eLearning Africa

Leveraging AI and Verifiable Credentials for Dynamic TVET Systems in Africa and Beyond

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ICoBC International Council on Badges & Credentials

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Definitions related to this presentation

Generative AI

Generative AI is a subset of artificial intelligence that uses models to **create original content** such as text, images, videos, or other forms of data **in response to user prompts**.

Wikipedia

TVET

TVET stands for Technical and Vocational Education and Training, which encompasses education and training programs that equip individuals with **practical skills and knowledge for specific trades and professions**.

UNESCO-UNEVOC

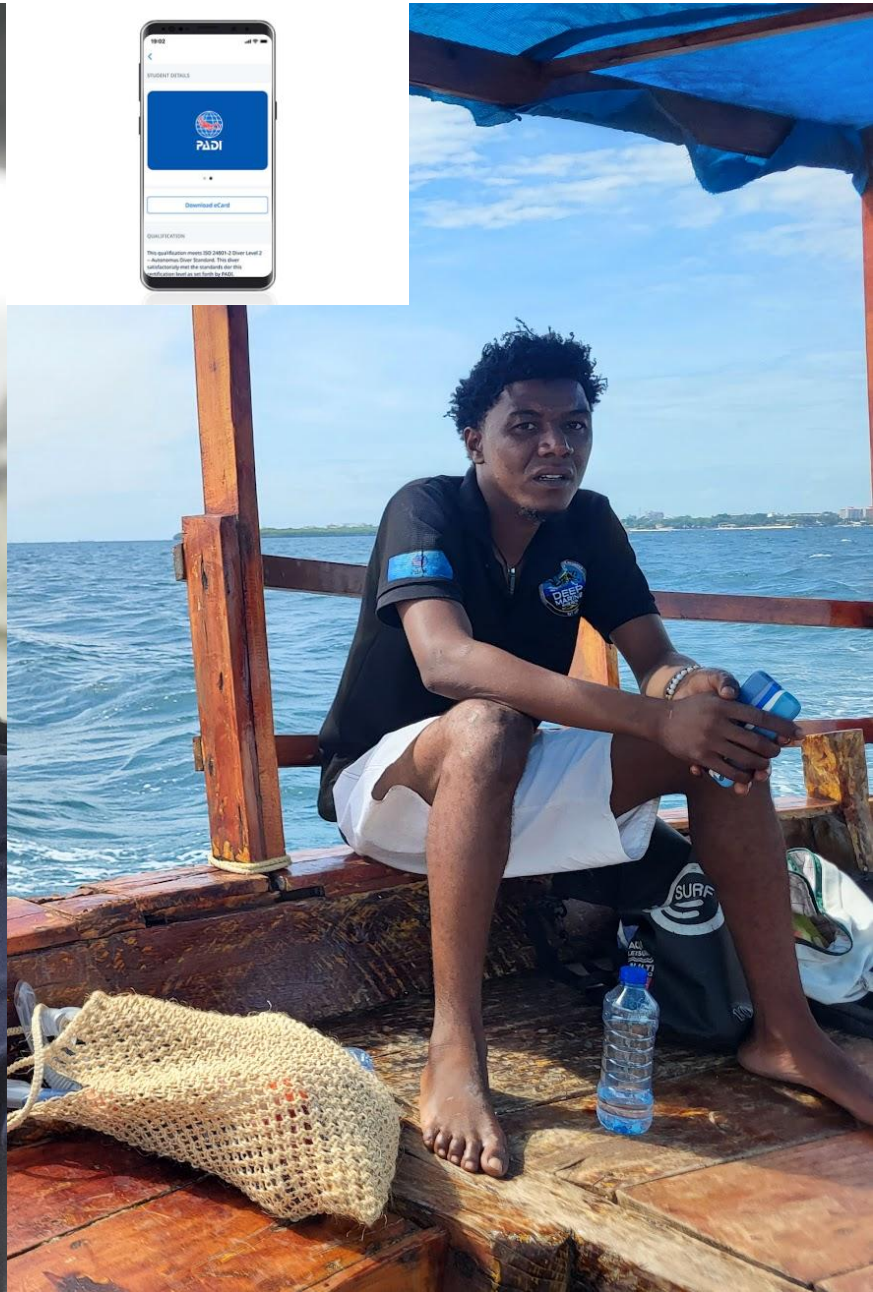
Microcredentials

"the certification of the **learning outcomes of short-term learning experiences**, which offer a flexible and targeted way to help people develop the knowledge, skills, and competences they need for their **personal and professional development**"

European Commission

Sample
JABATAN PEMBANGUNAN KEMAHIRAN
KEMENTERIAN SUMBER MANUSIA
SIJIL KEMAHIRAN MALAYSIA
PEMANDU PELANCONG
TARAF TIGA
Dengan ini adalah disahkan bahawa
telah mencapai tahap kompetensi yang ditetapkan dalam
Standard Kemahiran Pekerjaan Kebangsaan (SKPK)
PENILAIAN TELAH DILAKSANAKAN DI PUSAT BERTAULIAH
KOLEJ ANTARABANGSA GREENCITY
WILAYAH PERSEKUTUAN KUALA LUMPUR
Ketua Pengarah
Ketua Setiausaha
B 223054

