



Blockchain Records ("Blockcerts"): Improving Employment & Economic Outcomes

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Learning Machine

www.learningmachine.com



THE PROBLEM



STANDARDS COMPLIANT



JOB APPS

85% MISLEAD

- EMPLOYERS CHOICE

FAKE DEGREES

~ 200K ANNUALLY

55K PH.D. PURCHASED

45K PH.D. EARNED

FRAUD DAMAGES

\$1.48B USD

/ IMPOSTERS /

- FTC

5M

/

SINGLE POINT OF FAILURE

/

LACK OF OWNERSHIP



OPPORTUNITY COST. ECONOMIC COST.

\$9.3 TRILLION

Property Unclaimed Legally

1 BILLION

Lack Legal Identity

2 BILLION

People Unbanked

ECONOMIC GROWTH HINGES ON EASE OF RECORDS VERIFICATION



BUSINESS LICENSE

 Verified



A SKILLS CERTIFICATE



A PASSPORT



A DRIVER'S LICENSE



A SOCIAL SECURITY CARD



BIRTH CERTIFICATE



DEATH CERTIFICATE

BLOCKCHAIN-POWERED ECONOMIC GOALS



1. EASE OF GETTING A JOB



2. EASE OF DOING BUSINESS

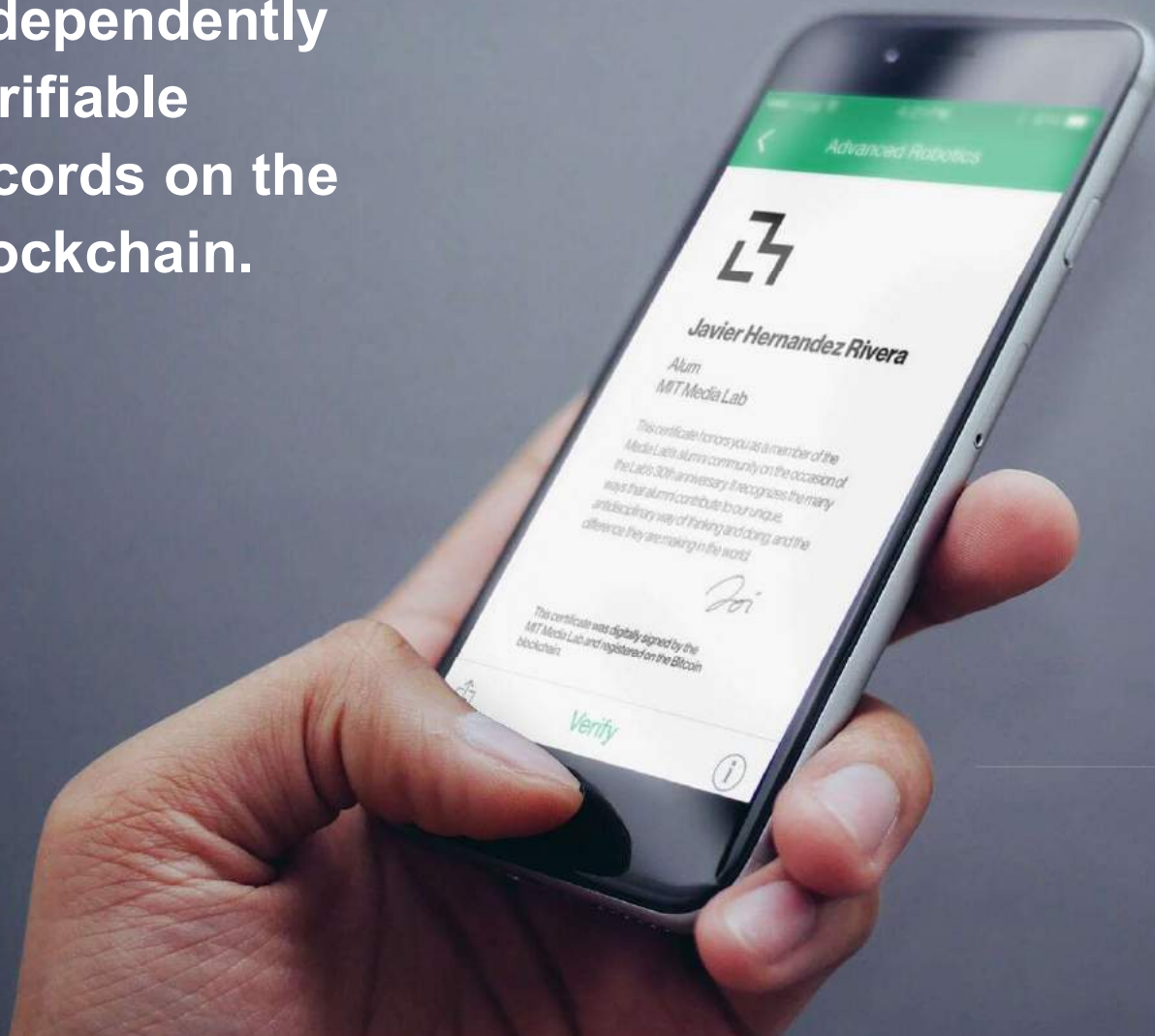


THE SOLUTION



STANDARDS COMPLIANT

Independently
verifiable
records on the
blockchain.



