**WHITE PAPER**

# UNIVERSAL PLASTIC®

Decentralized platform to manage data derived from plastic waste collection in the environment

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## Executive Summary

Unlike general belief, plastic market is set to grow during the following years. The Paris-based International Energy Agency expects plastic production to reach some 540 million metric tons by 2040, while Oil companies plan to invest $400 billion into new petrochemical plants to cover and generate plastic demand. That increase will account for around 45% of total oil demand.

The active life of plastic in the modern world, as well as its presence in marine and terrestrial ecosystems, can affect the carbon and $CO_2$ cycle in various ways, such as:

**(i) Accumulation of $CO_2$ in the atmosphere** directly after incineration, at a rate of 2.9 tons of $CO_2$ for every ton of plastic burned. Most of it is plastic of the PET type (polyethylene terephthalate), which after being collected from the environment can reduce emissions by recycling these plastics by between 30 and 70%.

**(ii) Accumulation of $CO_2$ in the atmosphere indirectly** through processes in the carbon cycle that include emissions of methane and polyethylene derived from certain types of plastics. Low-density polyethylene (LDPE) increases emissions during its useful life, and in the sea increases gases associated with hydrocarbons. Emissions continue throughout the plastic lifecycle, in particular in contact with sunlight, and water. As the plastic degrades, it is converted into micro plastics, increasing the emissions owing to the higher surface-area exposed.

**(iii) Impact of micro plastics on marine ecosystems** due to "domino" effects through the reduction in the growth of plankton due to the direct impact of plastic and derivatives in the photosynthesis process. Plankton is the major global responsible for transferring $CO_2$ from the atmosphere to the ocean, and sinking that $CO_2$ in the form of carbon to the sea bed.

Marine ecosystems generate approximately 50-80% of the terrestrial oxygen ($O_2$), which comes from micro algae that float in the oceans, as well as bacteria and organisms that carry out photosynthesis. Likewise, they absorb between 2 and 3 billion tons of carbon dioxide ($CO_2$), which is equivalent to 31% of anthropogenic (human-induced) emissions, globally.

That is why it can be said that the direct and indirect $CO_2$ footprint that plastic leaves behind does not end when the plastic itself is manufactured, but, that it is an increasing curve throughout its active life in our planet. Thus, the importance of closing the circle of plastic waste management through traceability systems that reveal the true uses and routes that plastic follows. This would facilitate a record and a greater control over the cycle of the $CO_2$ footprint produced by plastic waste, as well as an increase in individual responsibility (organizations, companies, users, businesses, people, etc.). The correct use of traceability systems could legitimately avoid or quantify the pressing need of plastic production and consumption, as well as stimulate greater environmental awareness in the sector thanks to incentive systems.

The main problems conditioned by the gaps in information systems, are:

- Technical deficiencies in the data treatment process (origin and traceability) during the manufacture of plastic and its derivatives

- Lack of protocols and unified methodologies for capturing polluting waste from the various marine and terrestrial ecosystems

The data and traceability generated by plastic had never before been analyzed from the perspective of data management, its value, transfer and its subsequent monetization to generate value markets of commercial data for different stakeholders interested on its exploitation.

Herein, we present **Universal Plastic®**; a decentralized data management platform linked to a plastic collection protocol. The platform uses an incentive scheme, Blockchain technology, and an electronic data interchange (EDI) to convert data obtained during plastic collection (the “underlying”) into exchangeable commodities (“tokens”). These tokens represent plastic footprint credits, and are tradeable. The platform facilitates the creation of consensus truthfulness of information, and establishes a responsibility regarding the traceability of plastic waste from its collection in the environment to its recycling.

## 1. Introduction

Nowadays, the generation of responsibility during plastic waste management under a technology that allows autonomy is difficult to generate owing to the absence of trusted data input protocols. The credibility and trust of third parties depends on the way in which information is stored or is muted with adequate responsibility, and according to the value of the data.

The treatment of information and its value around environmental plastic waste collection processes leads to a data exploitation pathway that can allow different contributions to a market “value”. To this end, it would be necessary to correctly develop the input flow and data collection under incentive schemes. These will generate origin and traceability outputs that will allow a sustained and quantifiable results, thus enabling us to capitalize these processes based on environmental variables generated in different territories and differentiating the environmental impact. In turn, a transformation of value could be generated for future processes with a wide variety of applications.