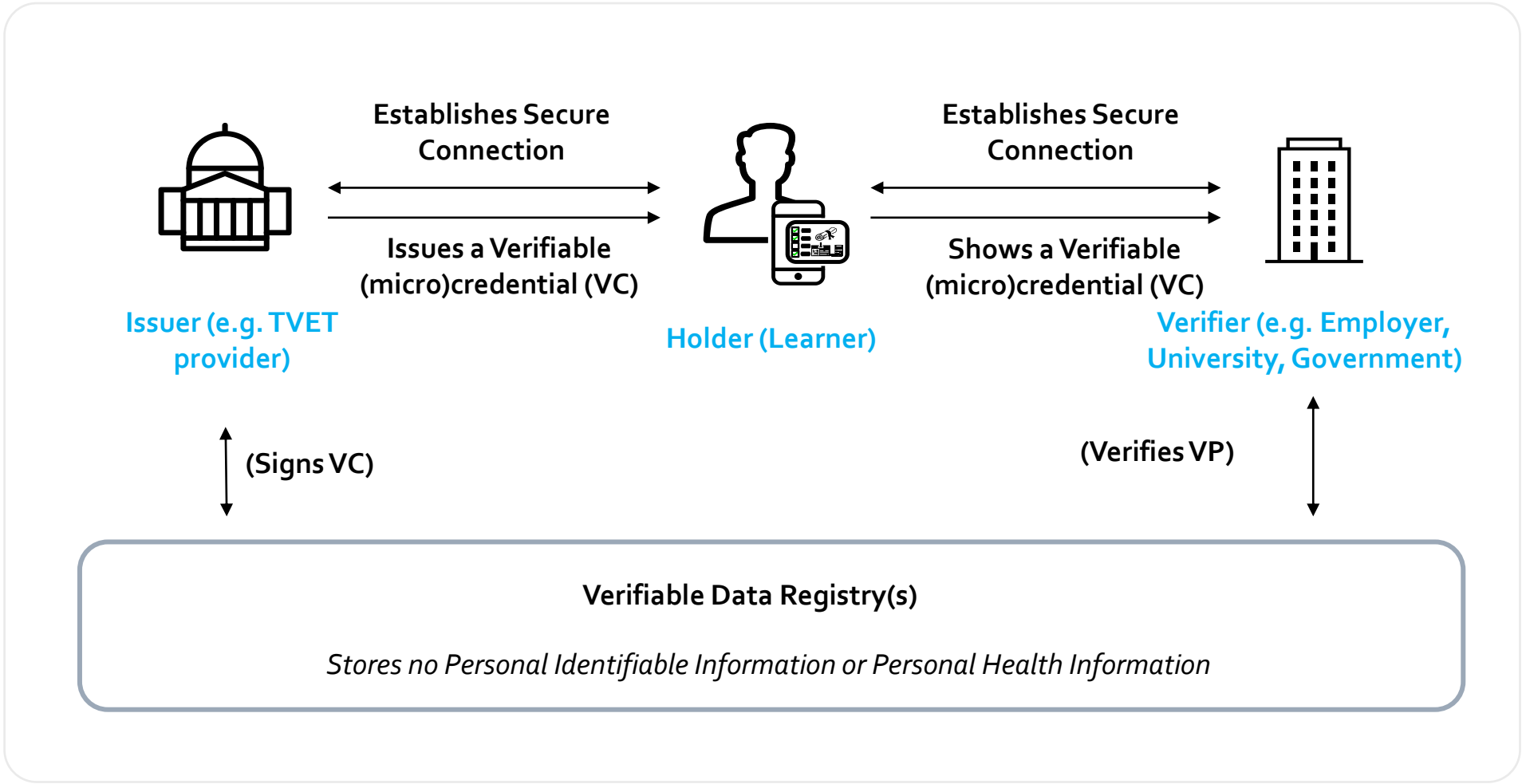
PADI
Download eCard



Differences between traditional certificates and microcredentials

Area	Traditional Certificates	Microcredentials
Format and Delivery	Physical, paper-based format	Digital, often earned through online platforms
Scope and Focus	Broad range of subjects, longer time commitment	Specific skills or competencies, shorter duration
Recognition and Portability	Well-recognized and widely accepted by employers and educational institutions	Emerging recognition, stackable for comprehensive skill sets

Understanding the main advantage of verifiable (micro)credentials



Short introduction into the technical terminology

Open Badges 3.0

Open Badges 3.0 is special because it aligns with theW3C Verifiable Credentials data model, enhancing security, transparency, and interoperability across different systems and platforms.

Verifiable Credentials Data Model v2.0

Digital Wallets

The Open Wallet initiative is crucial because it promotes global interoperability and security for digital credentials, ensuring that microcredentials are verifiable, portable, and trusted across different systems and borders

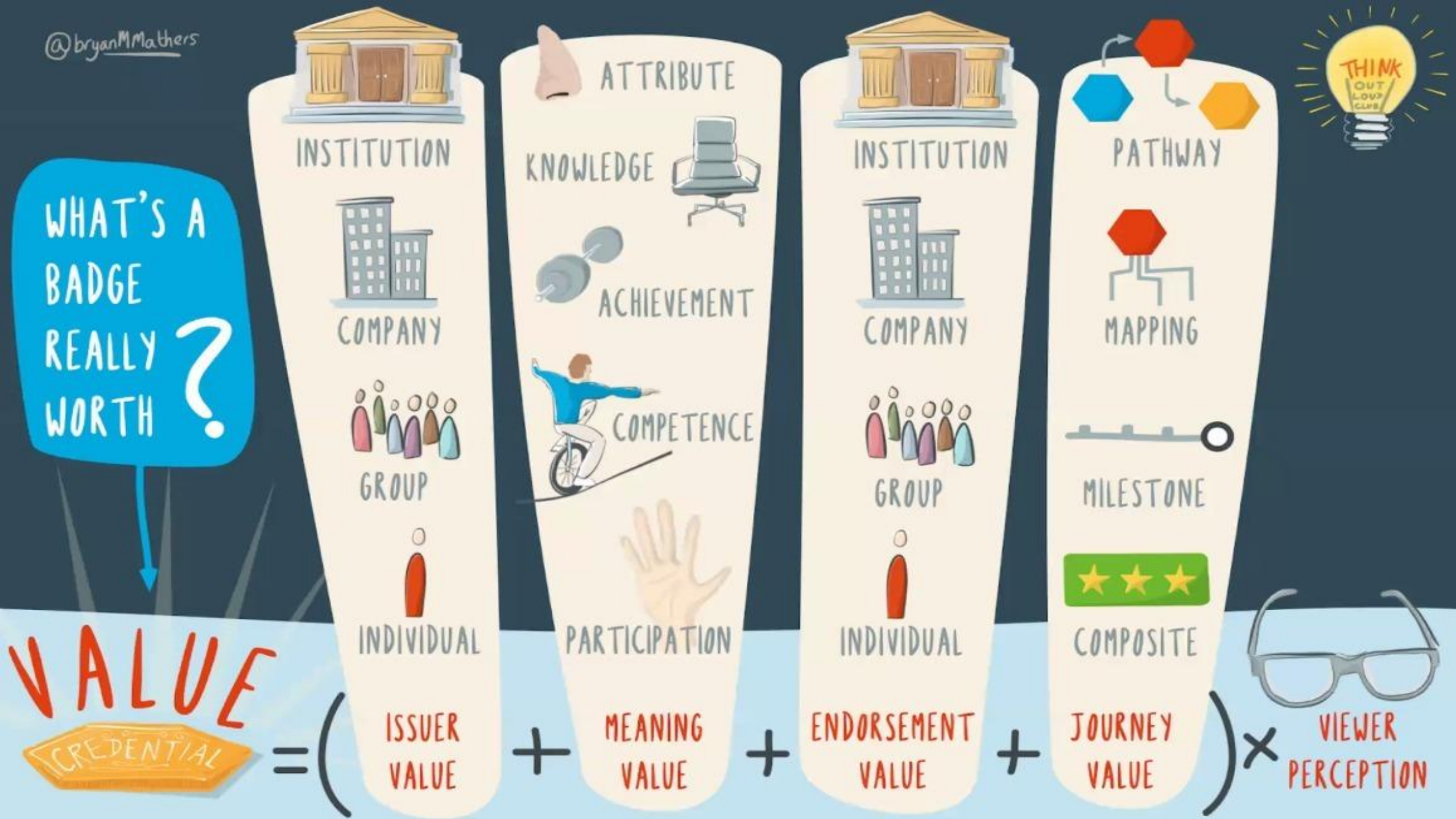
OpenWallet Foundation – Linux Foundation Project

