Tempus project no. 544088-TEMPUS-1-2013-1-SI-TEMPUS-JPHES

FINAL REPORT

Project

Enhancement of cyber educational system of Montenegro (ECESM)

Authors:

Matjaž Debevc, Ines Kožuh, Ramo Šendelj, Ivana Ognjanović, Anđela Jakšić-Stojanović, Bojana Tošić, Stefano Guarino, Massimo Capelli, Marko Kääramees, Florin Ioras, Indrachapa Bandara, Ana Rakocević, Nada Rakocević, Jelena Konatar, Olga Pregl

Maribor, January 2017

1. TABLE OF CONTENTS

2. PROJECT OBJECTIVES

Summary Of The Project

The ECESM project has been designed to enhance overall cyber security posture of the Montenegro (ME) by accelerating the availability of educational and training resources designed to improve the cyber behavior, skills, and knowledge of every segment of the population.

The main project objective was to improve, develop and implement standards, guidelines and procedures at national system levels in ME in order to enable creation of agile and highly skilled forces capable of responding to a dynamic and rapidly developing array of e-threats.

This Tempus project was funded by the European Commission Education, Audiovisual and Culture Executive Agency (544088-TEMPUS-1-2013-1-SI-TEMPUS-JPHES).

ECESM project objectives:

- Adjusting national legislative and principles for meeting EU requirements and standards in cyber security.
- Adjusting educational practice in cyber security at national level in accordance with EU practice and standards.
- Increasing public awareness of cyber security risks and understanding of specialty areas of cyber security needs.
- Improving knowledge of cyber security within organizations so that resources are well applied to meet the most obvious and serious threats.
- Accreditation of master program recognized and supported by relevant international academic society, for continuous future education of highly skilled professionals in specific areas of cyber security.
- Encouragement of Montenegrin environment for further research activities in cyber security area.

3. CONSORTIUM

The ECESM Consortium consists of eleven partner organizations coming from EU and Montenegro, representing universities, educational centres, and institutes, ministries of education and information society, of information society and telecommunications and the Chamber of Commerce.

Project Coordinator:

UNIVERSITY OF MARIBOR
Faculty of Electrical Engineering and Computer Science (UM FERI)
Slomškov trg 15
SI-2000 Maribor
Slovenia

Matjaž Debevc, Associated Professor
+386 2 220 71 05
matjaz.debevc@um.si

Buckinghamshire New University (BUCKS)
High Wycombe, United Kingdom

Università degli studi Roma Tre (UR3)
Roma, Italy

Tallinn University of Technology (TUT)
Tallinn, Estonia

Global Cyber Security Center (GCSEC)
Rome, Italy

University of Donja Gorica (UDG)
Podgorica, Montenegro

University Mediterranean (UNIM)
Podgorica, Montenegro

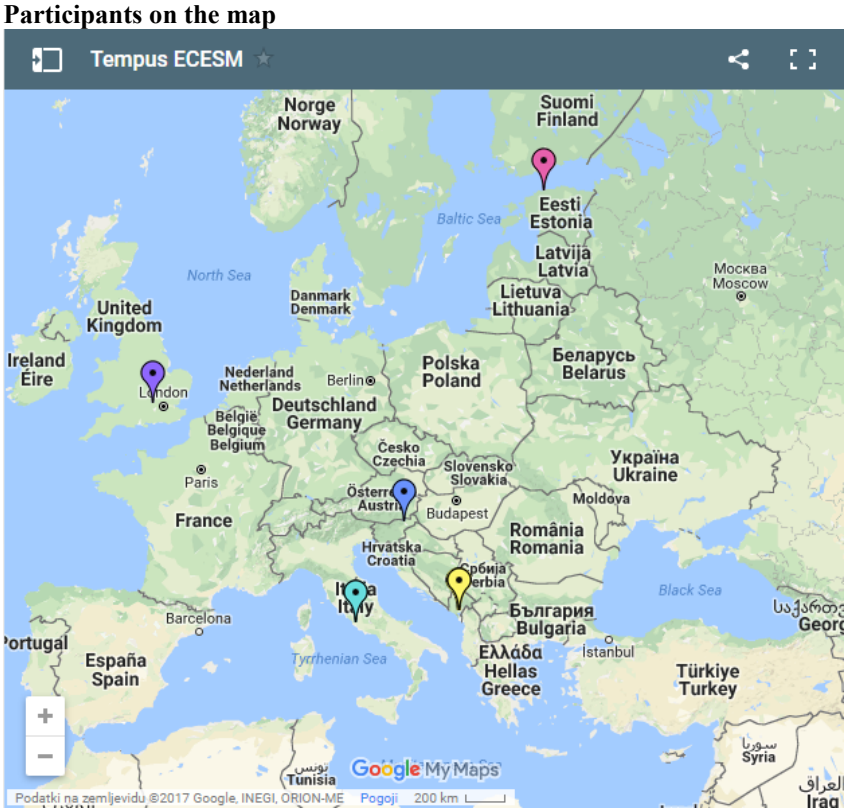
Institute of Modern Technology Montenegro (IMTM)
Podgorica, Montenegro

Ministry of Information Society and Telecommunications (MID)
Podgorica, Montenegro

Ministry of Education (MED)
Podgorica, Montenegro

Chamber of Economy of Montenegro (CEM)
Podgorica, Montenegro

Participants on the map



Maribor, Slovenia
Project Coordinator:
UNIVERSITY OF MARIBOR
Faculty of Electrical Engineering and Computer Science (UM FERI)

High Wycombe, United Kingdom
Buckinghamshire New University (BUCKS)

Roma, Italy
Università degli studi Roma Tre (UR3)

Roma, Italy
Global Cyber Security Center (GCSEC)

Tallinn, Estonia
Tallinn University of Technology (TUT)

Podgorica, Montenegro
University of Donja Gorica (UDG)

Podgorica, Montenegro
University Mediterranean (UNIM)

Podgorica, Montenegro
Institute of Modern Technology Montenegro (MTM)

Podgorica, Montenegro
Ministry of Information Society and Telecommunications (MID)

Podgorica, Montenegro
Ministry of Education (MED)

Podgorica, Montenegro
Chamber of Economy of Montenegro (CEM)

4. ACTIVITIES CARRIED OUT

4.1 WORK PACKAGES

Work Packages

Work package N°	Type of work package	Title of work package	Start	End
WP.1	Development	Review and analyze existing European practice for Cyber security	1	6
WP.2	Development	Raise awareness about the risk of online activities	7	12
WP.3	Development	Develop and maintain an unrivaled, globally competitive cyber security workforce	12	34
WP.4	Development	Broaden the pool of skilled workers capable of supporting a cyber-secure nation	21	36
WP.5	Quality plan	Quality Control and Monitoring	1	36
WP.6	Dissemination	Dissemination	1	36
WP.7	Exploitation	Sustainability	1	36
WP.8	Management	Management	1	36

4.2 DEVELOPMENT OF PROGRAMMES AND COURSES

ECESM project is focused on organization of sets of trainings within WP2 (activity 2.3) and WP3 (activity 3.3), and accreditation of multidisciplinary Master study program in cyber security (WP4). In the period till Intermediate Report all preparatory activities for WP2 and WP3 were undertaken, and after that, all training activities in WP2 and WP3 are successfully implemented, as well as WP4 aimed on establishment of Master study program in cyber security.

Trainings in WP2

-In accordance with activities 2.1 and 2.2, different target groups are identified; their training needs and supporting materials are identified and created. Therefore, different training events are organized as follows (link 2.3): http://ecesm.net/dev-23-improve-cyber-security-knowledge

Target group 1: Future trainers in Montenegro – 2 trainings for ME trainers are organized at experienced EU partners: BUCKS and GCSEC, as well as online CISCO training taught by BUCKS (as reported in Intermediate Report). After attending the trainings and successfully passing official CISCO exams, ME future trainers are certified by CISCO (http://ecesm.net/news/cisco-training).

Target group 2: Professors and ICT coordinators at elementary and secondary schools - The training program is divided into two parts: (I) Cyber security concepts, Malicious programs, and Network security; (II) Safe use of Web, Safe use of communications, Management of data security.

The participants were divided into 5 groups in accordance with geographic diversity of Montenegro, which gave cost effective approach of organization of trainings:

Group I (Nothren part)- cities: Bijelo Polje, Kolašin, Mojkovac, Pljevlja

Group II (Nothren part)- cities: Andrijevica, Berane, Petnjica, Plav, Rožaje
Group III (Central part)- cities: Danilovgrad, Cetinje, Podgorica
Group IV (Central part)- cities: Nikšić, Plužine, šavnik, Žabljak
Group V (Sothren part)- cities: Herceg Novi, Kotor, Tivat, Budva, Bar, Ulcinj

After organizing the training, all participants are certified (total number: 234) (Report: http://ecesm.net/dev-23-improve-cyber-security-knowledge), and, in strong cooperation with the Ministry of education, all trainees were invited to apply for official ECDL certification (Module: Information security) (number of trainees how obtained ECDL certificate: 80) (Report: http://ecesm.net/dev-23-improve-cyber-security-knowledge).

Target group 3: Student population at elementary and secondary schools - As described in the Section II (Report: DEV 2.3), education of student population at elementary and secondary schools is long term activity which shall be led and coordinated by the Ministry of education, and implemented by professors and ICT coordinators. To this end, ECESM project put significant efforts on creating well educated and trained professors and ICT coordinators at national level in Montenegro; as well as on establishing strong links with the Ministry of education, thus ensuring sustainable actions this regard.

Target group 4: Student population at HEIs – ME partner universities, UDG and UNIM, implemented several trainings for students at different educational levels. The trainings are organised within existing courses with selected topics form cyber security field (http://ecesm.net/trainings-within-wp2-improve-cyber-security-knowledge).

Target group 5: Adults - As described in the Section II (Report: DEV 2.3), adult population is heterogeneous and cannot be reached easily in general. ECESM project reached the following subcategories: (i) Parents of children at elementary and secondary schools (they will be reached by ICT coordinators during their usual visits to schools when special sessions about cyber security should be organized, promotional materials distributed, etc.); (ii) Workers (several categories of workers will be reached at WP3 which is aimed on raising awareness and knowledge of workforce); (iii) Others (intensive dissemination activities are expected to rise awareness about cyber security issues in general).

Trainings in WP3

- As agreed at 3rd National Coordination Meeting (see: Minutes of the 3rd National Coordination Meeting), WP3 trainings are scheduled for September 2015 (see Report titled 'Improve cyber security knowledge') and they were coordinated by Chamber of Economy:

(i) Introductory training aimed on presentation of training topics and contents was organized as a part of II ECESM Conference held in Budva (as integral part of the largest regional Festival of ICT advancements- InfoFest)

(ii) 10 trainings were organized during 2015 and 2016, with total number of participants: 200 (see: http://ecesm.net/dev-23-improve-cyber-security-knowledge)

(iii) As agreed at 5th National Coordination Meeting (see: Minutes of the 5th National Coordination Meeting), on the bases of careful analyses of list of attendees from organized trainings for workers professionals (WP3), additional training events for workers at northern and southern regions of Montenegro are organized- total number of participants: 200 (see: http://ecesm.net/trainings-within-wp3-improve-knowledge-within-organisations)

(iv) All trainees are certified by ECESM project consortium (see: Report_Certification Ceremony)
Detailed Report about all organized trainings within WP3 is available at: DEV3.3- Improve knowledge within organizations

Accreditation of Master study program (WP4)

Final goal- the development of Master study program and courses in Cyber security is developed iteratively by partner universities in Montenegro with close cooperation with EU partners, in the following phases:
Phase I- Analyses of current situation in Montenegro- during the period after ECESM proposal submission (February 2013) till 2015, Montenegrin universities took several activities moving toward establishment of cyber security educational programs. More specifically: University of Donja Gorica (UDG) started with multidisciplinary Master program in Cyber security in September 2013; while University Mediterranean (UNIM) integrated several courses in cyber security in existing programs at different levels (undergraduate, graduate, Master).

Phase II – Adjustment of ECESM goals to current situation in Montenegro, and EU trends in education and cyber security – On the bases on conducted analyses, as well as recent EU trends in cyber security education, ECESM consortium made the following decision: Existing Master study program at UDG shall be updated by establishing 3 different specializations: CYBERSECURITY TECHNOLOGY, CYBERSECURITY POLICY & ECONOMY, and CYBERSECURITY MANAGEMENT; while existing programs at UNIM should be updated with new and innovated courses. Formal approval of the changes are received by EACEA on: 10th August 2016.

Phase III – Development of update study program and courses – ME universities together with experienced EU partner universities worked on development on updated study programs and courses, all adopted to specificities of Montenegro as a small country and its educational system.

