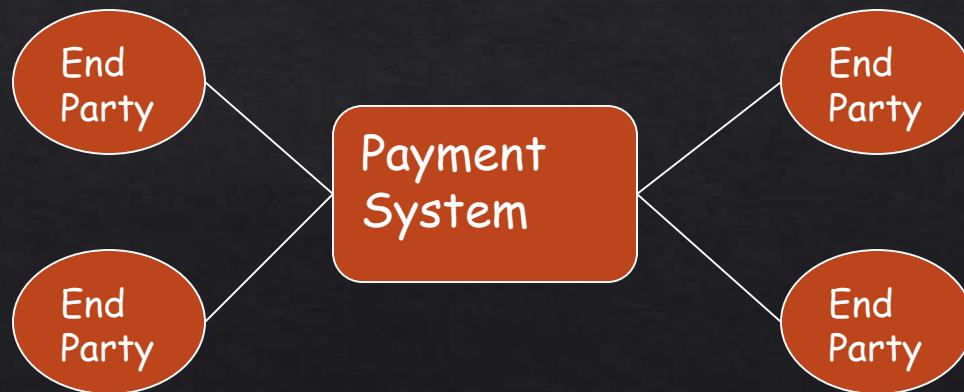


Payments Systems (USA) Domain & Technology (Quick Overview)

Payments

Payments are a big part of all of our lives. We pay for things, we write checks and we pay bills online etc.

Payments Transfer Value from One End Party to Another



Payment Systems

Systems with estimated count & amount (2009 figures)

- ❖ Cash (31.5%, 0.2%)
- ❖ The checking system (16.7%, 2.6%)
- ❖ ACH (Automated Clearing House) (11.8%, 3.5%)
- ❖ Credit Card Systems (14.9%, 0.2%)
- ❖ Debit Card Systems (25.0%, 0.1%)
- ❖ Fed wire (0.1%, 93.4%)

Total Txns: 154.13 Billions with amount 1,065,666.8 Billions

India Debit Card usage for POS transactions

Table 2

Debit Card Payments						
Year / Period	Number of Valid Cards as of End-March (Lakh)	Number of Transactions (Lakh)	Average Number of Transactions per Card	Amount of Transactions (Rs. Crore)	Average Amount per Transaction (Rs.)	Average Amount of Transactions per Card (Rs.)
2003-04	—	377.57	—	4873.67	1291	
2004-05	—	415.32 (10%)	—	5361.04 (10%)	1291	
2005-06	497.63	456.86 (10%)	—	5897.14 (10%)	1291	
2006-07	749.76 (51%)	601.77 (32%)	0.96	8171.63 (39%)	1358	1310
2007-08	1024.37 (37%)	883.06 (47%)	1.00	12521.22 (53%)	1418	1412 (8%)
2008-09	1374.31 (34%)	1276.54 (45%)	1.06	18547.14 (48%)	1453	1546 (10%)
2009-10	1813.87 (32%)	1701.09 (33%)	1.07	26417.97 (42%)	1553	1657 (7%)

India Credit Card usage for POS transactions

Table 1

Credit Card Payments						
Year / Period	Number of Valid Cards as of End-March (Lakh)	Number of Transactions (Lakh)	Average Number of Transactions per Card	Amount of Transactions (Rs. Crore)	Average Amount per Transaction (Rs.)	Average Amount of Transactions per Card (Rs.)
2003-04	—	1001.79	—	17662.72	1763	
2004-05	—	1294.72 (29%)	—	25686.36 (45%)	1984	
2005-06	173.27	1560.86 (21%)	—	33886.47 (32%)	2171	
2006-07	231.23 (33%)	1695.36 (9%)	8.38	41361.31 (22%)	2440	20451
2007-08	275.47 (19%)	2282.03 (35%)	9.01	57984.73 (40%)	2541	22887 (12%)
2008-09	246.99 (-10%)	2595.61 (14%)	9.94	65355.80 (13%)	2518	25018 (9%)
2009-10	183.19 (-26%)	2340.65 (-10%)	10.88	62851.86 (-4%)	2685	29221 (17%)

Payment Sectors/Domain

- ❖ Retail (POS)
- ❖ Restaurant
- ❖ HealthCare
- ❖ E-Commerce
- ❖ Electronic Bill Payment
- ❖ Mobile Payments
- ❖ Petroleum/Fuel Station
- ❖ B2B payments
- ❖ P2P payments
- ❖ Income Payments

Banks And Payments

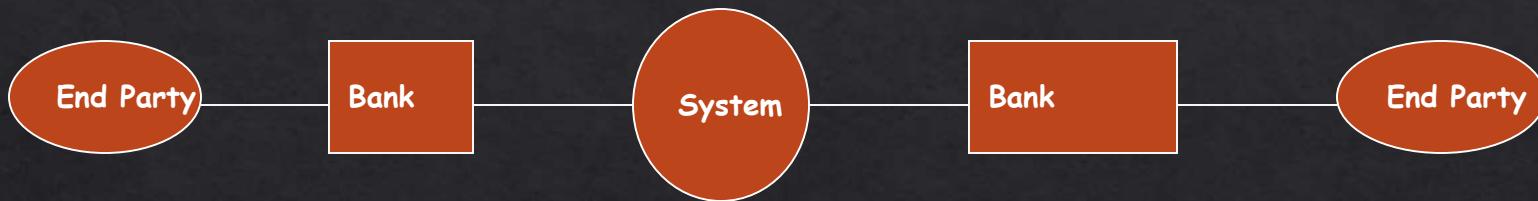
- ❖ Banks have OWNED the payment systems.
- ❖ Banks have CONTROLLED the payment systems.
- ❖ Consumers and Enterprises have USED the payment systems through their relationships with banks.
- ❖ Banks have been the PRIMARY DIRECT ECONOMIC BENEFICIARIES of the payments systems.