Platforms & Taxonomies

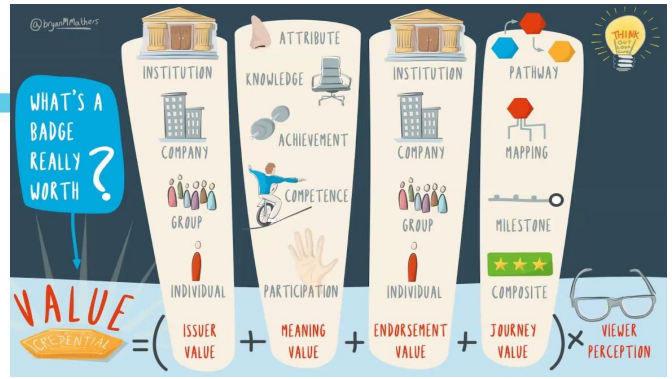
Platforms that issue and claim microcredentials, along with their underlying taxonomies, are essential for ensuring the credibility, interoperability, and transparency of these credentials, thereby enhancing their value and recognition in the job market.

→ Simone is going deeper here, I will just show some examples.

OH WOW!
MICROCREDENTIALS!
TECHNOLOGY
STANDARDS
COMMUNITY
IDEOLOGY
VISUAL THINKERY


@bryanMMathers
WHAT'S A BADGE REALLY WORTH ?
VALUE
CREDENTIAL
=(
INSTITUTION
COMPANY
GROUP
INDIVIDUAL
ISSUER VALUE
+
ATTRIBUTE
KNOWLEDGE
ACHIEVEMENT
COMPETENCE
PARTICIPATION
MEANING VALUE
+
INSTITUTION
COMPANY
GROUP
INDIVIDUAL
ENDORSEMENT VALUE
+
PATHWAY
MAPPING
MILESTONE
COMPOSITE
JOURNEY VALUE
)×
VIEWER PERCEPTION
THINK OUT LOUD CLUB

African Context & Policy Drivers



The ACQF Final Report highlights several key findings:

Diverse Educational Systems: Africa's educational landscape is highly diverse, with varying levels of development and implementation of national and regional qualifications frameworks.

Need for Harmonization: There is a significant need to harmonize qualifications to ensure they are recognized across borders, facilitating better mobility for students and workers.

Microcredentials: The study emphasizes the growing importance of microcredentials in addressing skills gaps and providing flexible learning pathways.

Capacity Building: Strengthening institutional capacities and developing robust quality assurance mechanisms are crucial for the successful implementation of the ACQF.

To advance the goals of the ACQF, the following areas require further attention:

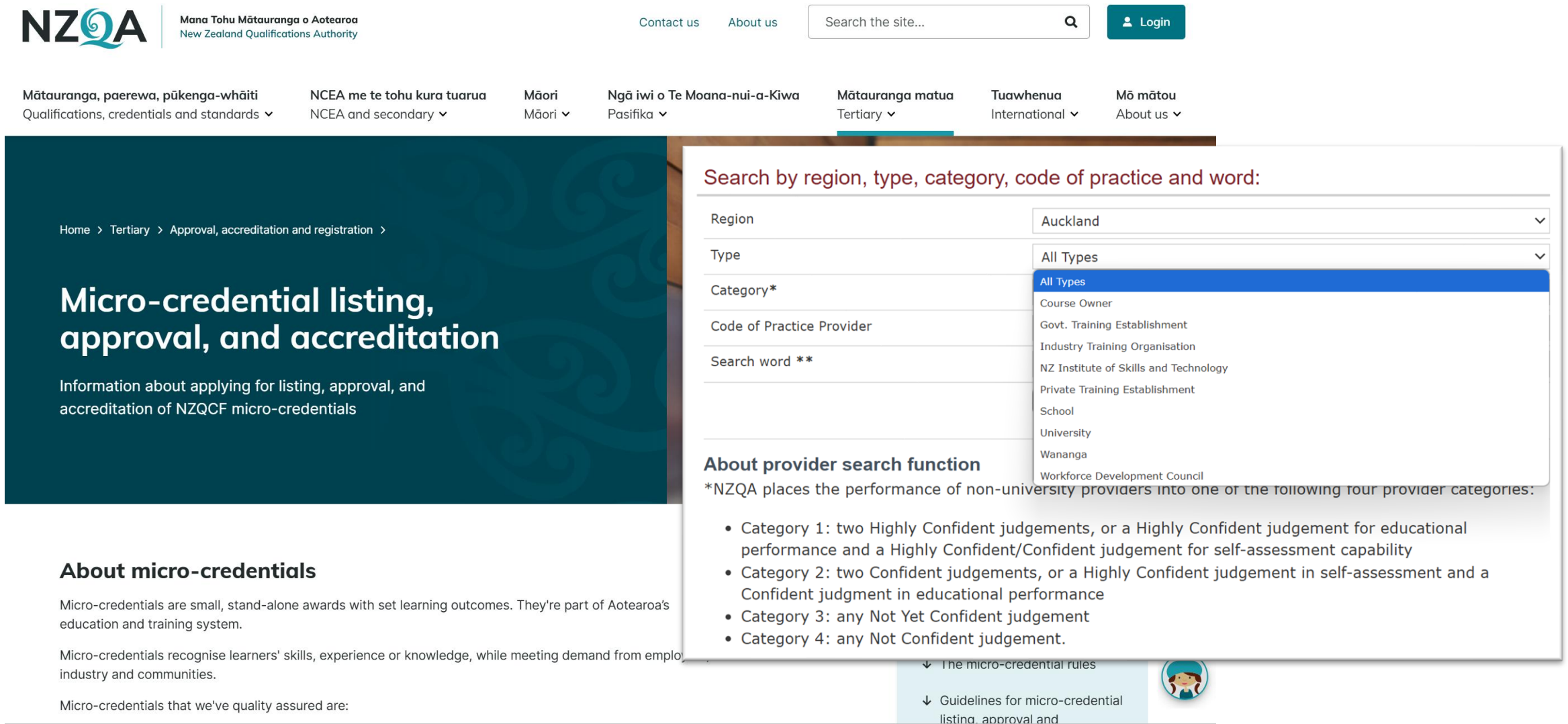
Policy Development: Continued development and alignment of policies at national and regional levels to support the ACQF framework.

