TECH SCAN

DIGITAL PAYMENT TECHNOLOGY

The world of advanced technology and digital transformation is witnessing a major shift with the emergence of digital payment technology. These innovative payment solutions are gaining widespread attention as individuals, businesses, and governments increasingly adopt secure, fast, and convenient alternatives to traditional cash-based transactions. Their growing relevance is driven by the need for seamless financial services, enhanced transaction security, and efficient payment systems capable of supporting the rapidly evolving digital economy.

Digital payment technology is becoming essential in applications ranging from e-commerce and mobile banking to retail transactions, public services, and cross-border payments. Unlike conventional payment methods, digital payment systems enable instant fund transfers, reduce reliance on physical currency, and improve financial inclusion by providing accessible and efficient payment options. Their advancement represents a significant step toward a cashless economy, fostering greater transparency, operational efficiency, and economic growth.

Innovation in this field is reflected through patents covering advanced payment authentication methods, secure transaction protocols, artificial intelligence-based fraud detection systems, blockchain-enabled payment platforms, and specialized digital wallet technologies designed to enhance payment efficiency and user experience. These patented technologies focus on improving transaction speed, data security, interoperability, scalability, and overall system reliability, ensuring that digital payment solutions meet the stringent requirements of financial institutions, businesses, and consumers. Securing intellectual property rights for these advancements supports continuous innovation, strengthens competitiveness, and promotes the sustainable development of the global digital payment ecosystem.

INNOVATION TIMELINE

- **1950** — Diners Club launches the first universal charge card shifting transactions from paper to plastic.
- **1967** — The first Automated Teller Machines (ATMs) appear at a Barclays Bank branch in Enfield, North London.
- **1998** — PayPal is founded, pioneering peer-to-peer web-based payments and digital money transfers.
- **2005** — Satellite-based tolling system was first introduced in Germany.
- **2007** — M-PESA launches in Kenya, becoming the world's first widely adopted mobile phone-based payments system.
- **2009** — Bitcoin and Blockchain technology are introduced, laying the groundwork for decentralized cryptocurrency networks.
- **2011** — Google launches Google Wallet, introducing smartphone-based contactless payments.
- **2014** — Apple Pay is introduced, utilizing Near Field Communication.
- **2015** — Samsung Pay introduces Magnetic Secure Transmission.
- **2016** — The National Payments Corporation of India launches the Unified Payments Interface, revolutionizing digital transactions.
- **2017** — QR code-based digital payment systems experience widespread adoption.
- **2019** — Biometric payment authentication becomes widely integrated into mobile payment applications.
- **2024** — Federated learning and multi-modal models adaptively detect fraud in real-time UPI transaction profiling.
- **2025** — NFC-enabled card tapping on smartphones for seamless online transactions.

PATENTABLE COMPONENTS

Payment Authentication and Verification Mechanisms
- Multi-factor authentication methods
- Identity verification workflows
- Transaction approval techniques
- Adaptive authentication systems

Transaction Processing and Routing Systems
- Methods for selecting payment pathways
- Optimizing transaction flow
- Managing payment requests
- Handling transaction failures

Payment Data Processing and Analytics Systems
- Transaction pattern analysis
- Customer behaviour modelling
- Payment insights generation
- Automated reporting systems

Data Encryption and Secure Communication Methods
- Encryption techniques
- Secure data exchange protocols
- Protected payment channels
- Privacy-preserving transaction communication

Automated Payment and Recurring Transaction Systems
- Subscription payment management
- Automated billing workflows
- Scheduled payment execution
- Intelligent payment reminders

Contactless and Near-Field Payment Innovations
- Communication techniques for short-range payments
- Device-based payment interactions
- Secure proximity transaction methods

Biometric-Based Payment Technologies
- Payment authorization using biometric identifiers
- Biometric matching processes
- Combining biometric data with payment security layers

Tokenization and Digital Credential Management
- Replacing sensitive payment information with secure tokens
- Managing temporary credentials
- Controlling token usage permissions

Digital Wallet Architecture and Management Systems
- Wallet storage frameworks
- Wallet interoperability methods
- Balance management systems
- Transaction access controls

Payment Security and Fraud Prevention Technologies
- Fraud detection algorithms
- Risk scoring models
- Anomaly detection systems
- Real-time transaction monitoring system

