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Quality Management Plan

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Places of the development of the result
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University of Ss. Cyril and Methodius in Trnava, Slovakia
University of Montenegro, Montenegro

Content

List of Abbreviations

FAAI	"The Future is in Applied Artificial Intelligence" project
HEI	Higher Education Institute
ICT	Information and communications technology
WPn	Work Package n (i.e.: WP1)
SME	Subject-Matter Expert
UBB	University of Bielsko-Biała
ULSIT	University of Library Studies and Information Technologies
UNI	University of Niš
UCM	University of Ss. Cyril and Methodius in Trnava
UoM	University of Montenegro

Introduction

Artificial Intelligence (AI) represents a massive opportunity for businesses and consumers. Most Organisations are only just starting to scratch the surface of what they can achieve with AI solutions. The services with AI already exist. With the AI potential, a lot of new possibilities could be design and develop.

FAAI's general objective is to prepare experts in AI based on competency learning.

The project aims to develop common EU competencies for skills-building systems using the capabilities of AI in the SME sector, thus meeting the labor market needs of skills shortages and gaps in all sectors. At the same time, the project aims to improve the relevance of providing training on the application of AI in SMEs to meet the needs of the cyber market in the economy. FAAI envisages the development of a new curriculum related to the use of AI and ML to improve the quality of management of modern ecosystems. In this way, students will improve their knowledge by using IT tools and by sharing aspects of big data management skills training, thus improving accessibility for all. The main priority of AI study is to increase the quality and relevance of students' knowledge and skills, as the project aims to support higher education institutions to:

- identify urgent technological challenges and needs of highly qualified staff
- to train highly qualified students in ICT specific topics based on skills needed in the labor market
- to promote open links betweenqualified universities and industry, increase the relevance of higher education by supporting new ICT-based internship programs, links between student universities and industry, the market and industry premises.

The FAAI project supports innovation and creativity through partnerships, strengthens the links between the higher education institutions involved in the project and interdisciplinary and transdisciplinary approaches and strengthens the role of higher education at regional level by

- highlighting emerging, cutting-edge technologies based on big data and AI as defined by market innovators
- support for open educational and training resources.

Project Quality Assurance and Evaluation Mechanism

An internal Quality Assurance Mechanism for the quality evaluation of the project implementation and outputs has been agreed and established during the kick-off meeting under the guidance of the coordinator. Namely, the Members of the Steering Committee (SC, Annex 1) agreed that all project processes, outputs and Dissemination Activities are going to be evaluated in accordance with the quality criteria and indicators set in the proposal.

Quality issues will be discussed during the Steering Committee Meetings when convenient, or through other means of communication that will be agreed ad hoc when needed (online meetings, emails, messengers etc). The Steering Committee will be responsible for coordinating this activity and ensuring the proper implementation of the Quality Assurance Mechanism.

The evaluation methodology and tools, developed by FAAI SC will cover:

- internal monitoring of the tasks delegated, implemented and approved by the teams within the work packages (using AdminProject facilities)
- internal evaluation of processes:
    - analysis and project evaluation during
        - project meetings,
        - teacher trainings
        - student trainings
        - dissemination events;
- external evaluation of outputs of the activities:
    - evaluation of outcomes, impact of the outputs of the work package activities by IT companies and research institute (in the form of quality assurance certificates),
    - evaluation of the results of each work package by the external expert (in the form of reports).

A final evaluation report consists of the evaluation reports of WP2, WP3, WP4, WP5 including the internal and external evaluations. It will be delivered in the last month of the project.

The quality management plan will be covered in three directions: project processes, project outputs and project dissemination activities.

Project processes

Project processes will be evaluated regularly by the partners, in three ways:

- Monitoring of the tasks in AdminProject platform,
- Evaluation of the project meetings, applying an evaluation questionnaire that each participant will fill-in online (during or after the meeting – but within one week from the end of it),
- Evaluation of the dissemination events, applying online questionnaires.

