

Scientific day of the National Economic and Financial Committee focused on the digital Economy

# TOPIC: EVOLUTION OF PAYMENT TECHNOLOGIES IN DEVELOPED COUNTRIES

*An In-Depth Look at Advancements and Supporting Infrastructure*

# SUMMARY

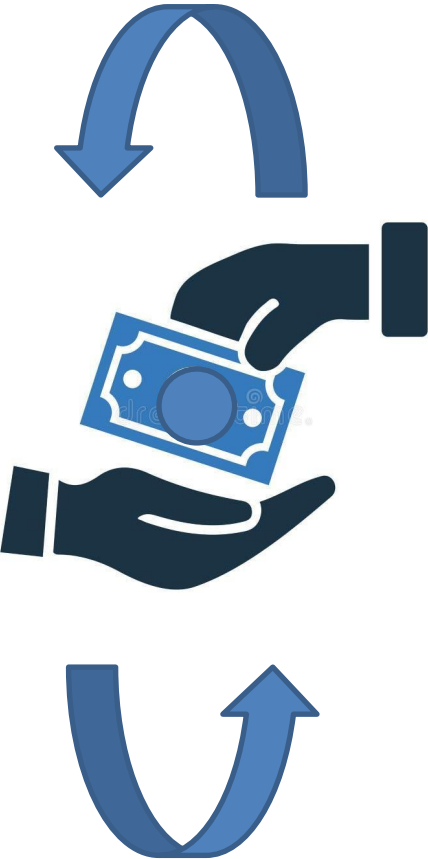
<b>1</b>	<b>Historical context</b>
2	Traditional payment modes
3	Modern Payment technologies
4	Supporting Infrastructure
5	Future trends
6	Cameroon digital Infrastructure
7	How to reduce the gap?



# Historical context



## Goods



## Services



# Historical context



**Cash and Checks**  
Dominant forms of payment in the early 20th century

**Electronic Funds Transfer**  
Emerged in the 1970s, facilitating direct transfers between bank accounts.

**PoS**  
PoS became mainstream, enhancing retail transactions

**Credit cards**  
Introduction in the 1950s revolutionized consumer payments.

**ATM**  
Automated Teller Machines (ATMs) enabled 24/7 access to cash

**Online banking**  
Internet banking services allowed customers to manage accounts and make payments online



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# Traditional payment methods used today

1. Cash: Physical currency (coins and banknotes)
2. Checks:
  - Paper checks (Personal checks)
  - Bank drafts (Issued by banks or financial institutions)
3. Bank Transfers:
  - Wire transfers used for domestic payments on the same day with high fees
  - ACH (Automated Clearing House) transfers used for domestic payments (2-3 days) with low fees.
  - Electronic checks used for domestic payments (2-5 days) with lower fees.
  - SWIFT transfers: Preferred for international payments due to its global reach and standardized processes (1-5 days).





# Traditional payment methods used today

## 1. Credit Cards:

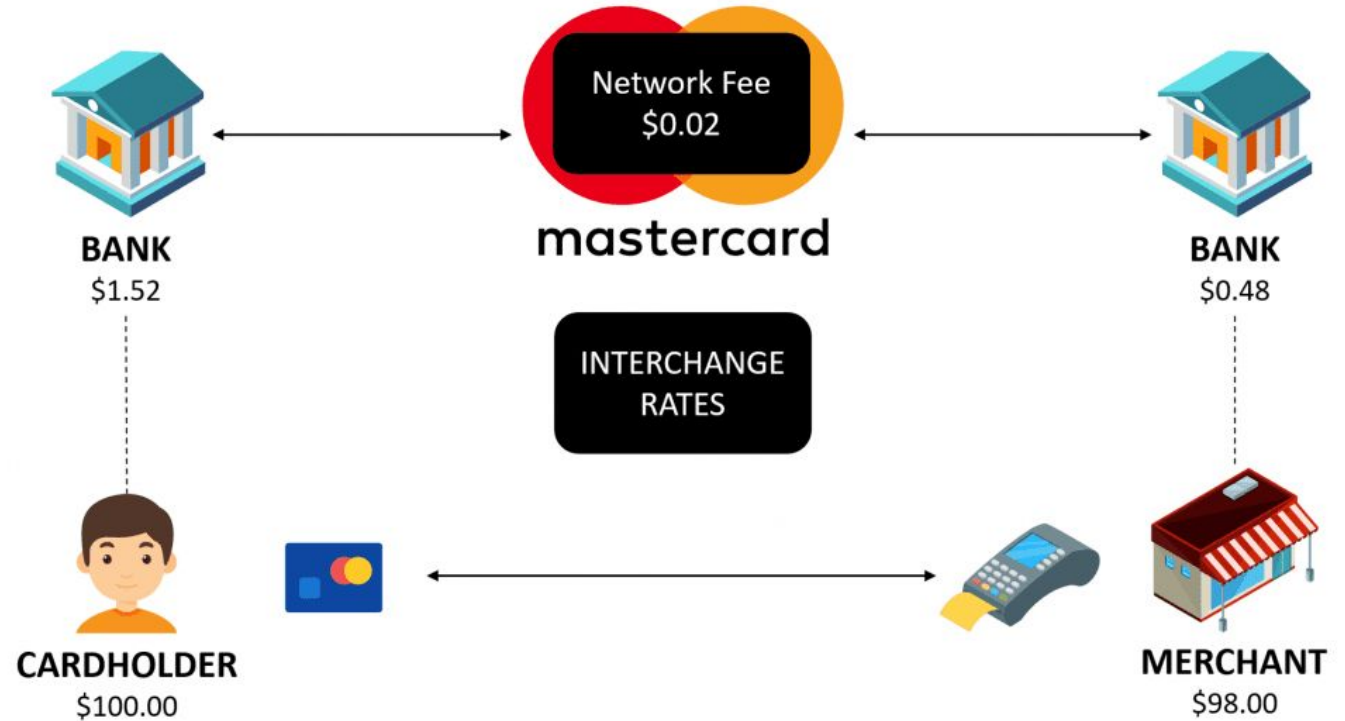
- Visa, MasterCard, American Express, Discover