Phase IV- Implementation of updated study program – Both universities, UDG and UNIM implemented updated study program and courses and enrolled 1st generation of students (reports: http://ecesm.net/sites/default/files/4.3.pdf Section: Enrolment procedure). Professors from EU partner universities participated actively in organization of lectures and courses (Reports: http://ecesm.net/sites/default/files/4.3.pdf Section: Lectures and courses-Fall semester 2016/2017)

4.3 RESTRUCTURING: UNIVERSITY MANAGEMENT AND GOVERNANCE

Authorities of both universities are introduced about enrolment rules of the 1st generation of students of adopted study programs at Master level in cyber security. To this end, Dean of Humanistic studies at University of Donja Gorica signed Decision on enrolling all students with no scholarship for Master program in cyber security (as reported in 4.3: http://ecesm.net/sites/default/files/4.3.pdf). On the other side, reporting about all project activities was organised regularly and all participating institutions at national level strongly supported them.
On the other side, by establishing the Montenegrin Centre for Cyber education (MCEC) at national level (http://www.imtm.me/me-cyber-edu-center/), both, academic, governmental institutions and companies, accepted MCEC as a core entity for cyber security topics; proved by the following key indicators:

- Ministry of education promoted developed Moodle platform among professors, teachers and children, for the purpose of raising awareness in cyber security
- 1st Forum in Cyber security is organised by MCEC, with very significant impact and audience at national level: National Security Agency, Ministry of information society and telecommunications, Ministry of interior, etc. See report: http://www.imtm.me/me-cyber-edu-center/forum-sajber-bezbjednosti-u-crnoj-gori/

MCEC which is established as IMTM unit, is located at 1st Montenegrin Innovative Entrepreneurship Centre Tehnopolis Nikšić (http://tehnopolis.me/)

4.4 MOBILITY AND TRAINING ACTIVITIES FOR STAFF AND STUDENTS

A. TRAINING ACTIVITIES

Since the submission of the intermediate report, we organised and implemented the following training activities:

1. Within work package 2 we organised the following training activities:

- **Training of Montenegrin trainers:** on 16th May 2015 training was held in Rome, Italy. Massimo Cappelli and Alessio Coletta (GCSEC) trained 5 future trainers at Montenegro. The trainees encompassed three main topics: ISO/IEC 27001 Information Security Management - Introduction, ISO/IEC 27001:2005 Information technology -- Security techniques -- Information security management systems -- Requirements, Topic 3: Joint Master program in Cyber Security at GCSEC. The report from the training is available here: http://ecesm.net/sites/default/files/Minutes-Bucks-wp2%20training%2018-20.03.2015.%20NEW.pdf

- **Training of professors and ICT professionals:** within this target group we trained four subgroups. Each subgroup was trained on two different topics: information security - part I and information security - part II. The trainings on the first topic were conducted in five large Montenegrin cities: Berane, Nikšić, Bijelo Polje, Podgorica and Budva.
    - 27th August 2015, Berane, Montenegro: Ramo Šendelj (UDG), Dejan Tomović (UDG) and Igor Vujačić (IMTM) trained 21 trainees.
      Agenda: http://ecesm.net/sites/default/files/Agenda_Berane_27th%20August%202015.pdf
      Report: http://ecesm.net/sites/default/files/Report%20Berane%2027th%20August%202015.pdf

- 27th August 2015, Bijelo Polje, Montenegro: Srdjan Jovanovski (UNIM), Adis Balota (UNIM) and Mladen Bukilić (UNIM) trained 27 trainees.
  Agenda: http://ecesm.net/sites/default/files/Program%20obuke%20%20BP.pdf
  Report: http://ecesm.net/sites/default/files/Report_Bijelo_Polje%2C_27th_August_2015-final.pdf

- 19th September 2015, Nikšić, Montenegro: Srdjan Jovanovski (UNIM), Adis Balota (UNIM) and Mladen Bukilić (UNIM) trained 25 trainees.
  Agenda: http://ecesm.net/sites/default/files/Agenda_Niksic_part_I.pdf
  Report: http://ecesm.net/sites/default/files/Report_Niksic%2C_19th_Sept_2015-1.pdf

- 19th September 2015, Podgorica, Montenegro: Ramo Šendelj (UDG), Ivana Ognjanović (UDG), Dejan Tomović (UDG) and Igor Vujačić (IMTM) trained 28 trainees.
  Agenda: http://ecesm.net/sites/default/files/Program%20obuke%20%20Podgorica.pdf Report: http://ecesm.net/sites/default/files/Report%20Podgorica%2019th%20September%202015.pdf

- 30th September 2015, Budva, Montenegro: Ramo Šendelj (UDG), Ivana Ognjanović (UDG), Igor Vujačić (IMTM), Massimo Cappelli (Global Cyber Security Center), Indrachapa Bandara (BUCKS), Marko Holbl (University of Maribor), Elena Vaarmets (TUT), Toomas Lepik (TUT) trained 25 trainees.
  Agenda: http://ecesm.net/sites/default/files/PROGRAM%20OBUKE-Budva_Sept%2030.pdf
  Report: http://ecesm.net/sites/default/files/Report_Budva_Sept_30.pdf

Likewise, the trainings on the second topic were performed in the same five cities.

- 10th October 2015, Berane, Montenegro: Srdjan Jovanovski (UNIM), Adis Balota (UNIM) and Mladen Bukilić (UNIM) trained 17 trainees.
  Agenda: http://ecesm.net/sites/default/files/Program%20obuke_Berane_part_II.pdf
  Report: http://ecesm.net/sites/default/files/Berane_part_2_group_1.pdf

- 10th October 2015, Bijelo Polje, Montenegro: Ramo Šendelj (UDG), Dejan Tomović (UDG), Igor Vujačić (IMTM) and Ivana Ognjanović (UDG) trained 21 trainees. Agenda: http://ecesm.net/sites/default/files/PROGRAM%20OBUKE-Bijelo%20Polje_10102015.pdf
  Report: http://ecesm.net/sites/default/files/Report_Bijelo_Polje_10102015_0.pdf

- 17th October 2015, Podgorica, Montenegro: Srdjan Jovanovski (UNIM), Adis Balota (UNIM) and Mladen Bukilić (UNIM) trained 36 trainees.
  Agenda: http://ecesm.net/sites/default/files/Program_obuke__Podgorica.pdf
  Report: http://ecesm.net/sites/default/files/Report_Podgorica%20_17.10.2015-1.pdf

- 17th October 2015, Nikšić, Montenegro: Ramo Šendelj (UDG), Dejan Tomović (UDG), Igor Vujačić (IMTM) trained 23 trainees.
  Agenda: http://ecesm.net/sites/default/files/PROGRAM%20OBUKE-Niksic_Oct_15_final.pdf
  Report: http://ecesm.net/sites/default/files/Report_Niksic_Oct_15_final.pdf

- 24th October 2015, Budva, Montenegro: Srdjan Jovanovski (UNIM), Adis Balota (UNIM) and Mladen Bukilić (UNIM) trained 28 trainees.
  Agenda: http://ecesm.net/sites/default/files/docs/PROGRAM%20OBUKE_Budva_24102015.pdf
  Report: http://ecesm.net/sites/default/files/Report_Budva%20_24.10.2015-pop.pdf

- **Training of university students:** in November 2015 we trained university students in Podgorica, Montenegro.
  - 9th November 2015, Podgorica, Montenegro: Srdjan Jovanovski (UNIM), Adis Balota (UNIM) and Mladen Bukilić (UNIM) trained 22 trainees. Report is available here: http://ecesm.net/sites/default/files/Report%20FIT%2C%209th%20Novembre%202015.pdf

  - 11th November 2015, Podgorica, Montenegro: Srdjan Jovanovski (UNIM), Adis Balota (UNIM) and Mladen Bukilić (UNIM) trained 27 trainees. Report is available here: http://ecesm.net/sites/default/files/Report%20FIT%2C%2011th%20Novembre%202015.pdf

  - 12th November 2015, Podgorica, Montenegro: Srdjan Jovanovski (UNIM), Adis Balota (UNIM) and Mladen Bukilić (UNIM) trained 32 trainees. Report is available here: http://ecesm.net/sites/default/files/Report%20FJS%2C%2012th%20Novembre%202015.pdf

- 13th November 2015, Podgorica, Montenegro: Adis Balota (UNIM) and Mladen Bukilić (UNIM) trained 10 trainees. Report is available here: http://ecesm.net/sites/default/files/Report%20MBS%2013th%20Novembre%202015.pdf

- 10th November 2015, Podgorica, Montenegro: Ramo Šendelj (UDG) trained 20 trainees. Report is available here: http://ecesm.net/sites/default/files/10november-udg.pdf

- 12th November 2015, Podgorica, Montenegro: Ramo Šendelj (UDG) and Ivana Ognjanović (UDG) trained 31 trainees. Report is available here: http://ecesm.net/sites/default/files/12november-udg.pdf

- 9th February 2016, Podgorica, Montenegro: Ivana Ognjanović (UDG) trained 45 trainees. Report is available here: http://ecesm.net/sites/default/files/9februar-udg.pdf

Finally, on 16th May 2016, there was a certification award ceremony organised at University Donja Gorica. Report can be found here: http://ecesm.net/sites/default/files/Report%20of%20the%20dissemination%20activity-UDG.pdf

2. Within work package 3 we organised the following training activities (list of all trainings is available here: http://ecesm.net/trainings-within-wp3-improve-knowledge-within-organisations):

- **Introductory training course**
  - 1st October 2015, Budva, Montenegro: Ramo Šendelj (UDG), Ivana Ognjanović (UDG), Igor Vujačić (IMTM) and Nada Rakocevic (CEM) trained 13 companies representatives. Report is available here: http://ecesm.net/sites/default/files/Minutes%20-%20Zero%20training.pdf

- **10 training courses**
  - 16th February 2016, Chamber of Economy, Podgorica, Montenegro: Marko Hölbl (UM) trained 23 participants (representatives of Montenegrin companies). The topic was Security threats on the Web - part I. Report: http://ecesm.net/sites/default/files/Course%20no1_Security%20treats%20on%20the%20Web_minutes.pdf
    Survey results: http://ecesm.net/sites/default/files/Survey%20results%20_Course%20no1_Security%20treats%20on%20the%20Web.pdf

  - 30th March 2016, Chamber of Economy, Podgorica, Montenegro: Flavio Lombardi (UR3) trained 32 participants (representatives of Montenegrin companies). The topic was Network and Security. Report: http://ecesm.net/sites/default/files/30march.pdf
    Survey results: http://ecesm.net/sites/default/files/Survey%20results_Course%20no2_Introduction%20to%20Network%20security%20I.pdf

    30th March 2016, Chamber of Economy, Podgorica, Montenegro: Stefano Guarino (UR3) trained 27 participants. The topic was Introduction to Access Control - Part I. Report: http://ecesm.net/sites/default/files/Course%20no3_Introduction%20to%20Access%20Control%20I_minutes.pdf
    Survey results: http://ecesm.net/sites/default/files/Survey%20results_Course%20no3_Introduction%20to%20Access%20Control%20I.pdf

  - 8th April 2016, Chamber of Economy, Podgorica, Montenegro: Toomas Lepik (University of Technology) trained 26 participants. The topic was First Responder Intro to Internet. Report: http://ecesm.net/sites/default/files/8april.pdf
    Survey results: http://ecesm.net/sites/default/files/Survey%20results_Course%20no4_First%20Responder%20Intro%20to%20Internet.pdf

  - 16th May 2016, Chamber of Economy, Podgorica, Montenegro: Stefano Guarino (UR3) trained 19 participants. The topic was Introduction to Access Control - Part II. Report: http://ecesm.net/sites/default/files/Course%20no5_Introduction%20to%20Access%20Control%20I

I_minutes.pdf Survey results:
http://ecesm.net/sites/default/files/Survey%20results_Course%20no5_Introduction%20to%20Access%20Control%20II.pdf

- 16th May 2016, Chamber of Economy, Podgorica, Montenegro: Flavio Lombardi (UR3) trained 19 participants. The topic was Network and security - part II. Report: http://ecesm.net/sites/default/files/16may.pdf
  Survey results:
  http://ecesm.net/sites/default/files/Survey%20results_Course%20no6_Network%20security%20II.pdf

- 24th May 2016, Chamber of Economy, Podgorica, Montenegro: Marko Holbl (UM) trained 32 participants. The topic was Security threats on the Web - part II. Agenda: http://ecesm.net/sites/default/files/AGENDA%20Computer%20networks%20and%20security.pdf
  Survey results:
  http://ecesm.net/sites/default/files/REPORT%20Security%20threats%20online%202nd%20part.pdf

- 30th June 2016, Chamber of Economy, Podgorica, Montenegro: Indrachapa Bandara (BUCKS) trained 22 participants. The topic was Computer networks and security part II. Report: http://ecesm.net/sites/default/files/AGENDA%20Computer%20networks%20and%20security.pdf
  Survey results:
  http://ecesm.net/sites/default/files/REPORT%20Computer%20networks%20and%20security.pdf