Networks in Payment System

- ❖ Card Association : Visa, MasterCard.
- ❖ Debit and ATM Networks : Star, NYCE, regional networks
- ❖ NACHA
- ❖ The Check and Image Clearing houses.
- ❖ The Fed & The Clearing House

Payment System Models

Open Loop Systems (Require Intermediaries)



***End Party:** Merchants, Billers, Governments, Person, Banks

***System:** Networks & Clearing Houses, Processors, Banks...

Close Loop Systems (Without Intermediaries)

Eg: Close loop card, Sears Card, AMEX, Discover System

Payment System Functions & Flow

Payments Systems Key Functions

- Processing (Switching, Authorization, Settlement, Reconciliation)
- Rules (Operating Rules-Fees, tech, processing, dispute)
- Brand (Do you take MasterCard?)

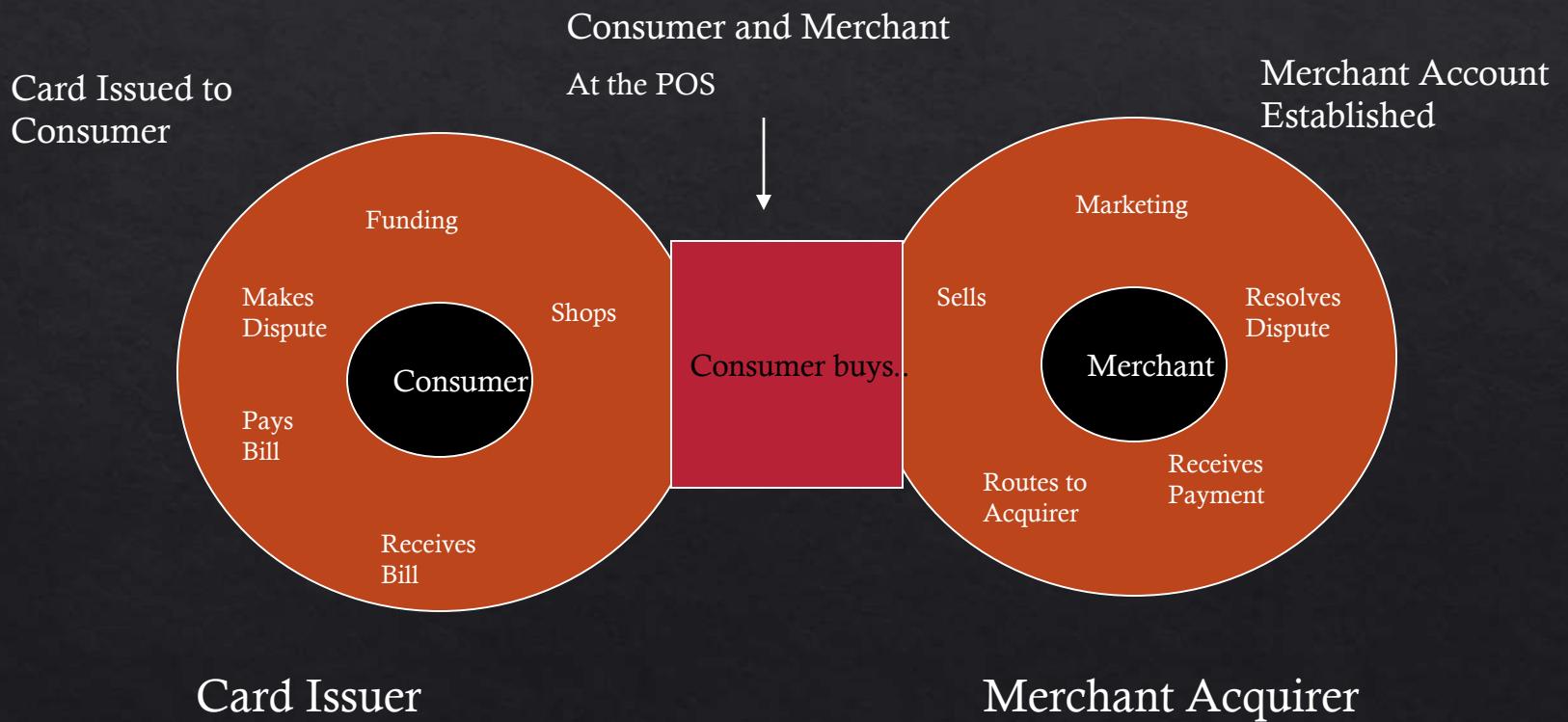
Flow

- Push (Direct deposit of payroll) - Less Risky (who has money sending..)
- Pull (Checks, Cards & ACH deposit) - Risky. But cards are less risky

What is Card transaction ?

