



**RV College of  
Engineering**

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## **E Commerce and Digital Payments**

<b>Course</b>	<b>ETC: Introduction to Cybersecurity</b>		
<b>BRANCH</b>	<b>Computer Science and engineering</b>		
		Done By:	Dr Krishnappa H K
			Associate Professor

## **Various challenges of online payment**

- **Card data security**
- **Technical Integration**
- **Multi Currency transaction**
- **User experience and checkout challenges**

- Plastic cards like credit and debit cards are now widely popular for in-store and online payments, driving a growing market.
- Their usage is expanding as more people adopt this convenient payment method, leading to a growing market for these cards.
- Cards are useful and convenient for consumers, widely accepted by merchants, and one of the most efficient ways of payments.
- Payment cards became a convenient replacement for cash and cards.

## What is Payment Card Fraud?

- Theft happens when someone's personal information is taken by another person without their permission.
- Identity fraud is when this stolen information is used for financial gain.
- This includes making payments, opening new accounts, and trying to get services like jobs or healthcare, all without the real person knowing or agreeing to it.

## Methods of payment card fraud

**Here are some methods commonly used by the criminals to obtain personal information:**

- **Lost or Stolen Wallet**
- **Shoulder Surfing:**It is a observation technique which is effective in crowded places.
- **Dumpster Diving:** Thieves dig through garbage looking for sensitive personal information.
- **Mail Theft:**Criminals intercept mail with the intention of stealing newly issued cards, checkbooks, bank statements, and tax forms.
- **Imposters:**Thieves can pose as someone else to commit identity theft.
- **Home Or Workplace:**Unfortunately, family members, friends, co-workers and in-home employees can steal personal information in our homes and workplaces.
- **Skimming:**The most commonly known type of payment card fraud involves skimming card details.
  - Copying the data held in magnetic strip of the card
  - Corrupted Employee can read your card by using an unauthorized device,that records the data from magnetic strip.
  - Skimming device might be fitted around the card entry slot of a cash machine so that the card's data is copied when it is inserted into the ATM machine.

## Dumpster diving

This entails combing through someone else's trash to find treasures—or in the tech world, discarded sensitive information that could be used in an illegal manner. Information that should be securely discarded includes, but is not limited to:



- **Phishing:** It is one of the fastest growing crimes on the Internet. Phishing involves creating authentic-looking e-mails that appear to be from existing legitimate businesses, including banks, Internet service providers, online retailers, etc.



