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Database Design for Enterprise Resource Planning Systems: A Comprehensive Approach

Sunil Yadav
University of Pune, India

Abstract: *Enterprise Resource Planning systems are a foundational infrastructure for modern businesses, integrating diverse operational areas into a cohesive framework. Optimal database design underpins successful ERP implementations, directly influencing performance metrics, cost efficiency, and organizational effectiveness. Through careful attention to requirements analysis, schema development, performance optimization, and security considerations, organizations can establish database architectures that support business objectives while mitigating risks. The balanced scorecard approach to database design demonstrates quantifiable benefits across financial, customer satisfaction, internal process, and organizational growth dimensions. Cloud migration further transforms ERP infrastructure possibilities when properly executed, offering enhanced scalability, security, and cost advantages. A comprehensive framework for ERP database architecture must incorporate modular design principles, appropriate normalization techniques, strategic denormalization, effective indexing, and robust integration capabilities. Organizations implementing these practices experience measurable improvements in implementation timelines, operational efficiency, system maintainability, and data integrity. As technology evolves, database designers must balance traditional design principles with emerging capabilities to create resilient, adaptable ERP foundations supporting strategic business objectives.*

Keywords: Enterprise Resource Planning, Database Design, Cloud Migration, Schema Optimization, High Availability

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