Blockchain Research

to Blockchain or Not: That is the Question
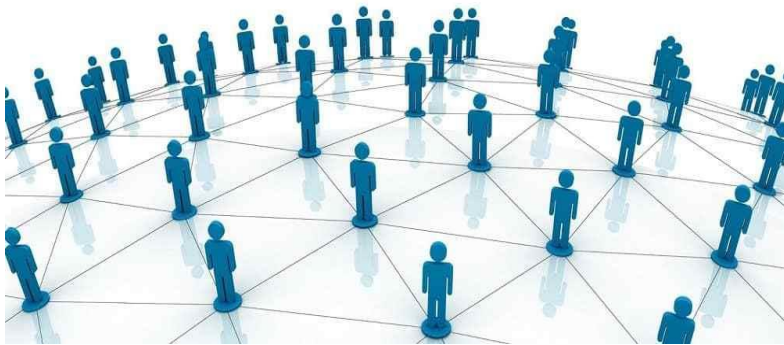
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Palestine Technical University – Kadoorie

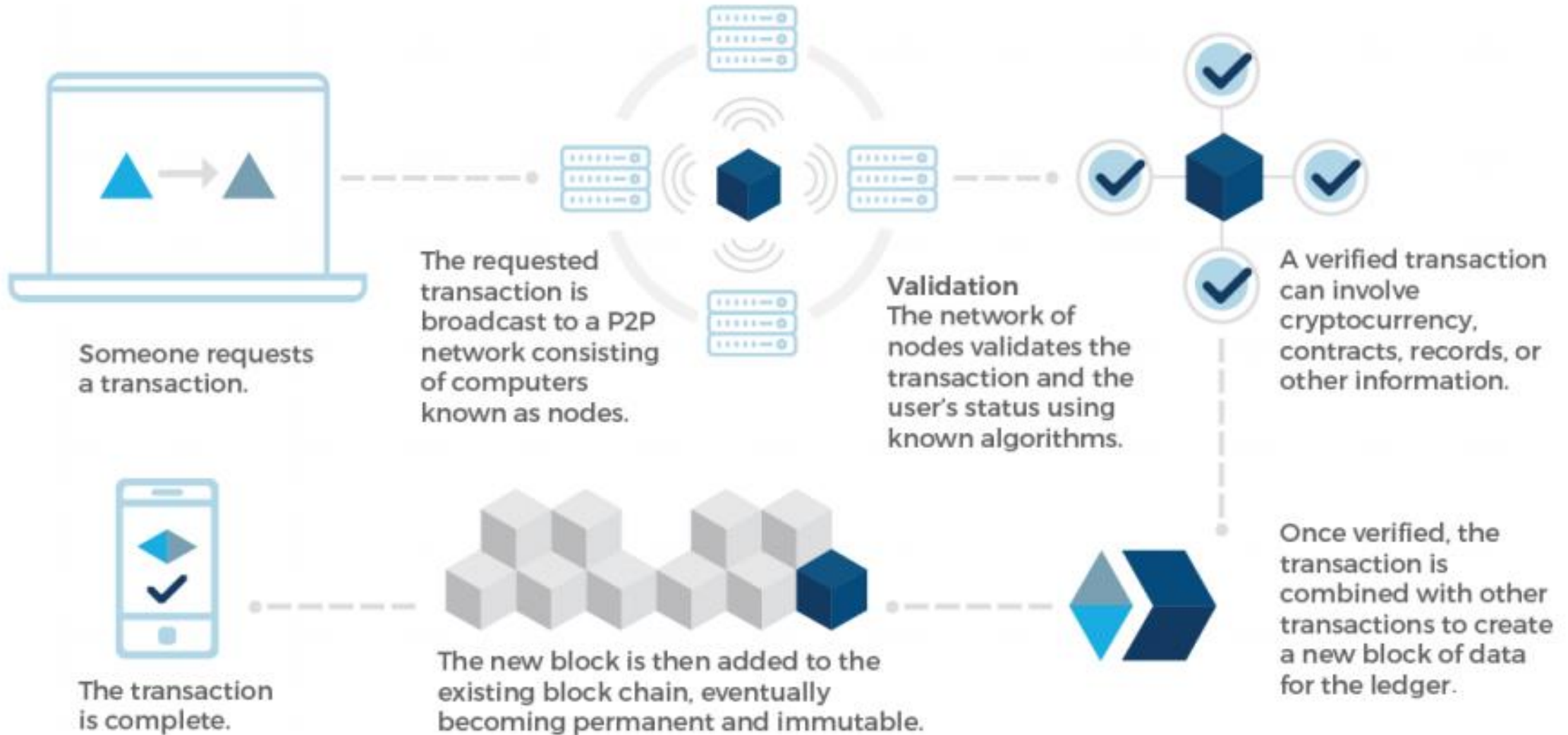# Blockchain Concept

Secure access, verification, sending or storing information

Decentralized and distributed information

Blockchain workflow

Someone requests a transaction.

The requested transaction is broadcast to a P2P network consisting of computers known as nodes.

Validation
The network of nodes validates the transaction and the user's status using known algorithms.

A verified transaction can involve cryptocurrency, contracts, records, or other information.

Once verified, the transaction is combined with other transactions to create a new block of data for the ledger.

