



ODEM In-depth Review for Colleges and Universities



Table of contents

About ODEM	3
Our Solution for Colleges and Universities	3
Digital Certificates of Verification	4
Issuer Verification	4
Skillprint Encoding	4
Revenue Sharing (Dividend Pay-out)	4
Selecting Students and Alumni Credentials	5
Certificate Issuance - How It Works	5
Issuing Digital Credentials	5
Saving and Accessing Certificates	6
Coding Digital Credentials	7
ODEM and ESCO: How ODEM is Leveraging Skills Competencies and Occupations for Meaningful Education and Employment	8
Uploading your Records though the ODEM EO (Educational Organizational) Portal	8
Institutions Onboarding and Use	8
Case Study: ODEM In Use	9
Southern Alberta Institute of Technology (SAIT)	9
Goal	9
Approach	9
Results	10
Blockchain Increases Academic Record Security	10
Blockchain Makes Educational Records More Accessible	10
SAIT Pilot Program	10
SAIT Spring 2019 Program	11
About SAIT	11
Looking Towards the Future	11
ODEM's Open Accreditation Exchange	11
Custom Designed Education	12
Changing the Face of High School Recruitment	12
Appendix	13
Additional Resources	13
Recognition and Mentions	13

About ODEM

The way that we learn, work, recruit and train has evolved dramatically in recent years. But, the underlying infrastructure that supports this ecosystem has not.

At ODEM, we believe that education and employment should be universally trusted, affordable, accessible, verifiable and transferable. Through Blockchain-based authentication of education records, ODEM allows K12 systems, higher education, and industry to become part of an education supply chain.

The ODEM Trust Network was developed to directly connect students with educators where students can design and crowdsource their own education with the skills needed to compete in today's global workforce.

