



Technical White Paper

'18

# Program Staking & Token Architecture

V1.4



# Contents

<a href="#">Overview</a>	1
Introduction .....	1
Platform Technology Overview .....	1
ODEM Platform.....	1
ODE (ERC-20) .....	2
ODEM Credits .....	2
ODEM Student Education DApp Solutions .....	3
ODEM Platform Use Cases Introduction .....	3
Excelorators Partnership and Beta Adoption.....	6
ODEM Platform Version Release Timetable.....	6
<a href="#">ODEM Development Environment</a>	6
ODEM Decentralized App (DApp): Open Source.....	6
ODEM Platform: Proprietary User Interface .....	7
Private Keys.....	7
Necessity of ODE .....	7
Velocity Problem.....	7
<a href="#">Appendix A: Technology Architecture Supporting Documentation</a>	8
1. Educational Program Token Staking (EPS) .....	8
2. Digital Education Certification (DEC).....	10
3. Education Activity Repository (EAR).....	10
4. Identity Through Education (ITE).....	11
5. Education Certification Viewing (ECV) .....	13
6. Perpetual Curriculum Royalty (PCR) .....	13
7. Program Revenue Sharing (PRS) .....	14
8. Education Token Sponsorships (ETS).....	14
9. Independent Credentialing Verification (ICV).....	15



10. Education Skill Badges (ESB) .....	15
11. Training Education Records (TER) .....	15
12. Incentive Management Program (IMP) .....	15
13. Professional Skills Network (PSN) .....	15
14. Currency Agnostic Settlement (CAS).....	16
<b>Appendix B: ODEM Platform Screenshots.....</b>	<b>16</b>
Login .....	16
Register .....	17
Reset Password.....	18
Student Profile.....	19
Educator Profile .....	20
My Claims.....	20
My Certificates.....	21
My Programs .....	21
My Program Events.....	22
Program Timeline.....	22
Program Catalog.....	23
My Calendar.....	23
Message Center .....	24
My Rewards.....	24
My Payments.....	25
Student Qualifications .....	25
<b>Appendix C: Legacy Model vs ODEM Platform.....</b>	<b>26</b>
<b>Glossary .....</b>	<b>27</b>



# Overview

## Introduction

ODEM, a global educational provider, has the world's first blockchain-driven software platform built on top of Ethereum's **decentralized ledger** technology. ODEM aims to make blended education more affordable, accessible, verifiable, and transferable by leveraging blockchain technology and Ethereum's **ERC-20** based ODEM Tokens (ODE). In ODEM's presale and main token event in early 2018, ODEM sold approximately 100 million ODE (about 10,000 ETH, which was worth about \$10 million at the time).

ODEM facilitates blended education (and eventually live streamed and online programs) through several core services.

## Platform Technology Overview

ODEM creates a marketplace through an open source **onchain** Ethereum-based ERC20 utility token used to transact ODEM digital assets and sets of corresponding **smart contracts** to manage transactional data related to education programs and credentials. This along with an **offchain** proprietary cloud-based platform provides students, educators, employers, and other stakeholders easy-to-use tools to participate in academic programs and receive blockchain-based educational certificates

## ODEM Platform

Unlike the onchain **DApp**, the Platform resides in a central location. Built with standard web and HTML technologies, the Platform is connected to the **Ethereum blockchain** using a web3 JavaScript library.

Within the ODEM Platform, users will see:

- Their profile
- Programs
- Events
- Certificates obtained



- Calendar
- Message center
- Rewards/payments
- Student's qualifications

Users will be able to:

- Request a new program
- Enroll in an available program
- List a program
- List an event
- Message other users
- Bid on programs
- Request certificates
- Verify/deny claims
- Issue certificates

## ODE (ERC-20)

The ERC-20 ODE sold in the crowdsale will provide access to the ODEM Platform through the staking process. The ODE economic model is based on the Sweetbridge Foundation's discount-token research. The design isolates the utility of ODE on the Platform from external market forces, ensuring that use of ODE is always advantageous.

The ODEM staking architecture is based on adoption of the Ethereum [ERC-900](#) interface. A student stakes a desired program by committing a small amount of ODE. Educators stake courses they intend to teach. Staking assists the Platform in assessing levels of student and educator interest. If a participant backs out, their staked tokens are forfeited. Using ODE eliminates issues associated with fiat, including high fees and lengthy processing times.

## ODEM Credits

ODEM uses the [ERC-780](#) protocol for creation of ODEM-Credits (ODEM-C). Adaptation of the protocol will account for a more general [payload](#) and limit the [transfer method](#). ODEM-C are digital certificates stored on the blockchain that are given to users who successfully complete educational offerings.



The ODEM-C includes the name of the student, educator, program, and institution, the program's date, and the [InterPlanetary File System \(IPFS\)](#) hash where the physical certificate can be accessed with a passphrase.

## ODEM Student Education DApp Solutions

Our solution architecture is broken down by value proposition for the student, our core consumer on the ODEM Platform. We are creating a series of smart contract use cases that will be made available for use on the Ethereum blockchain in early 2019.

## ODEM Platform Use Cases Introduction

### 1. Accessibility

**Education Program Staking (EPS)** is when a student makes a commitment to enroll in a program offered on the ODEM Platform. The student will typically stake, or deposit, about 10 percent of the full price of the program. Staking helps the Platform assess demand and discourages students from frivolously signing up for programs. If a student stakes a program and later backs out, the stake will be forfeited. Educators are also required to stake their intention to offer an ODEM program.

### 2. Verifiability and Transferability

Since educational diplomas and credentials are still managed almost entirely by centralized learning institutions, verification of one's education for the purpose of either employment or continued education is completely dependent on the physical institutions' centralized authority.

ODEM leverages the trustless nature of blockchain technology to move the authority of education verification onto the blockchain. Once mass adoption occurs, it allows other decentralized educational providers to offer programs and be recognized as legitimately credentialing bodies. This will create opportunities for new and nontraditional education models to be recognized and legitimized in the search for gainful employment and better transferability for relocation and future education.



