Digital assets value capturing classification theory

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PowerPool protocol

Featuring the upcoming article by Vasily Sumanov and Simon Polanski

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The Problem

> Despite numerous attempts to create token classification frameworks, we still lack an understanding of the value of tokens.

TE Space needs a systematic theory for understanding tokens value capturing

There are numerous classification systems, but none is devoted specifically to categorising tokens based on the source of their inherent (i.e. independent of the wider network) value.

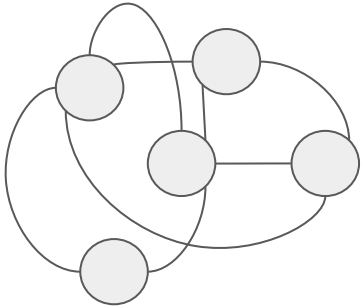
Decentralized networks as value networks

1985, Michael Porter - **value creation chain** for a firm
1998, Stabell and Fjeldstad - **value creation shops** & **value networks**
Now - value networks are decentralized networks & protocols

In decentralized networks the value produced is based on agents' coordination

1. *How does a token capture value from the system?*
2. *What issue does a token solve in the system?*
3. *How is the value captured by a token corresponding to the value produced by the system?*
4. *How can we classify analogies in token models of entirely different decentralized protocols?*

Mindmap: structuring network value



Value network

Mechanism design/policies
solving issues + achieving network goals

Policies and mechanism design defining token functions are predictors for the **origins of its value**

Value capturing mechanism **[VCM]**: combination+interrelation of **origins of value**

Value Capturing Implementation Pattern **[VCIP]** for the particular **[VCM]**

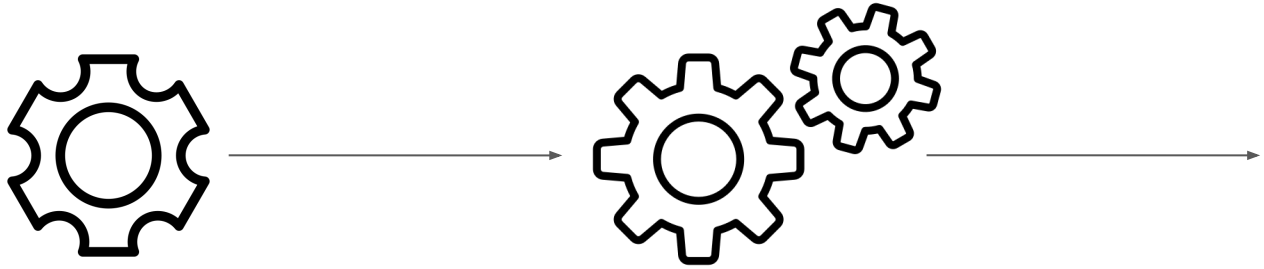
Particular token model: the combination of patterns [VCIPs]

Properties:

1. "Raw" (unstructured) coordination value
2. System goals & issues

Definitions for VCM, VCIP

Origin of Value: an elementary economic pattern, based on a system policy applied to a token, reflecting coordination value and token's value accrual.
Value Capturing Mechanism: a particular economic mechanism, composed from interacting origins of value
Value Capturing Implementation Pattern: code implementation for Value Capturing Mechanism in the particular system/environment