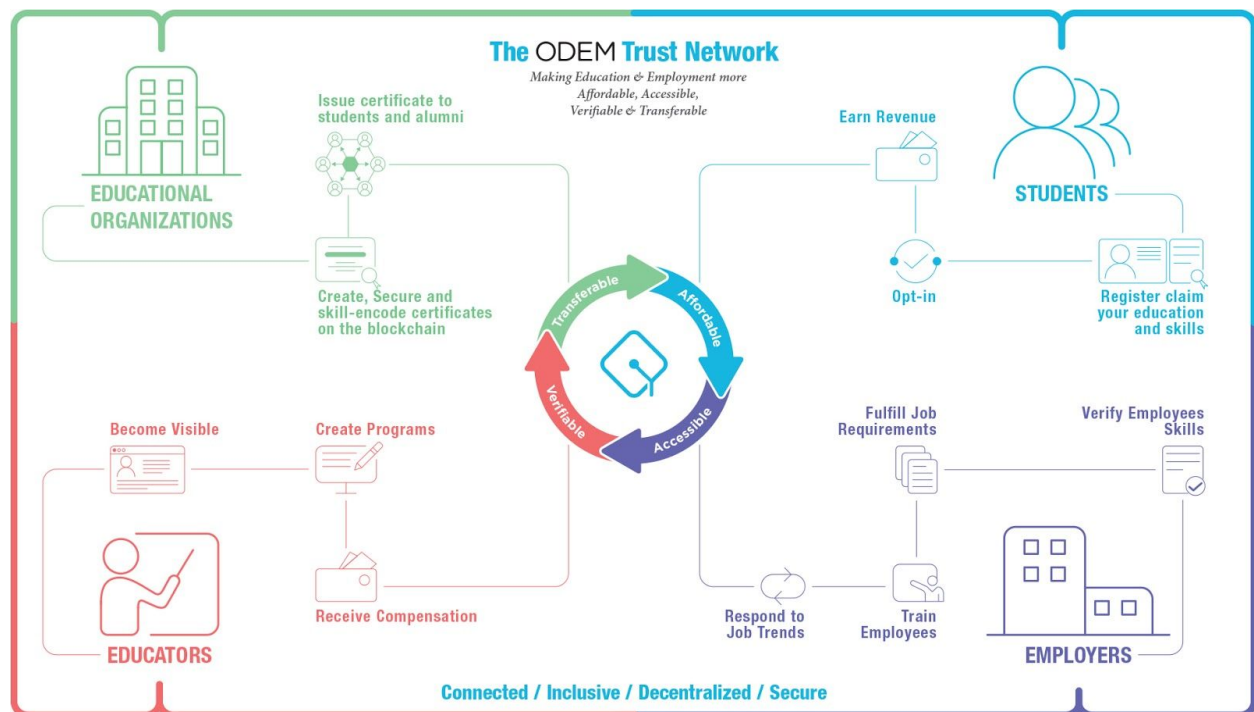


Diagram 1: ODEM Trust Network

Our Solution for Colleges and Universities

ODEM offers colleges and universities digital verification of diplomas and credentials for students and alumni. ODEM also encodes these digitally verified credentials with the relevant skills and occupations used to match individuals with meaningful employment and further learning in the ODEM marketplace.

ODEM is the only trust network that provides the comprehensive tools necessary to help your students thrive and grow your brand locally and globally while staying relevant in today's workforce. ODEM can help you: (notice I took out marketplace).

- Connect students with relevant employment
- Test and market new educational offerings
- Expand the reach of your current recruitment and enrollment to an international pool of potential applicants
- Protect and enhance your brand
- Prevent credential fraud

ODEM does this through utilizing a state-of-the-art Blockchain authentication of education records with the following benefits:

- To increase the efficiency of verifying and sharing education credentials and reduce credential fraud.
- An open education supply-chain to offer targeted education programs to an expanded audience
- Student-employer connection for recruitment and verification
- Revenue share with educational institutions and students when sharing data with employers

In summary, ODEM provides students and alumni with increased visibility to a global network of K12, higher education and employers for job opportunities and continued education.

Digital Certificates of Verification

The ODEM certificate of verification goes beyond just a digital representation of the diploma or certificates. ODEM digital certificates are also **issuer-verified**, **skillprint-encoded** and **dividend-paying**.

Issuer Verification

When ODEM issues digital credentials on behalf of a college or university, it uses a combination of blockchain-based verification and skill and occupation-encoding to generate a certificate that is digitally signed and always traces back to the signing issuer or institution.

The certificate is tracked back to the issuer in two ways:

- 1) The credential is passed through a ‘verifier’ that is initiated when the certificate is opened verifying the authenticity of the transaction issued on the blockchain and signed by the issuer.
- 2) The credential includes live links embedded on the certificate that can be traced back to both the Ethereum blockchain where the transaction is logged and to the signer of the issuing body through a link to the issuing institution’s website.

Skillprint Encoding

When certificates are created on the ODEM platform, either through programs created on ODEM.IO or through rosters of participants uploaded through the certificate wizard, ODEM has the ability to capture related occupations and skills associated with a program or credential.

These values, once specified, are captured, hashed (or carried) and stored in the digital certificate. Associated occupations and skills are then available for viewing by both the student in their ODEM profile as well as the verified portfolio when shared.

Revenue Sharing (Dividend Pay-out)

ODEM is reinventing how data is monetized by sharing revenue earned from viewed data with users and credential providers.

Like Amazon Kindle and Spotify, ODEM rewards its students and credential providers for sharing data on the ODEM Trust Network. Every time a verified credential is viewed by an employer, a percentage of employer subscriptions is paid as a royalty to both students and credential providers.

Selecting Students and Alumni Credentials

ODEM allows Educational Organizations (EOs) to create skillprint-encoded digital certificates for both existing students and alumni. The process of creating these certificates is currently identical to using a model of skillprint-encoding and uploading student and alumni record data to the ODEM EO portal.

Certificate Issuance - How It Works

ODEM has a unique, secure and distributed way of both issuing and saving digital credentials. The ODEM platform uses a hybrid of both centralized and decentralized data storage to ensure the best of both worlds while positioning itself for future adoption of new levels of decentralized data storage and sharing.