- ❖ The ability to buy something by using plastic money (like credit card, debit card etc..) having some limit to buy at any POS (Point of Sale) is called card transaction.

How cards work ?



Major Categories of Card Types

- ❖ Open-Loop Cards –
 - ❖ Can be used to purchase items at many different types of stores.
 - ❖ Open-loop stored value cards are often branded with familiar institutional names such as Visa, MasterCard and American Express.
 - ❖ E.g. Credit Cards, Debit Cards, Store value cards etc..

- ❖ Closed-Loop Cards –
 - ❖ Those that can only be used at a specific retailer (e.g. Home Depot, Gap) or environment (e.g. college campus or shopping mall).
 - ❖ Store Name and Logo.
 - ❖ E.g. Gift Cards, Loyalty Cards etc..

Card Types

- ❖ Credit Cards
- ❖ Debit Cards
- ❖ EBT Cards
- ❖ Store Value Cards
- ❖ Loyalty Cards
- ❖ Charge Cards

Credit Cards

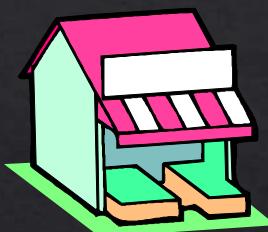
- ❖ Issued by Banks.
- ❖ No need of any bank account.
- ❖ Has a predefined “limit to buy” known as the credit limit.
- ❖ Worldwide Usage.

Credit Card Transaction Flow

Cardholder



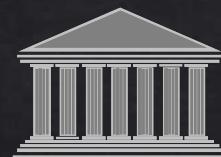
Merchant



Terminal



Merchant Acquiring Bank



Payment Gateway



Card
Issuing
Bank

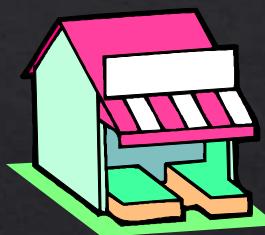
- Cardholder presents valid card to Merchant

Credit Card Transaction Flow

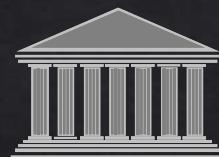
Cardholder



Merchant



Terminal Merchant Acquiring Bank



Payment Gateway



Card Issuing Bank

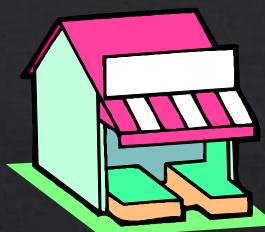
- **Merchant Swipes the customer card for transaction**

