

# Education about Technical Standardization (EaS) in Luxembourg



Parallel workshop 2A:  
A cross-European student certificate on standardisation

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# ILNAS – The National Standards Body - Luxembourg

- Public administration under the authority of the Minister of the Economy, SME, Energy and Tourism
- Creation: Law of May 20, 2008
- Legislation in force: amended Law of July 4, 2014 reorganizing ILNAS
- Total staff: 62 (June 2024)

## National Standards Body (OLN)

- Composed of 8 persons
- Close collaboration with the E.I.G. ANEC-N





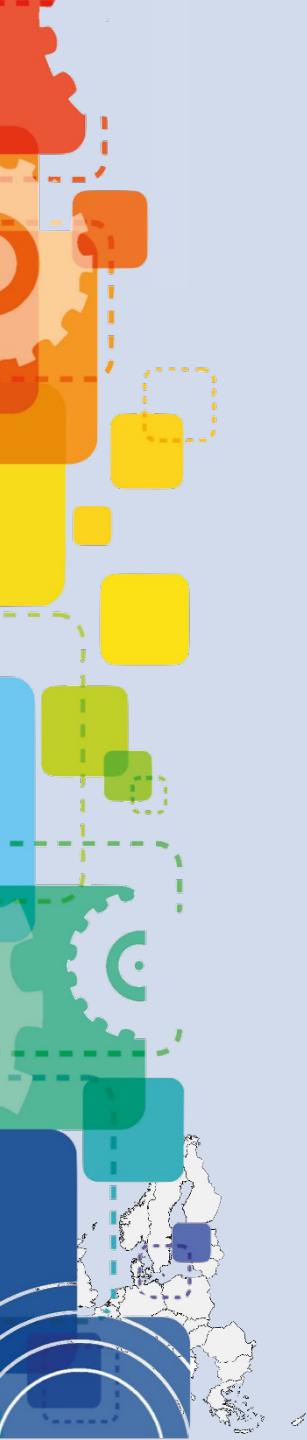
# Agenda

## I. Main national developments in EaS since 2010

- i. A first national standardization strategy (2010-2020)
- ii. A first idea about a dedicated university Master degree
- iii. A first related university certificate degree “Smart ICT for Business Innovation” (with two promotions)
- iv. A first idea of a dedicated university Master degree

## II. Main national developments in EaS since 2020

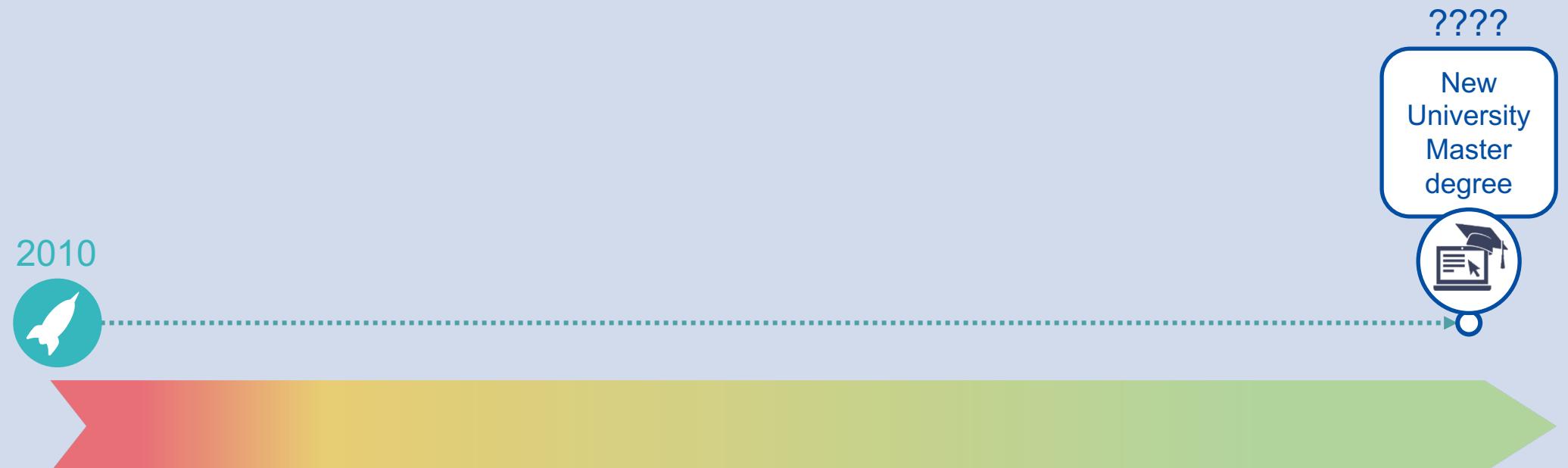
- i. A second national standardization strategy (2020-2030)
- ii. A first related university Master degree “MTECH” (with the second promotion currently running)
- iii. Next promotion of the Master MTECH (September 2024)
- iv. A first idea of a new university certificate degree (“Economy of Trust” paradigm)



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    - 1. Program
    - 2. Main technical standardization outcomes
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# A journey to develop Education about Standardization in Luxembourg



# A first national standardization strategy (2010-2020)

## One pillar dedicated to EaS

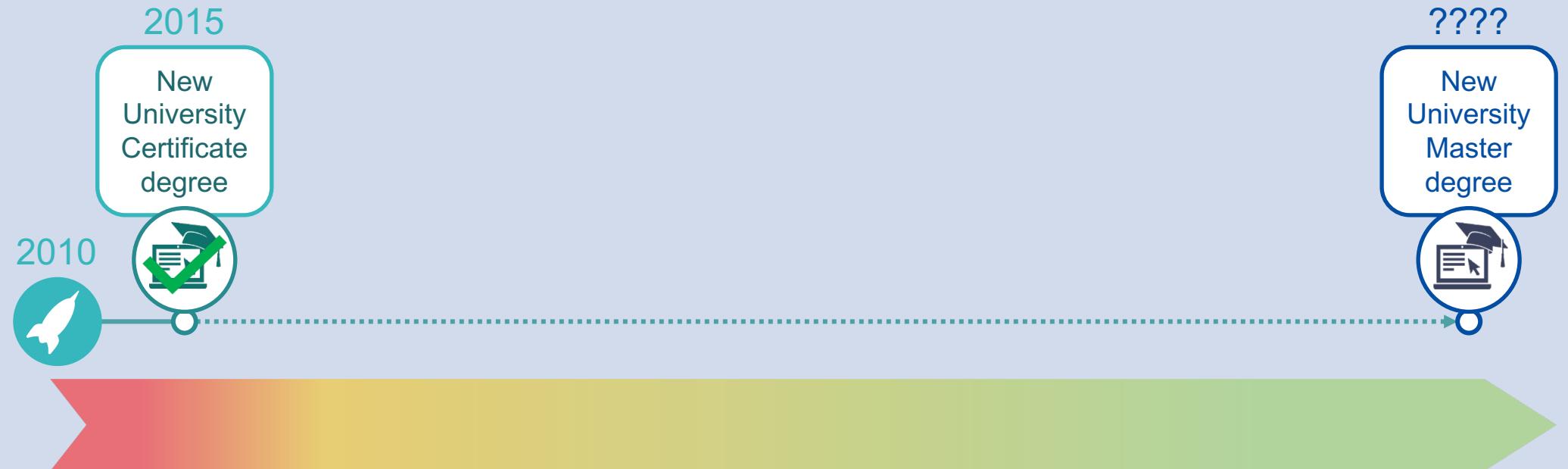
- “University training curricula in standardization will be specifically produced, in collaboration with the University of Luxembourg”

