Blockchain for Trade Facilitation

United Nations Centre for Trade Facilitation and Electronic Business
(UN/CEFACT)

White Paper on Blockchain and Trade Facilitation

Virginia Cram-Martos, Triangularity SàRL

UN/CEFACT Project Leader and Domain Coordinator for International Trade Procedures

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= One kind of Blockchain

Blockchain

= A Distributed Ledger Technology (DLT)

= The principal, most tested DLT

An example of another DLT is IOTA

Not all Blockchains and DLTs are equal, they vary in:

- **Vulnerability** (to hacking and other system failures)
- **Robustness** (including to flawed code)
- **Cost**
- **Speed and ability to scale up** (to large transaction volumes)
- **Degree of Privacy** (pseudo anonymity vs total anonymity)

The most valuable Blockchain applications for trade are based on Smart Contracts

Smart Contracts are computer programmes that are stored on a blockchain (so they cannot be changed) and are automatically executed based on defined «events».

For example, if a sensor inside a container indicates that its temperature has exceeded a permitted level, a smart contract could send a request for an inspection or trigger an insurance payment.

The concept of Smart Contracts was invented in the 1990s by Nick Szabo; the proposal to programme a blockchain for implementing them was made by Vitalik Buterin in late 2013 and Ethereum went live in July 2015.

ethereum

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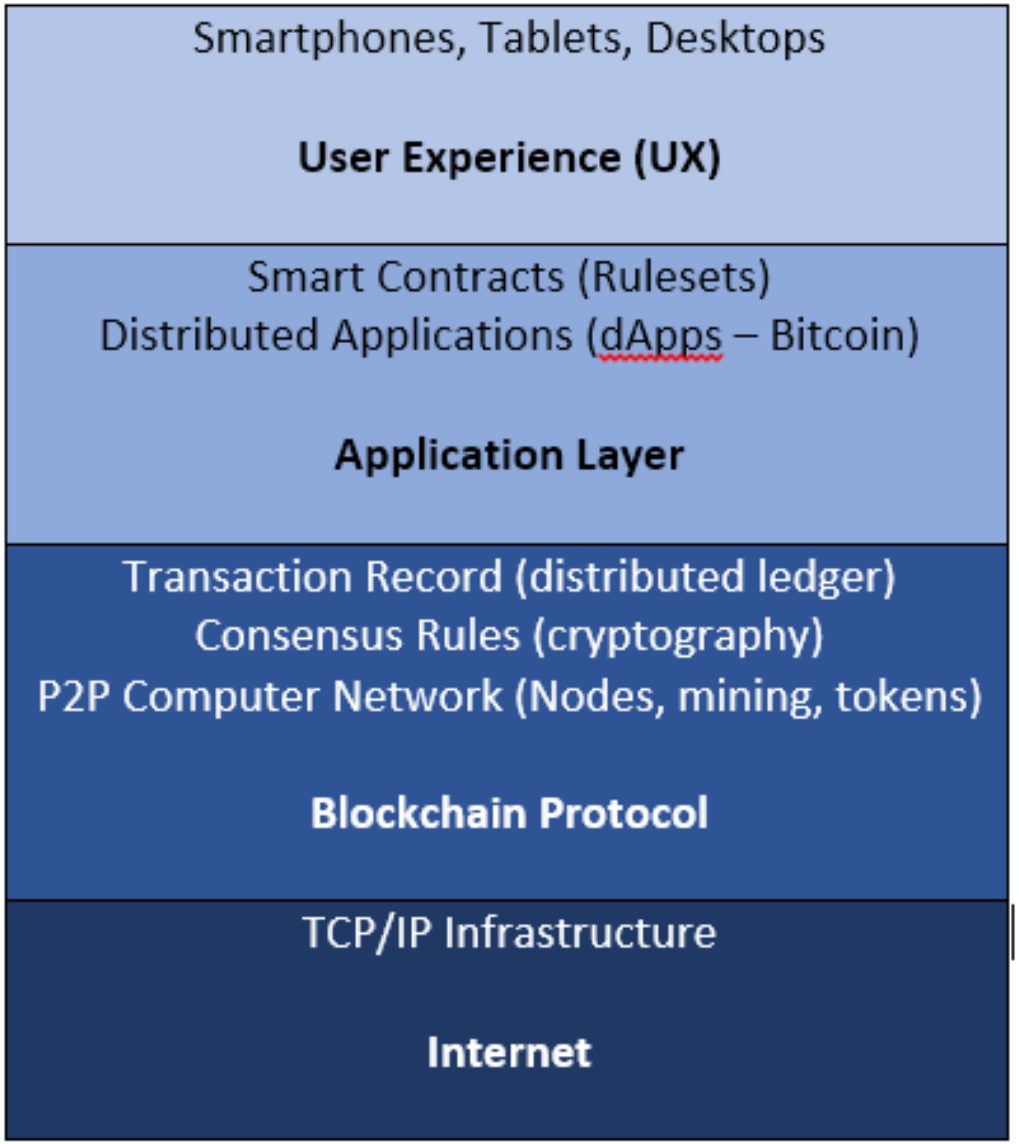
How do Smart Contracts fit into the overall blockchain context?