The new block is then added to the existing block chain, eventually becoming permanent and immutable.

The transaction is complete.

Identity and blockchain

Digital Identity

Identity: to prove we are who we say we are

Some people have more than one identity

    (Physical ID + many virtual IDs)

1.5 billion people do not have identity (World Bank, 2017).

Mainly in the developing countries

The questions of how the necessary personal data is stored, secured, and shared, and also who owns and controls it.

Blockchain ID Research

For Syrian war refugees

By Dublin-based AID:Tech, Irish Red Cross and Lebanese humanitarian

Ensures that the refugees receive aid

For MIT students

By MIT Media Lab

Encodes student information and course completion

- Orman, H. (2018). Blockchain: the Emperor's New PKI?. IEEE Internet Computing , 22(2), 23-28.
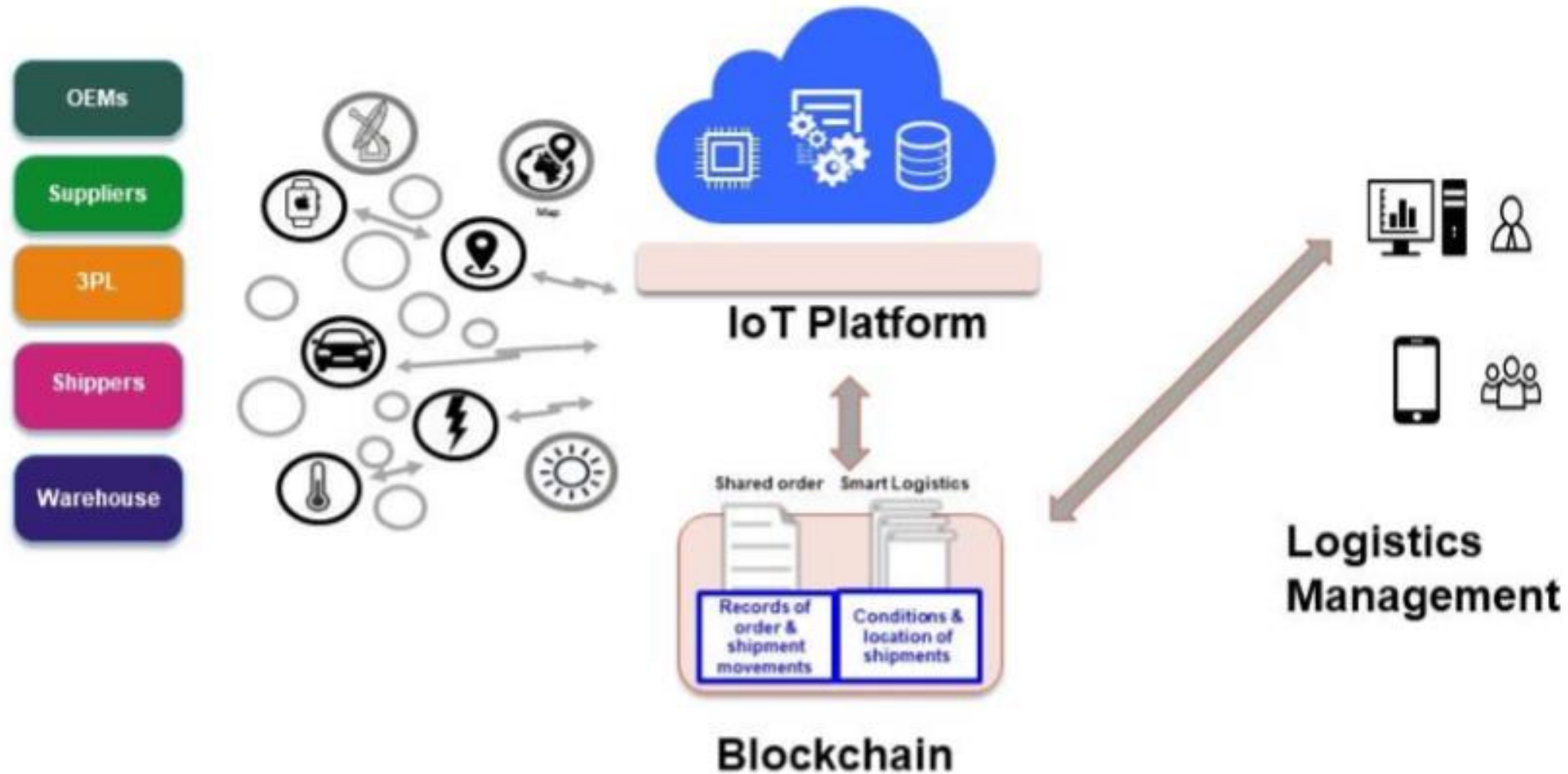
BLOCKCHAIN SUPPLY CHAIN