2013

- Update of the strategy
- Publication of a policy dedicated to EaS: objective to develop a Master program focused on "Entrepreneurship and Standardization" (mention ICT)



# A journey to develop Education about Standardization in Luxembourg



# A first related university certificate degree “Smart ICT for Business Innovation” (with two promotions)



2015-2019 - Pilot program for the Education about ICT Technical Standardization

2 editions  
organized

29  
students  
registered

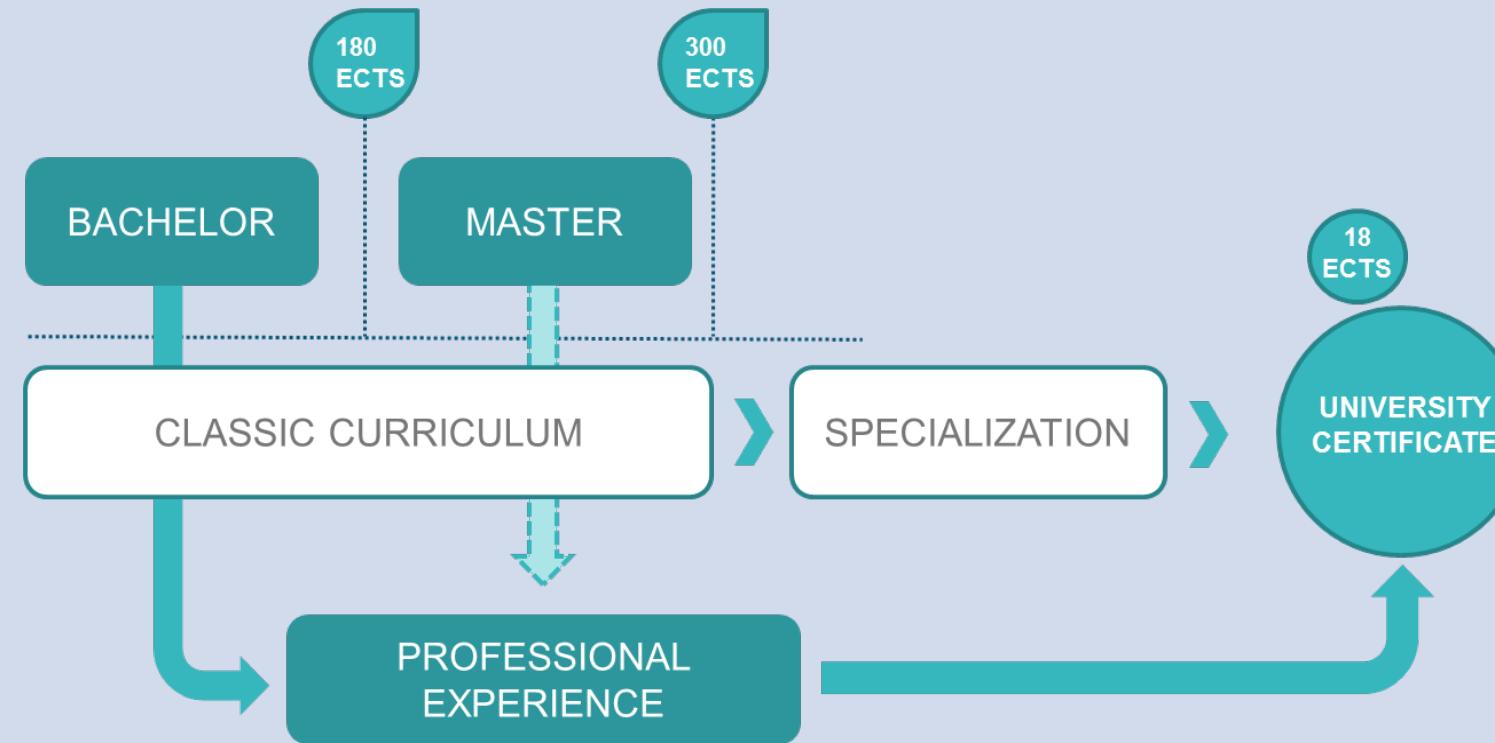
20  
students  
graduated



Supporting organizations:



# A first related university certificate degree “Smart ICT for Business Innovation” (with two promotions)



# University certificate SICTBI - Program



# University certificate SICTBI - Program

UNIVERSITY CERTIFICATE "SMART ICT FOR BUSINESS INNOVATION" (18 ECTS)			
SEMESTER 1 - 7 ECTS (72 Teaching Units)		SEMESTER 2 - 7 ECTS (72 Teaching Units)	
<b>Smart ICT concepts</b> <ul style="list-style-type: none"><li>■ Global network interconnection</li><li>■ Digital intelligence concept</li><li>■ Smart platforms concept</li><li>■ Smart interactions concept</li><li>■ Certificate Thesis Methodology</li></ul>	<b>Technical standardization</b> <ul style="list-style-type: none"><li>■ Overview of ICT standardization</li><li>■ Standards analysis of ICT sector - Lux</li><li>■ European MSP on ICT standardization</li></ul>	<b>Digital intelligence</b> <ul style="list-style-type: none"><li>■ ICT prospective</li><li>■ Development of ICT standardization</li><li>■ ICT governance concept</li></ul>	<b>Business innovation concept</b> <ul style="list-style-type: none"><li>■ Business development</li><li>■ ICT development and innovation</li><li>■ Business innovation</li></ul>
<b>Smart platforms I</b> <ul style="list-style-type: none"><li>■ Cloud Computing</li><li>■ Internet of Things</li></ul>	<b>Smart interactions I</b> <ul style="list-style-type: none"><li>■ Sensor Networks</li><li>■ Digital Trust</li></ul>	<b>Smart platforms II</b> <ul style="list-style-type: none"><li>■ Smart Cities</li><li>■ Green ICT</li></ul>	<b>Smart interactions II</b> <ul style="list-style-type: none"><li>■ Big data and Next generation analytics</li><li>■ Smart cyber-physical systems</li><li>■ Robotics</li></ul>
<b>Business Innovation Project - 48h of internship - 4 ECTS</b> <b>"HOW TO EFFICIENTLY IMPLEMENT SMART ICT IN MY COMPANY?"</b>			