The quality plan will cover the monitoring of project activities, accomplishment of tasks, and respect of the deadlines; the monitoring will be implemented with AdminProject tools.

Project outputs

Project deliverables in the form of the learning requirements for AAI training course will be evaluated externally during reviewing process of the corresponding publications. The key project deliverables in the form of educational materials (methodologies, guides, training materials) will be evaluated by the external experts.

The teaching-training activities will be evaluated through the online evaluation questionnaires that will be developed.

The target group of students will be evaluated based on the training course developed. At the beginning stage online miniquiz including questions on AAI will be offered for IT students. At the pilot stage the same miniquiz will be proposed for the students after the training.

The output evaluation will take place during the final months of the project.

Project Dissemination Activities

They can be evaluated into two ways: panel discussion during the events; feedback questionnaires distributed and filled in during and after the dissemination events. For appropriate amendment/adjustments to the key outputs, feedback from dissemination events will be consolidated and analyzed in the work package evaluation reports.

Evaluation Requirements

The outcomes that will be developed in the framework of the project quality assurance are:

- Quality management plan (the present document)
- Evaluation tools (questionnaires for the evaluation of the project meetings, questionnaires for the teacher-student trainings, questionnaires for the dissemination events, miniquiz on AAI for students)
- Evaluation reports on work packages

The implementation of the quality assurance methodology is the responsibility of the entire consortium. All partners are responsible for the quality of their own deliverables and of the work activities they lead.

Evaluation of the Project Process

Evaluation of the project meetings

During project meetings, the work already done will be presented, jointly reviewed, and –when necessary- possible steps for improvements agreed. Having the necessary information at certain points in time on actual variances against the planning will allow us to decide suitable corrective/preventive actions when detecting lacks

or gaps related to the project scheduling and or/ planning. These measures, decided after analyzing the associated risks (in delays, additional costs, and overall implications), are to ensure meeting the declared project objectives and targets and producing the foreseen results, according to the project planning.

Partners' meetings should be attended by preferably the same project team members in order to ensure smooth collaboration and project execution. The hosting organisation of the meeting and UBB, as coordinator, are jointly responsible for preparing the meeting agenda. During the meeting, each participant will circulate and sign a participation list. After each meeting, UBB will be responsible to prepare a brief report that will be uploaded to the project web-site.

After project meeting, the partners will be asked to complete an evaluation questionnaire in the AdminProject platform regarding the development of the transnational meeting. The questionnaire template will be modified according to the needs of each meeting. All remarks will be used to improve the organisation's strategy and the processes implemented by the partnership.

Final Quality Reporting

Formative evaluation of the project processes and reflective analysis are very important elements for ensuring quality and smooth implementation of the project.

The topics to be addressed in the Quality reporting are:

- Methodology of assessment
- Objectives
- Activities
- Key Achievements
- Recommendations

Evaluation of the Project Deliverables

State-of-the-Art Analysis

The desktop analysis will be combined with results from the questionnaires.

Artificial Intelligence Learning Requirements

The Learning Requirements will be evaluated based on the reviewing publications, questionnaires of the project meetings, dissemination events, and external evaluation.

Artificial Intelligence framework for training in HE, Methodology

The AI Framework will be evaluated through pilot testing with teachers and students in Montenegro and Slovakia, external evaluation by experts.

AI Job Hub platform

The AI Job Hub platform will be evaluated by all partners and participants in training sessions as well as the business during the dissemination events

Trainings

Teacher trainings

The **Teacher training** will be organized on May 2023 in Montenegro. The evaluation will be based on an evaluation questionnaire. The main quality criteria for the evaluation of the training are:

1. Profile of the participant
2. Logistic preparation and organization of the training *

3. Format of the training's agenda *
4. Arrangements of the training (venue, equipment, etc) *
5. Duration and timetable of the training *
6. Comments and recommendations for the next training's agenda *
7. Communication between the coordinator of the project and the other partners *
8. Quality of presentations and other materials provided during the training *
9. Clearness of the presentation of the coordinator regarding project goals, implementation *
10. Clearness of the presentation of the coordinator regarding goals of the training *
11. Clearness of the presentations of the project partners *
12. Objectives in the agenda reached *
13. State of communication between the training participants *
14. Potential issues identified during the training *
15. Opportunities to express your opinions *
16. Achievement of the project goals for the period *
17. Discussions during the training *
18. Conclusions and recommendations for the next trainings *

The **Second Teacher training** will be organized on May 2024 in Slovakia. The evaluation will be based on an evaluation questionnaire.