  2nd - 4th November 2016, University of Donja Gorica, Podgorica, Montenegro: Toomas Lepik (University of Technology) trained 34 participants. The topic was Digital Forensics. Report: http://ecesm.net/sites/default/files/Course%20no9_Digital%20Forenzic.pdf
  Survey results:
  http://ecesm.net/sites/default/files/Survey%20results_Course%20no9_Digital%20forensic.pdf

- 30th November 2016, University of Donja Gorica, Podgorica, Montenegro: Nicola Sotira (UR3) trained 18 participants. The topic was Hardware Security. Report:
  http://ecesm.net/sites/default/files/Course%20no10_Hardware%20Security.pdf
  Survey results:
  http://ecesm.net/sites/default/files/Survey%20results_Course%20no10_Hardware%20Security.pdf

On 25th November 2016 there was a certificate ceremony. Chamber of Economy Montenegro, together with partner institutions at ECESM project – Institute of modern technology Montenegro and University Donja Gorica handed certificates to participants who successfully completed the trainings. Report is available here: http://ecesm.net/sites/default/files/Certificate%20Ceremony.pdf

- **Additional training courses**
  - 14th - 16th June 2016, Lokalna samouprava, Bijelo Polje, Montenegro: Dragan Đurić (IMTM), Igor Vujačić (IMTM) and Igor Ognjanović (IMTM) trained 21 participants each day. Agenda:
    http://ecesm.net/sites/default/files/Course%20no1_Security%20treats%20on%20the%20Web_minutes.pdf
    Report: http://ecesm.net/sites/default/files/Training%20Bijelo%20Polje-minutes.pdf

  - 18th - 20th July 2016, Hotel Alexandar, Budva, Montenegro: Dragan Đurić (IMTM), Igor Vujačić (IMTM) and Igor Ognjanović (IMTM) trained 19 participants each day.
    Agenda:
    http://ecesm.net/sites/default/files/Course%20no1_Security%20treats%20on%20the%20Web_minutes.pdf
    Report: http://ecesm.net/sites/default/files/Training%20Budva-minutes%20-_0.pdf

B. MOBILITIES

Since submission of the intermediate report, there were eight consortium meetings, two national coordination meetings and six individual meetings between project partners. Besides that, staff from EU institution performed mobilities in order to conduct trainings within WP3 in Montenegro. All up to date information on performed staff mobility together with reports and photo galleries can be seen on http://ecesm.net/meetings.

a) Consortium meetings

Ninth meeting
17-19 June 2015
Podgorica, Montenegro

The meeting was organised by University Mediterranean. At the meeting, the consortium was informed about submission of the intermediate report. Important administrative issues were addressed where the partners discussed about the request for the second instalment and substantiation of costs incurred. Moreover, partners discussed about trainings for groups within WP2.

Participants from partner institutions:
EU Partners
Matjaž Debevc, University of Maribor, Slovenia
Marko Holbl, University of Maribor, Slovenia
Ines Kožuh, University of Maribor, Slovenia
Stefano Guarino, University Roma TRE, Italy
Massimo Cappelli, Global Cyber Security Center, Italy
Indrachapa Bandara, Buckinghamshire New University

Montenegro Partners
Ramo Sendelj, University of Donja Gorica
Ivana Ognjanovic, University Mediterranean
Srđan Jovanovski, University Mediterranean
Jelena Ljucović, University Mediterranean
Bojana Tošić, Institute of modern technologies Montenegro
Ana Rakocevic, Ministry of Information Society and Telecommunications
Nada Rakočević, Chamber of Economy of Montenegro

Tenth meeting
16-18 July 2015
London (Buckinghamshire), United Kingdom

The meeting was organised by BUCK, UK. At the meeting, the consortium discussed about the final plan of trainings within WP2 and WP3. Moreover, discussions about dissemination activities were held, where presentations at the local conference InfoFEST were emphasized. Finally, the detailed instructions for regular submission of evidences of expenditure of the Tempus grant to the coordinator were provided.

Participants from partner institutions:
EU Partners
Matjaž Debevc, University of Maribor
Ines Kožuh, University of Maribor
Sabina Weingerl, University of Maribor
Stefano Guarino, University Roma TRE
Flavio Lombardi, University Roma TRE
Indrachapa Bandara, Buckinghamshire New University
Florin Ioras, Buckinghamshire New University

Montenegro Partners
Ramo Sendelj, University of Donja Gorica
Dragan Vukčević, University of Donja Gorica
Ivana Ognjanovic, University Mediterranean
Srđan Jovanovski, University Mediterranean
Ana Rakocevic, Ministry of Information Society and Telecommunications
Nada Rakocevic, Chamber of Economy of Montenegro

Eleventh meeting
03-05 September 2015
Maribor, Slovenia

The meeting was organised by University of Maribor. The meeting was extremely important since the participants visited the Slovenian Computer Emergency Response Team – CERT-SI in Ljubljana, Slovenia, on the first day. They

discussed about the activities of the team, presented ECESM results and talked about opportunities for future cooperation. On the second and the third day of the meeting, round table about the content of the ECESM handbook was held, results of the first trainings were reported, as well as discussion about sustainability and dissemination took place. The coordinator also provided results of analyses of financial issues for each partner separately.

Participants from partner institutions:
EU Partners
Matjaž Debevc, University of Maribor
Indrachapa Bandara, Buckinghamshire New University
Ines Kožuh, University of Maribor
Sabina Weingerl, University of Maribor
Marko Kääramees, Tallinn University of Technology

Montenegro Partners
Ramo Sendelj, University of Donja Gorica
Ivana Ognjanovic, University of Donja Gorica
Ana Rakocevic, Ministry of Information Society and Telecommunications
Anđela Jakšić Stojanović, University Mediterranean
Adis Balota, University Mediterranean
Srđan Jovanovski, University Mediterranean
Manolina Bašović, University Mediterranean
Igor Ognjanović, Institute of Modern technology Montenegro
Ivan Petrović, Institute of Modern technology Montenegro
Dragan Đurić, Institute of Modern technology Montenegro

Twelfth meeting
28 September - 01 October 2015
Budva, Montenegro

The meeting was organised by University of Donja Gorica. The first day was dedicated to the 2nd Conference "Cyber security in the knowledge society: threats, risks and achievements" organized as a part of the Regional Festival of ICT achievements InfoFEST. On the same day, the second Monitoring Visit of the National Erasmus Office of Montenegro was held. They expressed satisfaction with achieved results and ECESM visibility at national level. On the following days, the participants extensively discussed about current results within WP2 and WP3, financial issues were in detail discussed and the trainings were held.

Participants from partner institutions:
EU Partners
Indrachapa Bandara, Buckinghamshire New University
Massimo Cappelli, Global Cyber Security Center
Marko Holbl, University of Maribor
Elena Vaarmets, TUT Toomas Lepik, TUT
Matjaž Debevc, University of Maribor
Ines Kožuh, University of Maribor
Marko Kääramees, Tallinn University of Technology
Toomas Lepik, TUT

Montenegro Partners
Ramo Sendelj, University of Donja Gorica
Ivana Ognjanovic, University of Donja Gorica
Ana Rakocevic, Ministry of Information Society and Telecommunications
Adis Balota, University Mediterranean
Srđan Jovanovski, University Mediterranean
Bojana Tošić, Institute of Modern technology Montenegro
Nada Rakočević, Chamber of Economy, Montenegro

Thirteenth meeting
10 - 12 December 2015
Rome, Italy

The meeting was organised by Roma Tre University. Participants discussed about the results on the EACEA's feedback on the intermediate report. Detailed discussions about research within WP2 were held. Reports about

performed trainings were provided. Constructive debate was performed about the current status within WP4 and reaccreditation of the master program in Montenegro. The coordinator addressed open issues on administrative and financial issues.

Participants from partner institutions:
EU Partners
Matjaž Debevc, University of Maribor
Ines Kožuh, University of Maribor
Indrachapa Bandara, Buckinghamshire New University
Stefano Guarino, UR3
Francesca Merola, UR3
Flavio Lombardi, UR3
Massimo Cappelli, Global Cyber Security Center
Marko Kääramees, Tallinn University of Technology
Toomas Lepik, Tallinn University of Technology

Montenegro Partners
Ramo Sendelj, University Donja Gorica
Ivana Ognjanovic, University Donja Gorica
Dragan Vukčević, University Donja Gorica
Kenan Duraković, Ministry of Information Society and Telecommunications
Ana Rakocevic, Ministry of Information Society and Telecommunications
Nada Rakočević, Chamber of Economy, Montenegro
Srđan Jovanovski, University Mediterranean
Manolina Bašović, University Mediterranean
Anđela Jakšić-Stojanović, University Mediterranean
Ivan Petrović, Institute of Modern technology Montenegro
Dragan Đurić, Institute of Modern technology Montenegro
Jelena Konatar, Ministry of Education of Montenegro
Marina Matijević, Ministry of Education of Montenegro

Fourteenth meeting
12 April - 14 April 2016
London, UK

The meeting was organised by BUCKS, UK. Results on WP2 were presented and discussed in detail. The activities not being performed were stressed and new deadlines were set. Discussions on trainings within WP3 were held and the progress of activities within WP4 was reported. Debate on dissemination plan and sustainability of project results was held. Extensive discussion about the coordinator's requirements on providing evidences of current expenditure was performed.

Participants from partner institutions:
EU Partners
Florin Ioras, Buckinghamshire New University
Indrachapa Bandara, Buckinghamshire New University
Marko Kääramees, Tallinn University of Technology
Marko Hölbl, University of Maribor
Matjaž Debevc, University of Maribor
Stefano Guarino, UR3
Massimo Capelli, GCSEC

Montenegro Partners
Ramo Sendelj, University Donja Gorica
Ivana Ognjanovic, University Donja Gorica
Dragan Vukčević, University Donja Gorica
Nikola Ivanović, Ministry of Information Society and Telecommunications
Ana Rakocevic, Ministry of Information Society and Telecommunications
Irma Nišić, Ministry of Information Society and Telecommunications
Dino Karailo, University Mediterranean
Abaz Dizdarević, University Mediterranean
Anđela Jakšić-Stojanović, University Mediterranean
Jelena Konatar, Ministry of Education of Montenegro

Marina Matijević, Ministry of Education of Montenegro
Nada Rakočević, Chamber of Economy, Montenegro

Fifteenth meeting
10 May - 13 May 2016
Talinn, Estonia

The meeting was organised by the Talinn University of Technology. Within WP4, detailed analysis was opened on updated master study program proposed by UDG and its comparison with study programs led by TUT. At the meeting, the study programme was agreed. The project partners agreed with the proportional transfer of budget intended for external audit to the coordinator since it was not planned in the project proposal that the coordinator would pay the cost. Moreover, activities of the Montenegrin Cyber Education Center were presented and financial issues were addressed.

Participants from partner institutions:
EU Partners
Marko Kääramees, Tallinn University of Technology
Tannel Tammet, Tallinn University of Technology
Toomas Leepik, Tallinn University of Technology
Matjaž Debevc, University of Maribor
Marko Holbl, University of Maribor
Ines Kožuh, University of Maribor
Indrachapa Bandara, Buckinghamshire New University
Stefano Guarino, UR3

Montenegro Partners
Ramo Sendelj, University Donja Gorica
Ivana Ognjanovic, University Donja Gorica
Dragan Vukčević, University Donja Gorica
Irma Nišić, Ministry of Information Society and Telecommunications
Bojana Delić, Ministry of Information Society and Telecommunications
Nada Rakočević, Chamber of Economy, Montenegro
Anđela Jakšić-Stojanović, University Mediterranean
Dušanka Vujišić, University Mediterranean

Sixteenth meeting
28 September - 30 September 2016
Budva, Montenegro

The last meeting was organised in Budva. The coordinator conducted financial monitoring with each partner individually. Analyses of current results within WP4 were performed. Participants discussed results on all work packages. Each partner presented his contribution to the final report.

Participants from partner institutions:
Olga Pregl, University of Maribor
Indrachapa Bandara, Buckinghamshire New University, United Kingdom
Marko Kaaramees, Tallinn University of Technology
Tannel Tammet, Tallinn University of Tecnology
Matjaž Debevc, University of Maribor
Marko Holbl, University of Maribor
Ines Kožuh, University of Maribor

Montenegro Partners
Ramo Sendelj, University Donja Gorica
Adis Balota, University Mediterranean
Anđela Jakšić Stojanović, University Mediterranean
Ivana Ognjanovic, University Donja Gorica
Nada Rakočević, Chamber of Economy, Montenegro
Srdjan Jovanovski, University Mediterranean
Dušanka Vujišić, University Mediterranean
Mladen Bukilić, University Mediterranean
Bojana Tošić, IMTM
Dragan Đurić, IMTM

Ivan Petrović, IMTM
Marina Matijević, Ministry of education
Josip Genić, Ministry of education
Nikola Ivanović, Ministry of Information and Telecommunications
Kenan Duraković, Ministry of Information and Telecommunications
Bojana Delić, Ministry of Information Society and Telecommunications
Sandra Veličković, Ministry of Information Society and Telecommunications
Irma Nišić, Ministry of Information Society and Telecommunications

b) National coordination meetings

Next to consortium meeting, since submission of the intermediate report there were held two national coordination meetings. Reports from national coordination meetings are available on: http://ecesm.net/meetings.