Stakeholder Engagement: Increased collaboration with stakeholders, including governments, educational institutions, and industry partners, to ensure broad-based support and implementation.

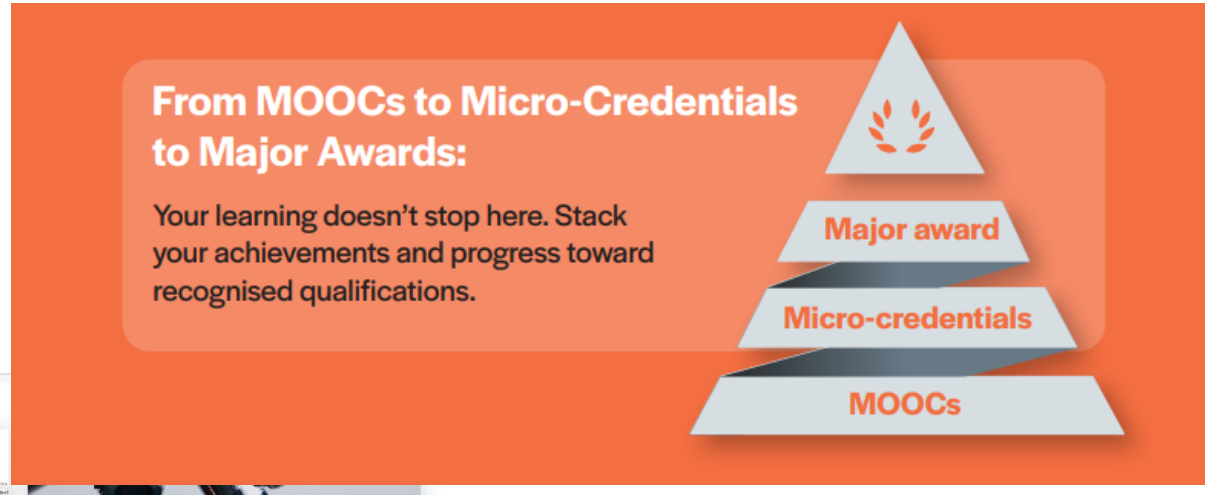
Capacity Building: Ongoing efforts to build the capacities of institutions and individuals involved in the qualifications framework.

Awareness and Advocacy: Raising awareness about the benefits of the ACQF and advocating for its adoption across the continent.

Example Education & Training: New Zealand



Example Higher Ed: ATU



ATU Ollscoil Teicneolaíochta an Atlantaigh Atlantic Technological University

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COURSE SEARCH

Search

TOPICS

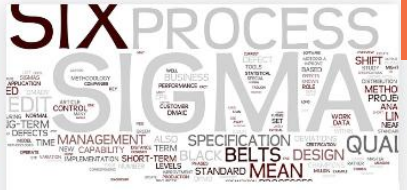
- Business
- Computing
- Construction
- Engineering
- Environmental
- Health and Safety
- Hospitality
- International
- Lean Six Sigma OpEx Academy
- Maths
- Outreach
- Preparing for university
- Quality
- Research
- Science
- Staff training

Workplace Safety, Health and Welfare Induction

The following course is about workplace safety, health and welfare. Unit 1 and 2 are compulsory, you and/or your employer can...

8 Weeks | 3 hrs per week.

View



Lean Sigma White Belt (Oct- Nov 2024)

Welcome to the ATU Sligo White Belt - Introduction to Lean Sigma Quality.
The first week of the White Belt course...

6 Weeks | 3 hrs per week.

View

Medical device manufacturing

This is an ATU Sligo course developed for campus students that has been opened to the public on a pilot basis. Once you register on...

0 Weeks | 0 hrs per week.

View

Introduction to lean construction (HE4.0)

The objective of the course is to introduce the learner to the lean concepts and how these concepts can help improve the productivity o...

Yellow_Belt

Yellow belt hosted by ATU Sligo.
This course is not open to the public.
This is a specialised in-company training...

C Programming 101

A free course by Seán Mullery introducing you to the basics of the C programming language.
You can enroll yourself on this course using...