Credit Card Transaction Flow

Cardholder



Merchant



Terminal



Merchant Acquiring Bank



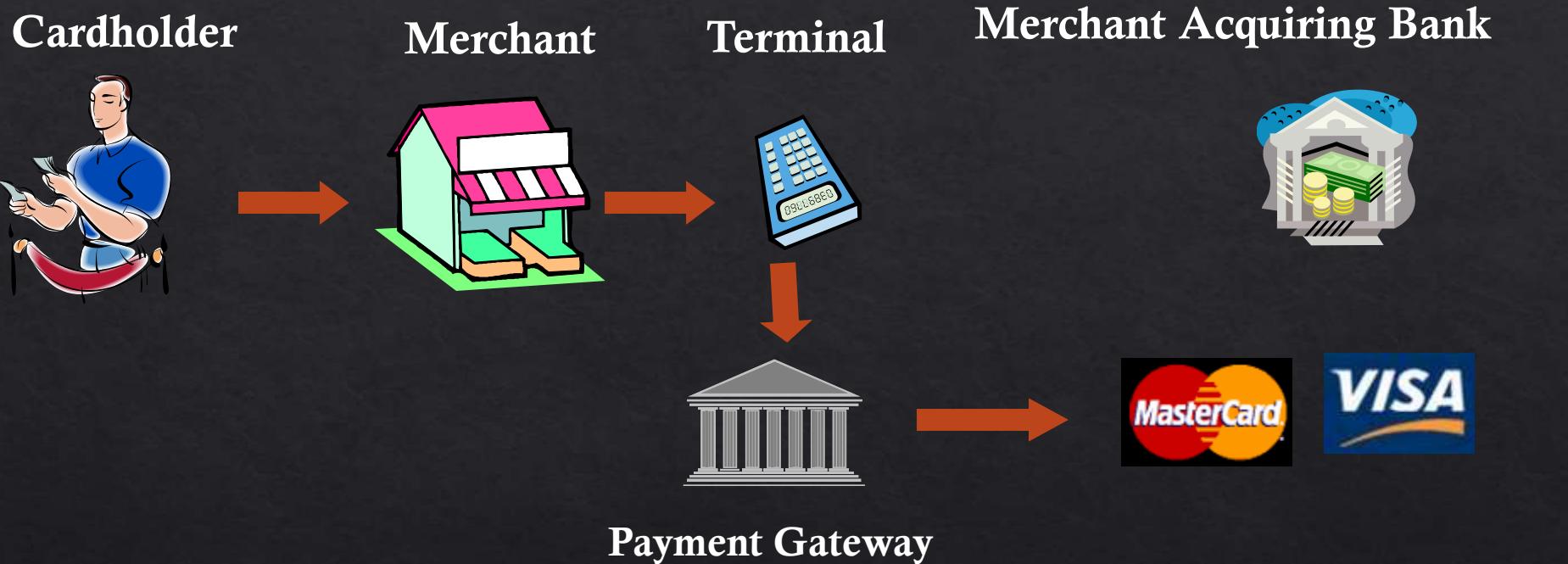
Payment Gateway



Card
Issuing
Bank

- Sends the transaction info. to the merchant's payment gateway

