# DeSCA

## Decentralized Supply Chain Application

*powered by:*

# Semantic Blockchain: DESCA

# Semantic Supply Block Chain

By: Eng. Héctor Ugarte

# Melting 3 Powerful concepts and technologies

Semantic Web

Supply Chain Management

BlockChain

By: Eng. Héctor Ugarte


The Semantic Web is an extension of the Web through standards by the World Wide Web Consortium (W3C) The standards promote common data formats and exchange protocols on the Web, most fundamentally the Resource Description Framework (RDF).

Source:
https://en.wikipedia.org/wiki/Semantic_Web

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Supply chain management (SCM), the management of the flow of goods and services, involves the movement and storage of raw materials, of work-in-process inventory, and of finished goods from point of origin to point of consumption.

Source: https://en.wikipedia.org/wiki/Supply_chain_management

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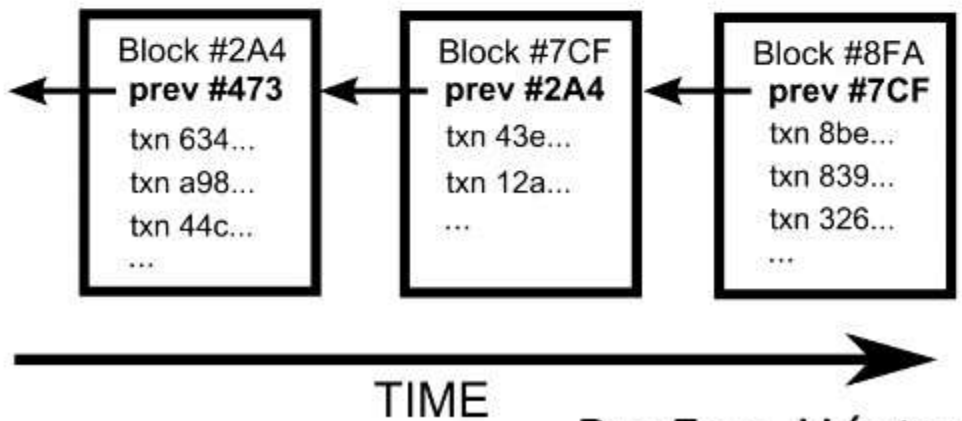
BlockChain

Block chain is a distributed database that maintains a continuously-growing list of data records secured from tampering and revision.

Source: https://en.wikipedia.org/wiki/Blockchain_(database)

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# THE FRAMEWORK BEHIND IS SEMANTIC BLOCKCHAIN


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# Semantic Blockchain:

Semantic Blockchain is a distributed database that maintains a continuously-growing list of standardized data records, using generally Resource Description Framework (RDF), hardened against tampering and revision.

Source:
https://semanticblockchain.wordpress.com/2016/07/29/what-the-heck-is-semantic-blockchain/

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# So what is DeSCA?

DeSCA. **A prototype** that merge the 3 technologies:

- **Semantic Web.** Data is also replicated on RDF format and stored on IPFS or in the blockchain.
- **Supply Chain Management.** Using the blockchain principles, a basic SCM system is implemented on top of the blockchain.
- **Blockchain.** The chosen technology is Ethereum.