# University certificate SICTBI - Program

**BUSINESS INNOVATION PROJECTS: “How to efficiently implement Smart ICT in my company?”**

## OBJECTIVES

- Develop a concrete project of business innovation
- Provide developments directly based on the concepts and principles of Smart ICT & technical standardization

## MAIN STEPS

- Development of a business plan to integrate concepts of Smart ICT in the company (with a normative dimension)

# University certificate SICTBI - Main technical standardization outcomes

## eIDAS regulation opportunity study

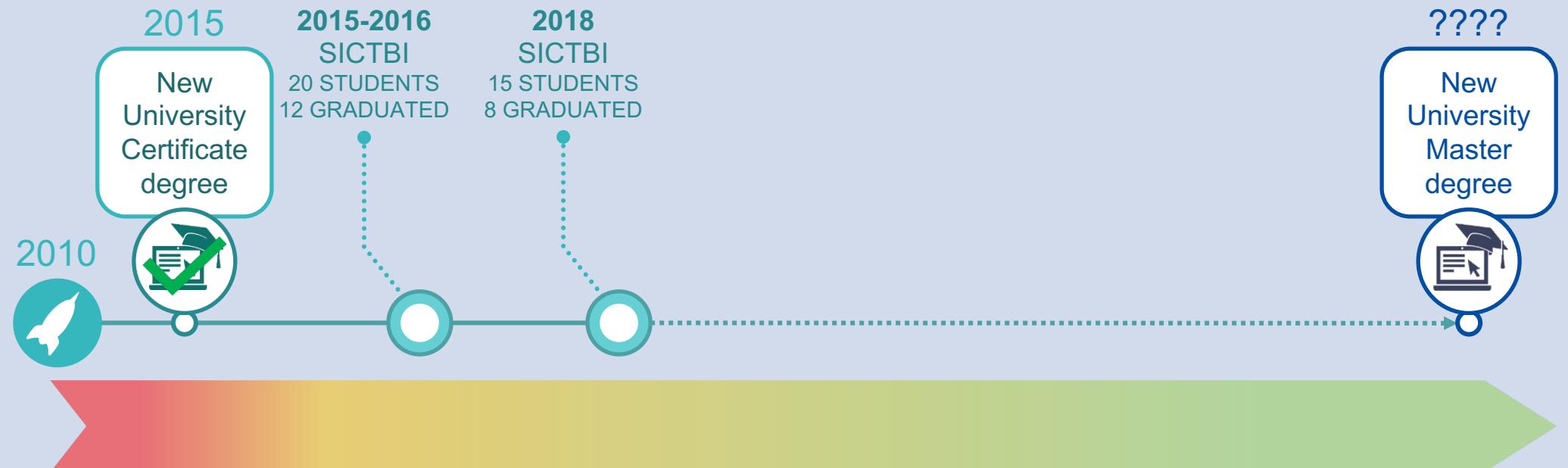


STANDARDIZATION	<ul style="list-style-type: none"><li>▪ <b>Involvement</b><ul style="list-style-type: none"><li>○ ISO/IEC JTC 1/SC 17</li><li>○ ISO/IEC JTC 1/SC 27</li><li>○ CEN/TC 224</li><li>○ ISO/TC 68/SC 7</li></ul></li><li>▪ <b>Information</b><ul style="list-style-type: none"><li>○ ISO/IEC JTC 1/SC 17</li><li>○ ISO/IEC JTC 1/SC 27</li><li>○ ISO/TC 68/SC 2</li><li>○ CEN/TC 224</li></ul></li><li>▪ <b>Fora &amp; Consortia</b><ul style="list-style-type: none"><li>○ ETSI TC ESI</li><li>○ ETSI TC CYBER</li><li>○ eIDAS Regulation (EU) N° 910/2014</li><li>○ OASIS</li></ul></li></ul>
BUSINESS DEVELOPMENT	<p><b>eIDAS opportunity study for service, integration, quality and performance</b></p> <ul style="list-style-type: none"><li>▪ Strong eID and Trust services technical standardization watch</li><li>▪ Identification of:<ul style="list-style-type: none"><li>○ Enabler to more easily implement and use products and services based on digital</li></ul></li></ul> <ul style="list-style-type: none"><li>○ An enabler to support the digital transformation of business on a global scale</li><li>○ A common technical language</li><li>○ A help in order to comply with the (eIDAS EU) regulation</li><li>○ The requirement of a trusted and interoperable framework for banking sector</li></ul>
BUSINESS PLAN	<p>Possibility to develop an activity of contract online (e.g. both “on boarding” new customers, as well as offering new products to existing clients). Customers will be able to use their own national eIDs to access services on-line taking full advantage of their rights across the EU, with security and privacy concerns addressed.</p> <p>Plan: 1) ETSI activity monitoring in the frame of eIDAS; 2) Participation to the ISO/IEC JTC1 SC27 on IT security; 3) Contribution into the company concerning technical evolution on the study field.</p>
COMMITMENT FROM THE COMPANY	<ul style="list-style-type: none"><li>▪ Interest to:<ul style="list-style-type: none"><li>○ Continue in technical standardization to anticipate future market opportunities</li><li>○ Develop more knowledge into technical standardization</li><li>○ Register more students into future diplomas regarding technical standardization</li><li>○ Consider the future master Smart Secure ICT for Business Innovation</li></ul></li><li>▪ Opportunity to create new business</li></ul> <ul style="list-style-type: none"><li>▪ Help of technical standardization as an important support regarding regulation</li><li>▪ Important internal commitment regarding standardization, interest for the standards watch service</li><li>▪ Important awareness work carried out internally and connection with ILNAS,</li><li>▪ Knowledge about the added value of standards and technical standardization provided to Grand-Duchy of Luxembourg, and about the added value provided by research activities</li></ul>
BUSINESS INNOVATION	<ul style="list-style-type: none"><li>▪ New Business innovation target: eIDAS benefits study for market opportunity for the Banking sector</li></ul>

# University certificate SICTBI - Diploma



# A journey to develop Education about Standardization in Luxembourg



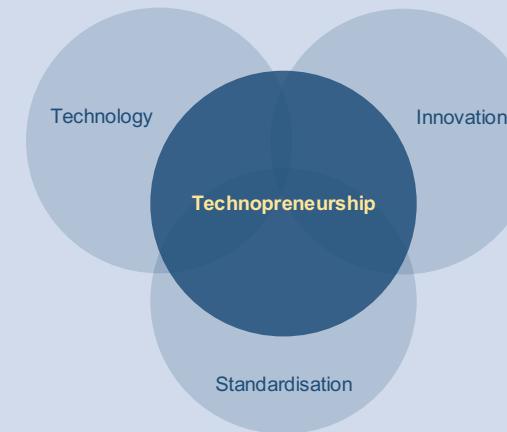
# A first idea of a dedicated university Master degree



