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## Overview

Aartum is envisioned as a platform for an ecosystem of technologies and activities in which communal benefit (such as, conceivably, all UN SDG outcomes) is the basis of value and can be reported, verified, tokenised, traded and retired.

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One-sentence summary of Aartum.

Regarding the name 'Aartum':

In a large variety of languages including Afrikaans, Arabic, Danish, Dutch, English, German and Hebrew the letter sequence 'a-r-t' constitutes the root for the word 'earth'.

It also occurs in inverted form, in the languages deriving from Latin (where the letter sequence is then 't-r-a').

We chose this name because we intend the platform to be used for communal benefits pertaining to all aspects of life on planet earth.

Re slogan "real value": "real" vs "imaginary" value of cryptographic tokens.

## The concept

- Similar to environmental credits and PES
  - Entities, activities and outcomes
  - Standards and methodologies
  - Verification
  - Issuance
  - Trade/retire

...but for outcomes under all SDGs, not just under Climate Action (SDG 13).

- Blockchain

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People/entities undertake activities that aim to achieve certain outcomes. During the course of an activity the activity operators measure their progress according to certain standards and methodologies. An independent evaluator evaluates those measurements and if the activity is found to comply with all the criteria set out in the methodology, the activity is issued with credits under the outcomes that it had achieved. Those credits can then be traded or retired.

The whole system will be hosted on a blockchain.

## Distinguishing aspects

- Fundamentally open development of standards and methodologies
- Decentralised verification
- Tokens that are fully fungible yet unique
- Importance of SDG 17

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Similar initiatives do exist; there are, however, four aspects of the Aartum platform that distinguish it from similar initiatives.

## DA1: Fundamentally open standards and methodologies

Development of standards and methodologies will be subjected to the principles of:

- Openness
- Identity
- Reputation

Wikipedia – example of quality in an open system

Stack Exchange – example of an open, reputation based system

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Openness – in principle anyone in the world can contribute to the development of the standards and methodologies;

HOWEVER contribution is tied to identity and reputation:

You need to operate under a consistent identity and that identity carries with it a reputation.

If you make a good contribution, your reputation will increase (as other contributors upvote you); if you make a bad contribution your reputation will decrease (as other contributors downvote you).

The extent to which you are allowed to participate in the different phases of development of a standard or methodology is determined by your reputation score.

So instead of trying to manage this from the top (like the Gold Standard, VCS or UNFCCC), we want the process to be managed and driven by a global, decentralised community.

Reason: the task resting on the shoulders of the human race to achieve the UN SDGs is far too great, too urgent and too complex to be placed in the hands of a few individuals. The amount of resources, time and innovation required to make that possible is much greater than will ever be accessible to a limited group of individuals. We need the energy and expertise of every single individual who wishes to contribute to this – even if they can only do so in their free time.

Usually the first question that pops up in people’s minds is the one about quality. How can we be sure that a radically open, self-curated community will be able to produce standards and methodologies of usable quality?

Well, Wikipedia is a good example:

- Wales-founded Nupedia: an earlier project to produce a free online encyclopaedia ... but they had this closed group of highly qualified volunteer contributors and an elaborate multi-step peer-review process.
  - Despite having quite a number of volunteer contributors plus a full-time editor-in-chief...the writing of content for Nupedia was extremely slow, with only 12 articles written during the first year.
  - There was considerable resistance on the part of Nupedia's editors and reviewers to the idea of associating Nupedia with a wiki-style website.
  - Sanger suggested giving the new project its own name, Wikipedia, and Wikipedia was soon launched on its own domain, [wikipedia.com](http://wikipedia.com), on Monday 15 January 2001.
  - In the first year of its existence, over 20,000 encyclopaedia entries were created – a rate of over 1,500 articles per month.
  - An article in Nature Journal (December 15, 2005 issue) "Internet Encyclopedias Go Head to Head," revealed the results of expert comparisons between Wikipedia and its major peer, Encyclopaedia Britannica. The study found that "Wikipedia comes close to Britannica in terms of the accuracy of its science entries“.
- Wikipedia's worldwide monthly readership was approximately 495 million by September 2018.
- ~ [https://en.wikipedia.org/wiki/History\\_of\\_Wikipedia](https://en.wikipedia.org/wiki/History_of_Wikipedia)

Reputation will be domain-based: your reputation score for e.g. developing methodologies pertaining to SDG-4 will be distinguished from your reputation score for developing methodologies for SDG-9.