Student Training

The **Student training** will be organized on May 2024 in Slovakia. The evaluation will be based on the evaluation questionnaire (Annex 6.1).

Evaluation of Dissemination Activities

All Dissimination Events are going to be evaluated along with the project dissemination activities.

The evaluation of the Dissimination Events will be based on a short questionnaire addressed to local events participants, exploring their opinion about the project results, whether they will be able to use them, and in which ways.

The dissemination activities will be evaluated in AdminProject, according to the following steps:

- Fill in the basic field: Activity name
- Choose reporting partner – Who?
- Choose between types of dissemination activities from the dropdown menu – How?
- Select date of dissemination activity – When?
- Choose the level – reach of the activity.
- Make a note of the location of the activity – Where?
- Enter the number of people who were targeted by the activity and received information about the project and/or its results.
- Provide a short description in *Activity description*.
- Describe the *Target groups*.
- Provide short information in the *Impact of the activity*.
- Include information on *Feedback received*.
- Upload files that will serve as evidence of the activity, this could be screenshot, scans of the attendance sheet, pictures from the meeting, etc.
- The dissemination actions reported can be edited afterwards, if e.g. number of social media interactions changed

The results from the dissemination activities' evaluation will provide a critical insight on the impact potential & sustainability of the project.

Evaluation Questionnaires

The questionnaires developed under Annex 5& 6.

ANNEXES

Annex 1. Members of Steering Committee

	Name
UBB	Aleksandra Kłos-Witkowska
ULSIT	Eugenia Kovatcheva
USCM	Jiří Pospíchal
UNI	Olivera Pronic
UCG (UoM)	Savo Tomovic

Annex 2. Indicators for Evaluation

- The following **quantitative indicators** will be used to determine whether the objectives set have been achieved:

  - Number of good practices analyses (at least 10)
  - One curriculum developed addressing the skill-gaps identified
  - One methodology to anchor the program into the local environments (Industry, HEIs, local organizations) securing fruitful cooperation and direct inter-connections among all stakeholders
  - One skills Foresight Study appointing concrete skills gaps and talent needs
  - One common AI platform/AI Job Hub engine developed
  - Number of staff trained at the transnational level (at least 20)
  - Number of students involved (at least 40 from partners organizations)
  - Number of academics involved (4 from other HEIs networks)
  - Number of entrepreneurs involved (20 from partners networks)
  - Number of regional stakeholders involved in the pilot (from academy-industry-government) (at least 1 representative for each target group per partner country)
  - Number of communication materials developed (website, leaflets, mailing lists)
  - Number of press appearances discussing the related skill alliances mechanisms
  - Number of online science facilitation resources accessed through FAAI open AI job hub engine.
  - Number of online user return rates to FAAI online presence means
  - Number of HEIs reached by FAAI communication (at least 5)
  -Number of Companies reached by FAAI communication (at least 15)
  - Number of Governmental organizations reached by FAAI communication (at least 10)

- The following **qualitative indicators** will be used:

  - FAAI online AI Job Hub established
  - Feedback/Satisfaction monitoring from the target groups (primary target group) of the partnering institutions
  - Feedback/Satisfaction form the pilot attendees, students, instructors and entrepreneurs (secondary target group)
  - Informal agreements (Molls) with stakeholders for incorporating/utilizing the outputs of the project
  - Informal agreements (Molls) with stakeholders for post-project collaboration