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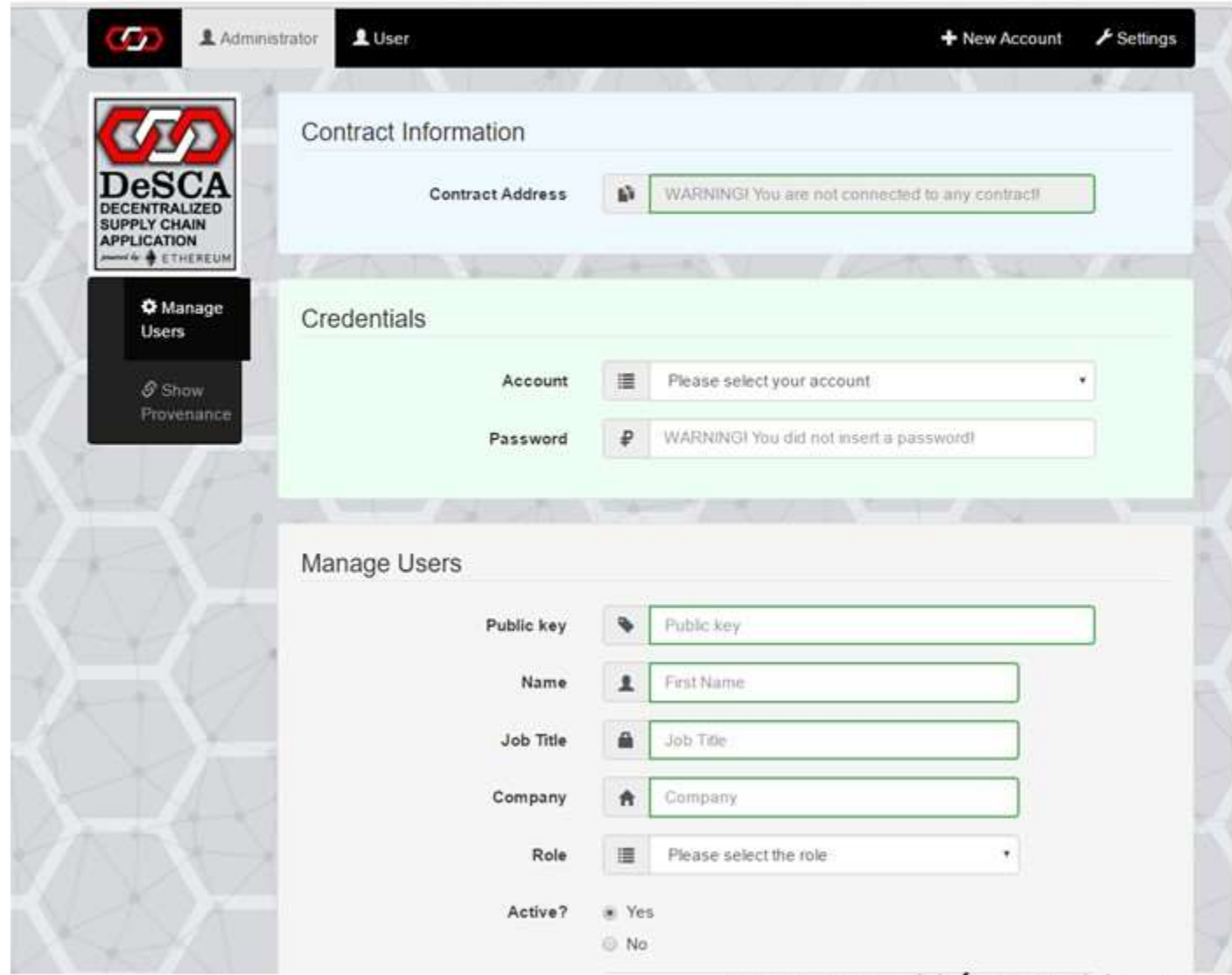
# DeSCA screenshots:

An administrator register new users

Only this new users and the admistrator can make use of the system

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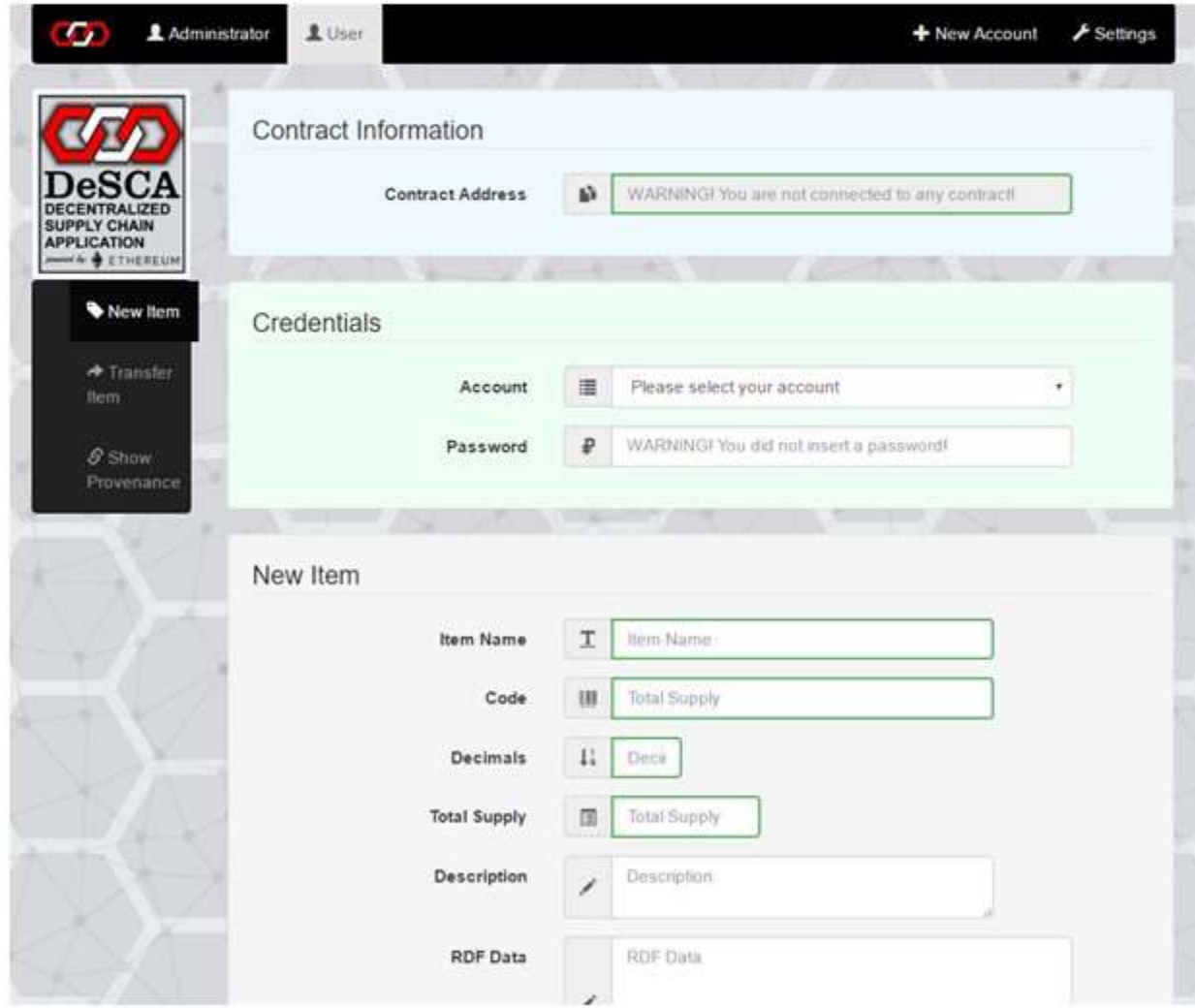
# DeSCA screenshots:

A register user can
Register new Items

Every new item has an Initial owner (creator) and can be transferred to other registered users.