Step 1 of 5
Computing SHA256 digest of local certificate [DONE]

Step 2 of 5
Fetching hash in OP_RETURN field [DONE]

Step 3 of 5
Comparing local and blockchain hashes [PASS]

Step 4 of 5
Checking MIT signature [PASS]

Step 5 of 5
Checking not revoked by issuer [PASS]


 VERIFIED

Public Key
1HYpitzbwR83M3Smw6Gws5XeQzEw0JAEes

Blockchain Address
4bf64ff1517554dac3496e9da0a28ca9ae492682b0898e384ea17e7f90ee1295

THE BLOCKCHAIN IS A TRUST TECHNOLOGY

Blockcerts Universal Verifier




Completion of Training
Dimi Arhontidis

[View Record](#) >

Issued Feb 8, 2018 by Learning Machine

- ✓ **Format validation**
[4 Items](#) ^
- ✓ **Hash comparison**
[3 Items](#) ^
- ✓ **Status check**
[3 Items](#) ^
- ✓ **Verified**
[View Blockchain Transaction](#)

[Verify another record](#)

 BLOCKCERTS

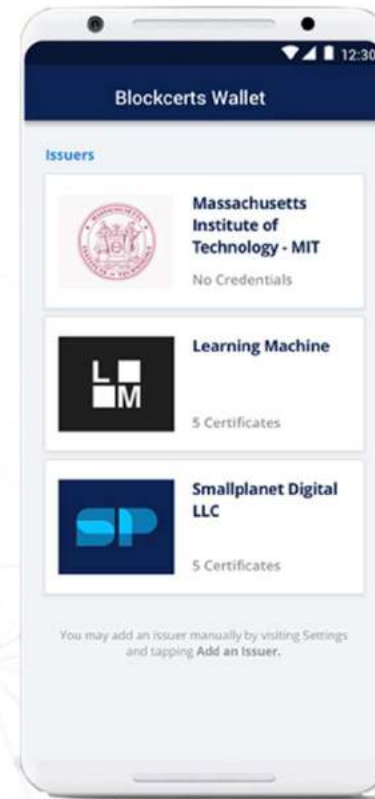
BLOCKCERTS: AN OPEN STANDARD THAT WRITES TO ANY BLOCKCHAIN

Blockcerts Background

Incubated with MIT in 2016 and remains aligned with the W3C and other standards bodies for open source development.

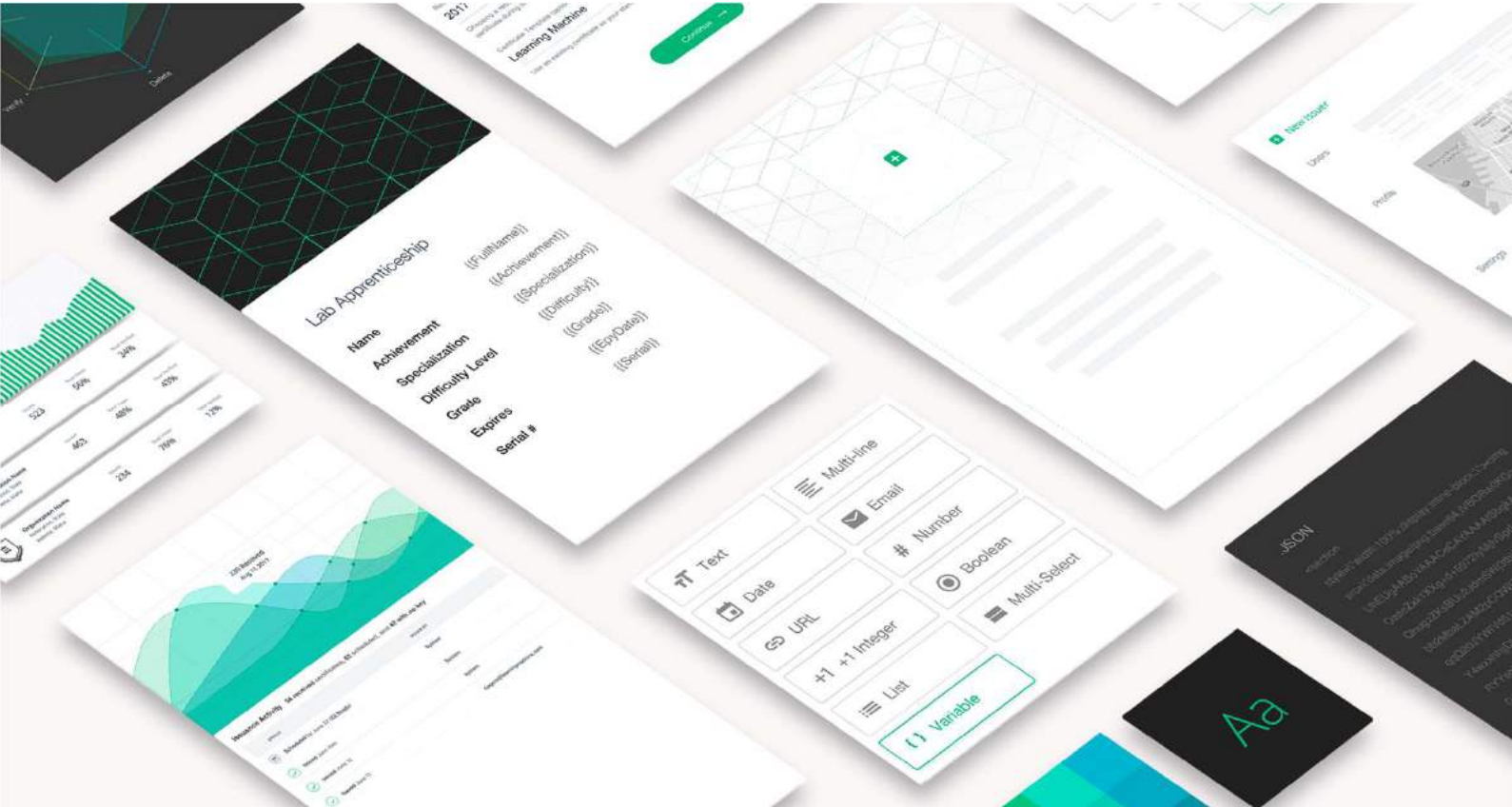
Value

- Any Issuer aligned with Blockcerts can contribute
- LLR grows organically for recipients over time
- Openness provides interoperability + longevity
- Avoids friction of proprietary solutions



THE LEARNING MACHINE ISSUING SYSTEM

Create, issue, and manage digital records.



