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Certification of skills with the blockchain

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INTRODUCTION

In the context of adult education, the INTRA project stands as an innovative and interdisciplinary initiative, designed to address emerging personal and specialist challenges in an era of digital transformation.

With the aim of promoting psycho-physical well-being, INTRA integrates data and experiences to allow users to exploit the potential of technology through an individual-centered approach.

The project, born from the collaboration between partners from Italy, Romania and Poland, focuses on the development of digital and technological skills essential for daily life, while promoting active and aware citizenship.

INTRA does not limit itself to providing educational solutions, but aims to create a dynamic ecosystem that fosters personal and professional growth through the exchange of experiences and good practices.

Through the e-learning platform and the well-being toolkit, the project offers practical tools for the development of transversal skills, contributing to the reduction of social marginalization and the increase in the competitiveness of the local social fabric.



CERTIFICATION OF SKILLS IN EUROPE

Skills certification in Europe is a key pillar for enhancing formal and informal learning and promoting labour mobility and lifelong learning.

With the increasing emphasis on the need for a flexible and adaptable labour market, skills certification allows individuals to demonstrate their skills and knowledge in a transparent and transnationally recognised way.

Europe has undertaken initiatives such as the European Qualifications Framework (EQF) and Europass to facilitate the recognition and comparison of qualifications between different member countries. These initiatives support the idea that learning and acquired skills should be valued regardless of where and how they were obtained. The European Skills Certification therefore aims to build bridges between national education systems, while strengthening vocational education and training (VET) and supporting the lifelong learning strategy.

Such efforts are particularly relevant in a context of rapid technological change and changes in the employment landscape, where digital skills, adaptability and lifelong learning become essential.

The certification process in Europe strives to be inclusive, considering various forms of learning and promoting equity in access to educational and employment opportunities. Through certification, individuals gain formal recognition that facilitates mobility, employability, and the path of personal and professional development, emphasizing the importance of a holistic approach to education and work.



USE OF THE MOODLE PLATFORM FOR THE ACQUISITION OF SKILLS

Moodle, a management learning platform (LMS), has become a key tool in European education to facilitate the acquisition and certification of skills. This open-source platform is widely used for its flexibility and customization capabilities, allowing institutions to create online learning environments that address the specific needs of learners and educators.

Through Moodle, users can access a wide range of educational resources, participate in virtual classes, complete assignments and tests, and interact with faculty and peers, all within a single virtual environment. This facilitates student-centered learning, where they can control their own educational path, exploring materials and activities autonomously and collaboratively.

The adoption of Moodle in the European context supports the objectives of lifelong learning and educational inclusion, making education more accessible to students of different ages, contexts and abilities. In addition, the platform allows the implementation of innovative teaching methodologies, such as problem-based learning (PBL), flipped classroom and blended learning, enriching the learning experience.

Traceability and performance analysis in Moodle also provides valuable data to assess the effectiveness of educational interventions and to further personalise the learning experience. Teachers can monitor student progress, identify areas for strength and improvement, and adjust resources and instructional support accordingly. In this way, Moodle establishes itself as a crucial resource for the acquisition and certification of skills in Europe, promoting a dynamic and responsive educational approach.

THE BLOCKCHAIN SYSTEM

The adoption of blockchain technology in skills certification represents an advanced revolution in the education sector, offering a secure, transparent, and unalterable method of recording and validating academic and professional qualifications. Identifying the key parameters and variables in the use of blockchain is crucial to ensure the effectiveness of this system.



Key parameters include data security, interoperability between different educational and certification systems, scalability of the solution, and ease of access for users. Blockchain allows for the creation of a permanent and verifiable record of an individual's skills and learning outcomes, which can be easily shared with employers, educational institutions, and other stakeholders without the risk of fraud or alteration.

Variables involved in implementing blockchain for skills certification may include the cost of developing and maintaining the blockchain platform, the technical complexity for end-users, and the acceptance of such a system by the market and the educational community. In addition, regulation and legal compliance are crucial variables, as certification of skills often involves the handling of sensitive and personal data.

The use of blockchain in skills certification promises to reduce the risk of certified fraud, improve efficiency in the verification of qualifications, and increase trust among stakeholders in the educational and work landscape. To optimize the use of blockchain in this context, a balance between technological innovation, usability, and regulatory compliance is required, ensuring that the system is robust, accessible, and internationally recognized.



BLOCKCHAIN INTEGRATION WITH MOODLE

To integrate blockchain technology with Moodle for the certification of the skills outlined in the e-learning course modules and toolkits, a structured approach was followed that leverages the security, immutability, and transparency offered by blockchain.

The steps are provided below:

1. Creation of digital certificates on blockchain

- **Description:** Use blockchain to issue digital competency certificates that are immutable and verifiable. These certificates can be linked to the learning outcomes obtained through Moodle.
- **Implementation:**
 - **Moodle plugins:** Integrate a plugin that allows the creation and management of digital certificates on blockchain directly from Moodle.
 - **Smart Contracts:** Use smart contracts to automate the issuance of certificates once a module or toolkit has been successfully completed.
 - **Decentralized ledger:** Certificates are recorded on a decentralized ledger, ensuring that they are tamper-proof and easily auditable by third parties.

2. Certification Process

- **Skills Identification:** Each module and toolkit is associated with specific key skills. These skills are mapped in a standardized format that can be easily entered into a digital certificate.
- **Evaluation and Verification:**
 - **Automatic Assessment:** Use automatic assessment tools within Moodle to determine if students have achieved the required skills.