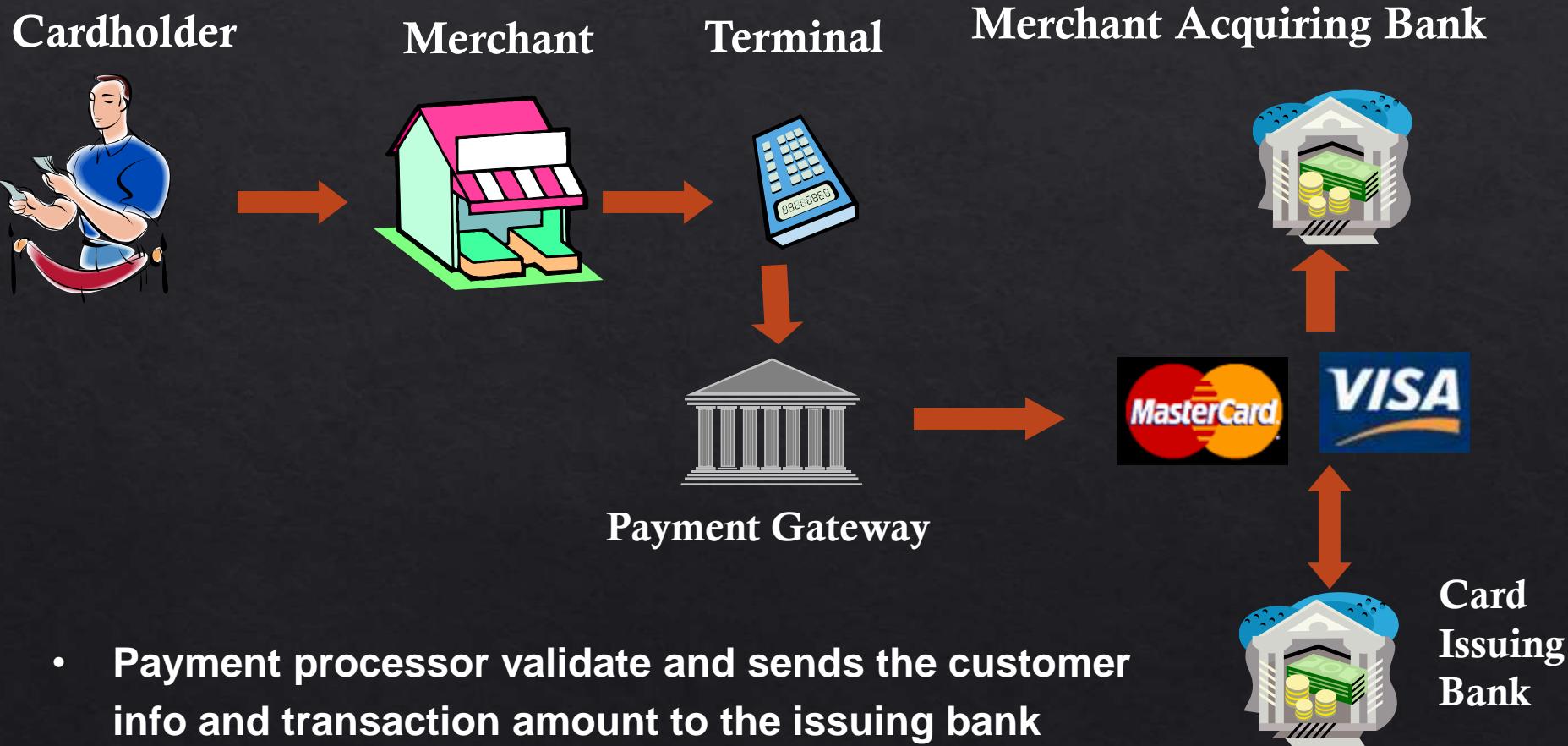
Credit Card Transaction Flow



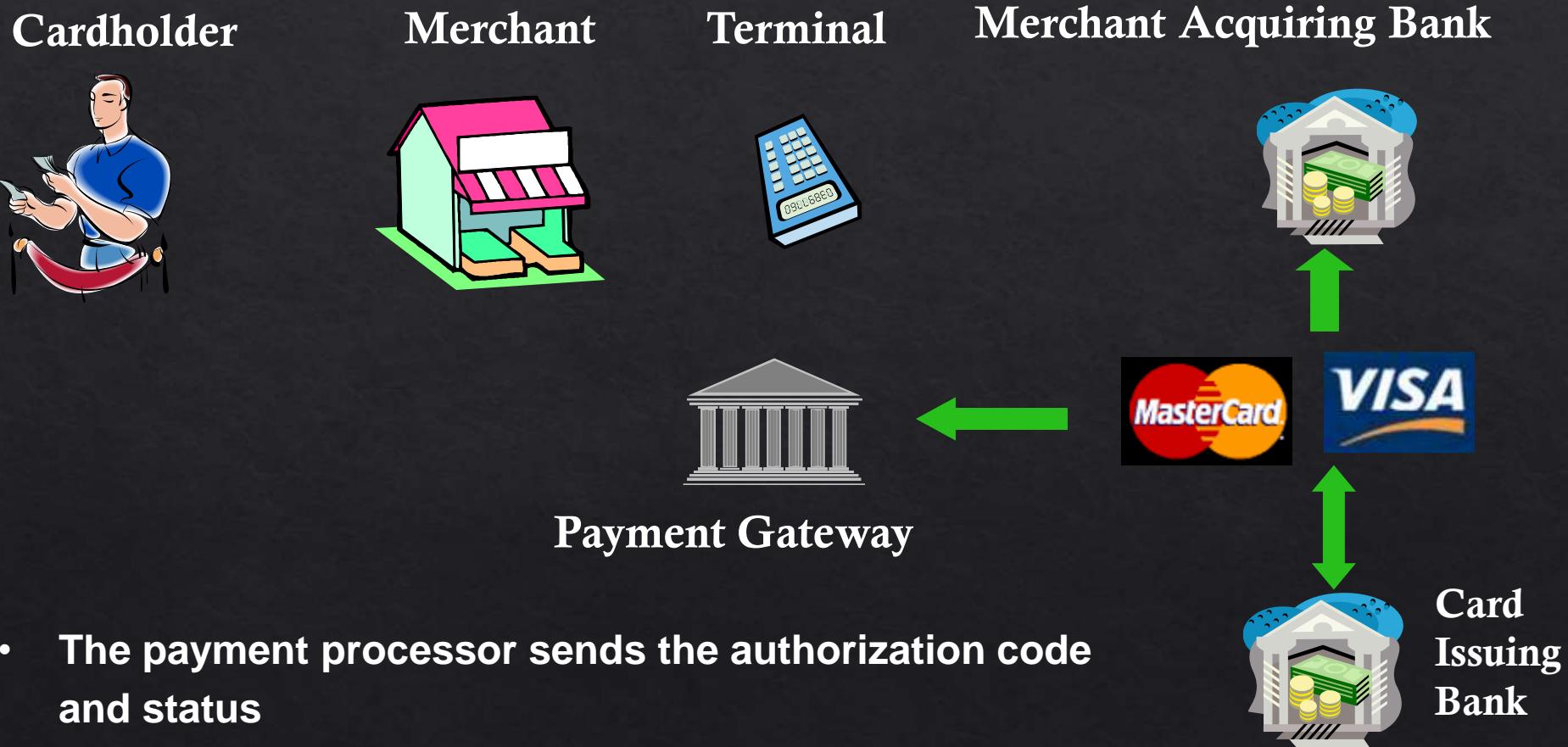
- **gateway sends the transaction information to the acquiring bank's payment processor .**