FOURTH NATIONAL COORDINATION MEETING
13th January 2016
Podgorica, Montenegro

The main topic of the meeting was the accreditation of multidisciplinary master study program from the field of cyber security. It was concluded that the contribution of EU partners would significantly contribute to the establishment of high quality master programs which are completely in accordance with the best EU practices as well as the modern labour market needs.

Participants on the meeting:
Anđela Jakšić Stojanović, University Mediterranean
Ramo Šendelj, University of Donja Gorica
Dragan Đurić, Institute of Modern Technology Montenegro
Nada Rakočević, Chamber of Economy of Montenegro
Ana Rakočević, Ministry of Information Society and Telecommunications

FIFTH NATIONAL COORDINATION MEETING
15 April 2016
Podgorica, Montenegro

Activities within WP2 and WP3 were emphasized since they are focused on organizing different trainings and raising awareness campaigns. Additional training events for workers at northern region of Montenegro were agreed and if successful in southern region as well.

Participants on the meeting:
Dragan Đurić, Institute of Modern Technology Montenegro
Anđela Jakšić Stojanović, University Mediterranean
Ramo Šendelj, University of Donja Gorica
Nada Rakočević, Chamber of Economy of Montenegro
Ana Rakočević, Ministry of Information Society and Telecommunications

c) Individual meetings between project partners

Since submission of the interim report, there were held six individual meetings between project partners. Reports from individual meetings between project partners are available on: http://ecesm.net/meetings.

Individual meeting between BUCKS and UR3
24-25 September 2015
High Wycombe, UK

The intention of the meeting was to discuss the current situation and solve a few open issues related to WP2 and WP3, that BUCKS and UR3 respectively lead, and that present many communal aspects. The addressed the cyber security handbook, trainings at ME schools and plans for trainings.

Participants on the meeting:
EU Partners
Stefano Guarino, Roma Tre University (UR3)
Francesca Merola, Roma Tre University (UR3)
Indrachapa Bandara, Bucks New University (BUCKS)
Florin Ioras, Bucks New University (BUCKS)

Individual meeting between TUT and UDG
17-18 February 2016
Talinn, Estonia

The intention of the meeting was to solve open issues regarding creation of master programme in Montenegro. The meeting was aimed on analysing suggestion / request stated in EACEA Intermediate Report regarding the study programme. Participants agreed on creation new approach addressing the situation at two partner universities from Montenegro, University Donja Gorica and Mediterranean University. It should be focused on reaccreditation of existing study program and developing new more specialized orientations within existing program.

Participants on the meeting:
EU Partners
Marko Kääramees, TUT
Tanel Tammet, TUT

Montenegro Partners
Ramo Sendelj, University of Donja Gorica
Ivana Ognjanovic, University of Donja Gorica

Individual meeting between GCSEC and IMTM
17-18 May 2016
Rome, Italy

The intention of the meeting was to find best modalities for sustainable work of established Montenegrin Cyber Educational Center Montenegro (MCEC). The IMTM team also pointed out the absence of ICT professionals from the north of country, and presented the conclusions between IMTM and management of companies adopted during IMTM visits and presentation of MCEC among private sector in previous few months. GCSEC and IMTM agreed that the best way is to overcome this issue is to organize 3day training in one of the biggest towns in North Montenegro and invite companies.

Participants on the meeting:
EU Partners
Massimo Cappelli, GCSEC
Elena Agresti, GCSEC

Montenegrin Partners
Ivan Petrovič,
IMTM Bojana Tošić, IMTM

Individual meeting between BUCKS and Montenegro consortium
7-9 July 2016
High Wycombe, UK

At the meeting, results and activities within WP2 were discussed, as well as further sustainable actions in this direction were a subject of debate. Also, analysis of WP3 progress with special focus on recently organized additional trainings at northern part of Montenegro (as agreed at National Board) were discussed. Afterwards, the partners discussed about the needs for sustainable education in cyber security field at national level in Montenegro.

Participants on the meeting:
EU partner institutions:
Florin Ioras, BUCKS
Indrachapa Bandara, BUCKS

ME partner institutions:
Ramo Šendelj, UDG
Ivana Ognjanović, UDG
Anđela Jakšić Stojanović, UNIM
Manolina Bašović, UNIM
Dragica Žugić, UNIM
Abaz Dizdarević, UNIM
Dino Karailo, UNIM
Igor Ognjanović, IMTM
Nada Rakočević, CoE

Irma Nišić, MID
Marina Matijević, MoE
Jelena Konatar, MoE

Individual meeting between UM and UDG
22-25 October 2016
Maribor, Slovenia

At the meeting, partners discussed about improved Master study program in Cyber security at University Donja Gorica, its implementation and enrolment of new generation of students. Moreover, analyses of sustainability indicators and cross-matching of Intermediate Report results with achieved results/ corrections/ indicators were performed. Additionally, the review of submitted financial documentation was performed.

Participants on the meeting:
EU Partners
Matjaž Debevc, University of Maribor
Ines Kožuh, University of Maribor
Marko Hoelbl, University of Maribor

Montenegro Partners
Ramo Šendelj, University Donja Gorica
Ivana Ognjanović, University Donja Gorica

Individual meeting between GCSEC, IMTM and UDG
21-23 November 2016
Rome, Italy

The representatives of GCSEC and IMTM agreed to include each other in the preparation of project proposals in the field of cyber security. Moreover, Montenegrin partners attended "Advanced Persistent Threats: real cases" event, organized by European Electronic Crime Task Force (EECTF). Discussion of sustainability of master studies at UDG, and review of best practices in the world was held.

Participants on the meeting:
EU Partners
Massimo Cappelli, GCSEC
Nicola Sotira, GCSEC

Montenegrin Partners
Ivan Petrović, IMTM
Bojana Tošić, IMTM
Ramo Šendelj, UDG
Ivana Ognjanović, UDG

Individual meeting between UM and MID
21-22 November 2016
Maribor, Slovenia

The meeting was aimed on analyses of improved Master study program in Cyber security in Universities in Montenegro and importance for new generations of students as well as the whole population in ME. Moreover, discussions on financial report were held.

EU Partners
Matjaž Debevc, Ines Kožuh, Olga Pregl, Marko Holbl, University of Maribor

Montenegro Partners
Nikola Ivanović, Kenan Duraković, Dzevad Purišić, Sandra Veličković, Tamara Popović, Irma Nišić, Ministry for Information Society and Telecommunications

Individual meeting between UM and IMTM
26 November 2016
Maribor, Slovenia

The meeting was aimed on sustainability of project outcomes and review of financial reports.

EU Partners
Matjaž Debevc, Olga Pregl, University of Maribor

Montenegro Partners
Bojana Tosić, Dragan Đurić, Ivan Petrović, Institute of Modern Technology Montenegro

Individual meeting between UM, IMTM and UDG
28-29 November 2016
Maribor, Slovenia

The meeting was aimed on analyses of enrolment procedure and enrolled students at innovated Master study program in Montenegro, Cross-matching of Intermediate Report results with achieved results/ corrections/ indicators, the preparation for the Final report, analyses of sustainability indicators and analysis of the Financial documentation.

EU Partners
Matjaž Debevc, Ines Kožuh, Olga Pregl, Marko Holbl, University of Maribor

Montenegro Partners
Bojana Tosić, Institute of Modern Technology Montenegro
Dragan Đurić, Institute of Modern Technology Montenegro
Ivan Petrović, Institute of Modern Technology Montenegro
Ramo Šendelj, University of Donja Gorica
Ivana Ognjanović, University of Donja Gorica

d) Staff mobilities for training activities within WP3

As it was already mentioned in the text under point 'A. Training activities' within this section, staff from EU partner institutions performed mobilities in order to provide trainings within WP3 in Montenegro. Reports are available here: http://ecesm.net/trainings-within-wp3-improve-knowledge-within-organisations

NO. 0: INTRODUCTORY TRAINING (ORGANISED AS A PART OF INFOFEST 2015)
1st October 2015
Akademija Znanja Budva, Budva, Montenegro

NO. 1: SECURITY THREATS ON THE WEB
16th February 2016
Chamber of Economy, Podgorica, Montenegro
Lecturer: Marko Hölbl, University of Maribor, Maribor, Slovenia

NO. 2: NETWORK AND SECURITY – PART I
30th March 2016
Chamber of Economy, Podgorica, Montenegro
Lecturer: Flavio Lombardi, Roma Tre University, Rome, Italy

NO. 3: INTRODUCTION TO ACCESS CONTROL – PART I
30th March 2016
Chamber of Economy, Podgorica, Montenegro
Lecturer: Stefano Guarino, Roma Tre University, Rome, Italy

NO. 4: FIRST RESPONDER INTRO TO INTERNET – PART I
8th April 2016
Chamber of Economy, Podgorica, Montenegro
Lecturer: Toomas Lepik, University of Technology, Talinn, Estonia

NO. 5: INTRODUCTION TO ACCESS CONTROL – PART II
16th May 2016
Chamber of Economy, Podgorica, Montenegro
Lecturer: Stefano Guarino, Roma Tre University, Rome, Italy

NO. 6: NETWORK AND SECURITY – PART II
16th May 2016

Chamber of Economy, Podgorica, Montenegro
Lecturer: Flavio Lombardi, Roma Tre University, Rome, Italy

NO. 7: SECURITY THREATS ON THE WEB – PART II
24th May 2016
Chamber of Economy, Podgorica, Montenegro
Lecturer: Marko Holbl, University of Maribor, Slovenia

NO. 8: COMPUTER NETWORKS AND SECURITY – PART II
30th June 2016
Chamber of Economy, Podgorica, Montenegro
Lecturer: Indrachapa Bandara, BUCKS, UK

NO. 9: DIGITAL FORENSIC
2nd - 4th November 2016
University of Donja Gorica, Podgorica, Montenegro
Lecturer: Toomas Lepik, Talinn, Estonia

NO. 10: HARDWARE SECURITY
30th November 2016
University of Donja Gorica, Podgorica, Montenegro
Lecturer: Nicola Sotira, Rome, Italy

4.5 EQUIPMENT

Additional equipment was purchased after receiving EACEA approval (received on 10th August 2016), with the procedure described as follows. University Mediterranean and University of Donja Gorica, announced the Tender in order to select the best supplier for procurement of technical equipment. The Tender was announced in: daily newspaper "Vijesti", on universities web site and National web site for Tender calls on 24th of August 2016. Bid opening Committee was composed of two representatives of the University Mediterranean and two representatives of the University of Donja Gorica. The Committee analyzed three bids which participated in tender procedure. The Committee created Minutes of bid opening and Minutes of evaluation received bids for selection the most favourable supplier of the technical equipment supply for this Tempus Project. The tender procedure was realized according to national legislation and is completely in accordance to Tempus rules. During the tender procedure we did not have any complaint on tender procedure.

In accordance with Minutes of evaluation received bids and selection the most favorable supplier, each University signed Agreement with „ČIKOM" (elected ICT company) for purchase technical equipment in November 2016. All purchase equipment were delivered and installed in the appropriate condition and place.

The equipment items are selected to meet the educational needs of students at all three study levels (undergraduate, graduate and postgraduate level) with a special accent on students of master of cyber security as well as researchers and teaching staff of both Universities. The equipment will be used for demonstration, training, simulation and analysis of different aspect of cyber security.

The following documentation provides information about purchased equipment and process of tender procedure:

1. Tender calls
2. Tender calls in newspaper "Vijesti"
3. Decision on forming a Committee for the opening and evaluation of bids
4. Minute of bid opening
5. Minute of Minutes of evaluation received bids and selection the most favourable supplier
6. Contracts with the most deliverable supplier

5. DISSEMINATION AND SUSTAINABILITY

5.1 DISSEMINATION

Since submission of the intermediate report, there was intensive dissemination held in the ECESM project. In what follows, we summarize the main results and activities from the second half of the project. All dissemination results are published on the ECESM website as well: http://ecesm.net/dissemination

The results of the ECESM project activities were disseminated to a wide range of target groups both within the project countries and other European countries. The activities were aimed at promoting its research and at reaching the widest and varied audience possible. Our target groups were: professors and ICT coordinators at elementary and secondary schools in Montenegro, university students in Montenegro, ICT companies, worldwide scientific community, local authorities and governments, members of the project consortium, as well as the broader public.

Dissemination was conducted by following four key approaches:

1) Interpersonal communication
2) Organisational media
3) News media
4) Advertisement and promotion

In what follows, we briefly describe actions performed within each of these four approaches.

1) Interpersonal communication

It was performed with personal engagement of target groups, information exchange (scientific and professional conferences, professional meetings and visits) and special events (annual ECESM conference, face-to-face trainings, certificate award ceremonies, national dissemination events).