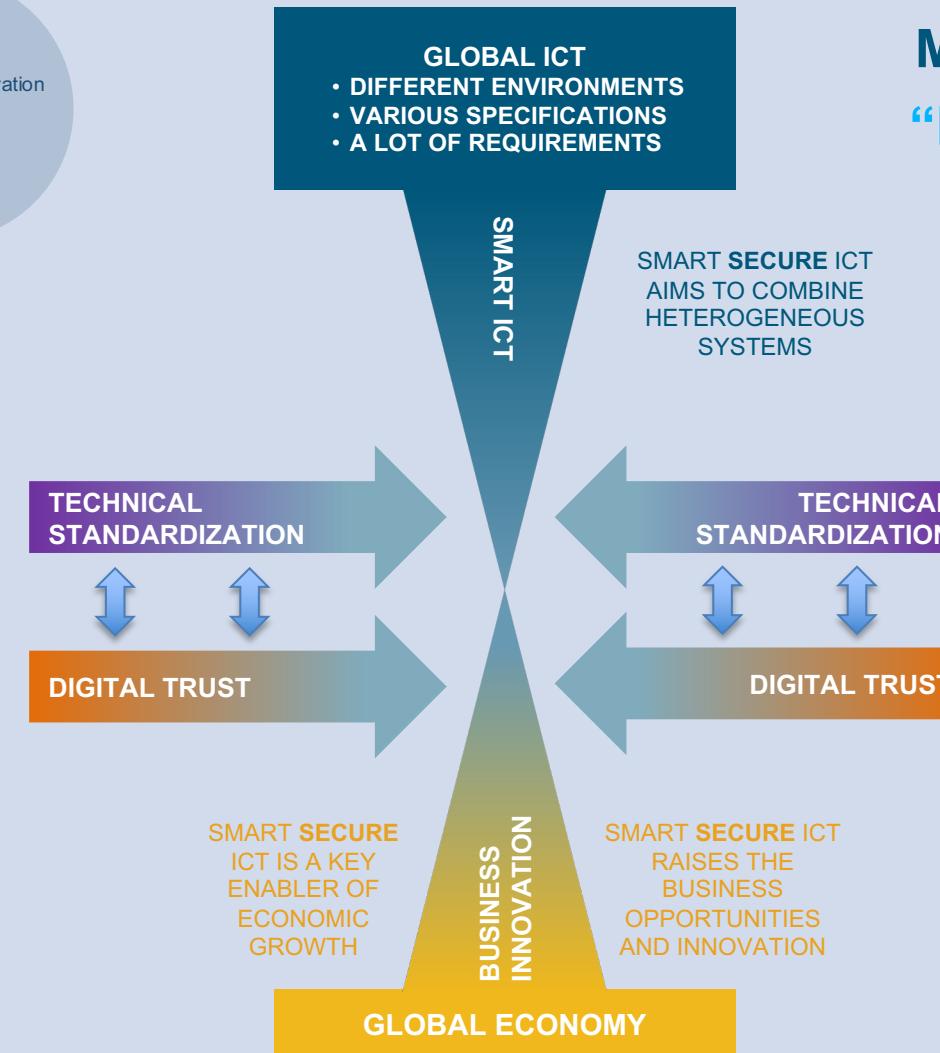
The MTECH Master is the result of more than 10 years of work and fruitful collaboration between ILNAS and the University of Luxembourg (2010-2021):

- University Certificate “Smart ICT for Business Innovation” (2015-2019)
- Research Program “Technical Standardisation for Trusted Use in the Field of Smart ICT” (2017-2020)
- Research Program “Technical Standardisation for Trustworthy ICT, Aerospace, and Construction” (2021-2024)
- Master “Technopreneurship: mastering smart ICT, standardization and digital trust for enabling next generation of ICT solutions” (2021-...)

# A first idea of a dedicated university Master degree



EFFECTIVENESS AND GROWTH OF THE ICT INDUSTRY ARE DETERMINED BY THE ABILITY OF THE COMPONENT PARTS TO SECURELY "TALK" TO EACH OTHER – TO INTEROPERATE

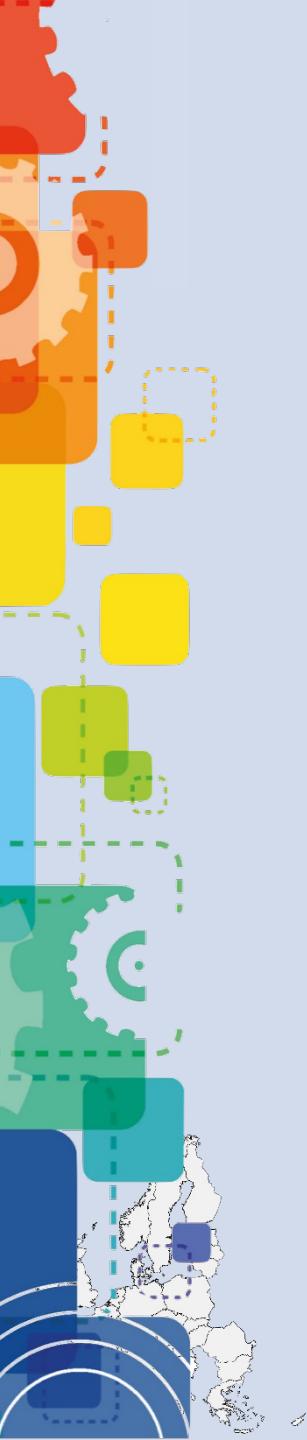


**Master MTECH**  
**"Reading Grid"**

TECHNICAL STANDARDIZATION:

- COMMON LANGUAGES
- INTERNATIONAL OUTCOMES
- CONSENSUS
- BUSINESS-DRIVEN

A FORCE MULTIPLIER FOR ICT INNOVATION ...



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# A second national standardization strategy (2020-2030)