Annex 3. Partners meeting evaluation questionnaire

Questions for logistic
Questions for content and duration

Annex 5. Evaluation questionnaire of the training course (miniquiz)

1. What neural networks are used for coping with sequences? *
 convolutional neural network
 recurrent neural network
 classic neural network
 2-layer neural network
 U-Net
 I have not encountered (studied) such a problem until today
2. What kind of neural network does allow us to avoid vanishing gradient problem? *
 convolutional neural networks
 recurrent neural networks
 2-layer neural network
 LSTM
 generative adversarial network
 I have not encountered (studied) such a problem until now
3. What procedure is used for tuning the parameters of recurrent neural network? *
 cross-validation
 backpropagation through time
 error backpropagation
 gradient descent
 vanishing gradient
 I have not encountered (studied) such a problem until now
4. What is the purpose of the usage of the activation functions inside the neural networks? *
 to preserve the linear behavior of the network
 to add the nonlinearity to the network
 to add the convexity to the network
 to add the concavity to the network
 none effect
 I have not encountered (studied) such a problem until now
5. How many layers are required for the neural network to model any continuous function? *
 5
 4
 3
 2
 1
 I have not encountered (studied) such a problem until now
6. What model is used for the language translation? *
 convolutional neural network
 multilayer perceptron
 encoder-decoder
 SVM
 decision tree
 I have not encountered (studied) such a problem until now

Annex 6. Evaluation Tools

6.1. Student training

1. What is your nationality? *

Polish

Serbian

Bulgarian

Montenegrian

Slovakian

Other

2. What is your age? *

17 to 20 year

21 to 24 year

25 to 34 year

35 to 44 year

45 year and more

3. What level student are you now? *

Student (I level)

Student (II level)

For students

This section is for the filling in by the students. Some questions may by answered by the graduates also

4. In what education degree are you studying now? *

Bachelor

Master

5. What is your specialization? *

Your answer

6. What is your year of study? *

1

2

3

4

Other

7. What activities do you prefer to extend your knowledge in Applied Artificial Intelligence? *

Lectures

Classes

Laboratories

Projects

Question and answer sesion

Student internships

Participation in the activity of students' scientific groups

Getting to know the results of research conducted at the University

Thematic courses / seminars / webinars

Solving use cases

Other

8. What obstacles/issues do you see in implementing Applied Artificial Intelligence subject into a teaching programme *

Limitations resulting from the study program

Formal barriers in submitting a new form of classes

Inadequate or maladjusted laboratory/lecture room equipment

Other

Participation in Applied Artificial Intelligence training

9. Have you participated in classes which were based on Applied Artificial Intelligence *

Yes

No

I don't know

Important competencies

10. Do you think Applied Artificial Intelligence issues are important for your future career? *

Not at all important

Low importance

Slightly important

Neutral

Moderately important

Very important

11. Select a profession for which you are working or want to work (in accordance with the list of the European framework of IT competences) *

Service Desk Agent

Technical Specialist

ICT Trainer

Business Analyst

Business Information Manager

Project Manager

ICT Consultant

Digital Media Specialist

Test Specialist

Software Developer

Systems Architect

Systems Administrator

Information System Developer

ICT Operations Manager

ICT Security Specialist

Enterprise Architect

Quality Assurance Manager

Chief Information Officer (CIO)

