UOC Universitat Oberta de Catalunya | 20 años

Proyecto

TeSLA
Adaptive trust-based e-assessment

Evolución de un sistema que garantice la evaluación en línea

CRUE
TIC Comisión Sectorial de las Tecnologías de la Información y las Comunicaciones

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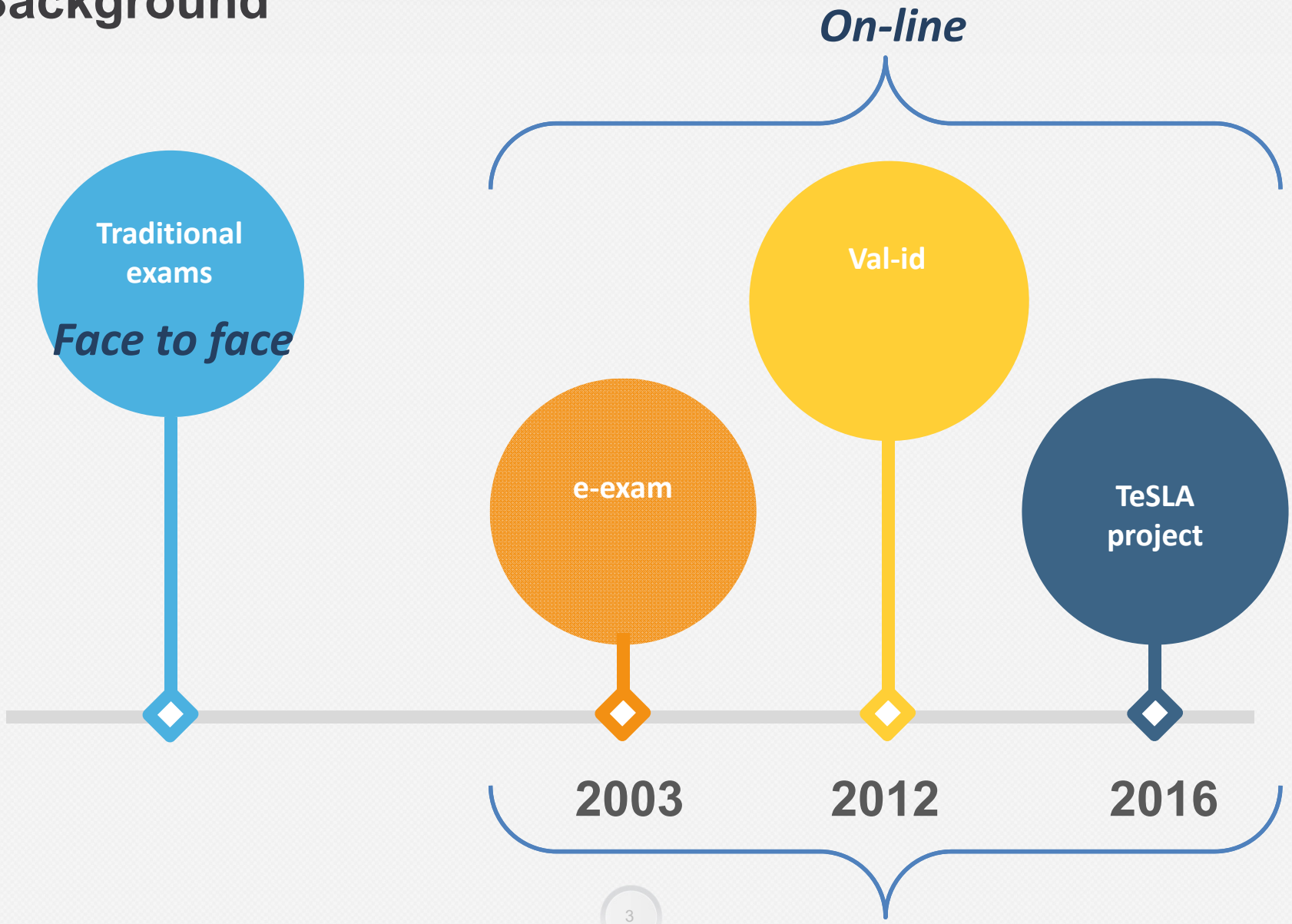
Málaga, 22/04/2016

Contents

Background

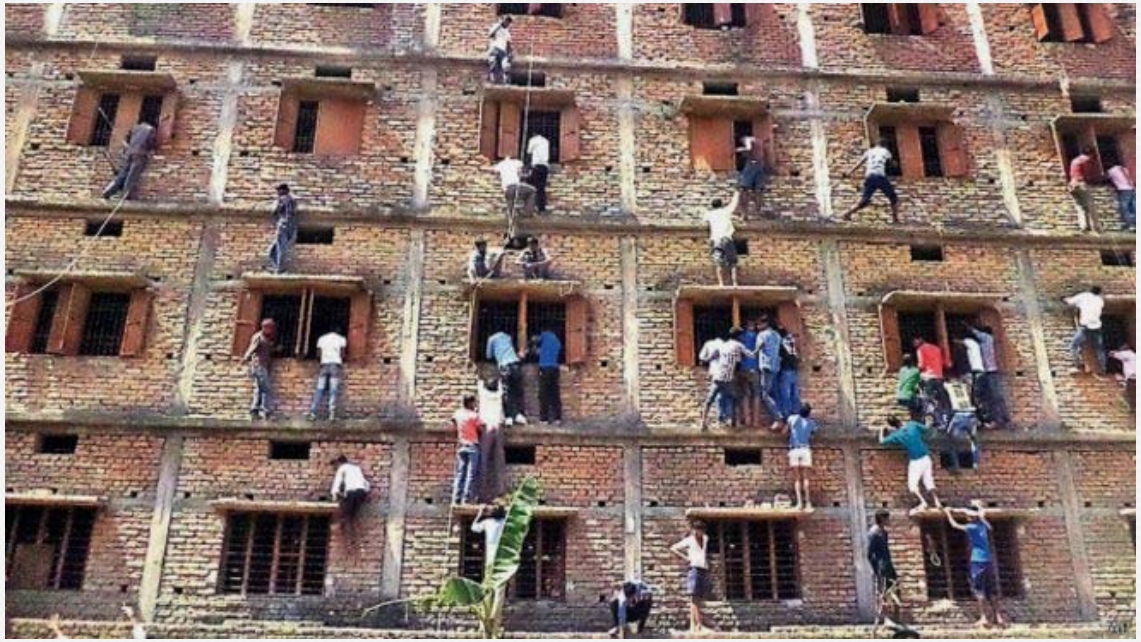

On-line
Traditional exams
Face to face
Val-id
e-exam
TeSLA project
2003
2012
2016

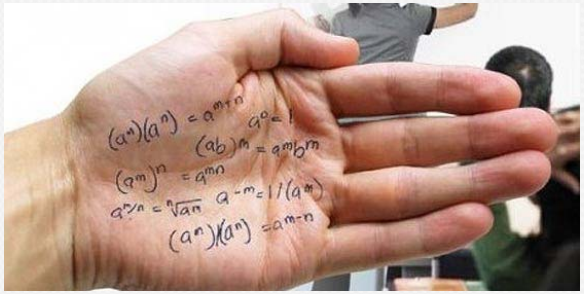
Background: traditional exam – 1 [crime_scene]

Background: traditional exam - 2 [trad_copy]