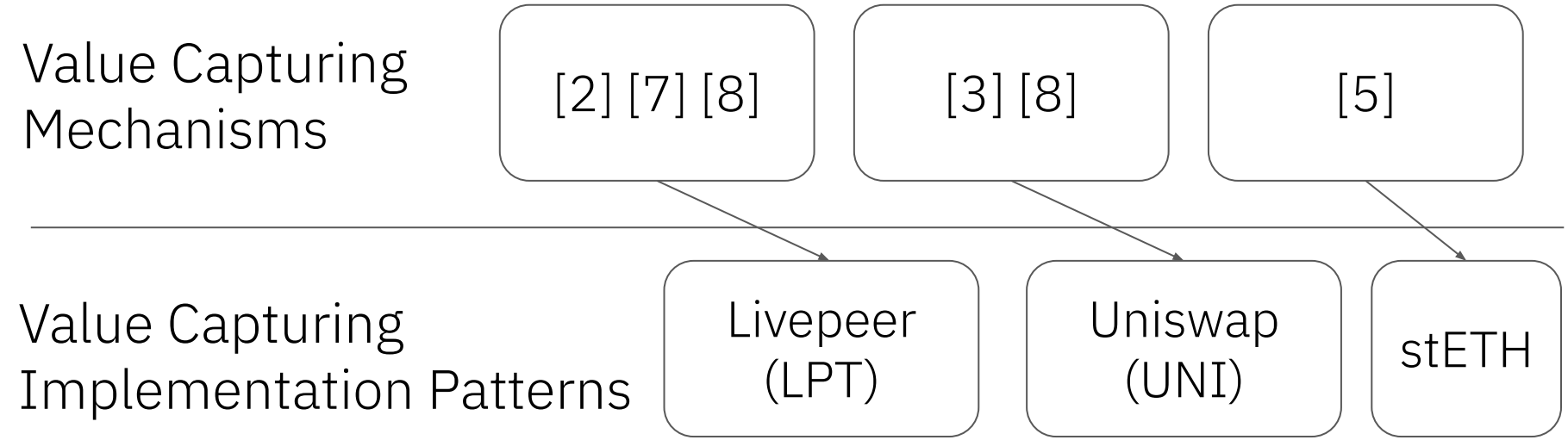
Origin of value

Value capturing mechanism

Value Capturing Implementation Pattern

Three-level hierarchical classification

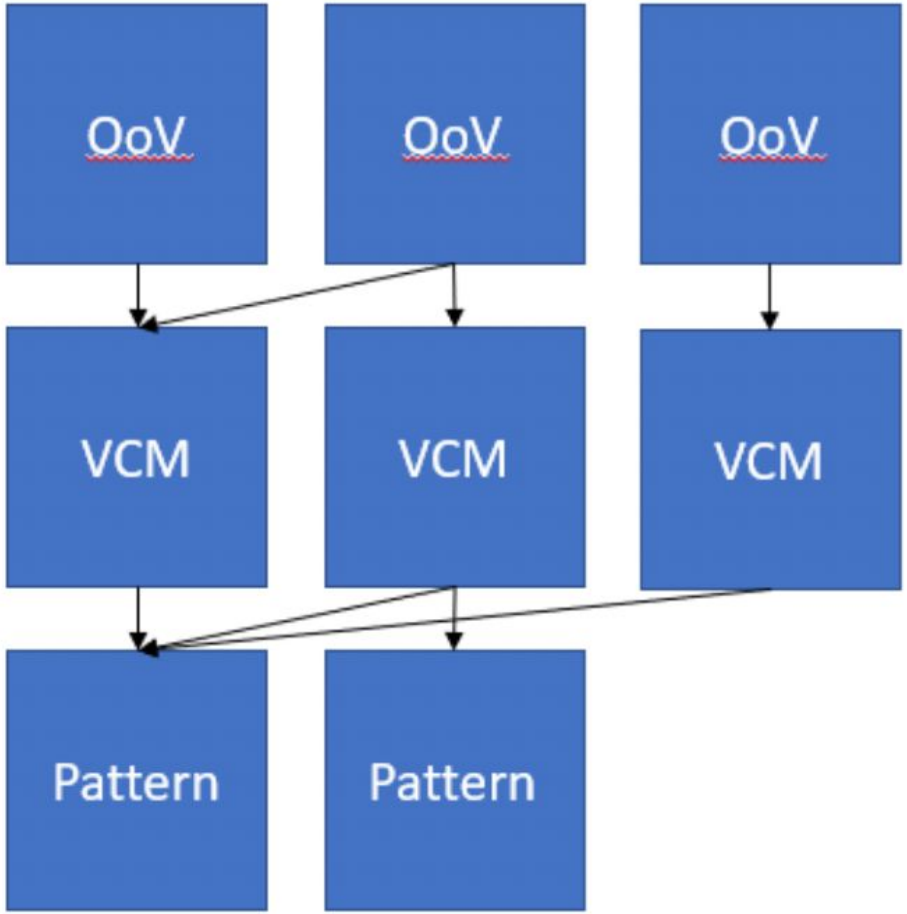
Origins of value [1] [2] [3] [4] [5] [6] [7] [8]



