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Enhancing Transaction Reliability: A Case Study on Payment and Refund Issues in Shopee

Software Engineering

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Characterize

Shopee users frequently report issues related to failed payments, delayed refunds, and incorrect deductions* after transactions. Some customers experience scenarios where payments are deducted from their accounts, but the order remains unsuccessful, while others face long refund processing times

Background Information:

- **System:** Shopee, a leading e-commerce platform in Southeast Asia, facilitating online purchases and payments through various methods (credit/debit cards, e-wallets, bank transfers, cash-on-delivery).
- **Users:** Online shoppers and sellers who rely on Shopee's payment gateway for seamless transactions.
- **Impact of the Problem:**
 - **Customer Frustration:** Users lose trust due to financial inconveniences.
 - **Seller Revenue Loss:** Delays in payments affect sellers' cash flow.
 - **Negative Brand Perception:** Frequent payment issues lead to bad reviews and reduced platform credibility.

Collected Data & Evidence:

- **User Reports:** Customers on social media and Shopee's help center report failed payments and refund delays.
- **Shopee's Customer Support Forum:** Multiple complaints highlight issues with refund processing taking longer than expected.
- **Industry Reports:** According to a TechAsia report (2023) on Southeast Asian e-commerce, payment failures and refund inefficiencies are among the most common complaints in digital shopping platforms.

Potential Causes:

1. **Bank Processing Delays:** Refunds depend on banks' transaction processing speeds.
2. **System Bugs:** Errors in Shopee's payment gateway may cause payment failures.
3. **Transaction Verification Delays:** Shopee's fraud detection system might flag legitimate payments, leading to unintentional delays.
4. **Technical Downtime:** Server downtime or system maintenance could affect payment processing.



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Hypothesis:

"Shopee's payment and refund issues stem from slow bank processing times and inefficient error handling in its payment gateway. Implementing real-time transaction verification and an automated refund system will reduce failed payments and processing delays."

Proposed Solutions:

1. Enhance Real-Time Transaction Verification:

Improve fraud detection algorithms to minimize false-positive transaction rejections.

2. Implement an Automated Refund System:

Introduce AI-driven refund processing to speed up approvals.

3. Improve Server Load Management:

Increase server capacity to handle peak transactions smoothly.

4. Strengthen Customer Support for Payment Issues:

Create a dedicated support line and chatbot for instant resolution of payment disputes.

Technical Reasoning:

- Real-time verification ensures payments are processed instantly, reducing failures.
- Automation in refunds eliminates manual approval bottlenecks.
- Server optimization prevents crashes during high-traffic sales periods.



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Predict

Expected Improvements:

- Reduced Payment Failures: Fewer users will experience transaction errors.
- Faster Refund Processing: Refund time will decrease significantly.
- Higher Customer Satisfaction: Improved user trust and positive feedback.

Measurable Metrics:

- Payment Failure Rate: Should decrease by at least 40% within 6 months.
- Refund Processing Time: Should improve from 7-14 days to 2-5 days.
- User Complaint Volume: Should reduce by 30% based on Shopee's customer support logs.

Experiment

1. Identify Frequent Transaction Errors:

Analyze transaction logs to find the most common failure points.

2. Implement Automated Refunds on a Small Scale:

Test AI-driven refund processing for a selected group of users.

3. Optimize Server Load Balancing:

Deploy cloud-based solutions to manage high traffic volumes.

4. Monitor User Feedback and Transaction Success Rates:

Use customer surveys and payment analytics tools to track improvements.

Tools & Techniques:

- AI-Based Fraud Detection: Machine learning models for real-time verification.
- Server Performance Monitoring: AWS CloudWatch for tracking server downtime.
- Customer Feedback Analysis: Shopee's internal review system and surveys.



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Challenges & Alternatives:

- Challenge: Some banks may still delay refund processing.
- Alternative: Partner with financial institutions to offer instant refunds via e-wallets.