Credit Card Transaction Flow



Credit Card Transaction Flow

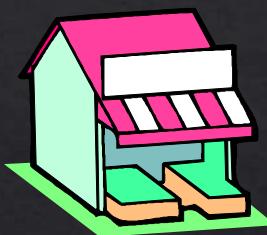


Credit Card Transaction Flow

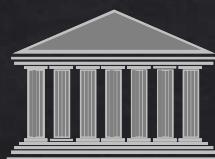
Cardholder



Merchant



Terminal



Payment Gateway

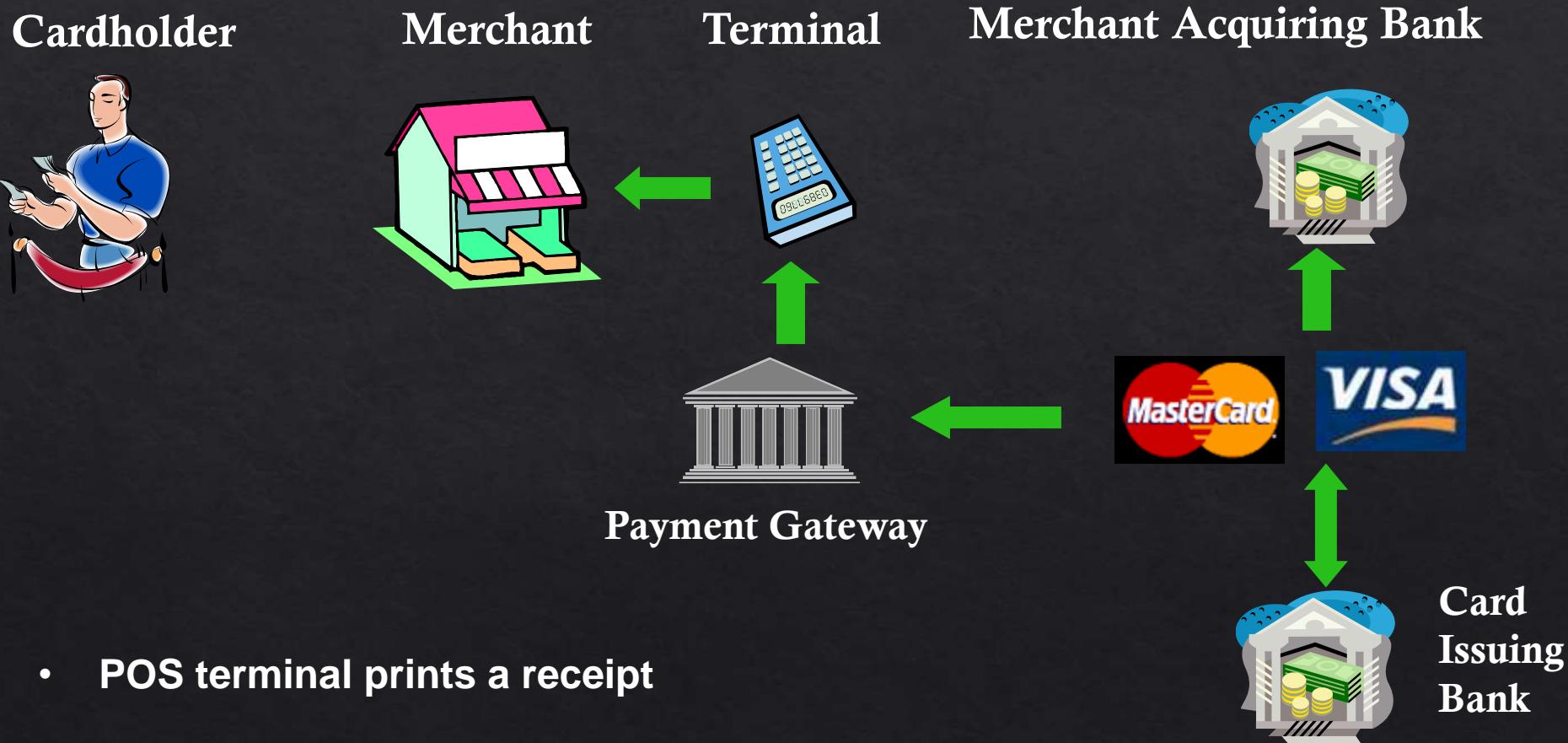
Merchant Acquiring Bank



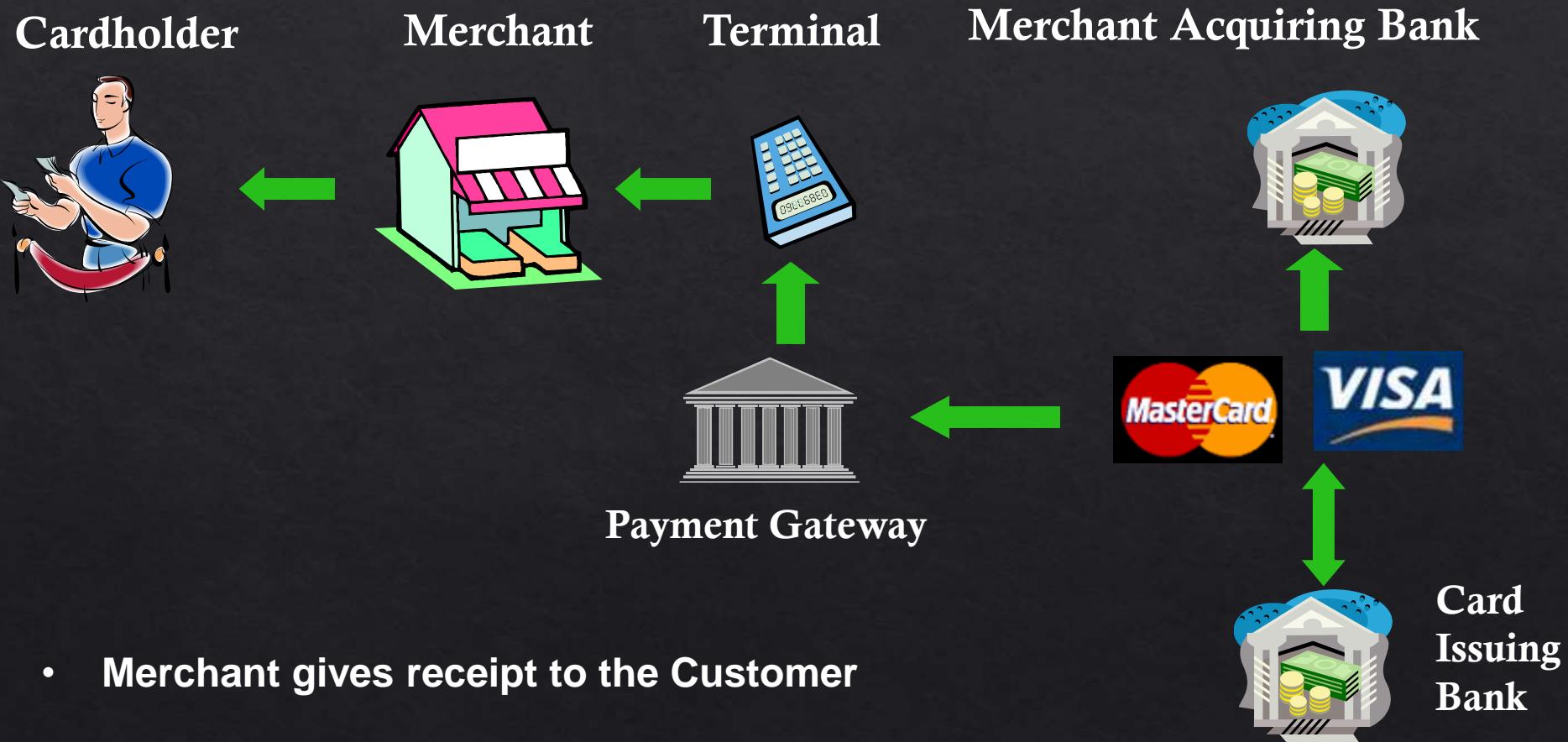
Card
Issuing
Bank

- Payment gateway sends the authorization code (or declined message) back to POS terminal.

Credit Card Transaction Flow



Credit Card Transaction Flow



Major Categories of Transaction

- ❖ Card Not Present Transaction
 - ❖ Telephone Order
 - ❖ Mail Order
 - ❖ E-commerce
 - ❖ Online Ticket Booking
- ❖ Card Present Transaction
 - ❖ Retail Stores
 - ❖ Shopping Malls
 - ❖ Restaurant
 - ❖ QSR
 - ❖ Fuel Stations

Credit Card Transactions

- ❖ Sale
- ❖ Credit/Refund
- ❖ Pre-Auth
- ❖ Post-Auth
- ❖ Sale with Gratuity
- ❖ Void
- ❖ Reconciliation/Settlement

Debit Cards

- ❖ Access a bank checking account (“DDA”).
 - ❖ Operates at POS in 2 modes:
 - ❖ Signature-based – use Visa, MasterCard networks without PIN
 - ❖ Pin-based – uses ATM debit networks with PIN
 - ❖ “Online” vs. “Offline” Terminology
 - ❖ “Offline”- Signature based works at any Visa/ MasterCard card accepting merchant
 - ❖ “Online” – PIN-based only works at merchants with PIN pads, cannot be used for “CNP” purchases.

Debit Card Transactions

- ❖ Sale
- ❖ Return
- ❖ Void
- ❖ Bal. Enq.

EBT Cards

- ❖ Electronic Benefits Transfer (EBT) is a way of issuing and processing certain benefits electronically
- ❖ Government plays a major role in issuing EBT cards.
- ❖ Card Processing is similar to debit card.
- ❖ Face to Face environment. No Mail order type business.
- ❖ Need a card swipe device and a PINPAD on the merchant location.

Types of EBT Cards

- ❖ Food Stamps
- ❖ Social Security payments
