Proyecto

Evolución de un sistema que garantice la evaluación en línea

Josep Prieto – jprieto@uoc.edu

Málaga, 22/04/2016
Contents

1. Introduction - Background
   1.1 Background: traditional exam vs e-exam
   1.2 Background: Rational behind the project
   1.3 Background: internal pilots & prototype (UOC case)

2. TeSLA project
   2.1 Features of the call & Budget
   2.2 Consortium and Impact
   2.3 Concept and Objectives
   2.4 Pilots scheme
   2.5 The TeSLA system: Architecture Overview
Background

- Traditional exams
  - Face to face

On-line

- Val-id (2012)
- TeSLA project (2016)
Background: traditional exam – 1 [crime_scene]
Background: traditional exam - 2 [trad_copy]
Background: traditional exam - 3 [solution_1]

Copiar en un examen
resulta cada vez más difícil
Background: traditional exam - 4 [unlimited_imagination]
Background: traditional exam - 5 [the_solution!]
Background: traditional exam - 6 [NP-Complete]
Background

On-line

- Val-id
- e-exam
- TeSLA project

2003 2012 2016

Traditional exams
Face to face
Background: to e-exam

The **mobility of teachers and learners** is increasing: ubiquity (any place, any time).

**Online universities** consider the **e-assessment process** as a key element in the teaching and learning process.

**Activities** are the core **for achieving competences** (cross curricula or specific competences).

**Technology** has to improve and to **facilitate how can we teach and how can students learn**.

**Authorship and student identity** is behind the teaching and learning process.

- Autentificación
- Veracidad y integridad
- Confidencialidad
- No-copia:
  - libros
  - espectador experto
  - ordenador limpio
  - comunicación vía radio
Background: internal pilots & prototype (UOC case)

UOC-Val-ID project: Evolution

- **2012-2**
  - Start (February)
  - Innova Val-ID (April)
  - Pilot 0 (April)

- **2013-1**
  - Pilot 0.1
  - Pilot 1

- **2013-2**
  - Pilot 0.2
  - Pilot 2

- **2014-1**
  - Pilot 0.3
  - Protocol ERE virtual
  - Transfer Report
  - H2020

- **2014-2**
Background: internal pilots & prototype (UOC case)

Pilot 2: March 2014- June 2014
Goal: to test the same methods and techniques in other subjects and introduce a prototype for final exams

350 students from 11 subjects (degrees and master level, language school)

Continuous Assessment Activities:

Image and video in activities
Synchronous interviews
Plagiarism tools
Peer reviews on collaborative works
Trust level by teachers feedback

Final examination with prototype for:

Facial recognition/Keystroke dynamics
TimeStamp/Digital Signature
Final examination with prototype

Application that students install on their computers.

Integration of biometric methods through the BioAPI standard.

Activity management linked to student information and subject.

Timestamp and digital signature of delivers.

<table>
<thead>
<tr>
<th>JAVA based GUI application</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BioAPI</td>
<td>UOC Server</td>
</tr>
<tr>
<td>Face Recognition</td>
<td>Voice Recognition</td>
</tr>
<tr>
<td>UOC Campus Authentication</td>
<td>Keystroke dynamics</td>
</tr>
<tr>
<td>Activity Management</td>
<td>TS</td>
</tr>
</tbody>
</table>
Background: internal pilots & prototype (UOC case)

1.- User login
2.- Current activities list
   - 3.- If activity hasn’t been started, it can be selected and downloaded from server
   - 4.- Selection of desired activity
5.- Control acknowledgement and acceptance
6.- Available tools (video recording)
7.- Activity deliver (TS and signature)
Background: internal pilots & prototype (UOC case)

Prototype results

Tested Biometric Mechanisms

<table>
<thead>
<tr>
<th>Mechanism</th>
<th>Success Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facial Recognition</td>
<td>90.3%</td>
</tr>
<tr>
<td>Voice Recognition</td>
<td>71.2%</td>
</tr>
<tr>
<td>Keystroke patterns</td>
<td>52.6%</td>
</tr>
</tbody>
</table>

All instruments have been applied with collected data during the pilots, both by already existing tools and new designed tools. Models have been created using partial set of the data or from different activities.