Background: traditional exam - 3 [solution_1]

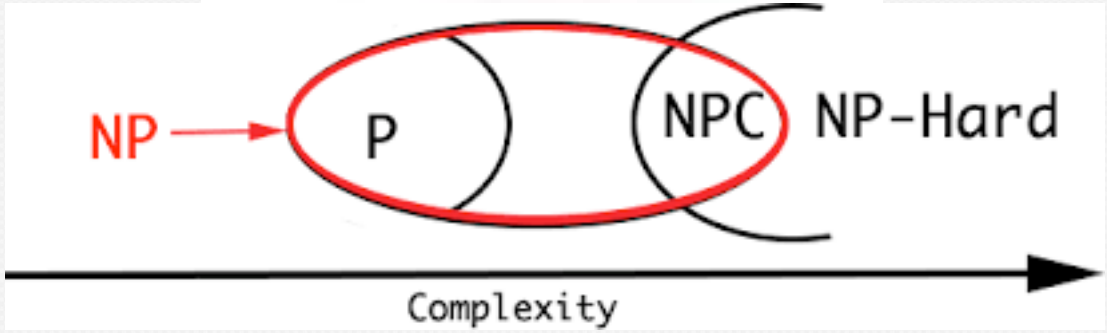
Background: traditional exam - 4 [unlimited_imagination]





Background: traditional exam - 5 [the_solution!]

Background: traditional exam - 6 [NP-Complete]



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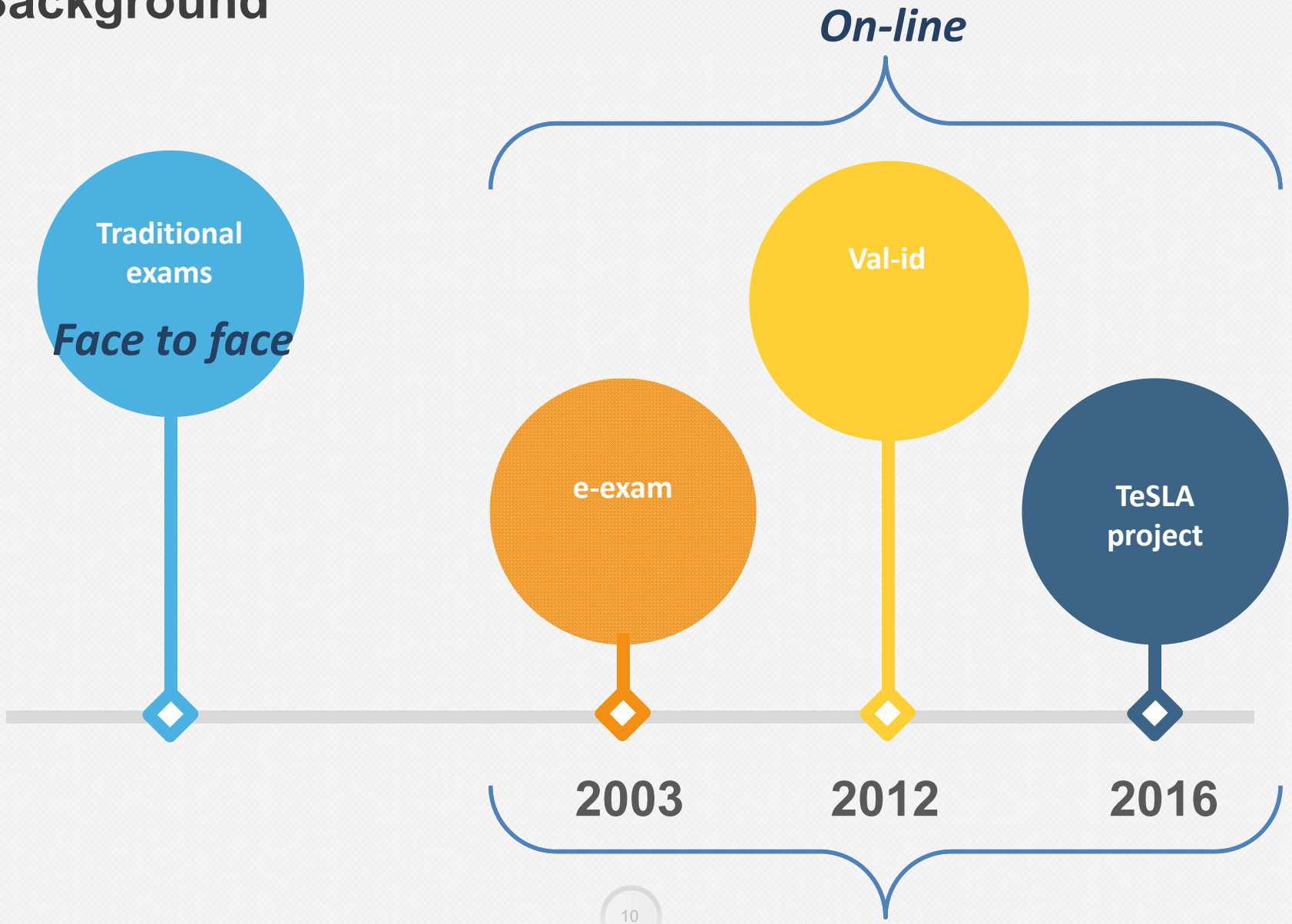
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Background: to e-exam

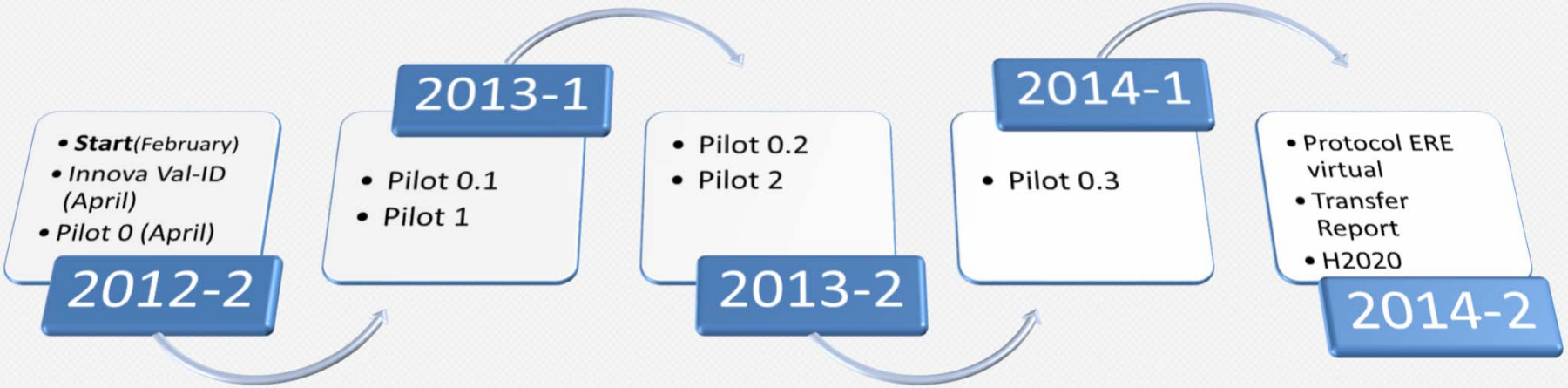
- The **mobility of teachers and learners** is increasing: **ubiquity (any place, any time).**
- **Online universities** consider the **e-assessment process** as a key element in the teaching and learning process.
- **Activities** are the core **for achieving competences** (cross curricula or specific 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.