## 1

OVERVIEW

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To achieve this, ODEM has created a set of smart contracts and interfaces through its Platform that allow educational certificates of any kind to be created, signed, verified, secured, shared, and managed entirely on the blockchain. These applications include:

ODEM's ERC780 Certificate created using **Digital Education Certification (DEC)**. DEC acts as a blockchain instance of a student's education certificate representing a completed educational experience digitally signed and verified by the educator (and if applicable, the institution). ODEM DECs are immutable certificates on the blockchain owned by the student. The core data includes the public key of the stakeholders and their transactions live and onchain. The corresponding metadata reflecting this education program is captured and managed securely and offchain on the ODEM Platform. Students can view digital certificates through a combination of accessing their onchain certification and logging into the Platform. ODEM requires a small amount of ODE for each certificate created on the blockchain.

As students accumulate blockchain certificates, their experiences can be managed in aggregate through an **Education Activity Repository (EAR)**. An EAR is a secure record of an individual's educational history as verified by the educational institutions that the student has attended.

Should a student lose access to their educational identity such as in the case of displaced refugee populations, ODEM has a social claims verification process where a student's educational records can be recreated through a process called **Identity Through Education (ITE)**. Once recreated, the students records become part of their immutable EAR.

**Independent Credentialing Verification (ICV):** Allows academic records to be automatically transferred from the blockchain to an academic institution's database.

**Education Skill Badges (ESB):** Digital badges of a student's accomplishments and on-the-job skills verified by an employer that are stored on the blockchain.

**Training Education Records (TER):** An employee's training credentials issued by an employer that are stored on the blockchain. They collectively represent a lifetime of learning and personal improvement.



### 3. Affordability

The ODEM Platform reduces the cost of education by offering short-term academic programs (instead of more expensive four-year degrees) and allowing students to bid on courses and programs.

Not only can students have complete control over their educational records through ODEM certificates, they can also receive ODE by letting employers and other interested parties view their certifications through the **Education Certification Viewing (ECV)** contract. This allows third parties such as employers to purchase access to students' digital certificates. Access fees are shared with opted-in users. ODEM charges an ODE fee for viewing (the fee is split some % between ODEM and the students).

**Program Revenue Sharing (PRS):** Using smart contracts to automatically distribute revenue to ODEM Platform Partners, including speaking and literary agents, when their services are delivered through the ODEM Platform.

**Perpetual Curriculum Royalty (PCR):** ODE are sent to educators when their licensed curriculum is used by other educators for teaching. Smart contracts automatically send ODE when third-party educators access licensed material through a passphrase. There is an ODEM fee associated with this process.

**Education Token Sponsorships (ETS):** Similar to scholarships, ETS fund the cost of studies for disadvantaged students and use smart contracts to ensure that conditions on the donations are being fulfilled.

**Professional Skills Network (PSN):** Informs ODEM's employment partners of students who have completed specific program requirements for potential hiring.

**Currency Agnostic Settlement (CAS):** ODEM will leverage blockchain-based mechanisms to use ODE as a voucher for use on the platform. ODE will be used on the Platform to ensure fast, reliable, cross-border, transactions with multiple parties on each side regardless of currency type.



## Excelorators Partnership and Beta Adoption

The ODEM team was inspired by the success of its partner, Excelorators Inc. For six years, Excelorators has provided high-quality educational services to overseas students, managers, and executives on the campuses of top U.S. learning institutions. Excelorators' clients will test the ODEM Platform in preparation for mass adoption. ODEM will stake on behalf of Excelorators' students and educators during testing.

Through the achievement of operational efficiencies in the ODEM Platform, Excelorators expects to reduce the cost of its educational programs.

## ODEM Platform Version Release Timetable

11/21/18: Closed ODEM Platform Beta 1.4

12/31/18: Closed ODEM Platform Beta 1.5

01/10/19: Closed ODEM Platform Soft Launch

02/28/19: ODEM Platform Mainnet Launch

## ODEM Development Environment

### ODEM Decentralized App (DApp): Open Source

The DApp forms the backend to the ODEM Platform. The DApp's smart contract links students, educators, and service providers considering educational offerings.

ODEM is creating a set of smart contracts, protocols, and standards to interact with ODE on the Ethereum platform. These self-executing contracts incorporate unique terms and criteria such as a program's value in ODE, duration, and location. The contracts manage transactions in ODE to educators and the issuance of students' certificates. The DApp stores data about participants to assist on decisions about their future engagement in academic programs on the Platform.



Once published, the DApp's code will be available to the community for re-use and augmented development to create new opportunities for the ODE.

## ODEM Platform: Proprietary User Interface

The ODEM Platform is the proprietary interface and first application running on the ODEM network.

Services provided include:

- Staking ODE for educational offerings
- Viewing other user's educational data
- Viewing aggregated educational data
- Sponsorships
- Education Activity Repository (EAR)
- Identity through Education (ITE)

## Private Keys

ODEM is providing integration of online and hard wallet providers with front-end user friendly wallet management of **private keys**. ODEM will not hold private keys or ODE directly for the users of the ODEM Platform.

## Necessity of ODE

The ODE, in addition to being used for staking, drives the ODEM-C smart contract. Controlling staking requirements is used to tune the system. Maintaining a properly tuned staking requirement is difficult if secondary market forces dictate the staked tokens' utility. By using ODE, the effect of external market fluctuations will be reduced.

## Velocity Problem

With instantaneous transactions, there is a problem with velocity where a token that is spent does not have any real consistent forces on the price. By staking ODE, a function for the Token of just passing through is created. For more about the velocity problem please click [here](#).



