

Project Title:
**MODERNIZING AGRICULTURAL PRACTICE USING
INTERNET OF THINGS**

Project Acronym:
MAPIoT

Grant Agreement number:
20-COP-0019

Project No.
F-SEE-026/06.2021

Subject:
**INTERNAL REPORT FOR 2ND TRANSNATIONAL PROJECT MEETING (TPM2)
25-27 JULY 2022¹**


Dissemination Level:
RESTRICTED TO OTHER PROGRAMME PARTICIPANTS

Project Coordinator:
“Lucian Blaga” University of Sibiu

Contributors:
ULBS/ USN

Revision	Preparation date	Period covered	Project start date	Project duration
V1	July 2022	Month 3-8	01/12/2021	24 Months

This project has received funding from SEE 2014-2022 Grant agreement No 20-COP-0019



¹ The digital materials do not reflect the views of Financial Mechanism Office (FMO), and they do not purport to be representative of the countries, regions and themes they illustrate. The use of the materials does not imply endorsement by the FMO, the Donor States, the Beneficiary States, or any other stakeholder of the EEA and Norway Grants. The FMO is not liable for any law infringements by third parties in the context of the operation and use of the media library.

1. General information

Between July 25-27 the MAPIoT project team from Sibiu was in Melsomvik, municipality of Sandefjord, Vestfold county, Norway, where had been second transnational meeting (it was attached into a separate file the agenda of the meeting - http://digifof.omilab.ulbsibiu.ro/static/docs/TPM2_Detailed_agenda_Sandefjord_25-27_July_2022.pdf). The meeting was organised in one of the classrooms and in the library of High School from Melsom. Mr. Roar Jenshagen, the Rector of Melsom High School and Ms. Linda Isolde Hiis, the Assistant Rector of Melsom High School were present in two different days at our second TPM meeting and to the Multiplier Event. Before starting our meeting Mr. Roar Jenshagen presented us the school classrooms, the library, utilities and the surroundings. Melsom High School was established as an agricultural school on April 30, 1957, known as Vestfold Landbruksskole, and uses the actual name since 1994.



Figure 1. Lasse Berntzen discussed with Roar Jenshagen, the Rector of Melsom High School

This TPM2 meeting comes after the kick off MAPIoT project meeting (TPM1) held in January 2022 at Tonsberg, and after second meeting that happened on March 23, 2022 at Sibiu when professor Lasse Berntzen have visited us. It was discussed the communication plan inside of the project team, the list with all project activities (started, in progress or that follow), the documents prepared for students, lectures, and the summer school challenges. The focus was on the problems / challenges that occurred in organization of the summer school and for estimating the additional budget required for organizing this summer school in good conditions in the context of Norwegian high prices.

Adrian Florea (project coordinator), Daniel Morariu, Ion Mironescu and Anca Sipos (professors) participated from Lucian Blaga University of Sibiu. Lasse Berntzen (coordinator from USN partner), Camilla Nereid, Head of Department USN, Tove Boe and Qian Meng from University of South-Eastern Norway participated at TPM2.



Figure 2. Camilla Nereid, Head of Department USN revealed the importance of collaborations between USN and ULBS

Besides the members of ULBS and USN project partners have attended representatives from different companies: Vegard Steinstø from 7Sense (sensor company - <https://7sense.no/en>) and Åsmund Bjertnæs, the manager of Bjertnæs & Hoel (farm which produces, packs and sells salad and potatoes - <https://bogh.no/>).



Figure 3. The ULBS team start preparing the documents required for discussion

2. Discussion about the summer school

The discussion started with offering an opportunity for students to access all materials from the summer school. For this, a Google classroom called “*Summerschool Norway*” - <https://classroom.google.com/u/0/c/NTMxNzEwNDEyNjI3> was created and the possibility of Norwegian students who do not have a google account to access this classroom was discussed. Lasse Berntzen also asked if, for the second summer school, could be used the same students.

Unfortunately this is not possible! It was discussed the final format of “Certificate of attendance” that will be received by every student who successfully completes all courses in the summer school. Also, the project members had a short discussion about the letter with 5 ECTS credits that will be received by every student that successfully finish the summer school.

To whom it may concern,

MAPIoT Summer School: 5 ECTS-Credits
Organized by University of South-Eastern Norway, Norway, July-August 2022
Placed: Melsom High School, Sandefjord campus.
Period: 24 July 2022 – 07 August 2022

With this letter, we would like to inform you about the workload and associated ECTS credits awarded in the “Modernizing Agricultural Practice using Internet of Things (MAPIoT)” Summer School.

