Investment Mining and Principles of the DICE Economy

The "*Investment Mining*" concept is one of the biggest breakthroughs in DICE.

Investment mining refers to a process in which currency units are being created while at the same time value for a designated entity is also being added. What this means in essence – you create money for yourself, but at the same time raise the valuation of a selected business of your own choice.

For simplicity in the representation we talk about "business" although in reality that could be just about anything – an actual business, a charitable organisation, a single individual, or even a whole country. In the DICE ecosystems any unifying node which is forming its own cluster is called "*operator*".

In order to explain better the investment mining we need to take a step back and repeat some of the key elements about how DICE is mined in first place.

DICE is mined in a process in which the "miner" tries to compose such fixed length sequence of bytes, so it conforms to a certain set of rules. The process normally requires a very large number of iterations repeating with different byte sequences until a valid one is found.

DICE mining uses two externally fed parameters – "global complexity" and "local complexity".

The global complexity is a single number which defines the difficulty of mining DICE globally. In addition to it the local complexity is another number which can only vary within a certain small range from the global complexity. That number is set by every operator individually, and defines the minimum value of a valid unit associated with that particular operator.

Scraping

The key element in the investment mining concept lies in the "local complexity" value, and more precisely – in the difference between it, and the absolute global minimum.

Let's visualise this with an example:

Let's assume the global complexity of mining a unit with value DICE is set at 44 bits. The local complexity can only spread in the range of plus or minus 10 bits from the global one. In the exact example that means operators have the

freedom to set their own "local complexities" ranging from 34 through 54 bits. Anything outside of this range will not produce valid DICE units.

Let's imagine an operator has set their own local complexity at 37 bits. This means the minimum value of DICE associated with this operator will be $2^{(37-44)}$ DICE, or 2^{-7} DICE. This is a value of 0.0078125 DICE. The operator will not validate any associated mined units with value lower than this.

The global limit on the other hand is not controlled by the operator. It is a fixed number exactly 10 less than the global complexity level, or in this case – 34 bits.

That means the absolute global valid minimum DICE value is $2^{(34-44)} = 2^{-10}$ DICE, or 0.0009765625 DICE.

There is obviously a difference between what the operator considers as valid minimum value for associated units, and what the global valid minimum value for a unit of DICE is. A miner who is mining for the particular operator would not be able to validate with it any unit with value lower than 2^{-7} DICE, and equal or higher than 2^{-10} DICE, although in fact it will be a completely valid unit of DICE in global aspect.

Those "rejected" DICE however are not lost. They are still valid globally, and are in fact the value that the miner raises for this operator. Every other mined DICE with equal or above the operator's local complexity, gets successfully validated by the operator, and given to the miner.

This scheme allows the operator to "scrape" the units which are not passing the pre-set minimum, but are still valid globally, white the miner gets the rest.

The obvious question arises "Why would a miner want to mine for an operator with minimum complexity greater than 2^{-10}?"

The reasons for this could be a variety of preferential options given to the miner when dealing with the particular operator. They could be brand support, or could be also completely speculative.

On the other end a similar question - "Why would an operator want to set a local complexity at 2^{-10}?"

Obviously at par with the global minimum there will not be a possibility for scraping for such operator, however apart from marketing and promotion reasons, it could still have options for raising in another ways mentioned below.

Donation Mining

As the name suggests this is mining done on behalf of an operator with all mined units going to the operator. There is no financial incentive for the miner in this case. Such scenario can be used by charitable organisations or ones who offer loyalty benefits.

Valuation Collateral

Due to the specifics of DICE mining, the process inevitably leaves a unidirectional digital signature data block called "*prototype*" in possession of the operator for every mined currency unit.

Prototypes are not tradeable as DICE units, however they are proof of already done work for the particular operator, therefore holding inherent residual value up to 50% of the actual value of the original unit.

The reason for this halving is because the creation of a prototype requires exactly half the amount of the work needed for the creation of an original DICE unit.

Since prototypes are proof of work done exclusively for the operator, they can be considered as legal stock in a commercial entity, therefore can be used by the operator as collateral in credit deals. In a bad case the creditor would then be able to assume full control over the validation of those prototypes, and in fact acquire a stake in the business up to their total value.

Acquisitions and Discontinuation

Already mined DICE units are impossible for modification, therefore once mined, every DICE will hold the operator's address in its data forever. When an operator acquires another operator it also acquires its entire prototype database. Therefore the new owner will need to continue emulating the original operator in deals with the already existing units, although further mining for the old operator address could be disabled.

In case of an operator going completely off grid, there wouldn't be a validation authority for the DICE associated with the particular operator. Transactions will lack the "third side" of the witness. Therefore all DICE units associated with this

operator will not be tradeable anymore nor any new ones would be possible to be mined.

This potential outcome serves as immunity against dodgy operators in the ecosystem since miners would be naturally less attracted toward raising for businesses with unclear future.

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