In particular, the following actions within this category were performed:

- **Presentations at the international conferences and workshops (altogether presentations at more than 10 international conferences)**
  - InfoFest 2014, 2015, 2016, Budva, Montenegro,
  - CyberCrime 2014, Tallinn, Estonia,
  - Cyber Security Workshop 2016, Tallinn, Estonia,
  - Workshop with Critical Infrastructure Owners in Italy,
  - Workshop with Public Institutions in Italy,
  - Two workshops held at the Buckinghamshire New University, UK:
    - **1st Workshop**: "CYBERSECURITY AWARENESS TRAINING" was held on the Wednesday, 18th, 19th and 21st march 2015 at Buckinghamshire New University, UK. It was dedicated to the presentation and discussion of new trends and schemes for Cybersecurity as well as this program is developed through a collaboration of cyber specialist, defence leader (US government) and Bucks New University to develop the cyber security skills to manage future threats and stay at the forefront of this rapidly expanding field. The training program delivered to TEMPUS-ECESM Montenegro partners. It has covered the security in sectors such as: government; schools, universities and training providers; and other partners with expertise in the area, such as professional bodies.
    - **2nd Workshop**: "CCNA- CISCO Introduction to Cybersecurity Courses & Certification" was held on the 16th - 18th July 2015, at Buckinghamshire New University, UK. This workshop was organised in the context of WP 2 and was dedicated to the cybersecurity and its new trends.
  - 14-18 June 2015, IEEE Conference MECO 2015, Budva, Montenegro,
  - 22 September 2015, IEEE Conference ERK 2015, Portorož, Slovenia,
  - 28-20 November 2015, INFOSEC 2015, Nova Gorica, Slovenia,
  - 22nd November 2016, Advanced Persistent Threats: real cases, Rome, Italy,

- **National dissemination events**
  - 26 May 2016, Dissemination at the Summer School "Be Ready for EU Values"
  - 20 October 2016, 1st Forum of Cyber Security Montenegro,

- 8 December 2015, Cybersecurity Workshop (The Slovenian Society Informatika), Maribor, Slovenia.

- **Annual ECESM conference**

Annual ECESM conferences were organised in 2014, 2015 and 2016. The conference entitled "Cyber security in the knowledge society: threats, risks and achievements" was organised as a part of the conferences InfoFest which were annually organised in Budva, Montenegro. In the second half of the project, two ECESM annual conferences were organised: 1) the second ECESM conference was organised on 28th September 2015 in Budva, Montenegro; report from the conference can be found on the project website: http://ecesm.net/sites/default/files/2nd_Conference.PDF ; 2) the third ECESM conference was organised on 26th September 2016 in Budva, Montenegro, where a special panel "Cybersecurity is a joint responsibility" was held, report from the conference can be found on the project website: http://ecesm.net/sites/default/files/MIST-dissemination%20%282%29.pdf .

- **Face-to-face trainings**

In order to successfully recruit participants for trainings within the work packages 2 and 3, the project partners conducted intensive dissemination in Montenegro. In this situation, interpersonal communication was applied between project consortium members and trainees.

- **Certificate award ceremonies**

Two special events as certificate award ceremonies were organised in the ECESM project lifetime. The first certificate ceremony was organised on 16th May 2016 at the University Donja Gorica, Montenegro. Almost 2000 participants (professors and ICT coordinators) trained within the work package 2 were handed certificates. The second certificate ceremony was organised on 26th November 2016 at the Chamber of Economy in Podgorica, Montenegro where certificates were handed to 84 trainees trained within 9 trainings in 9 months.

- **Meetings with managers in Montenegro**

Chamber of Economy of Montenegro organized regular meetings with managers of Montenegrin companies in order to foster the participation of their employees to training activities within the work package 3.

2) Organisational media

Our organisational media were exploited for dissemination by using general publications (leaflets, brochures, posters), electronic media (e-mails, website, online newsletters, Skype calls and video conferences for individual partner meetings and consortium meetings, the Moodle platform) and social media (social media profiles on Facebook, LinkedIn and Twitter).

In particular, the following actions within this category were performed in the second half of the project lifetime:

- *Website*

The project website was established at the beginning of the project and is available at: http://www.ecesm.net/ . During the project website it was regularly updated according to the ongoing project activities. The website includes all the important information regarding the project, the deadlines, news considering project meetings and dissemination activities, documents needed for successful implementation of the outcomes, agendas, minutes of the meetings as well as useful links to other resources. During the project lifetime, the coordinator has been responsible for the project website to be publicly accessible.

- *Online newsletters*

In the project, we published six online newsletters where we regularly published new trends in cyber security to the public. On average, in every newsletter, we published approximately ten articles on the topic cyber security. All online newsletters can be found on the ECESM website: http://ecesm.net/online-newsletter

- *Leaflets, brochures, posters and penguin stands*

In the project, we prepared leaflets, brochures and posters, so that ECESM project activities were intensively disseminated to target groups. . We printed numerous leaflets and posters, focused on promoting: (i) the project, (ii) organised trainings, (iii) organised national conference and 1st Forum in cyber security, and (iv) established Montenegrin Centre for Cyber Education (MCEC) in Montenegro. The promo material is enclosed to this final report.

- *The Moodle platform*

A Moodle platform (http://www.imtm.me/mcec/distance_learning/) was created by partner IMTM to promote trainings and publish training material, with all participants to the courses being given an account for the moodle platform.

- *Social media profiles: Facebook, LinkedIn and Twitter*

The project activities and outputs were regularly disseminated to specific and wider public through social media channels. Project activities and photos from the meetings were regularly published, as well as useful information on the topic of cybersecurity were provided in order to increase awareness of cybersecurity in society.

3) News media

Within the category of news media, we used direct information subsidy (news and social media releases, journal and conference publications, publications in magazine of CEM), indirect information subsidy (letters to editors of national and regional media) and interactive media engagement (studio interview).

In particular, the following actions within this category were performed in the second half of the project lifetime:

- **Television and radio news**
  - 18 July 2015, Visit to Atlas Television Podgorica, Podgorica, Montenegro
    Members from the partners' universities, Marko Holbl (University of Maribor), Stefano Guarino (University Roma Tre) and Ana Rakočević (Ministry of Information Technology of Montenegro) were guests at the Atlas television. In the interviews emitted in the family show »5 do 5« they presented current situation in the cybersecurity and its importance for the Montenegrin society.

  - 25 May 2016, Visit to Atlas Television Podgorica, Podgorica, Montenegro
    ECESM project activities and results of the project were introduced in the popular TV show »5 do 5«.

  - 24th June 2016, Radio Atlas, Podgorica, Montenegro
    Cyber security threats and all dangers that can be met in virtual world were introduced at the popular radio where the audience is mainly young generation.

- **Regular articles in monthly magazine Glasnik released by the Chamber of Economy in Montenegro**

Montenegrin partner Chamber of Economy leveraged its strong connections with Montenegrin public and private companies in order to promote the events related to work package 3 in its daily activities. Accordingly, Chamber of Economy of Montenegro regularly published articles with updated on WP3's action plan in its magazine.

- **Published conference articles**
  - R.Šendelj, F.Lombardi, I.Ognjanović, S.Guarino, Cyber Security in Montenegro: Practice, Framework and Challenges, Proceedings of INFOFEST 2014 Conference, 28th September-4th October 2014, Milocer - Budva, Montenegro.
  - I.Bandara, F.Ioras, K. MaherI, Cyber Security Concerns in E-Learning Education, Proceedings of ICERI 2014 Conference, p. 728-734, 17th-19th November 2014, Seville, Spain.
  - I. Ognjanović, R. Šendelj, I. Ognjanović, Cyber security awareness in Montenegro, IT Conference, Žabljak 2015, Montenegro
  - J. Ljucović, I. Ognjanović, R. Šendelj, Analysis of cyber security educational system in Montenegro, IT Conference, Žabljak 2015, Montenegro
  - I.Bandara, F.Ioras, K. MaherI, C. Lusuardi, Cyber Security Challenges of Distributed E-Learning Systems, INTED2015, the 9th International Technology, Education and Development Conference, 2nd March 2015, Madrid, Spain.
  - R.Šendelj, I.Ognjanović, Cyber Security Education in Montenegro: current trends, challenges and open perspectives, 7th annual International Conference on Education and New Learning Technologies (EDULEARN15), 2015, Barcelona, Spain.
  - I. Vujačić, I.Ognjanović, R.Šendelj, "SM@RT HOME: personal security and digital forensic issues", BISEC 2016, Belgrade, Serbia.
  - I.Ognjanović, R. Šendelj, I.Ognjanović, Impact analysis of cyber attacks on cloud systems, BISEC 2016, Belgrade, Serbia.

4) Advertisement and promotion

For the purpose of promotion the ECESM project, the video has been created which has been intensively

disseminated to a wide range of target groups in Montenegro and other Balkan countries. The video can also be found on the project website: https://www.youtube.com/watch?v=UUYnLhU8LUI&sns=em.

5.2 SUSTAINABILITY OF PROJECT RESULTS

In order to ensure future sustainability of project results, the project partners provided a wide range of activities on the following levels:

1) Activities for sustainable project results through future cooperation between project partners

Project partners applied joint projects to continue the cooperation established within the ECESM project. The applied projects were:

- ERASMUS + Programme: Mobility for learners and staff – Higher Education Student and Staff Mobility. Project Coordinator: Bucks New University, UK,
- Bilateral project Slovenia-Montenegro: Development of security models over families of service-oriented architectures. Partner institutions: University of Donja Gorica, Montenegro; University of Maribor, Slovenia,
- EC Twinning project: Western Balkans Regional Cyber Defence and Security Research Centre. Partner institutions University of Donja Gorica, Montenegro; Tallinn Univ of Technology, Estonia.
- Erasmus + KA2 project: *'Enhancement of study programs in Public Health Law, Health Management, Health Economics and Health Informatics in Montenegro'* (PH-ELIM) (coordinator: UDG, partners: UNIM, IMTM (MCEC))
- IPA projects: *'Enhancement of Cooperation Model with Stakeholders of Critical Information Infrastructure in Montenegro*' (coordinator: UDG); '*Modern technology development for Health Information System in Montenegro*' (coordinator: IMTM-MCEC); '*Market oriented research on SME perspective about cloud computing solutions in ME*' (partners: UDG, IMTM-MCEC).

GCSEC has also signed a Memorandum of Understanding and Partnership with the Institute of Modern Technology Montenegro to strengthen the collaboration between the two Institutions. The idea is to continue to provide education & training and jointly apply to R&D projects.

2) Activities for sustainable project results through providing clear instructions to project partners in the project lifetime

We provided all involved organizations clear instruments to specify knowledge, skill, and performance expectations, and to determine whether current and potential employees meet job-skill requirements without additional and/or recurring development activities.

3) Activities for sustainable project results through taking responsibility for sustainability of project results

The coordinator takes the responsibility for maintenance of project website after the project end in order to ensure sustainability of project results. Accordingly, the project website will remain publicly available and accessible and maintaining of the project website will be incorporated in the regular activities of the coordinator since the coordinator comes from the Faculty of the Electrical Engineering and Computer Science from Maribor, Slovenia, where the expertise with the technical maintenance of the websites is on a high level.

Likewise, the social media profiles will not be deleted after the project end, but will maintain publicly available on these widely used platforms. The coordinator UM will be responsible for these profiles not to be deleted, as well as will regularly monitor if any of social media users will provide any query on already published posts on these profiles and will respond accordingly.

6. PROJECT OUTCOMES AND IMPACT

6.1 OVERALL ACHIEVEMENT LEVEL AND IMPACT

ECESM project is prepared in order to address the following national priorities (as explained in the project application):

"The issues of cyber-security vulnerabilities, national security, public safety, economic prosperity and critical

infrastructure were discussed on Explanatory session between EU and ME (December 2012) during the Screening chapter 10 – "Information society". EU has highlighted for ME to begin with coordinated national initiative focused on cyber-security awareness, education, trainings, and professional development. Therefore, the Government and higher education institutions (HEI) **must encourage cyber-security competence** across the nation and build an agile, **highly skilled workforce** capable of responding to a dynamic and rapidly developing array of threats.

This project will enable fulfilment of mentioned issues by enhancing the overall ME cyber-security educational system and accelerating the **availability of educational and training resources** designed to improve the cyber behaviour, skills, and knowledge of every segment of the population, enabling a safer cyberspace for all. Thereby, **the project will help to secure ME digital nation capable of advancing national economic prosperity and security in the 21st century through innovative cyber-security education (with different levels, ranging from promotions, specialized trainings to master studies), and awareness on a grand scale**. "

In the following we summarize the objectives and activities led to their fulfilment, by highlighting impacts and created opportunities:

Work Package 1 (WP1) - Review and analyse existing European practice for Cyber security was aimed on creation of a good research ground for carrying out the other project WPs by reviewing and analysing current EU practice and principles of cyber security policy, principles, practice and education at the institutional and at the national level.

