

## Proposal: Pallet Development - Graded Assets & Fractional Uniques

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**Date:** June 2022

**Requested DOT:** 2635 ( \$ 27,300 @ EMA30 DOT Price= \$ 10.359)

**Short description:** Development of two pallets in support of relevant use cases. These pallets work together as a marketplace for graded assets and fractional uniques (NFTs).

## Summary

As more real-world assets continue to make their way to blockchain applications, there is an increasing need to ensure that users are trustworthy and that the assets they trade have been verified or graded by an expert third party/appraiser. This treasury proposal seeks to build Substrate pallets that allow developers to launch a gated marketplace for graded assets that can be fractionalized in configurable quantities.

We believe that these pallets will be applicable and reusable for the Polkadot ecosystem, and we are requesting support for Treasury funding.

Below we describe some use cases for each of these pallets. These come from our existing clients and associates (real projects/people) interested in migrating or building their application within the Polkadot ecosystem.

## Graded Assets and Marketplace

### Use cases

#### Diamonds

We previously built a blockchain-powered, cooperative marketplace for diamonds<sup>1</sup>. Since it is a complex process requiring a special skill set and instrumentation, and there is a high incentive for fraud, all diamonds must be graded by a community-approved grader (e.g. Gemological Institute of America or IGI). See example report below<sup>2</sup>. These diamonds are then purchased by Diamond Standard Company<sup>3</sup>, where they are molded into pucks of equal value, stored in a secure vault, and minted on the Ethereum main net<sup>4</sup>.

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<sup>1</sup> <https://thedse.co/>

<sup>2</sup> <https://www.gia.edu/analysis-grading-sample-report-diamond>

<sup>3</sup> <https://diamondstandard.co>

<sup>4</sup> <https://diamondstandard.co/technology>

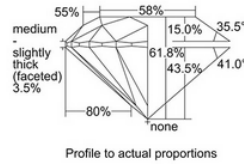


GIA REPORT  
2141438167

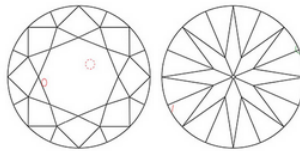
Verify this report at [GIA.edu](http://GIA.edu)

| GIA NATURAL DIAMOND GRADING REPORT |                                     |
|------------------------------------|-------------------------------------|
| January 01, 2014                   |                                     |
| GIA Report Number .....            | 2141438167                          |
| Shape and Cutting Style .....      | Round Brilliant                     |
| Measurements .....                 | 6.41 - 6.43 x 3.97 mm               |
| GRADING RESULTS                    |                                     |
| Carat Weight .....                 | 1.01 carat                          |
| Color Grade .....                  | F                                   |
| Clarity Grade .....                | S11                                 |
| Cut Grade .....                    | Excellent                           |
| ADDITIONAL GRADING INFORMATION     |                                     |
| Polish .....                       | Excellent                           |
| Symmetry .....                     | Excellent                           |
| Fluorescence .....                 | None                                |
| Inscription(s):                    | GIA 2141438167, I Love You          |
| Comments:                          | "SAMPLE" "SAMPLE" "SAMPLE" "SAMPLE" |

#### PROPORTIONS



#### CLARITY CHARACTERISTICS



#### GRADING SCALES

| GIA<br>COLOR<br>SCALE        |                 | GIA<br>CLARITY<br>SCALE      |                     | GIA<br>CUT<br>SCALE |
|------------------------------|-----------------|------------------------------|---------------------|---------------------|
| EXCELLENT<br>GIA GRADES 1-11 | D               | EXCELLENT<br>GIA GRADES 1-11 | FLAWLESS            | EXCELLENT           |
|                              | E               |                              | INTERNALLY FLAWLESS |                     |
|                              | F               |                              | VVS <sub>1</sub>    | VERY GOOD           |
|                              | G               |                              |                     |                     |
|                              | H               |                              | VVS <sub>2</sub>    | GOOD                |
|                              | I               |                              |                     |                     |
|                              | J               |                              | VS <sub>1</sub>     | FAIR                |
|                              | K               |                              |                     |                     |
|                              | L               |                              | VS <sub>2</sub>     | POOR                |
|                              | M               |                              |                     |                     |
| N                            | SI <sub>1</sub> |                              |                     |                     |
| O                            |                 |                              |                     |                     |
| P                            | SI <sub>2</sub> |                              |                     |                     |
| Q                            |                 |                              |                     |                     |
| R                            | I <sub>1</sub>  |                              |                     |                     |
| S                            |                 |                              |                     |                     |
| T                            | I <sub>2</sub>  |                              |                     |                     |
| U                            |                 |                              |                     |                     |
| V                            | I <sub>3</sub>  |                              |                     |                     |
| W                            |                 |                              |                     |                     |
| X                            |                 |                              |                     |                     |
| Y                            |                 |                              |                     |                     |
| Z                            |                 |                              |                     |                     |