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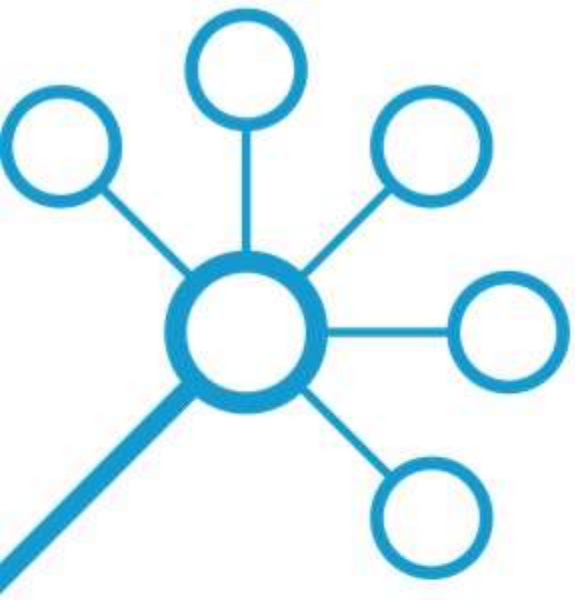
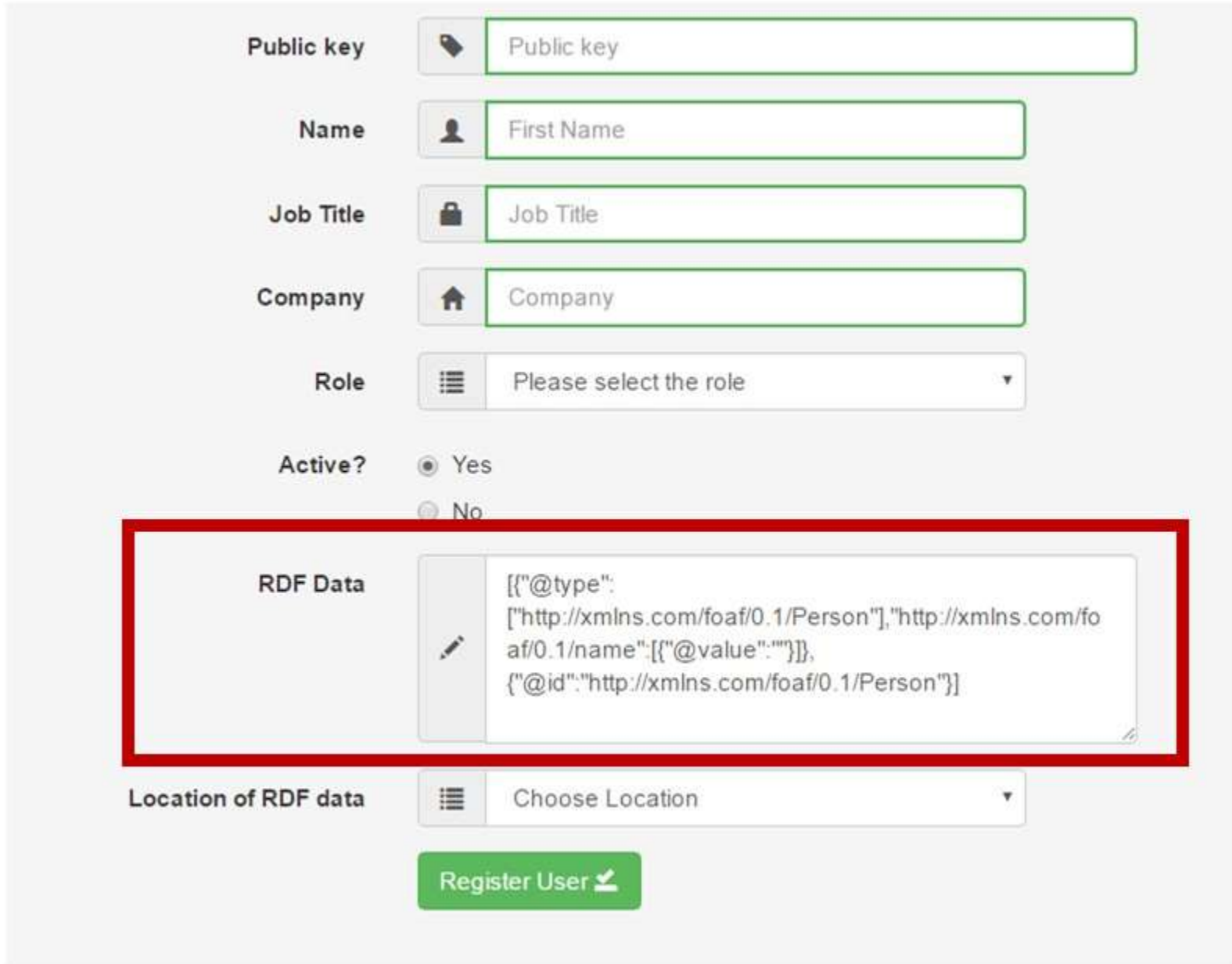


