания, умения и компетентности на таргетираните два професионални профила на инженери, опериращи в областта на DS и IoT;
- Разработване на **обща референтна схема** от компетентности, умения, знания и нива на професионална квалификация, в съответствие с Европейските класификационни рамки (eCF класификационна рамка и Европейска класификация на уменията/компетентностите, квалификациите и професиите в ИТ сектора – ESCO);
- Разработване на **две модулни резултатно-ориентирани програми за професионално образование и обучение**, едната насочена към DS, а другата – към IoT, в съответствие с изискванията на Европейската референтна рамка за осигуряване на качество в професионалното образование и обучение (EQAVET);

Annex 2

Project flyer produced in English, Greek and Bulgarian



SEnDIng

Sector Skills Alliance for the design and delivery of innovative VET programmes to Data Science and Internet of Things professionals

(591848-EPP-1-2017-1-EL-EPPKA2-SSA)

www.sending-project.eu

Aim

The SEnDIng project aims to address the skills' gap of Data Scientists and Internet of Things engineers identified at the ICT and other sectors (e.g. banking and energy) where Data Science and Internet of Things have broad applications. Acquired skills will be certified by a mechanism that will be designed and applied at the later phases of the project, while recommendations will be outlined for the validation, certification and accreditation of provided VET programs ensuring alignment with NQFs, EQF and ECVET.

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

Workplan & Outcomes

The SEnDIng consortium will join its efforts to reach the following outcomes:

- Definition of the targeted **learning outcomes** in terms of knowledge, skills and competences for the occupational profiles of engineers working in the DS and the IoT domains.
- Design of **a common reference scheme** of competences, skills, knowledge and proficiency levels, in compliance with the European eCompetence Framework (eCF) and the ESCO IT occupations.
- Design of **two modular outcome-oriented curricula**, one targeting DS and another targeting IoT, taking into consideration EQAVET.
- Delivery of **vocational trainings** to address the skills gap of Data Scientists and IoT engineers employed in the ICT and other economic sectors, in three phases: e-learning, face-to-face and work-based learning.
- Design of a mechanism that will be used for the **certification** of skills and competences acquired and provision of recommendations for the validation, certification & accreditation of provided VET programs, as well as NQFs, EQF and ECVET alignment.
- Production of a set of **toolkits**, guiding stakeholders and especially companies and VET providers on how to exploit project's results.
- Organization of three **workshops** and a **final conference** to effectively disseminate project's activities and outcomes to target groups and all related stakeholders.

Project partners

The consortium consists of higher education institutions (University of Patras, University of Cyprus), VET providers (Olympic Training and Consulting, ESI Center Eastern Europe, University of Cyprus), private-sector companies (Universal Learning Systems, Yodiwo, Mixanografiki, Code Runners, Nemetschek), associations of IT companies and IT scientists (Greek Computer Society, Bulgarian Association of Software Companies), as well as a certification organization (Unicert).

Target groups

IT professionals and associations, VET providers, certification bodies, higher education institutions, companies & SMEs, as well as policy-makers.

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Στόχος

Το έργο SEnDIng στοχεύει στην κάλυψη της έλλειψης δεξιοτήτων των Επαγγελματιών Πληροφορικής που δραστηριοποιούνται στις περιοχές της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων σε διάφορους τομείς της αγοράς εργασίας (π.χ., ΤΠΕ, τραπεζικό, ενεργειακό κλπ) όπου οι ανωτέρω επιστήμες και τεχνολογίες έχουν ευρεία εφαρμογή. Οι δεξιότητες που θα αποκτηθούν θα πιστοποιούνται με κατάλληλο μηχανισμό που θα σχεδιαστεί και θα εφαρμοστεί στις μεταγενέστερες φάσεις του έργου, ενώ θα εκπονηθούν συστάσεις για την επικύρωση, πιστοποίηση και διαπίστευση των παρεχόμενων προγραμμάτων Επαγγελματικής Εκπαίδευσης και Κατάρτισης (ΕΕΚ) σε συμφωνία με τα Εθνικά Πλαίσια Προσόντων, το Ευρωπαϊκό Πλαίσιο Προσόντων και το ECVET.