- ❖ Disability payments

EBT Transaction Types

- ❖ **Cash:** Issued for a Social Security payment.
- ❖ **Food Stamp:** To deduct money from the EBT card.
- ❖ **Food Stamp Credit:** To credit money back onto the EBT card.
- ❖ **Account Inquiry:** Allows the merchant to inquire into a customer's account.

Top 3 transaction have following sub-types:

1. **Withdrawal** – This action increases the cardholder's limit to buy.
2. **Post** – This action makes an approved Voice Authorization transaction available for retransmission.
3. **Void** – This action removes a withdrawal transaction from the re-transmission information.

Store Value Cards

- ❖ A Stored Value card represents money on deposit with the issuer.
- ❖ These cards are issued to anonymous whereas financial cards are issued to individual card holder.

Types of Store Value Card

- ❖ **Cash cards**
 - ❖ Prepaid cash cards
 - ❖ Promotional cash reward cards
 - ❖ Campus cards
- ❖ **Gift Cards** - A stored value gift card is a prepaid card with a merchant name or logo.
- ❖ **Payroll cards** - Payroll cards are a cost effective alternative to printing, cutting, and mailing paper payroll checks.
- ❖ **Mall cards** - The mall card is designed for a closed system and can only be used for payments of goods or services with those merchants who participate in the program
- ❖ **Incentive cards** - Incentive cards are purchased by an employer and sent to the recipient as a reward for excellent performance.
- ❖ **Transit cards** - These cards are like traveling check cards issued by transport company
- ❖ **Stored value credit cards** - gift card but issued to individual card holder

Transactions Supported by SV Cards

- ❖ Activation
- ❖ Deactivation
- ❖ Redemption
- ❖ Reload/Add Value
- ❖ Balance Inquiry
- ❖ Add Points
- ❖ Redeem Points
- ❖ Cash back