Figure. Example GIA Diamond Grade Report

## Coins and Cards

Sports memorabilia and historic or rare coins have long been collected as a hobby and store of value. Sports memorabilia alone is estimated at \$5.4 Billion, but has a reputation for fakes<sup>5</sup>. A common marketplace for these is eBay, and in their buying guide, they recommend having cards graded:

*These independent organizations evaluate a card for authenticity and quality. Many use a 10-point grade scale. They then secure the card in a sealed, tamper-evident plastic holder complete with a certification tag, grade designation, and other pertinent card information. Graded cards command premium prices and allow collectors to buy and sell with confidence.*<sup>6</sup>

The graded organizations provide a physical representation of their certificate and grade embedded within a plastic holder, but these attestations lack digital verification and trust.

Professional Coin Grading Services<sup>7</sup> offers a very similar process and value proposition to owners of historic and/or rare coins.

5

<https://www.sportscasting.com/sports-memorabilia-market-estimated-at-5-4-billion-but-beware-of-the-fakes/>

<sup>6</sup> <https://pages.ebay.com/buy/guides/sports-cards-buying-guide/>

<sup>7</sup> <https://www.pcgs.com/services>

## Tax Credits

In many areas, tax credits offered by governments are transferable from the credit earner to other taxpayers interested in redeeming the credits. It is often the case that a credit may be earned by a person or company that does not have enough of a tax burden to leverage the credit. However, the validity of a tax credit requires an assessment from a Certified Public Accountant (CPA), lawyer, or other trained professional.

The grader must review a credit owner's documentation and evidentiary materials to determine if in fact the credit will be honored by the taxing authority (government).

## Pallet - Graded Assets and Marketplace

This pallet will support the selection and approval of graders, accounts that will perform asset verification or assessment on behalf of asset owners. Similar to the Identity pallet's registrars, these parties may have a corresponding fee for their services, and the community's trust in their attestation is secured by their reputation.

## Asset Redemption

Some graded assets in our use cases also require a specific skill set or equipment for asset redemption. The pallet will also support this functionality, where again the redeemer pays a fee to a redemption specialist for the service.

The pallet will be compatible with the prebuilt Uniques pallet, and possibly the RMRK or other NFT standards to widen reusability.

## Fractional Uniques

### Use Cases

Some of the above mentioned use cases are fractionalizable, meaning a new asset may be spawned from an existing one and the new one inherits the attributes of the parent. Here are more details on these and other relevant use cases for this pallet.

### Commercial Leases

When a commercial office space lease is signed, it becomes a future promise to pay the rent from the renter to the owner (landlord). This instrument can be sold or used as collateral for borrowing. The landlord may sell it shortly after executing it in order to receive capital immediately. It would be sold for less than the face value due to the risk and time-value-of-money. The difference between the sales price and the face value is the return awarded to the buyer.

Leases are typically monthly, and each individual month is a separate future promise to pay. The leases can be fractionalized into monthly units where each one has a different value because the time to receipt is different.

## Cannabis Traceability and Regulation

The 'war on drugs' has failed, and cannabis legalization and regulation is sweeping free cultures around the world. In the United States, cannabis has remained prohibited at the federal level, and the regulation is happening at the state-level. Nearly all 50 states have some form of cannabis regulation, with the trend towards more support for allowing and taxing recreational cannabis.

Although each state applies a bit of nuance to their specific rules, one rule remains consistent. **All cannabis material must be closely tracked and accounted for.** Growers purchase a bag of seeds, such as 100 seeds of a single strain. These are placed in water to germinate, where some will succeed and others will not. Of the successful ones, some are planted into a cube of potting soil substrate and others are frozen for safekeeping.

The cubed plants are grown to become "mother plants", where the yield, potency, and other traits are closely measured and monitored. These mother plants spawn clones and also flower that is dried and packaged. The flower is sold, often to a dispensary, where it is sold to the consumer.

At each of these steps, a new Universally-Unique-Identifier (UUID) is assigned to each unit, where its characteristics and weight are recorded. Test results, images, videos, PDFs, and other files or content can be attached to each UUID, and by default, each UUID inherits the parent's attributes. These attributes may also be overwritten, and/or un-inheritable attributes may be added to each UUID.

In the context of the pallet, each UUID is a fractional unique. We are actively modeling this with growers<sup>8</sup> in the state of New York, where recreational cannabis is legal and the details of licensing and regulations are still being decided. We think a blockchain-enabled platform on Polkadot would be a compelling solution for more transparency and regulatory compliance in this fast growing industry.

## Tax Credits

Tax credits are earned or created with a specific face value, determined by the taxing authority and corresponding asset grade. Buyers of the tax credit may not have a tax liability equivalent to the face value of the credit listed for sale. It is common practice for the owner to split the credit into a child asset in the precise amount desired by the buyer.