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

Πλάνο δράσης και Αποτελέσματα

Η κοινοπραξία SEnDIng στοχευμένα θα επιδιώξει την επίτευξη των ακόλουθων αποτελεσμάτων:

- Καθορισμός των μαθησιακών αποτελεσμάτων (γνώσεις, δεξιότητες και ικανότητες) των προγραμμάτων ΕΕΚ για επαγγελματίες που δραστηριοποιούνται στους τομείς της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων.
- Σχεδιασμός ενός κοινού πλαισίου αναφοράς γνώσεων, δεξιοτήτων και ικανοτήτων, σε συμφωνία με Ευρωπαϊκά Πλαίσια Αναφοράς και Πρότυπα (eCF και ESCO).
- Σχεδιασμός δύο αρθρωτών προγραμμάτων σπουδών για τις περιοχές της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων σύμφωνα με το πλαίσιο EQAVET.
- Παροχή των προγραμμάτων ΕΕΚ σε τρεις φάσεις -online, δια ζώσης και σε πραγματικό εργασιακό περιβάλλον- με σκοπό την κάλυψη της έλλειψης δεξιοτήτων των Επαγγελματιών Πληροφορικής που δραστηριοποιούνται στις περιοχές της Επιστήμης Δεδομένων και του Διαδικτύου των Πραγμάτων.
- Σχεδιασμός μηχανισμού πιστοποίησης των γνώσεων, δεξιοτήτων και ικανοτήτων που αποκτήθηκαν, καθώς και παροχή συστάσεων για την επικύρωση, πιστοποίηση και διαπίστευση των παρεχόμενων προγραμμάτων ΕΕΚ σε συμφωνία με τα Εθνικά Πλαίσια Προσόντων, το Ευρωπαϊκό Πλαίσιο Προσόντων και το ECVET.
- Σχεδιασμός εργαλείων αξιοποίησης των αποτελεσμάτων του έργου, με σκοπό την καθοδήγηση των ενδιαφερόμενων και ιδιαίτερα των εταιρειών και παρόχων ΕΕΚ.
- Διοργάνωση τριών σεμιναρίων και ενός συνεδρίου για την διάχυση των δραστηριοτήτων και των αποτελεσμάτων του έργου σε στοχευμένες ομάδες και ενδιαφερόμενους.

Εταίροι Έργου

Η κοινοπραξία αποτελείται από ιδρύματα Ανώτατης Εκπαίδευσης (Πανεπιστήμιο Πατρών, Πανεπιστήμιο Κύπρου), παρόχους ΕΕΚ (Ολυμπιακή Εκπαιδευτική & Συμβουλευτική, ESI Center Eastern Europe, Πανεπιστήμιο Κύπρου), ιδιωτικές εταιρείες (Universal Learning Systems, Yodiwo, Μηχανογραφική, Code Runners, Nemetschek), Ενώσεις εταιρειών και επιστημόνων πληροφορικής (Ελληνική Εταιρία Πληροφορικής, BASSCOM) καθώς και έναν οργανισμός πιστοποίησης (Unicert).

Ομάδες Στόχοι Έργου

Επαγγελματίες και Επιμελητήρια Πληροφορικής, Κέντρα ΕΕΚ, Φορείς Πιστοποίησης, Ανώτατα Εκπαιδευτικά Ιδρύματα, Εταιρίες και Μικρομεσαίες Επιχειρήσεις, Φορείς χάραξης πολιτικών

SEnDIng

Секторен алианс на уменията за разработване и предоставяне на иновативни програми за професионално образование и обучение, насочено към специалисти в областите Наука за данните (Data Science - DS) и Интернет на нещата (Internet of Things - IoT)

(591848-EPP-1-2017-1-EL-EPPKA2-SSA)

www.sending-project.eu

Цели

Проектът SenDing си поставя за цел да преодолее несъответствията в уменията на специалистите в областите на DS и IoT, като се таргетира не само ИКТ секторът, но и други икономически сфери (като банковото дело и енергетиката), в които DS и IoT намират широко приложение. Придобитите умения и компетентности ще бъдат сертифицирани посредством механизъм, който ще бъде разработен и приложен в следващите фази на проекта, като същевременно ще бъдат изготвени препоръки за валидиране, сертификация и акредитация на предоставяните професионални обучителни и образователни програми, гарантирайки съответствието им с националните квалификационни рамки (НКР), Европейската квалификационна рамка (ЕКР) и Европейската система за трансфер на кредити в професионалното образование и обучение (ECVET).

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

Подкрепата на Европейската комисия за издаването на настоящата публикация не представлява верификация на нейното съдържание, като то отразява единствено възгледите на авторите и Комисията не носи отговорност за начина, по който може да бъде използвана съдържащата се в публикацията информация.