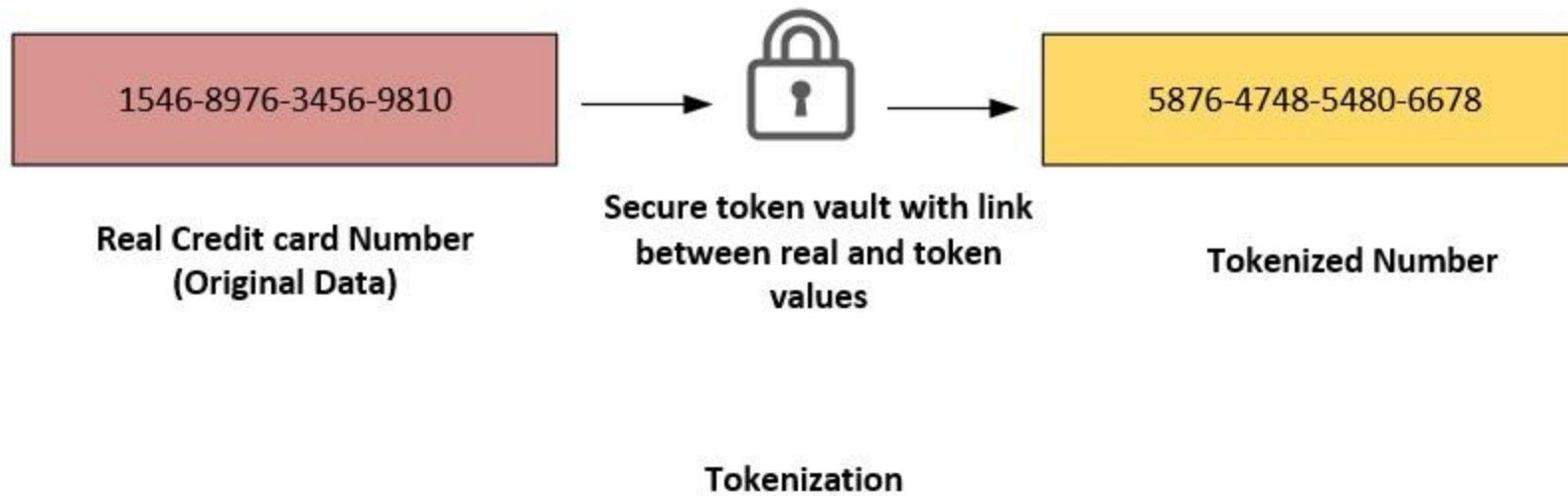
## Prevention

**Here are some key measures and practices that ensure card data security:**

- **PCI DSS Compliance:** A must for all handling card data. It safeguards cardholder info during transactions. Compliance is obligatory for processing, storing, or transmitting card data.
- **Encryption:** Encrypt cardholder data during transmission and storage to prevent unauthorized access. Strong algorithms keep it unreadable if intercepted.
- **Tokenization:** Tokenization replaces card data with a unique identifier (token) for secure transactions and storage, reducing sensitive data exposure.



## Prevention



## Prevention

**The process of tokenization involves**

- Data Identification
- Token Generation
- Storage
- Usage
- Tokenisation system security

## Prevention

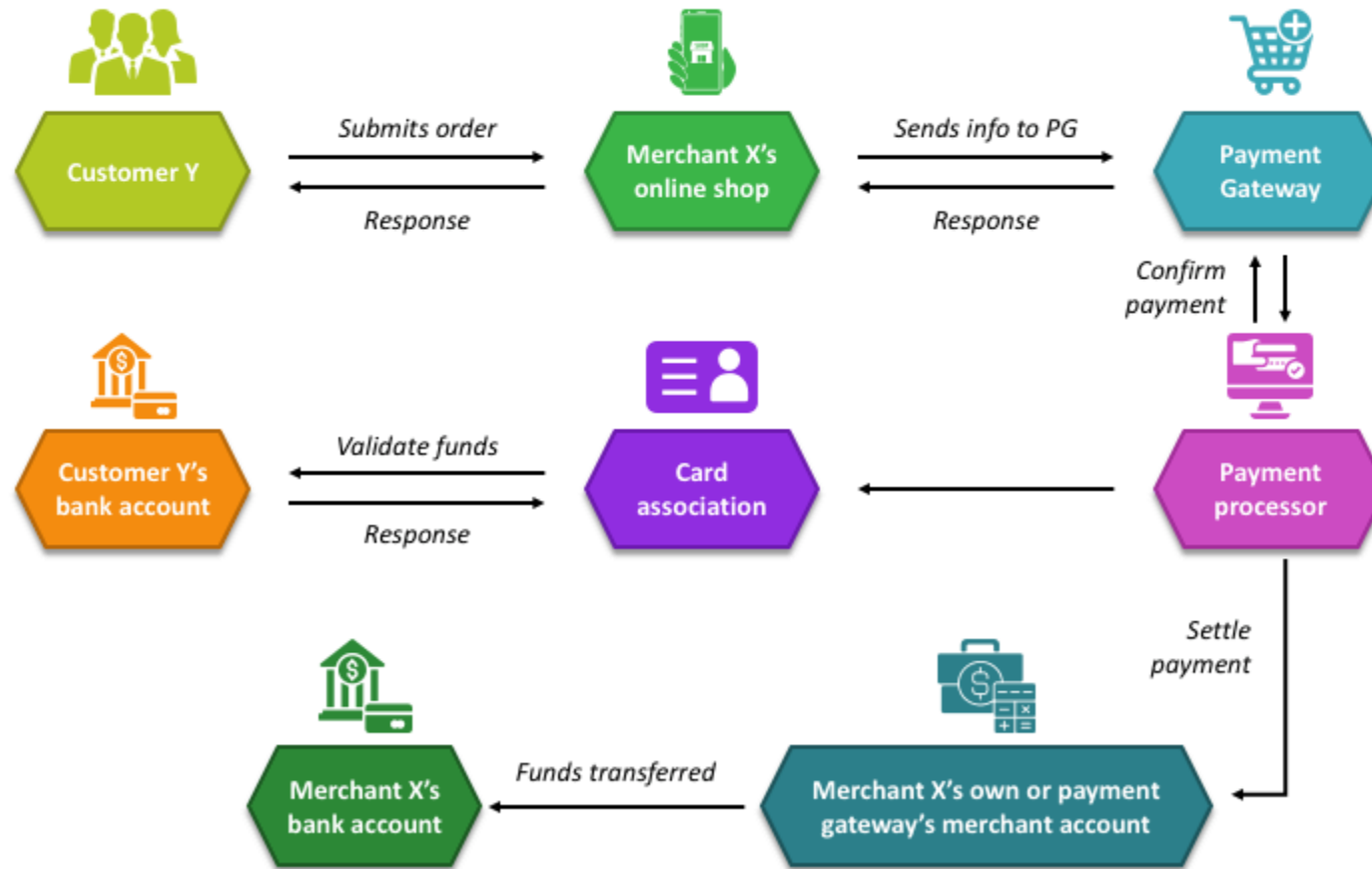
- **Secure Sockets Layer (SSL) and Transport Layer Security (TLS):**