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<sup>8</sup> <http://nuponixlabs.com/>

In a recent report, Goldman Sachs has reported that they are “exploring NFTs in the context of financial instruments”<sup>9</sup>.

## Pallet - Fractional Uniques

In terms of data structure and functionality, tax credits, commercial leases, and cannabis units all can be modeled as fractional uniques/NFTs.

Each use case requires:

1. Attaching any various data elements or supporting materials (e.g. files)
2. A parent-child relationship:
  - a. Each NFT starts as a root and supports spawning 0..n child NFTs.
  - b. Each child NFT inherits attributes and data from the parent, but may also override them.
3. Numerical constraints may be applied to each NFT, for example:
  - a. Sum of all tax credit children must match the original face value of the root.
  - b. Sum of the weight of cannabis must be tracked and enforced, even what goes to "scrap".
  - c. Face value of a lease is the sum of its years, quarters, months, and weeks.

Just like graded assets above, the pallet will be compatible with the prebuilt Uniques pallet, and possibly the RMRK or other NFT standards to widen reusability.

## User Interfaces

We will build polkadot-{js} style web user interfaces for all functionality. Since these components are general purpose, high fidelity screens and interfaces will be developed by individual use case projects.

## Documentation

We will provide detailed documentation, including step-by-step instructions, on how to use both pallets.

## The Team

[Hashed Systems DAO LLC](#) has significant experience developing and operating blockchain applications across the industry, including in the public domain, enterprise, and banking.



### Project Team members

- Max Gravitt - Architect/Lead and Proposal Author
- Sebastian Montero - Blockchain Engineer
- Abel Yanez - Blockchain Engineer
- Alejandro Garcia - UI Developer
- Other team members as needed

<https://github.com/hashed-io>

## Polkadot Ecosystem

Polkadot's easy to use identity features and generally multi-chain philosophy make it an ideal hub for tokenized real-world assets. We hope our contribution makes it easier for existing businesses to migrate and for entrepreneurs to create new marketplaces in the ecosystem.

All code produced will be MIT licensed.

## Phases

### Phase 1

#### User Story: Asset and Grader Onboarding

User onboarding functionality for registering, configuring, and approving asset graders by an asset class. These tasks will take 180 hours of effort from 4 team members to develop & test, as follows.

| #   | Description                                                                                                                 | Hours |
|-----|-----------------------------------------------------------------------------------------------------------------------------|-------|
| 1.1 | Allow for Gatekeeper to view and approve graders                                                                            | 20    |
| 1.2 | Ability for Gatekeeper to viewing and approving new user (market participant) requests                                      | 32    |
| 1.3 | Asset onboarding functionality for registering, configuring, and viewing new Uniques. Upload files that describe the asset. | 140   |
| 1.4 | Validation and testing, project management                                                                                  | 20    |

### Phase 2

**Time: 4 weeks**

#### User Story: Fractionalizable Uniques

This milestone is for developing the Fractionalizable Uniques pallet. We estimate 128 hours of effort from 4 team members to develop & test, as follows.

| #   | Description                                                              | Hours |
|-----|--------------------------------------------------------------------------|-------|
| 2.1 | Functionality for spawning new child Uniques from a parent               | 38    |
| 2.2 | Ability to inherit and/or override attributes and metadata of the parent | 32    |

|     |                                                                                 |    |
|-----|---------------------------------------------------------------------------------|----|
| 2.3 | Functionality for calculating and enforcing numeric constraints during spawning | 60 |
| 2.4 | Validation and testing, project management                                      | 20 |

## Phase 3

**Time: 4 weeks**

**User Story: Marketplace and Settlement**

**This milestone is for development of the marketplace and settlement processes.**

We estimate 184 hours of effort from 4 team members to develop & test, as follows.

| #   | Description                                                                                                                                | Hours |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------|-------|
| 3.1 | Functionality for an account to list a fractional unique (graded asset) for sale with a specific price.                                    | 24    |
| 3.2 | Functionality to access a fractional unique's lineage and/or descendants, along with all attributes and informational materials/files.     | 60    |
| 3.3 | Functionality to select a fractional unique listed in the marketplace, purchase it at the listed price, or make an offer at a lower price. | 40    |
| 3.4 | Functionality for the seller to accept the offer, paying appropriate fees and commissions.                                                 | 40    |
| 3.5 | Validation and testing, project management                                                                                                 | 20    |

## Total Cost

USD Amount:           \$ 27,300  
 EMA30 DOT Price:   \$ 10.359  
 DOT Amount:           2635

## Contact Information

- Hashed Systems
- [hello@hashed.io](mailto:hello@hashed.io)

## Road Map / Future Enhancements

- Substrate pallet(s) for "NFT Candle auctions" to support expiration-configured pricing
- Support for encrypted files attached to NFTs
- Support for combining multiple fractionalized Uniques into a newly minted Unique