Supply Chain

- Real business problem

- The supply chain network is growing

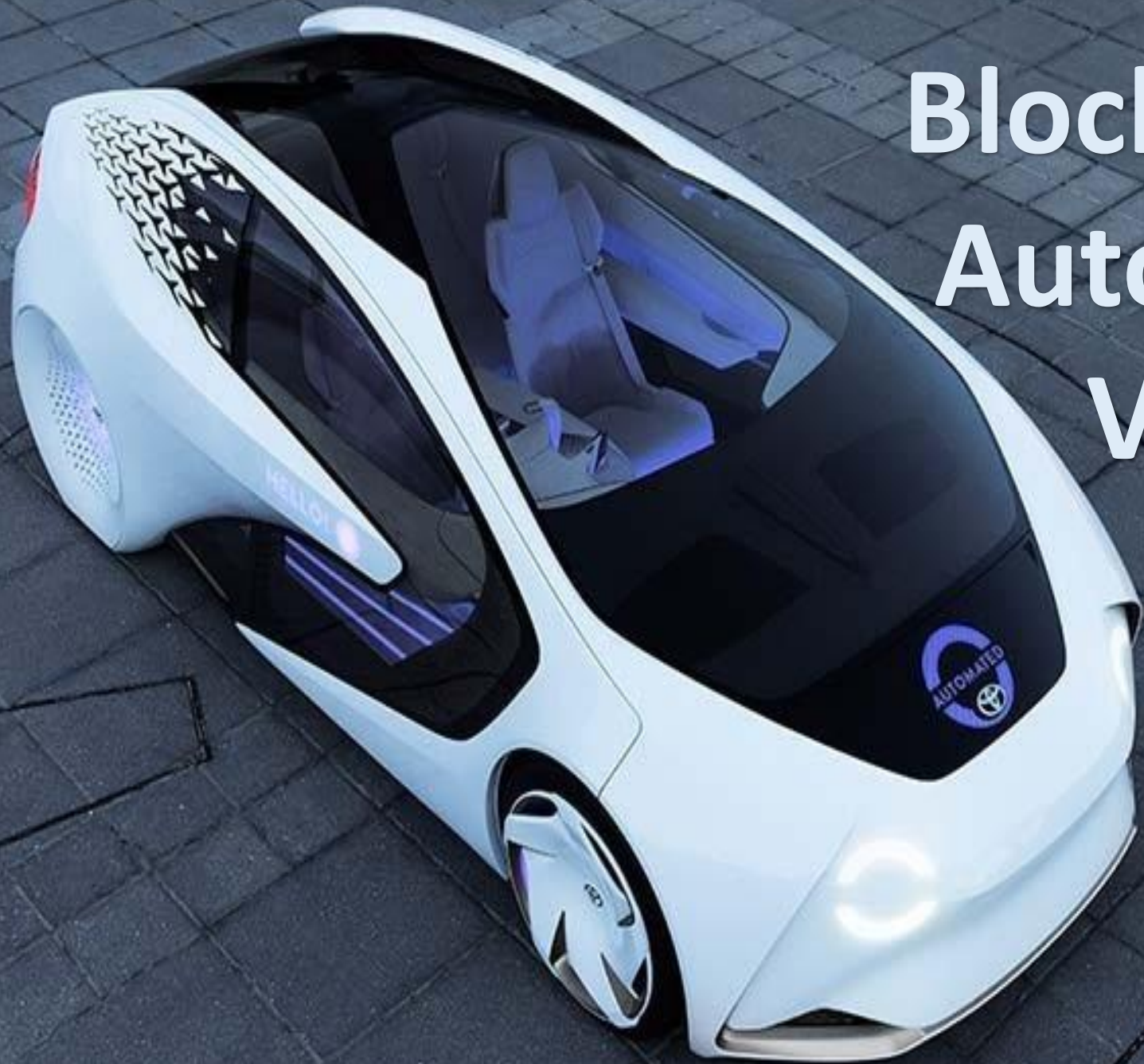- Delay due to intermediaries and paperwork