Background: e-exam – 1 (2003)

- 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



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>
<tr><td colspan="6">JAVA based GUI applicaton</td></tr>
<tr><td colspan="4">BioAPI</td><td colspan="2">UOC Server</td></tr>
<tr><td>Face Recognition</td><td>Voice Recognition</td><td>UOC Campus Authentication</td><td>Keystroke dynamics</td><td>Activity Management</td><td>TS</td></tr>
</table>

Background: internal pilots & prototype (UOC case)

UOC Prototype

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 acceptation
6.- Available tools (video recording)
7.- Activity deliver (TS and signature)

Background: internal pilots & prototype (UOC case)

Prototype results

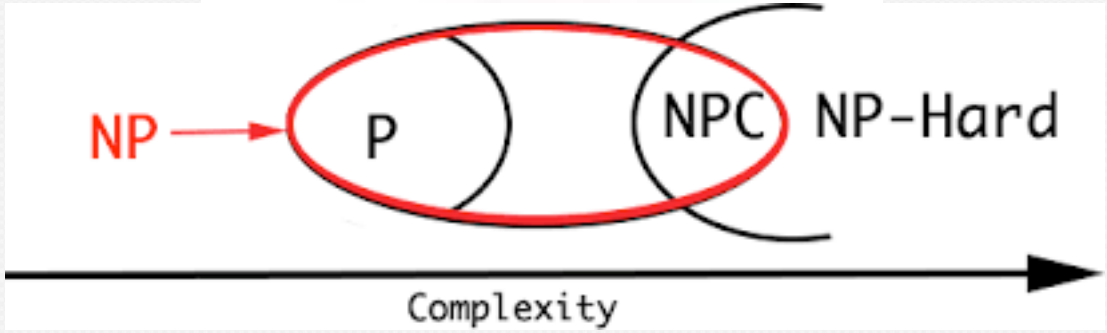
Tested Biometric Mechanisms

Facial Recognition	90.3%
Voice Recognition	71.2%
Keystroke patterns	52.6%

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 aproaches (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]



TeSLA
Adaptive trust-based e-assessment

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.

Funded by
the European Union

Project Number: 688520 – TESLA – H2020-ICT-2015/H2020-ICT-2015
Agreement Number: 688520

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€

TeSLA
Adaptive trust-based e-assessment

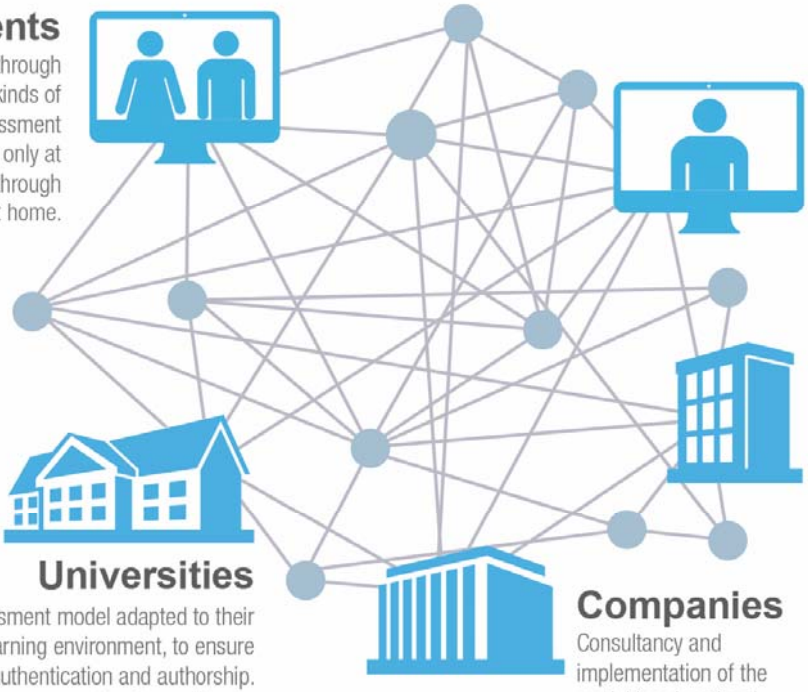
Consortium

18 Partners

8 Universities 3 Quality Agencies 4 Research Centers 3 Enterprises

UOC Universitat Oberta de Catalunya
ENQA European Association for Quality Assurance in Higher Education
Université de Namur
AQU Agència per a la Qualitat del Sistema Universitari de Catalunya
LPLUS
Open Universiteit www.ou.nl
Св. Климент Охридски
The Open University
prot os Soluciones Educativas
Institut Mines-Télécom
Imperial College London
Технически университет София
Anadolu University
University of Jyväskylä
EQANIE European Quality Assurance Network for Informatics Education
INAOE
idiap Research Institute
Watchful Keep IT secret.

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.

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.

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 (exploitation).

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)

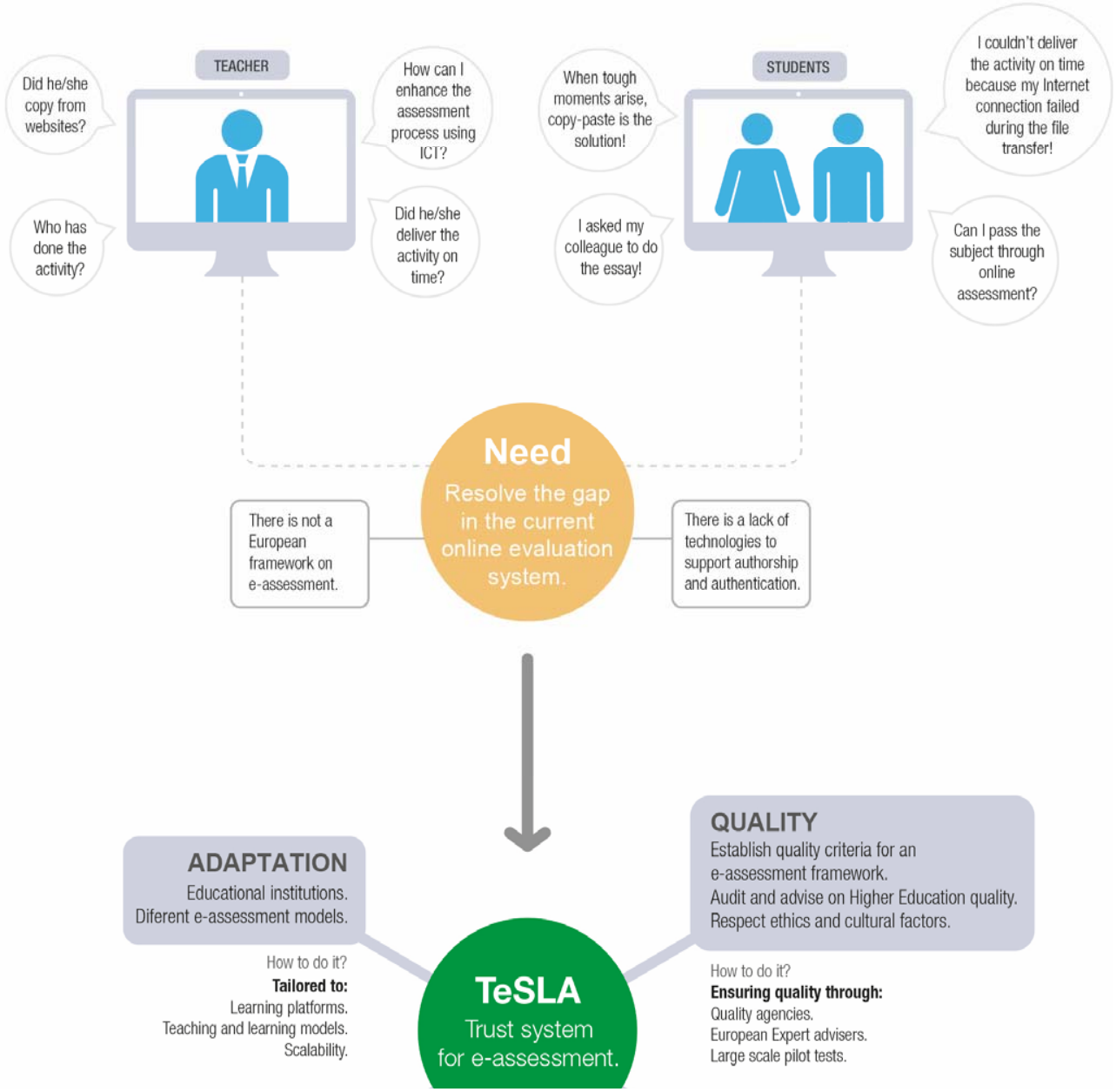
Centres de recerca:
- University of Namur (BELGIUM)
- Imperial College London (UK)
- IDILAB (SWITZERLAND)
- Instituto Nacional de Astrofísica, Óptica y Electrónica (MEXICO)