## 2. Debit Cards:

- Visa Debit, MasterCard Debit, Maestro

## 3. Prepaid Cards:

- Gift cards, Reloadable prepaid cards



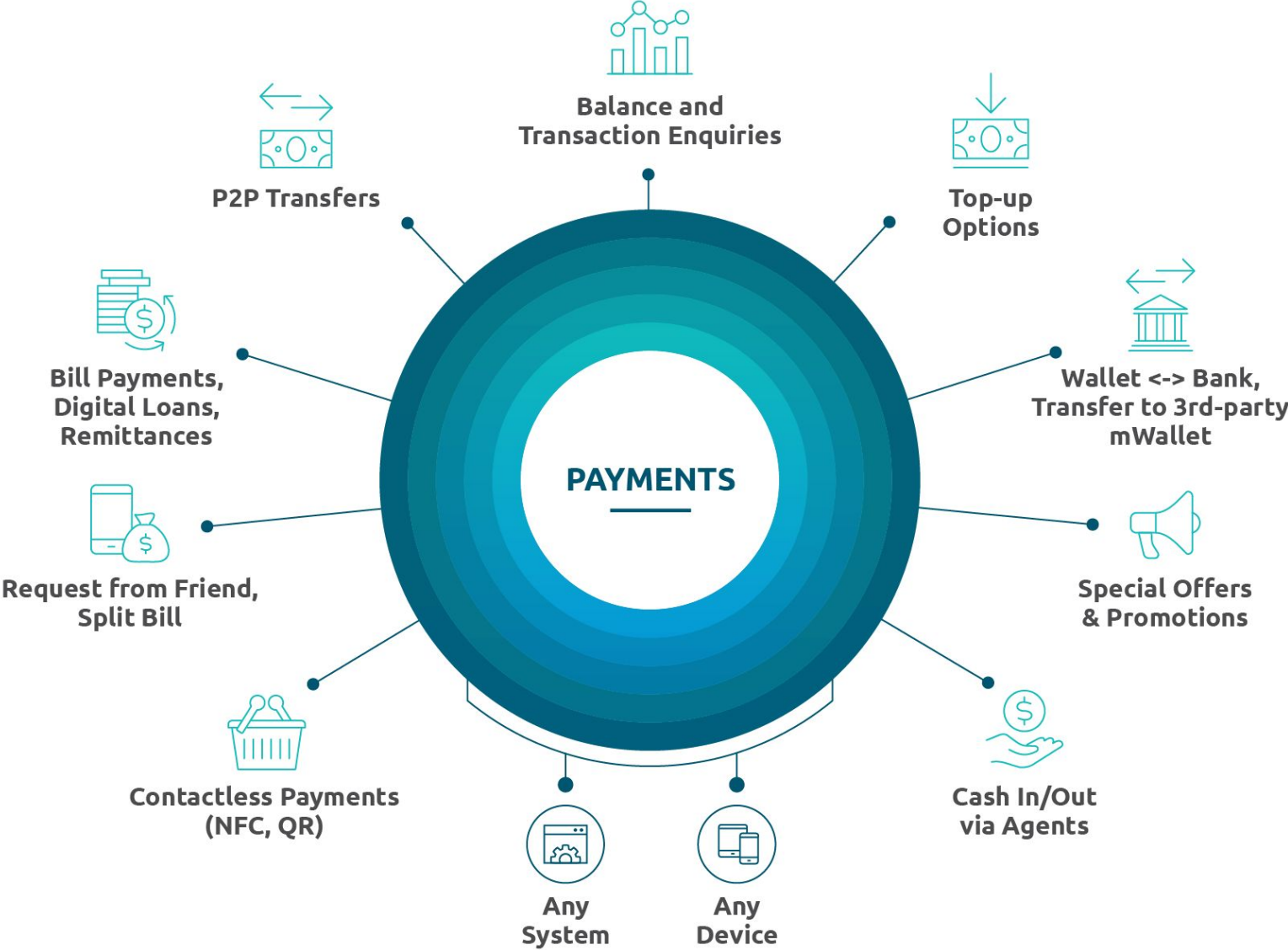
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# Modern payment technologies



**Security**

**Convenience and Ux**

**Speed and efficiency**

**Cost-effectiveness**

**Interoperability**

**Innovation**

**Compliance**

**Financial inclusion**

Historical context

Traditional

**Modern tech.**

Infrastructure

Future trends

Cameroon infra.

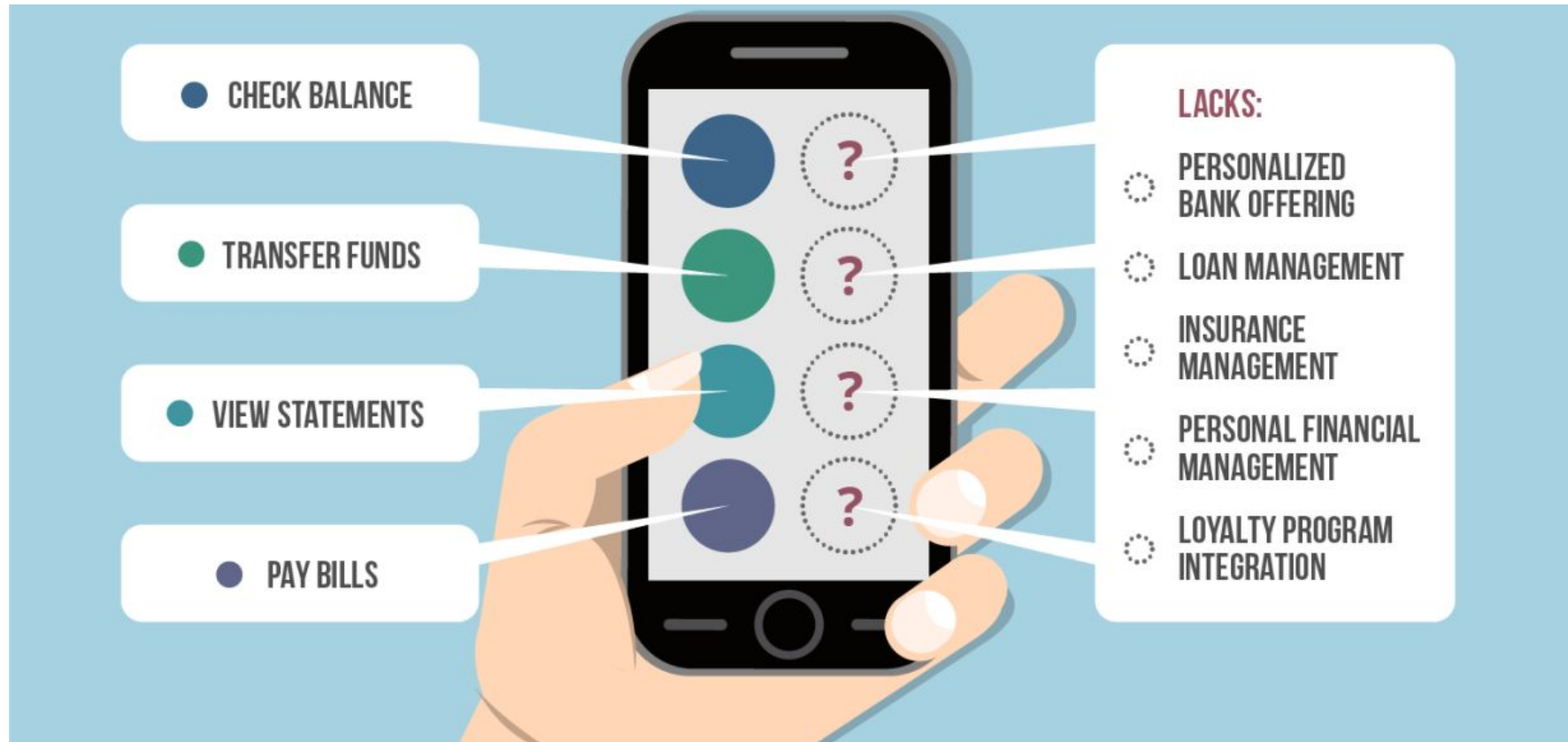
Recommendations

# Modern payment technologies

## Mobile Banking Apps



- Apps provided by traditional banks
- Neobanks and fintech apps



Historical context

Traditional

**Modern tech.**

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Cameroon infra.