# Appendix A: Technology Architecture Supporting Documentation

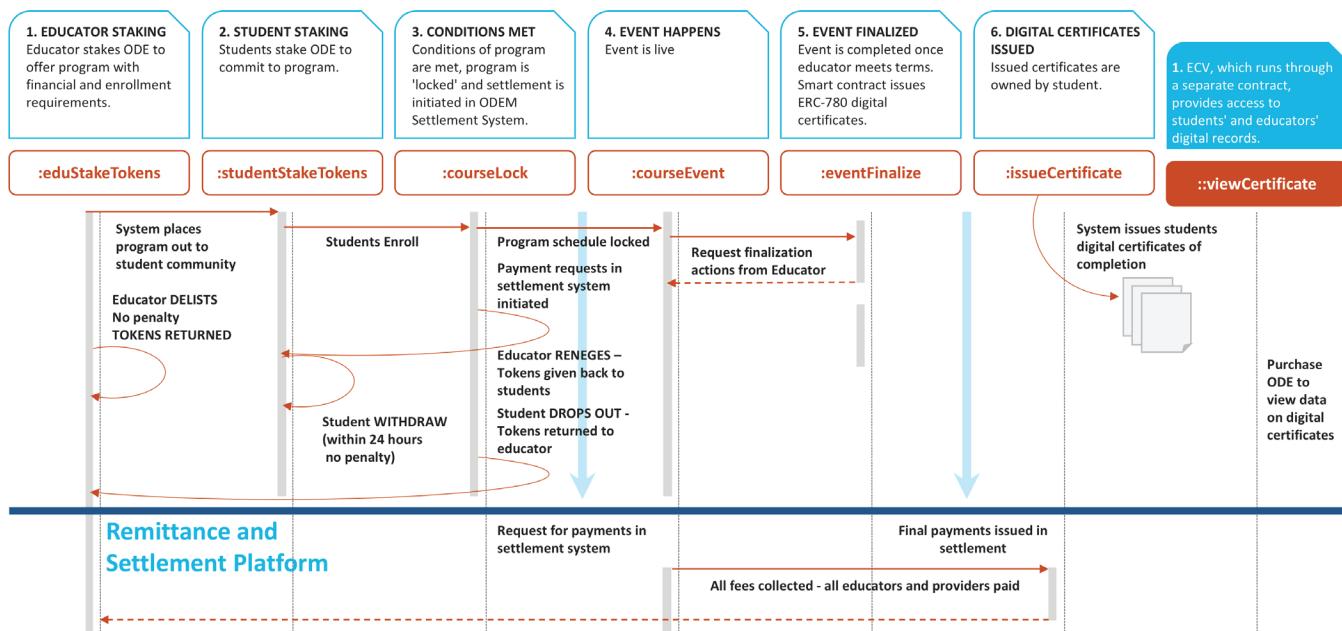
## 1. Educational Program Token Staking (EPS)

Students and educators will use ERC-20-based ODE to commit to academic program offerings by staking. Participants commit ODE to lock in their financial commitment. ODEM's staking model follows predefined conditions that grant reward ODE for following through. It docks fees when commitments are not upheld. When a program is scheduled and participants have met all conditions, the staked ODE will be unlocked.

The process is applicable to individual offerings and programs. They do not require another smart contract. Programs can be set up by configuring educational offerings as defined by a set of prerequisites.

Users will be able to see each other's educational history and credibility scores based on information stored in the Platform, DApp, and blockchain.

ODEM stakes = Percent of stake (based on **Oracle** / whitelist contract) x number of seats created x cost to register for a seat.





1. An educator stakes ODE to commit to teach events within an academic program pending the receipt of a sufficient number of students
2. A student stakes ODE to request an offering or register for a program. A typical stake will be as little as 10% of the final price of an academic program
3. An educator can commit to teach an offering that a student requested
4. When all the conditions are met, a program is ‘locked’
5. A locked program triggers definitive collection of ODE in ODEM’s Settlement System
6. The educator finishes the events within the program and issues digital certificates to students
7. Staked ODE are unlocked and ODEM pays educators and service providers

## **ODEM Program Selection Generator**

The ODEM Program Selection Generator uses data stored within the Platform, DApp, and blockchain to make recommendations about educational offerings. A student, for example, would request a preferred program, date, value in ODE, educator, location, lodging, and travel options. The generator finds the closest matches to trigger program creation. It also creates a smart contract for fulfillment, delivery, and ODE transfer.

## **Renege Policy**

Penalties will apply for reneging on program commitments. ODEM reserves the right to levy fines after observing user behavior. ODEM aims to incentivize responsible behavior and avoid penalizing excessively. Some cases, such as a death in the family, may be unavoidable.

## **Surveys**

ODEM users who participate in an educational offering will receive a questionnaire. Users will be asked to rate other ODEM participants who attended the program. Survey responses will influence the user’s educational rating on the Platform, DApp, and blockchain. Survey participants may also be rewarded with ODE.



## 2. Digital Education Certification (DEC)

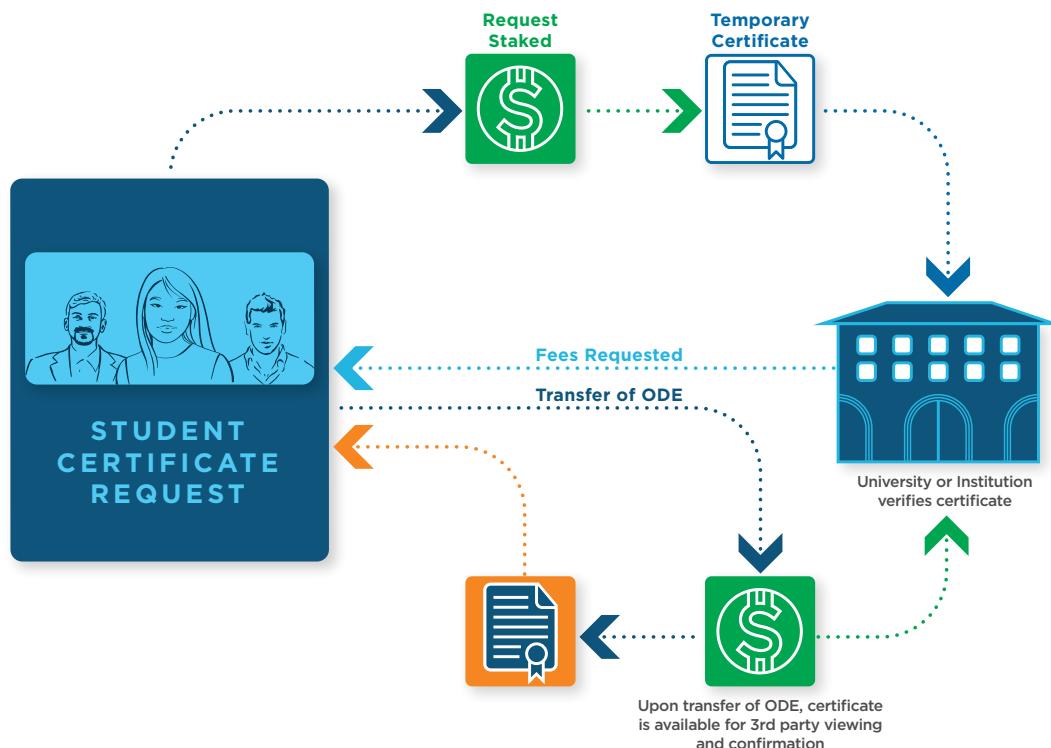
DEC refers to immutable digital records of academic accomplishment created for use in these ways:

1. Permanently inserting the certification on the blockchain
2. Creating indelible proof of participation and completion of programs on the ODEM Platform for students and educators
3. Creating a mirrored digital record of proof of completion of certification through other traditional academic institutions or certification programs

ODEM will obtain a fee in ODE in exchange for the certificate creation from the issuing body or institution.