Network Specialist

Database Administrator

Systems Analyst

Service Manager

Ict Security Manager

Account Manager

6.2. Evaluation questionnaire for trainees

1. What is your country? *
Poland
Bulgaria
Slovakia
Serbia
Montenegro
Other
2. If country was "Other" please write the name of the country
Your answer
3. What is your full name?
Your answer
4. What is your e-mail? *
Your answer
5. What is your Applied Artificial Intelligence skills level? *
Base
Beginner
Intermediate
Advanced
Expert
Other
6. Where did you get this Applied Artificial Intelligence skills? *
University degree
Specialized course
Self-educated
Other
7. Have you got experience in conducting Applied Artificial Intelligence at your university? *
No requirement
Short practice up to one year
From 1 to 3 years
Over 5 years
Other
8. Do you think Applied Artificial Intelligence teaching should be supported by external Applied Artificial Intelligence experts (from industry)? *
Disagree
Somewhat disagree
Neither agree or disagree
Somewhat agree
Agree
9. What activities do you prefer to extend your knowledge in Applied Artificial Intelligence ? *
Projects (commercial part/time job)
Projects (open source).
Participation in the activity of public scientific groups.
Getting to know the results of research conducted at the universities
Thematic courses / seminars / webinars
Participation in conferences
Other
10. Please rate the quality of the materials presented during Teacher training *
1 - unsufficient 2 - unsufficient 3 - sufficient 4 - good 5 - excellent
Module 1 - Basic principles of the application of Artificial Intelligence in science and in modern business solutions

Module 2 - Embeddable modules from IBM, Microsoft, Google, AWS, etc.

Module 3 - Conducting research related to the practical application of artificial intelligence

Module 4 - Building software applications using AI
Module 5 - Implementation of external AI modules in software applications

Module 6 - AI-based solutions for Ecology
Module 7 - AI-based solutions for Agriculture
Module 8 - AI-based solutions for HealthCare
Module 9 - AI-based solutions for Smart City
Module 10 - AI-based solutions for Industry
Module 11 - AI-based solutions in Robotics
Module 12 - Application of other AI modules
11. Please rate the quality of the organization and management of A5.4 - Teacher training *
1 - the worst 2 3 4 5 - excellent
quality of the management (organization) of A5.4
12. Participation in the project FAAI *
Your answer
13. Are you familiar with the newest Applied Artificial Intelligence trends, technics, solutions by virtue to project FAAI? *
Yes, I am participating in applied artificial intelligence conferences, projects etc.
Yes, I am reading a lot of articles trying to be up to date in this area.
Rather yes, I am occasionally, investigating the area from time to time.
Only knowledge which is required to conduct classes/laboratories with students.
No, at most the basics
14. Participation like a researcher in the project FAAI *
Your answer
15. Have you participated in project FAAI for the purpose of study? *
Yes
No
16. Have you published any scientific articles on Applied Artificial Intelligence matters within the framework of project FAAI? *
Yes, more than one
Yes
No
17. Have you participated in researches which were based on Applied Artificial Intelligence within the framework of the project FAAI? *
Yes
No
18. Participation like a trainer in the project FAAI *
Your answer
19. Would you like to get into Applied Artificial Intelligence teaching? *
I am already in
Yes, I know about it and I know how to use it.
Yes, I have heard about the it but I have never opportunity to use it.
Yes, I have not heard about it and but I would like to start using it.
Maybe
No, I am not interested at all
20. Recommendations *
Your answer
21. What would you propose to implement on your university to better understand Applied Artificial Intelligence matters? *
1-low-importance 2 3 4 5-high importance
Organising regular presentations, webinars on Applied Artificial Intelligence matters

Patronizing a Applied Artificial Intelligence event to gather people, companies involved in this matter.

Setting up a students scientific group devoted for Applied Artificial Intelligence.

Getting into cooperation which some Applied Artificial Intelligence company, open-source community or experts to speed up the knowledge acquisition.

22. Why is it important to include Applied Artificial Intelligence subject in the education process? *
1-low-importance 2 3 4 5-high importance
Job market requirements
Provide students with better knowledge on data processing what becomes critical nowadays.

More opportunities for students and teachers to build their scientific skills.

23. How to overcome all shortcomings that would arise potentially when teaching Applied Artificial Intelligence subject? *
Improve the study program
Develop and implement new form of classes
Improve room equipment
None
24. What obstacles/issues do you see in implementing Applied Artificial Intelligence subject into the teaching programme *
Limitations resulting from the study program
Formal barriers in submitting a new form of classes.
Inadequate or maladjusted laboratory/lecture room equipment
Other