SSL/TLS are secure cryptographic protocols that encrypt data between a user's browser and a website's server, safeguarding it from interception.

- **EMV Chip Technology:** EMV chip technology enhances security with unique transaction codes, preventing card cloning and unauthorized use of stolen data.
- **Multi-Factor Authentication (MFA):** Implementing MFA adds an extra layer of security by requiring users to provide multiple forms of identification before authorizing a transaction.
- **Regular Security Audits and Penetration Testing:** Periodic security audits and penetration testing help identify vulnerabilities and weaknesses in card data security systems.
- **Employee Training:** Educating employees about data security best practices, including the proper handling of card data, can reduce the risk of accidental data breaches or insider threats.
- **Secure Payment Gateways:** Merchants should use reputable and secure payment gateways that comply with industry standards to handle payment transactions securely.

- Online payment systems are crucial for modern commerce.
- Technical integration is the connection between the website and payment gateway.
- Integration offers benefits but comes with unique challenges.
- We will explore these challenges and discuss practical solutions.
- Our goal is to ensure a smooth and secure payment experience.
- Gain insights into best practices for technical integration.
- Navigate complexities of online payment systems effectively.
- Let's explore the world of online payment technical integration challenges and solutions.

## ONLINE PAYMENT PROCESS



# Importance of Technical Integration

## Seamless User Experience

Online payment process is smooth and intuitive for customers.

Seamless transition from product selection to payment, reducing cart abandonment rates.

## Efficient Payment Processing

Streamlines the payment process, reducing transaction times and increasing payment success rates.

Optimizes communication between payment gateways, processors, and banks, minimizing delays and errors.

## Data Security and Compliance

Incorporates encryption, tokenization, etc. to safeguard data.

Standards like PCI DSS is facilitated reducing the risk of data breaches and fraud.

## Scalability and Growth

Allows businesses to handle increasing transaction volumes as they grow.

Lays the foundation for future growth and expansion.

## Importance of Technical Integration

### **Real-time Transaction Tracking and Reporting**

monitor transaction status, identify potential issues, and gain insights into customer behavior.  
enhances operational efficiency and empowers businesses to make data driven decisions.

### **Payment Method Diversity**

Allows businesses to accommodate credit/debit cards, UPI, bank transfers, etc.  
enhances customer satisfaction and encourages repeat purchases.

## Challenges of Online Payment Technical Integration(Pt.1)

### Security Concerns.

- Protecting sensitive customer data.
- Ensuring PCI DSS compliance for data security.
- Implementing robust encryption techniques.

### Payment Gateway Selection

- Choosing a suitable payment gateway.
- Integrating various payment methods.
- Considering supported features and functionalities.