## 3. Education Activity Repository (EAR)

Student transactions are hard to confirm, therefore, ODEM provides an Education Activity Repository (EAR), which is a ledger that keeps track of educational activities.





## Students

Students post their educational transactions. They will stake ODE which will be returned if the educational transactions prove to be valid.

- ODEM will request verification from students' institutions
- Once confirmed, the students will be notified
- Students can use ODE as a voucher to post certificates on the blockchain

## Private Institutions

- Private Institutions can post educational transactions
- Private Institutions can use ODE as a voucher to post certificates on the blockchain

## Public Institutions

- Public Institutions can post educational transactions
- Students can use ODE as a voucher to post certificates on the blockchain

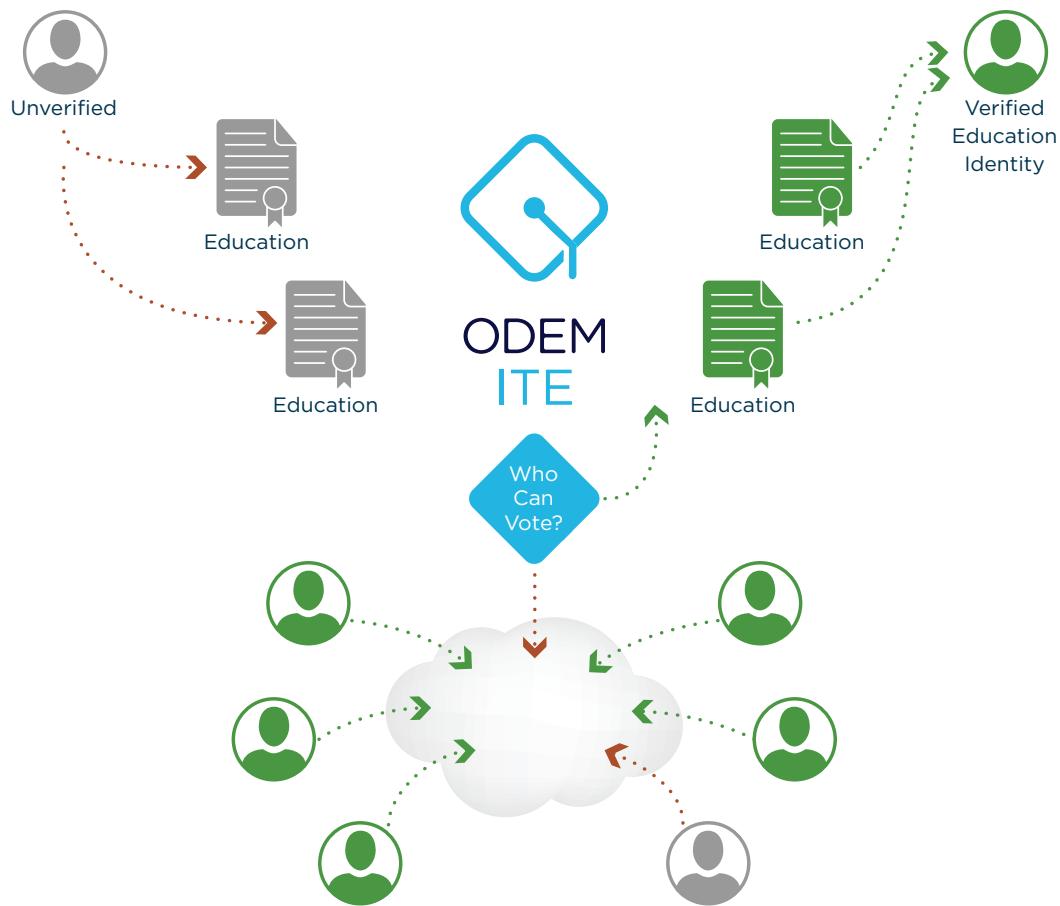
## 4. Identity Through Education (ITE)

ITE verifies a student's academic record when issuing institutions are unavailable. ODEM uses established entities and professionals to perform verification through a consensus model. ODEM charges an administration fee for this service.

- Students can post educational transactions
  - Students will stake ODE, which will be returned if the educational transactions are proved valid
  - ODEM will request consensus from established institutions
  - Once confirmed, the students will be notified
  - Students can use ODE as a voucher to post certificates on the blockchain
- Consensus
  - ODEM allows established entities to vote on student self-reported educational transactions
  - To vote, the established entity will stake ODE