Origins of Value

Value Capturing Mechanisms

Implementation Patterns



Understanding value

Value can be defined as a solution for a particular optimization problem of the form:

$$U = Q(p, x, s, t) - L(p, x, s, t)$$

Q represents:

- the general utility of holding **X** tokens at price **P**,
- given the blockchain state **S** and the holding time **T**
- where **T** it is the time of holding the token in its value-activated form.

Q = utility or “gains” for holder

L represents:

- General risks & costs associated with holding tokens in value-activated form

L = costs & risks for holder

Origins of value: the list

[1] **Value transfer** - value is gained based on the involvement in transactions(settlements)

[2] **Future cashflow** - future income stream exposed by the token, related to the use of the token in the protocol (and not related to the use of it in third-party financial instruments, like LP pools etc.)

[3] **Governance** - value is derived from the unique option to influence the management or distribution of limited resources

[4] **Access** - pure provision of access to some resource without compounding it with any other utility

Origins of value: the list

[5] **Representation** or **'backed by another asset'** - the value is gained by being a representation of a unit of some asset

[6] **Hedonic value/scarcity** - the value of the asset appears as a result of a 'social contract', popularity, or context

[7] **Token-related risk exposure** - Generalized loss/risk exposure as a part of essential way to use asset productively (staking with slashing, etc)
-> 7.1 lock-up period (price-related risk exposure)
-> 7.2 slashing possibility (token-related risk exposure)

[8] **Conditional action** - Generalized loss/risk related to necessity to carry out some actions to use token productively/activate the utility
(such as necessity to provide liquidity in order to activate token utility, or use protocol to get discounts, etc)

What do origins of value depend on?

It can be tricky and is based on the economic nature of origin of value. Let's explore:

What is P, X, S, and T?

- **P** is the token price
- **X** is the number of tokens (or the share in the supply)
- **S** is the state of blockchain/network
- **T** is the time of holding the token in a value activated form

OoV	p	x	s	t
Value Transfer	+	+	+	-
Future Cashflow	-	+	+	+
Governance	-	+	+	+
Access	-	+	-	-
Representation	-	+	-	-
Hedonic Value	-	+	-	-
Risk Exposure	+	+	+	+
Conditional Action	+	+	+	+

Where "+" means "YES, it depends on it" and "-" means "NO, it doesn't depend on this variable"

Widespread value capturing mechanisms

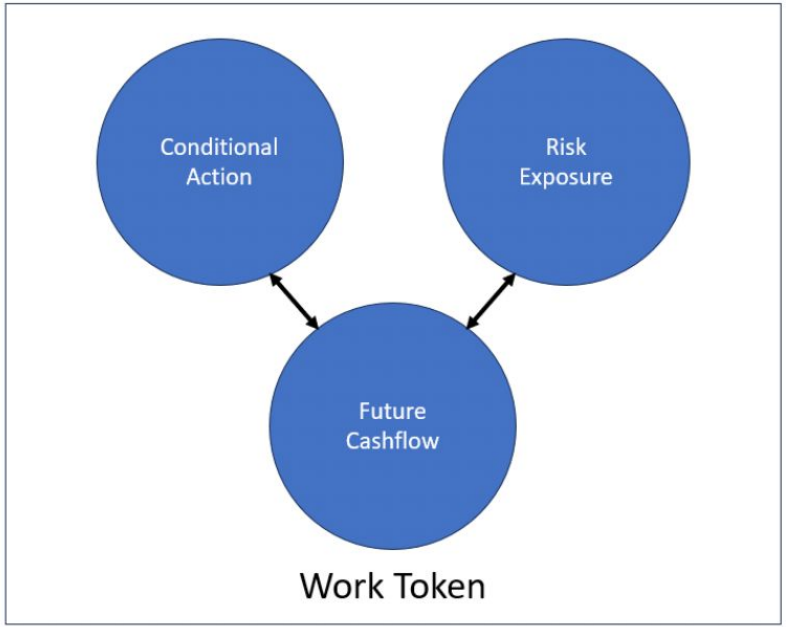
1 [1] value transfer	2 [2],[7],[8] work token	3 [2]*, [7], [8] consensus	4 [2] dividends	5 [5] representation
6 [2], [8] discount	7 [3], [8] generalized governance	8 [5]*N meta	9 [6] hedonic value	10 [4] access