### Integration Complexity

- Addressing compatibility issues.
- Resolving conflicting technologies.
- Managing version disparities and upgrades.

### User Experience (UX)

- Providing a smooth payment experience.
- Reducing cart abandonment rates.
- Enhancing checkout process efficiency.



# Solutions of Online Payment Technical Integration(Pt. 1)

## Security Concerns

- Implement robust encryption and tokenization techniques.
- Regularly conduct security audits and updates.
- Employ multi-factor authentication for added protection.

## Payment Gateway Selection

- Choose a reliable and reputable payment gateway.
- Follow integration best practices and guidelines.
- Utilize comprehensive API documentation for seamless integration.

## Integration Complexity

- Test for compatibility and resolve issues beforehand.
- Adopt version control practices to manage updates smoothly.
- Leverage continuous integration for streamlined deployment.

## User Experience (UX)

- Optimize payment forms for a user-friendly experience.
- Implement responsive design for various devices.
- Provide clear and concise instructions during the payment process.



# Challenges And Solutions(Pt.2)

## Mobile Optimization

- Adapting to the varying screen sizes and resolutions of mobile devices.
- Ensuring a consistent user experience across different mobile platforms.
- Handling the complexities of mobile app integration and compatibility.

- Adopt a mobile-first design approach for payment pages and forms.
- Implement mobile payment SDKs to provide a smooth in-app payment experience.
- Ensure compatibility with various mobile devices and operating systems.

## Error Handling and Recovery

- Identifying and resolving errors in real-time to prevent transaction failures.
- Balancing the need for robust error handling without causing delays for legitimate transactions.
- Ensuring a smooth recovery process to prevent customer frustration.

- Implement real-time error monitoring to identify and address issues.
- Set up automated alerts to notify stakeholders about potential problems.
- Design fallback mechanisms to handle payment failures and ensure transaction integrity.

## Payment Gateway Downtime

- Payment gateway downtime can lead to lost sales, frustrated customers, and damage to a business's reputation.
- Technical integration must address this challenge to ensure uninterrupted payment processing.

- Implementing redundant payment gateways allows businesses to switch to an alternative gateway if one fails.
- This redundancy ensures continuous payment processing and minimizes the impact of downtime.

## PCI DSS Compliance

- Compliance with the Payment Card Industry Data Security Standard (PCI DSS) is a crucial aspect of online payment security.
- Achieving and maintaining compliance can be a complex and resource-intensive process.

- Outsourced payment solutions shift the burden of PCI DSS compliance to specialized third-party providers.
- These providers have expertise in handling sensitive payment data securely, reducing the compliance responsibilities for the merchant.



## Challenges of Online Payments and solutions:

**1)Security:** This is the primary concern for both businesses and consumers when it comes to online payments. Hacks, data breaches, identity theft, and fraudulent activities are common security threats.

**Solution:** Businesses should adopt secure payment gateways and adhere to Payment Card Industry Data Security Standards (PCI DSS). Advanced security measures like two-factor authentication, end-to-end encryption, and secure socket layer (SSL) can also enhance the security of online payments.

**2)Privacy:** There's always a risk of personal information getting exposed during online transactions.

**Solution:** Strict privacy policies must be in place. Encrypting transaction data and masking card details can help in safeguarding user information. Also, companies should be transparent about their data collection and usage practices.

**3)Transaction Errors:** Transaction failures, processing errors, or sudden website crashes can create a poor customer experience.

**Solution:** Regular site maintenance, effective system design, and robust server support can minimize such issues. Efficient customer support can also be beneficial in handling these situations smoothly.

**4)Cross-Border Transactions:** Different countries have different rules and regulations for online transactions, and sometimes, international payments can be complicated and costly.

**Solution:** Businesses should partner with payment processors that are capable of handling multi-currency transactions. They should also be knowledgeable about international payment laws and tax obligations.

## What is Multi-Currency Transaction?

Generally! Multi-currency transactions refer to business activities that involve more than one currency

**Definition:** Multi-currency transactions occur when a business or individual conducts trade or financial operations involving more than one currency. This can be a result of international trade, investment, or other financial dealings across borders.