ODEM's model also integrates completely with international data protection laws along with FERPA and other regional family and student privacy laws.

Issuing Digital Credentials

ODEM digital certificates are issued through the following steps:

- 1) The issuing institution uploads the roster of issuing recipients to the ODEM EO (Educational Organization) portal through the certificate wizard.
- 2) Individual certificates are created to include the represented individuals in each degree or certificate program with credential details specified in the ODEM CSV template.
- 3) The Issuer can then 'preview' the certifications, approve them and invite students or alumni to generate their certificates.
- 4) The recipient is provided a link back to their existing (or new) ODEM profile to 'generate' the digital certificate initiated and signed by the issuing organization.

Digitization of student's certificate and hash signatories on certificate takes place in order to verify all components

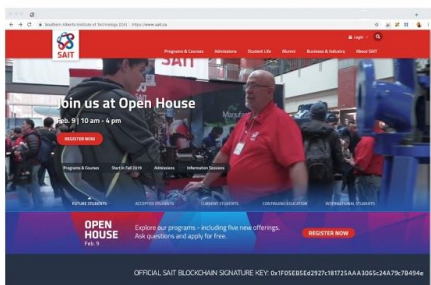


Diagram 2: SAIT Certificate along with the link back to verification web page

Saving and Accessing Certificates

When the recipient generates the certificate, three copies are created:

- 1) A first copy is saved to the IPFS (Interplanetary File System) using a recipient-generated passphrase. NOTE: This is a completely decentralized copy and ONLY the recipient has access to this passphrase and can access this copy. ODEM does not save a copy of this passphrase and cannot re-issue this passphrase to the owner. Users must use this passphrase to open the certificate which also initiates the certificate verifier upon opening.
- 2) A second copy is saved to the ODEM platform. These certificates are stored for convenient sharing within the ODEM Trust Network for data sharing with employers, colleges and universities and other data-viewing partners. NOTE: Copies stored centralized on the ODEM platform are subject to deletion upon any right to be forgotten or other relevant privacy law provisions.
- 3) A third copy is made available to the owner for direct download to a local device.