MAPIoT is a project Financed by EEA and Norway Financial Mechanism 2014-2021, Education, Scholarships, Apprenticeships and Youth Entrepreneurship Programme (ESAYEP) in Romania GRANT 20-COP-0019 ESAYEP Nr. F-SEE-026/06.2021. Based on this project two summer schools are organized, one in 2022 in Norway and one in 2023 in Romania. It focuses on development and application of digital technology in agriculture to transferring digital skills, knowledge, and technologies from Computer Science domain toward Agriculture, Food Processes and Safety improving efficiency. Its aim is to equip Bachelor and Master Students with knowledge for using techniques related to Internet of Things, Artificial Intelligence, Robotics and Smart Drones and their application in Agriculture and Food Safety Processes. To get more information on content, please visit:
<http://diferito.omilab.ulsibiu.ro/psm/content/mapiot/info?view=activities>

The total workload per attending student is calculated to 126 hours, which corresponds to 5 ECTS credits awarded by “Lucian Blaga” University of Sibiu (ULBS). The workload is divided in the following way:

Devoted to	Hours
Lectures	32
Exercises	22
Hackathon	20
Presentations	22
Self-study for written examination	30

The students must visit all lectures during the two weeks of classes. In the supporting exercise units participants work on specific problems. At the Hackathon the students need to “Develop your own business in agriculture and food industry”. The final exam consists of a presentation based on student projects, as well as a written examination. The presentation takes place during the last day of MAPIoT Summer School. In the written examination students need to answer questions prepared by lecturers and distributed through an online platform.

If you have any further questions, please don't hesitate to contact me!

With best regards,
Prof. Eng. Adrian FLOREA, PhD
Manager of MAPIoT project

Prof. Eng. Sever-Gabriel RACZ, PhD
Dean of Engineering Faculty, ULBS

Working together for a green,
competitive and inclusive Europe

Adresa Str. Emil Ciocan, nr. 4
Sibiu, 550025, Romania
e-mail: inghiorac@ulbsibiu.ro
<http://inghiorac.ulbsibiu.ro>

Tel: +40 (269) 217 928
Fax: +40 (269) 212 718

Figure 4. The final format of “Certificate of attendance” and ECTS form

Professor Anca Sipos emphasized in discussion the infrastructure challenges – large distances between NESTOR accommodation in Melsomvik and other objectives/cities like Tonsberg, Sandefjord, Verdens Ende or Oslo, and especially high costs for living or traveling in Norway. This occurs because the accommodation for the students from the summer school has been chosen relatively closer to the Melsom High School (where the summer school took place). At NESTOR the students had all the conditions regarding accommodation, breakfast, and dinner. But this location was into a village at 11 km from Tonsberg. In choosing the place where the summer school took place, the main reason was the proximity to an agricultural farm that the students could visit and finding a place to stay that would not exceed too much the money provided in the project budget for this (58 Euro per student per day for accommodation and meal). All these problems regarding organizing the summer school were debated in order to be able to start the preparation of the second summer school in Romania.



Figure 5. Professor Anca Sipos warned about summer school costs

At this summer school, in order to implement “Drones for gathering images and Computer Vision – theory and applications” course, it were acquired 2 performant drones. Lasse Berntzen presented the purchased drones and made a short summary related to the performances offered by them.



Figure 6. Analyse the drone performance

Regarding the documents for course quality evaluation (QA) that the students, participants at the summer school, need to be completed for each course was a discussion when we could give to complete them, and we decide that at the end of first week the students could complete the documents from the first week and at the end of summer school the students could complete rest of the forms.

Because we need to print a lot of papers (evaluation reports of courses by students) for the summer school and we were relatively far from the university one small portable printer was decided to be purchased.

We continue with the discussion about the first Multiplier Event that need to be organised closer to the end of the summer school and how can be realised and where. There were discussed some aspects regarding the possible guests. Lasse Berntzen proposed a list of possible guests and he said that some people already confirmed the participation (Camilla Nereid, Head of Department USN, Linda Isolde Hiis, Assistant Rector, Melsom High School). Also, guests from Romania will participate – Prof. Delilah Florea, the Assistant Rector of Samuel von Brukenthal National College Sibiu, Prof. Sorin Cazacu, lector, PhD at University of Craiova, Prof. Monica Mironescu from Lucian Blaga University of Sibiu. Lasse invited Erlend Larsen, member of the Parliament of Norway, Vestfold, Norway that confirmed in the meeting period. Thus the agenda was established and part of the list of participants.

A short discussion with vice-rector for Melsom High School took place when the way the summer school is organized was presented.