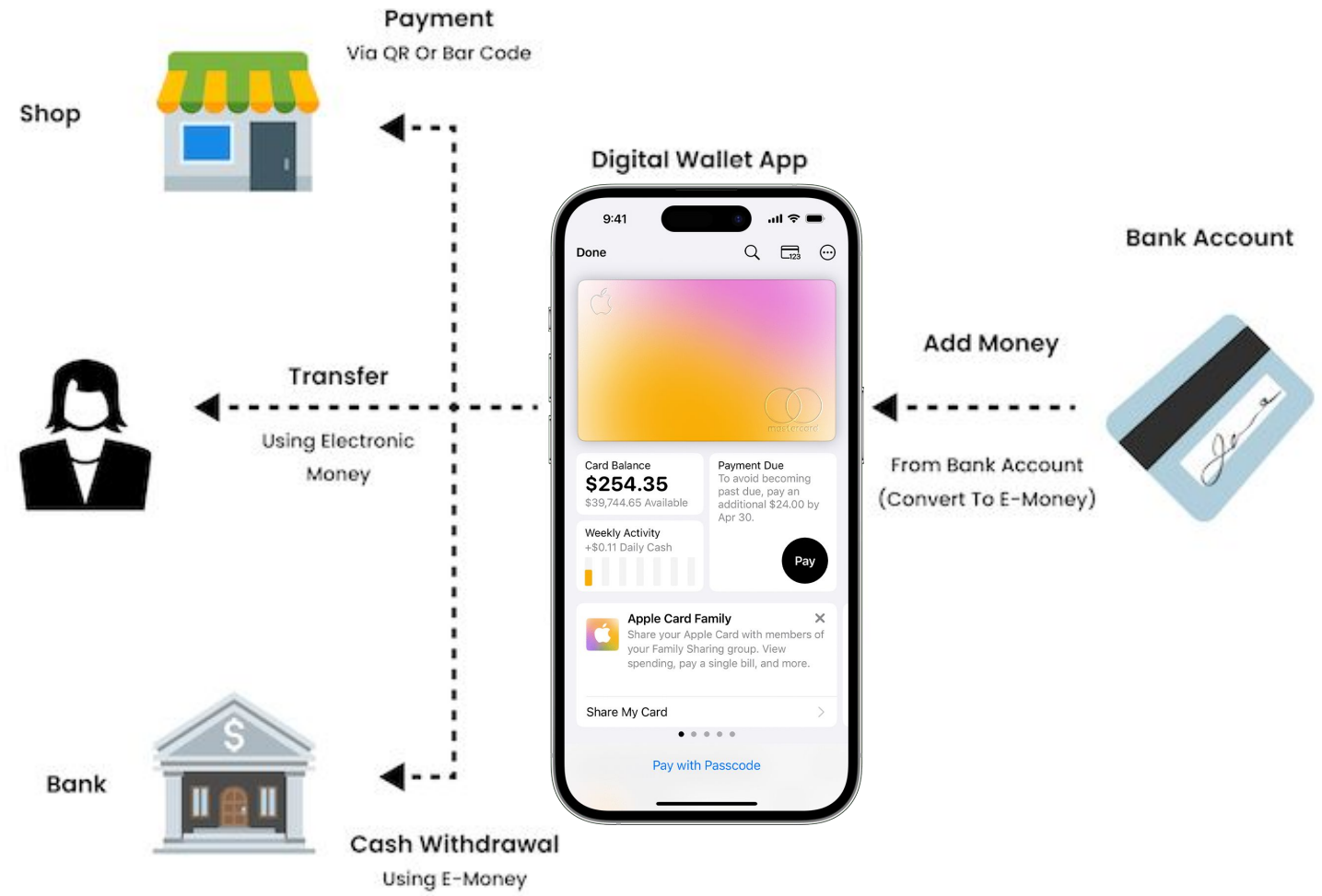
Recommendations



# Modern payment technologies

## Mobile Wallets and Payment Apps

- Apple Pay
- Google Pay
- Samsung Pay
- PayPal
- Venmo
- Alipay
- WeChat Pay



# Modern payment technologies

## Online Payment Systems



- PayPal
- Stripe
- Square
- Authorize.Net
- Adyen



Historical context

Traditional

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Future trends

Cameroon infra.

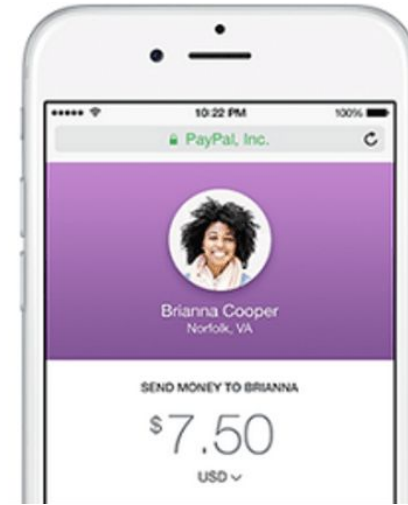
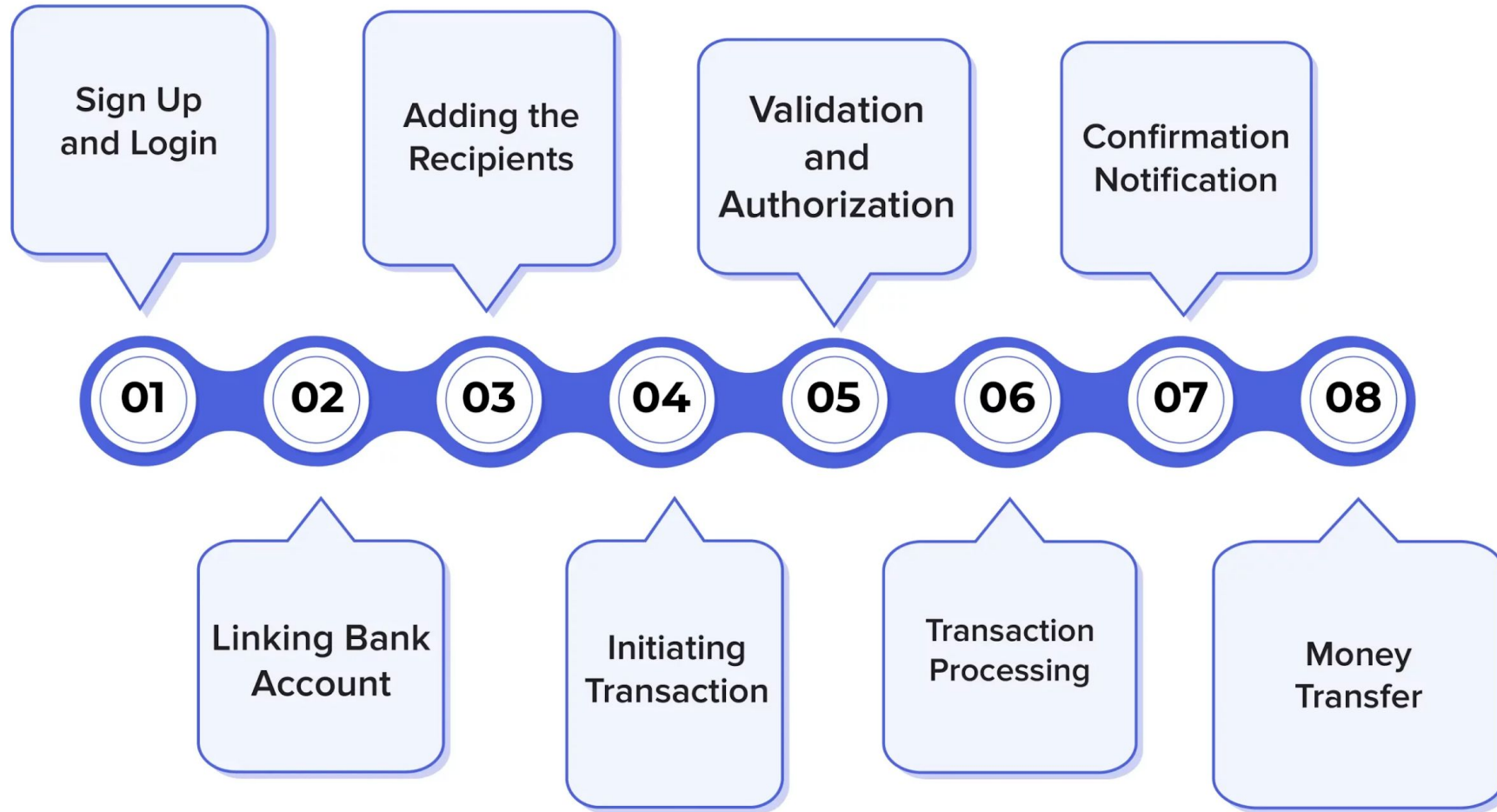
Recommendations