HOW THEY WORK TOGETHER

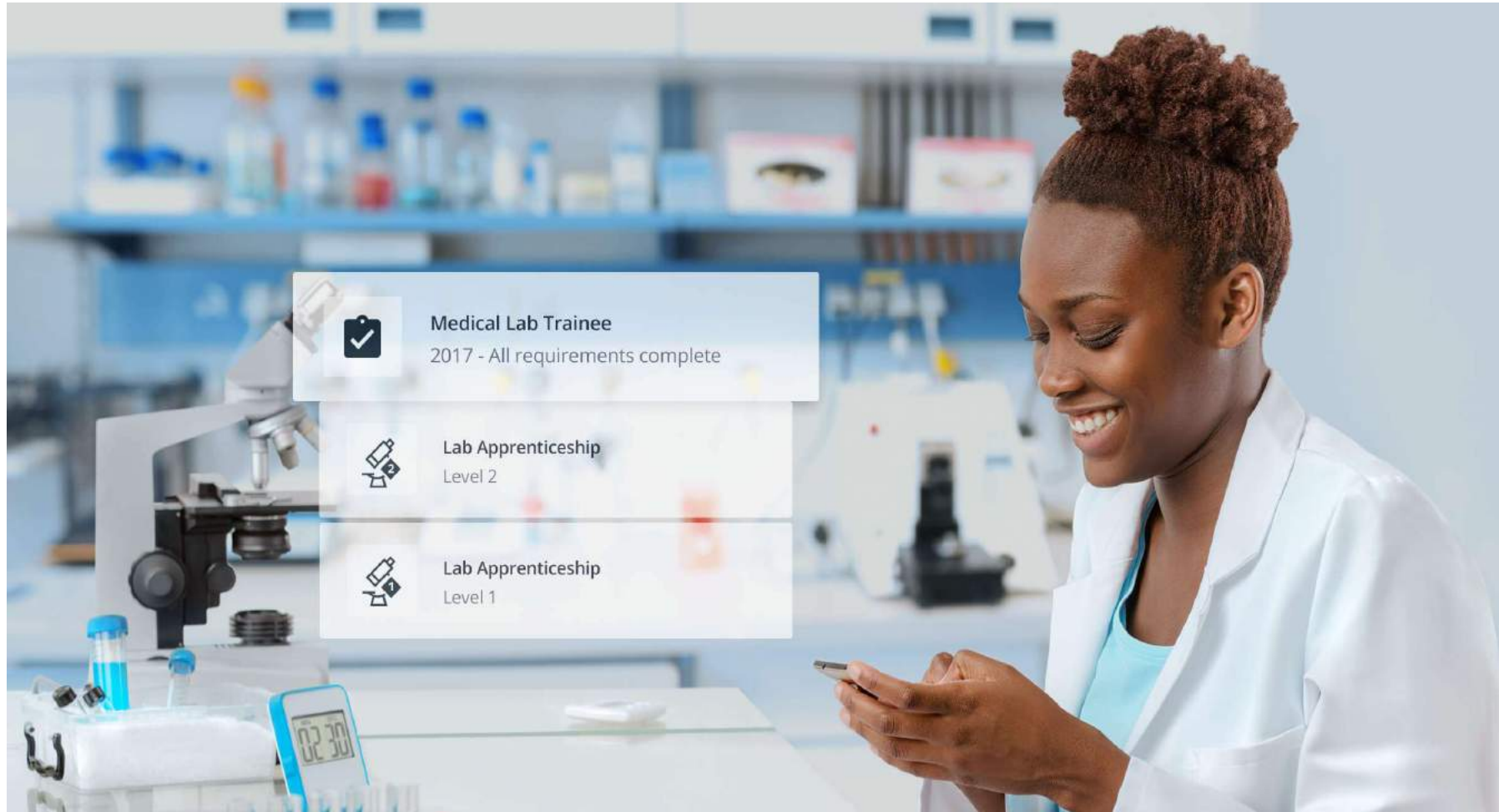


PAYOFF: INSTANT VERIFICATION FOR A SKILLED WORKFORCE

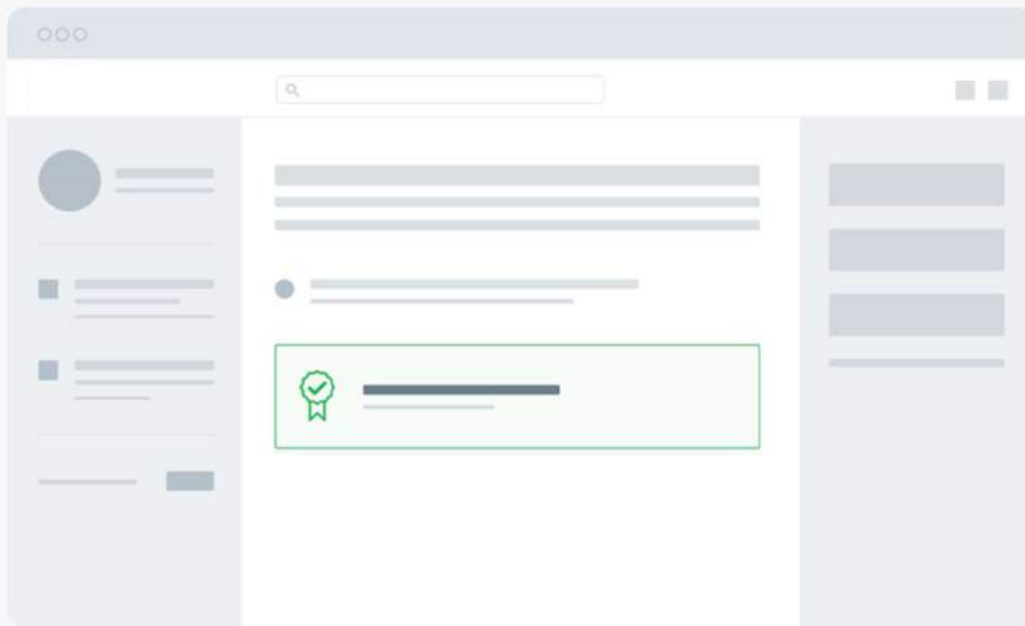
Verify **BLOCKCERTS**

- Format validation - PASS**
Hide ▾
 - Validating receipt
 - SHA256 digest of local record
 - Fetching Bitcoin Transaction
- Hash comparison - PASS**
Hide ▾
 - Comparing local and merkle hashes
- Status check - PASS**
Hide ▾
 - Issuer signature check
 - Revoked status check
 - Expired status check

STACK CREDENTIALS TO BUILD A PRIVATE, LIFELONG LEARNING RECORD



COMPLETING THE ECOSYSTEM: INTEGRATION WITH EMPLOYER SYSTEMS



Instant Verification

Blockcerts verification and screening can easily be built into already-existing Applicant Tracking Systems, so HR departments can automatically verify whether applicants have the skills they claim to have.