This WP was planned to have three main outputs in form of three reports provided for the following three main issues:

1. cyber security practice, principles and policy at EU and cross-matching with ME;
2. cyber security education at EU and cross-matching with ME;
3. on which basis the forth report is planned to be created representing a roadmap for implementation and managing of cyber education in ME.

Thus, the following activities were planned and carried out:

- **Activity 1.1 (Deliverable 1.1 - Report on Existing EU practices for cyber security)** At the beginning, current work and results on cyber security practice, regulation and policy at EU shall be explored, focusing on main initiatives and projects by ENISA (European Network and Information Security Agency), ITU (International Telecommunication Union) and many others.
- **Activity 1.2 (Deliverable 1.2 - Report on EU practice for cyber security education)** Special attention shall be put on education in Cyber security at EU, identifying specificities of implemented cyber educational approaches at different levels (from citizen's awareness, over formal educational systems to specialized education of professionals). It is expected to create overview of best practices and experience at EU and global levels in cyber security.
- **Activity 1.3 (Deliverable 1.3 - Cross-matching of practice in ME with EU standards)** After implementing activities 1.1 and 1.2, analysis and comparing of the structure and organization of national educational system of cyber security at all levels (ranging from raising national awareness, over specialized education to master studies) in Montenegro shall be made.
- **Activity 1.4 (Deliverable 1.4 - Roadmap for new Cyber security education in ME)** On the basis of previous activities, national roadmap for implementing and managing Cyber Security Education in Montenegro shall be created and established. The Roadmap shall define guidelines and recommendations for new cyber practice and educational system in ME; which includes all levels, from citizen's awareness to education of highly specialized professionals; and also the formal/legal structure on which governmental, public and private institutions will support cyber security posture of ME.

All planned activities are successfully implemented, as follows:

- **Activity 1.1**
  A project group formed of academy staff from each ME educational and research institution and representatives of public authorities (members of Ministry of Information society and telecommunications) together with representatives from each EU partner country worked on identifying relevant cyber security practices at EU and global levels, analysing their regulations and policy frameworks. Additionally, a visit to the leading institution from Slovenia (University of Maribor) was organized. It was aimed at exchanging good practice and presenting achievements during the activity.
  Finally, the activities resulted in a report titled "DEV 1.1 – Report on existing EU practices for cyber security" which includes a comprehensive analysis of existing cyber security practices in EU member states and in well-known global actors in this field (Australia, Canada, Japan, USA).
- **Activity 1.2**
  Similarly, to implementation of the previous activity, a project group formed of ME educational and

research institutions together with EU partner universities worked on the analysis of existing practices in educational systems in cyber security. Educational systems included formal educational systems (bachelor study programs, master study programs, doctoral study programs), informal educational systems (professional training and domain specific training), as well as cyber security education for the broader public (rising awareness campaigns and informative campaigns on cyber security). Additionally, activities of well-known and widely recognized cyber security education associations were analysed (e.g. SANS, ISACA, NICE – NICCS, etc.).
A visit to the partner university from Italy (Università degli studi Roma Tre -UR3) was organized. The visit was aimed at exchanging good practice and presenting achievements during this activity.
Finally, a report titled "DEV 1.2 - Report on EU practice for cyber security education" was published, which included a comprehensive analyses of cyber education practice at EU and global level.

- **Activity 1.3**
  A project group formed of representatives from each EU country and relevant national institutions from ME (Ministries, Chamber of Commerce, etc.) and ME universities, identified specifics of the Montenegrin educational system and similarities in cyber security practices within EU countries. The analysis was aimed at the identification of possibilities for applying these practices in Montenegro.
  The project group had one meeting in ME, organized by University Mediterranean (UNIM).
  Finally, a report titled "DEV 1.3 - Cross-matching of practice in ME with EU standards" was published, which included a comprehensive analysis of cyber practice in Montenegro (relevant organizations and institutions as well as cyber security standards and frameworks at national level), with special focus on cyber security education in Montenegro (with detailed analysis of formal education at HEIs, informal education on cyber security and cyber security education for the broader public). A cross-matching between EU practice and current practice in Montenegro was crafted.
- **Activity 1.4**
  A project group, made up of academic staff from each ME educational and research institution and representatives of other governmental bodies explored the EU good practices and ME specificities and created a roadmap with short term goals (2014-2016) expected to be achieved within ECESM, and long term goals (2016-2020) as well as a Plan - Do – Check - Act (PDCA) list.
  The project group together with other partner institutions had one meeting organized in Montenegro, hosted by University of Donja Gorica (UDG).
  A report titled "DEV 1.4 - Roadmap for new Cyber security education in ME" was crafted.

All reports were originally created in English and later translated on Montenegrin. They are available at:

- http://ecesm.net/sites/default/files/DEV_1.1_ME.pdf
- http://ecesm.net/sites/default/files/DEV_1.2_ME.pdf
- http://ecesm.net/sites/default/files/DEV_1.3_ME.pdf
- http://ecesm.net/sites/default/files/DEV_1.4_ME.pdf

Working package 2 (WP2)- Raise awareness about the risk of online activities is aimed on increasing public awareness of cyber security risks, responsible use of the Internet, and cyber security as a career path, consistent with the European policies and trends, defining a public cyber security awareness framework in Montenegro. In order to reach the aim, the following activities are planned:

- **Activity 2.1- Analysis of the existing level of cyber security public awareness in Montenegr**o- through inquiries, and cross-matching with European standards previously analyzed in DEV 1.1 and DEV 1.2. This activity shall define the ground on which build the structure of the framework, which is expected to be sustainable for the ME government, institutions and citizens, and consistent with the EU standards. (DEV 2.1)
- **Activity 2.2. Development of a draft framework** implementing cyber security methodology: defining the draft cyber security framework; i.e. all the processes for raising awareness of risks of online activities at home, in the workplace, and in communities; understanding of the problem, technical and social aspects; recognizing personal responsibility, and acquiring protection tools and knowledge, accessing resources to gain ability to act.
- **Activity 2.3. Improve cyber security knowledge -** After making detailed analyses of specific educational needs for each specific group, devoted workshops and trainings for all citizens shall be organized and promoted.
- **Activity 2.4. Development of cyber security Handbook**, the reference document that will establish roles, procedures, methodologies to be applied for designing, delivering, monitoring and evaluating cyber security resources (education modules, courses and programs) for citizens. It will consist of all needed tutorial for naive users who encounter cyber security for the first time.

All planned activities are successfully implemented, as follows:

- **Activity 2.1**
  Project group formed of academy staff from each ME educational and research institution and representatives of public authorities (members of Ministry of telecommunications, Chamber of Economy) together with representatives from each EU partner country worked on analyzing current level of public awareness in cyber security. The following analyses are used:
  1.Existing indicators about ICT literacy at national level (among citizens and workforce) officially published by MONSTAT, conducted by following EROSTAT methodology. The indicators are used to make comparative analyses of current ICT use and knowledge in Montenegro.
  2. Additionally, we conducted survey analyses about cyber security knowledge, which is used as key bases for planning future training and capacity building activities, as well as identifying target group, their existing level of knowledge and appropriate methodological approach that should be applied.
  (see Report titled 'Dev 2.1-Analysis of the ME Cyber Security Public Awareness')
- **Activity 2.2**
  According to actual state recorded in Montenegro, regarding cyber security education Roadmap for new Cyber security Education in Montenegro is created in WP1 ('DEV 1.4- Roadmap for new Cyber security education in ME'), project group made up of academic staff from each ME educational and research institution worked on considering, analysing and addressing all aspects of cyber education at national level. Two versions of the Framework are created:
  1. Framework v1 is created based on previous research, to show proper steps needed to be taken for proper education among citizens, identify key stakeholders and their roles and responsibilities (defined in Action Plan). Link to framework v1.

  2. Framework v2 - after organising sets of trainings for different training groups and other promotional campaigns (activity 2.3), the direct insights from both, identified stakeholders, and several target groups among citizens are measured and evaluated, on which bases defined goals and planned activities are revised. Link to framework v2 (see Section- Updated Framework v2)
  (http://ecesm.net/sites/default/files/Minutes%20Rome%20TRAINING%20WP2%20FINAL.pdf)

- **Activity 2.3**
  On the bases of previous reports and action plans, the following target groups are identified:
  1. *Future trainers at national level* - highly skilled academic and/or non-academic staff members that will be trained, having than key importance in training activities for other target groups at national level.
     Number of trainings: 2
     Trainers: EU partner institutions (BUCKS, GCSEC)
     Number of trainees: 10
     Certification: BUCKS as being CISCO academy, organised CISCO certification of all ME trainers. http://ecesm.net/news/cisco-training)

  2. *ICT coordinators at elementary and secondary schools*- ICT coordinators and professors at elementary and secondary schools are selected as vehicles for future long-term continual activities at schools among children population.
     Number of trainings: 10
     Trainers: ME trainers
     Number of trainees: 25
     Certification: all participants are certified by ECESM project http://ecesm.net/sites/default/files/Report%20of%20the%20dissemination%20activity-UDG.pdf and invited to conduct well known ECDL certification (funded and supported by the Ministry of education)- number of trainees that obtained ECDL certificate: 25

  3. *Student population at elementary and secondary schools*- Having in mind size of student population at elementary and secondary schools, as well as strict rules about changing and/or establishing any educational content at schools (defined by the Ministry of Education in Montenegro), the following approach is defined: (i) trained ICT coordinators will be responsible for continual children education after project implementation; (ii) Learning materials are created, published on Moodle platform created by project partner IMTM (for the needs of newly established ME Cyber educational center) , and supported by the Ministry of education (http://www.skolskiportal.edu.me/Lists/Novosti/DispForm.aspx?ID=118)

  4. *Student population at HEIs* - Partner HEIs will be responsible for enhancing the knowledge about cyber security at their universities and including student population from other HEI institutions.

Number of trainings: 7
Trainers: ME trainers from partner universities: UDG and UNIM
Number of trainees: 187

5. *Adults* - Adult population is heterogeneous and cannot be reached easily in general. For the purpose of this project, the following subcategories are identified: (i) Parents of children at elementary and secondary schools (they will be reached by ICT coordinators during their usual visits to schools when special sessions about cyber security should be organized, promotional materials distributed, etc.); (ii) Workers (several categories of workers will be reached at WP3 which is aimed on raising awareness and knowledge of workforce); (iii) Others (intensive dissemination activities are expected to rise awareness about cyber security issues in general)

Reports about all organised trainings are available at project web site: http://ecesm.net/trainings-within-wp2-improve-cyber-security-knowledge , while summary report with evaluation results is available at: http://ecesm.net/sites/default/files/Dev2.3%20-%20v1_new.pdf)

- **Activity 2.4**
  Simultaneously to organizing training and educational events over different target groups, cyber security the following handbooks and training materials are created:
  - Trained national trainers agreed about preparation of training materials adapted to specific groups of trainees at native language (Montenegrin): http://ecesm.net/sites/default/files/Handbook%20II.pdf
  - EU partner institutions agreed about sharing their experience and created materials with ME partners (Handbook prepared on English): http://ecesm.net/sites/default/files/Dev.2.4-v1_new.pdf
  - By considering experience of ME HEIs in educational approaches, national board agreed about establishing Distance Learning System developed as Moodle platform (Link: www.imtm.me/mcec/distance_learning) (see: Minutes of The 2nd National Coordination Meeting). Established platform had huge impact on sharing learning materials enabling open access, inviting citizens to use materials, etc.

Working package 3 (WP3) - Develop and maintain an unrivalled, globally competitive cyber security workforce is aimed on increasing the cyber security knowledge maturity of the governmental, public and private institutions. The following activities are planned:

- **Activity 3.1. Analysis of the level of existing knowledge of cyber security within ME organizations and cross-matching with European standards** through inquiries for employers within different works and positions; cross-matching with European standards and practice; all used as a basis to define realistic needs and basic structure of the future sustainable framework.
- **Activity 3.2. Development of a usable cyber security competency framework** (Human Resources & Curriculum focus) defining how to provide highly skilled workers and specialists for cyber security at adequate places within organizations. The competency framework will also facilitate the identification of training needs and guides the design of a professional development program.
- **Activity 3.3. Improve knowledge of cyber security within organizations and governmental bodies**- organisation of different set of trainings aimed on building the workforce with the practical skills, resources, and credibility to fulfil their roles.
- **Activity 3.4. Professional issues on cyber career fields**- Competency framework, developed in DEV 3.2 will be further extended in order to assist organizations in specifying knowledge, skill, and performance expectations; determining whether current and potential employees meet job-skill requirements without additional and/or recurring development activities; and by providing a model for assessing knowledge and skills, creating employee professional development plans.

