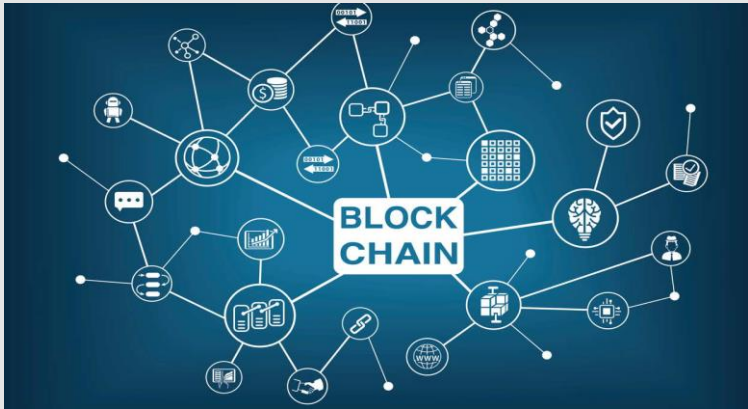
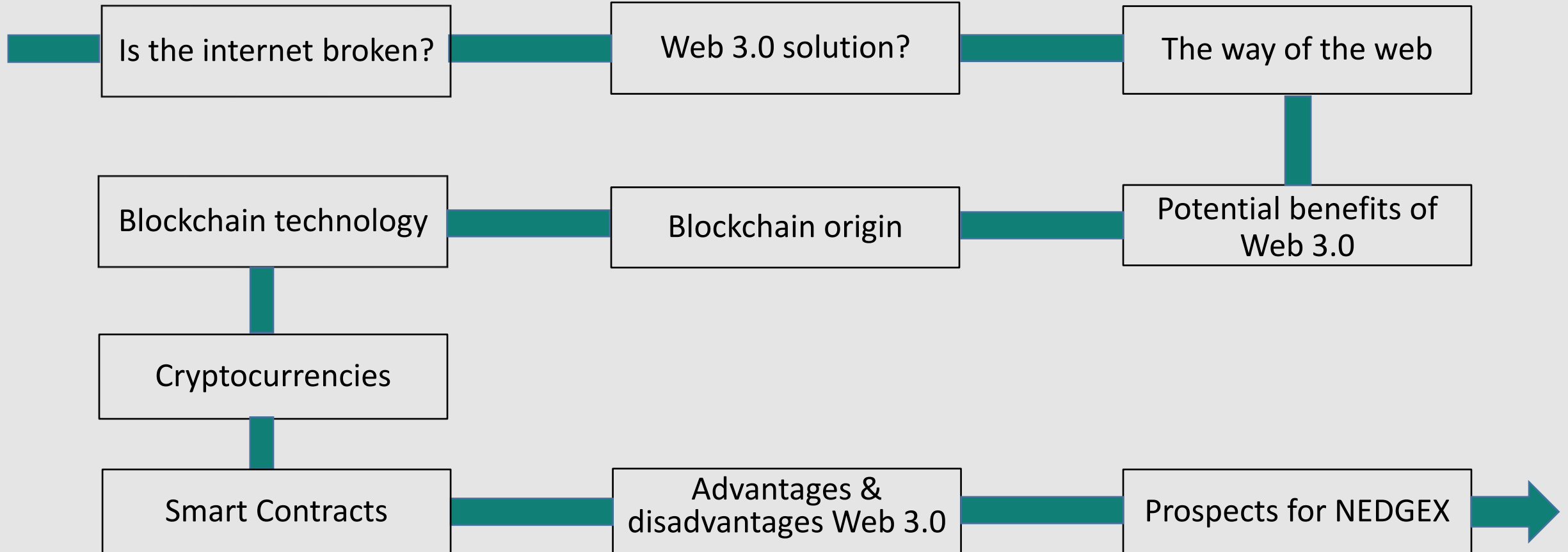