# Modern payment technologies

## Peer-to-Peer (P2P) Payment Methods



- Zelle
- Venmo
- PayPal
- Cash App



Historical context

Traditional

**Modern tech.**

Infrastructure

Future trends

Cameroon infra.

Recommendations

# Modern payment technologies

## Contactless Payments



### 1. NFC (Near Field Communication):

- Contactless credit/debit cards
- NFC-enabled devices  
(smartphones, smartwatches)



### 2. RFID (Radio Frequency Identification):

- RFID-enabled cards



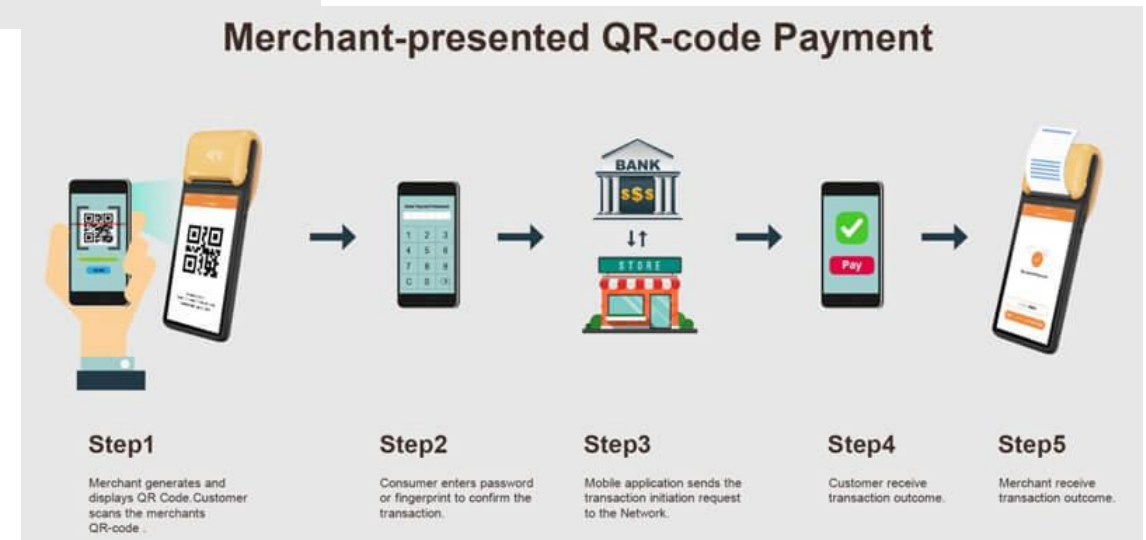


# Modern payment technologies

## QR Code Payments



- WeChat
- PayAlipay
- Paytm



Historical context

Traditional

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Recommendations

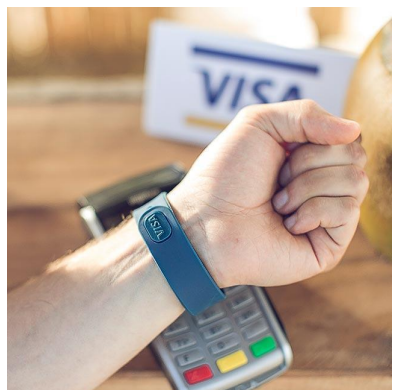


# Modern payment technologies

## Wearable Technology



- Smartwatches (Apple Watch, Samsung Galaxy Watch)
- Fitness trackers with payment capabilities (Fitbit)



# Modern payment technologies

## Biometric Payments



- Fingerprint scanners
- Facial recognition



Historical context

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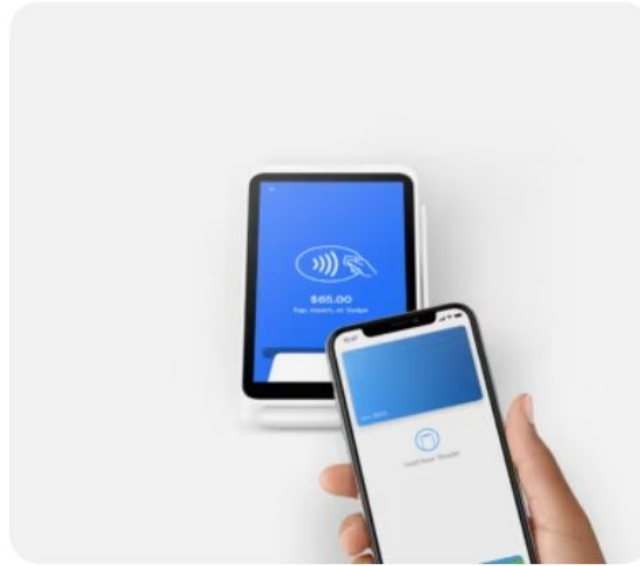
Recommendations

# Modern payment technologies

## Modern POS Payments



- Square POS
- Clover
- Toast
- Lightspeed



Tap a contactless card or device.



Dip a chip card.



Swipe a magstripe card.

Historical context

Traditional

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Cameroon infra.