## Technical standardization

**"Inclusive tool for performance and excellence to serve the economy"**



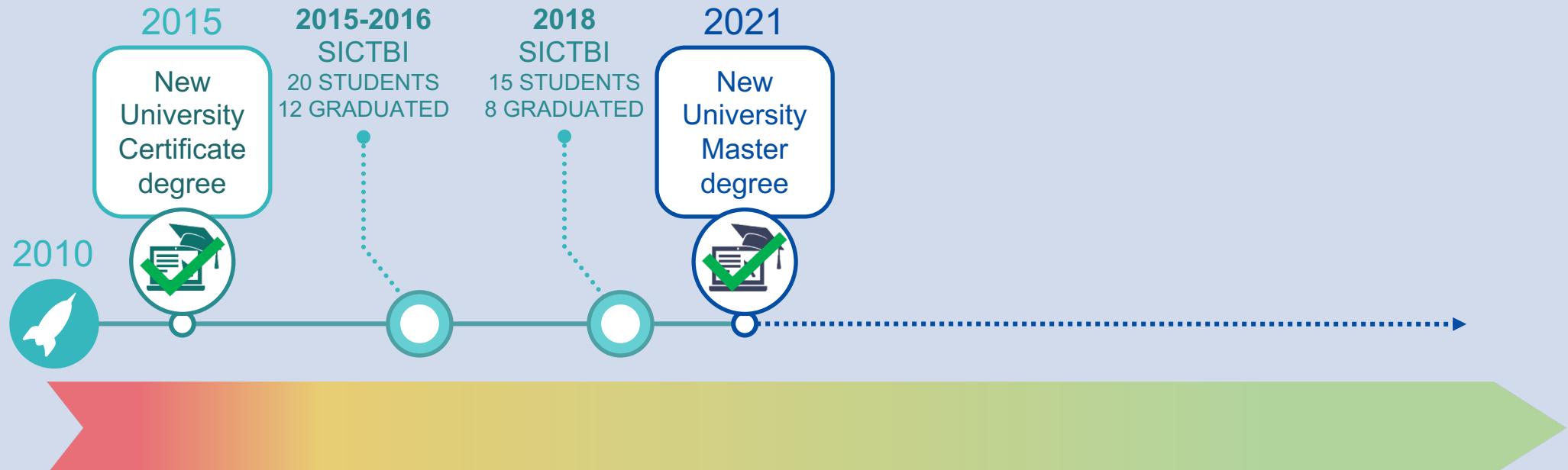
### PERFORMANCE

- Pillar 1 – Use of relevant technical standards**
- Pillar 2 – Involvement in the standardization process**

### EXCELLENCE

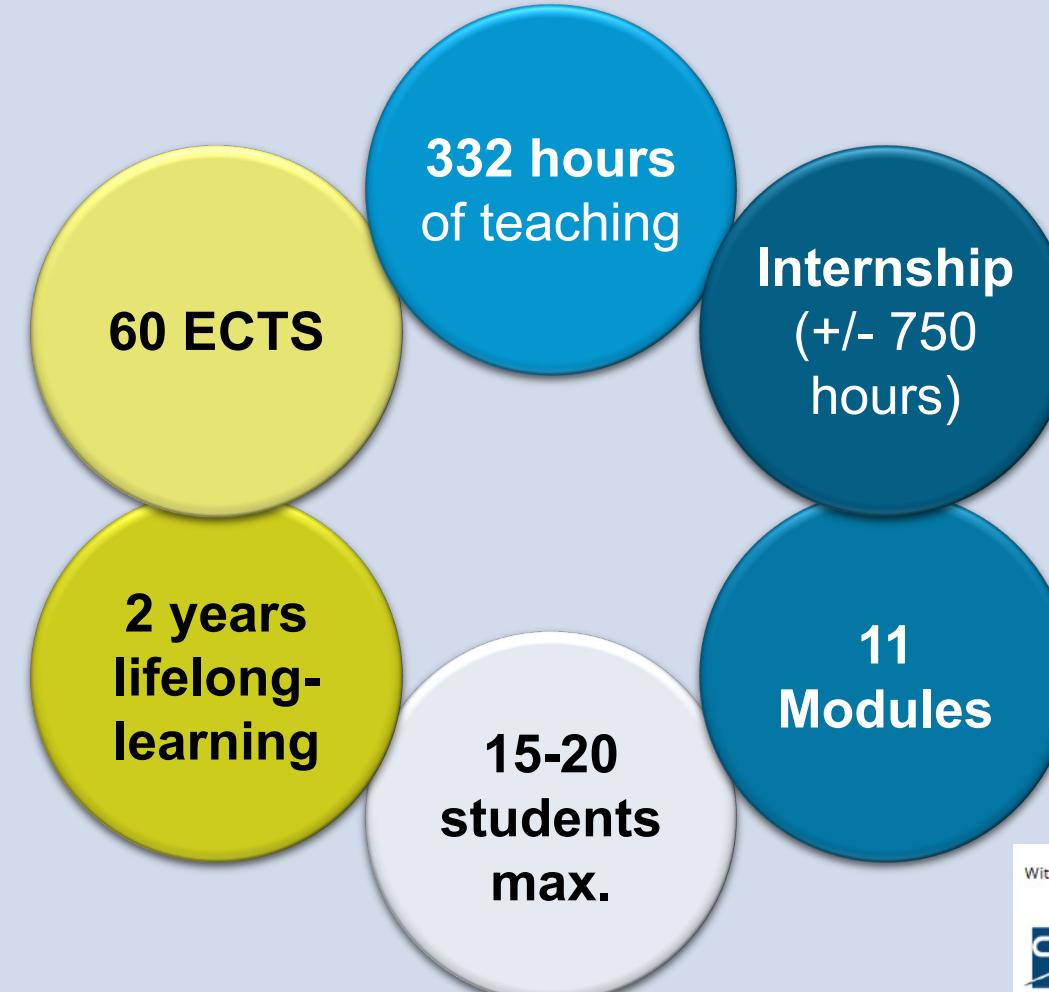
- Pillar 3 – Active participation of the NSB in the European and international standardization organizations**
- Pillar 4 – Development of research and education about standardization**