Web 3.0

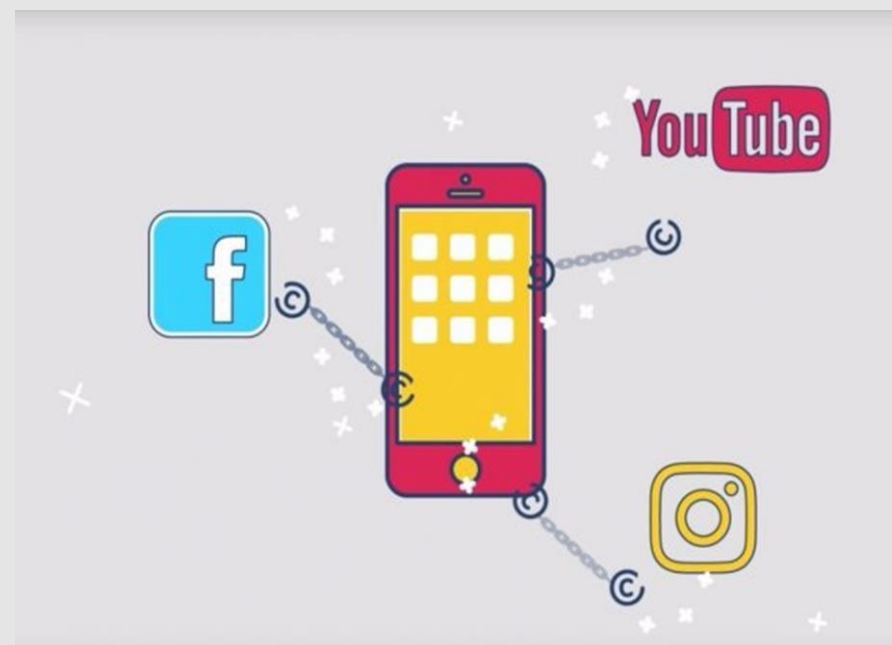


Agenda



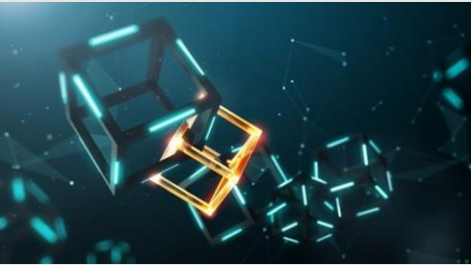
This is why the internet is "broken"

- Originally Internet organised in a decentralised way
- Currently we use centralised services
- Today's internet is dominated by platforms like Facebook and YouTube
- Few companies control this
- Main problems identity & security
- Reason for claim: "Internet is broken" (Sascha Lobo)



Web 3.0 as a solution?

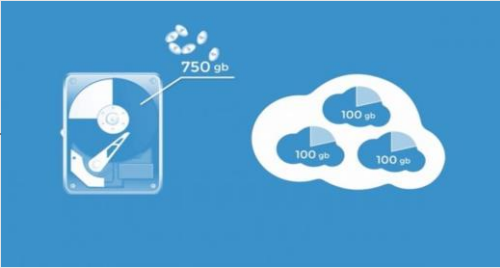
Security & Identity



Blockchain

Objective:
Decentralised
solutions

Decentralise user data



Many decentralised projects

Web 3.0 the future is decentralised



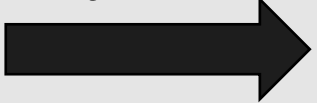
Many blockchain start-ups

What is Web 3.0?

Web 3.0 ...