- Values present results of instruments in an isolated manner. In a real system, the different modalities must be combined.
- Small amount of data and classical instrument approaches (not state-of-the-art)
- During the pilots we have detected many issues in how the learners use the tools, that must be addressed in future implementations.
Background: e-exam - 6 [NP-Complete]
An Adaptive Trust-based e-assessment System for Learning

Overview

Call submitted:
Horizon2020 – INFORMATION AND COMMUNICATION TECHNOLOGIES
Topic: Technologies for better human learning and teaching.
Type: Innovation Action, with Large Scale Pilots.
Features of the call and Budget

**Horizon2020** – ICT 20 (Information and Communication Technologies)
Topic: Technologies for better human learning and teaching

Type: **Innovation Action**, with Large Scale Pilots

Means: **20% Research & 80% Innovation**

**TeSLA is one of the 5 selected projects for funding** (over 47, not usual, first&second)

**Total budget**: 7.283.092€
Consortium

18 Partners

8 Universities 3 Quality Agencies 4 Research Centers 3 Enterprises
Impact

**Students**
They will be evaluated through activities attending different kinds of assessment models. The assessment process can be done not only at educational institutions but through the Net at home.

**Universities**
An e-assessment model adapted to their learning environment, to ensure learner authentication and authorship. A reliable e-assessment system will open new opportunities in a global space.

**Companies**
Consultancy and implementation of the model in educational institutions all over the world (expansion).

**Teachers**
They will be able to define and design new learning activities including multimedia aspects and security items for ensuring learning data.

**Agencies**
An online validation model accepted by educational quality agencies in Europe that follows their educational and technological criteria.
NOOO- TeSLA Consortium (18 partners)

Universitats:
- UOC
- Open University: Institute of Educational Technology (UK)
- University of Jyväskylä, Open University (FINLAND)
- Open Universiteit Nederlands. Welten Institute
- ANADOLU University (TURKEY)
- Sofia University (BULGARIA)
- IIR - TELECOM Bretagne (FRANCE)
- Technical Sofia University (BULGARIA)

Centres de recerca:
- University of Namur (BELGIUM)
- Imperial College London (UK)
- IDILAB (SWITZERLAND)
- Instituto Nacional de Astrofísica, Óptica y Electrónica (MEXICO)

Agències de qualitat:
AQU (SPAIN)
EQANIE
ENQA

Empreses:
PROTO (Backboard)
WATCHFUL, Portugal
LPLUS GmbH Company (GERMANY)
An Adaptive Trust-based e-assessment system for learning (TeSLA)

TeSLA concept (1/2)
TeSLA concept (2/2)

TeSLA concept (2/2)

TeSLA
Trust system for e-assessment.

Need
Resolve the gap in the current online evaluation system.

There is not a European framework on e-assessment.

There is a lack of technologies to support authorship and authentication.

QUALITY
Establish quality criteria for an e-assessment framework.
Audit and advise on Higher Education quality.
Respect ethics and cultural factors.

How to do it?
Ensuring quality through:
Quality agencies.
European Expert advisers.
Large scale pilot tests.

INNOVATION
Transfer technologies from other fields to education.
Apply learning analytics for e-assessment.

How to do it?
Enhancing:
Teaching and learning processes.
e-assessment models.
Technologies from several disciplines.

ADAPTATION
Educational institutions.
Different e-assessment models.

How to do it?
Tailored to:
Learning platforms.
Teaching and learning models.
Scalability.

PRIVACY
Protect users and institutional data respecting European and national legislation.

How to do it?
Applying privacy within:
Educational institutions.
Teachers.
Stakeholders.

TRUST
Ensure:
Authorship.
Authentication.