Recommendations





# Modern payment technologies

## Cryptocurrencies and Blockchain-Based Payments

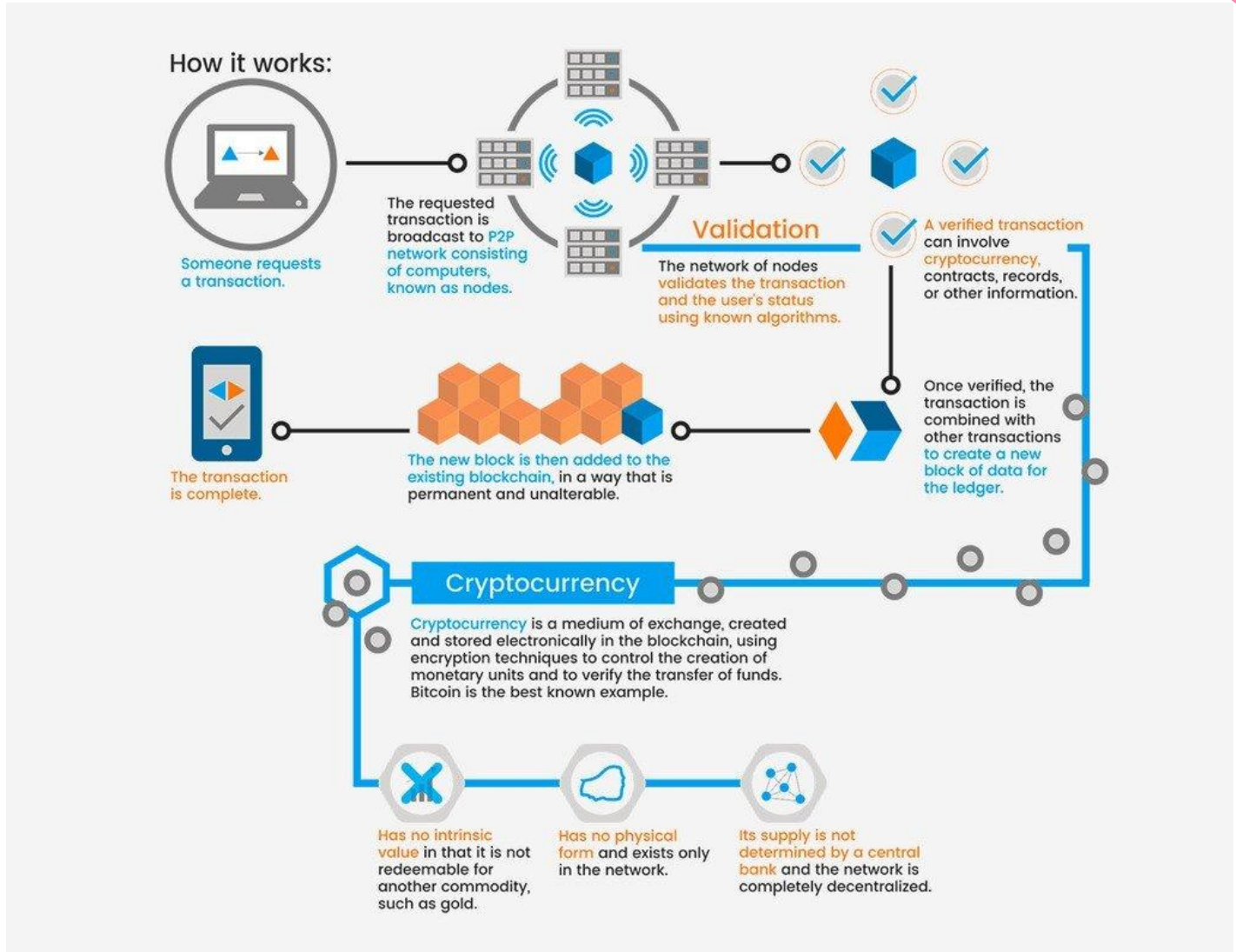
### 1. Cryptocurrencies:

- Bitcoin
- Ethereum
- Litecoin

### 2. Blockchain-Based Payment

#### Systems:

- Ripple (XRP)
- Stellar (XLM)



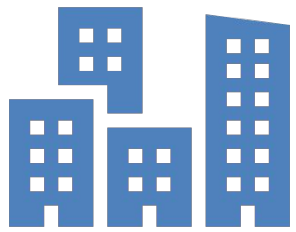
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<b>4</b>	<b>Supporting Infrastructure</b>
5	Future trends
6	Cameroon digital Infrastructure
7	How to reduce the gap?





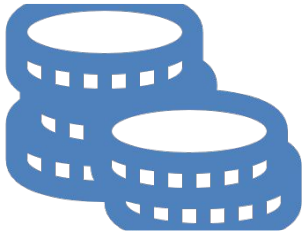
# Supporting Infrastructure



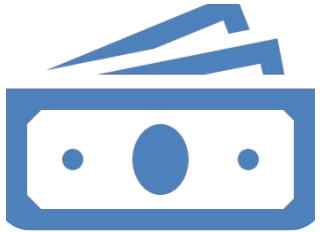
Regulatory frameworks



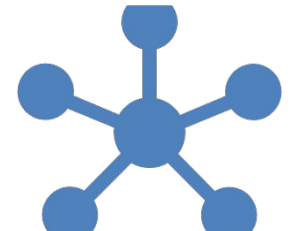
Financial Institutions



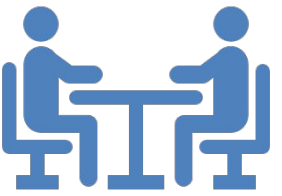
Clearinghouses and settlement systems



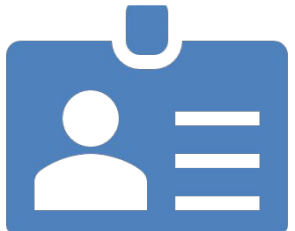
Payment networks and Schemes



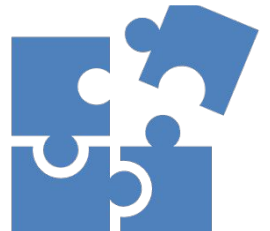
Communication Networks



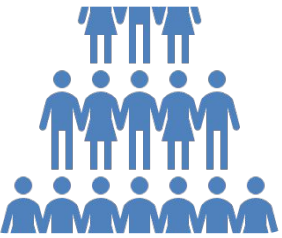
Technology providers and platforms



Security and authentication



Innovation Hubs and Sandboxes



Industry Consortia and standard bodies



Digital identity and verification

# Supporting Infrastructure

## Communication and data networks (1/2)



1. Internet and Broadband Infrastructure: Supports online and mobile payment systems through reliable connectivity.
  - High-Speed Internet (Optical fiber, broadband access, etc.)
  - 5G Networks: improves the speed and reliability of transactions
2. Secure Communication Channels: Ensures data transmitted during payment transactions is encrypted and secure
  - Encryption(SSL/TLS): Protects data during transmission.
  - Tokenization: Sensitive data is replaced with non-sensitive tokens.

# Supporting Infrastructure

## Communication and data networks (2/2)



1. Interbank Communication Networks: SWIFT, Fedwire, and similar networks that handle secure messaging for transactions.
2. Messaging Standards: Protocols like ISO 20022 that standardize financial messages for clarity and efficiency.
3. Blockchain and Distributed Ledger Technologies (DLT): Provide decentralized platforms for secure and transparent transactions.
4. APIs and Open Banking: Enable third-party access to bank data and services, promoting interoperability and innovation.

# Supporting Infrastructure

## *Regulatory Frameworks*

1. Central Banks and Monetary Authorities: Set monetary policies and regulations for financial stability.
2. Financial Regulators: Enforce compliance with financial laws and regulations.
3. Regulatory Standards and Directives: Implement frameworks like PSD2, GDPR, AML, and KYC for secure and transparent financial operations.



Historical context

Traditional

Modern tech.

**Infrastructure**

Future trends

Cameroon infra.

Recommendations

# Supporting Infrastructure

## *Financial Institutions*



1. Retail and Commercial Banks: Provide traditional banking services and infrastructure for digital payments.
2. Credit Unions and Building Societies: Offer financial services to members, often with a focus on community and cooperative principles.
3. Investment Banks: Facilitate large-scale financial transactions and investments.
4. Payment Service Providers (PSPs): Enable online payment processing for businesses and consumers.