# A journey to develop Education about Standardization in Luxembourg

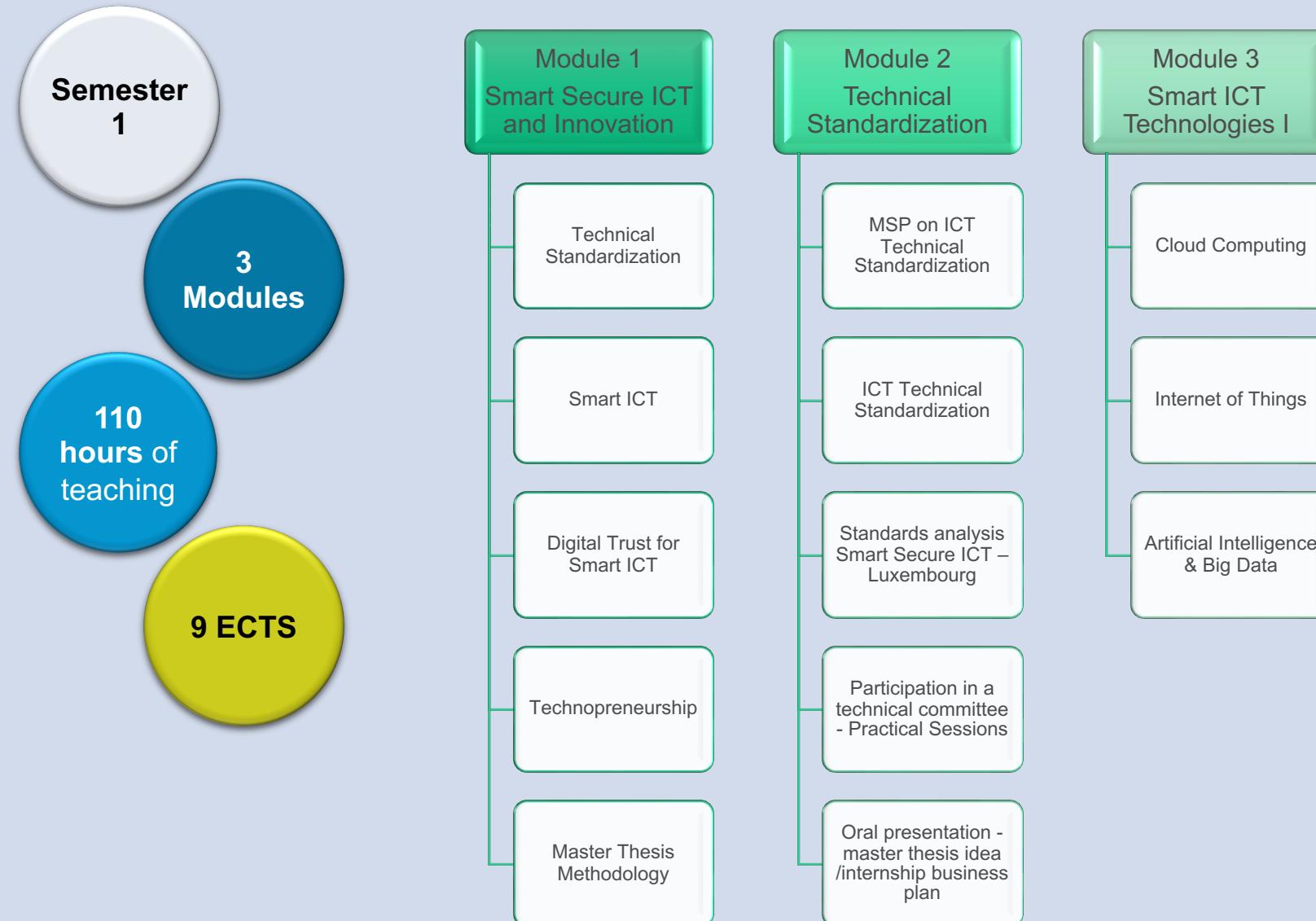


# A first related university Master degree “MTECH” (with the second promotion currently running)

PROGRAMME	
STANDARDISATION	ECTS
Smart Secure ICT and Innovation	1
Technical Standardisation	3
<b>TOTAL</b>	<b>4</b>
SMART ICT	ECTS
Smart ICT Technologies I	5
Smart ICT Technologies II	5
<b>TOTAL</b>	<b>10</b>
DIGITAL TRUST FOR SMART ICT	ECTS
Security for Smart ICT I	2
Security for Smart ICT II	3
Trust Architectures for Smart ICT	4
<b>TOTAL</b>	<b>9</b>
TECHNOPRENEURSHIP	ECTS
Management of Business and Technical Innovation	3
Digital Intelligence	2
Legal Aspects	2
<b>TOTAL</b>	<b>7</b>
MASTER THESIS	ECTS
Master Thesis	30
<b>TOTAL</b>	<b>30</b>



# Master MTECH - Program



# Master MTECH - Program

**Technopreneurship project to be implemented during the internship**

**Core question:** How to implement Smart ICT technology and entrepreneurial skills (Technopreneurship) supported by technical standardization and Digital Trust in my company?

**Core elements of the Master Thesis:** Business plan and goals (expected project outcomes); Services, products or processes addressed (business case); Smart ICT topic addressed; **Relevant technical standards and/or technical standardization committees considered**; Information security/Digital Trust needs considered; Results of the project

# Master MTECH - Main technical standardization outcomes (2021-2022)

Standardization topics in the students' projects (Internship + Master thesis)

2021-2022

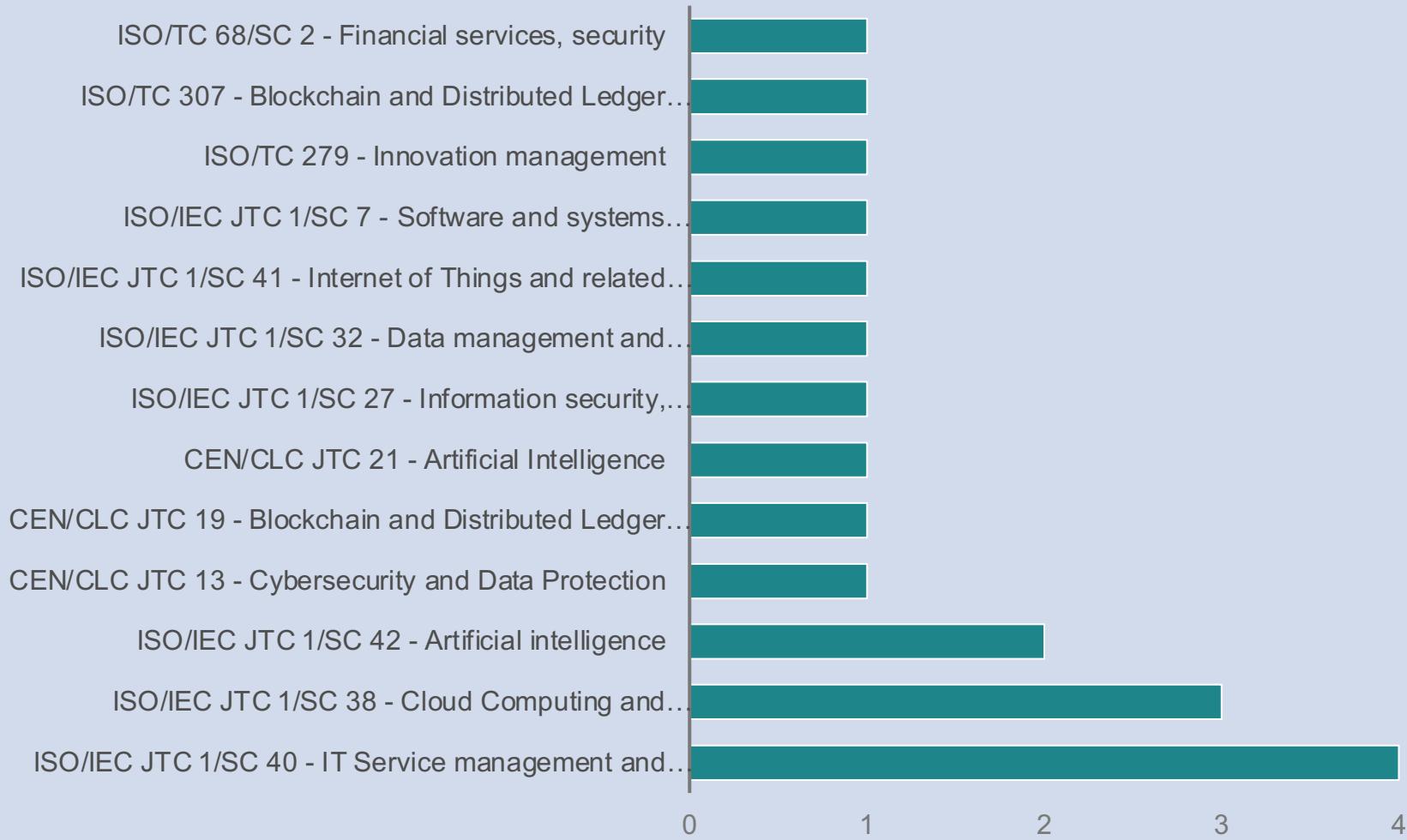


- Blockchain
- IT service management and IT governance
- Innovation management
- Cloud computing
- Financial services
- Artificial intelligence
- Cybersecurity and data privacy
- Biometrics
- E-Signature
- Data management