How to do it?
Using technologies:
Keystroke dynamics.
Voice and facial recognition.
Natural language analysis.
Digital signature.
Time stamp.
TeSLA
An Adaptive Trust-based e-assessment System for Learning

Horizon 2020 Project

Funded by the European Commission
Main objective

The overall objective of the TeSLA project is to define and develop an e-assessment system, which ensures learners authentication and authorship in online and blended learning environments while avoiding the time and physical space limitations imposed by face-to-face examination.

The TeSLA project will cover teaching and learning processes as well as ethical, legal and technological aspects.
Specific objectives

O1. Analyse and design the most appropriate learning activities for e-assessment taking into account both, academic requirements to ensure the learning process and the adaptation to a fully online and cross-curricular assessment.

O2. Improve the e-assessment process by introducing tools and resources in the learning activities that capture learners’ data to ensure their authentication and authorship.

O3. Conduct several pilots of the TeSLA e-assessment system that guarantee the equality of opportunity and respect for diversity in real teaching and learning scenarios while ensuring the authentication and authorship of the learners during the e-assessment processes.

O4. Provide a core version of the TeSLA e-assessment system free of charge for educational institutions, in order to improve their e-assessment processes.

O5. Hold a set of training workshops, provide guidelines and elaborate learning resources for teachers to show how the TeSLA e-assessment system can be used for enhancing e-assessment processes.

O6. Implement a professional and commercial version of the TeSLA e-assessment system to be sold and distributed at international level.
NOOOO - Work Packages

WP 1. Project Management (UOC).
WP 2. Requirements and modeling of the educational model (UOC).
WP 3. Data privacy and ethics (Namur).
WP 4. Quality assurance in online higher education (AQU).
WP 5. Design and implementation of trusted assessment mechanisms (Lplus).
WP 6. Integration of the framework in learning environments (Watchful).
WP 7. Design and development of pilots (SU).
WP 8. Pilots evaluation (OU).
WP 9. Communication, dissemination, liaisons and exploitation (protOS).

+ New WP by the EC about ethics requirements (it includes an Ethic Audit that will be financially covered by the UOC (unexpected))
NOOO - Management structure
Large scale pilots

1st Pilot
Small educational pilots
Course 2016/17 1S

Goals
- To test the protocol of communication among partners for pilots execution.
- To test the implementation protocol at partner level.
- To select the most suitable activities for the e-assessment process at subject level.

Impact
- 1 Pilot
- 7 Institutions
- ≈ 600 students
- ≈ 75 students/institution

Level of:
- e-assessment model
- Development
- Integration
- TeSLA system

External Dimension

Internal Dimension
3rd Pilot
Large scale pilots
Course 2017/18

Goals
To test
the full integration of TeSLA system and its scalability.
To refine
modular technologies and the European e-assessment framework.
To verify
the reliability of the authentication and authorship.

Impact
2 Large Scale Pilots
Minimum 7 Institutions
They can choose some technologies or the whole system

Stage 1
6,500-7,000 students

Stage 2
10,000-14,000 students

An Adaptive Trust-based e-assessment system for learning
TeSLA
AuthToken: Signed by TESLA private key, validated by any module using TESLA public key.
TeSLA Tools

User Story: **US1**
TeSLA Settings

As a Instructor
I want to configure an Activity in my Classroom
So that I have TeSLA available for tracking students performing the activity.
User Story: US1
TeSLA Settings

As an Instructor
I want
to configure an Activity in my Classroom
So that
I have TeSLA available for tracking students performing the activity.
Deliverables & Reporting

We have 102 deliverables to submit (before submitting, Peer Review process, by 2 partners as peer reviewers).

Interim reports as Deliverables

- 6 Interim deliverables (one per semester). It includes: technical & financial reports (18 partners)

Reporting periods to EC (Brussels)

The coordinator must submit a periodic report within 60 days following the end of each reporting period. The periodic report must include the following: periodic technical report & periodic financial report

RP1: from month 1 to month 18
RP2: from month 19 to month 36

The coordinator goes to Brussels for the evaluation of project status

Final report: It must include: (a) “final technical report” and (b) “final financial report”