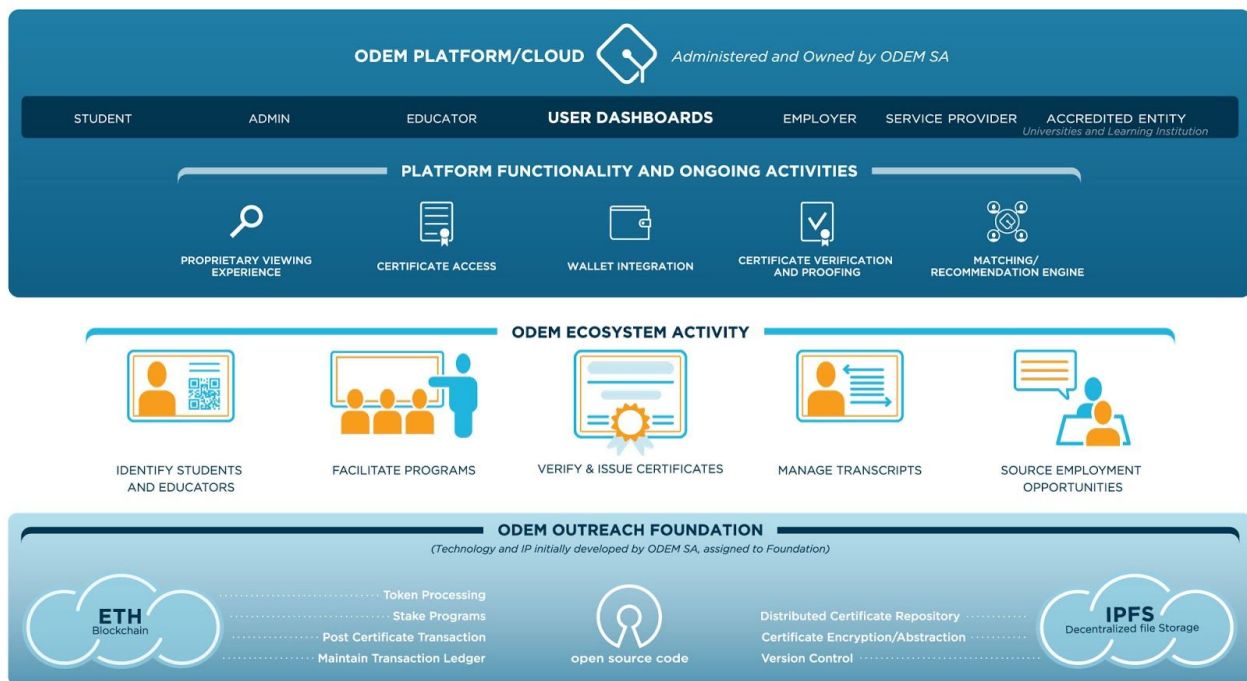


Diagram 3: ODEM Ecosystem

Coding Digital Credentials

ODEM's unique digital credentialing process allows issuers to code certificates with related occupations and skills. Related occupations and skills are suggested in the ODEM Certificate Upload Template and can be modified and approved before uploading.

Related occupations and skills are made available through the ODEM user profile for matching with employers and additional educational opportunities.

They are also available for viewing using the ODEM certificate verifier which is activated when certificates are viewed individually.

ODEM and ESCO: How ODEM is Leveraging Skills Competencies and Occupations for Meaningful Education and Employment

Millions of jobs around the world go unfilled because employers cannot find qualified workers to fill them. In Western Europe, the European Commission has developed ESCO, an innovative, multilingual employment skill, competency and occupation classification dataset and framework to help solve this problem.

ESCO, the “European classification of occupations, skills, qualifications and competencies” system, functions as a common language that organizes and standardizes job-related data to enable and improve job mobility across Europe’s labor market. In addition to making it easier for employers to find qualified workers, ESCO also aspires to become a tool for stakeholders to detect and analyze employment trends and emerging skill deficits.

ODEM has fully integrated the ESCO data framework into its Platform. The ESCO data selection and ODEM’s augmented lists accommodate new skills and occupations as they are developed. They are leveraged by all stakeholders in the ODEM Trust Network to encode education, credentials and skills to easily match individuals with meaningful employment and education. ODEM couples its ‘SkillPrint’ data matching with machine learning and AI to enhance this process as its Trust Network grows.

ODEM recognizes that as students engage in smaller and more ‘micro’ educational experiences, capturing and sharing their preferences and interests using this structure will be vital in matching them with meaningful lifetime learning and work.

Uploading your Records though the ODEM EO (Educational Organizational) Portal

ODEM offers Educational Organizations a mechanism to bulk upload and offer digital credentials to current and past students and alumni.

Institutions Onboarding and Use

The following steps outline how to onboard students and alumni, as well as interact with your community and other ODEM individuals for increased and improved visibility of your university to new applicants.

1. Create an ODEM EO Portal and Get Verified
2. Assign Admins and Educators to your Organization
3. Upload, Verify and Invite Students and Alumni to Create Blockchain Certificates
4. Discover skill and occupation experiences and interests from your student and alumni's profiles
5. Access ODEM's Insight Portal to reach a larger pool of applicants
6. Create and offer programs on the ODEM platform to increase academic reach
7. Build partnerships and integrate curriculum from other institutions and providers to augment and increase academic offerings to your community

Case Study: ODEM In Use

Southern Alberta Institute of Technology (SAIT)

Southern Alberta Institute of Technology (SAIT) placed its 2019 graduating classes onto ODEM for verified consideration for employers and continuing education opportunities.

SAIT officially became the first in Canada to offer its entire graduating class digital blockchain-based diplomas in June 2019. These digital credentials are immutably verified and can be easily accessed by employers, as well as used to see an individual's unified education and skill profiles.