Agències de qualitat:
AQU (SPAIN)
EQANIE
ENQA

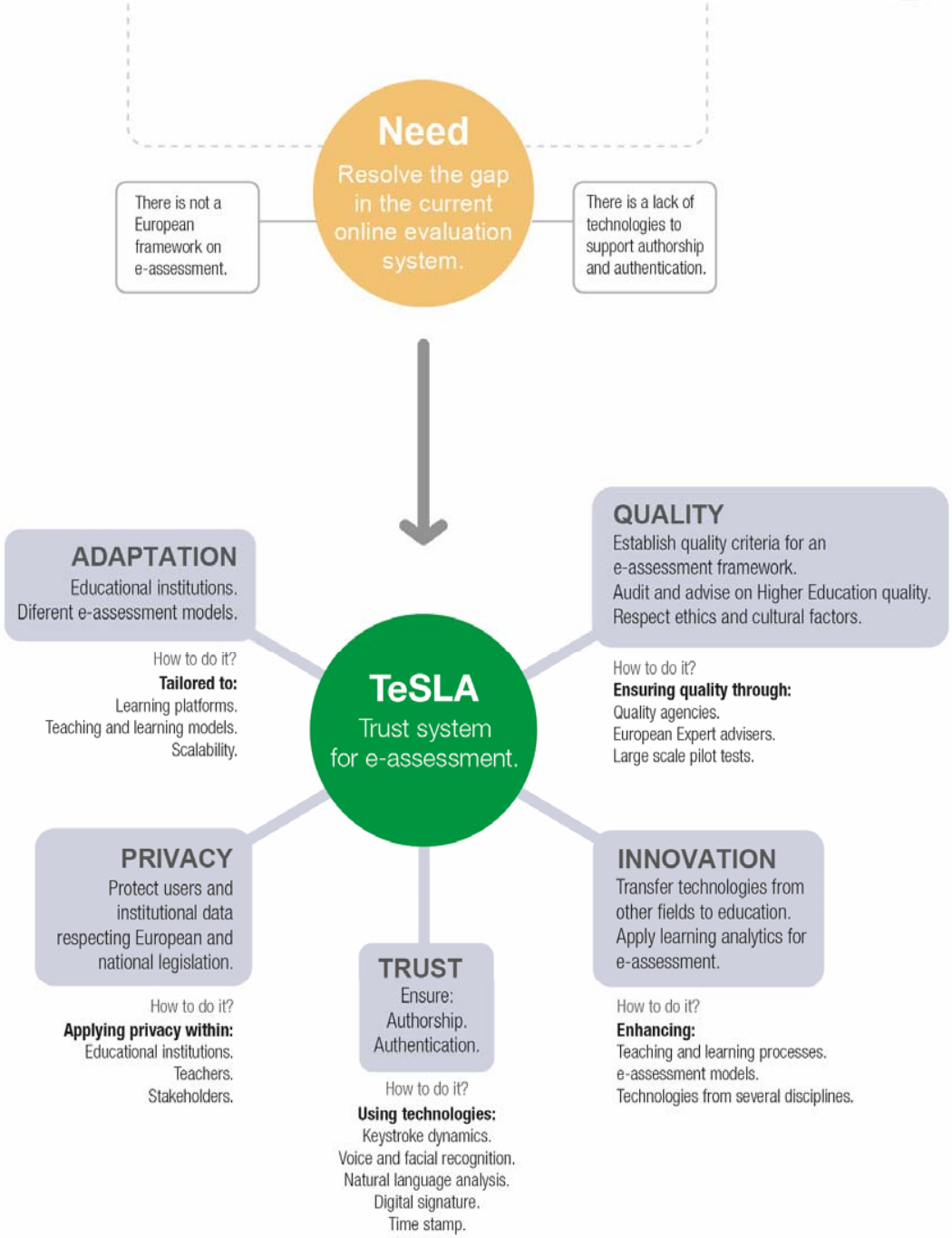
Empreses:
PROTOS (Backboard)
WATCHFUL, Portugal
LPLUS GmbH Company (GERMANY)

An Adaptive Trust-based e-assessment system for learning (TeSLA)