# Multi Currency transaction



# Challenges of Multi-Currency Transactions and their Solutions:

Multi-currency transactions can present several challenges for businesses, including both large multinational corporations and smaller entities that might be doing business internationally for the first time. Here are some of the common challenges and potential solutions.

## MAIN CHALLENGES:

Fluctuating Exchange Rates

Transaction Fees

Accounting Complexity

Currency Risk

Regulatory Challenges

Fraud and Security Concerns

**1)Exchange Rate Fluctuations:** Foreign exchange rates can fluctuate significantly over short periods of time. These fluctuations can significantly impact the cost of doing business internationally.

Solution: One possible solution is to use hedging strategies, which can help to manage and mitigate the risk associated with currency fluctuations. These might involve forward contracts, futures, options, or swaps.

**2)Transaction Fees:** Banks and financial institutions often charge fees for international transactions, which can add to the cost of doing business internationally.

Solution: Some companies may choose to work with specialized payment processors or digital payment platforms that offer lower fees for international transactions.

**3)Accounting Complexity:**

Recording and reconciling multicurrency transactions can be complex and time-consuming.

Solution: Use modern accounting software that supports multicurrency operations. They can automate conversions and keep track of exchange rate gains or losses .



**4)Currency Risk :** The value of foreign assets or liabilities can change due to exchange rate fluctuations, impacting financial statements.

**Solution:** Diversify holdings across various currencies or use financial instruments like options or futures to mitigate potential losses.

**5)Fraud and Security Concerns:** International transactions can be targets for fraud or scams.

**Solution:** Use secure platforms, employ robust verification processes, and educate staff about potential risks.

By being aware of these challenges and actively seeking solutions, businesses and individuals can effectively navigate the complexities of multicurrency transactions



## PRESENT SCENARIO OF MULTI-CURRENCY TRANSACTIONS

**As of my last update in September 2021, the scenario of multi-currency transactions in the world had been shaped by various factors. Here are four generalized points that describe the situation at that time:**

**Digitalization and Fintech Boom**

**Cryptocurrencies and Blockchain**

**Trade Tensions and Exchange Rate Volatility**

**Regulatory Frameworks and Compliance**

**While these points provided a generalized view of the situation up to 2021, the world of finance and trade is dynamic. New developments, technological advancements, and geopolitical shifts can influence the scenario of multi-currency transactions, so it's essential to stay updated with current events and trends in the financial sector.**

## Introduction:

Online payment experiences.

Impact of UX on conversion rates and customer loyalty.

Common challenges: Checkout friction, security concerns, and more.

Exploring key challenges and effective solutions.

- 32% of users will leave a brand they love if they have one bad experience.
- Businesses lose 35% of sales due to bad UX
- A 0.1-second site speed improvement leads to better sales.
- A user will settle on a key area of a page in 2.6 seconds.

## UX Challenges

- Complex Checkout Process
- Slow Page Loading
- Security concerns
- Forced Account Creation
- Unclear error messages
- Cross-Device Consistency

## Impact of UX Challenges

- Negative Brand Perception
- Customer Retention and Loyalty
- Potential long-term impact on customer retention rates
- Competitive Disadvantage

## UX Solutions

- Streamlined Checkout Forms
- Mobile-Centric Design
- Transparent Security Measures
- Diverse Payment Options
- Real-time Error Handling
- Guest Checkout Option

## Checkout Challenges

- Limited Payment Options
- Payment Declines
- Mobile Optimization.
- Cart Abandonment
- No Guest Checkout
- Page Loading Speed

## Impact of Checkout Challenges

- Cart Abandonment Rates
- User Frustration and Mistrust
- Reduced Conversion Rates
- revenue loss due to incomplete purchases.

## Checkout Solutions

- Simplified Checkout Forms
- Mobile-Centric Design
- Security Assurance
- Diverse Payment Options
- One-Page Checkout
- Guest Checkout Option

## Benefits of Implementing Solutions

- Enhanced User Satisfaction
- Improved Conversion Rates
- Increased Customer Loyalty
- Competitive Advantage
- Boosted Revenue and Growth

*Thank you*