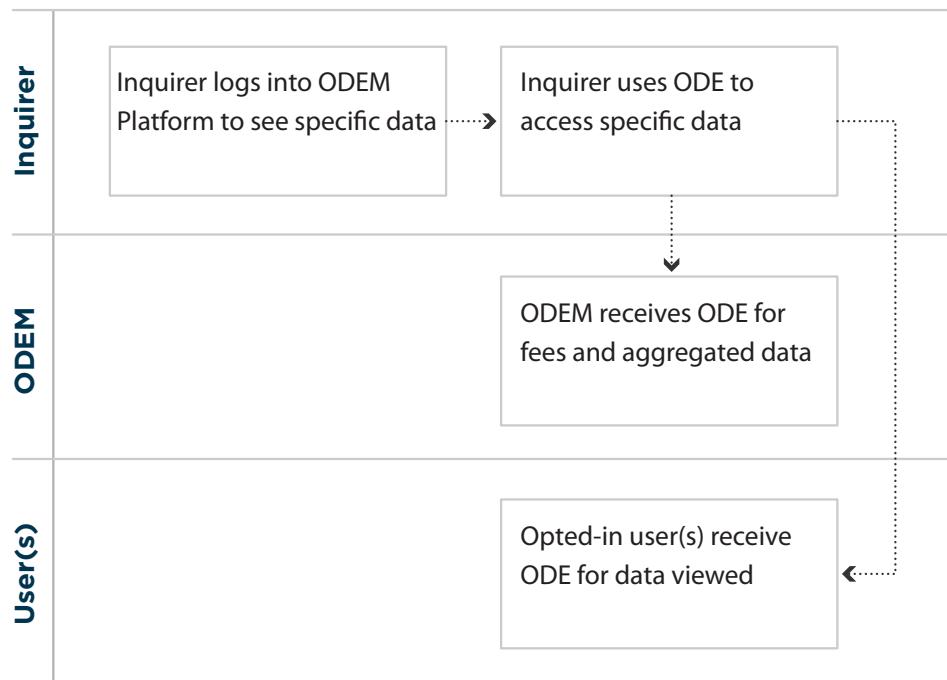
- If a consensus of five or more is reached -
  - The records are confirmed
  - The established entities get their stake back
  - Each entity receives a reward as part of the original student stake
- If no consensus is reached -
  - Established entities get the stake back
  - The records are rejected





## 5. Education Certification Viewing (ECV)

ECV allows employers, universities, students, educators, and service providers to access secure data. The information includes digital certificates, program activities and completion rates, educator participation from opted-in users, and aggregated information within ODEM. ODE are used for ECV access. The ODE used to access the ECV and aggregated data goes to ODEM. Opted-in users whose data was viewed also receive ODE.



## 6. Perpetual Curriculum Royalty (PCR)

Educators will receive ODE in royalties when their licensed passphrase protected blockchain stored curriculum is used by other educators. Smart contract execution of this process would have an ODEM fee associated with it. Educators may want to use licensed courses instead of creating their own as many are established successful courses, which tend to be more economically efficient. In the ODEM Platform, educators will be able to see existing licensed curriculum in which they can use for an educational offering.



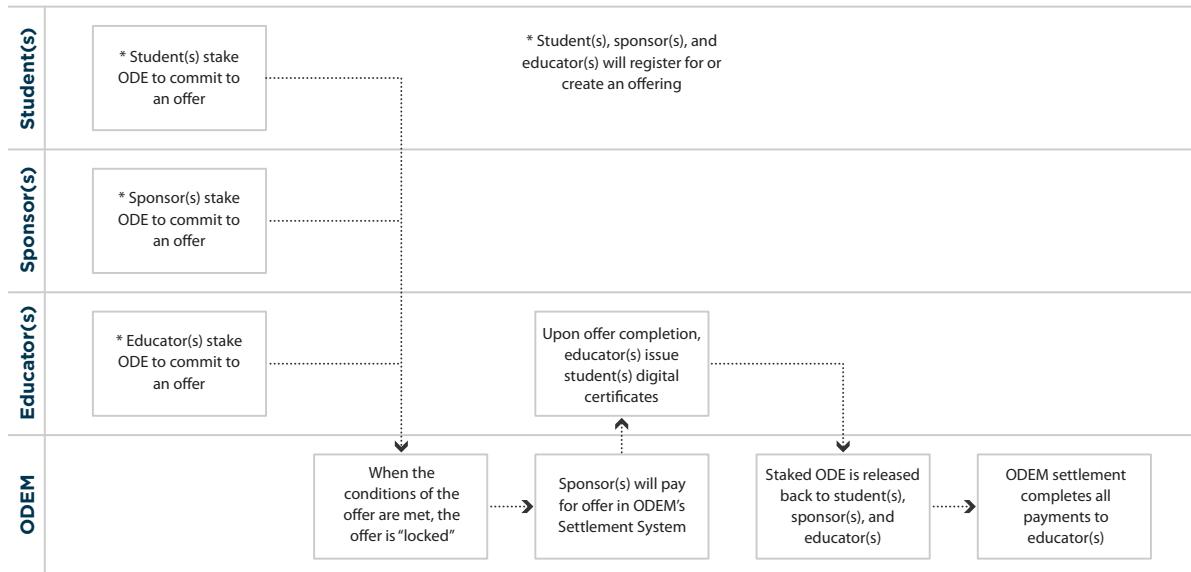
## 7. Program Revenue Sharing (PRS)

PRS refers to using smart contracts to automatically distribute revenue to ODEM Platform Partners, including speaking and literary agents, when their services are delivered through the ODEM Platform.

## 8. Education Token Sponsorships (ETS)

Educational sponsors promote equal access to learning in a safe and secure location for disadvantaged users. Sponsoring these individuals will ultimately result in greater earnings and tax revenue.

Most individuals who are sponsored are driven to succeed by someone who believes in them by providing needed resources. Sponsorship includes paying for another student's program, curriculum, or program expenses. Sponsors can specify the types of students they want to support. Selection criteria may include geography, family income, age, gender, and scholastic record.





## 9. Independent Credentialing Verification (ICV)

ICV allows records to be automatically transferred from the blockchain to an academic institution's database. The institution can select the specific information they want to transfer.

## 10. Education Skill Badges (ESB)

ESB are students' on-the-job skills that have been verified by employers that will be posted to the blockchain. This will help students further their career. Students can stake ODE to attest to skills to be validated by past and/or current employers. They will receive their stake back upon the verification of the skills by the employer. A small amount of ODE will be used to post the skill badge on the blockchain. The employer will receive a reward in ODE for participating in this program.

## 11. Training Education Records (TER)

Employers can use ODE as vouchers to post employee training credentials on the blockchain. Training credentials are from training programs taken internally with the employer that can be used for employee advancement within the organization.

## 12. Incentive Management Program (IMP)

The IMP is an ODE reward system for ODEM Platform participants who complete actions such as registering on the Platform, creating a profile, and/or completing an academic program.

## 13. Professional Skills Network (PSN)

Students who participate in training or obtain certificates on the ODEM Platform are eligible for professional utilization via ODEM employment partners.