- **Decentralized verification:** The blockchain allows for decentralized verification of certificates, eliminating the need for a central authority to confirm the authenticity of certificates.

3. Benefits of using blockchain

- **Immutability:** Once issued, a certificate cannot be altered, ensuring the integrity of the data.
- **Security:** Data stored on blockchain is protected by advanced encryption, reducing the risk of fraud.
- **Transparency:** Students, employers, and other stakeholders can easily verify certificates through the blockchain network.
- **Global Accessibility:** Digital certificates can be accessed from anywhere in the world, facilitating the international mobility of students and professionals.

The integration of blockchain with Moodle for skills certification offers a secure, transparent and efficient system to recognize and validate the skills acquired by students, improving trust in certification processes and facilitating the recognition of skills globally.



MATRIX OF SKILLS TO BE CERTIFIED

To ensure that the certification of competencies is meaningful and relevant, each module and toolkit of the INTRA project must be accompanied by a well-defined competency matrix. This matrix serves as a tool to identify, assess and certify the specific skills that learners are expected to acquire by completing the module or using the toolkit.

Each competency matrix must outline the specific skills that students are expected to develop, the means by which these competencies will be acquired and evaluated, and the criteria for certifying success. This structured approach not only ensures the coherence and quality of learning but also facilitates the process of recognition and validation of competences at a broader level.

Skills Matrix for E-Learning Course Modules

Module 1: Stress Management

- **Skills to be developed:**
 - Understanding of stress theories (biological, transactional, resource conservation)
 - Ability to identify and manage the effects of stress (biological, psychological, social)
 - Application of stress management techniques (mindfulness, art therapy, cognitive methods)
- **Means of acquisition:**
 - Theoretical and practical lessons
 - Exercises on relaxation techniques
 - Quizzes and case studies
- **Certification criteria:**



- Completing a final quiz
- Hands-on demonstration of the techniques learned
- Active participation in discussion sessions

Module 2: Personal Development

- **Skills to be developed:**
 - Self-awareness and self-esteem
 - Planning and time management skills
 - Personal motivation techniques
- **Means of acquisition:**
 - Interactive lessons
 - Personal reflection exercises
 - Coaching simulations
- **Certification criteria:**
 - Completion of self-assessment exercises
 - Participation in coaching simulations
 - Drawing up a personal development plan

Module 3: Time Management

- **Skills to be developed:**



- Planning and prioritization
- Identification and management of "time thieves"
- Delegation and workflow management capabilities
- **Means of acquisition:**
 - Lectures on time management methods (Eisenhower Matrix, Pareto principle)
 - Practical planning exercises
 - Group discussions
- **Certification criteria:**
 - Completing a Time Management Plan
 - Participation in group discussions
 - Assessment of delegation skills

Skills Matrix for the Wellbeing Toolkit

Intellectual Wellbeing Toolkit

- **Skills to be developed:**
 - Self-awareness and management of emotions
 - Development of soft skills (effective communication, problem solving)
 - Capacity for self-reflection and personal growth
- **Means of acquisition:**



- Simulated coaching exercises
- Personal orientation test
- Group activities and role-playing
- **Certification criteria:**
 - Completion of self-reflection exercises
 - Participation in simulated coaching sessions
 - Presentation of a personal development project

These competency matrices provide a clear framework for identifying, assessing, and certifying the specific competencies that learners are expected to acquire, making the certification of competencies more meaningful and relevant.



KEY COMPETENCES IDENTIFIED

To certify the competencies developed with the e-learning course modules and toolkits, the contents of the same were examined and compared with the key competencies identified in the new certification models.

These activities have brought to light the following key competencies.

For the e-learning course modules:

1. **Stress Management (Module 1):**

- **Key competences:** stress management, personal development, mental and physical resilience.
- **Course unit contents:** Theories on stress, biological, psychological and social effects of stress, stress management techniques such as mindfulness and art therapy.

2. **Personal Development Training (Module 2):**

- **Key competencies:** personal development, self-esteem, motivation, personal effectiveness.
- **Course unit contents:** Essence of personal development, motivation, time management, self-esteem and self-acceptance.

3. **Time Management (Module 3):**

- **Key competencies:** time management, prioritization, delegation of tasks.
- **Contents:** Time management methods, identification of "time thieves", planning and prioritization.

For intellectual wellbeing toolkits:

- **Key skills:** self-esteem, emotional management, self-awareness.



- **Contents:** Simulated coaching sessions, personal orientation tests, emotion management and development of soft skills such as time management and effective communication.



CONCLUSION

The INTRA project represents a significant step towards the integration of innovative technologies in adult education, promoting a holistic approach to well-being and skills development.

Through the use of Moodle and blockchain technology, INTRA ensures a secure and transparent skills certification system, improving trust in certification processes and facilitating the recognition of skills globally.

The initiative not only supports the acquisition of digital skills and soft skills, but also contributes to the creation of a community of positive practices, fostering social inclusion and active participation in democratic life.

INTRA is committed to providing resources and support in key areas such as guidance, counselling and soft skills, recognising that individual and organisational success is closely linked to the overall well-being of adults. With a focus on lifelong learning and educational inclusion, the project aims to prepare informed, competent and engaged citizens, ready to face the challenges of the modern world.