Most security flaws in blockchain systems occur in these top two layers and, especially, in UX

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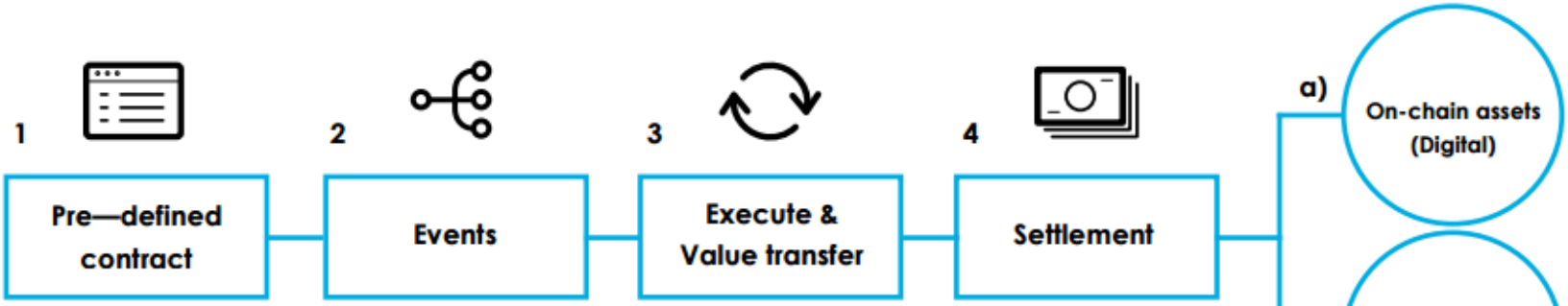
Smart Contracts are programmes on a blockchain that automatically execute based on defined «events»



- Terms are established by all counterparties, such as:
  - ◊ Variable interest rate (e.g LIBOR)
  - ◊ Currency of payments
  - ◊ Currency rate
- Conditions for execution (e.g time and date, LIBOR rate at given value)

- Event triggers contract execution
- Event can refer to:
  - ◊ Transaction initiated
  - ◊ Information received

- Terms of contract dictate movement of value based on conditions met.

a. For digital assets on the chain, such as a cryptocurrency, accounts are atomically settled

b. For assets represented off the chain, such as stocks and fiat, changes to accounts on the ledger will match off-chain settlement instructions

Source: sharetheledger.com

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Smart Contracts

Bob leaves his car and car key in a garage locked with a smart contract controlled smart lock. The car has its own blockchain address (public key) 13849Z stored on the blockchain