Historical context

Traditional

Modern tech.

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Cameroon infra.

Recommendations

# Supporting Infrastructure

## *Payment Networks and Schemes*

1. Card Networks: Facilitate global card-based payment transactions.
2. Automated Clearing House (ACH) Networks: Manage electronic funds transfers between banks.
3. Wire Transfer Networks: Enable secure and immediate transfers of funds internationally.



Historical context

Traditional

Modern tech.

**Infrastructure**

Future trends

Cameroon infra.

Recommendations



# Supporting Infrastructure

## *Technology Providers and Platforms*

1. **Cloud Service Providers:** Offer scalable and secure infrastructure for hosting payment systems and processing transactions.
2. **Payment Gateways:** Act as intermediaries between merchants and payment processors for online transactions.



Historical context

Traditional

Modern tech.

**Infrastructure**

Future trends

Cameroon infra.

Recommendations

# Supporting Infrastructure

## *Security and Authentication*

1. **Security Standards:** Guidelines like PCI DSS and EMV that ensure the safety of payment data.
2. **Authentication Methods:** Techniques such as MFA, biometric authentication, and tokenization to verify user identities.
3. **Fraud Detection and Prevention:** Systems and algorithms that monitor transactions for suspicious activity and prevent fraud.



Historical context

Traditional

Modern tech.

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Cameroon infra.

Recommendations

# Supporting Infrastructure

## *Clearinghouses and Settlement Systems*

1. Clearinghouses: Entities that facilitate the clearing of payments between institutions.
2. Real-Time Gross Settlement (RTGS) Systems: Systems that provide real-time, high-value payment settlements between banks.



Historical context

Traditional

Modern tech.

**Infrastructure**

Future trends

Cameroon infra.

Recommendations

# Supporting Infrastructure

## *Innovation Hubs and Sandboxes*

1. Regulatory Sandboxes: Controlled environments where fintech companies can test new products under regulatory oversight.
2. Innovation Labs and Hubs: Collaborative spaces for developing and testing new financial technologies.



Historical context

Traditional

Modern tech.

**Infrastructure**

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Cameroon infra.

Recommendations

# Supporting Infrastructure

## *Industry Consortia and Standards Bodies*

1. International Standards Organizations: Groups like ISO and NIST that develop standards to ensure interoperability and security.
2. Payments Councils and Boards: Bodies that coordinate payment policies and practices across the industry.



Historical context

Traditional

Modern tech.

**Infrastructure**

Future trends

Cameroon infra.

Recommendations

# Supporting Infrastructure

## *Digital Identity and Verification*

1. Identity Verification Services: Tools and platforms that confirm the identities of users to prevent fraud.
2. Digital Identity Platforms: Systems that manage and verify digital identities for secure access to financial services.



Historical context

Traditional

Modern tech.

**Infrastructure**

Future trends

Cameroon infra.

Recommendations



# Supporting Infrastructure

## *Financial Infrastructure*

1. Automated Teller Machines (ATMs): Provide cash withdrawal and basic banking services 24/7.
2. Point of Sale (POS) Systems: Enable in-store payment processing for merchants.
3. Mobile and Online Banking Platforms: Offer consumers and businesses access to banking services via the internet and mobile devices.



Historical context

Traditional

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# Future trends in payment technologies

1. AI and Machine Learning: Fraud Detection: Enhanced security through predictive analytics.
2. Blockchain: Decentralized Payments: Increased transparency and reduced costs.
3. Internet of Things (IoT): Seamless and automated payment experiences.

Historical context

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# Digital ecosystem in Cameroon



04 mobile operators



02 MVNO



150 service providers



50+ ISP



04 submarine cables



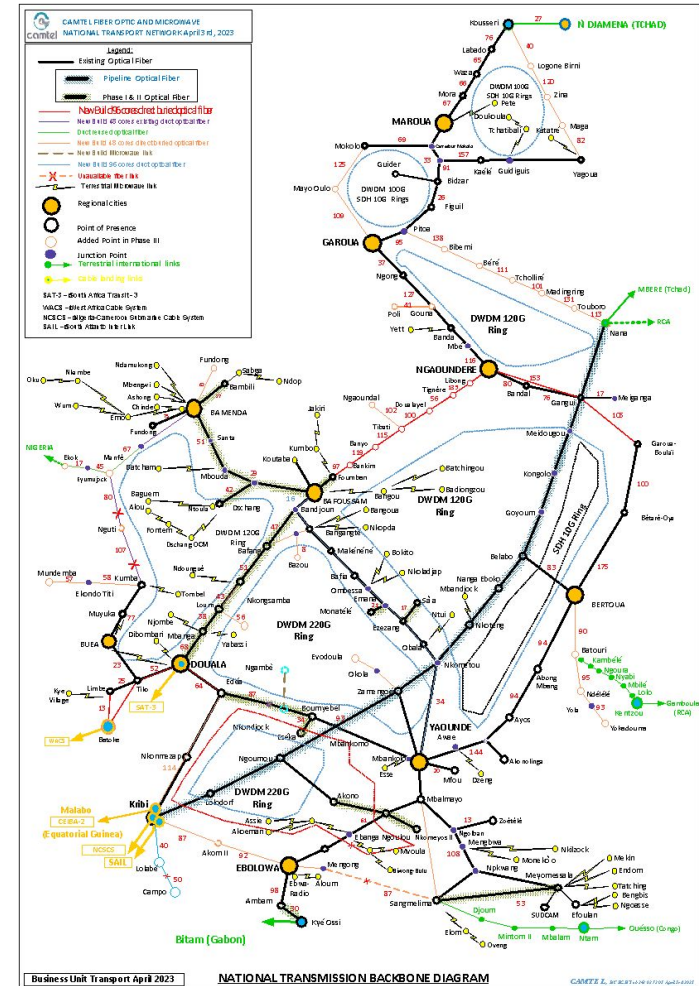
Fix network FTTH, ADSL and Last Mile



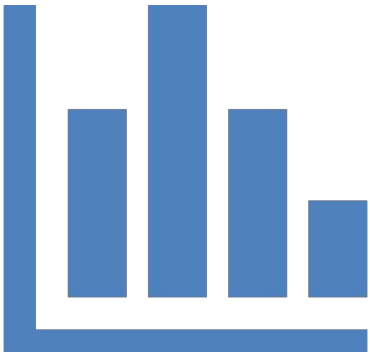
05 Data center



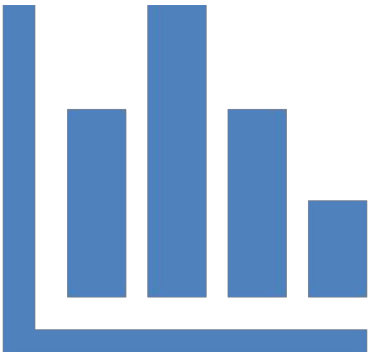
12 000+ km Backbone



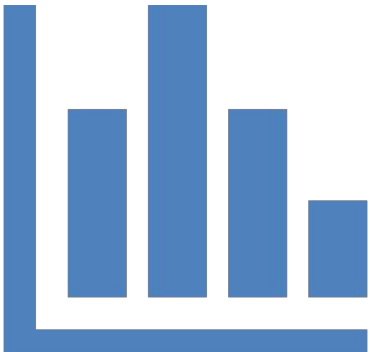
# Digital ecosystem in Cameroon



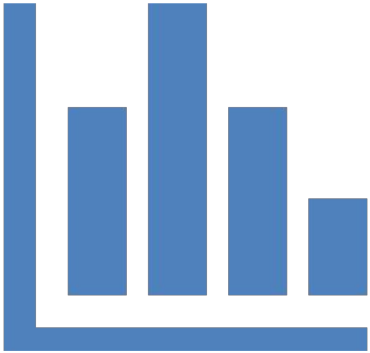
27.9+million population



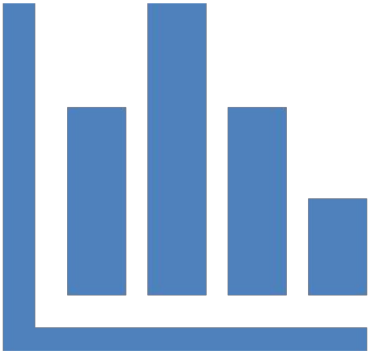
23% Unique mobile broadband subscriptions per 100 inhabitants