Here is a bit more about the process, opportunities and outcomes.

Goal

To store Southern Alberta Institute of Technology (SAIT) students' certificates on the blockchain to improve their security and accessibility and make them accessible and shareable with future employers.

Approach

Identified SAIT as an organization that can benefit by transitioning from paper to blockchain-based credentials. ODEM tested a pilot program placing 25 SAIT students' Pre-Employment Automotive Service Technician program certificates on the blockchain. After a successful pilot run, ODEM then put an entire graduating class's (over 4,800 SAIT students) certificates on the blockchain.

Results

ODEM successfully provided the mechanism to place these SAIT students' certificates on the blockchain by utilizing the ODEM Platform and smart contracts. The students now have authority over their digital credentials and can easily share them with future employers.

Blockchain Increases Academic Record Security

Students currently receive their academic records via mail or by accessing their institution's database. If a student loses their paper copy of their records, then they are gone until they can obtain new copies from their institute. If an academic institution's database is compromised, then their students' records could be unavailable for a long time. It can be very timely and expensive to restore them. According to USA Today, over 100 American school districts reported cyberattacks in 2018.

The blockchain is a decentralized and immutable distributed ledger where records reside on thousands of nodes throughout the world. Just one node has to be available for the information to be accessed (odds that are greater than 99.99999%). Academic institutions can place their records on the blockchain to ensure their security and integrity.

Blockchain Makes Educational Records More Accessible

The current way of obtaining academic records through educational intermediaries is a costly and timely process. It can cost hundreds of dollars and take several weeks for a student to obtain their academic records. Academic institutions are dealing with a more diverse student population than ever, and assessing credible and authentic transcripts is vital. The blockchain allows these records to be viewed instantly at no cost.

The Ethereum blockchain provides students with a central record of their academic experiences and certifications, granting digital ownership of their achievement. It also makes it easy for students to transfer or share their diplomas and instantly verify their graduate status with future employers and recruiters.

SAIT Pilot Program

In December 2018, 25 graduates from SAIT's Pre-Employment Automotive Service Technician program received a digital certificate through the blockchain as part of a pilot project with ODEM. These certificates featured the Province of Alberta's coat of arms and SAIT's official

seal. They also included the signatures of the institute's Chairman of the Board of Governors, the President and CEO and the Registrar. SAIT is the first Canadian institution to use blockchain technology to deliver secure credentials.

Dr. David Ross, SAIT's President and CEO, said, "We are thought leaders and this is a strong example of how we're increasing our value proposition for graduates and employers. This is only the beginning as we continue to put the potential of blockchain technology into practice." The idea of digitizing academic credentials at SAIT originated directly from the students. They worked with George Chase, an Instructor in the School of Information and Communications Technologies, to present the concept to SAIT's leadership. Their leadership team determined that blockchain technology could be a full-scale solution for the institution. Chase said, "What it will do is add even more value to getting a SAIT credential. It highlights SAIT as a progressive institution — on the cutting edge of not only teaching the technology but actually using the technology."

Dr. David Ross said, "We are thought leaders and this is a strong example of how we're increasing our value proposition for graduates and employers. This is only the beginning as we continue to put technology's potential into practice of blockchain."

SAIT Spring 2019 Program

In June 2019, ODEM provided the mechanism for over 4,800 of SAIT's graduating students to claim their blockchain-based program certificates. According to Dr. David Ross, "By making SAIT credentials accessible through blockchain, our graduates and employers will continue to benefit from this innovative technology that is responsive, authentic and widely accessible."

SAIT Registrar, Neera Arora, said, "We used blockchain technology to issue digital credentials to all our graduates this spring. This enables the graduates to have access to their credentials at all times, and they are able to share the same with employers without having to request a copy from SAIT." ODEM allows these credentials to be viewed instantaneously at no cost.