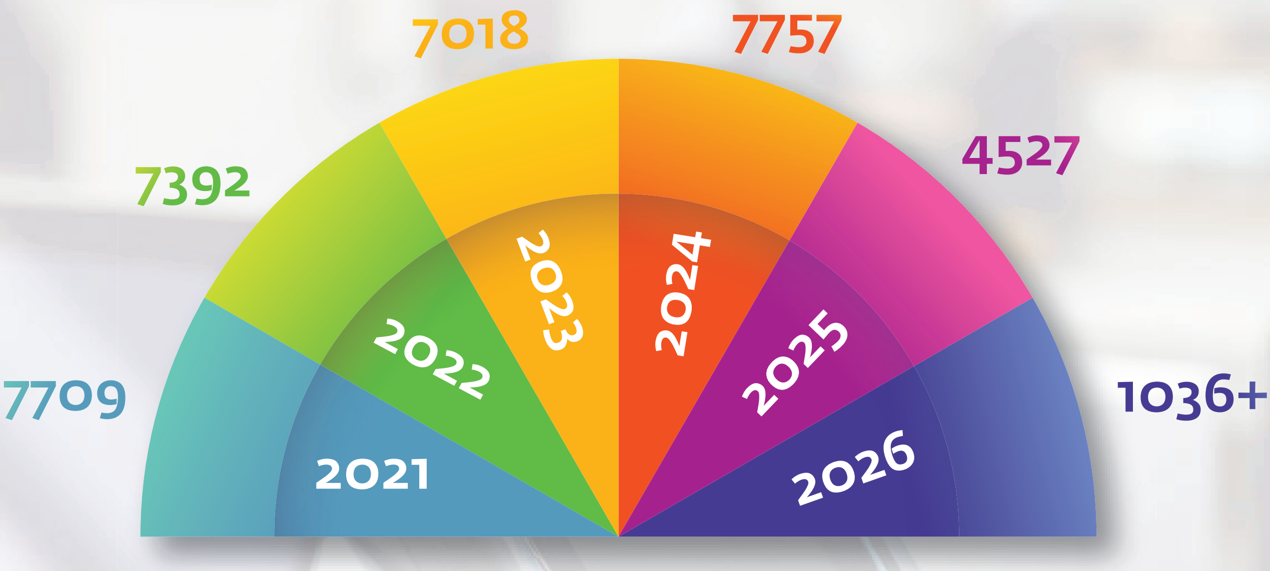
Cross-Platform and Interoperable Payment Frameworks
- Systems enabling payments across different devices, networks, financial platforms, or payment environments

Artificial Intelligence and Machine Learning Applications in Payments
- AI-based fraud detection
- Automated transaction decisions
- Predictive payment analysis
- Intelligent customer support systems