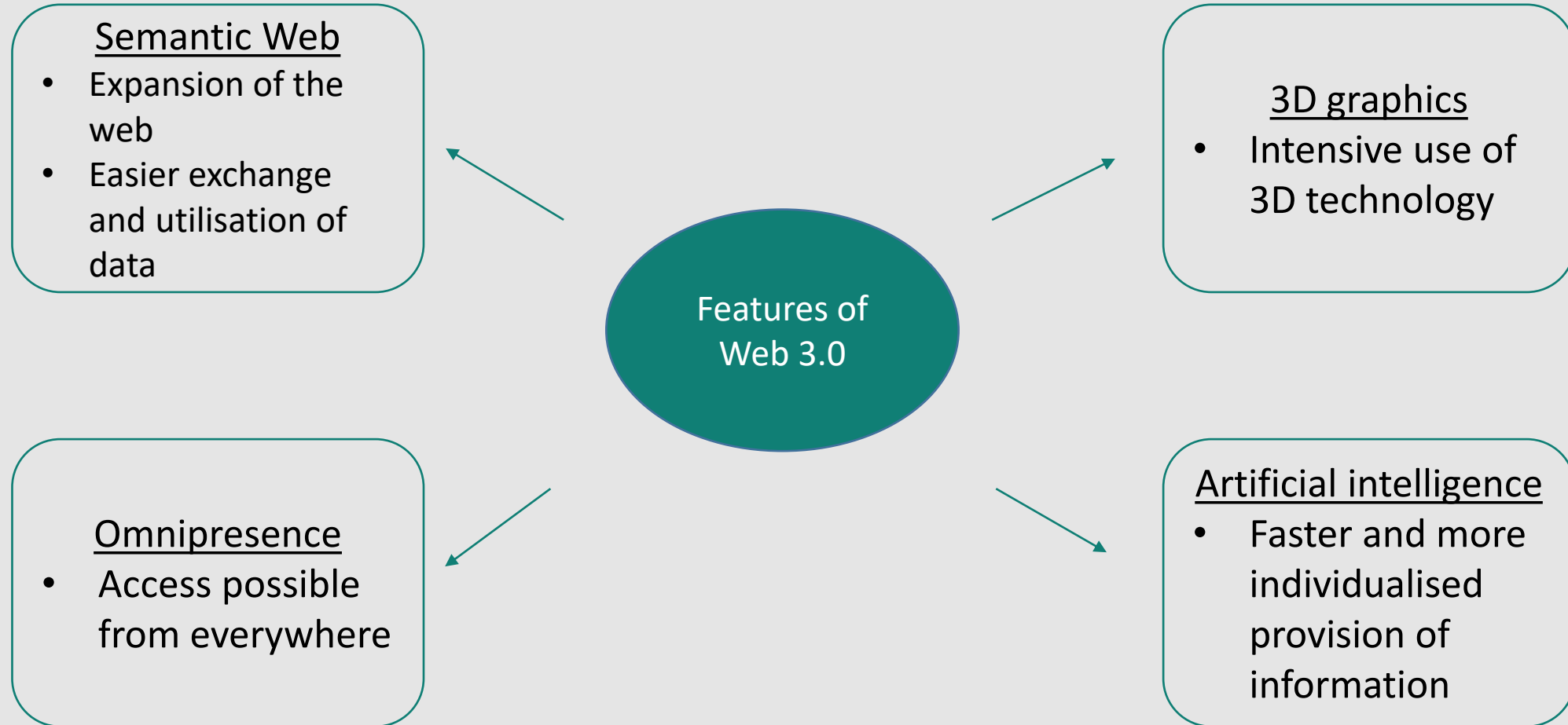
... refers to the new period in the development of the internet,
... Artificial Intelligence & Machine Learning are being increasingly
relied upon

Objective



More open, connected & intelligent websites and web applications

Features of Web 3.0



The way of the web

Web 1.0

Internet as a technology for publishing and distributing data, information or multimedia content.

Role allocation:

Active content creators

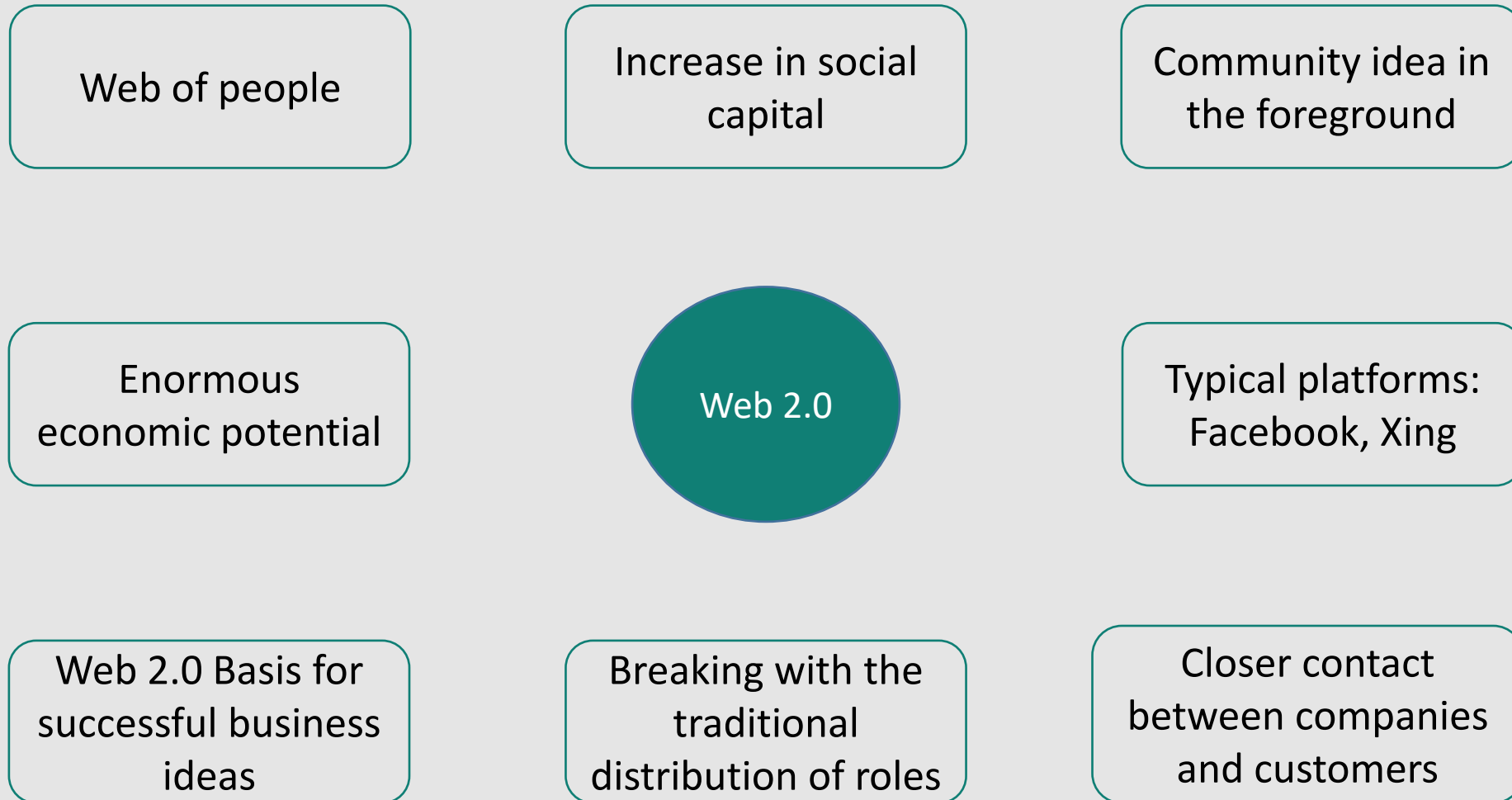


Passive consumers

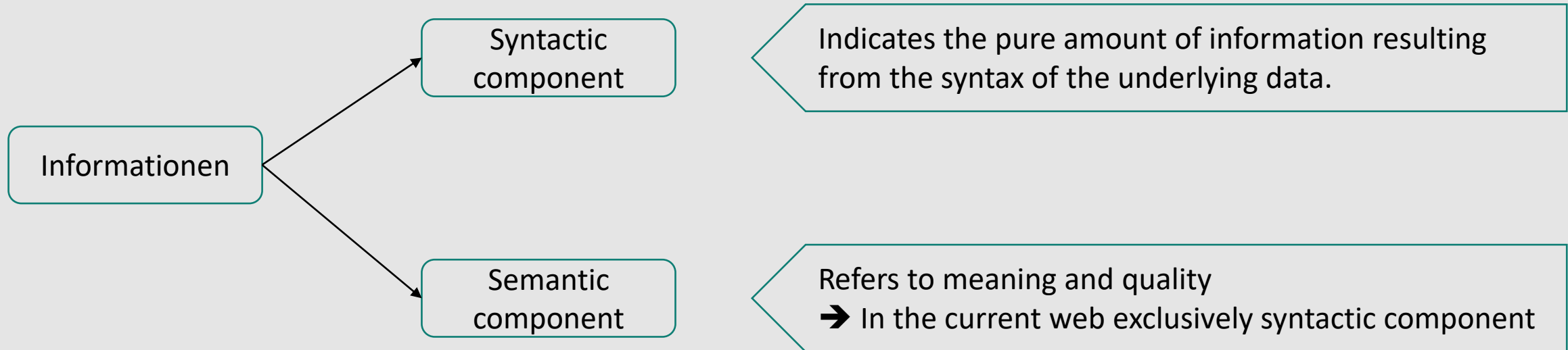


Web of companies

The way of the web



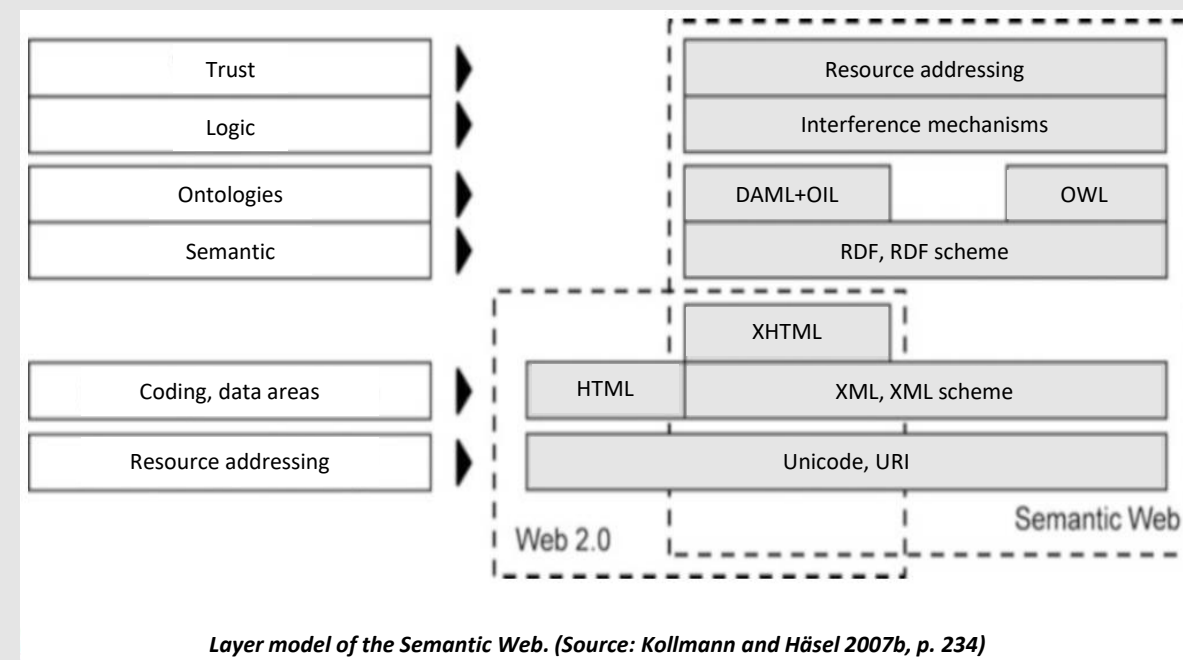
Web 2.x - Semantic Web



- Semantic Web (SW) to close gap in the current web → Expansion of Web 2.0 through further technologies and concepts
- Information should have a clearly defined meaning that can be interpreted by machines.
- In the SW, information resources are supplemented by metadata (expressing meaning, exchange between computer systems).