2

2 6

Alice can now pick up her car by unlocking the smart lock with her private key

Bob wants to sell his car. He identifies himself with his blockchain address (public key) 757382 and uses a smart contract to define the terms of the sale signing it with his private key

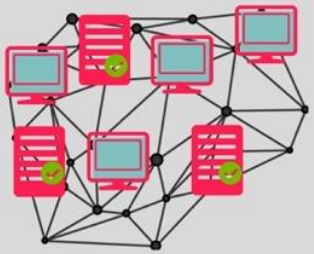
1

<Smart contract>

<contract>
If 20 000€ were sent to my account number 757382 then automatically transfer car ID 13849Z as well as grant smart lock access to the account from which the money has been transferred
</contract>

The smart contract is verified by each node on the blockchain network checking if Bob is the owner of the car and if Alice has enough money to pay Bob

4



5

If the network agrees, that all conditions are true, Alice automatically gets the access code to the smart garage lock. The blockchain registers Alice as the new owner of the car. Bob has 20 000€ more in his account, and Alice 20 000€ less

The smart contract is accessible from a web browser. Traditional online services can use smart contracts in the backend

3

Alice wants to buy a car. She finds Bob's car listed on the Internet. She signs the contract with her private key transferring 20 000€ from her blockchain address (public key) 389157 to Bob's blockchain address 757382

BlockchainHub

What Benefits for Trade?

Blockchain has the potential to deliver significant improvements to trade and eCommerce applications because:

- **Immutable and verifiable transactions** recorded in a blockchain can allow the elimination of paper in areas where today it is still required;
- **Automated (and immediate) reconciliation** algorithms can facilitate faster payments
- **The tracing of digital assets through 100s or 1000s of transactions** can support the tracking of sensitive goods and digital rights (for example IPR)
- **Immutable "original" electronic certificates, licenses and declarations can be linked with goods** in order to facilitate regulatory procedures.

Some Figures for Smart Ledger Technology benefits

- Estimated potential boost to World Trade: between $35 and $70 billion per year
- An estimated reduction in the cost of importing a single container of $45

From: *The Economic Impact of Smart Ledgers on World Trade*, The Centre for Economics and Business Research, the Cardano Foundation and the Z/Yen Group, April 2018

What impact on UN/CEFACT?

Being aware of the possible benefits for trade, the United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) has asked itself:

- Are there any new technical specifications that UN/CEFACT should develop in order to maximise this the value of blockchain for its government and business constituencies?

- Are there recommendations that should be made to governments on how to best use and/or manage this new technology?

To Answer these Questions: The UN/CEFACT Blockchain White Paper Project

Two white papers are being prepared

1) One on Standards, with the draft for consultation available at http://www.unece.org/fileadmin/DAM/cefact/cf_plenary/2018_plenary/ECE_TRADE_C_CEFACT_2018_INF.1.pdf

2) One on Blockchain and Trade Facilitation Processes with the draft well along, but still in preparation

Project Workshop/Conference on first results:

26 April 2018 at the UN/CEFACT Forum in the Palais des Nations, Geneva

Outline for White Paper on Blockchain and Trade Facilitation

#	Chapter	#	Chapter
1	Introduction	9	Agriculture
2	What is Blockchain?	10	Energy Trade
3	Smart Contracts, Oracles, Tokens & Internet of Things (IoT) with blockchain	11	Financial Services (for trade finance, supply-chain finance, etc.)
4	When to consider using Blockchain – and when not to	12	Government Services
5	Blockchain Security, Legal and Regulatory Issues	13	Travel and Tourism
6	Supply Chain and Traceability	14	Music and Arts Markets
7	Maritime	16	Recommendations
8	Transportation (non-Maritime)		Annex of use/case-study descriptions

Thank you

For more information contact

UNECE Secretariat

Lance Thompson
(lance.Thompson@unece.org)

The Project Leader

Virginia Cram-Martos
(crammartos@triangularity.net)

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