## 14. Currency Agnostic Settlement (CAS)

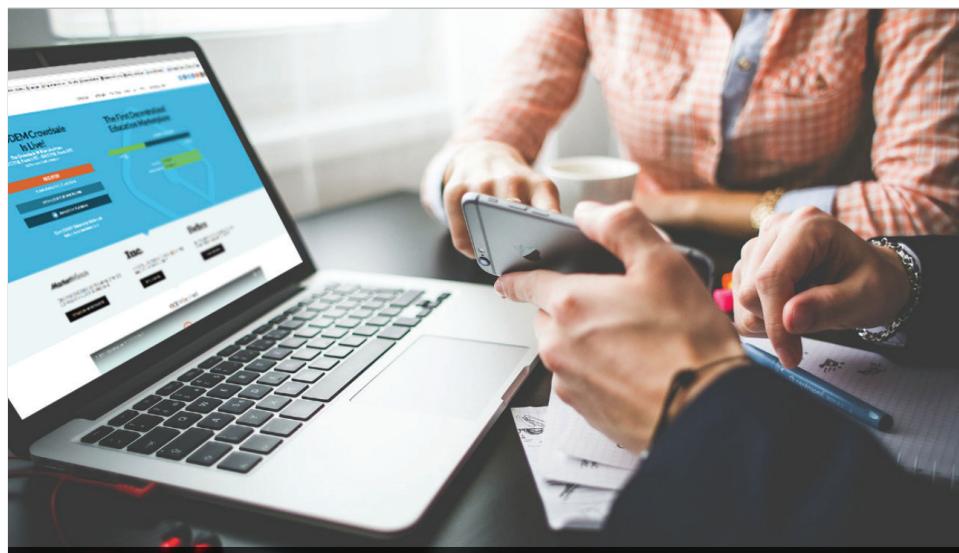
CAS is a system that allows ODEM Platform participants to pay for programs or services in their preferred currency by leveraging one of ODEM's exchange and wallet partnerships.

Examples of transactions include:

- Payments from clients, in particular students
- Remuneration to educators
- Remuneration to facility providers
- Remuneration for required program materials including books
- Remuneration for service providers (translators, caterers, etc.)

## Appendix B: ODEM Platform Screenshots

### Login



ODEM

Login to your account



Forgot your password?

No worries, click [here](#) to reset your password.
[Sign In](#)
Not a member yet? Click [here](#) to register.

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The First Decentralized Education Marketplace

The ODEM model will create an integrated platform where all types of students and student representatives can create and request services for education programs.



## Register

The First Decentralized Education Marketplace

The ODEM model will create an integrated platform where all types of students and student representatives can create and request services for education programs.

Create a new account

First Name  Last Name

Username

Email

Password

Re-enter Password

Student  Educator  Provider

**Register**

Already a member? Click [here](#) to login.

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## Reset Password



The First Decentralized Education Marketplace

The ODEM model will create an integrated platform where all types of students and student representatives can create and request services for education programs.



ODEM

### Forgot Password

Enter Your Email / UserName

OR

Enter Your Phone

Remember your password?

It's OK, click [here](#) to login to your account.

[Reset Password](#)

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## Student Profile

My Profile

Legal Name	First Name	Middle	Last Name	
Username				
Nationality	All			
Current Education Status	All			
My Areas of Interest	All			
Email	Mobile Number			
Alternate Email	Alternate Phone Number			
Wallet Address				
Birthdate	yyyy-mm-dd 			
Mailing Address	<p>Street Address</p> <p>City      State/Province      Choose Country      Postal Code</p>			
Upload CV/Resume	Browse...			



## Educator Profile

My Profile

Legal Name	First Name	Middle	Last Name	
Username				
Wallet Address				
Email		Mobile Number		
Alternate Email		Alternate Phone Number		
Educator University/Institute				
Birthday	yyyy-mm-dd <input type="button" value="Calendar"/>			
Education Title	Choose	Other		
Program Type	Choose	Other		
Areas of Expertise	Choose	Other		
Personal Website			LinkedIn URL	
Bio				
Mailing Address	Street Address <input type="text"/> City <input type="text"/> State/Province <input type="text"/> Choose Country <input type="text"/> Postal Code			
Upload CV/Resume	<input type="button" value="Choose File"/> No file chosen			
Approve admin added events	<input type="button" value="Choose"/>			

## My Claims

My Claims

							« «	«	1	»	» »
<input type="button" value="+"/>	Education Record Date ▲	Accredited Entity ^	Education Event ▲	Educator ▲	Grade ▲	Status ▲					
<input checked="" type="checkbox"/>	02-10-2018	Accredited Entity001	C++	Gerald Smith		Claim	<input type="button" value="Request Certificate"/> <input type="button" value="Delete"/>				



## My Certificates

My Certificates

Search Criteria																																																
Name	<input type="text"/>		University	<input type="text"/>																																												
City	<input type="text"/>																																															
<a href="#">I can't see my Certificates</a>					<a href="#">Reset</a>	<a href="#">Search</a>																																										
<table border="1"> <thead> <tr> <th colspan="2">Program Name</th> <th>Title</th> <th>Program Length</th> <th>Completion Date</th> <th>University</th> <th>City</th> <th>Country</th> <th>Signatory</th> <th>Signatory Title(s)</th> </tr> </thead> <tbody> <tr> <td colspan="2">Communication</td> <td>Title 1</td> <td>12</td> <td>01-01-2010</td> <td>Harvard University</td> <td>Cambridge</td> <td>American Samoa</td> <td>mohamed ahmed</td> <td>Title 1</td> </tr> <tr> <td colspan="2">Program 2</td> <td>Title 2</td> <td>15</td> <td>05-02-2012</td> <td>Harvard University</td> <td>Cambridge</td> <td>American Samoa</td> <td>mohamed ahmed</td> <td>Title 2</td> </tr> <tr> <td colspan="2">Program 3</td> <td>Title 3</td> <td>20</td> <td>04-15-2013</td> <td>Abertay University</td> <td>Scotland</td> <td>Albania</td> <td>mohamed ahmed</td> <td>Title 3</td> </tr> </tbody> </table>									Program Name		Title	Program Length	Completion Date	University	City	Country	Signatory	Signatory Title(s)	Communication		Title 1	12	01-01-2010	Harvard University	Cambridge	American Samoa	mohamed ahmed	Title 1	Program 2		Title 2	15	05-02-2012	Harvard University	Cambridge	American Samoa	mohamed ahmed	Title 2	Program 3		Title 3	20	04-15-2013	Abertay University	Scotland	Albania	mohamed ahmed	Title 3
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Program 3		Title 3	20	04-15-2013	Abertay University	Scotland	Albania	mohamed ahmed	Title 3																																							

