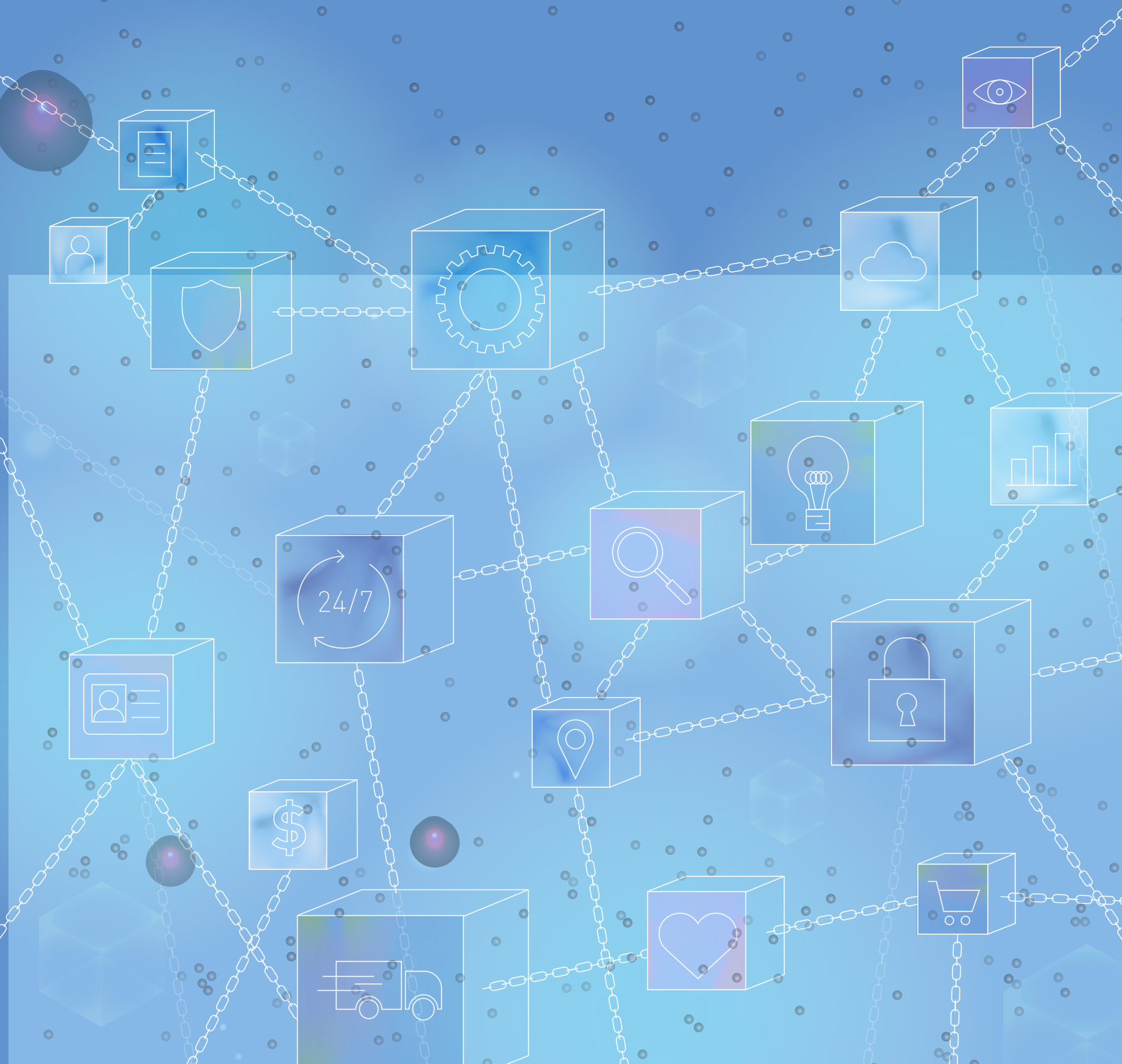


# HYPE OR HELP?

## The real benefits of blockchain

*By Jan Bieser and Daniel Fasnacht*



## Imprint

### **Authors**

Dr. Jan Bieser, Dr. Daniel Fasnacht

### **Editing**

Scribendi

### **Layout/Illustration**

Joppe Berlin, [www.joppeberlin.com](http://www.joppeberlin.com)

### **GDI Research Board**

Alain Egli, Karin Frick, Dr. Jakub Samochowiec, Christine Schäfer

© GDI 2023

ISBN: 978-3-7184-7143-0

### **Publisher**

GDI Gottlieb Duttweiler Institute

Langhaldenstrasse 21

CH-8803 Rüschlikon / Zurich

[www.gdi.ch](http://www.gdi.ch)

### **Initiators**

sminds/N9 House of Innovation, Inacta, EcosystemPartners

### **Industry and cooperation partners**

This study was made possible by various partners who contributed their expertise and experience: aXedras, Blockchain Nation Switzerland, Swiss Federal Office of Energy, Generali (House of Insuretech Switzerland HITS), Green, Inacta, Kantonsspital Baden, Novartis, OVD Kinegram, Association of Swiss Electricity Companies VSE.