Example: World Steel Association

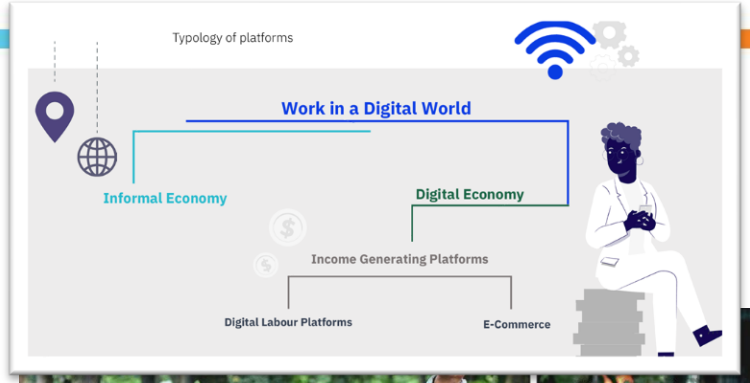
Occupation ➡ Functional Analysis ➡ Skills, Aptitude and knowledge ➡ Evidence and Learning Outcomes ➡ Learning Solution, Micro-credentials, among others

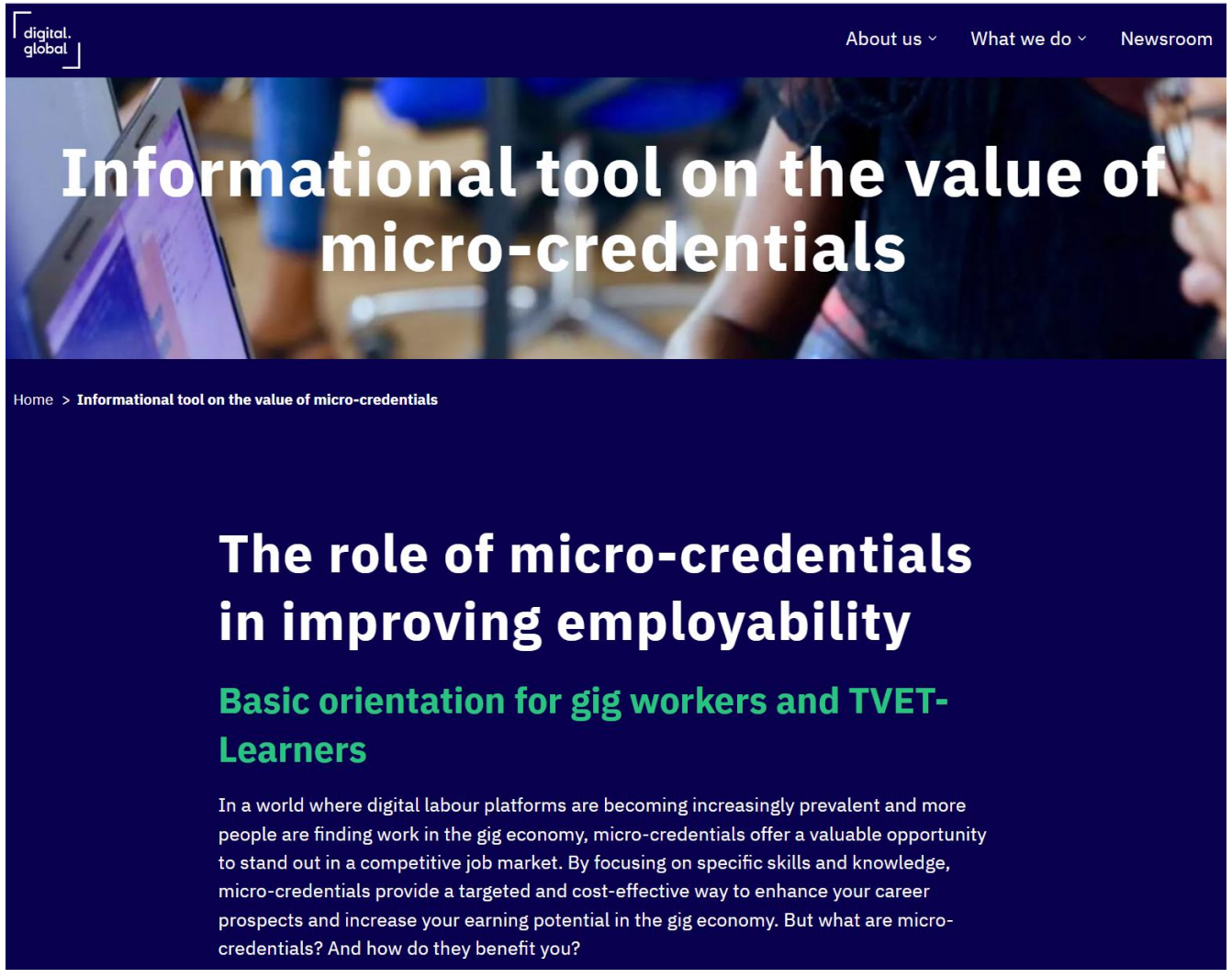
Skills, Aptitude and knowledge ⬇ Proficiency Levels (1-4)

Evidence and Learning Outcomes ⬇ European Qualification Framework (1-8)