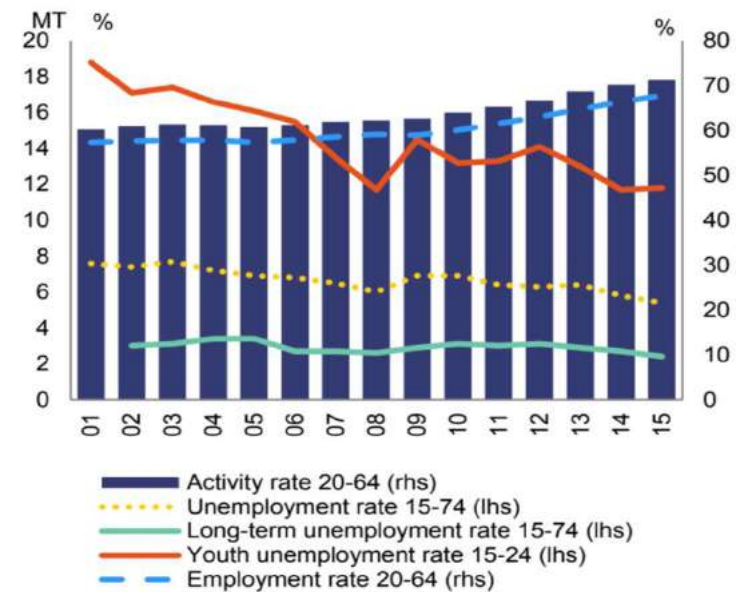
CASE STUDY: THE REPUBLIC OF MALTA



MALTA ECONOMIC OUTLOOK

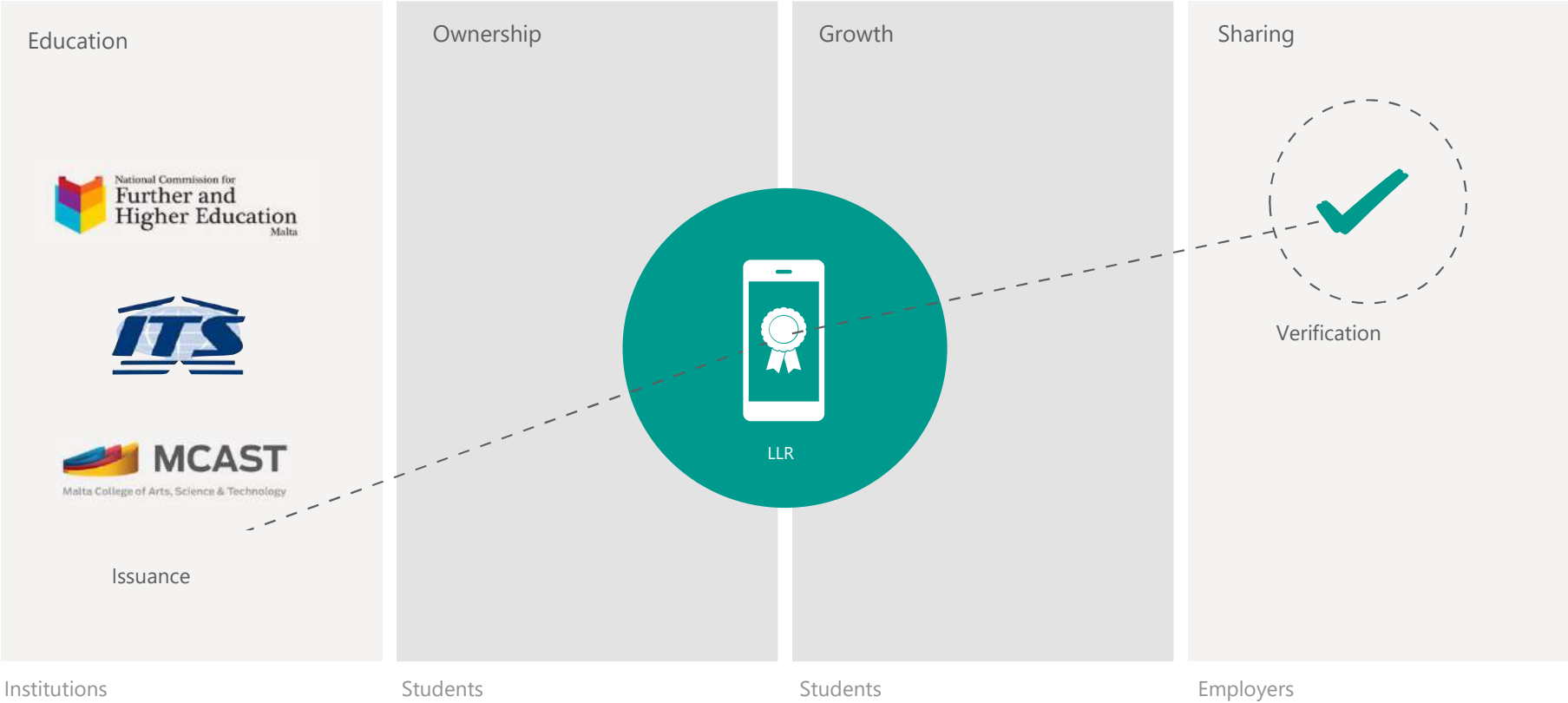
- **The skills supply does not yet adequately match labour market needs.** Access and participation in lifelong learning have generally improved, but labour market participation by the low-skilled remains low. While educational attainment is increasing, the rate of early school leaving remains high and basic skills attainment among young people is still weak. In response to tightness in the labour market, the reliance on foreign workers is increasing. This points to labour shortages across a broad spectrum of sectors and skills, possibly hindering investment.