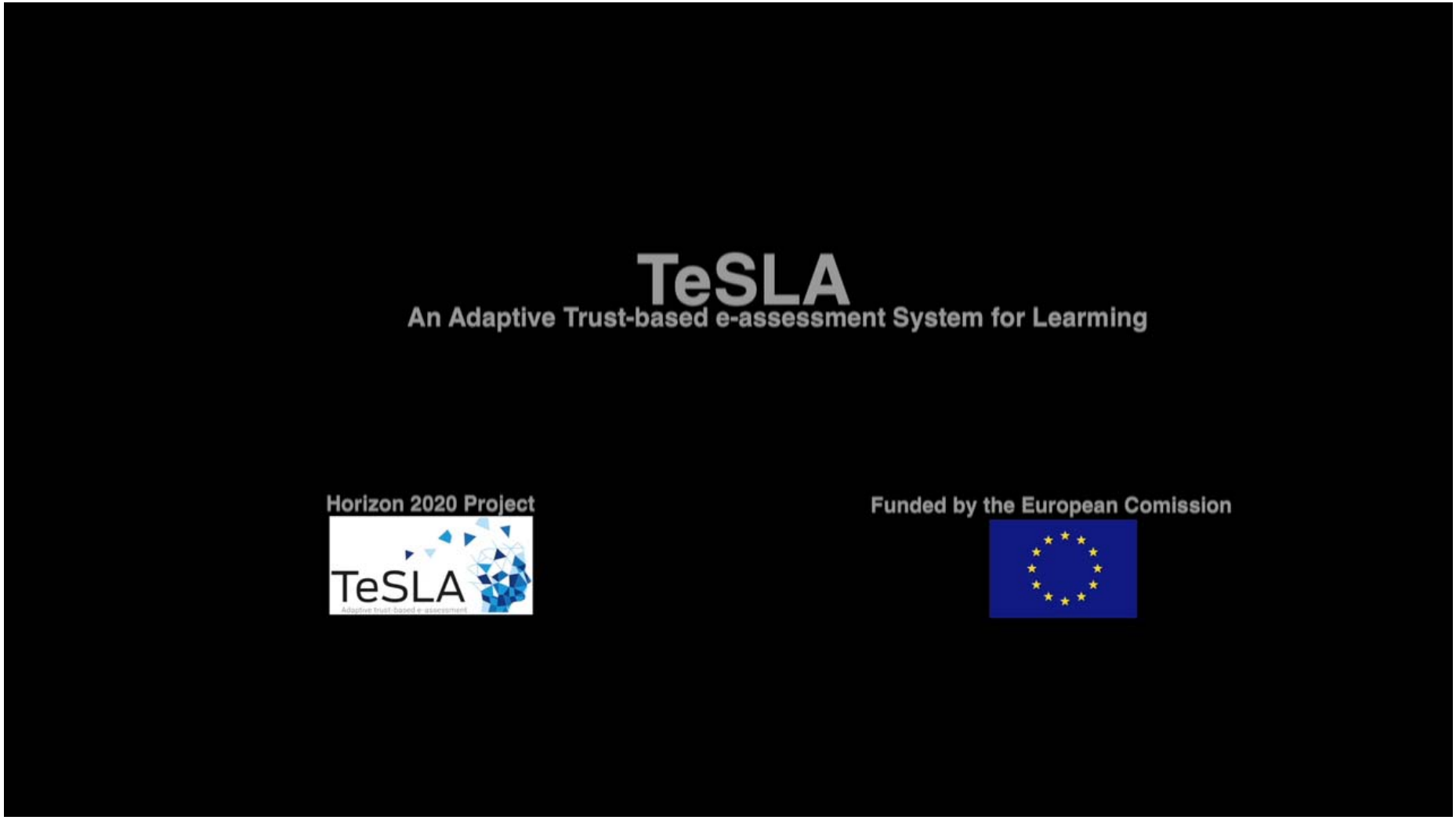
TeSLA concept (1/2)



TeSLA concept (2/2)

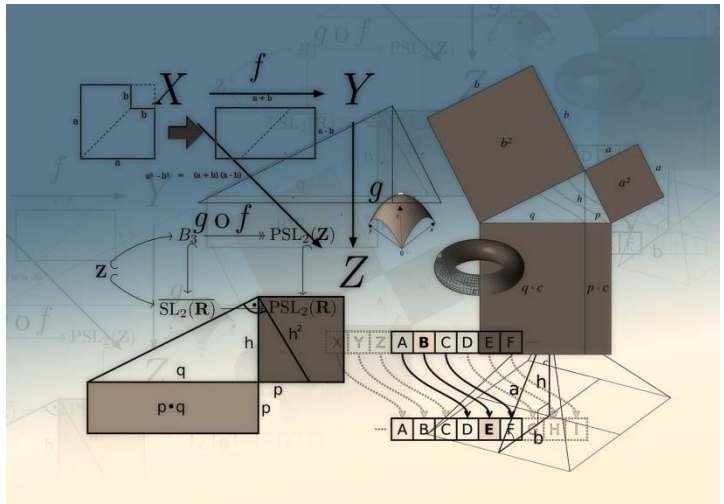


Instruments



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).

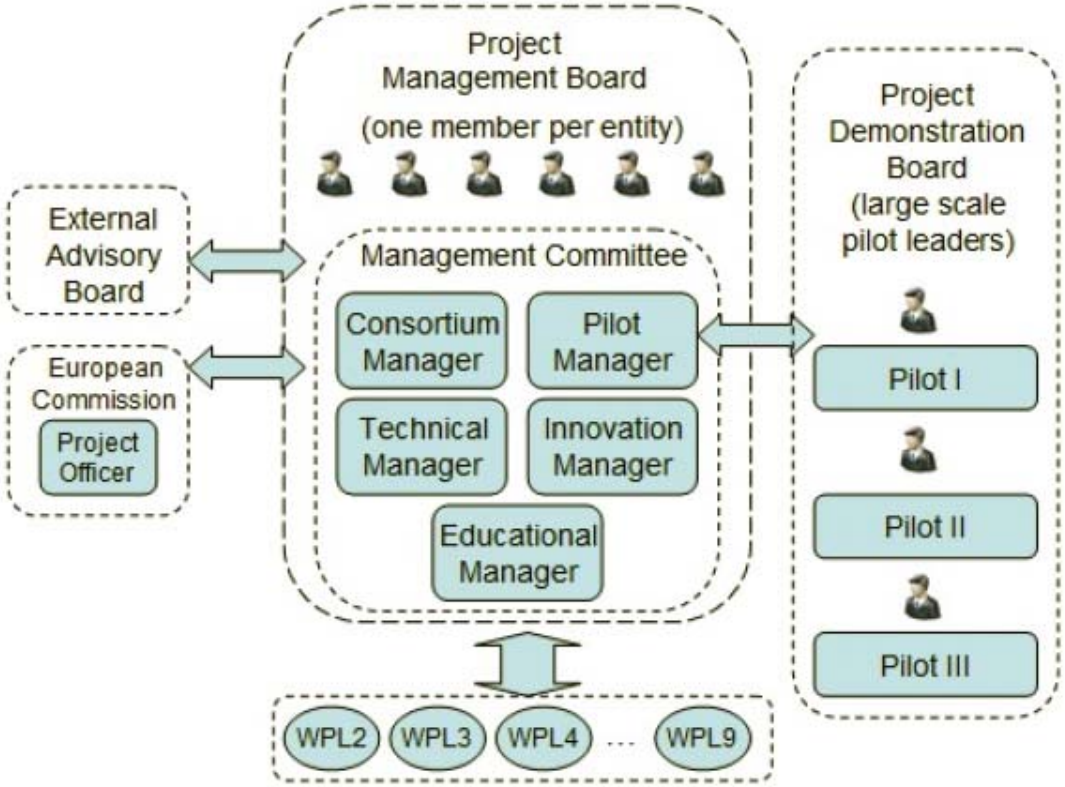
WP 7. Design and development of pilots (SU).

WP 8. Pilots evaluation (OU).

WP 9. Communication, dissemination, liaisons and exploitation (protOS).

