

Parveen A.

Blockchain Design & Use Cases

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ISBN 13 :	978-93-55384-02-7
ISBN 10 :	9355384025
E-ISBN 13 :	978-93-55384-02-7
Edition :	First
Pages :	96
Type of book :	Physical
Year :	2025
Language :	English
Publisher :	Khanna Publishing House
M.R.P :	Rs 148.00
Categories :	New Arrivals, Book Store, Sathyabama Series
Condition Type :	New
Country Origin :	India

Khanna Publishing House

4C/4344, Ansari Road, Daryaganj, New Delhi-110002

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Product Description

Blockchain Design & Use Cases

“BLOCKCHAIN DESIGN & USE CASES" is a comprehensive and expertly structured guide designed to equip readers with a mastery of the transformative technology that is blockchain. This book bridges theoretical concepts with practical use cases, highlighting blockchain's immense potential to revolutionize industries by ensuring transparency, security, and decentralization. The journey begins with foundational principles, tracing the evolution from digital money to Distributed Ledger Technology (DLT) and detailing key design primitives such as cryptographic hashing, digital signatures, and consensus mechanisms.

The core purpose is to provide readers with actionable knowledge, moving beyond mere theory to practical application. The text offers an in-depth focus on the enterprise-grade platform Hyperledger Fabric, covering its components, chaincode development, and the decomposition of its consensus process. Furthermore, it provides extensive coverage of real-world scenarios across critical sectors, including financial systems (settlements, KYC, capital markets), supply chain management (provenance, trade finance), and government use cases (digital identity, land records).

Targeted at a diverse audience, including students, developers, researchers, and business leaders alike, this text serves as both a detailed academic resource and a practical gateway for innovation. With thoughtfully designed exercises, summaries, and additional resources at the end of each unit, this book ensures readers are well-prepared to navigate, contribute to, and leverage the rapidly evolving blockchain ecosystem for the future.

Salient Features:

- **Foundational Concepts**: Begins with a strong base, covering the evolution from digital money to DLT, basic crypto primitives, and fundamental blockchain architecture.
- **Consensus Protocols**: Explores the requirements, scalability challenges, and specific mechanisms like Proof of Work (PoW) and those designed for permissioned blockchain networks.
- **Hyperledger Fabric**: Provides an in-depth analysis of this key enterprise framework, detailing its components, consensus decomposition, and chaincode design and implementation.
- **Finance Applications**: Dedicated coverage of blockchain use in financial systems for streamlining settlements, automating KYC/AML, and digitizing capital markets.
- **Supply Chain Focus**: Details practical applications in trade/supply chain, focusing on ensuring goods' provenance, supply chain finance, and invoice management and discounting.
- **Government Use Cases**: Investigates transformative public sector applications, including digital identity management, land records, and secure implementation in public distribution systems.
- **Security & Privacy**: Discusses advanced cryptographic primitives, permissions, and contemporary privacy measures like Zero-Knowledge Proofs to secure data on the ledger.
- **Pedagogical Tools**: Each unit is reinforced with solved problems (Beginner to Advanced), exercises, summaries, and "Teacher's Know More" sections for comprehensive learning.

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