Physical verification guided by standards and methodologies

What really happened? (Activities)

Wouldn't it have happened anyway? (Baseline)

Who is really responsible? (Agency)

Easy to verify the **integrity** of data on the blockchain; much harder to verify the **accuracy** of the data.

Thorough, physical verification of captured data is therefore essential.

## DA2: Decentralised verification

Verification will also operate under the principles of:

- Openness
- Identity
- Reputation

“Bottom up” approach with layers of (human and analytical) quality controls

Concept similar to Uber

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Openness – anyone can become an Aartum verifier (like anyone can become an Uber driver).

Identity – Uber drivers have to register their real-life identities on a public platform; Aartum verifiers will be required to do the same.

Reputation – Aartum verifiers will have reputation that can increase or decrease based on their performance and conduct, affecting how likely they are to be used in future by other activity operators.



## DA3: Trading tokenised outcomes

Tokens must be highly liquid

Main challenge: determining the value of a token

e.g.:

- converting 1 tonne CO<sub>2</sub> equivalent to ART
- converting 50 child immunisations against measles to ART

Tokens will therefore be issued with

- face value
  - info tag
- (analogy: posting stamps)

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People should be able to buy a cup of coffee with Aartum, just like they are doing with Bitcoin or loyalty shopper points.

A central problem to be solved for Aartum to be used as a general means of exchange is how to determine the relationship between the specific SDG-related units of measure (such as tonne CO<sub>2</sub>- equivalent for Goal 13) and the face value (in ART) assigned to that outcome at issuance.

Proposed solution:

Info tag: contain details of the provenance, the verification process and a quantification of the SDG-related outcome achieved in its appropriate unit of measure.

Face value: calculated from the mean of the recent transactions for comparable outcomes.

This should allow everyday trade as well as speculative/investment trade.

Post stamp analogy: similar the relationship between the face value of a stamp and its value to a collector. In normal usage (i.e. for posting a letter), the value of a stamp is its face value but a certain stamp may be worth much more to a collector due to some specific property of that stamp (e.g. its scarcity or being part of a batch with a rare printing mistake).

## DA 4: The importance of SDG 17: Partnerships for the goals

The approach of Aartum is to maximise broad participation

The token of SDG 17- related outcomes is special because it rewards participation in the development and functioning of Aartum itself

Incentives through 'put' options for specific SDG 17-related tokens

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Put options = bounties.

## Technical implementation

- Two blockchains – Accounting and Trading
- Hyperledger Sawtooth
- PoET consensus
- Standards > methodologies > data-structures, data-capture & verification procedures > transaction processors > tokens

Whitepaper accessible at [www.aartum.io](http://www.aartum.io)

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System will be a hierarchy of elements:

- Standards describe valued outcomes and their units of measure related to the SDGs as well as the broad rules for their reporting and verification
- Methodologies apply standards to a specific activity type
- Data from operation and verification activities are recored structured according to procedures described by a methodology in a specific format (data-structure)
- Transaction processors process the activity and verification data into tokens according to the methodology
- Tokens

## Use cases

- Voluntary SDG or environmental contribution
- Accounting and public reporting
- Offsetting
- Asset-based currency
- Environmental compliance
- Outcomes-based government
- Conservation of pristine areas
- Gaming

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Conservation of pristine areas: Brazil can capitalise on Amazon by conserving it rather than destroying it.

Games: especially world-building games, such as SimCity, Minecraft, Clash of Clans, Fortnite Creative, Age of Empires.

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