# Master MTECH - Main technical standardization outcomes (2021-2022)



## Participation in committees



# Master MTECH - Main technical standardization outcomes (2021-2022)

## Master Thesis:

- “Non-fungible token projects: An analysis of the standardization gaps in the field of Blockchain and Distributed Ledger Technologies”
- “Remote identity (ID) proofing”
- “Digital Finance Transformation – An International Entertainment Group case”
- “Migration to Cloud – Impact on Data Warehouse and Business Intelligence – An implementation project”
- “The Major Concerning of Building Up a Management Improvement System in a Commercial Bank”
- “An approach on digital transformation”
- “Reference Model Definition and Implementation of a Container-Based Environment Managed by a Container Orchestration Platform Addressing the Security and the Governance Concerns”
- “A resilient Single Sign-On Strategy - Taking an organization closer to a Cloud Strategy”
- “Law, Ethics and Policy of Artificial Intelligence - An implementation project”

# Master MTECH - Main technical standardization outcomes (2021-2022)

## “An approach on digital transformation”



<b>THESIS TOPIC</b>	<ul style="list-style-type: none"><li>▪ Present a baseline for two new consultancy services:<ul style="list-style-type: none"><li>▪ The first 'digital consultancy' service aims at helping businesses assess where they stand on their digital journey and in what key areas they need to improve</li><li>▪ The second 'automation consultancy' service aims at helping companies select the right process candidates to automate within the Robotics Process Automation (RPA) scope</li></ul></li></ul>
<b>CONTEXT</b>	<ul style="list-style-type: none"><li>▪ Companies today are under increased pressure to evolve and digitalize their operations should they wish to survive or stay relevant in the new digital age. The “now” has become the norm and we all want our products and services to be online, ubiquitous, and available on-demand. This requires highly efficient processes working in tandem to ensure the value chain is seamlessly delivered to the customer. So how does a company go about that? Two-word answer: digital transformation.</li><li>▪ With a lack of clear standard to date, many transformation projects are undertaken under “best practices” principles and often diverge from one company to another. It is overly complicated to objectively quantify and measure how mature and digital a business is and how does it compare with its competitors.</li></ul>
<b>TYPE OF ORGANIZATION</b>	<ul style="list-style-type: none"><li>▪ Self-employed</li></ul>
<b>STANDARDIZATION ASPECTS</b>	<ul style="list-style-type: none"><li>▪ <b>Involvement</b><ul style="list-style-type: none"><li>○ ISO/IEC JTC 1/SC 7</li><li>○ ISO/IEC JTC 1/SC 40</li><li>○ ISO/TC 279</li></ul></li><li>▪ <b>Information</b><ul style="list-style-type: none"><li>○ ISO/IEC JTC 1/SC 27</li><li>○ CEN/CLC JTC 13</li><li>○ ISO/IEC JTC 1/SC 38</li><li>○ ISO/IEC JTC 1/SC 42</li><li>○ CEN/CLC JTC 22</li></ul></li><li>▪ <b>Standards</b><ul style="list-style-type: none"><li>✓ ISO/IEC 30105 “IT Enabled Services-Business Process Outsourcing (ITES-BPO) lifecycle processes” standards</li></ul></li></ul>
<b>RESULTS EXAMPLES</b>	<ul style="list-style-type: none"><li>▪ Creation of a company in December 2022 with the aim to include the new services in its portfolio</li></ul>

# Master MTECH - Main technical standardization outcomes (2023-2024)

Standardization topics in the students' projects preproposals



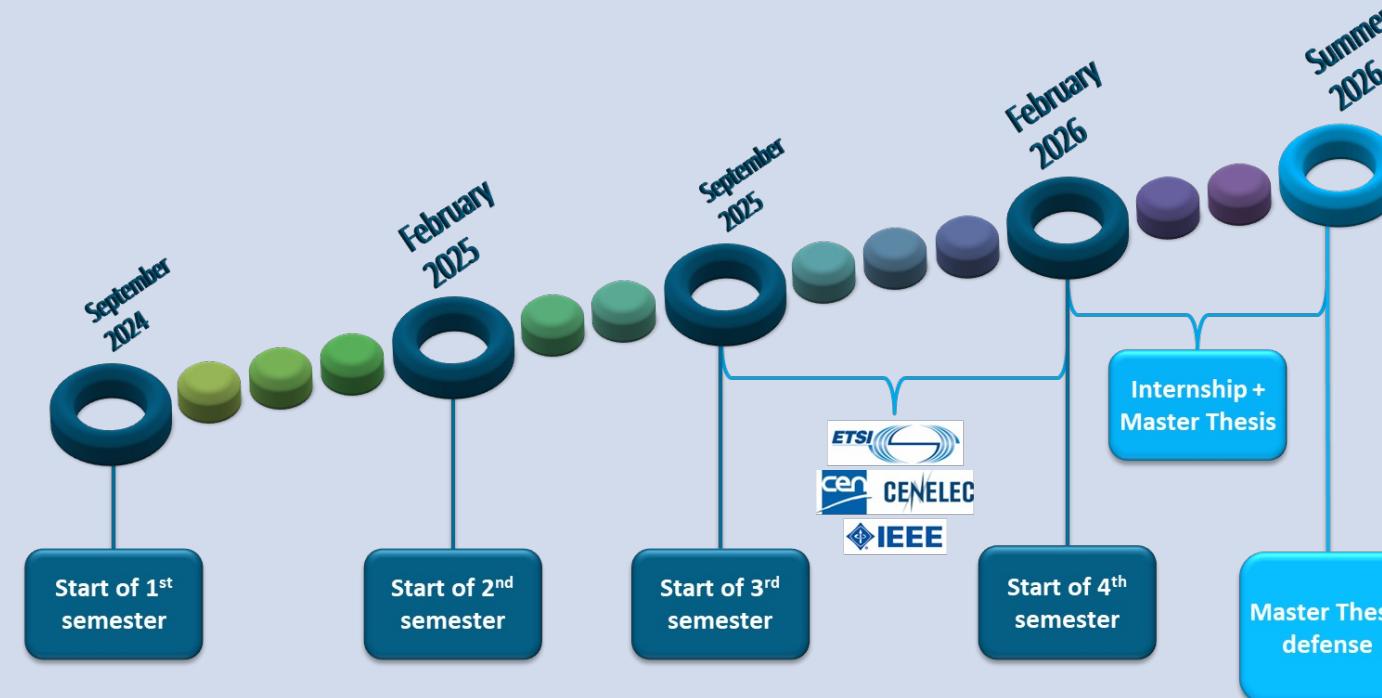
# Master MTECH - Main technical standardization outcomes (2023-2024)