# RDF Data Resource Description Framework

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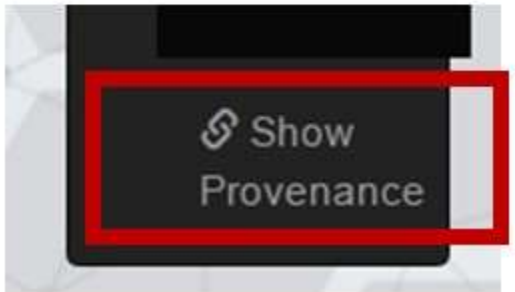
# PROVENANCE

- It is possible to track the provenance of Items

*“Provenance is a record that describes the people, institutions, entities, and activities involved in producing, influencing, or delivering a piece of data or a thing”*




Source: Moreau, Luc. Missier, \Prov-dm: The prov data model."

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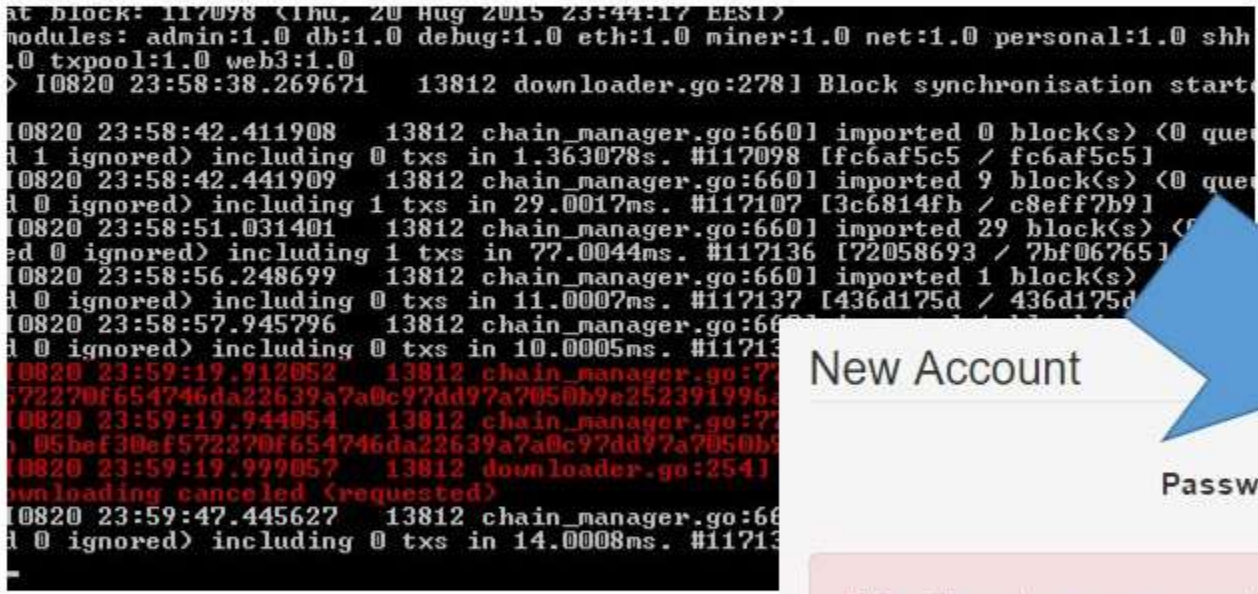
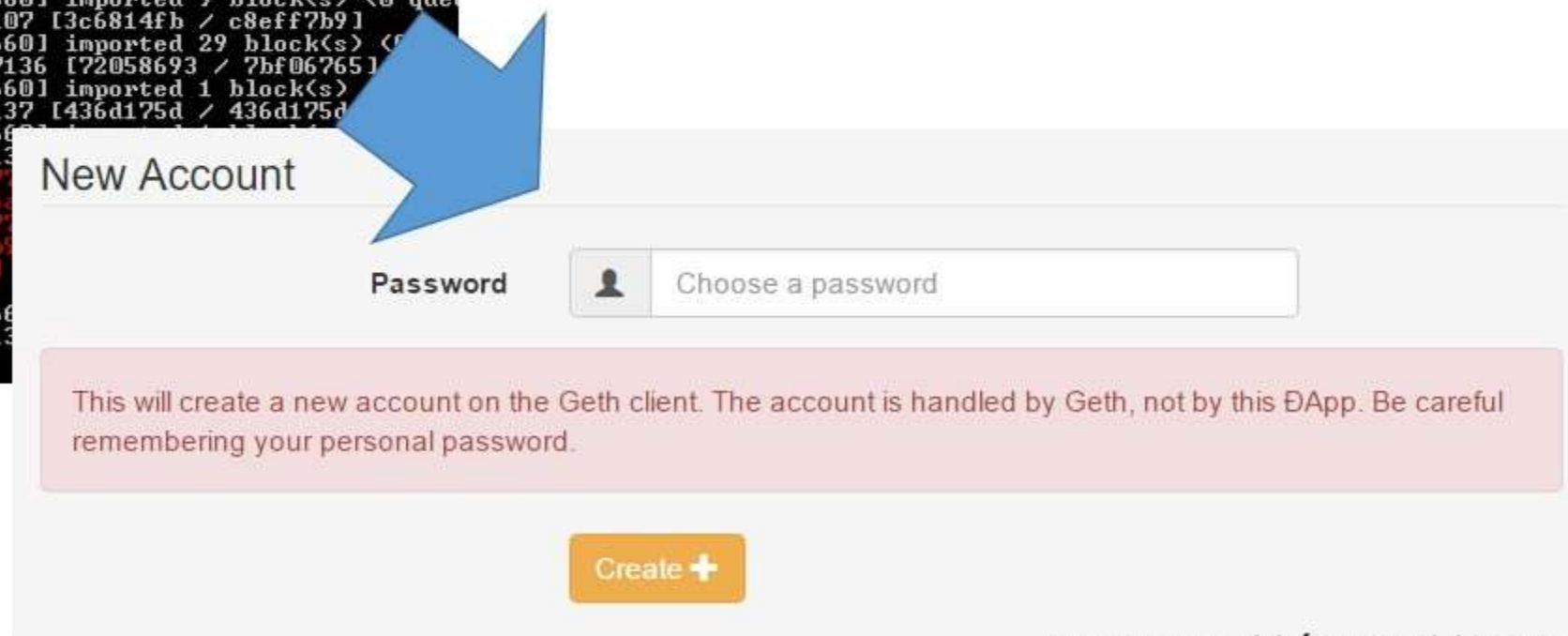
# Ethereum Management (Create accounts, Unlock accounts)

- GETH

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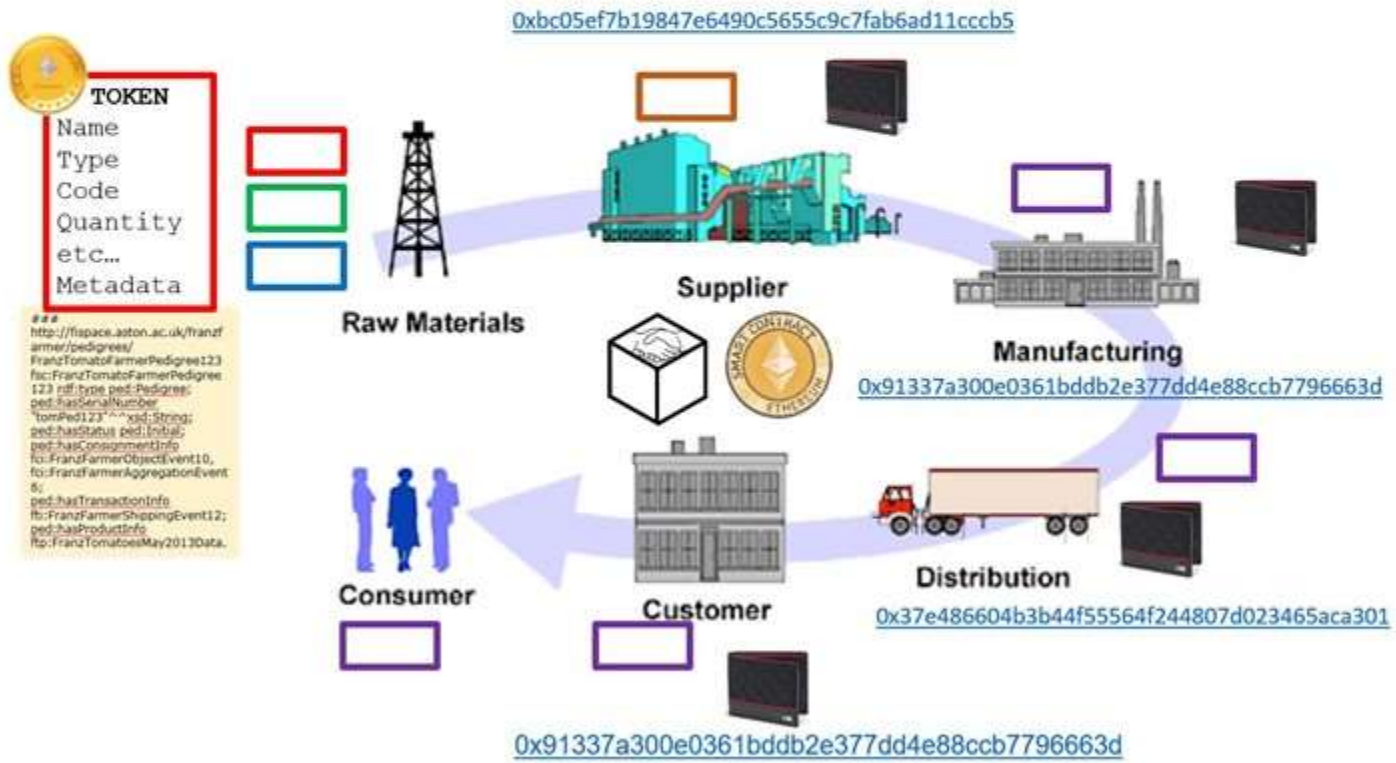
# General Proccess

Semantic blockchain

ethereum




Based on an image taken from: W. Vorhies, "Predictive Analytics in the Supply Chain"
http://www.datasciencecentral.com/profiles/blogs/predictive-analytics-in-the-supply-chain

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# Semantic Supply Block Chain

- Smart Contract

"Pieces of code, stored on the Ethereum blockchain"


```
contract SupplyChain {
  address public owner;
  uint public nextItemId = 0;

  struct User{
    string name;
    string jobTitle;
    string company;
    string role;
    bool active;
    string rdfData;
  }

  struct Item{
    string name;
    string code;
    uint8 decimals;
    uint256 totalSupply;
    string description;
    string rdfData;
    mapping (address => uint256) balanceOf;
  }

  mapping (address => User) public users;
  mapping (uint256 => Item) public items;

event Transfer(address _from, address _to, uint _id, uint256 _value);
event Register(address _userAddress, string _name, string _role);
event Creation(uint _nextItemId, string _name, uint256 _totalSupply, address _ownerItem, string _type);
event NewItemNormal(uint _nextItemId, string _name, string _code, uint8 _decimals, uint256 _totalSupply, string _description);
event NewItemDivide(uint _nextItemId, string _name, string _code, uint8 _decimals, uint256 _totalSupply, string _description, uint _id, uint256 _quantity);
event NewItemMerge(uint _nextItemId, string _name, string _code, uint8 _decimals, uint256 _totalSupply, string _description, uint _id1 , uint _id2, uint256 _quantity1, uint256 _quantity2);



function SupplyChain() {
  owner = msg.sender;
}

function newItemNormal(string _name, string _code, uint8 _decimals, uint256 _totalSupply, string _description, string _rdfData) {
  items[nextItemId] = Item({
    name: _name,
    code: _code,
    decimals: _decimals,
    totalSupply: _totalSupply,
    description: _description,
    rdfData: _rdfData
    });

    items[nextItemId].balanceOf[msg.sender]= _totalSupply;
    NewItemNormal(nextItemId,_name,_code,_decimals,_totalSupply,_description);
    Creation(nextItemId,_name,_totalSupply, msg.sender, "Normal");
    nextItemId++;
```

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# More

- Twitter: https://twitter.com/hectugaroj
- Blog: https://semanticblocks.wordpress.com/