План на дейностите и резултати

Консорциумът SEnDIng ще обедини усилия за постигане на следните резултати:

- Дефиниране на **целеви учебни резултати** по отношение на знания, умения и компетентности на таргетираните два професионални профила на инженери, опериращи в областта на DS и IoT;
- Разработване на **обща референтна схема** от компетентности, умения, знания и нива на професионална квалификация, в съответствие с Европейските класификационни рамки (eCF класификационна рамка и Европейска класификация на уменията/компетентностите, квалификациите и професиите в ИТ сектора – ESCO);
- Разработване на **две модулни резултатно-ориентирани програми за професионално образование и обучение**, едната насочена към DS, а другата – към IoT, в съответствие с изискванията на Европейската референтна рамка за осигуряване на качество в професионалното образование и обучение (EQAVET);
- Организиране и провеждане на **професионални обучения** за преодоляване на констатираните несъответствия в уменията на инженери, заети в областите DS и IoT в ИКТ сектора, както и в други икономически сфери, на три фази: асинхронно онлайн обучение, присъствено обучение и практическо обучение на работното място;
- Разработване на механизъм, който да бъде използван за **сертификация** на придобитите умения и компетентности, както и предоставяне на препоръки за валидиране, сертификация и акредитация на предоставяните професионални обучителни и образователни програми, гарантирайки тяхното съответствие с националните квалификационни рамки (НКР), Европейската квалификационна рамка (ЕКР) и Европейската система за трансфер на кредити в професионалното образование и обучение (ECVET);
- Създаване на **инструментариум**, който да подпомага заинтересованите страни и най-вече компаниите и центровете за професионално образование и обучение, в процеса на последващо прилагане на резултатите по проекта;
- Организиране на три **семинара** и **финална конференция** за ефективно популяризиране на дейностите и резултатите по проекта сред целевите групи и заинтересованите страни.

Партньори по проекта

Консорциумът се състои от висши училища (University of Patras, University of Cyprus), центрове за професионално образование и обучение (Olympic Training and Consulting, ESI Center Eastern Europe, University of Cyprus), компании от частния сектор (Universal Learning Systems, Yodiwo, Mixanografiki, Code Runners, Nemetschek), асоциации на ИТ компании и учени от ИТ сектора (Greek Computer Society, Bulgarian Association of Software Companies), както и сертифицираща организация (Unicert).

Целеви групи

ИТ специалисти и асоциации, центрове за професионално образование и обучение, сертифициращи организации, висши училища, компании и малки и средни предприятия, както институции, разработващи политики в сектора.

Annex 3
Promotional flyers for the 2 VET programs

www.sending-project.eu

SEnDIng

Vocational Training program
IoT & Data Science

Expression of Interest : FREE of Fees* (https://bit.ly/2XWvtZY)
Registrations: September 2019
Duration: November 2019 - August 2020.

*THE COST OF THE TRAINING PROGRAMS ARE FUNDED BY THE ERASMUS+ PROJECT SENDING

24,697 open Data Scientist positions on LinkedIn in the United States alone, while the top 3 most common skills requested in LinkedIn data scientist job postings are Python, R, and SQL

"Your Staff, Your Asset, Your Future"

28%	demand increase for DS professioanls in 2020	**43%**	IT Industry reports lack of DS skills	**0.5M**	Unfilled DS Positions by 2020	**68%**	businesses strunggle to hire IoT experts

The SEnDIng vocational training programs are based on modular and multi-disciplinary curricula combining technical with transversal (or soft) skills. They have been designed in consultation with VET providers, academics, technology companies and experts that are active at the Data Science and IoT domains. Their aim is to fight the skills' gap by providing vocational trainings that meet the demand and last trends of Data Science and IoT industries.

- **Upskill your employees at Data Science and IoT domains for FREE**
- **Find experts on IoT and Data Science certified by SEnDIng VET program**
- **Boosting Data Science & IoT Skills**
- **Meet new challenges in the market**
- **Reap reduced training expenses.**
- **Help your organization to capitalize on the Data Science and IoT potential.**
- **Available in Greece, Cyprus and Bulgaria**

Phase 1 Online training (103 hours).
The online training will be provided in the form of asynchronous courses at the areas of Data Science or IoT. Each online training program consists of a series of modules that helps you master specific knowledge, skills and competences at the areas of Data Science or IoT.

Phase 2 Face to face training (20 hours).
The face to face training aims to cultivate the transversal skills of the trainees. Trainees will be eligible to participate in the face to face training, once the online Data Science or IoT training are completed. Offered in Greece, Bulgary and Cyprus

Phase 3: Work based learning (4 months).
Work based learning aims to provide knowledge, skills and competences by doing a job and by reflecting on the experience. It will run at the companies whose employees will participate in the training.The use cases will be defined in cooperation with the companies participating in the program based on their interests and needs.