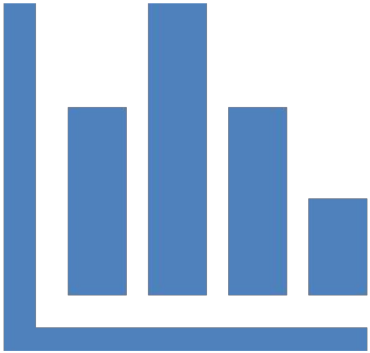
141<sup>st</sup> out of 193 countries on e-Government Development Index



47% of individuals using the Internet

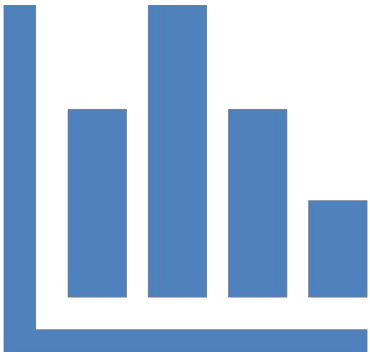


45.6% internet penetration rate



4+ million social media users

# Digital ecosystem in Cameroon



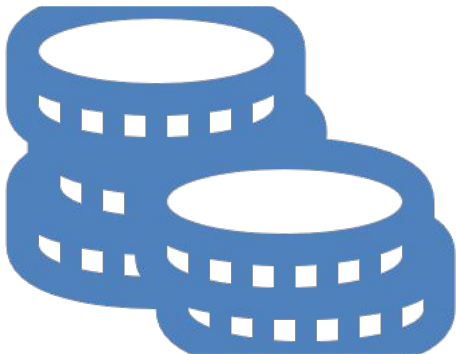
18 Banks



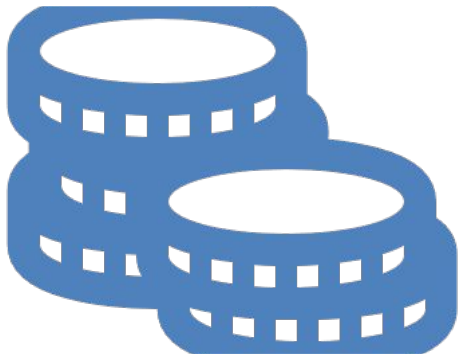
7 financial institutions



402+ micro-credit institutions



4 mobile money operators



22+ millions mobile money users



GIMACPAY (53 banks, 10 micro-credit institutions, 11 mobile money operators, etc.)

# Digital ecosystem in Cameroon

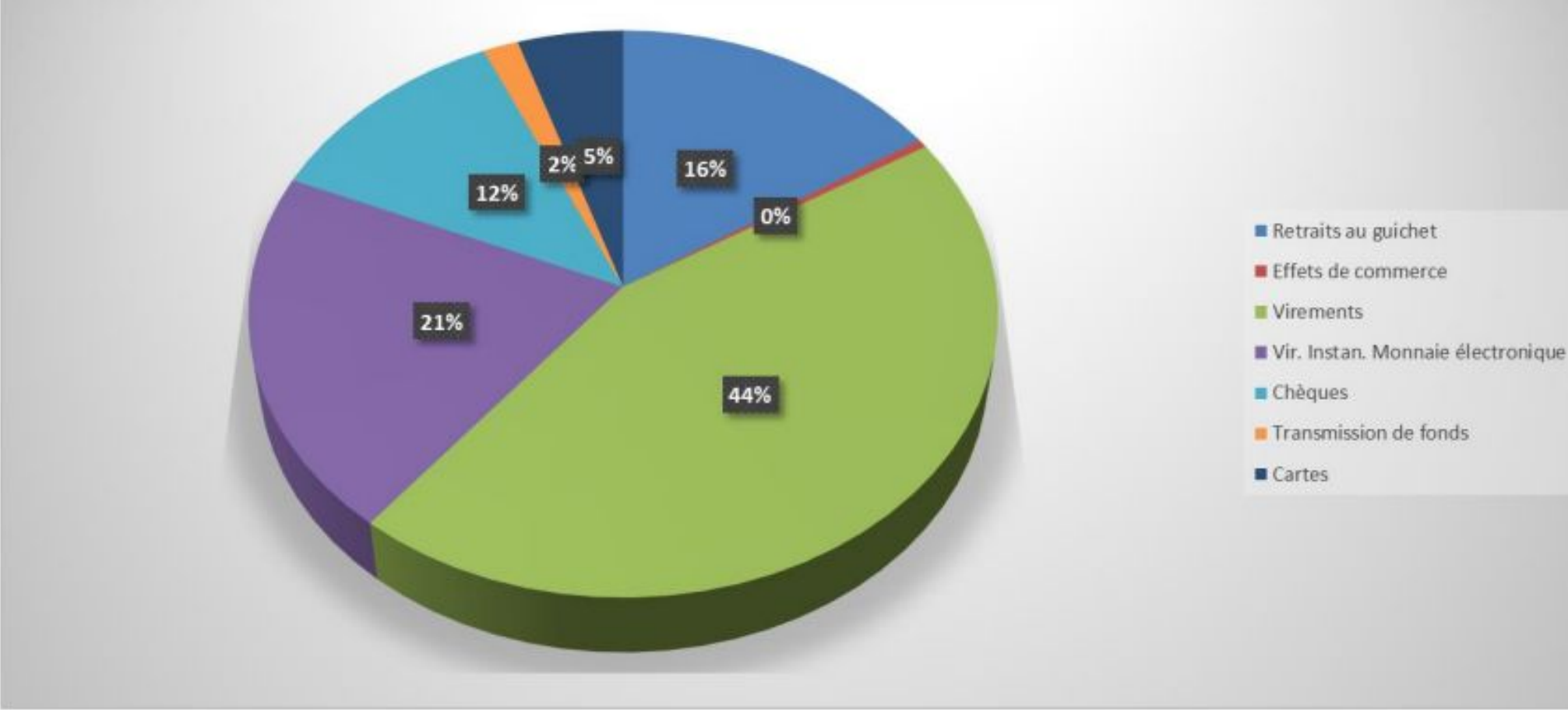


Figure 2 : Répartition des paiements par valeurs dans la CEMAC  
Source : DSMP, BEAC