Graph 1.4: Employment developments



Source: European Commission

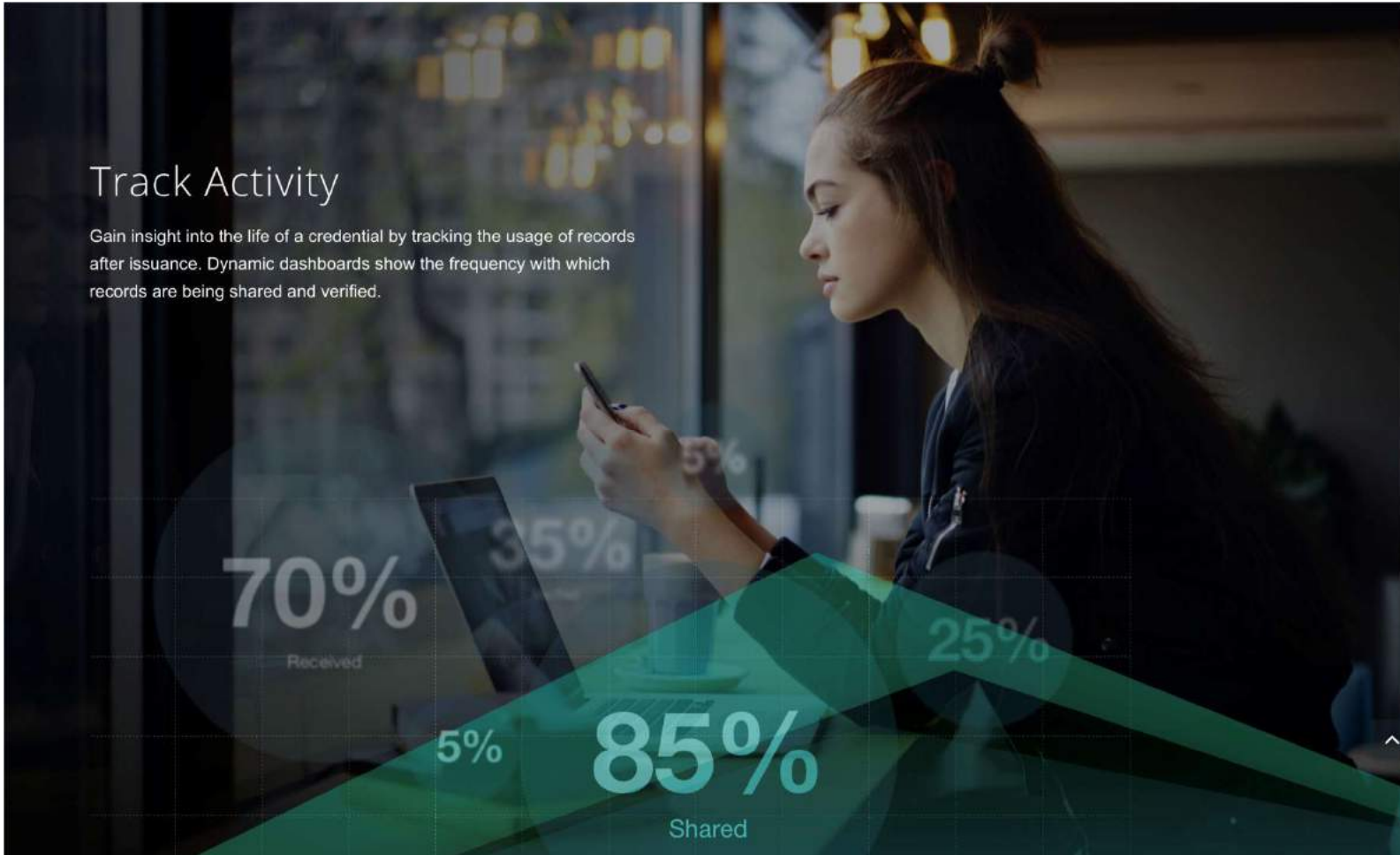
MALTA ECOSYSTEM



BLOCKCERTS GENERATE ANALYTICS FOR LEADERSHIP.

Track Activity

Gain insight into the life of a credential by tracking the usage of records after issuance. Dynamic dashboards show the frequency with which records are being shared and verified.



“Maltese businesses will find that hiring workers with the right qualifications has gotten much easier. This is a win/win for Malta, whose skilled workforce is among the primary drivers of its economic success.”