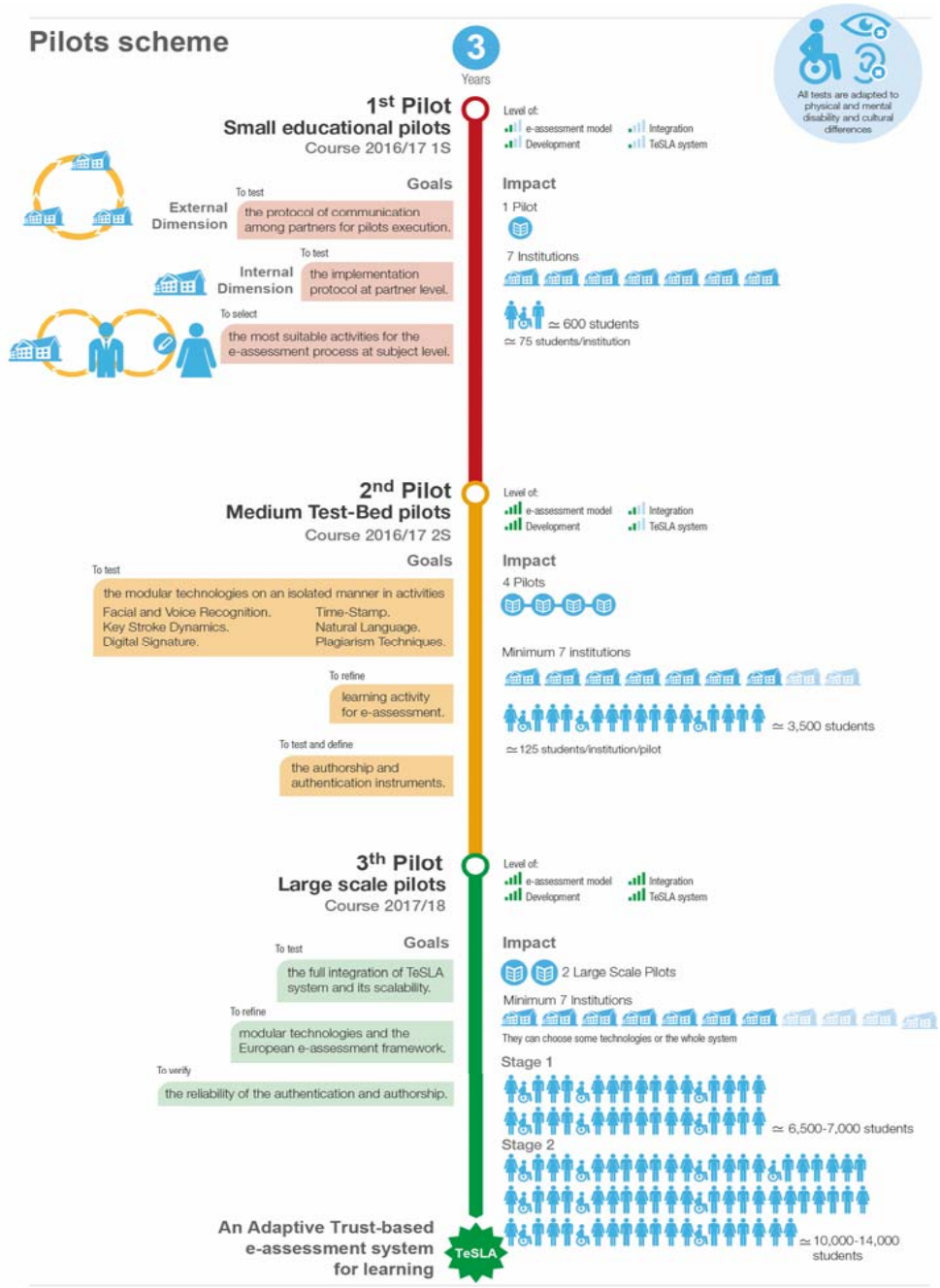
+ New WP by the EC about ethics requirements (it includes an Ethic Audit that will be financially covered by the UOC (unexpected))