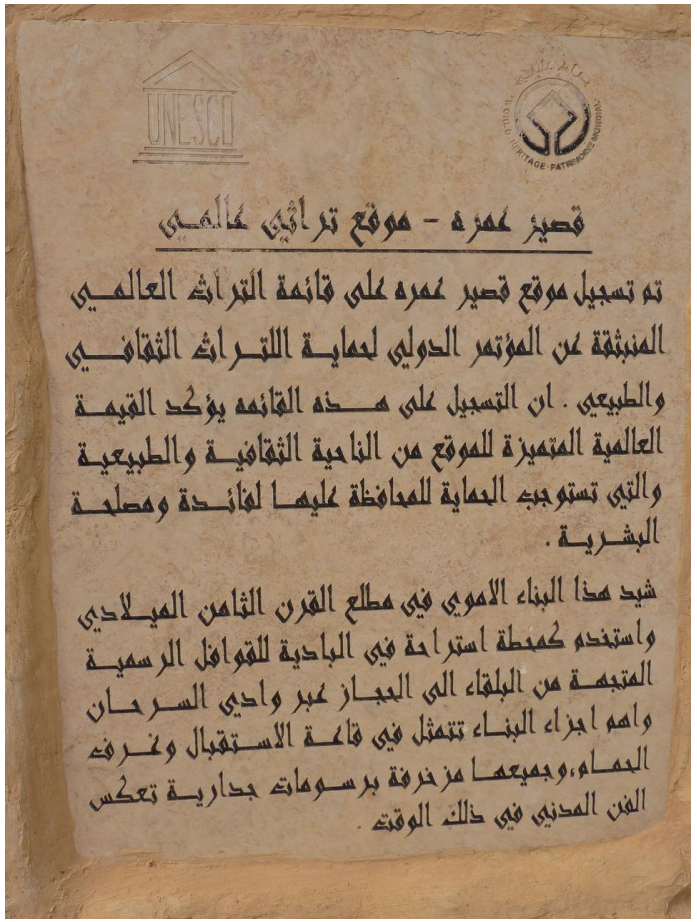
Skill Definition	Proficiency Level	Learning Outcomes	European Qualification Framework: Category	EQF Level	Learning solution Directory
Manage Budget Gather information and prepare budgets for the organization to support short- and long-term business plans. Engage colleagues and stakeholders in the process. Submit them to decision-makers and agree final budgets to be implemented. Monitoring budgetary performance, taking corrective actions when required. Propose revisions and provide reports to decision-makers, including identifying potential fraud is necessary.	1				
	2	Negotiate the proposed budgets with decision-makers to agree final budgets	Practical	5	
		Take corrective action when required to manage budgets	Practical	5	
	3	Produce budget proposals based on your evaluation of the information gathered	Cognitive	5	
		How to discuss, negotiate and confirm a budget with those with budgetary responsibility and the key factors that should be covered	Cognitive	5	
		The main causes of budget variances, how to identify them and the different types of corrective action.	Factual	2	
	4	Your organisation's key performance indicators (KPIs)	Factual	2	

Example: Gig Economy





AI-enhanced recognition of credentials and prior learning

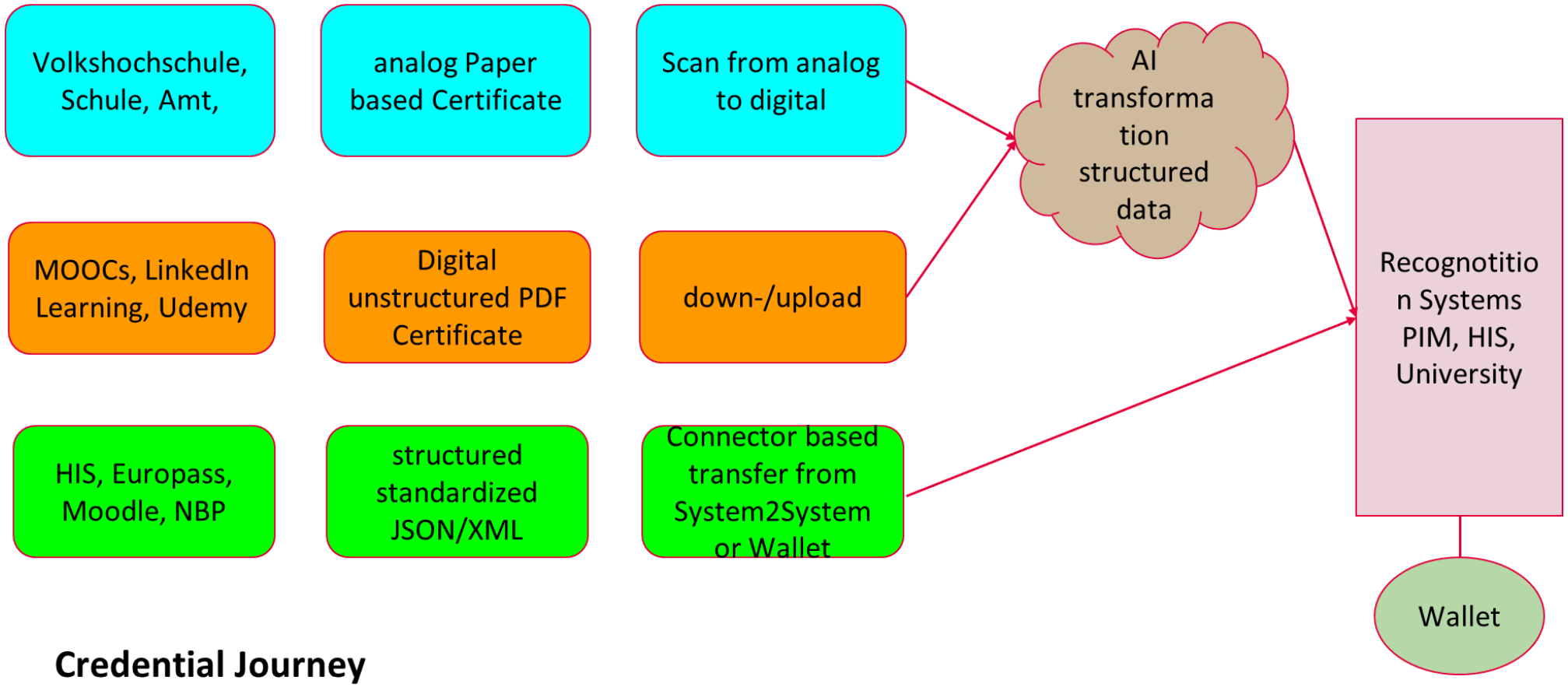


Modul: Machine Vision

Niveau	Bachelor	**Kürzel**	MaVis
Modulname englisch	Machine Vision		
Modulverantwortliche	Ralph Hänsel		
Fachbereich	Elektrotechnik und Informatik		
Studiengang	(Nicht festgelegt)		
Verpflichtungsgrad	(Nicht festgelegt)	**ECTS-Leistungspunkte**	5
Fachsemester	4	**Semesterwochenstunden**	4
Dauer in Semestern	1	**Arbeitsaufwand in Stunden**	150
Angebotshäufigkeit	SoSe	**Präsenzstunden**	60
Lehrsprache	Deutsch	**Selbststudiumsstunden**	90
Der folgende Abschnitt ist nur ausgefüllt, wenn es **genau eine** modulabschließende Prüfung gibt.			
Prüfungsleistung	Portfolio-Prüfung	**Prüfsprache**	Deutsch
Dauer PL in Minuten		**Bewertungssystem PL**	Drittelnoten