Evarist Bartolo
Minister for Education and Employment

CASE STUDY: THE COMMONWEALTH OF THE BAHAMAS



BAHAMAS EMPLOYMENT CHALLENGES

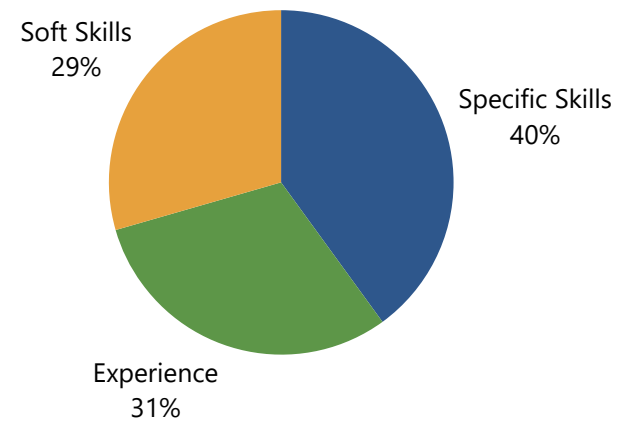
2015 Unemployment Rates

15% Total

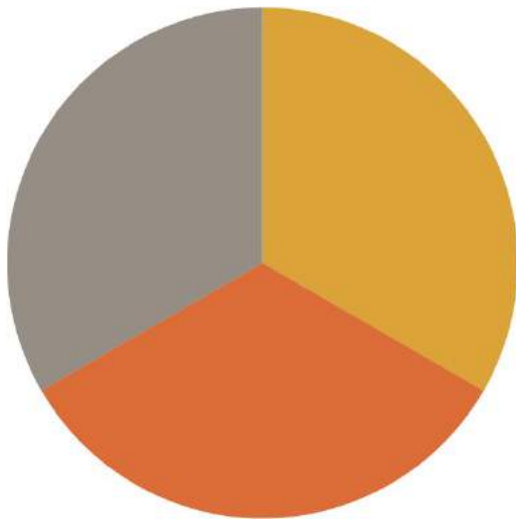
30% Ages 15-24*

*Rate has doubled since 2001

Reasons Provided by Employers



NATIONAL APPRENTICESHIP PROGRAMME



■ Maritime ■ IT/Telecom ■ Medical

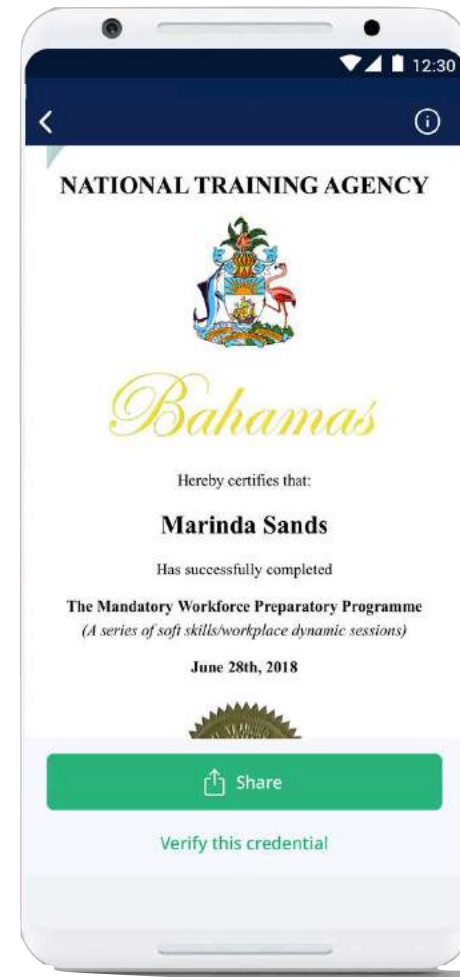
80% on the job
20% off the job

Solution

Integral part of Skills for Current and Future Jobs Programme. Important to connect digital credentials with employer demand and feed Labor Information System with analytics.

2018: NATIONAL TRAINING AGENCY BLOCKCERTS PILOT

- Setup of first Federated Issuing System (FIS) on Bahamian private web infrastructure.
- Setup of the National Training Agency's Issuing Workspace.
- Identify first issuing cohort.
- In-person training of NTA staff.
- Test issuing.
- First live issuance to the blockchain (July 2018).