About SAIT

SAIT is a polytechnic institute located in Calgary, Alberta, Canada. They offer over 100 career programs and more than 1,300 continuing education and corporate training courses to greater than 200 companies annually. Their academic schools consist of Business, Construction, Energy, Health and Public Safety, Hospitality and Tourism, Information and Communications Technologies, Manufacturing and Automation and Transportation. According to their website, they have a 90% graduate employment rate.

Looking Towards the Future

ODEM's Open Accreditation Exchange

In its work with both accredited universities and colleges alongside private educational organizations, ODEM is seeing a growing interest in accredited institutions partnering with and incorporating the content from private education providers.

As ODEM offers more and more of these programs on its platform, many of which are being tailored to meet current workforce skills, it is also seeing accredited organizations looking to increase their offering of timely curriculum to meet workforce requirements and being able to 'bolt-on' these courses from private providers and accredit them as part of their university curriculum.

This is a feature ODEM is excited to be offering. As ODEM develops stronger and more comprehensive relationships with curriculum providers, especially those devoted to creating and maintaining high quality, workforce-centric programs where students can learn real skills for better workforce readiness, it will create opportunities for accredited institutions to pivot, partner and quickly re-invent academic offerings.

Inversely, colleges and universities will have the opportunity to place academic offerings onto the ODEM platform to offer beyond their campus walls to increase remote attendance and event partner with other institutions to fill curriculum gaps and create a more rich academic offering to their communities.

Custom Designed Education

With the ability to accredit courses across institutions, ODEM expects to see individuals already enrolled in these institutions along with others who are piecing together their education experience leveraging 'best of breed' courses simultaneously from more than one institution. Institutions have opportunities to onboard new students who have already demonstrated skill or previous education, bringing great value to their student communities.

Changing the Face of High School Recruitment

ODEM is already in discussions with universities to create an alternative model of student recruiting and acceptance by using the ODEM platform to verify student's high school credentials including transcripts, recommendations and extra-curricular activities. ODEM expects this to challenge the status quo for international recruiting, allowing qualified and talented applicants a way to share their experience with universities already registered in the ODEM Trust Network.

We expect this model to level the playing field for students who are homeschooled, have alternative education situations or have been displaced from their country of origin and are looking for ways to capture and verify their high school education as they move from one location to another.

Appendix

Additional Resources

Video Tour - ODEM Platform - https://www.youtube.com/watch?v=U79f_R9gyCE

ODEM Technical Whitepaper -

<https://odem.io/wp-content/uploads/2019/01/ODEM.IO-Technical-Whitepaper.pdf>

Unique Utility Token Business Use Case - <https://odem.io/the-odem-token/>

Recognition and Mentions

State of EdTech 2020-2021 -

<https://edtechdigest.com/downloads/state-of-edtech-2020-2021/>

ODEM cited by United Nations in Blockchain Use Case Study -

https://www.unece.org/fileadmin/DAM/cefact/cf_plenary/2019_plenary/CEFACT_2019_INF03.pdf

SAIT (with ODEM) first in Canada to issue digital credentials through blockchain -

<https://www.sait.ca/about-sait/media-centre/news-and-events/news/news-2018/2018-12-17-sait-first-in-canada-to-issue-digital-credentials-through-blockchain>

Completed integration of European Union Skills Competencies and Occupation (ESCO)

framework - <https://ec.europa.eu/esco/portal/news/ffd897b4-294c-4645-8ce1-b591d4703747>

Accepted Swiss Grant for ODEM HES-SO Fribourg University A Matching System for

Learners, Educators, Job Seekers, and Employers - <https://www.zhaw.ch/en/university/>

One of 10 of Europe's most promising early-stage blockchain startups -

<https://www.eu-startups.com/2019/03/10-of-europes-most-promising-early-stage-blockchain-startups/>

One of 10 Blockchain Ideas That Are Out-of-This-World or May Change It -

<https://cointelegraph.com/news/10-blockchain-projects-that-are-out-of-this-world-or-may-change-it>

Bitfinex and ODEM Collaborate in Blockchain Education Initiative -

<https://blog.bitfinex.com/announcements/bitfinex-and-odem-in-blockchain-education-initiative/>