Final Exams- Certification
After the completion of the 3 phases training, the trainees will be asked to take a final exam in order to be formally certified.

Contact us!
EMAIL gkamas@ceid.upatras.gr
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SEnDIng
Co-funded by the Erasmus+ Programme of the European Union

www.sending-project.eu

SEnDIng

Vocational Training program

IoT & Data Science

Expression of Interest: FREE of Fees** (https://bit.ly/2XWvtZY)
Registrations: September 2019

Expression of Interest

** THE COST IS FUNDED BY THE PROJECT SENDING

What your staff will learn?

Those interested to participate in work based learning will be eligible, given that they have successfully attend the online Data Science (103 hours) or IoT training (103 hours) and the face to face training on transversal skills (20 hours). Please visit our website http://bit.ly/vet-program to see the Data Science & IoT online courses, as well as the face to face courses for transversal skills.

IoT LEARNING OUTCOMES

Knowledge

- Describe the value that IoT delivers in different business domains.
- Explain the business processes related to IoT in specific domains.
- Understand IoT architectures and the related network and communication protocols.
- Recognize different types of sensors, actuators, displays and related embedded electronics
- Design the application level (e.g. use protocols that support different IoT applications) of IoT in the context of big data, cloud technologies and DS.
- Formulate requirements about IoT information security.

Skills

- Analyse, argue and describe the business value of a particular IoT system.
- Design an IoT system that includes sensors, controllers, actuators and displays, connected to a cloud platform through Internet connection.
- Develop and deploy workflows and dashboards for an IoT system that includes sensors, controllers, actuators and displays, connected to a cloud platform through Internet connection.
- Develop working code for an IoT system that includes sensors, controllers, actuators and displays, connected to a cloud platform through Internet connection.
- Apply IoT information security concepts.

DATA SCIENCE LEARNING OUTCOMES

Knowledge

- Describe the key concepts of Data Science.
- Describe ICT methods and tools applicable for the storage and retrieval of data.
- Describe methods and tools applicable for the statistical analysis of data.
- Explain basic concepts and requirements related to information security and privacy.

Skills

- Analyse domain specific trends and present them as structured information.
- Create code to statistically analyse data.
- Apply data statistics and data visualization.
- Deploy simple machine learning techniques.
- Deploy data storage and retrieval techniques.
- Implement data models validation techniques.
- Ensure that IPR, security and privacy issues are respected.

Competence

- Exercise self-management within the guidelines of work or study contexts that are usually predictable, but still are a subject to change;
- Supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities;

Transversal (soft) Skills

- Communication skills;
- Adaptability to change;
- Teamwork;
- Ability to present in front of colleagues and clients;
- Goal-orientation; Thinking outside the box; Agile mind-set;

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Registrations: September 2019
Duration: November 2019 - August 2020.

*THE COST OF THE TRAINING PROGRAMS ARE FUNDED BY THE ERASMUS+ PROJECT SENDING

24,697 open Data Scientist positions on LinkedIn in the United States alone, while the top 3 most common skills requested in LinkedIn data scientist job postings are Python, R, and SQL

"Accelerate your Career"

28% demand increase for DS professioanls in 2020

43% IT Industry reports lack of DS skills

0.5M Unfilled DS Positions by 2020

68% businesses strunggle to hire IoT experts

The SEnDIng vocational training programs are based on modular and multi-disciplinary curricula combining technical with transversal (or soft) skills. They have been designed in consultation with VET providers, academics, technology companies and experts that are active at the Data Science and IoT domains. Their aim is to fight the skills' gap by providing vocational trainings that meet the demand and last trends of Data Science and IoT industries.

- **Available in Greece, Cyprus and Bulgaria**
- **Boosting Data Science & IoT Skills**
- **Get certified knowledge, skills and competences**
- **Work with the latest technology stacks**
- **Meet new challenges in the labor market**
- **Grab the top paying Data Science and IoT expert job titles**
- **Get qualified to occupy new positions**
- **Apply the knowledge and skills gained at a real working environment**

Phase 1 Online training (103 hours).
The online training will be provided in the form of asynchronous courses at the areas of Data Science or IoT. Each online training program consists of a series of modules that helps you master specific knowledge, skills and competences at the areas of Data Science or IoT.