NOOO -Management structure

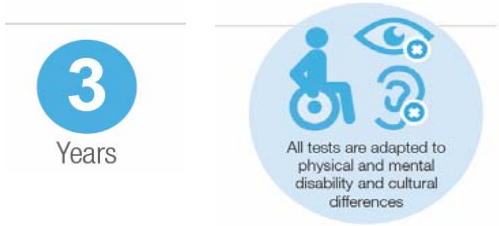


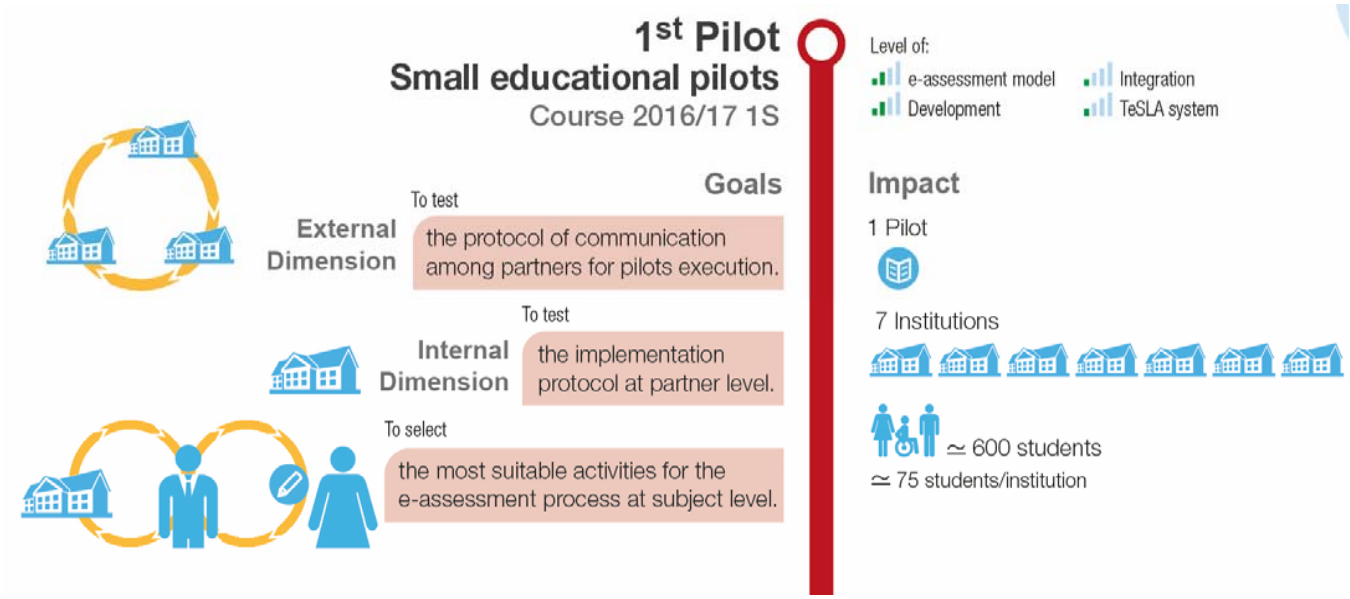
TeSLA
Adaptive trust-based e-assessment

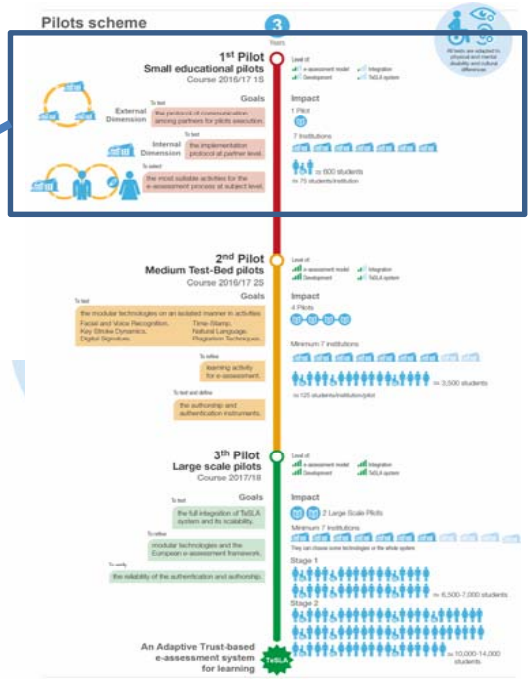
Large Scale Pilots scheme



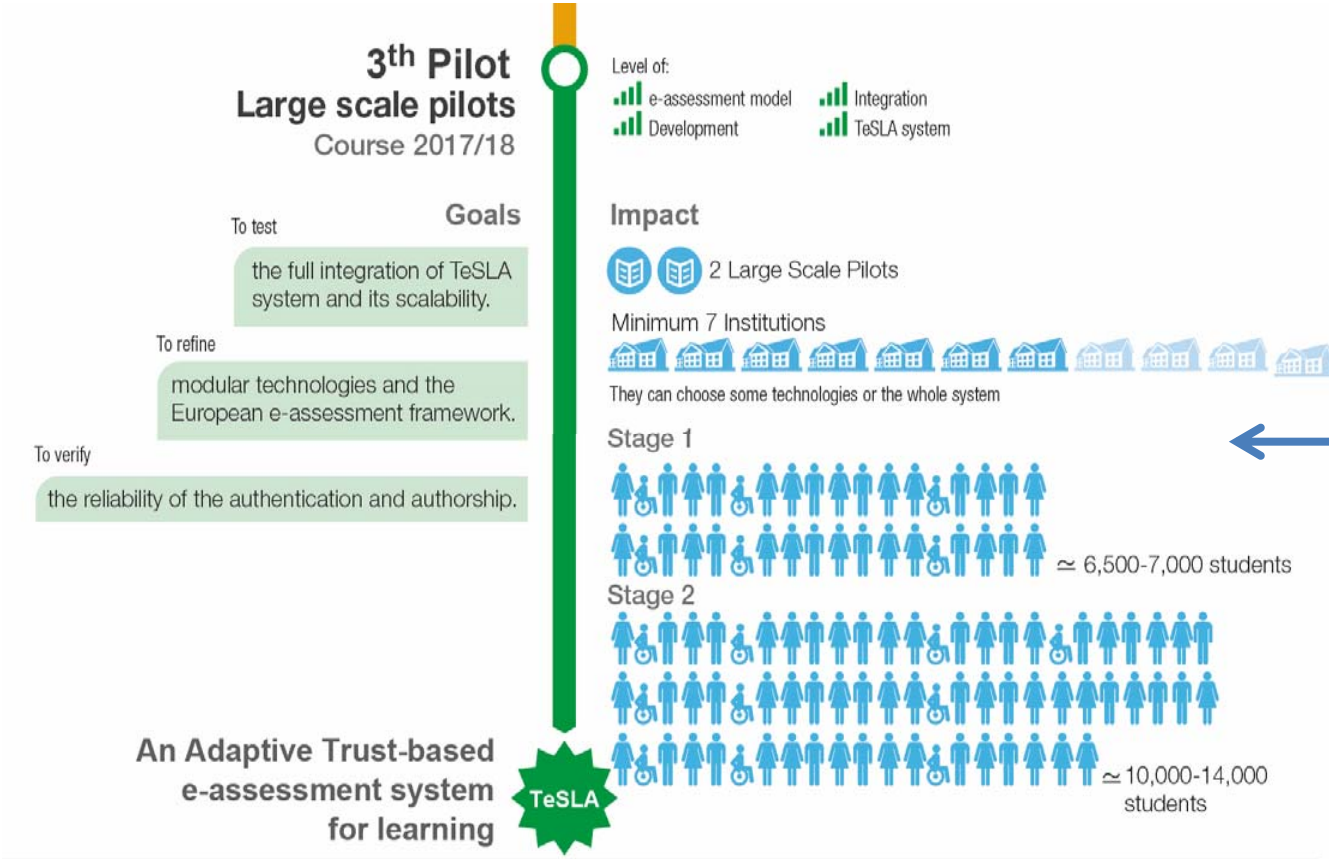
Large scale pilots

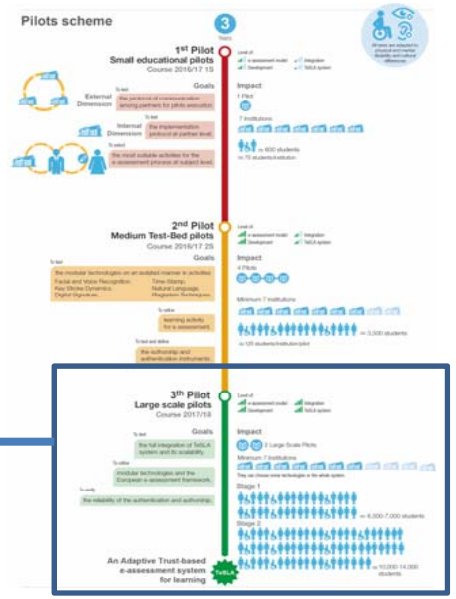




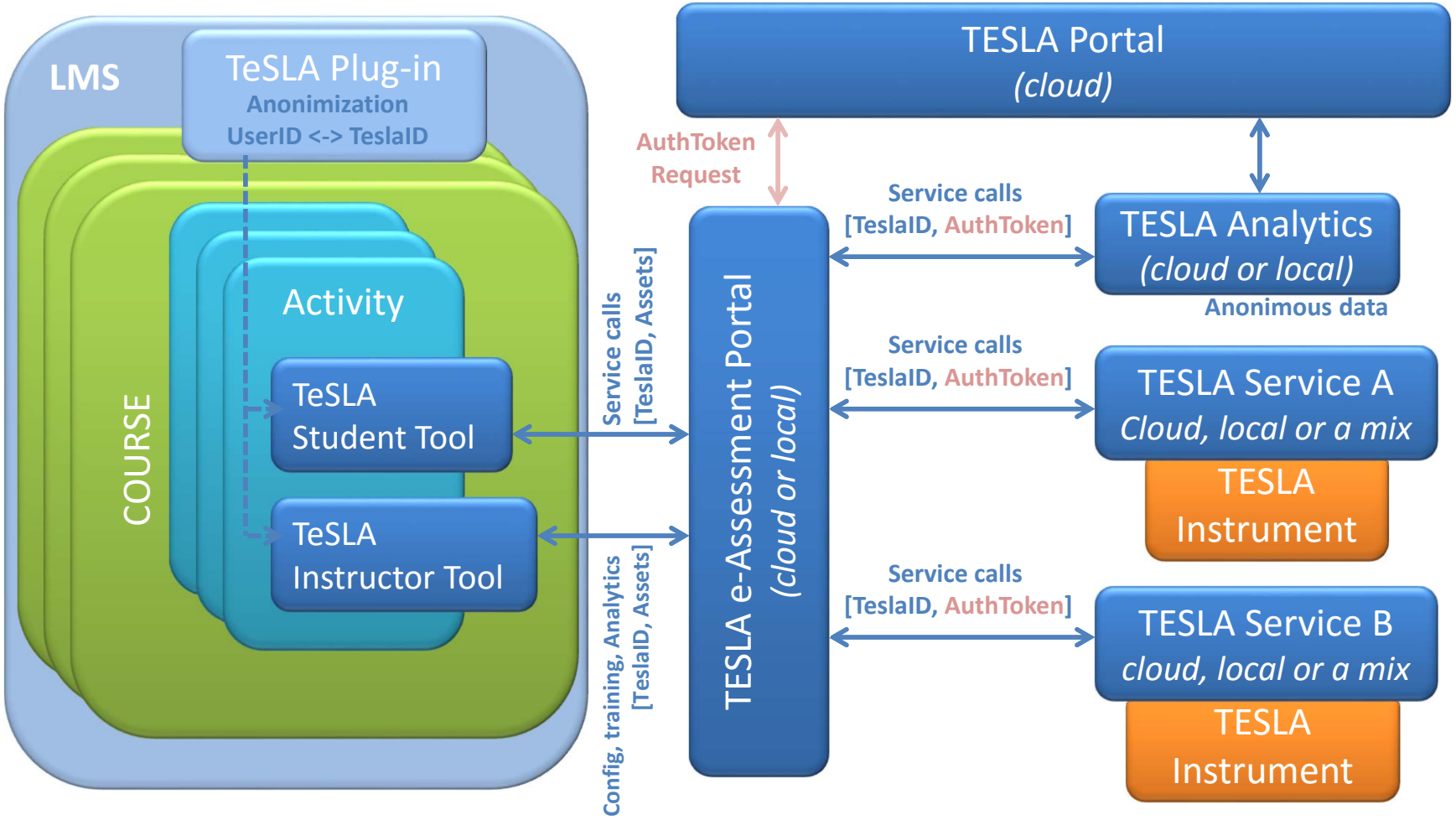


NOOOO - Large scale pilots





Architecture Overview