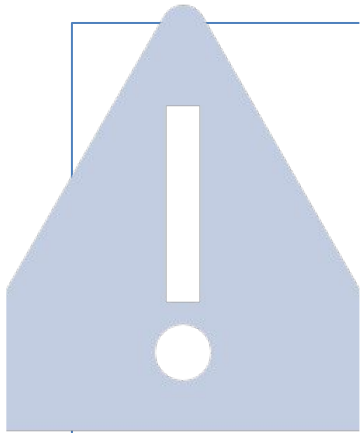
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70%

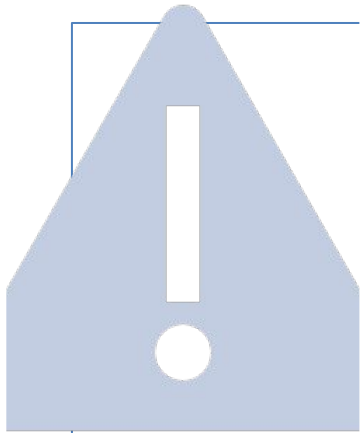


## Regulatory framework

- enforce monetary policies and regulations for financial stability
- Enforce compliance with financial laws and regulations
- Implement frameworks like PSD2, GDPR, AML, and KYC for secure and transparent financial operations.



90%

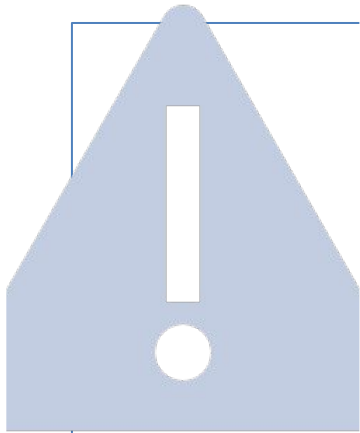


## Financial institutions

- Retail and Commercial Banks: Provide traditional banking services and infrastructure for digital payments.
- Investment banks: Facilitate large-scale financial transactions and investments.
- Payment service Providers: Enable online payment processing for businesses and consumers.



90%

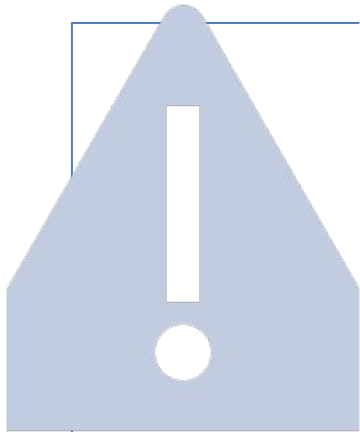


## Payment Networks and Schemes

- Card networks: Facilitate global card-based payment transactions.
- Automated Clearing House (ACH) Networks: Manage electronic funds transfers between banks.
- Wire Transfer Networks: Enable secure and immediate transfers of funds internationally.



30%

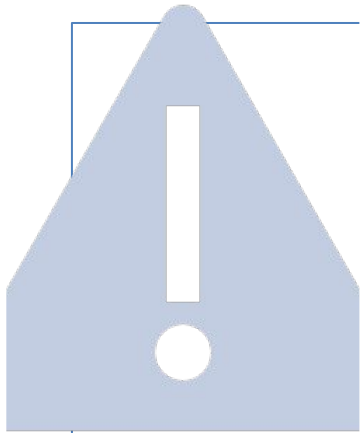


## Communication Networks and Protocols

- SWIFT, Fedwire, and similar networks that handle secure messaging for transactions.
- Protocols like ISO 20022 that standardize financial messages for clarity and efficiency.
- Provide decentralized platforms for secure and transparent transactions.
- Enable third-party access to bank data and services, promoting interoperability and innovation.



30%



## Technology Providers and Platforms

- Offer scalable and secure infrastructure for hosting payment systems and processing transactions.
- Act as intermediaries between merchants and payment processors for online transactions.



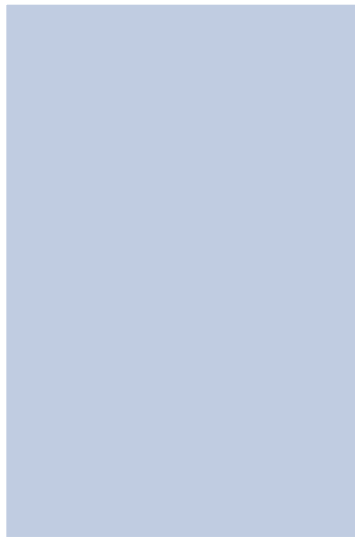
35%

## Security and Authentication

- Guidelines like PCI DSS and EMV that ensure the safety of payment data.
- Techniques such as MFA, biometric authentication, and tokenization to verify user identities.
- Systems and algorithms that monitor transactions for suspicious activity and prevent fraud.



100  
%



## Clearinghouses and Settlement Systems

- Entities that facilitate the clearing of payments between institutions.
- Systems that provide real-time, high-value payment settlements between banks.





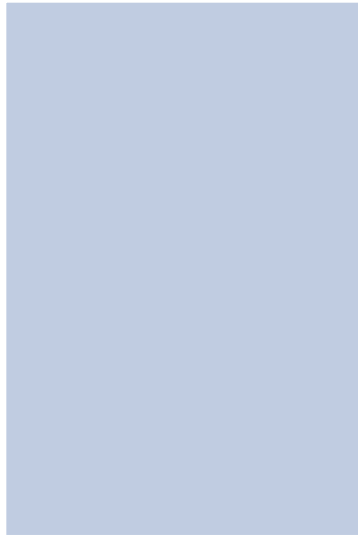
10%

## Innovation Hubs and Sandboxes

- Controlled environments where fintech companies can test new products under regulatory oversight.
- Collaborative spaces for developing and testing new financial technologies.



70%

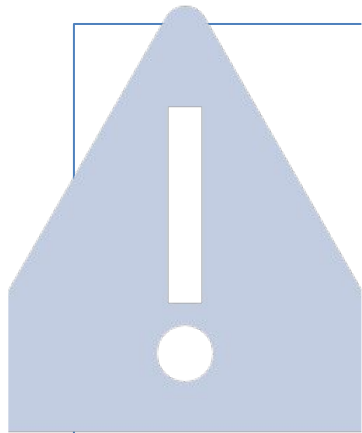


## Digital Identity and Verification

- Tools and platforms that confirm the identities of users to prevent fraud.
- Systems that manage and verify digital identities for secure access to financial services.



100  
%

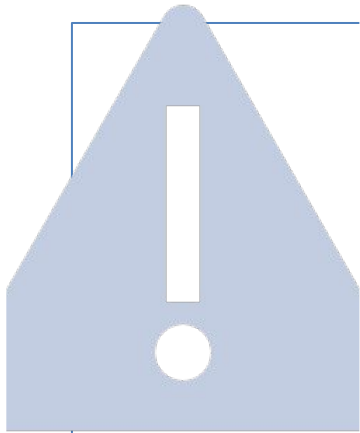


## Financial Infrastructure

- Provide cash withdrawal and basic banking services 24/7
- Enable in-store payment processing for merchants.
- Offer consumers and businesses access to banking services via the internet and mobile devices.



60%



## Communication and Data Networks

- Supports online and mobile payment systems through reliable connectivity.
- Ensures data transmitted during payment transactions is encrypted and secure.

*Smart*

*&*

*t*

*Simple*