COCO white paper

December 21, 2018

Abstract

Coco is a decentralized, autonomous, anonymous, open-source, for-profit, platform for online collaborative projects based on virtual shares.

What does COCO try to solve?

- A company's **stock prices** are determined externally by the free-market ("invisible hand")

- How the company distributes its **shares** are decided internally; This is where COCO tries to innovate.

Real-name vs anonymity

All contribs are anonymous by default; Users can use their real names optionally.

Shares

Contributors get shares automatically when peers vote up their contribs.

When an outside **investor** puts money into the company, his contrib is treated just like any other contrib. His investment earns him an amount of shares determined by existing share-holders in the project. This price may vary depending on the investor's outlook for the project.

Branching

Branching occurs when there is a dispute whether to include a contrib or not.

After branching, all previous contribs up to that point are included in the new branch. Then users decide which branch they want to contribute to.

Voting scheme

Votes (also called ratings) can be any number $\in [-1, 1]$. They represent the % (percentage shares) a user wants to give to a particular contrib.

All votes are visible for public scrutiny.

If some features (contribs) are seen to be voted unfairly, share-holders may initiate new branches.

Buying the product

Buyers pay for the project's end project, which includes all its branches.

She can choose to deploy any branch for her usage.

By paying for the product, buyers automatically become share-holders.

Buyers have the right to up/down-vote features (contribs) just like other share-holders.

Potential problems and possible solutions

The problem of free-riders

In principle, if a founder hoards shares without performing useful work, his shares in the company should be reduced. But how could we distinguish between lazy free-riders and someone who has high standards for other people's work?

A possible solution is via **branching** when founders disagree with each other.

The essence of branching is: to preserve both options in a disagreement.

1. branch A accepts new contrib X
    (a) X is a good contrib
    (b) X is a bad contrib
2. branch B rejects new contrib X
    (a) X is a good contrib
    (b) X is a bad contrib

In cases (1b) and (2a), branch 1 and 2 should be penalized respectively.

Obviously, there should exist users who can determine which branches are better, but in practice there may be too many branches to consider. Users may be unable to tell which branches are contaminated with free-riders.

However, if all votes are openly visible, then statistically we may believe that good branches will win out eventually.

Insider attacks

Typical scenario: a sub-group of insiders systematically up-vote themselves and down-vote outsiders. They share their identities and contribs among themselves, contrary to COCO's anonymity intention.

Solution: If some users see their contribs are not voted fairly, they may initiate new branches.

We may have an additional feature to penalize bad voting?