Card Associations

- ❖ Brands
 - ❖ VISA
 - ❖ MasterCard
 - ❖ American Express

Role of Card Associations

- ❖ Membership with Banks
- ❖ Governance
- ❖ Operating Regulations
- ❖ Technical Standards
- ❖ Funding Mechanisms
- ❖ Transfer Pricing
- ❖ Risk Management
- ❖ Liability Transfer
- ❖ Enforcement, Arbitration

Card Associations : Operating Rules

- ❖ Defines roles, responsibilities of members
- ❖ Define how transaction is processed, settled and disputed.
- ❖ Specify pricing and fees for association provided service.
- ❖ Specify pricing for inter-member interchange fees.
- ❖ Define how disputes are arbitrated.
- ❖ Define requirements of brand promotion.

Card Economics : P&L Drivers

❖ Credit Card Issuers

- ❖ Revenues from
 - ❖ Interchange
 - ❖ Revolving interest income
 - ❖ Other fees
 - ❖ Charges
- ❖ Expense from
 - ❖ Cardholder acquisitions
 - ❖ Cost of funds
 - ❖ Processing costs
 - ❖ Cardholder service costs
 - ❖ Credit losses
 - ❖ Fraud losses

❖ Merchant Acquirers

- ❖ Revenue from
 - ❖ Merchant Discount
 - ❖ Float
 - ❖ POS h/w & s/w services.
 - ❖ Processing fees
 - ❖ Exception handling fees
- ❖ Expenses from
 - ❖ Merchant Acquisitions
 - ❖ Processing costs
 - ❖ Servicing costs
 - ❖ Credit losses
 - ❖ Fraud losses

Card Economics : Interchange Fees

- ❖ Interchange is an “Issuer Reimbursement Fee” (IRF).
- ❖ A transfer of value from the Acquirer to the Issuer in “Open loop” Systems.
- ❖ Based on the following factors:
 - ❖ Guarantee (or Risk) Costs
 - ❖ Financing Costs
 - ❖ Processing Costs

Card Economics : Interchange Fees

- ❖ Interchange Fees varies by card type as shown

	Credit Card MasterCard and Visa	Charge Card American Express	Signature Debit	PIN Debit
Purchase Amount	\$100.00	\$100.00	\$100.00	\$100.00
Interchange paid by acquirer to the issuer	\$1.75	\$2.50	\$1.10	\$0.45
Processing fees paid by merchant to acquirer	\$0.50	\$0.50	\$0.50	\$0.30
Total Merchant Discount Fee paid by Merchant to Acquirer	\$2.25	\$3.00	\$1.60	\$0.75

Card Issuer : Credit Card

❖ Credit Card Responsibilities:

- ❖ Manage through a mix of in-house and outsourced solutions.
- ❖ Authorize transactions, post transaction to cardholder accounts
- ❖ Fund association settlement to merchants
- ❖ Manage extension of credit, collect payments, manage collections and credit losses.
- ❖ Provide customer service, statements, online access and call centers
- ❖ Manage disputes
- ❖ Manage fraud losses
- ❖ Package and securitize receivables.

Card Issuer : Debit Card

- ❖ Debit Card Issuer Responsibilities
 - ❖ Account acquisitions: part of DDA account acquisition
 - ❖ Transaction authorization
 - ❖ Post transaction
 - ❖ Fund merchants
 - ❖ Manage Fraud
 - ❖ Manage customer service, dispute resolution
 - ❖ No credit management
 - ❖ Business Promotion

Merchant Acquirer

- ❖ An acquirer is an association member bank who enables merchants to access payment card networks.
- ❖ Responsible for the actions of merchant.

Role of Merchant Acquirer

- ❖ Simplify and consolidate merchant access to payment systems
 - ❖ Common technical interface for multiple payment types
 - ❖ Consolidated, daily settlement
 - ❖ Consolidated reporting, merchant service.
- ❖ Sells and signs merchants
- ❖ Provides POS equipments
- ❖ Provides processing services and payment to merchant
- ❖ Provides merchant servicing, customer support
- ❖ Monitors merchant activity
- ❖ Manage and defends chargebacks
- ❖ Monitors potential frauds, errors etc.

Card Fraud

- ◊ Types of Card Fraud
 - ◊ **Application Fraud**
 - ◊ Identity theft
 - ◊ Identity creation.
 - ◊ Account takeover
 - ◊ Bust-out
 - ◊ **Transaction Fraud**
 - ◊ Lost & Stolen Cards
 - ◊ Skimming
 - ◊ CNP Fraud (“I dint do it”)
 - ◊ Phishing
 - ◊ **Trends**
 - ◊ Technical Sophistication
 - ◊ Offline and online linkages

Manage Card Fraud

- ❖ Preventing application fraud
 - ❖ Analyze incoming applications for internal inconsistencies.
 - ❖ Matches with external DB
 - ❖ Matches with internal and external negative files
 - ❖ Matches against cross industry patterns
- ❖ Transaction Fraud Management
 - ❖ Dynamic cardholder profiles
 - ❖ Neural network models
 - ❖ Merchant profiles