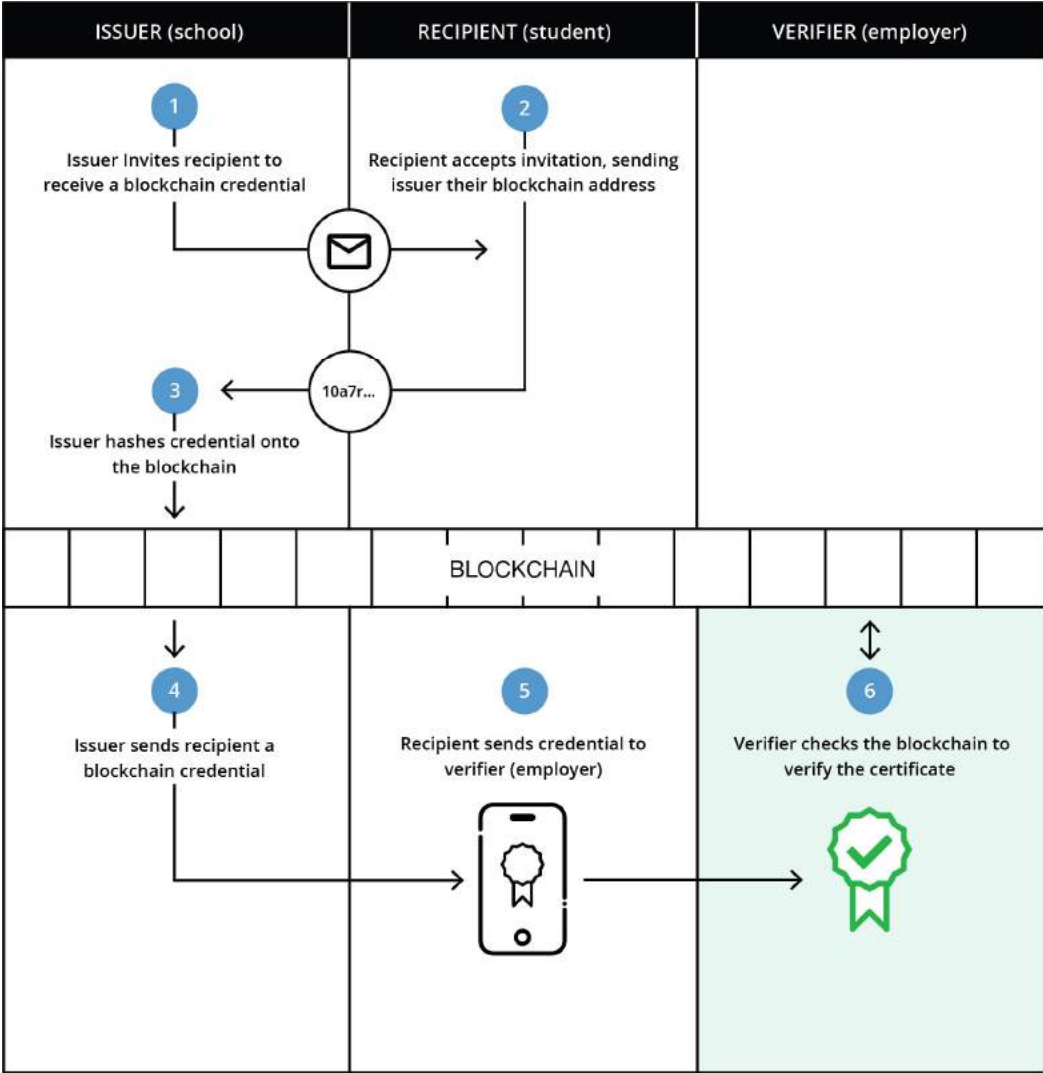




APPENDIX: HOW BLOCKCERTS WORKS



STANDARDS COMPLIANT

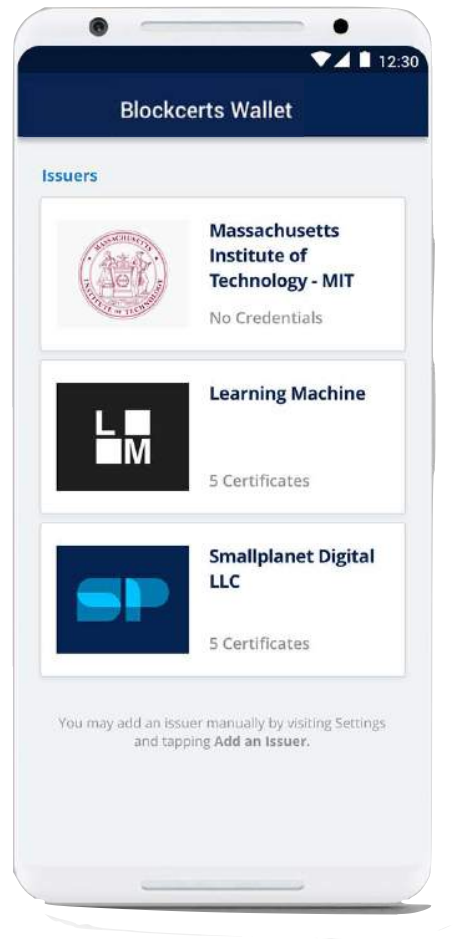


1

ISSUER INVITES RECIPIENTS.

The screenshot shows a web interface for Blockcerts. At the top, there is a dark blue header with the 'BLOCKCERTS' logo on the left and 'Learning Machine' with a notification bell and user icon on the right. Below the header, a sidebar on the left contains a 'Recipients' link and a table with the following names: Adan Gutierrez, Chris Jagers, Dan Hughes, Dimi Arhontidis, Kim Duffy, and Natalie Smolenski. The main content area is a modal window titled 'Add Learning Machine to your Blockcerts Wallet'. It features a blue icon of a classical building. The modal contains two numbered steps: Step 1: 'Download the mobile app. Use Blockcerts Wallet to receive, share, and independently verify credentials from your issuers.' with buttons for 'Download on the App Store' and 'GET IT ON Google Play'. Step 2: 'Open this email on your phone and tap the link below to add the issuer to your wallet.' with a green button labeled 'One-time Use: Add Issuer to Wallet'. Below the button, it says 'An issuer can only be added through this link one time.' At the bottom of the modal, there is a dark blue footer with the text 'Copyright © 2018 Blockcerts Wallet. All rights reserved.' and a set of navigation arrows.

2 RECIPIENT ACCEPTS INVITATION AND ADDS ISSUER.



3 ISSUER HASHES CREDENTIAL TO BLOCKCHAIN.

← Issue Certificate

Layout Metadata

Name
Certified Security Expert - Test Issuance

Recipient List
South Ural State University- 0% recipients ready

Expires
Pick a date

Expiration date
2018-12-31


Time
12:00am

Note: All times are UTC

EMAIL MESSAGE TO RECIPIENTS

Recipient Email Message
Recipient Certificate Ready Email

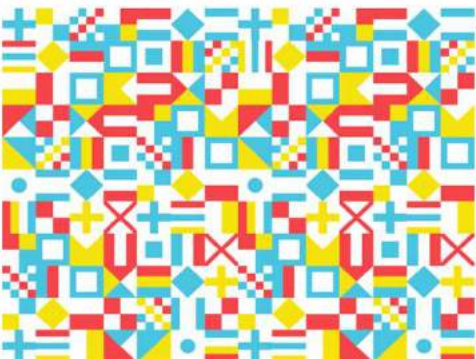
Continue Cancel



Brandon Sanders, PhD.