- Blockchain – Transaction

Container location
Time stamp
Proof of shipment
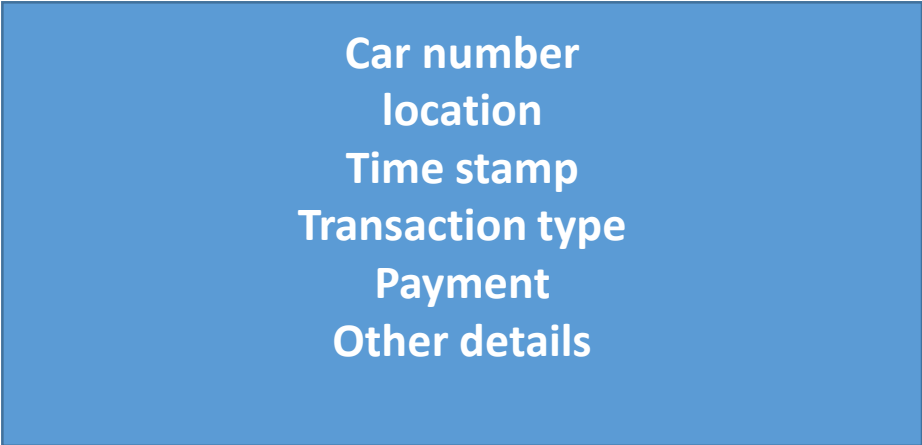**Proof of delivery**