The disruption of current plastic monitoring systems thanks to Blockchain technology, produces from the genesis of the data, weighted and unique labels for future uses in a systematic way. This unlocks the data value allowing their use as tokens. Our objective is the tokenization of information as a tradeable unit, giving traceability from the origin. The data generated during physical plastic surveys (the “underlying”), and their conversion into tradeable tokens, will generate an incentivized increase in plastic collection from the environment.

## 2. Objective

The challenge we face is to structure a legitimate input data matrix from the origin (physical plastic collection from the environment), by providing dynamic data capture formats. At the same time, we aim to audit and process the information using artificial intelligence (AI) algorithms. Owing to the nature of the information involved, we use public Blockchain technology, so that the records are made with different consensuses, and then be able to proceed to their subsequent call.

All parties involved require adequate guarantees in the processes that take place on the platform, especially the quality of information that is processed. To this end, data entry protocols require certain identification and verification labels.

Our mission is to provide a decentralized plastic information governance system in order to decrease both environmental and social footprints.

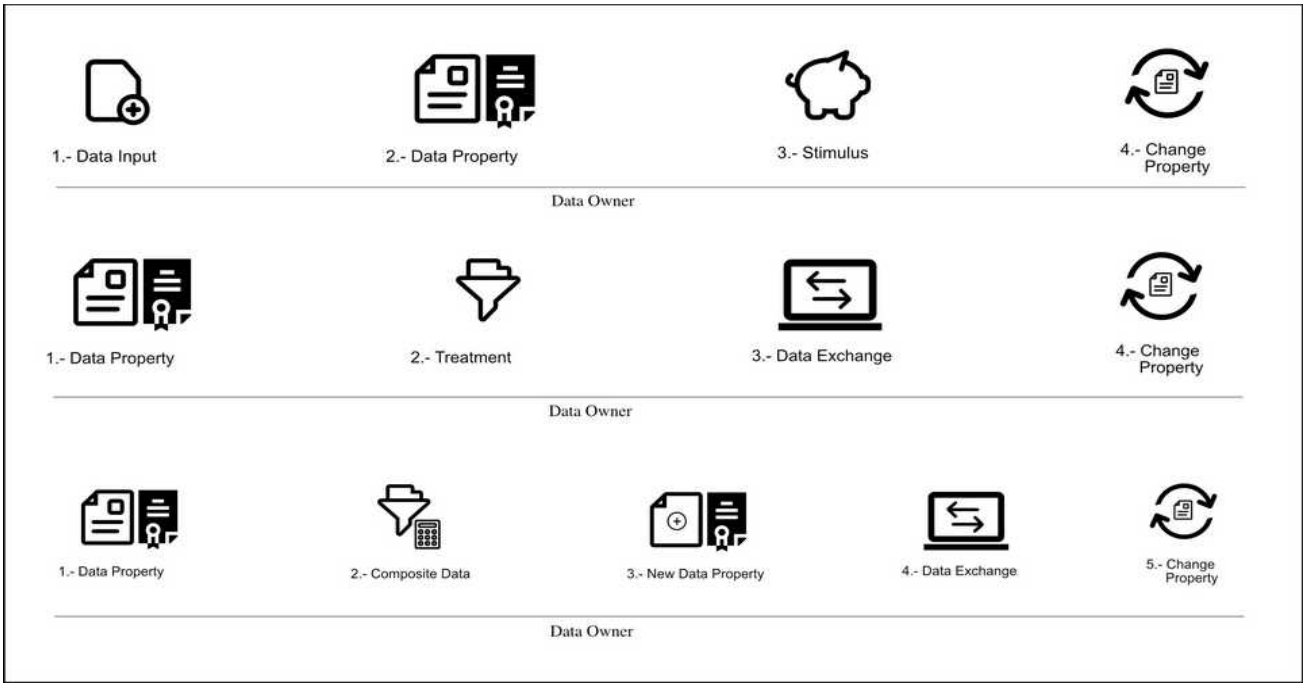



**Figure 1.** Data entry and change of property

## 3. Our proposal

Our solution allocates “responsibility” thought data. Agreeing on its registration is the key that the property issues, which can be exchanged or simply give the appropriate permissions in controlled environments for its use.

Structuring composite data obtained under the characteristics of the protocol, will allow to expand the power of the data, executing blockchain sequences in certain timelines for specific purposes.

Our value proposition is to be able to monetize the power of data. This will be diversified to functional information needed during processes involved in data registration, and based on a decentralized consensus protocol between different parties. This allows to legitimize data, thus providing the appropriate value to each data input.