Since each VCM is a member of origin of value power set, there are (excluding the trivial member) **2^8 – 1 = 255** possible distinct Value Capturing Mechanisms.

An example of VCM composure from OoV

2 [2],[7],[8]

work token



[2] Future Cashflow - since the agents are rewarded for task execution, participation in the network exposes to them a cashflow

[7] Risk Exposure - since we wish to impose financial losses onto malicious actors, we require them to first make their tokens available for alienation in case of slashing, as there is no other way to impose said losses.

[8] Conditional Action - since agent reward is conditioned upon task execution as a necessary criterion

VCIPs Value Capturing Implementation Patterns

1 [1]

value transfer

Value is based on involvement in trades/settlements

VCIPs: classic cryptocurrencies (BTC, LTC, XMR, ZEC), ETH 1.0 - PoW Ethereum, payment tokens of networks BAT, LINKv1.0, Helium (circulation is based on mint and burn).

BTC ETH(when it was POW) XMR LINK v1.0, BAT

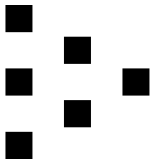
2 [2], [7], [8]

work token

The token allows receiving a cashflow **only** when performing work for the users of the network. There is a Job Owner, providing rewards.

Work can only be performed if there is a collateral in the token (serves as a risk deposit, guaranteeing the honest behavior of the network participant).

LPT
CVP



Gains: cashflow
Costs & risks: staking and slashing

VCIPs Value Capturing Implementation Patterns

ETH ATOM AVAX DOT

3 [2]*, [7], [8]

consensus

Special interaction of [2],[7],[8] origins of value combination and a unique nature of the job

- **No particular Job Owner (the chain *is* a job owner).** The job is set up by design in the initial chain logic.
- **The network itself pays for the job** via an algorithm for job payment (emission + algorithms of fees collection, like EIP-1559)
- **A special nature of job** (proposing and attesting to new blocks)
- **Consumer is largely unspecified**, at least the entire set of chain users, but can be argued to include also the potential chain users; quite close to a public good, in fact).

BNB (in 2017, when it was created) GT (Gate.io token before GT chain)

USDC DAI rETH

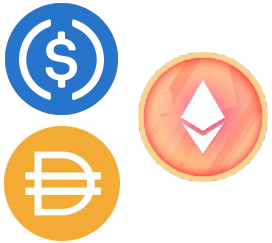
4 [2]

dividends

LQTY

5 [5]

backing



6 [2], [8]

discount

VCIPs Value Capturing Implementation Patterns

8 [5]*N

meta

Origins of value: [5] representation, indirectly any (N representations)

A generalisation of a Wrapped token which can wrap any number of tokens of any kind and compose them with arbitrary additional functionality. One example is a token of an index which combines different yield-bearing options

9 [6]

hedonic value

10 [4]

access

Access NFTs

Also is backed by another asset!
The socks!