All planned activities are successfully implemented, as follows:

- **Activity 3.1**
  Detailed overview of the referential standards for cyber security in EU public and private organizations, as well as report and discussion of the the results of our survey about the current mechanisms in place in the most important Montenegrin organizations in order to enforce cyber security at all levels, is published in the **Deliverable 3.1**
- **Activity 3.2**
  The usable cyber security competency framework is created based on the outcome of Dev. 3.1, defining proper actions to provide highly skilled workers and specialists for cyber security at adequate places within organizations. It identifies: (i) guidelines for definitions and standards in order to measure and assess the cyber security workforce with any consistency, and (ii) facilitates the identification of training needs and guide the design of a professional development program. Report is available at: Deliverable 3.2

- **Activity 3.3**
  Sets of training are organised, mostly at premises of the Chamber of economy Montenegro (who led all activities in cooperation with the companies and organisation, as agreed by National board), as follows:
  1. *Zero (introductory) training* - introductory training aimed on presenting all training topics, organised as a part of the largest Festival of ICT achievements in Montenegro- INFOFEST (2nd conference was also organised as a part of Infofest)
  2. *Training events with different topics in the fields of cyber security* (e.g. Security threats on the web, Network security, Digital forensics, Hardware forensics, Access control, etc.)
  Number of trainings: 10
  Trainers: EU experienced partners
  Number of trainees: 25
  3. *Training events at northern and southern parts of Montenegro* - after careful evaluation of organized trainings, the National Board made decision to organise 3 days training events at northern and southern parts, from which part there was very small participation evidence, all due to geographical heterogeneity.

  Certification ceremony for all trainees was organised at premises of the Chamber of economy Montenegro
  Reports from all trainings are available at project web site: http://ecesm.net/trainings-within-wp3-improve-knowledge-within-organisations with evaluation results.
  Furthermore, created Moodle platform is used for publishing and sharing training materials, and Cyber security Handbook for professionals is created and published.
- **Activity 3.4**
  Deliverable 3.4 is published in order to assist ME organizations in addressing three main objectives: (i) Specifying knowledge, skill, and performance expectations; (ii) Determining whether current and potential employees meet job skill requirements without additional and/or recurring development activities, and (iii) Creating employee development plans by providing a model for assessing knowledge and skills. The deliverable give analyses of major issues, recommendations and suggestions.

Working package 4 (WP4) – Broaden the pool of skilled workers capable of supporting a cyber-secure nation is aimed on increasing the number of fully skilled workers trained and qualified to support a cyber-secure nation, by their further postgraduate education and specialization. The following activities are planned:

- **Activity 4.1. Detailed analysis of master programs in EU** will be done as a starting point in creation of Montenegrin curriculum.
- **Activity 4.2. Multidisciplinary curriculum** will be created to cover all subareas of cyber security that are recognized as important for Montenegro. Curriculum will be suited for implementation in already running educational process in Montenegrin HEIs. Based on small ME population, different disciplines of proposed program will be accredited at different from the two partner HEIs and authorities of HEIs will agree about its division.
- **Activity 4.3. Accreditation of multidisciplinary master program** by Montenegrin HEIs.
- **Activity 4.4. Cyber security research and development-** Analyses of EU practice for identification and implementation of mechanisms that increase quantity and improve quality of graduate research and development will be done.

All planned activities are successfully implemented, as follows:

- **Activity 4.1**
  Detailed analyses of study program across EU and at global level are done, with special focus on partner countries (as well known is the fields of cyber security), as well as the others (USA, Canada, Australia, etc.). Having in mind informal and specialised educational approach well known and used among professionals working in the field, we also analysed professional courses by ENISA; SANS, etc. The reports includes overview of current situation in Montenegro, because in the period after ECESM project proposal submission, universities in Montenegro worked on establishing cyber security educational programs by their own. Report is available at project web site.
- **Activity 4.2**
  After receiving approval by EACEA, final goal of creating multidisciplinary program is changed:
  (i) The program already exists at University of Donja Gorica and it shall be updated and improved by creating 3 different specialisations, namely:
  (ii) Due to very small Montenegrin population (less than 1 million), University Mediterranean decided to improve existing program in Information technology, by developing new course.
  Report about developed changes and new study programs and courses contents is available at project web site (Deliverable 4.2).

- **Activity 4.3**
  In accordance with agreed adoptions in the previous activity, both ME universities: (i) formally established

adopted study programs, (ii) announced open calls for enrolment of new generation of students, and (iii) started with new academic year.
Reports about all implemented activities are available at project web site (Deliverable 4.3: http://ecesm.net/sites/default/files/4.3.pdf).

- **Activity 4.4**
  The joint research was not the direct goal of the project, but the network built and relations established for a good basis for future collaboration in education and research. Most of the productive collaboration relations between the universities and groups are based on the common interests in research. Building up the research activities is an important foundation for future collaboration in education also. (Deliverable 4.4.)

The **supporting activities** (implemented within **WP5-WP8**) significantly contributed to achieving the impact at national level in Montenegro, as follows:

- **Montenegrin Cyber Education Center (MCEC) (http://www.imtm.me/me-cyber-edu-center/)** is established aimed on providing support to future both, training and informal educational activities at national level. MCEC had very intensive activities at national level, succeeded to be positioned at national level (as supported by the Ministry of education, located at newly built the 1st Montenegrin Tehnopolis, etc.). Detailed report about MCEC activities is available at project web site with short term and long term strategic documents.
- Dissemination activities (http://ecesm.net/dissemination-intermediate-and-final-results-0) were focused on both, general audience and professionals and academia. The following activities had significant impact to the society increasing visibility of all results: (i) **1st Cyber security Forum in Montenegro** (http://ecesm.net/news/first-cyber-security-forum-montenegro), (ii) published deliverables 1.1 and 1.2 translated on Montenegrin with **ISBN** (http://ecesm.net/news/isbn-deliverables), (iii) cyber security **newsletter** (http://ecesm.net/online-newsletter) and **conference** (http://ecesm.net/start-annual-regional-conference), etc.

The activities presented above had significant impact on both, academic, professional and general audience in Montenegro, summarised as follows:

- increased public awareness of cyber-security risks, responsible use of the Internet, and cyber-security as a career path;
- raised the competency and capability of information security professionals and practitioners through education, training, employment, and certification;
- significant benefits into the employing process and internal training of all main ME public institutions an private organizations;
- Links between the ME academic and professional world have been established and they will be useful in the future to guarantee the required cooperation for research and training in cyber security.;
- increasing the awareness of private organizations about the importance of employing cyber security experts will significantly improve the employability of ICT and cyber security graduates.
- develop the next generation of cyber-security workers by establishing Master study in Cyber security;
- encourage research activity in Cyber Security in ME

6.2 OBSTACLES AND SHORTCOMINGS

There have been recognised/experienced the following obstacles:

- **Developing a joint master study programme** as planned in the project w**as not allowed due to the law of Montenegro**. Accordingly, a new version of the cybersecurity program was developed for UDG and additional courses for MED to be included into the existing program.
- **Low level of English language among young students in Montenegro**. It is important that Montenegrin students improve their language in order to be more confident also with the teachers and the materials provided by project partners. The project team addressed the problem in a way that on trainings a person who could speak both English and Montenegrin continuously provided translations of content which was provided in English and was not understood by participants.
- **A lack of interest for active participation in the project among Montenegrin companies**. It was difficult to establish good conditions and obtain efficient feedback from the Montenegrin companies concerning cyber security questionnaires or participation of their employees to training activities within the work package 3.
- Even if the public and private companies expressed readiness to take part in the surveying, the number of responses was below the expectations of the project consortium. In order to solve the problem, ME partners, especially public institutions (CEM, MID, MED), used all available connections, including

personal relationships with managers and staff. Probably, we underestimated the problem because we assumed that organizations were very interested in taking part to a project that offered free help in improving their cyber security workforce. If we had to do the project again, we would have probably started contacting companies more intensively in the earlier phase of the project.

- **Administrative obstacles**. The consortium experienced a lack of flexibility in changing the budget allocation for the project, when some partners experienced that the needs could be slightly different. Specifically, if according to the Tempus rules it was not allowed to switch travel costs versus staff costs, the coordinator strictly followed the rules and could not provide any flexibility. As a result, in this case, part of the work has been done in economy and co-contribution of partners.

6.3 CURRICULAR REFORM

One of project objectives was aimed on accreditation of new multidisciplinary master study program. Is is achieved as follows:

- After making analyses of current situation in Montenegro (Deliverable 4.1) it is concluded that: **(i)** multidisciplinary study program already exists at University of Donja Gorica, and **(ii)** national regulations in Montenegro do not allow to established joint degrees at national level. Current situation was informed to EACEA representatives who approved the following change: Existing Master program at University of Donja Gorica should be improved by establishing different specializations, and existing Master program at University Mediterranean should be improved with new courses specialized in cyber security topics.

- Therefore, the following is implemented (as reported in Deliverable 4.2):
  University of Donja Gorica: existing Master program in cyber security is improved by establishing three specializations: (I) CYBERSECURITY TECHNOLOGY, (II) CYBERSECURITY POLICY & ECONOMY, (III) CYBERSECURITY MANAGEMENT (see report).
  University Mediterranean created the following courses at existing Master study program in Information technology: (I) Advanced System of Information System Security, (II) Cybercrime and Cyber Security, (III) Digital Forensics of Mobile Phones.

- The newly developed programme was structured and courses developed according to the three cycle system and using ECTS.
- The studying methods of the courses have been reviewed and new methods established in relation to the newly equipped labs and using virtual environments. Furthermore, CISCO lab and lab for Digital forensic is bought and installed, for the needs of educational process at updated Master study program in cyber security.
  - The first generation of students is enrolled (See report http://ecesm.net/sites/default/files/4.3.pdf), and in accordance with EACEA rules the students are exempt from paying the scholarships. Furthermore, the lectures in the fall semester were mainly taught by professors from EU partner universities. Many civil servants, employees in the private sector and students have taken part in the courses given by the European partners during the project.
- The mutual recognition between the Montenegrin and European universities are based on common ECTS system. Furthermore, the mutual recognition is proved by receiving ***ERASMUS + Programme: Mobility for learners and staff – Higher Education Student and Staff Mobility*** between University of Donja Gorica and BUCKS university, which included mobility of both, staff members and students at Master study program in cyber security.

6.4 GOVERNANCE REFORM

In the lifetime of the ECESM project, new joint cyber security centre was established. GCSEC from Italy signed a Memorandum of Understanding with the Institute of Modern Technology Montenegro to cooperate in education, training and research and development. GCSEC could provide professors to the education courses and also a new tool to analyse the cyber security awareness of citizens in Montenegro, in order to fill the gap through addressed campaigns. Moreover, in 2015 the Cyber Resilience Centre has been established by BUCKS New University on its University Campus Aylesbury Vale as a gate to support industry to troubleshoot problems related to cyber risk when they cannot afford to pay for Research support.

In Montenegro, Tempus ECESM project helped raise awareness of alternative ways of working at universities,

especially in accountability. In particular, the Montenegrin universities worked jointly in the ECESM consortium together with well-developed European countries which allowed sharing partners' own experiences, exposure to European best practices and learning from them. In the project, academics and professionals from different institutions across Europe were in close contact when collaborating in direction towards project success. As a result, the ECESM project ensured intensive knowledge sharing which is crucial for educational institutions in Montenegro as well as for Montenegrin society. All these issues have encouraged the higher education structure and system in Montenegro towards new fresh positive changes which were even more intense due to newly developed master study programme of cybersecurity at UDG and UNIM.

6.5 LINKS WITH SOCIETY

The ECESM project helped to strengthen the role of higher education institutions in society at large. In the project, new master study program was developed and now it matches better to the needs of Montenegro society. The ability, new equipment and learning environment developed and purchased in the project allows consortium members to teach the technical specialists in cyber security who are able to detect and mitigate the cyber security threats.

Links between higher education institutions and labour market in Montenegro have been increasingly intensified in the project since the project activities within work package 3 provided trainings for the employees of Montenegrin companies. These training sessions highlighted the importance of higher education institutions in training a globally competitive cyber security workforce and the result were raised knowledge and awareness of the importance of cyber security in Montenegro. Specifically, we provided clear indications that proper employing processes and on-the-spot training are possible only if universities provide experts and trainers in cyber security.

In addition to these training sessions, it is planned that in the future, in cooperation with existing partners, UDG, Mediterranean University and the Institute of modern technologies organized trainings for employees in the economy, through regular training activities in the Chamber of Economy of Montenegro. These trainings will become part of the regular activities of the Chamber of Economy of Montenegro and accordingly, with these plans we significantly contribute to development of lifelong learning which is crucial for upgrading and updating the knowledge of trainees in the field of cyber security. As a result, the links between higher education institutions and labour market in Montenegro became stronger and sustainable.

Moreover, in the ECESM project lifetime, a one stop gateway was established by Bucks New University to provide training and procedures recommendations to reduce the impact of social engineering risk on people and SMEs livelihoods.