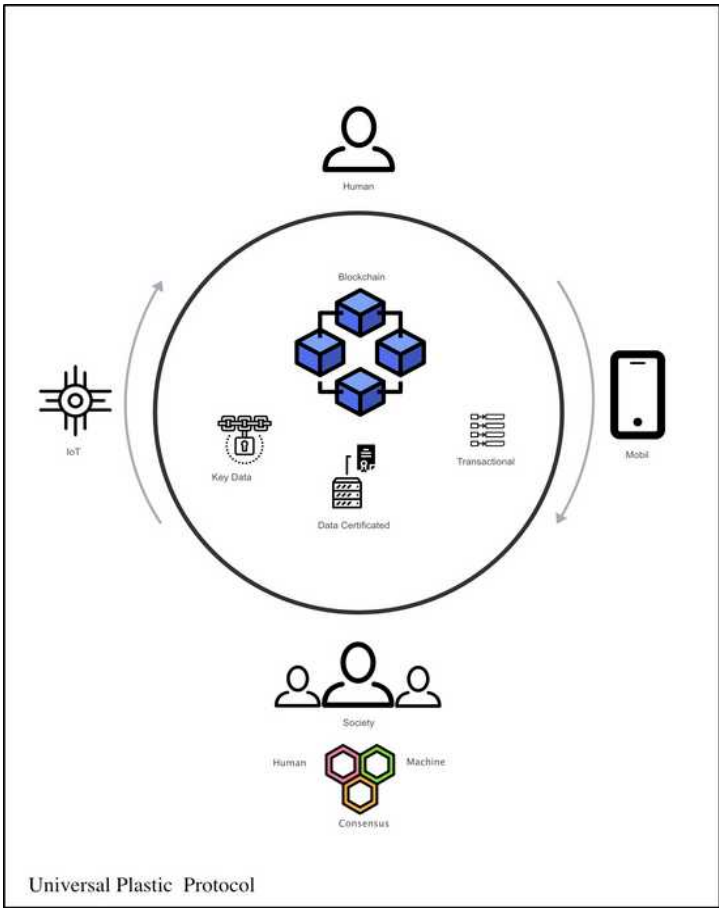



**Figure 2.** Proposal and solution

### 3.1 UNIVERSAL PLASTIC® - Protocol

The plastic management process, prior to its registration as tokenizable information, can be started in various ways: through individual collections, organized collections, collected through industrial initiatives (public and private), or any type of collection or initiative that brings plastic together.

After collecting the plastic, it is must be spread on a surface and scanned through the UNIVERSAL PLASTIC® platform, which uses an Artificial Intelligence (AI) algorithm to quantify, classify, and audit the collected material. We process the input information with another data quantification algorithm which, considering the different variables of the collection protocol, conducts the tokenization process.

Parallel to the registration of information for tokenization, a series of data with scientific value is generated (geolocation, size of the sampling territory, sampling time, environmental conditions, type of plastic, etc). This is stored in a database, and is used to monitor plastic in the environment.

Once the tokenization process is finished, the collected plastic is taken to the nearest management point and this information is registered, varying with the collection geolocation. This way, the plastic waste is considered cleaned and the token is generated for later commercialization. The token now receives a value, and the user gets an incentive for collection.

### 3.2 UNIVERSAL PLASTIC® - Tokens

The data tokenization process is directly related to the origin data, costs to obtain data in real-time, incurred during platform management, Blockchain registration cost, and other process adds variables value during the process.

*Utility Token (UPT)*

This token is an incentive for the physical plastic collection, and its conversion into valuable information. We can quantify how many UNIVERSAL PLASTIC® Tokens (UPTs) correspond to such information, using algorithms and account units (tokens).

### 3.3 UNIVERSAL PLASTIC® - Platform

*Platform as a Service (PaaS)*

Through our platform we allow users to exchange data with specific characteristics, managing its intrinsic value or as unique (raw) data. It is also possible, based on appropriate requirements, to structure compound data equations for specific purposes, providing the appropriate participation to its owner.

It is fundamental to register the encrypted metadata, associated to digital IDs in a data sequence, to allow transferring data creation responsibility, and its subsequent categorization.

The platform works following a machine-human consensus protocol for the registration of information. Our algorithm validates which data will be processed and registered in the Blockchain in the form of a cryptographic fingerprint, or the complete safeguard.