5 [5]

backing

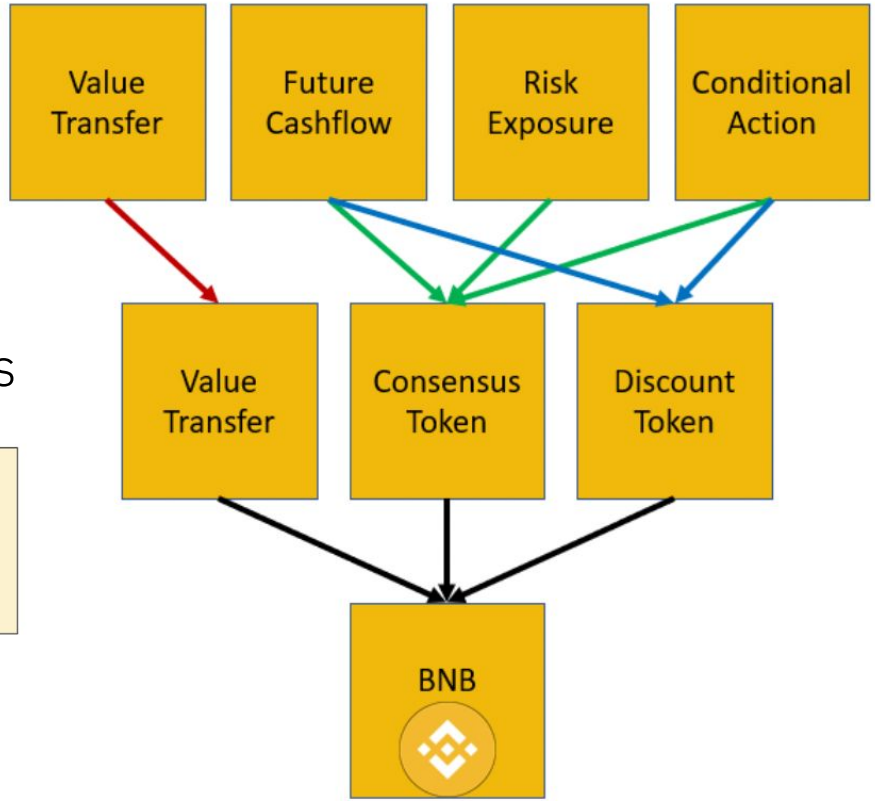
Examples: BNB

Origins of value

[1], [2], [7], [8]

Value Capturing mechanisms

1 [1] value transfer	3 [2]*, [7], [8] consensus	6 [2], [8] discount



More examples (taken from an upcoming article by Vasily Sumanov and Simon Polanski)

Table 3. Token classification examples

Token	OoVs	VCMs	Implementation Pattern	Comments
BTC	1	Value Transfer	Original PoW Bitcoin Blockchain	
ETH	1, 2, 7, 8	Value Transfer, Consensus Token	Ethereum 2.0 PoS system with EIP1559	The original Ethereum PoS consensus
stETH	5	Representation	Lido rebasing staked ETH	The original implementation for granting the Ethereum consesnsus participation proceeds in a gasless way via token rebase model
WBTC	5	Representation	Simple ERC20 version of BTC	ERC20 BTC backed by BTC on Bitcoin with KYC/AML when minting
DAI	5	Representation	Collaterazied debt position	First CDP-based stablecoin

More examples (taken from an upcoming article by Vasily Sumanov and Simon Polanski)