CERTIFIED SECURITY EXPERT & SYSTEM DESIGNER

Software developer with 15 years of experience. Broad foundation in algorithms, mathematics, distributed systems, and scalability. Certification renewed by Federation of CompSci based in Washington D.C on December 2017.





4

ISSUER SENDS CREDENTIAL TO RECIPIENT.

Learning Machine  Inbox - Learning Machine Yesterday at 12:25 PM 

Your Digital Certificate is Ready.
To: Dimi Arhontidis


 **BLOCKCERTS**





Learning Machine has issued a credential to you

Please download the attached JSON file and save it in a secure place. To view and share your credential, add it to your mobile device by tapping the following link:

[Import My Credential](#)



Blockcerts Wallet
Use Blockcerts Wallet to receive, share, and independently verify credentials from your issuers.

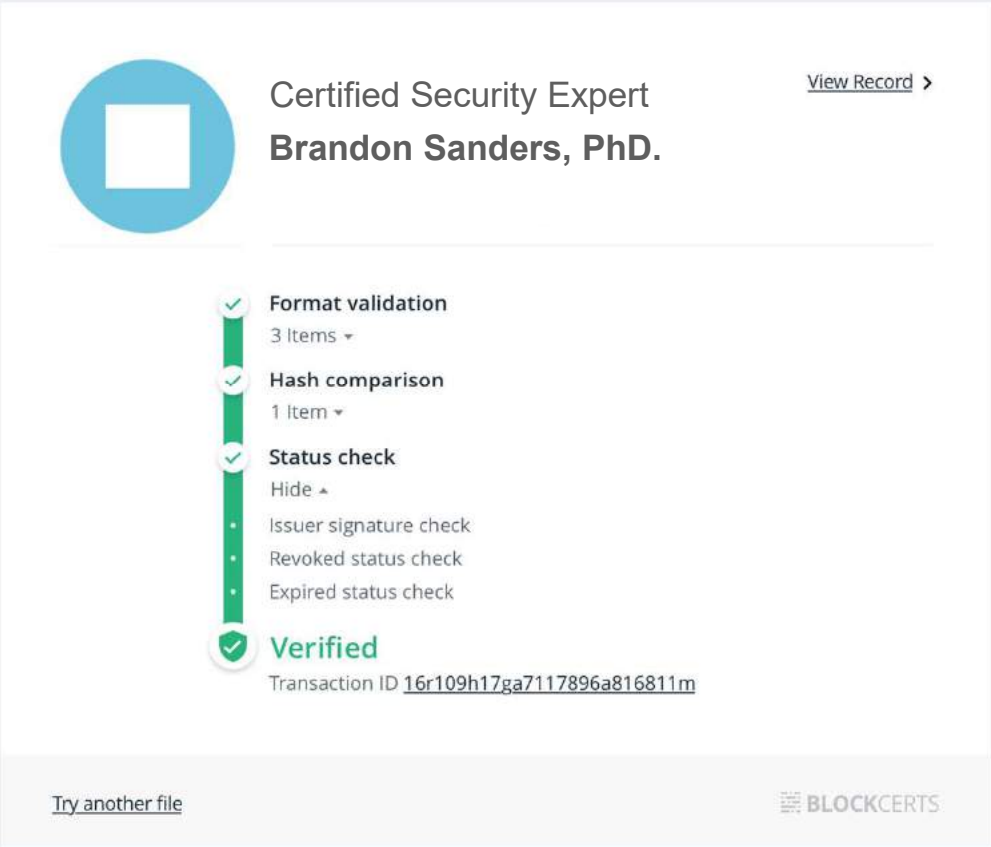
 

5 RECIPIENT SHARES CREDENTIAL WITH VERIFIER.



6

VERIFIER CHECKS THE BLOCKCHAIN FOR AUTHENTICITY.




The screenshot displays a digital certificate verification interface. At the top left is a blue circular profile icon containing a white square. To its right, the text reads "Certified Security Expert" and "Brandon Sanders, PhD." in bold. A "View Record >" link is positioned to the right of the name. Below this, a vertical green bar with white checkmarks indicates the verification steps: "Format validation" (3 items), "Hash comparison" (1 item), and "Status check" (Hide). Under "Status check", three sub-items are listed: "Issuer signature check", "Revoked status check", and "Expired status check". At the bottom of the bar is a larger green checkmark icon next to the word "Verified" in bold, followed by the text "Transaction ID [16r109h17ga7117896a816811m](#)". At the bottom left of the interface is a link "Try another file", and at the bottom right is the "BLOCKCERTS" logo.

[View Record >](#)

Certified Security Expert
Brandon Sanders, PhD.

- ✓ **Format validation**
3 Items ▾
- ✓ **Hash comparison**
1 Item ▾
- ✓ **Status check**
Hide ▲
 - Issuer signature check
 - Revoked status check
 - Expired status check
- ✓ **Verified**
Transaction ID [16r109h17ga7117896a816811m](#)

[Try another file](#)

 **BLOCKCERTS**

ANATOMY OF A BLOCKCERT

PRESENTATION

CONTENT

RECEIPT



PUBLIC KEY (ID)
a23b1642bhJ89



ONE WAY HASH
e3b2e95739gxRI9aa17s2ccF4

ON BLOCKCHAIN
& RECIPIENT JSON FILE



LEARNING
MACHINE
CHINA