Web 2.x – Semantic Web

- Prerequisite: Information must be unambiguously findable.
- Ensured by the use of Unicode, unique resource addresses (URIs) and data areas described in the XML markup language.
-
- Resource Description Framework (RDF) supplement information resources with independent metadata
- Semantic relationships are modelled as a triple (resource, property, value)



Prospects in Web 3.0

	Web 1.0	Web 2.0	Web 3.0
Platform type	E-Procurement E-Shop E-Marktplatz	E-Community E-Company	E-Desk
Content creation	Provider	Participant („user-generated Content“)	Demanders
Content annotation	By supplier	Through participants „Tagging“	Demanders, through clearly defined metadata
Search for content	Keyword search finds documents ("Hit list")		Structured search finds data, generates documents
Problems for content	Inference by providers/demanders/participants themselves ("information overload")		Inference through platforms and software agents



Shadow sides of Web 3.0

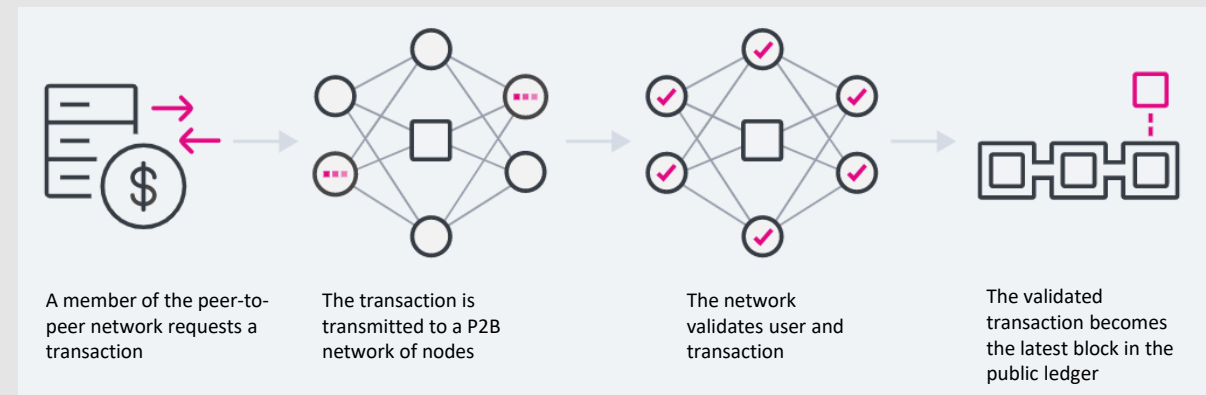
- Not all people and devices can handle it
- Standards difficult to implement
- How detailed should semantic relations be modelled?
- Construction of semantic networks reserved for experts because of complexity (small group of people with great power of definition)
- Users become more passive and may unlearn things

Origins of blockchain technology

- 1979 - Starting point: Merkle Tree Principle (concept of the hash tree method for providing a digital signature)
- 1983 - First white paper with electronic currency
- Mid-90s - W.Scott Stornetta and Stuart Haber: Fundamentals of a cryptographically secured concatenation of individual digital hash blocks
- 1997 - Basic proof-of-work algorithm of Bitcoin (proof of work in the form of computing power)
- 2008: Satoshi Nakamoto "Bitcoin: A Peer-to-Peer Electronic Cash System": the white paper is considered the founding document of virtual currencies

Blockchain

- One of the leading developments in the digital economy
- Each block of the chain contains a set of valid transaction records and attributes of the transacted item in a given time period
- Blockchain act as trust engines
- Can be used for any type of transfer of an item/attribute of value in a peer2peer network



Blockchain - Advantages

- Auf Grundlage des Distributed Ledger (Hauptbuch) wird jede Transaktion sicher dokumentiert
- Updates/Änderungen nur möglich, wenn alle zustimmen
- Damit sind in einer Blockchain abgelegten Daten transparent, akkurat und konsistent
- Informationen liegen in einem Netzwerk und nicht auf einzelnen Servern
- Bsp. Storj – dezentrales Pendant zu Dropbox
- Rückverfolgbarkeit, da alles bis ins Detail dokumentiert wird und somit nachvollziehbar ist
- Kostenreduktion im Bereich Verwaltung, keine Third Parties o.ä.

Blockchain - Nachteile

- High storage requirements, as the chain grows with each block.
- Blockchain technology is not easy to integrate into an existing IT landscape.
- Cost-intensive change management is necessary
- If there is disagreement in the decision-making process, the chain can be split up.
- Even the blockchain is not one hundred percent tamper-proof.
- Transparency is actually desired with the blockchain, but it can backfire because others can also view past and sometimes future transactions.