Table 3. Token classification examples

Token	OoVs	VCMs	Implementation Pattern	Comments
LPT	2, 7, 8	Work Token	Work token with delegation option and slashing	Livepeer original implementation of work token with delegation option
LDO	3, 8	Governance	DAO governance token	
FXS	2, 3, 5, 8	Governance, Representation, Dividend Token	Frax Share model	
MKR	2, 3, 8	Governance, Dividend Token	Original MKR governance and protocol fee burining implementation	Indirect dividends via MKR token burning as protocol fee payment (DAI's CDPs interest rate)
AAVE	2, 3, 7, 8	Pooled Insurance + Governance	Original AAVE implementation of governance and protocol pooled insurance (the Safety Module)	
CRV	2, 3, 7, 8	veToken	ve token model by Curve	The original voter-escrowed model with governance rights granted proportionally to the duration of the token lock-up
CVX	2, 3, 5, 8	Metagovernance	CVX meta-governance implementation	The original model based on accumulating veCRV and transferring voting rights to vlCVX token holders
LQTY	2	Dividend Token	Pure dividend token granting pro rata shares of protocol income	LQTY original implementation of governance-minimized protocol token

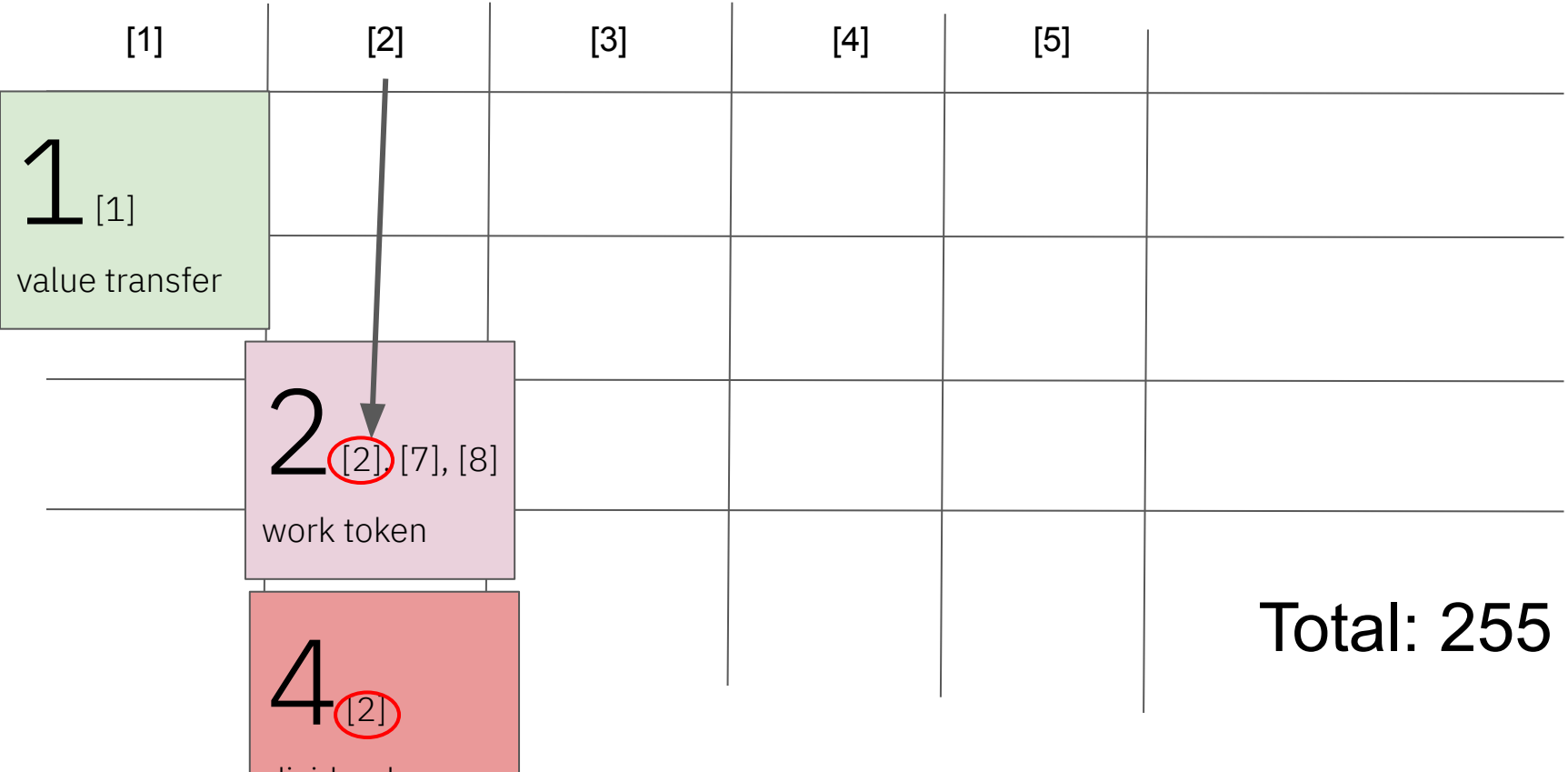
TDLR

1. a novel hierarchical demand-side classification of tokens/Value Capturing theory **is presented**

2. root of all value lies in promotion of some desirable agent behaviour, and **Origins of Value** are the principal pathways along which this promotion is carried out

3. The theory can be used for decomposing existing tokens and understanding their value **OR** designing new tokens

Ultimate goal: the periodic table



A special thanks

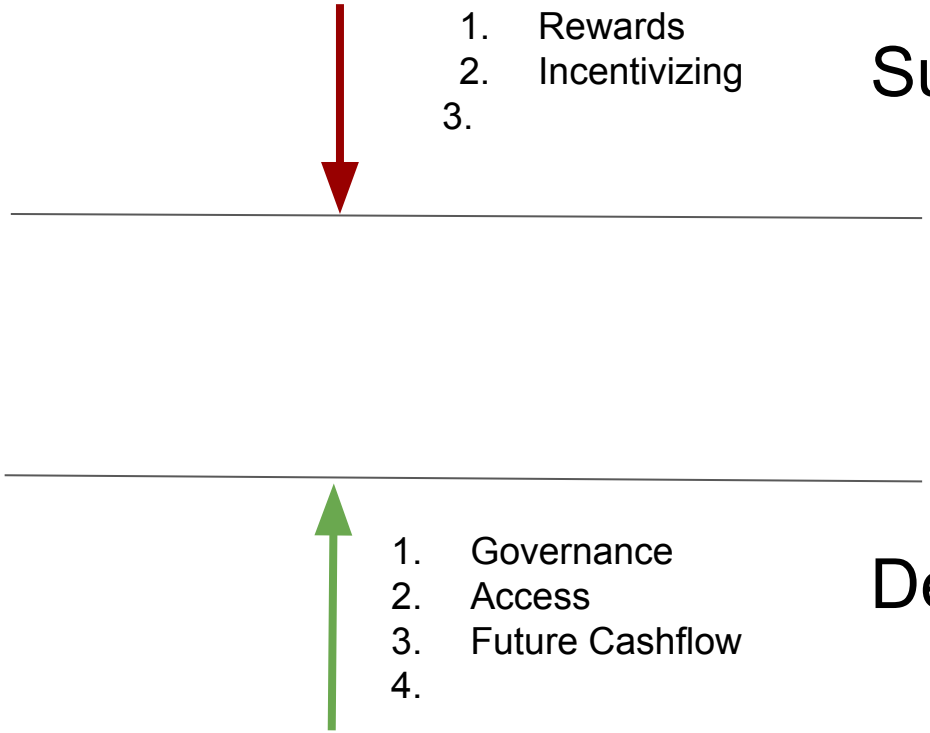
Token Engineering Academy

Token Engineering Community

PowerPool Protocol

Questions or ideas? Drop DM to twitter.com/vasily_sumanov

Paper Draft:
https://drive.google.com/file/d/1Z8NokKZCWPRw4manBU7aFbTgrV6lRuEx/view?usp=sharing



Supply side tokenomics

Demand side tokenomics

General considerations

For understanding value capturing, we should focus on the demand side

Recognize separate origins from which token's value is derived

Understand how **origins** interact/create a new economic pattern (VCM) is there are >1 Origins of Value for the token

Understand how **VCMs** are combined into a particular token model and what value is behind it