## My Programs

Upcoming Programs

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Program Name		<input type="text"/>																																													
<table border="1"> <thead> <tr> <th colspan="2">Program Name</th> <th>Program Type</th> <th>Prerequisites</th> <th>Customizable Content</th> <th>Fixed Schedule</th> <th>Start Date</th> <th>End Date</th> <th>University / Institute</th> <th>City</th> <th>Country</th> <th>Cost</th> <th>Registration Deadline</th> <th>Bookmark Program</th> <th>Register for Program</th> <th>Events</th> <th>Timeline</th> </tr> </thead> <tbody> <tr> <td><a href="#">Q</a></td> <td>Program 01</td> <td>Student</td> <td></td> <td><input checked="" type="checkbox"/> Yes</td> <td>No</td> <td>September 03, 2018</td> <td>September 07, 2018</td> <td>Harvard</td> <td>Cambridge</td> <td>United States</td> <td>\$2000.00</td> <td>August 20, 2018</td> <td><a href="#">B</a></td> <td><a href="#">R</a></td> <td><a href="#">E 7</a></td> <td><a href="#">T</a></td> </tr> </tbody> </table>														Program Name		Program Type	Prerequisites	Customizable Content	Fixed Schedule	Start Date	End Date	University / Institute	City	Country	Cost	Registration Deadline	Bookmark Program	Register for Program	Events	Timeline	<a href="#">Q</a>	Program 01	Student		<input checked="" type="checkbox"/> Yes	No	September 03, 2018	September 07, 2018	Harvard	Cambridge	United States	\$2000.00	August 20, 2018	<a href="#">B</a>	<a href="#">R</a>	<a href="#">E 7</a>	<a href="#">T</a>
Program Name		Program Type	Prerequisites	Customizable Content	Fixed Schedule	Start Date	End Date	University / Institute	City	Country	Cost	Registration Deadline	Bookmark Program	Register for Program	Events	Timeline																															
<a href="#">Q</a>	Program 01	Student		<input checked="" type="checkbox"/> Yes	No	September 03, 2018	September 07, 2018	Harvard	Cambridge	United States	\$2000.00	August 20, 2018	<a href="#">B</a>	<a href="#">R</a>	<a href="#">E 7</a>	<a href="#">T</a>																															



## My Program Events

My Program Events

Search Criteria

Event Title	All
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[Back to Program](#) [Reset](#) [Search](#)

Event Title	Event Type	Start Date	End Date	Status	Action
Event 02	Group Presentation	Sep-03-2018 09:00	Sep-03-2018 11:00	Pending	
Event 06	Roundtable	Sep-03-2018 13:00	Sep-03-2018 15:00	<a href="#">Generate Certificate</a>	
Meeting	Seminar	Sep-04-2018 11:30	Sep-04-2018 13:30	<a href="#">Generate Certificate</a>	
Event 10	Symposium	Sep-04-2018 15:00	Sep-04-2018 17:00	<a href="#">Generate Certificate</a>	
Event 04	Lecture	Sep-05-2018 09:00	Sep-05-2018 11:00	<a href="#">Generate Certificate</a>	
Event 05	Outdoor Activity	Sep-06-2018 09:00	Sep-06-2018 11:00	<a href="#">Generate Certificate</a>	
Event 08	Conference	Sep-07-2018 14:00	Sep-07-2018 16:00	<a href="#">Generate Certificate</a>	

Displaying 1 - 7, of 7 Rows [10](#) [25](#) [50](#) [100](#)

## Program Timeline

Program Timeline

[Back to Program](#)

09/03/2018 01:00		Event 06
09/06/2018 09:00		Event 05
09/07/2018 02:00		Event 08 Event 08



## Program Catalog

My Program Catalogs

Search Criteria																																																															
Program Name																																																															
							<input type="button" value="Reset"/>	<input type="button" value="Search"/>																																																							
<table border="1"> <thead> <tr> <th colspan="2"></th> <th colspan="7"></th> </tr> <tr> <th colspan="2"></th> <th colspan="5">Program Name ▲</th> <th>Program Type ▽</th> <th>City ▽</th> <th>Country ▽</th> <th>Start Date ▽</th> <th>End Date ▽</th> <th>University / Institute</th> <th>Bids</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td>AI Advanced</td> <td>Student</td> <td>SFO</td> <td>United States</td> <td>Aug-20-2018</td> <td>Aug-31-2018</td> <td></td> <td></td> <td>12</td> <td></td> </tr> <tr> <td></td> <td>Program 001</td> <td>Student</td> <td>Program 001</td> <td>Andorra</td> <td>Jan-31-2020</td> <td>Apr-02-2021</td> <td>Program 001</td> <td>39</td> <td></td> </tr> <tr> <td></td> <td>Program 002</td> <td>Student</td> <td>Program 002</td> <td>Bonaire, Sint Eustatius and Saba</td> <td>May-03-2019</td> <td>May-03-2020</td> <td>Program 002</td> <td>1</td> <td></td> </tr> </tbody> </table>																				Program Name ▲					Program Type ▽	City ▽	Country ▽	Start Date ▽	End Date ▽	University / Institute	Bids			AI Advanced	Student	SFO	United States	Aug-20-2018	Aug-31-2018			12			Program 001	Student	Program 001	Andorra	Jan-31-2020	Apr-02-2021	Program 001	39			Program 002	Student	Program 002	Bonaire, Sint Eustatius and Saba	May-03-2019	May-03-2020	Program 002	1	
		Program Name ▲					Program Type ▽	City ▽	Country ▽	Start Date ▽	End Date ▽	University / Institute	Bids																																																		
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	Program 002	Student	Program 002	Bonaire, Sint Eustatius and Saba	May-03-2019	May-03-2020	Program 002	1																																																							

## My Calendar

Calendar

July 2018

Mon	Tue	Wed	Thu	Fri	Sat	Sun
25	26	27	28	29	30	1
					Project Management Rich Newman	
2	3	4	Marketing Vincent Karpenko	5	6	Strategic Management Alexander Hayes
Economics Chuck Barrette		10	11	12	13	Project Management Rich Newman
9			Marketing Vincent Karpenko	14	15	
16	17	18	Marketing Vincent Karpenko	19	20	Strategic Management Alexander Hayes
					21	Project Management Rich Newman
					22	



## Message Center

The screenshot shows a list of messages on the left and a compose input field on the right.