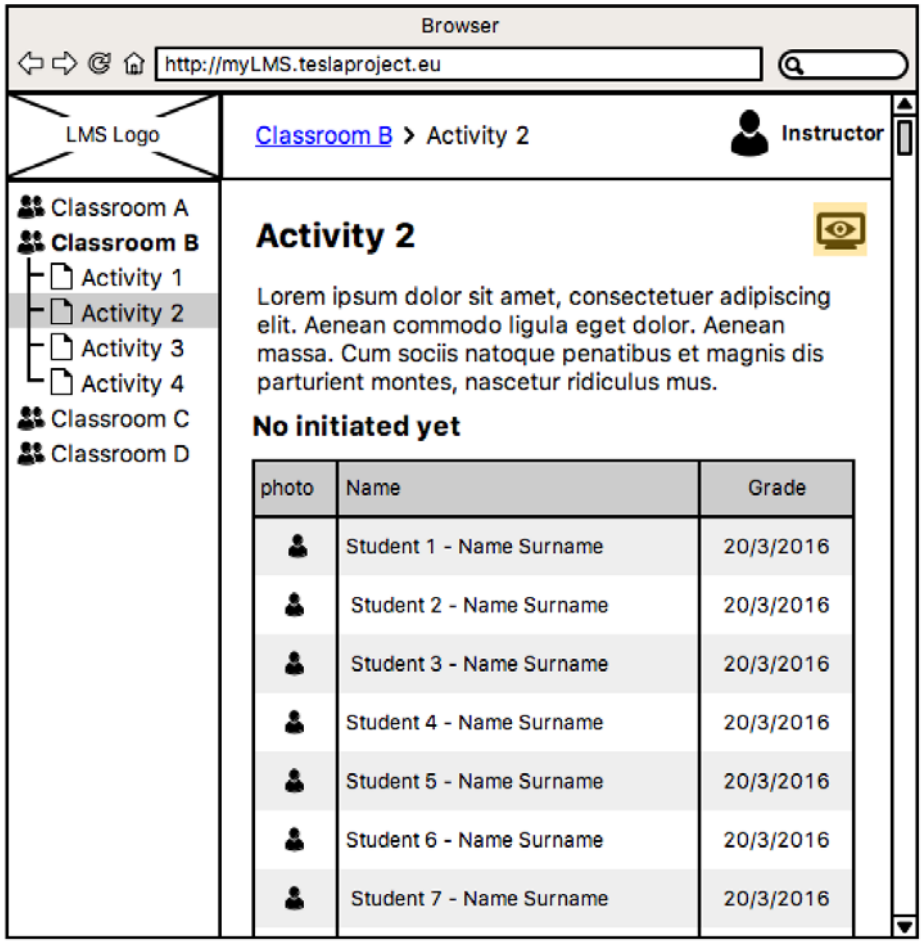


AuthToken: Signed by TESLA private key, validated by any module using TESLA public key.

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.



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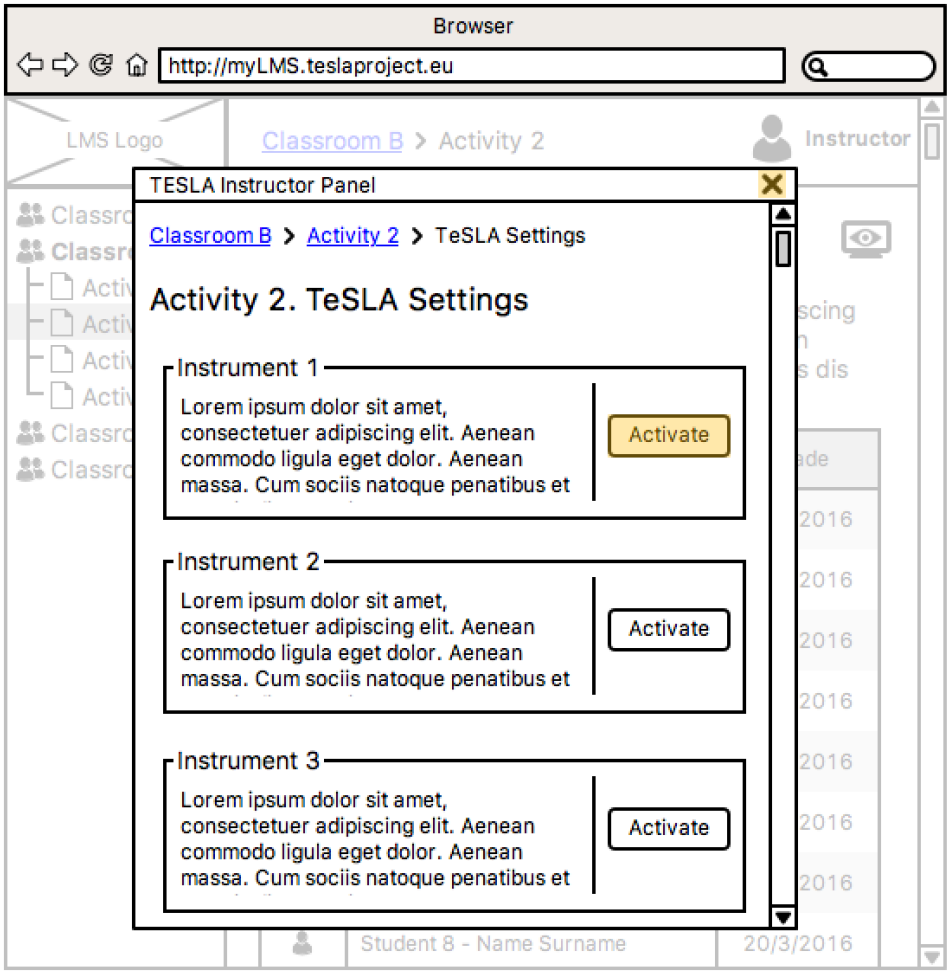

Deliverables & Reporting

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”

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