Lernergebnisse	Die Studierenden kennen folgende Bildverarbeitungsmethoden und können diese unter Verwendung gängiger Frameworks anwenden.
	• Bildgewinnung
	  • Modulationsübertragungsfunktion (Schärfe)
	  • Bestimmung der inneren und äußeren Kalibrierungsparameter
	• Objektdetektion & ML Verfahren zur Segmentierung
	  • Objektdetektion mit klassischen ML Verfahren (HOG+SVM)
	  • Objektdetektion mit Deep-Learning Verfahren (Convolutional Neuronal Networks)
	• Entfernungsschätzung
	  • Objekttracking (Kalman, Partikel Filter, Optischer Fluss)
	  • 3D Rekonstruktion
	  • Deep-Learning basierte Entfernungsschätzung		

Example Higher Ed: TH Lübeck's AI Applications



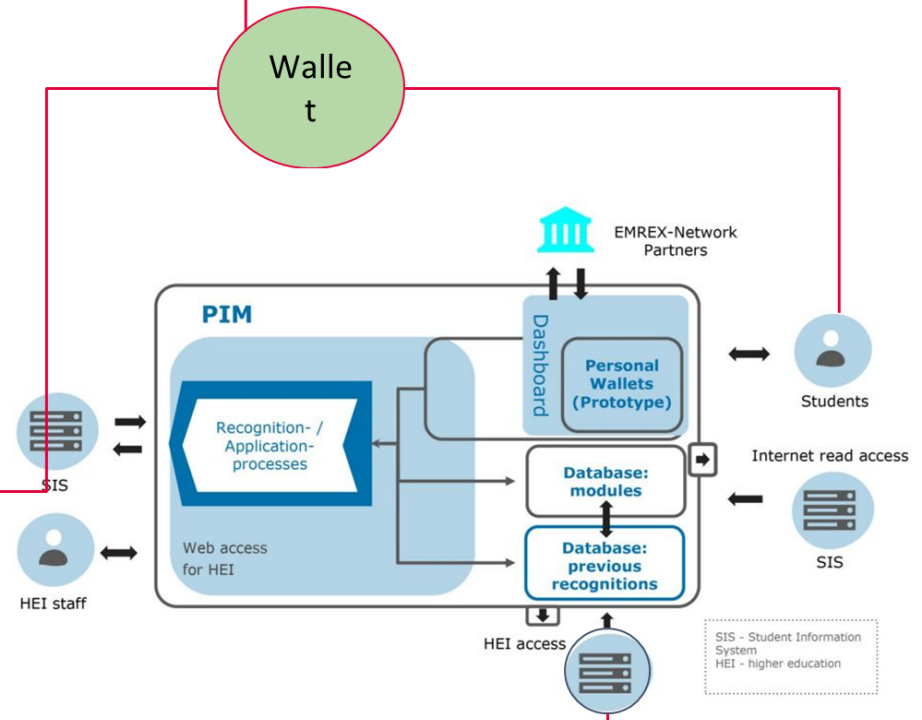
Credential Journey

Example Higher Ed: TH Lübeck's alignment

Papier

Microcredential ELM Version 2 Certificate

Transcript of Records + ELM V2 + ELMO & Hochschule Urkunde



Credential Journey

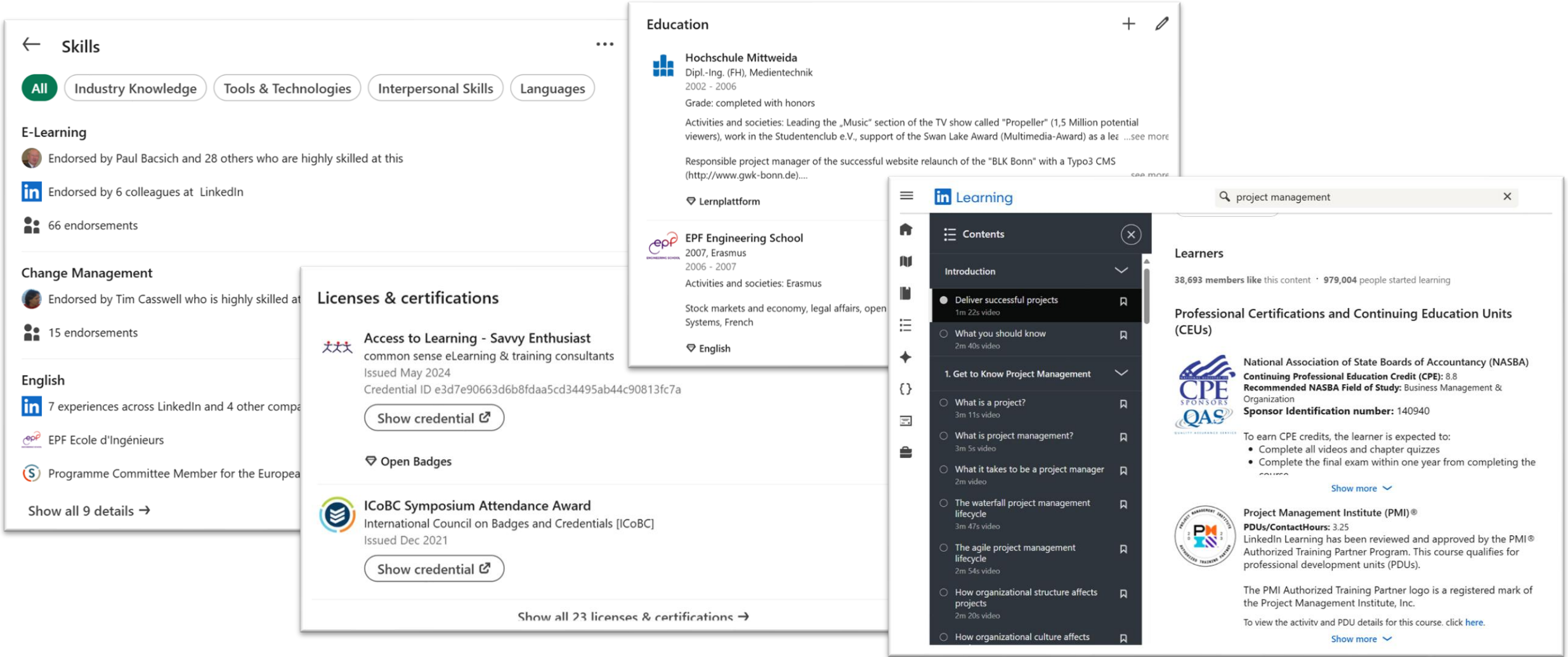
The role of eAssessment in TVET and microcredentials

1. Efficiency and Scalability: AI can process large volumes of assessments quickly and accurately (tamper and corruption proof), making it possible to issue microcredentials to a vast number of learners simultaneously. This is crucial for addressing the high demand for skilled workers in various sectors across Africa .