## Projects pre-proposals:

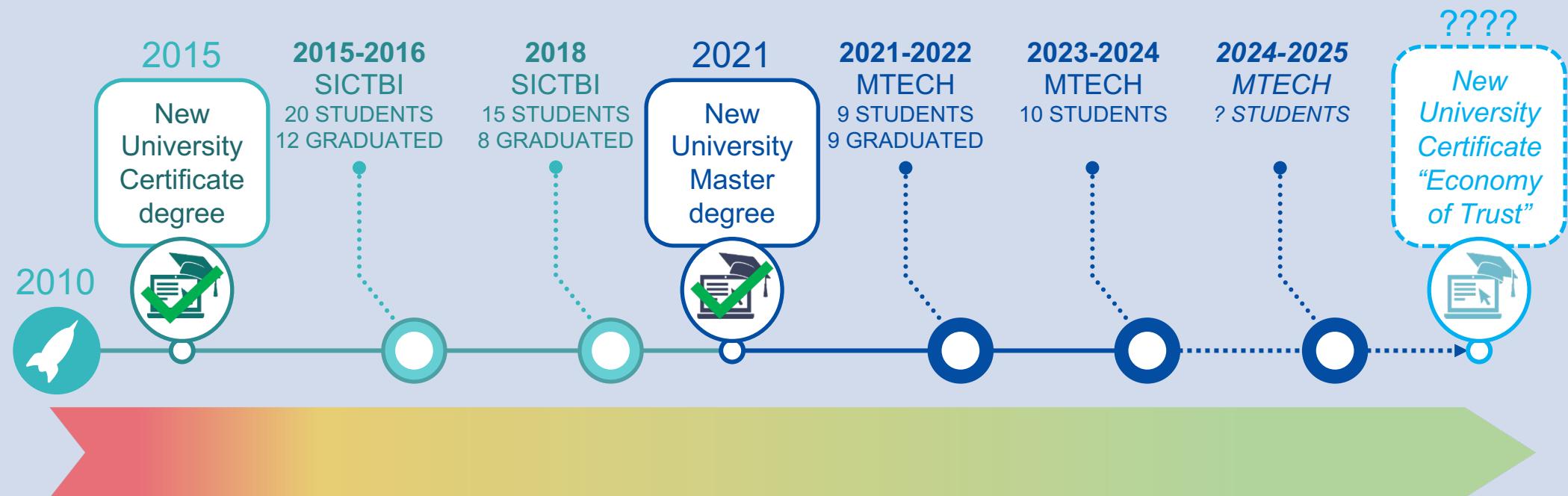
- “A Cloud-based Integrated Workplace Management Software”
- “Customer Trust in Digital Financial Services”
- “Decarbonization with ICT for a Sustainable Tomorrow”
- “AI-Powered Point-and-Click Adventure Game MOOCs Platform - Proof-of-concept and business plan”
- “The compliancy of AI usage, analyzing the combination of personal identifiable Information and technical (network) data, preventing bias while ensuring the animosity of customers” / “IoT service delivery: Secure & Standardized”
- “Expand the scope of the current Information Security Management System as part of the ISO/IEC 27001:2022 standard certification”
- “Confidential Computing For Data Privacy, Digital Rights and Intellectual Property”
- “Assessing Company's Digital Design for Successful Technology Adoption”
- “Use of Real Time Locating System for the industry 4.0”
- “Explore innovation to Improve translation and related language processes and services”

# Next promotion of the Master MTECH (September 2024)

- 20 participants max.
- Interviews with candidates are currently organized



# A journey to develop Education about Standardization in Luxembourg



# A first idea of a new university certificate degree (“Economy of Trust” paradigm)

## First insights:



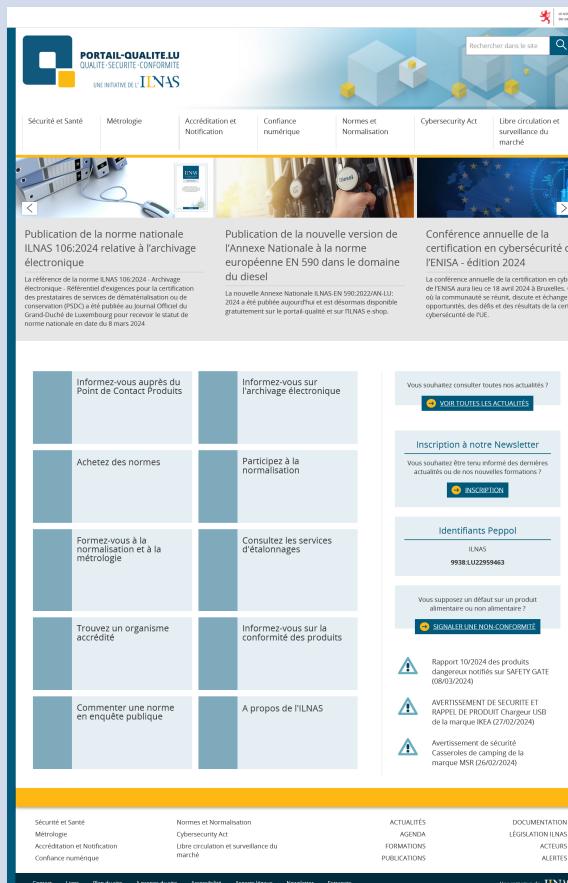
University certificate “Economy of Trust”				
<b>Economy of Trust</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Systemic Approach</li></ul>	<b>Legal framework for international trade</b> <ul style="list-style-type: none"><li>• National market</li><li>• European market</li><li>• International trade</li></ul>	<b>Conformity assessment</b> <ul style="list-style-type: none"><li>• Introduction</li><li>• Certification</li><li>• Inspection</li><li>• Testing and calibration - metrology</li><li>• Proficiency testing</li></ul>	<b>Accreditation</b> <ul style="list-style-type: none"><li>• National Accreditation Body - OLAS</li><li>• EA</li><li>• ILAC/IAF</li></ul>	<b>Standardization</b> <ul style="list-style-type: none"><li>• Introduction to standardization</li><li>• ISO/CASCO standardization</li></ul>

→ An intern is currently working at the E.I.G. ANEC-N in order to establish a state of the art of the “Economy of Trust” paradigm and refine the degree proposal

# THANK YOU FOR YOUR ATTENTION!

→ Portail qualité:

[www.portail-qualite.lu](http://www.portail-qualite.lu)



→ Newsletters: <https://portail-qualite.public.lu/fr/support/newsletter.html>

→ Social Networks:

