VahanRent – A Blockchain Powered Peer-to-Peer Car Rental System

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Abstract: *Traditional car rental platforms suffer from high commissions (20-30%), opaque trust mechanisms, and limited vehicle monitoring, leading to disputes and safety risks. VahanRent introduces a blockchain-powered peer-to-peer (P2P) car rental system that eliminates intermediaries using smart contracts on Polygon/Ethereum for automated escrow, payments, deposits, and immutable reputation scoring. The platform integrates real-time GPS/IoT tracking with geo-fencing for owner visibility, hybrid payments (UPI/cards/crypto), KYC via decentralized identity, and DAO-based dispute resolution, built on React Native frontend, Node.js/FastAPI backend, MongoDB/PostgreSQL databases, and IPFS for documents. Expected outcomes include zero commissions, 98% transaction accuracy, sub- second GPS updates, and enhanced user trust through tamper-proof ratings, reducing costs by 25-30% and disputes by automating 80% of resolutions. This solution transforms mobility into a trustless, scalable sharing economy.*

Keywords: Blockchain, Smart Contracts, IoT GPS Tracking, Peer-to-Peer Rental, Geo-fencing, Decentralized Reputation, VahanRent