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	Nota di contenuto	Introduction -- Overview of Blockchain -- Blockchain Consensus Protocols -- Adaptive and Scalable Design for Proof of Work Blockchains -- Adaptive and Scalable Design for Proof of Stake Blockchains -- Adaptive and Scalable Design for Sharding-based Blockchains -- Future Work -- Conclusion.
	Sommario/riassunto	This book systematically studies blockchain adaptability and scalability, combining theoretical analysis with practical implementation. The book provides a comprehensive exploration of blockchain adaptability and scalability solutions through six chapters. Chapter 1 introduces blockchain overviews and current scalability challenges, emphasizing the need for adaptive and scalable blockchains. Chapter 2 systematically reviews consensus protocols, from classical BFT to modern PoW, PoS, and sharding approaches, setting the theoretical foundation for subsequent chapters. Chapter 3 presents AdaptPoW, which enhances PoW blockchain adaptability and scalability through dynamic structure adjustment and efficient transaction processing. Chapter 4 presents AdaptPoS, a PoS-based system with role decoupling and filter mechanism, enabling dynamic throughput adjustment while maintaining security. Chapter 5 describes AdaptShard for sharding-

based blockchains, including its transaction allocation and optimistic processing strategy for cross-shard transactions. Chapter 6 concludes with insights and future research directions. Presents a comprehensive progression of blockchain scaling solutions at the consensus layer; Introduces three novel adaptive scaling blockchain approaches: AdaptPoW, AdaptPoS, and AdaptShard; Bridges theoretical analysis with practical applications through extensive real-world implementations and evaluations.