# Proof of Equilibrium
# - Debate3 -
# Make ‘em Stay

**General Problem :**

Anyone can create over 100 forums with different addresses but still be the same person. He is “digitally” / “virtually” proven to be different (0x1 differs from 0x2) but still the same Human person. This is the problem of multiple false identities.

**Solution we are providing :**

Staying active in a forum is something that has not been doable, since each forum tends to close if the hype diminishes also. We intend to make our forums sustainable and viable for the long term by eliminating the number of false identities and adding the Proof Of Humanity concept done by reality.eth. In this case we can have only real humans and verify that 1 = 1.

But even if we have a Proof Of Humanity, how can we make sure that our members will not be upset, going through a forum where no one hasn't really met the other in real life and where the disputes are usually very frequent. This is done by incentivizing our members to be active but not only for the goal of having a continuous stream of data messages flowing inside the forum. It is by combining the Proof Of Humanity and the Proof of Moderation that we can achieve that.

This diagram is an Explanation of what we have created as a debate3 App. We are calling it : **Proof of Equilibrium**

**Rational explanation :**

We are using the time as parameter t , and _impact as the variable following the reward mechanism implemented by debate3, and _partipationRate the ratio of

the involvement of a member of the forum multiplied by his _ScoreReputation. We then have :

*_impact (t) = _scoreReputation * _participationRate (%)*

If the _scoreReputation goes up, then :

- If the _participationRate goes up, the _impact is increasing by X.
- If the _partipationRate goes down, the _impact is stagning (1)

In case (1) , the impact is approaching 0, which means that debate3 is down, and this is something that is not sustainable for a Forum in the long term.

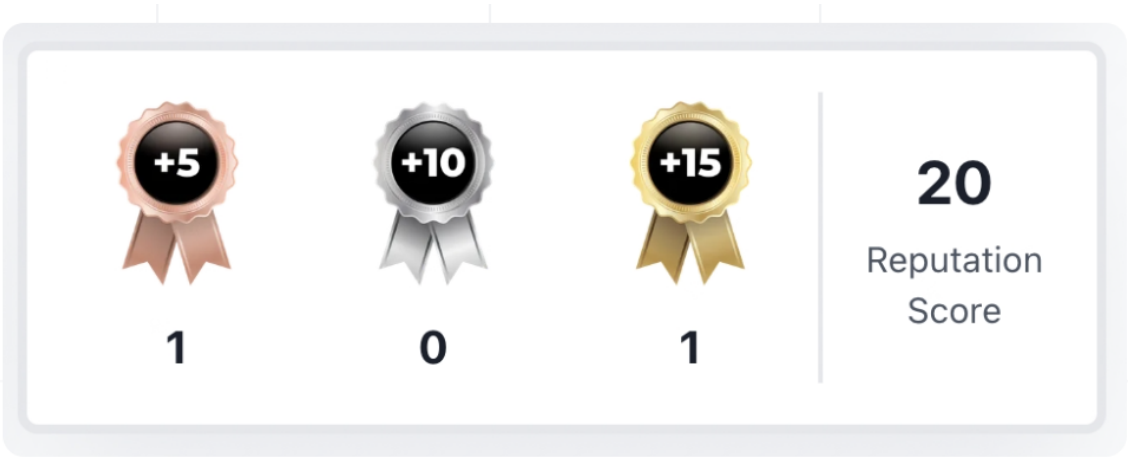
If the _scoreReputation goes down, then :

- If the _participationRate goes up, the _impact is stagning (2)
- If the _participationRate goes down, the _impact is negative (3)

In case (2), the impact is approaching 0, similar to case 1, absence of sustainability of the Forum.

In case (3), the impact is negative which shows that both _scoreReputation and _participationRate need to keep growing over time (t) for the Forum to be sustainable. That is why we are implementing ERC1155 badges that are represented by the _participationRate. In fact :

Where n is an integer representing  +5 , +10 or +15.




_scoreReputation(t) = badge_score + _scoreReputation(t-1)

When (t) goes up, the badge_score is the only constant and over time has a slight impact on the reputationScore. This shows that another parameter is crucial for the _reputationScore to keep growing.

In fact, the time will be impacted as shown in (1), (2), (3) by the combination of the two factors : _participationRate and _scoreReputation.

As a matter of fact the Proof of Equilibrium is following this equation :

_impact (t) = _scoreReputation * _participationRate (%)

**The Proof of Equilibrium** is a specific related formula only for the use case of the participation of Humans and their activity in the digital area and cannot be applied everywhere.
For example in the use case of the release of CO2 where the _scoreRepuation is similar to the quantity of CO2 released and the _participationRate to the number of kilometers browsed. In this fact, we are looking to reduce the _impact over time. If we browse more kilometers we necessarily release more CO2, so the impact is not reduced.

The Proof of Equilibrium is designed specifically for humans, that is why to be applied we need to make sure that a _scoreReputation member X is not biased by being different for different public keys specific to one human. In fact, Bob can have multiple addresses in which :

| Address | _scoreReputation |
|---|---|
| 0x1 | 100 |
| 0x2 | 400 |
| 0x3 | 30 |
| 0x4 | 10 |

If Bob wants to behave at a certain way in the forum he will use an address of those 4 and biais his involvement in the forum, and by that can pretend to show interest for a certain amount of time and then disappear.
Bob can then have a _scoreReputation of 30 and be active on other forums. We are by then giving a _scoreReputation to an address and not a real person.

**Technology deployed to solve the problem :**

We are using reality.eth :

- Quickly arrive to find the  identity of a person : proof of Humanity.
- Anti-sybil attack with an identity system.

We are using ERC1155 for the badges that represent the _scoreReputation. In that sense, each member previously verified to be Human, has his _scoreReputation decentralized and stored in his account. No one can take his _scoreReputation from him apart from the time that will make him lose it under some conditions (_participationRate that diminishes ).