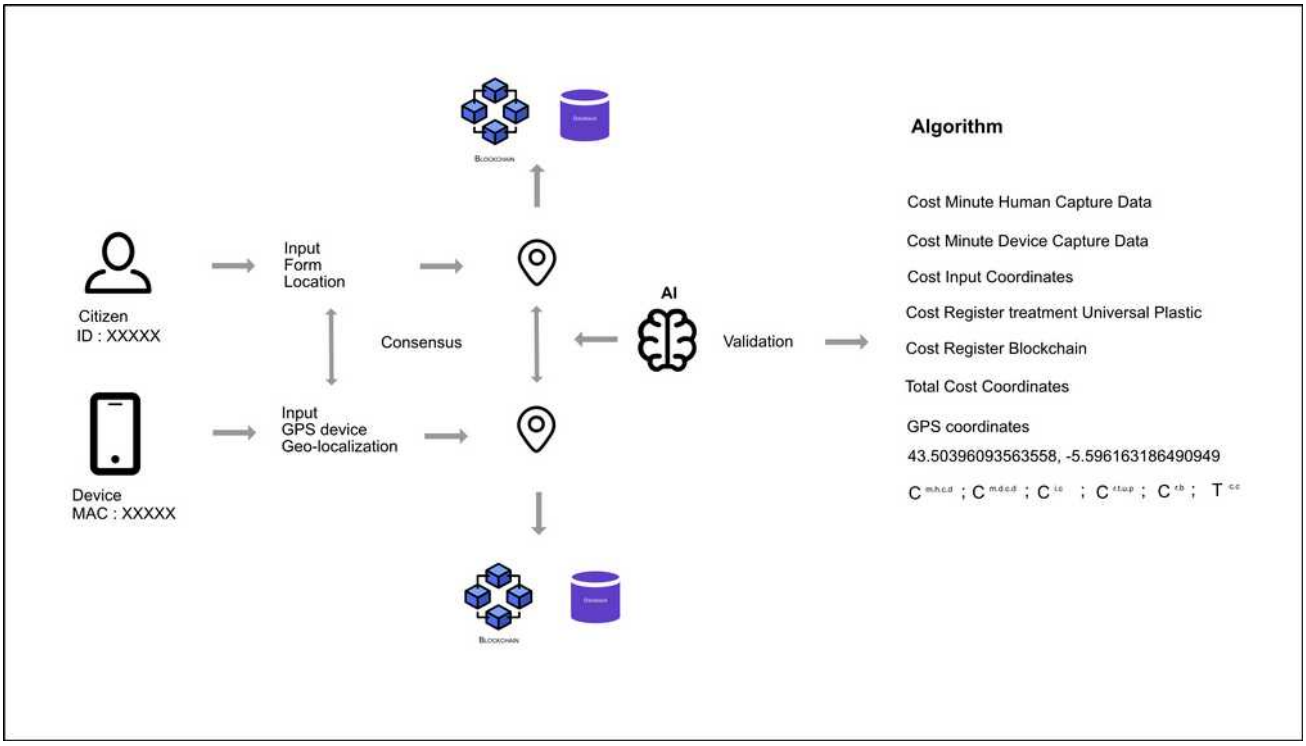



**Figure 3.** Platform and tokenization

The platform has the following features:

1. A decentralized information storage solution using public Blockchain technology and encrypted under private keys, generating true information owners

2. An economy based on the “tokenization” of exchangeable and actionable data, which generate benefits for the different sectors / markets / interested participants

3. A data governance protocol that involves different factors in data entry and processing processes, thus validating a consensus between electronic and human devices

4. An adequate data responsibility issuance system under the different data entry and processing mechanisms

*Blockchain Technology*

Our key support is the use of Blockchain technology that registers the variables that form the data features, allocating proof of property to each user. This will allow us to facilitate information exchange systems through public and private keys within a chain of blocks.

We use a public Blockchain, which uses the consensus algorithm “Proof of Work (PoW), with capacity for high demand in data registration. This way, the cryptographic fingerprint or the full document is stored in a Blockchain

*Blockchain Data Interchange (BDI)*

Data exchange process is based on EDI (Electronic Data Interchange) systems. Using our platform, and thanks the capture in the blockchain, we can offer data exchange systems within the same blockchain, as metadata. This data is represented in the form of UPTs, providing exchanges between the different information owners.

In our platform, the different tokens that associate the information can be traded, being able to offer any interested party the purchase of data in real time through UPT. In turn, and depending on the nature of the data, they may have different features that will make them behave differently under a free market system: supply and demand.