Phase 2 Face to face training (20 hours).
The face to face training aims to cultivate the transversal skills of the trainees. Trainees will be eligible to participate in the face to face training, once the online Data Science or IoT training are completed. Offered in Greece, Bulgary and Cyprus

Phase 3: Work based learning (4 months).
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Annex 4
Press Releases

SEnDIng

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SECTOR SKILLS ALLIANCE FOR THE DESIGN AND DELIVERY OF INNOVATIVE VET PROGRAMMES TO DATA SCIENCE AND INTERNET OF THINGS PROFESSIONALS

Press Release

Data Science (DS) and Internet of Things (IoT) have been recognized as the technologies among the key drivers of change regarding the skills and competences required by IT professionals. The forecasted skills' gap together with the rapid and continuous evolution of DS and IoT technologies and their broad application at many economy's sectors make the skills required by the related occupational profiles increasingly sophisticated, and the need to be constantly updated imperative.

The **Sector Skills Alliance for the design and delivery of innovative VET programmes to Data Science and Internet of Things professionals** (SEnDIng) project aims to address the skills' gap of Data Scientists and Internet of Things professionals and provide them with knowledge, skills and competences that meet the labor market needs. To achieve this goal, SEnDIng will develop and deliver to the two aforementioned occupational profiles two learning outcome-oriented modular VET programmes using innovative teaching and training delivery methodologies. Each VET program will be provided according to the blended learning model incorporating a strong work based learning component. Furthermore, a common reference scheme of competences, skills, knowledge and proficiency levels needed by DS and IoT professionals will be designed in accordance with European frameworks (European eCompetence Framework and ESCO), together with a certification scheme following the ECVET framework, to ensure that the produced results will be transferable and recognized among European countries.

The SEnDIng alliance brings together twelve partners coming from Greece (University of Patras, Greek Computer Society, Olympic Training and Consulting, Yodiwo, Mixanografiki, Unicert), Bulgaria (Bulgarian Association of Software Companies, European Software Institute - Center Eastern Europe, Code Runners, Nemetschek), Cyprus (University of Cyprus) and Ireland (Universal Learning Systems) with different profile, expertise and culture (higher education institutes, VET providers, IT associations, SMEs and a certification body) that share a common vision: to provide the European labor market with high qualified Data Science and Internet of Things professionals.

During the project's kick-off meeting which took place in Patras, Greece, on 31st January and 1st February 2018 the project was presented to the partners and many fruitful discussions took place for the smooth start of the project and its implementation according to the defined timetable.

SEnDIng is a 3 year project coordinated by University of Patras, Greece and co-funded by the Erasmus+ Programme of the European Union. It started on 1st December 2017 and will end on 30th November 2020.

For more info please visit http://sending-project.eu

SEnDIng

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

SECTOR SKILLS ALLIANCE FOR THE DESIGN AND DELIVERY OF INNOVATIVE VET PROGRAMMES TO DATA SCIENCE AND INTERNET OF THINGS PROFESSIONALS

Press Release

SEnDIng is a 3-year Sector Skills Alliance Erasmus+ project run during the period November 2017 – January 2021 under the coordination of University of Patras. The project consortium consists of 12 partners coming from 4 European countries (Greece, Cyprus, Bulgaria and Ireland): two Higher Education Institutions, two Vocational Education and Training providers, five IT SMEs, two Associations of IT companies and professionals and one Certification Body.

The SEnDIng project addresses the skills gap at the Data Science and IoT domains, by providing IT professionals with technical knowledge and skills together with transversal skills and competences that are relevant to the needs of the labor market, are transferable and are recognized among European countries.

The main project objectives achieved are the following:

- Design 2 VET programs for Data Science and IoT that are based on multi-disciplinary and learning-outcomes oriented curricula and combine technical knowledge and skills with transversal skills and competences.
- Design 2 reference models of knowledge, skills and competences for Data Scientists and IoT professionals in accordance with well-known European frameworks, such as the e-Competence Framework (and the European Skills, Competences, Qualifications and Occupations.
- Develop 12 Data Science and IoT online courses and 1 online course for transversal skills development that are available at http://mooc.sending-project.eu/
- Develop more than 250 Open Educational Resources that are available for downloading here: Data Science, IoT, Transversal skills.
- Pilot the VET programs in three phases (online Data Science/IoT training, online transversal skills training and work-based learning) and certify the learning outcomes obtained.
- Disseminate the project results to target groups and engage them with the project to maximize its potential impact.
- Take actions towards the sustainability of project outputs and their exploitation by relevant stakeholders.

For more information about the project, its activities and outputs please visit http://sending-project.eu.

You can also access the project final report, as well as all public deliverables.

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