- Program 03:**
  - test** (Jun 28, 2018 - 8:23 PM)
  - Event 05**
  - c** (Jun 28, 2018 - 8:24 PM)
  - Event 04**
  - b** (Jun 28, 2018 - 8:24 PM)
  - Event 02**
  - Test 3** (Jul 2, 2018 - 10:38 PM)
  - Event 10**
  - Hey- it's great to see you here!** (Jun 20, 2018 - 1:13 PM)
  - esraa**
  - A second test** (Jul 2, 2018 - 10:30 PM)
  - Program 02**
  - esss**
  - event**
- Your message goes here...** (Compose input field)

## My Rewards

The dialog box contains the following fields:

- Email**: An input field with a question mark icon.
- Invitation Url**: A text field containing the URL <https://dev.odem.cloud/#/register/null>.
- Cancel** and **Send** buttons at the bottom right.



## My Rewards

## Self Rewards

			««	«	1	»	»»
Reward Name ▾	Date ▾	Reward					
Complete Profile	Aug-07-2018	75					
Displaying 1 - 1, of 1 Rows							
10	25	50	100				

## Referral Rewards

				««	«	»	»»
Reward Name ▾	Date ▾	Reward	Referred Username				
Displaying 1 - 0, of 0 Rows							
10	25	50	100				

## My Payments

			««	«	1	»	»»
Payment ▾	Date ▾	Transaction					
230	Nov-10-2018	200					
Displaying 1 - 1, of 1 Rows							
10	25	50	100				

## Student Qualifications

Qualification List										
				««	«	1	2	3	»	»»
	Name ▾									
<input checked="" type="checkbox"/>	Adobe ActionScript		<a href="#">Students</a>	<a href="#">Events</a>						
<input checked="" type="checkbox"/>	AJAX		<a href="#">Students</a>	<a href="#">Events</a>						
<input checked="" type="checkbox"/>	Apache Maven		<a href="#">Students</a>	<a href="#">Events</a>						
<input checked="" type="checkbox"/>	Apache Tomcat		<a href="#">Students</a>	<a href="#">Events</a>						



## Appendix C: Legacy Model vs ODEM Platform

Standard Model	ODEM Platform	Benefits
Client creates request directly via phone or email. Must cycle through many layers and negotiations	Easily request programs through the ODEM Platform	Request captured accurately and instantly put out to bid, triggering the fulfillment process. Customer is matched with the program with the dates desired at lower overhead
Extensive back and forth with client, partners, and sales	Facilitation of offers between customer and ODEM providers	ODEM providers accept project based on mutually agreed-upon price with client. Middlemen costs are eliminated
Difficult to secure speakers and facilities before client will make a commitment and leave deposit	ODEM client request can only be completed once all resources are committed	Using smart contracts, payments are exchanged at specified dates based on deliverables in terms and conditions of the contract
Creation of online schedule done via manual input	Schedule is built automatically as part of schedule request	Removes uncertainty and last minute requests to program schedule and fulfillment, as event schedule is created online directly from terms and conditions through the smart contract
Unpredictable payments causing subsequent delays in payouts to vendors, resources, and educators	Transactions managed through ODEM smart contracts	All transactions are processed within ODEM to be executed specifically when product terms and conditions are met, preventing delays in payouts, and building trust among all parties



Program curriculum is created ad hoc by a combined effort from the sales staff and program coordinators with little input from educators	Program and curriculum creation and ownership with lifetime royalty on programs used in the future	Educators from high-impact universities and businesses have already been engaged to design and create their own curriculum. This drastically increases the quality of the program's events and incentivizes clients to utilize curriculum developed by experts
Service providers are contracted on a per-case basis, feedback is not collected, and quality is not measured	Vetting, securing, and rating of all service providers in the Platform	Service providers will be vetted by the community through a rating system, allowing customers to select from those who have had prior work (like the rating system used by Upwork)

## Glossary

**Decentralized ledger** - Also known as a blockchain. A system for recording transactions on many computers that share control of the data.

**Decentralized app (DApp)** - An application in which the backend code runs within the Ethereum blockchain. DApps must be completely open-source (without restrictions of copyright or patent) and use a cryptographic token (such as ODE) for access.

**ERC-20** - Defines a common list of rules for all Ethereum tokens to follow, including how tokens are transferred and how users can obtain data about a token.

**Ethereum** - An open-source, public, blockchain-based distributed computing platform and operating system that was specifically designed to allow smart contract functionality.

**Ethereum blockchain** - A digitized, decentralized, public ledger of all Ethereum transactions.

**Hash** - A function that converts an input of letters and numbers into an encrypted output of a



fixed length. A hash is created using an algorithm and is essential to Ethereum.

**InterPlanetary File System (IPFS)** - A distributed file system that seeks to connect all computing devices with the same system of files (similar to a peer-to-peer file sharing service like BitTorrent).

**Non-fungible** - Not interchangeable when referring to goods or commodities.

**Offchain** - A transaction outside of the blockchain.

**Onchain** - A transaction within the blockchain.

**Oracle** - Trusted data feeds of real-world occurrences used to activate smart contracts.

**Payload** - Information about the program such as a participant's ID and grade.

**Private key** - An encrypted password that allows a user to access a digital currency wallet. A private key should never be shared with anyone.

**Public key** - An encrypted password used for transactions between users as well as to identify a digital wallet publicly.

**Smart contract** - Self-executing agreement within the Ethereum blockchain where the contract terms are directly written into lines of code.

**Staking** - Using ODE to access the ODEM Platform and services. The stake will be returned to the user (minus any fees) as long as they do not renege on the program offering.

**Transfer method** - The ODEM-C digital certificate cannot be transferred to anyone else.

**Whitelist** - A roster of registered and approved participants.