Figure7. Lasse Berntzen and Adrian Florea discussed with Linda Isolde Hiis, the Assistant Rector of Melsom High School



Figure 8. The MAPIoT project manager discussed with Vegard Steinstø from 7Sense

3. The MAPIoT project Web site

The meeting continued with debate about the MAPIoT web site problems issues during discussion about Intellectual Output 2 - Digital platform for transferring digital skills, knowledge and technologies from Computer Science domain toward Agriculture, Food Processes and Safety domain. Thus Adrian Florea presented the site <http://digifof.omilab.ulbsibiu.ro/psm/content/mapiot/info?view=activities> realised by the ULBS and illustrated the new elements that was added on the site in latest months. Adrian had shown also the format used on the site for adding the 2 proposed application by the Romanian partner (App1: [Supervising and controlling White Wines Fermentation Parameters Evolution](#) and App2: [IoT System for Irrigating and Monitoring a Thuja Conifer Nursery](#)) and discuss what elements need to be

put on the website by the Norwegian part. Lasse Berntzen agreed with these elements and presented the applications ideas from Norwegian part and will make the site in same manner for a good connection with ULBS site.

Adrian Florea presented the status for the first application that was proposed by the ULBS – “Supervising and controlling White Wine Fermentation” and how can be used and the materials regarding the user manual that was realised. Anca Sipos point some aspects regarding the benefits that can be obtained with this application.



Figure 9. Daniel Morariu (ULBS) shows the technical challenges of application for remote access

Daniel Morariu presents the server where the application for predicting using AI the parameters for Wine Fermentation is stored and the link that can be used by all peoples (<http://193.226.29.27/WineFermentation>) to access the application and made some simulations and predictions.

Adrian Florea presented the status of the second application proposed by the ULBS regarding “IoT System for Irrigation and Monitoring a Thuja Conifer Nursery”. He presented the elements that already was done and work as: all controllers for collecting data, the server that receives information’s from collectors, the server’s module (MongoDB database and MQTT Broker) that was realised and integrated on the same server. Daniel Morariu presented the detailed elements and how was integrated on the server. Also he had shown the web interface that was realised until that moment and what can be seen on the application. Also it was discussed how can this web application can be transferred on the web servers in order to can be accessed by all people, because the application need to have some pages that need to be restricted in order to be accessed and configured only by the farmer. Also, the farmer needs to have the possibility to establish exactly what information can be made public and what information can be made private.

In the second day of the TPM2 project meeting it was discussed the MAPIoT dissemination activities and the summer school schedule. Thus, Adrian Florea presented the LinkedIn page that already was created for the project (<https://www.linkedin.com/groups/9164050/>, https://www.linkedin.com/groups/9164050?lipi=urn%3Ali%3Apage%3Ad_flagship3_groups_entit_y%3BO9pPZ0B5SQiWbL0FTC1XIQ%3D%3D) and propose to present there also all the summer school activities that will be organised in this period. Also, all students from the summer school were announced about this dissemination media channel on LinkedIn and had suggested them to create an account on LinkedIn and share also this link on their private channels like Facebook or Instagram.

4. The article dissemination

The project partners had discussed about the Intellectual Output 1 - disseminating results through publishing articles to mainstream conferences or journals in the project topic. It was revealed that, this process of writing scientific papers till their acceptance and publishing, what was already realised and sent to conferences and journals for publication took a long time. The first achievement, the article with the authors Lasse Berntzen, Adrian Florea, “Design Thinking Applied to the Internet of Things - A Project on Technological Innovation in Agriculture and Food Processing”, ICDS 2022, The Sixteenth International Conference on Digital Society, Porto, Portugal, 26-30 June 2022, pp. 44-49, ISSN: 2308-3956, was already accepted and presented in the conference in June. It was highly appreciated by the conference reviewers that considered it as best paper.



Figure 10. The first article produced through MAPIoT project received the Best Paper Award at ICDS 2022 conference. Another article entitled “IoT System for Irrigating and Monitoring a Thuja Conifer Nursery” having authors from Romanian project team is closer to be finished to be sent at the “*Digital Innovations in Agriculture*” special issue of *Agriculture Journal* - https://www.mdpi.com/journal/agriculture/special_issues/Digital_Innovations_Agriculture#info. It was started a discussion regarding the new articles that can be written based on activities that were made together, as using artificial intelligence in wine fermentation process.

