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Blockchain in Process and Security Governance

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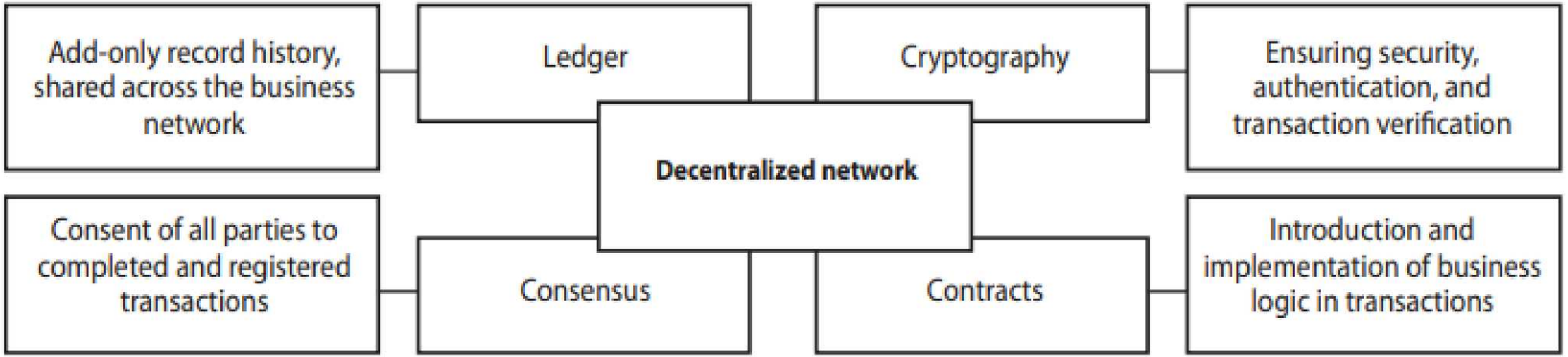
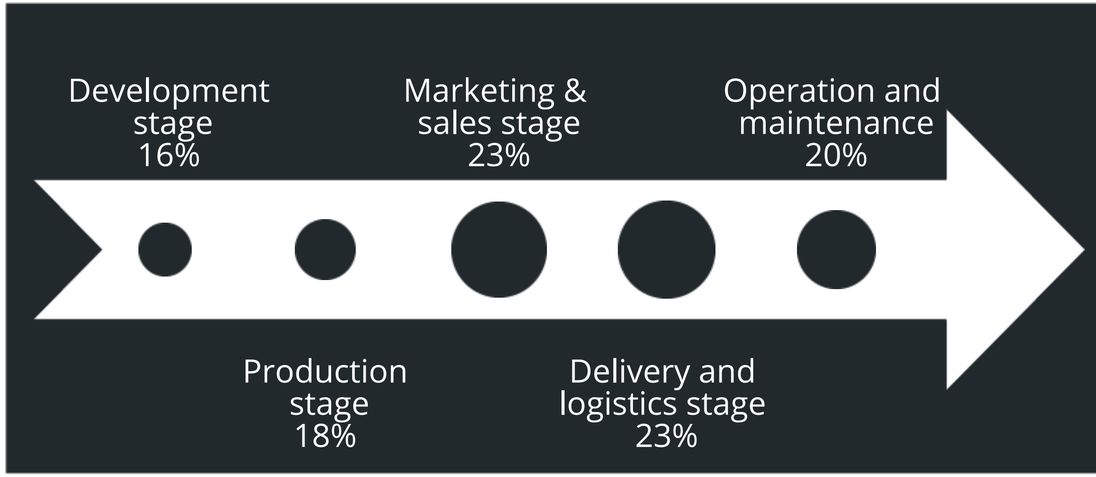
Blockchain technology should be considered as a decentralized computing system with five components, namely: a decentralized network, mathematical cryptography, distributed consensus, a transaction ledger, and smart contracts.





Automotive industry

Deep dive into market, audience, and competitor analysis.

Pharmacy

Record tracking and digital inventory management of pharmaceutical products

Technologies

Exploring the use of Blockchain technology to improve the security of cloud services and data protection.

Retail trade

Blockchain system for tracking the movement of cargoes between ports, using technology to track the movement of products from farmers to stores.

The use of blockchain technology in the sectors of manufacturing

Blockchain technology products and their implementation in companies' business processes

The proportion of technological products with Blockchain, which are offered by five leading developers – VeChain, Chronicled, Ethereum, Hyperledger, IBM Blockchain, takes more than 50% of the total market offering.

VeChain

VeChain is a blockchain platform specializing in improving supply chains and managing business processes. The VeChain platform uses a distributed ledger to create transparency and reliability of data about products at all stages of their production and delivery. VeChain employs a two-tier governance and economic model, making it an attractive solution for a variety of industries, including manufacturing, retail, and logistics.

