



**dutch
digital
delta**

Summary Dutch Blockchain Research Agenda



connect and create

Summary Dutch Blockchain Research Agenda

Vision

Blockchain research is best directed at **identifying and creating the conditions** to steer the development of blockchain technology toward **maximizing its potential for societal good**; and to the **exclusion or remediation of undesirable developments**.

These conditions arise from ethical, technological, economical, legal, and societal perspectives, all in close interrelationship. Blockchain research, therefore, must take a systems' point of view.

Blockchain Characteristics

Specific characteristics of blockchain technology may generate either great opportunities or great causes for concern. We identified some distinguishing blockchain characteristics, that all require a better understanding:

- Decentralization for a distributed, immutable ledger
(consensus and immutability in open and public/private permissioned blockchains)
- Automation and standardization of transactions
(smart contracts, interoperability, legal compliance)
- Digital Scarcity
(value versus information, cryptographic tokens)
- Disintermediation
(trust in institutions and technology, interfacing with off-chain world)

Overarching Research Concerns

Specifically, three overarching concerns need to be addressed, in order to align analytic and design challenges for creating and adopting blockchain technology that realizes a positive societal potential:

- Trustworthiness
 - Trust in social and legal institutions, that could either govern the transition to blockchain technology, cohabit peacefully with it, or might be replaced by it
 - Personal trust in the veracity, accuracy and security of information on the blockchain, including transparent user interfaces for domain engineers and end-consumers
 - Technological reliability and security of consensus and immutability of the ledger; correctness of smart contracts; scalability and performance of blockchain technology.
- Sustainability
 - Energy consumption versus the inherent cost of reaching consensus
 - Scalability, both in number of transactions and in number of participants
 - Resilience against disruption, power concentration, hostile takeover
 - Economic viability of blockchain technology versus alternative technologies, including a techno-economic analysis of its use cases
- Governance
 - Legal compliance, in particular on privacy (including the right to be forgotten) and (self-sovereign) identity management
 - Governance of a blockchain, rule- and decision-making, life-cycle management
 - Management of technology transition and evolution; including interoperability and migration between blockchains; emergence of blockchain infrastructure and services.