## Conclusion

UNIVERSAL PLASTIC® is a platform for social and environmental change, making use of new communication technologies, through portable/mobile devices, increasingly present in emerging countries. We use a decentralized system with Blockchain technology, to solve a global problem, which could be used as a commodity and use data to monetise the process.

# Technical Information

## UNIVERSAL PLASTIC® - UPT Calculations

For data tokenization, direct variables will be taken from their sources. Determining the necessary calculations to weight the value will provide us with underlying value markets. To record data, we start from a single process, with quantifiable variables. For example:

- How much does it cost to obtain and record geolocation data?
- What do we need?

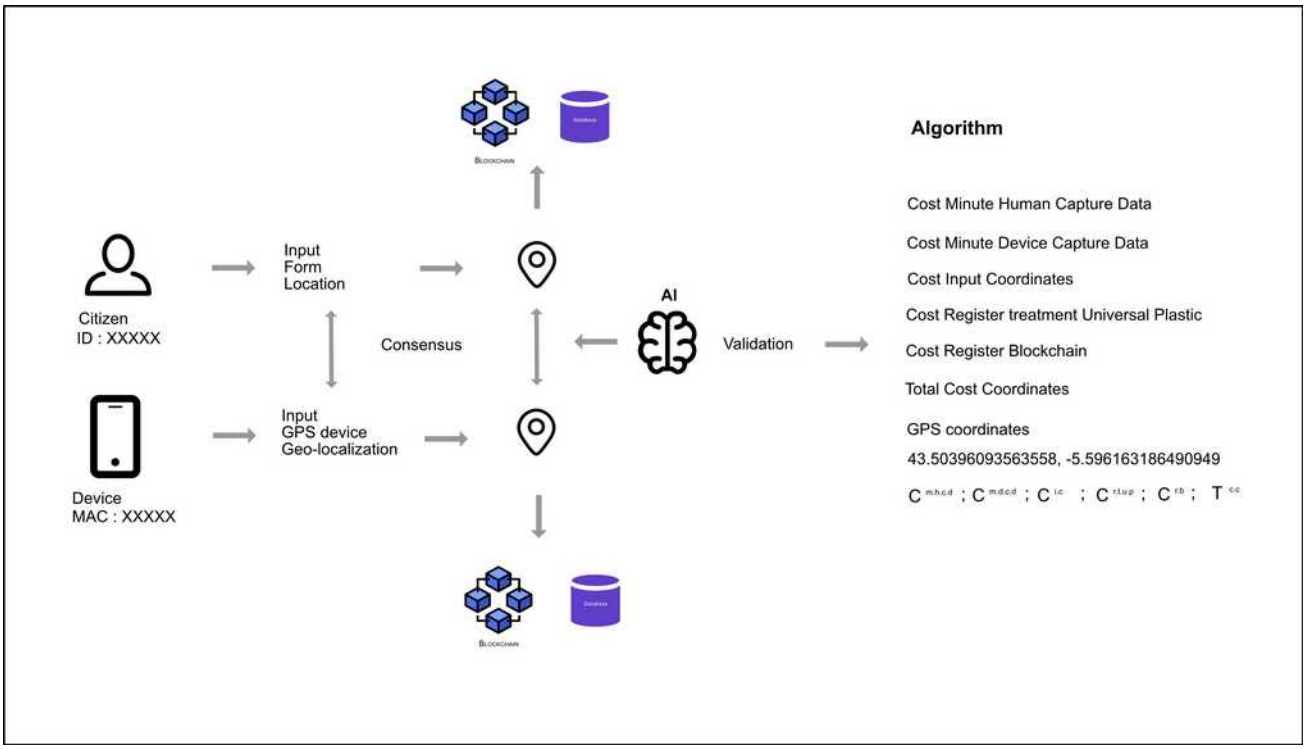
1. Mobile device (GPS) ☾ Cost of use device per minute
2. Device energy time ☾ Energy cost ☾ Charge battery ☾ $CO_2$ emission
3. Internet Service ☾ Service Cost ☾ Connect to third party API payment services
4. Human ☾ Time-Hour/Person
5. Platform ☾ System and platform fee operations ☾ $CO_2$ emission

Determining the cost of the data, later converted into UPTs will give an indication of its value in a raw format.