Blockchain Supply Chain Research

- Miller, D. (2018). Blockchain and the Internet of Things in the Industrial Sector. IT Professional, 20(3), 15–18.
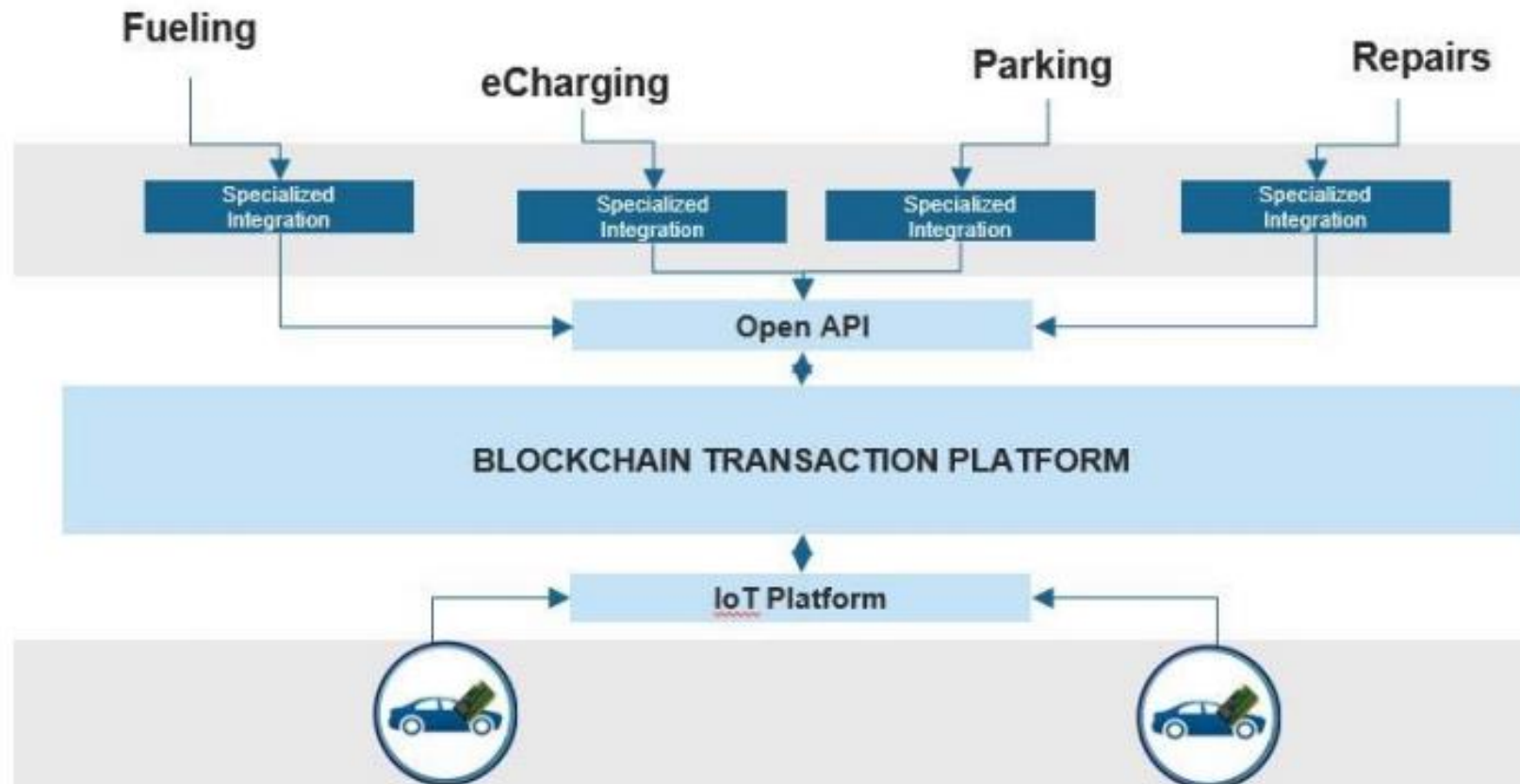
Blockchain for Autonomous Vehicle

Autonomous Vehicle

- Self-driving capacity by the early 2020s

- Autonomously refuel, charge, or make appointment for repair

- Requires secure and distributed monitoring of manufacturers, insurance company, customers, suppliers, regulators

- Blockchain – Transaction

Car number
location
Time stamp
Transaction type
Payment
Other details

Blockchain Autonomous Vehicle Research

• Miller, D. (2018). Blockchain and the Internet of Things in the Industrial Sector. IT Professional, 20(3), 15–18.

Other Blockchain Research

- Fund monitoring
  - Who does the money reach? How long does it take? How is it spent? (UN, 2015)
    - Example, Early Childhood Development (ECD) in South Africa

- Property rights
  - Who owns what?
    - In Africa, as much as 90% of rural land is undocumented (World Bank, 2013).

- Election
  - transparent and publicly verifiable voting system?
    - A vote could is like a transfer of a cryptocurrency from the voter's wallet to the candidate's one.

- Internet
  - Securing log files and eliminating file duplication on cloud
    - Log files are stored as transactions on Blockchain
    - Nodes are used to store portion of cloud files and hash function comparison to prevent duplication

Gatteschi, V., Lamberti, F., Demartini, C., Pranteda, C., & Santamaria, V. (2018). To Blockchain or Not to Blockchain: That Is the Question. IT Professional, 20(2), 62–74.

Thank You