5. The Action Lists, Scorecard indicators and Budget

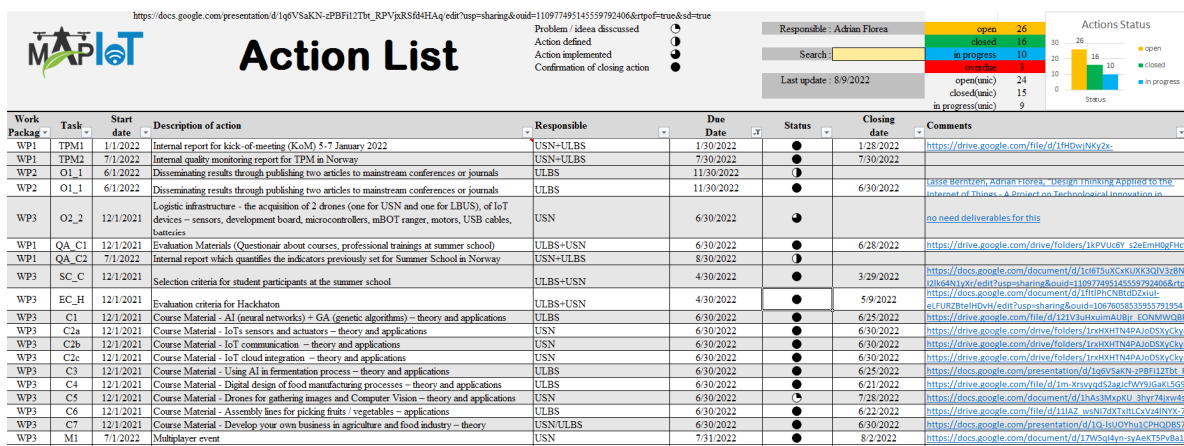


Figure 11. The status of activities developed through the MAPIoT project

At third day of the project meeting, in 27 July 2022 there were discussions about the activities developed through the project and which is the status of indicators from the first year. Actually the courses, the student selection criteria for the summer school, the QA documents were developed in time. Some internal reports for this TPM2 and summer school event should be finished after 8 of August 2022.

Project TPM2/Summer School in Norway

Norway July 2022	Actual	Expected
Teaching staff	7	7
from Roumania	4	4
from Norway	3	3
1 member from 2 companies	2	2
authority person	1	1

Students	Actual	Expected
ULBS - Computer Science	5	5
ULBS- Agriculture and Food Processing	5	5
USN - Information Science	8	10

Evaluation indicators

no. of participants(over participants)
no. of training materials developed
no. of training materials developed -ULBS
no. of training materials developed -USN
Feedback about dissemination event quality via evaluation forms of training materials, teaching activity at summer school
no. of hits on the project webpage
number of downloads of training materials
no. of teachers participant (beside staff)
Hackathon
no. of IoT kits to buy
number of drones
number of ECTS delivered

Figure 12. The indicators (selection) that need to be fulfilled through the MAPIoT project

In 27 July 2022 there was a discussion about the budget currently spent and estimation for the first year in order to develop the intermediary report.

		ULBS	USN	Total (ULBS+USN)
1.	Project management and implementation	5540	3480	9020
2.	Short term transnational mobility activities			0
2.1.	Student mobility	12515		12515
2.2.	Staff mobility			0
2.2.1.	TPM1	2372		2372
2.2.2.	TPM2	1779		1779
3.	Intellectual Output	4250.5	3000	7250.5
3.1.	IO1			
3.2.	IO2			
4.	Multiplier Events	0	400	400
5.	Special needs	0	0	0
6.	Exceptional costs	0	6800	6800
7.	Total Budget	38939	48,608	87547
8.	Received Budget at 1 st tranche (0.6*Line 7)	23363.4	29164.8	52528.2
9.	Spent budget in 1 st year	26456.5	13680	40136.5
10.	Percentage of 1 st year budget spent (Line 8 / Line 9)			0.764094334
11.	The percentage is higher than 70%?			TRUE

Figure 13. Budget estimation for first year of MAPIoT project

Largely, the ULBS spent more than 100% of its budget due to traveling costs and accommodation in Norway at TPM1, TPM2 and students summer school. USN spent more on equipment acquisition, supporting from management budget the Norwegian students' costs for participating at summer school and participation to ICDS 2022 conference. The estimation shows that aggregating costs from both partners is over the threshold of 70% percent allocated for first year of project!

6. Final discussions

At the end of TPM2 it took place a short discussion regarding to each of the partners thinking about continuing and proposing some new projects with involvement in the development of agriculture and food processing and the introduction of IoT in these areas. In this sense, the attention of each member was drawn that during the visits that we will make to agricultural, food and environmental protection companies during the summer school, to try to identify different problems from this point of view to be able to continue and develop the ideas and achievements obtained in this project.

Lasse Berntzen proposed also a further project collaboration and applying for financing at the ICT-AGRI-FOOD call - <https://www.ictagrifood.eu/>: deadline for submission of proposals to 2022 Joint Call was extended to 26 September 2022. At the moment of discussions Norway was not eligible but according to Lasse Berntzen the Norwegian Research Ministry will decide to pay if the project will be accepted.

Finally, Lasse Berntzen proposed a good research idea to project members to think at possible implication in protecting and detecting the various problems that occur within the forests and especially the trees in the forest using IoT.