The identification of the unique characteristics of each data point, according to its variables, gives an indication of the power of monetization for its subsequent commercialization in an exchange system under free market conditions: supply and demand.

| | | FIAT Minute Cost | UPT Minute Cost | Unit of Account |
|---|---|---|---|---|
| | **Mobile Cost** | 0,10 $ | 0,001 | UPT |
| | **Energy Device** | 0,05 $ | 0,0005 | UPT |
| | **Internet Service** | 0,05 $ | 0,0005 | UPT |
| | **Human** | 0,15 $ | 0,0015 | UPT |
| | **Platform** | 0,11 $ | 0,0011 | UPT |
| | **TOTAL** | **0,46 $** | **0,0046** | **UPT** |
| **1 UPT =** | **0,01 $** | | | |

## Assigning UPTs



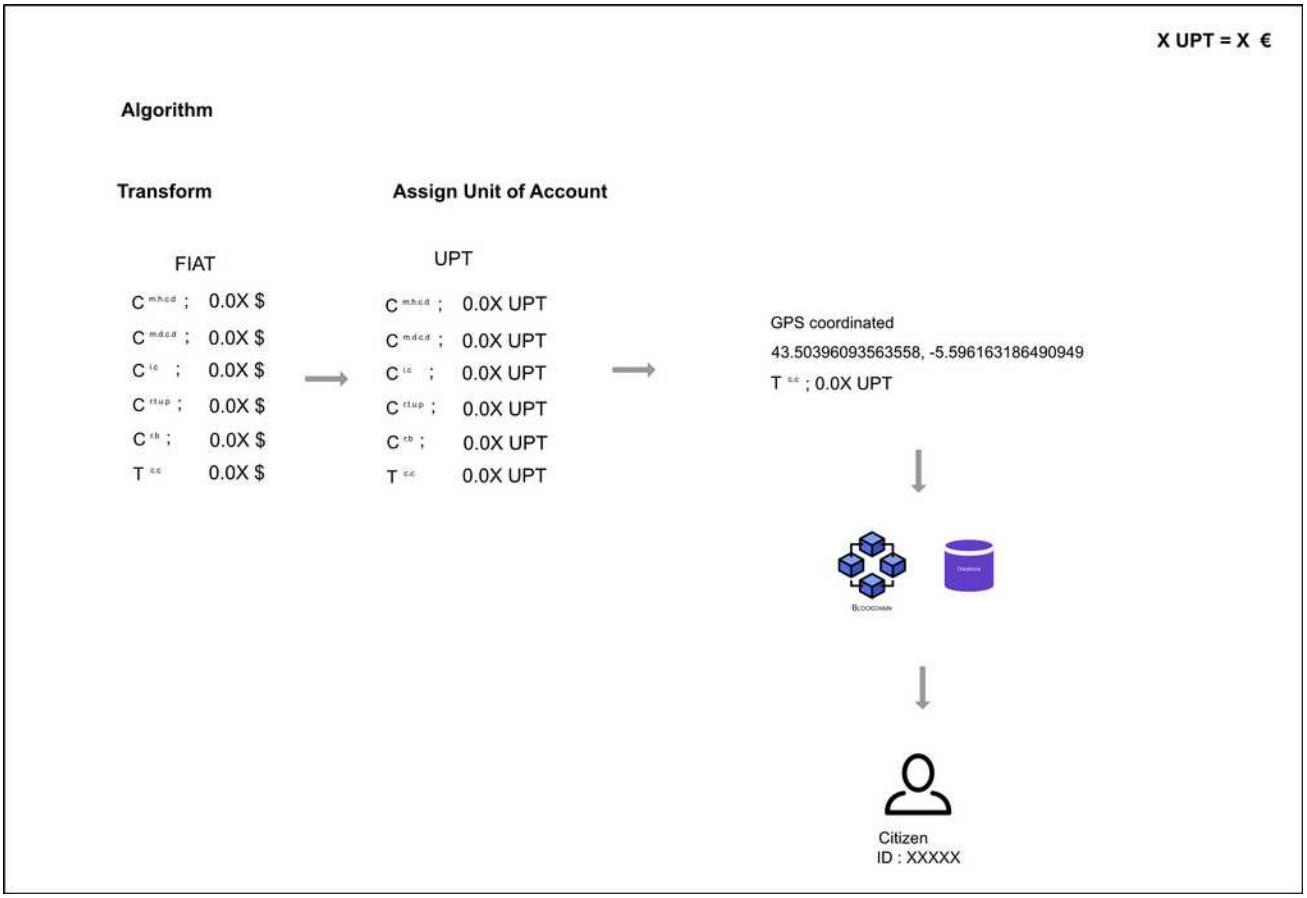




**Figure 4.** Tokens and UPTs allocation

## Additional information & literature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