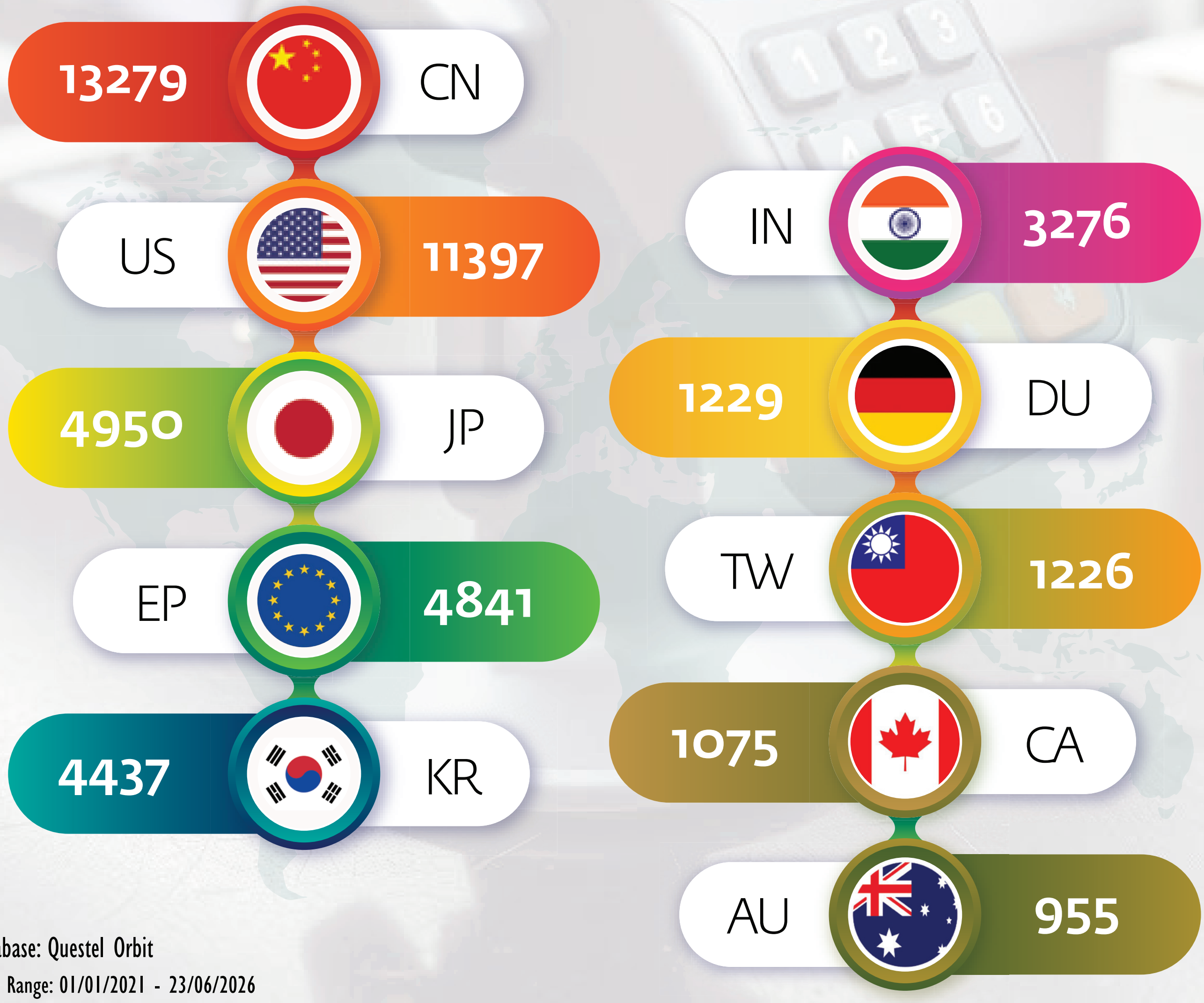
Blockchain and Distributed Ledger-Based Payment Methods
- Decentralized transaction validation
- Digital asset transfer mechanisms
- Distributed record management techniques

Payment User Interface and Transaction Experience InnovationsDistributed Ledger-Based Payment Methods
- Improved payment workflows
- Simplified checkout processes
- Transaction visualization methods
- User interaction designs

PATENT STATISTICS



PATENT LANDSCAPE



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Data Range: 01/01/2021 - 23/06/2026

TOP APPLICANTS

1548
Samsung Electronics

1007
LG Electronics

912
Bank of America

865
Softbank Group

666
Visa International

640
PayPay

549
Mastercard International

492
Tencent Technology Shenzhen

486
PayPal

442
Capital One Services

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NOTABLE INNOVATIONS

Patent Application	Priority date	Title	Assignee
IN202441060491	09.08.2024	Credit card payment using iris scan	REVA University
US11250461	25.09.2019	Deep learning systems and methods in artificial intelligence	Mastercard International Inc
US10438437	20.03.2019	Tap to copy data to clipboard via NFC	Capital One Services LLC
US11080741	23.04.2018	Digital wallet payment system and process	Mastercard International Inc
WO2017221085	12.05.2017	An electronic payment system and method thereof	National Payments Corporation of India
US9489673	01.04.2015	Payment system and methods	PDI Technologies Inc
US9355391	06.03.2012	Digital wallet	Google LLC
US8041338	10.09.2007	Mobile wallet and digital payment	Microsoft Technology Licensing LLC
CN1667632	08.05.2005	Method of mobile payment based on payment confirmation codes	Zheng Yin
US6327578	29.12.1998	Four-party credit/debit payment protocol	International Business Machines Corp; PayPal Inc

WHITESPACES

IoT Micropayments

Embedded B2B Payments

Cross-Border FX Optimization

Identity-Less Recurring Payments

AI-Assisted Payment Routing

Offline Digital Payments

Privacy Preserving Payments

Intent-Based Payments

Carbon-Aware Payments

Voice Payment Security

Stablecoin Payment Bridges

Fraud Detection Using Federated Learning

Multi-Wallet Orchestration

Wearable Authentication

Programmable Escrow

Digital Receipt Intelligence

Quantum-Resistant Payment Authentication

If you would like to learn more about any of these areas or have specific questions, we're here to provide further information and insights. Our team is dedicated to driving progress and staying at the forefront of Digital Payment Technology.

About IP Bazzaar

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Where Mind Meets Market

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