Cryptocurrencies

- 2009, birth with the creation of the Bitcoin.
- Goal: decentralisation, transparency and anonymity
- Realisation via blockchain (form a digital register distributed across several computers)
- Thousands of different cryptocurrencies
- Best known: Bitcoin, Ethereum and Litecoins

What is the Web 4.0

- Networking the physical world with the virtual world to create so-called Cyber Physical Systems (CPS).
- Cyber Physical Systems comprise the 3 areas of Machine to Machine Communication (M2M), Internet of Things (IoT) and Cloud Computing.

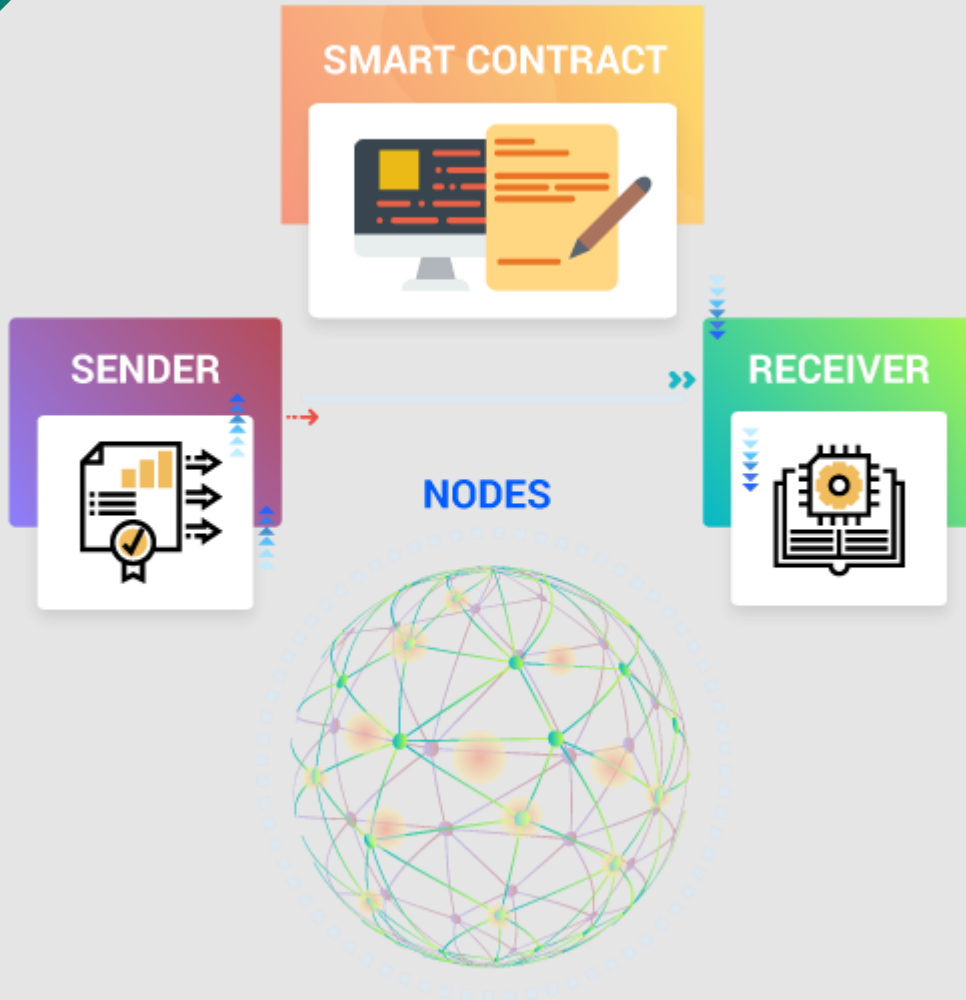




Prospects for NEDGEX

- Increase engagement with machine learning and AI
- 3D representations similar to object recognition and their use
- Semantic applications with enormous potential (description/networking of data)

Smart Contracts



What are smart contracts?