6.6 MOBILITY AND TRAINING ACTIVITIES FOR STAFF AND STUDENTS

ECESM project implemented the following *training activities* aimed on staff members and students:

1. *Training for future trainers at national level*
   (Report:))- Future trainers at national level are selected from HEI academic and non-academic staff due to their expertise and knowledge in cyber security fields. The following training activities are organised: (i) specialized training by BUCKS, (ii) specialized training by GCSEC, (iii) CISCO certification of trainers (organised by BUCKS, as being CISCO academy).
   Number of trained future trainers at national level: 10)

2. *Training for university students (Report -))* - University students are identified as a target group for raising awareness activities (in WP2) and ME partner universities organised focused lectures within existing courses aimed on cyber security topics:
   University of Donja Gorica: 3 lectures, 96 students, undergraduate and graduate level

   University Mediterranean: 4 lectures, 91 students, undergraduate and graduate level

3. *Specialized training in cyber security* (see Report)- Sets of specialised training in cyber security ere organised within WP3 and many staff members from both partner universities in Montenegro participated at trainings, due to their attractiveness, materials and contents, taught by EU partner universities.

4. *Courses for Master students in Cyber security (Report: http://ecesm.net/sites/default/files/4.3.pdf)* - Fall semester courses at Master cyber security program is mainly taught by EU partner universities in cooperation with academic staff members from University of Donja Gorica, implemented as: (i) online lectures, or (ii) guest lectures and training (implemented together with WP3 training events).

Furthermore, the other training activities (organised within WP2 and WP3) were opened to all HEIs' staff members and universities, as well as for the general audience at national level in Montenegro.

Student mobility: not applicable

Staff mobility: Mobility of all EU partners was necessary to organize: *(i) training activities of WP3*, and *(ii) teaching activities at Master study program*. Mobility of EU partners was fundamental to allow courses to be provided in ME to representatives of ME organizations. Training of ME partners was useful to allow them to provide additional training to other organizations and in the future to keep employees up-to-date.

6.7 EQUIPMENT

The purchase of equipment is realized in two phases. In the first phase the purchase of equipment is realized according to application. That equipment is used in order to equip classrooms which will be used for realisation of teaching and learning process with special accent on demonstration, training, simulation, and analysis of different aspects of cyber security. During the implementation of the project we have come to conclusion that existing Master cyber program in cyber security field is poor as being focused only on cyber security management and therefore it should be improved in technical aspects. Since early beginning, the ECESM Quality Assurance Board recognized that the key areas in cyber security technologies are network security, digital forensics and software security and encouraged effective expenditures during project implementation in order to provide savings specified in the budget heading „ travel cost" and use the money for the purchase of additional equipment. After the approval of Agency, the tender procedure was realized and additional equipment was bought. The additional equipment is used for equip laboratories for cyber securities on University Mediterranean and University Donja Gorica. Three labs for cyber securiry have been equiped- two on University Donja Gorica (lab for network security and lab for digital forensic) and one lab on University Mediterranean for software security. These labs have been used by students of MSc and PhD studies from both universities. These labs have also been used by Institute of Modern Technologies (ME Cyber Education Center) for organisation of specilized trainings for professionals and companies.

The purchased equipments has crucial role for sustainability of the project results because it enables continuous specialized trainings and education of a large number of beneficiaries.
University Mediterranean and University of Donja Gorica, announced the Tender in order to select the best supplier for procurement of technical equipment. The Tender was announced in: daily newspaper "Vijesti", on universities web site and National web site for Tender calls on 24th of August 2016. Bid opening Committee was composed of two representatives of the University Mediterranean and two representatives of the University of Donja Gorica. The Committee analyzed three bids which participated in tender procedure. The Committee created Minutes of bid opening and Minutes of evaluation received bids for selection the most favorable supplier of the technical equipment supply for this Tempus Project. The tender procedure was realized according to national legislation and is completely in accordance to Tempus rules. During the tender procedure we did not have any complaint on tender procedure.

In accordance with Minutes of evaluation received bids and selection the most favorable supplier, each University signed Agreement with „ČIKOM" (elected ICT company) for purchase technical equipment in November 2016. All purchase equipment were delivered and installed in the appropriate condition and place.

The equipment items are selected to meet the educational needs of students at all three study levels (undergraduate, graduate and postgraduate level) with a special accent on students of master of cyber security as well as researchers and teaching staff of both Universities. The equipment will be used for demonstration, training, simulation and analysis of different aspect of cyber security. Tender calls on 24th of August 2016. Bid opening Committee was composed of two representatives of the University Mediterranean and two representatives of the University of Donja Gorica. The Committee analyzed three bids which participated in tender procedure. The Committee created Minutes of bid opening and Minutes of evaluation received bids for selection the most favorable supplier of the technical equipment supply for this Tempus Project. The tender procedure was realized.

6.8 ACADEMIC AND ADMINISTRATIVE MANAGEMENT OF THE PROJECT

The institutions from the EU and Montenegro participating in the project were intensively involved both academically and administratively. Accordingly, administrative staff from European countries and Montenegro included in the project was empowered by increasing their awareness of the crucial role they can have in the higher education institution's success. Administrative staff of the coordinating institution and project partner institutions was continuously in close contact, so that they were on the right way towards project success. The reason is that the coordinator requested regular reporting from partners strictly following of Tempus rules which was from time to time perceived as too bureaucratic to some partners. For instance, they were missing more flexibility in terms of allowance of changing the budget, e.g. switching the budget from one budget heading to another, especially in situations when the implementation of the project shows that the output of the project would significantly benefit when heading costs changed. Anyway, the coordinator stayed in regular contact with each partner institution and thoroughly explained the necessity of respecting the administrative rules. As a result, administrative staff became proactive and more motivated for work at home institutions.

Concerning academic involvement, the coordinator strictly and cautiously scheduled project activities and deliverables, so that the deadlines for deliverables could be flawlessly respected. For instance, the contribution of all EU partners was fundamental in all phases of work package 3. First, each EU partner helped identifying relevant EU standards for cyber security policies, training and management in public and private companies. Next, with the help of ME partners, these standard were cross-matched with the current situation in ME. EU partners then collaborated to develop a competency framework for cyber security professionals, that allowed designing and organizing training activities for ME cyber security professionals and non. Finally, each partner contributed reporting on possible issues for the professionalization in cyber security fields, including both typical problems and personal experiences of their staff. Similarly, all consortium members collaboratively participated in dissemination of project activities.

6.9 DISSEMINATION AND SUSTAINABILITY

In the ECESM project, we achieved a multiplier effect in the following manner:

- We **linked ECESM Tempus project to other international projects**. In particular, new IPA projects directly contributed from ECESM project (sharing knowledge, specialised trainings, established links with the society, etc.): *'Enhancement of Cooperation Model with Stakeholders of Critical Information Infrastructure in Montenegro*' (coordinator: UDG); '*Modern technology development for Health Information System in Montenegro*' (coordinator: IMTM-MCEC); '*Market oriented research on SME perspective about cloud computing solutions in ME*' (partners: UDG, IMTM-MCEC).
- The successfully shared knowledge of cybersecurity through **trainings of professors and ICT coordinators at elementary and secondary schools** of Montenegro will be spilled over to other staff at elementary and secondary schools in Montenegro, as well as pupils at these schools and indirectly their families. Accordingly, in the project, at trainings participated 251 professors and ICT coordinators (= 128 individuals).
- The successfully shared knowledge of cybersecurity through **trainings of university students** of Montenegro will be spilled over to other students in Montenegro, as well as their friends and families. Accordingly, in the project we trained altogether 187 university students.
- The successfully shared knowledge of cybersecurity through **trainings of staff employed at Montenegrin companies** will be spilled over to other staff employed at these companies, as well as other companies they are in contact with. Accordingly, in the project, the summarized number of participants was 385 (= 124 individuals).
- Publications produced in the project through dissemination which will be available to wider public in Montenegro. We put special focus on promoting: (i) project in general, (ii) training and raising awareness campaigns, (iii) established Montenegrin Cyber Educational Centre, and (iv) 1st Forum on Cyber Security in Montenegro and organised conferences.
- Dissemination events in the ECESM project. For instance, BUCKS conducted 3 dissemination workshops in Oxford with 50 participants in total. In Montenegro, there were organised very important dissemination events, such as the 1st Forum on Cybersecurity Montenegro. At this forum, more than 70 participants from the economy, financial sector, governmental and public institutions attended and were informed about the effects of ECESM project activities as well.

We firmly believe that the success will go beyond the immediate target group consisting of university students, ICT

professionals and ICT coordinators in elementary and secondary schools. Besides that, we trained the Montenegro future trainers who became certified by CISCO in the ECESM project. Since such a prominent certification was done, we believe that the success of the know-how will be much wider than impacting only these target groups. With high-quality of trainings we ensured that the level of awareness about cyber-security in Montenegro will be much higher. The success will go beyond the already trained target groups since the trainings of ICT professionals will continue after the project end as well - by the Chamber of Economy of Montenegro. Moreover, materials produced in the ECESM project could be also a good input to improve know-how also in the institutions that participated in the project.

We believe that the beneficiaries will be able to sustain and develop the achievements of the project. Specifically, in Montenegro there was established Montenegrin Cyber Educational Center and for its needs the learning materials are created and published on the Moodle platform. These material will be accessible beyond the end of the project and there will be opportunities for the material to be further developed in the domain of the Montenegrin Cyber Educational Center. Moreover, the project achievements in terms of training staff in Montenegrin companies will be further developed and will remain sustainable since the Chamber of Economy in Montenegro will continue with the training activities of ICT professionals at Montenegrin companies after the end of the project.

To support this continuation of development of ECESM project achievements, we planned specific measures. In particular, the Montenegrin Cyber Educational Center (MCEC) will be allowed to measure number of users who use the Moodle platform and their frequency of use. They will report about it on their website and will thus ensure transparency in providing the feedback about the popularity of using the platform. The Chamber of Economy will be allowed to measure number of newly trained ICT professionals after the end of the project. At this institution they regularly release the monthly magazine Glasnik and publish the news on events at their institution. After the end of the project, they will publish in this magazine and also on their website when the trainings are held and how many participants are trained. During the lifetime of the project, there were recognised no obstacles in providing measures of these project achievements, so we do not expect any obstacles to appear after the project end. In order to ensure that, these activities will be incorporated in the regular permanent activities of these institutions. Besides that, the following results of the project will be maintained after the end of the project: new cyber security national framework, guidelines and procedures for cyber security programs at all levels of education, accredited multidisciplinary master programs, retrained workforce and governmental and public authority staff, annual national conference “Cyber security in the knowledge society: threats, risks and achievements” and online newsletter “Cyber instructions for all”.
Furthermore, we implemented several very important activities which provide strong support to MCEC position and future activities at national level, naming just a few:

- MCEC is supported and promoted by the Ministry of education
- MCEC is located at 1st Montenegrin Innovative Entrepreneurship Centre Tehnopolis Nikšić, thus providing national support and links with MCEC at national level
- MCEC received few new EU funded grants that will ensure financial sustainability for next 3 years
- MCEC signed cooperation agreements with several well known institutions at regional and international level in cyber security field (Global Cyber Security Center- Italy, eSecurity-Serbia, etc.)

Report about MCEC activities are continually updating at web site: http://www.imtm.me/me-cyber-edu-center/

We foresee fruitful future co-operation between the beneficiaries of the ECESM project after the end of the project as well. The beneficiaries have good relations, they already show the interests in maintaining relations and looking for further project to apply together. In particular, discussions were conducted between BUCKS and Montenegro colleagues for Erasmus+ KA1 action project (2015-2017 successful submission, 24 motilities) and KA2 opportunities. Moreover, in 2016 there was submitted the project proposal for the bilateral cooperation between the University of Maribor and the University Donja Gorica. The project proposal was successfully submitted to the Slovenian Research Agency and also approved for funding. The topic of the project was related to the ECESM project - cybersecurity. In this way, the collaboration between both institutions will strengthen and in the ECESM project shared knowledge will remain sustainable and will even be empowered in the future projects.

In the future, results of the project are planned to be efficiently used. The newly developed master study programme will continue to be developed, the new modern handbook available in Montenegrin language and in English will be used at beneficiary institutions

The links with local non-university partners will be formalised, especially through the Montenegrin Cyber Educational Center which aims to educate, train and qualify students and graduates from Montenegro, senior managers, officials and technicians in public administration, operators in the private sector, officials and operating units in the police force about cyber security issues. Concurrently, the Montenegrin Cyber Educational Center will closely cooperate with the Montenegrin universities, such as University Donja Gorica and Mediterranean University which will result in exchange of know-how, as well as teaching materials.

6.10 GENDER BALANCE

The project has been developed with an extraordinary balance between women and men. There is no more a question of gender balance, women and men, also of different religions have collaborated to implement the project in a trusty and friendly environment. In what follows, we provide indicators of gender balance among decision-making bodies, working groups, and trainers, as follows:

	Men	**Women**	**Total**
Project Management Board	8	3	11
Quality Management Board	4	1	5
National Management Board	2	4	6
Working Groups	41	31	72
Trainers at National level	9	3	12

6.11 UNEXPECTED OUTCOMES/ SPIN-OFF EFFECTS

The project implementation did not produce any unexpected outcomes or spin-off effects.