## Table of contents

2	<b>Foreword</b>
4	<b>Summary</b>
6	<b>Initial situation</b>
10	<b>An introduction to blockchain</b>
	> The blockchain technology
	> Blockchain and distributed ledger technology
	> Permissionless and permissioned blockchains
	> How blockchain works
	> Blockchain governance
22	<b>Benefits of blockchain technology</b>
	> Goals of the use of blockchain
	> Blockchain in corporate practice
31	<b>Blockchain in Switzerland and internationally</b>
34	<b>The shift to distributed value networks</b>
	> Visions of distributed value networks
	> Advantages and disadvantages of distributed value networks
	> Blockchain and power concentration
42	<b>The potential of blockchain applications in detail</b>
	> Self-sovereign identities
	> Distributed management of sensitive data using health data as an example
	> Tracking and tracing of goods using pharmaceuticals as an example
63	<b>Critical success factors of blockchain projects</b>
68	<b>Is the future distributed?</b>
69	<b>Acknowledgements</b>
70	<b>Appendix</b>
73	<b>Bibliography</b>

# Summary

Many digital applications have become critical infrastructures for business and our everyday lives. Dependencies on digital infrastructures exist beyond the technology industry, as digital tools are also used to provide physical infrastructures and services in, for example, finance, healthcare, transportation, building management, energy, or manufacturing. Often, these applications are provided by central service providers, such as IT companies or network operators. Citizens must trust these service providers to ensure the systems' availability and integrity and not abuse their market power.

The introduction of Bitcoin and the blockchain technology behind it in 2009 raised the hope of reducing such dependencies—in the case of Bitcoin, the dependencies on (central) banks. Since then, the technology has been continuously developed to exploit the potential of blockchain in the corporate context. Today, it is no longer a technology specifically for cryptocurrencies, but a technology that offers advantages for digital applications in many industries. Yet, many leaders continue to find it difficult to assess the short- and long-term benefits of blockchain technology for their organizations. Therefore, the goal of this study is to provide a nuanced understanding of the potential applications, opportunities, and limitations of blockchain technology.

Blockchain can be used for two fundamentally different purposes:

**More robust and efficient digital infrastructures:** The distributed operation of a digital application on the systems of multiple business partners increases its tamper resistance and availability. Valuable assets can be digitally mapped and traded with tokens, and

business processes can be automated with smart contracts. This simplifies cross-organizational collaboration and saves on costs and time. Once processes have been digitized in a secure manner using blockchains, new business areas can open up. For example, blockchain enables the creation of secure electronic identities that allow the secure digital identification of people, organizations, and objects. This can enable access management in buildings without physical keys, tamper-resistant authenticity certificates for goods, peer-to-peer marketplaces, or a robust data infrastructure for the Internet of Things.

**Reduction of dependencies:** Distributed operations additionally provide the possibility of eliminating dependence on central service providers. In self-regulating, distributed value networks, all members make decisions together and control each other without a central authority: Internet without Google, ride-sharing without Uber, and payments without banks. However, this is not only a technological but also a social process in which new forms of cooperation must be established and conflicts of interest overcome. If this succeeds, blockchain technology offers a suitable technological basis for implementation.

A literature search revealed more than 50 applications in 10 industries. In the enterprise context, centrally managed applications dominate the market with the goal of increasing system integrity, automation, and cost efficiency. Often, the attempt to deploy blockchain technology is also a driver for standardizing existing processes, as this is a prerequisite for digitizing them using blockchain.

Key challenges in implementing blockchain projects include establishing suitable governance structures for cross-organizational collaboration, eliminating regulatory ambiguities, ensuring data quality and security (on blockchains and in adjacent systems), and fostering trust and acceptance in the technology. If companies forge new partnerships with competitors and regulators, and collaboratively test applications, these challenges can be overcome. Switzerland is considered an international hub for blockchain with forward-looking blockchain regulations, leading research hubs, and over 1,100 companies developing blockchain solutions.

Due to the continued substantial progress in the digitization of processes, which has been further spurred, not least by the COVID-19 pandemic, it can be assumed that digital applications will continue to gain importance. The properties of blockchain—tamper resistance and availability, efficient data exchange, decision rules that can be fixed in smart contracts, and value trading with tokens—offer a suitable technical basis for creating robust and efficient digital infrastructures.

© GDI 2023

**Publisher**

GDI Gottlieb Duttweiler Institute

Langhaldenstrasse 21

CH-8803 Rüschlikon

[www.gdi.ch](http://www.gdi.ch)