Ethereum

Ethereum is a decentralized platform for creating and using smart contracts, which automatically execute contractual terms using programming code. Ethereum plays a key role in the development of blockchain technologies and the ecosystem of decentralized applications (DApps). A distinctive feature of Ethereum is its support for Turing-complete smart contracts

Hyperledger

Hyperledger is an open-source collaborative effort created to advance cross-industry blockchain technologies. it serves as an umbrella project for various blockchain and related tools designed to support industries ranging from finance to healthcare. Unlike public blockchains like Bitcoin or Ethereum, Hyperledger focuses on private and permissioned blockchain networks, which are crucial for enterprises requiring privacy and scalability.

Chronicled

Chronicled is a technology company at the forefront of leveraging blockchain and IoT (Internet of Things) to enhance supply chain management and secure peer-to-peer ecosystems. Chronicled has developed a platform that enables the tracking and verification of products and transactions in a tamper-proof system, primarily focusing on pharmaceuticals and high-value goods.

Governance and security challenges solved by the implementation of technology

Development stage

Blockchain facilitates collaborative work and secure data exchange in the research and development process. This allows different organizations (companies, universities) to safely share research results and innovative developments.

Integration of the technology accelerates and simplifies the processes of verification and certification of new products through reliable and continuous documentation.

Production stage

Blockchain ensures transparency of supply processes, allowing tracking and verification of the authenticity of each delivery. This helps prevent counterfeiting and ensures the quality of materials.

Smart contracts automate many manufacturing processes, such as settlements with suppliers for delivery or product quality.

Marketing & sales stage

Blockchain can be used to verify the authenticity and origin of goods, which is especially important in sectors at high risk of counterfeiting (e.g., luxury goods).

The technology also allows for the management of loyalty programs, transparently recording each user action and automatically accruing bonuses

Delivery and logistics stage

Blockchain provides unified and reliable data for all participants in the supply chain, simplifying the tracking of goods movement and ensuring delivery accuracy.

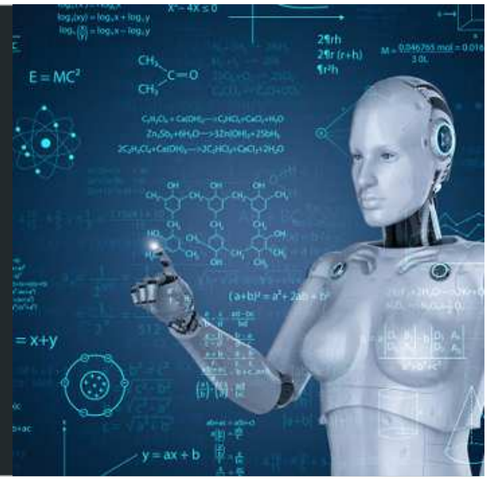
The use of smart contracts minimizes human errors and optimizes interactions between different parties in the delivery process

Operation and maintenance

Blockchain can store the entire history of maintenance and operation of a product, making these data accessible and transparent to the product owner and service agencies.

The technology ensures adherence to established maintenance and repair procedures and helps maintain manufacturers' warranty commitments

Look at the use of blockchain technology at the approval stage of a new product model (development stage), and how the verification and certification of new products can be improved and automated.
The focus is on the role of smart contracts that automate and standardize these processes, reducing the risk of human error and increasing the transparency of each step of the development process.



Total assessment of the parameters of a new product by certain standards can be calculated as follows:

$$A = \sum_{i=1}^{n} W_i \times S_j .$$

The set ***Ci*** , where i =1,...n is the set of criteria for a given product model. The criteria may include product features, environmental sustainability, manufacturing costs, and more.

Each criterion ***Ci*** corresponds to a score ***Si*** in the range [0...1], which shows how well the parameter of the new product corresponds to the corresponding criterion.

The set ***Wi*** – the value of the weight of each criterion depending on its importance.

In Blockchain, data is structured into blocks. To compare the product model, each product evaluation can be thought of as a block with fields:
ProductID: a unique identifier for the product;
CriteriaScores : a list of *Si* scores for each *Ci* criterion;
Weights: a list of *Wi* weights;
AggregateScore: the calculated cumulative score of *A*;
Time-stamp: date of evaluation;
Evaluator: information about the expert who conducted the assessment.

```
products[_productID] = Product({
      productID: _productID,
      criteriaScores: _criteriaScores,
      weights: _weights,
      aggregateScore: _aggregateScore,
      evaluator: msg.sender,
      timestamp: block.timestamp
    });
```

The use of blockchain and smart contracts in the development stage of a new product model allows companies to significantly improve the efficiency of development and approval processes.
These technologies contribute to speeding up the product's market entry, increasing its compliance with quality and safety standards, and ensuring the necessary legal and operational transparency.

BENEFITS OF USING SMART CONTRACTS

Smart contracts automatically verify whether the product being developed meets predefined standards and requirements. This significantly speeds up the verification process and reduces the time needed to start production.

Blockchain and smart contracts offer reliable protection of intellectual property as data recorded on the blockchain cannot be altered or deleted without the consent of all network participants.

All data regarding agreements and design changes are recorded on the blockchain, providing full transparency and auditability at every stage of development. This allows all stakeholders to stay informed about the current state of the project.

Automation reduces risks associated with human errors and ensures that each step is completed according to the predefined conditions of smart contracts.

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Thank You!