2. Personalized Learning and Assessment: AI can tailor assessments to individual learners' needs, providing personalized feedback and adaptive learning pathways – as well as translate the outcome to a given context. This ensures that each learner's unique skills and competencies are accurately recognized and validated .

3. Cost-Effectiveness: Combining eLearning (e.g. MOOCs) AI-enhanced eAssessment reduces the need for extensive human resources and infrastructure, lowering the overall costs associated with traditional learning and assessment methods. This makes it a sustainable option for widespread adoption in the African context.

Employability on the example of LinkedIn: informal, non-formal and formal data points

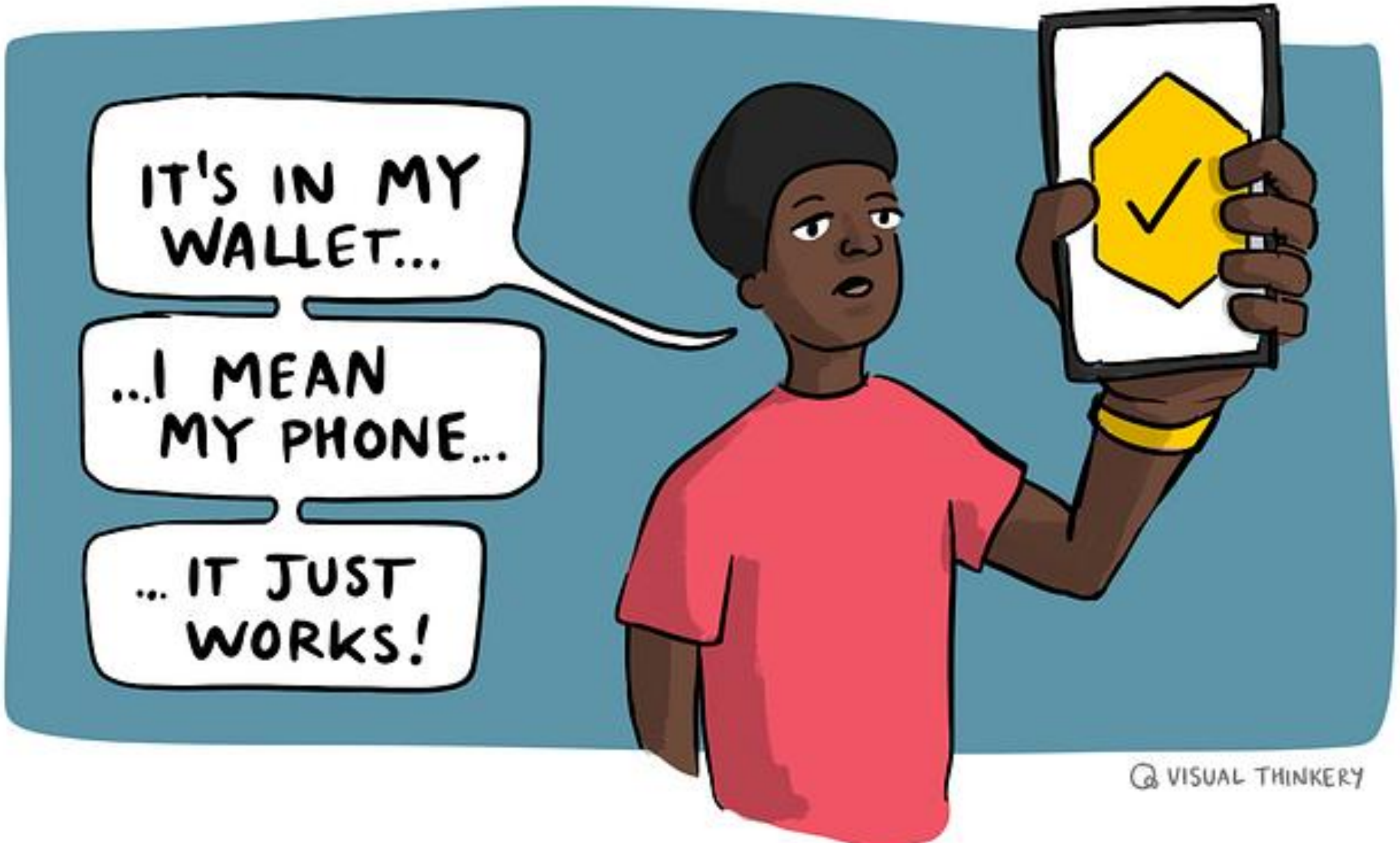


Summary

***Enhanced Recognition*: AI-enhanced interoperability** (e.g. via middleware (identity), connectors (profession and skill data) and eAssessment integration could help microcredentials to be more widely **understood, recognized and accepted** across different institutions and employers, facilitating the mobility of learners and workers.

***Transparency and Credibility*:** Given a (legal) framework (by associations or governments) and related accreditation, transparency and credibility in **verifying the authenticity and quality** of microcredentials can be ensured.

***Alignment with Industry Needs*:** Aligning and bundling microcredentials with **industry standards (tools etc.) and requirements**, ensuring that the skills and competencies acquired are relevant and valuable in the job market. Stackability of a variety of credentials can play a significant role here.


IT'S IN MY WALLET...
..I MEAN MY PHONE...
... IT JUST WORKS!
VISUAL THINKERY

Thank you!

Resources

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