- Smart contracts are computer programs that run on blockchain nodes and can be issued between untrusted, anonymous parties without the involvement of a third party.
- As simple forms of smart contracts, the standard types of Bitcoin transactions, such as pay-to-public-key hash (P2PKH) and pay-to-script hash (P2SH), are all defined with Bitcoin Script.
- There are also platforms that allow for more complex contractual functionalities and flexibility, such as Ethereum, which uses a Turing-complete language for smart contracts.

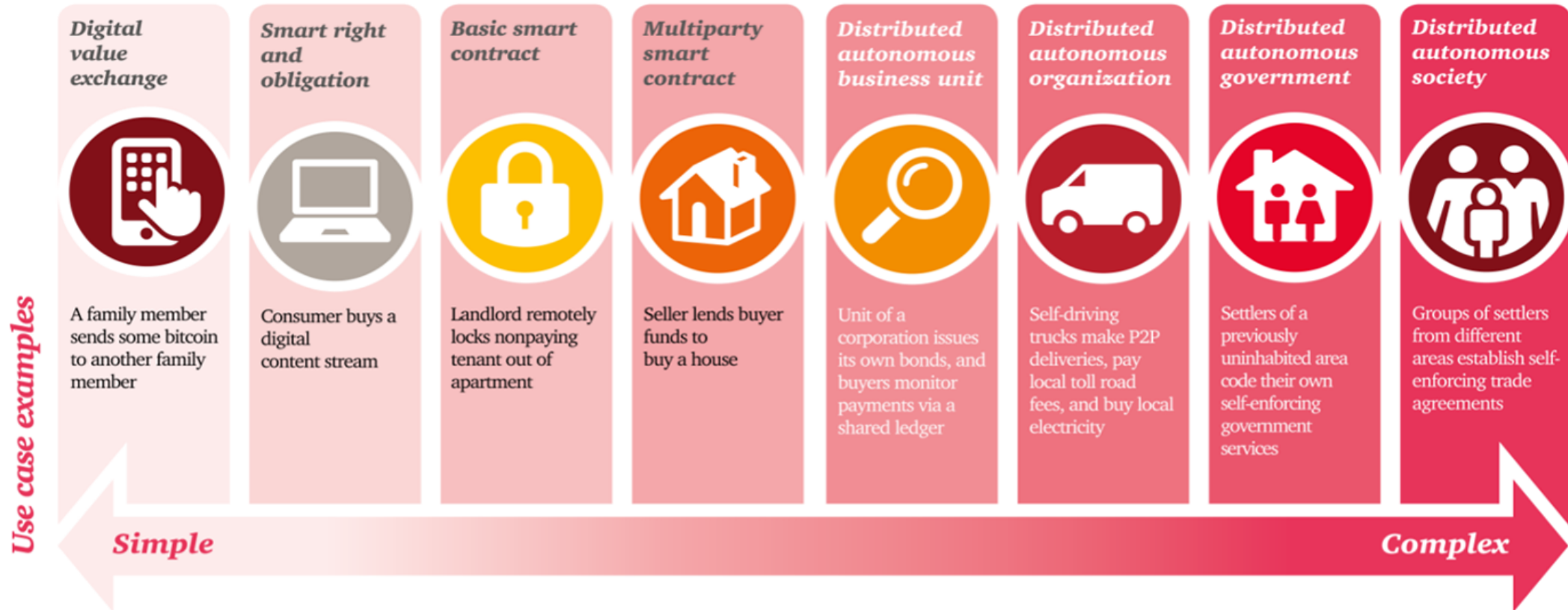
Smart Contracts

Why do we need smart contracts?

- Smart contracts inherit the properties of the underlying blockchains, such as the immutable record of data and the ability to mitigate single points of failure.
-
- Smart contracts can also interact with each other via calls.
- Unlike traditional paper contracts that depend on middlemen and third-party providers for execution, smart contracts automate contracting processes, minimise interactions between parties and reduce administrative costs.

Smart Contracts

Smart contracts – simple to complex



Discussion

Web 3.0

Hype or Happening ?