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MLWallet

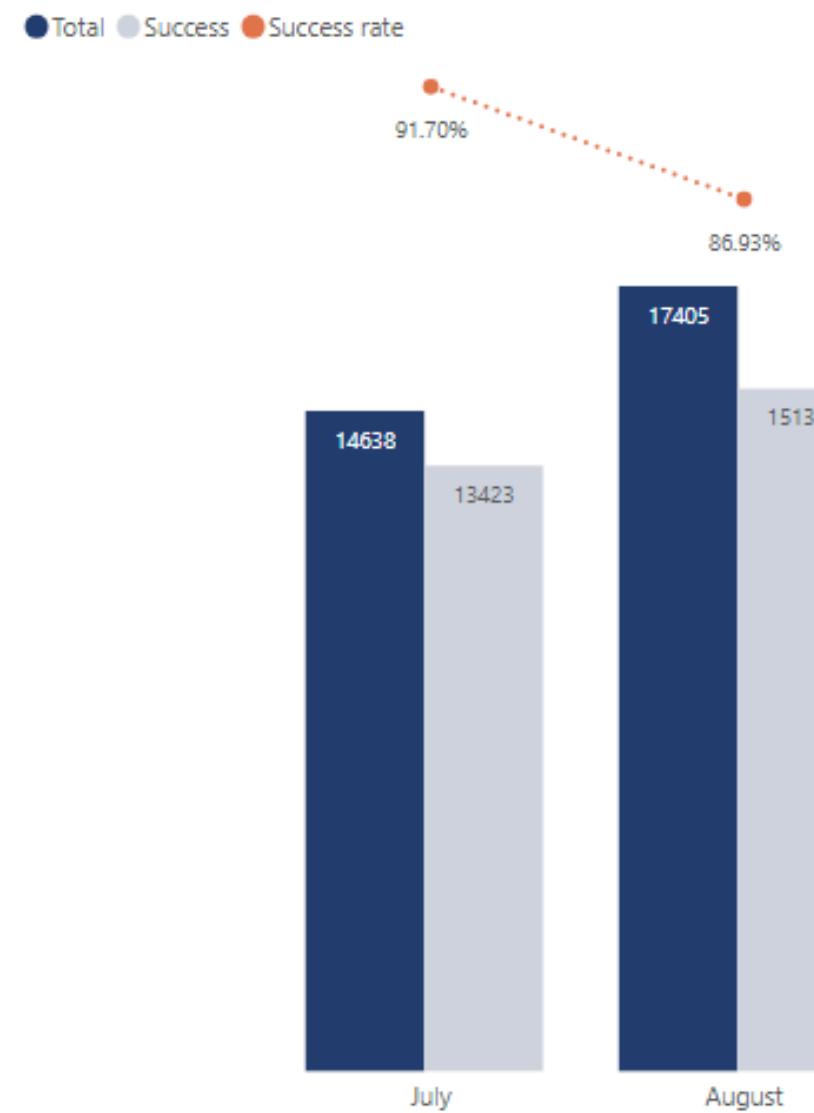
Analysis Report

on Payment Success Rate Decline

Nguyen Hai Hoang



Transaction Volume and Success Rate



Problem Overview

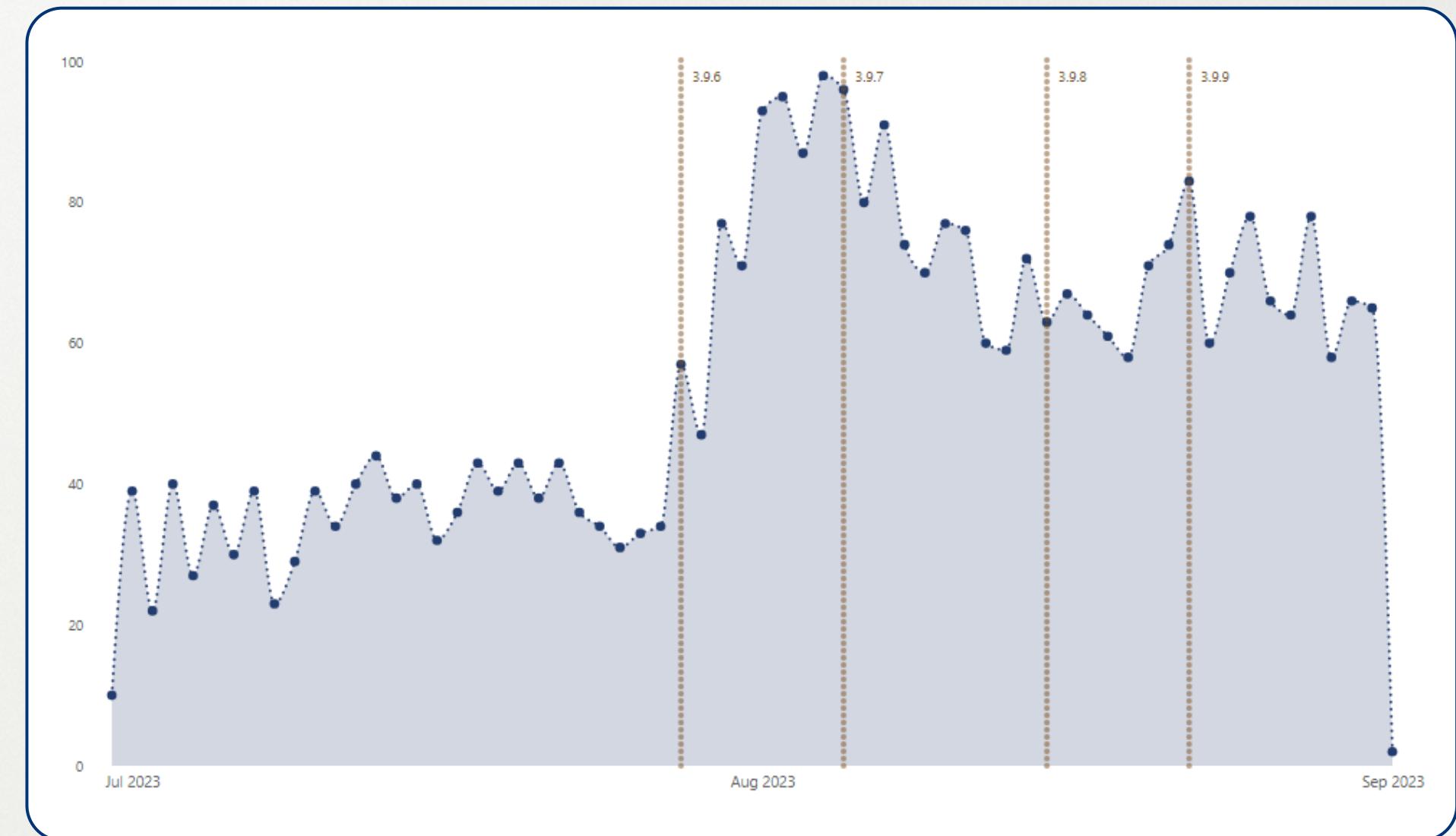
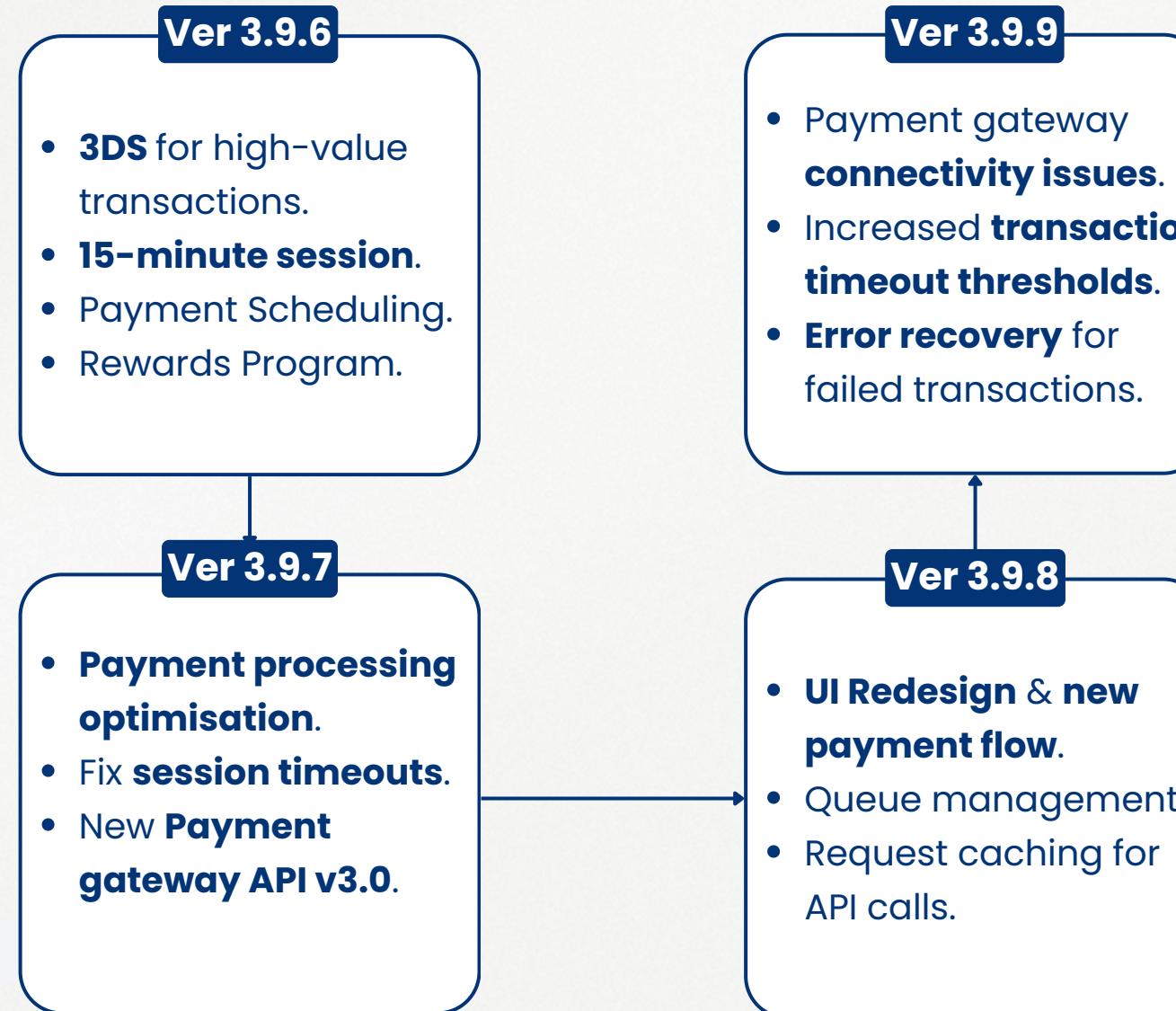
Dramatic Decline in Payment Success Rate

High-level stakeholders reported that **MLWallet** experienced **a serious decline** in **billing payment success rate**.

- From July to August, while the overall transaction volume **increased by 22%**, the **success rate decreased from 92% to 87%**.
 - The ongoing situation massively impacted not only **customer experience** but also **platform performance** and **business activities**.

Context

Daily failed transactions show **a clear shift in behavior** over time. For most of **July, errors remain relatively low and stable**. However, starting **mid-August**, the **failure count rises sharply** and becomes **highly volatile**. When aligned with the app's release timeline, this pattern reveals a strong correlation between increased failures and specific version rollouts:



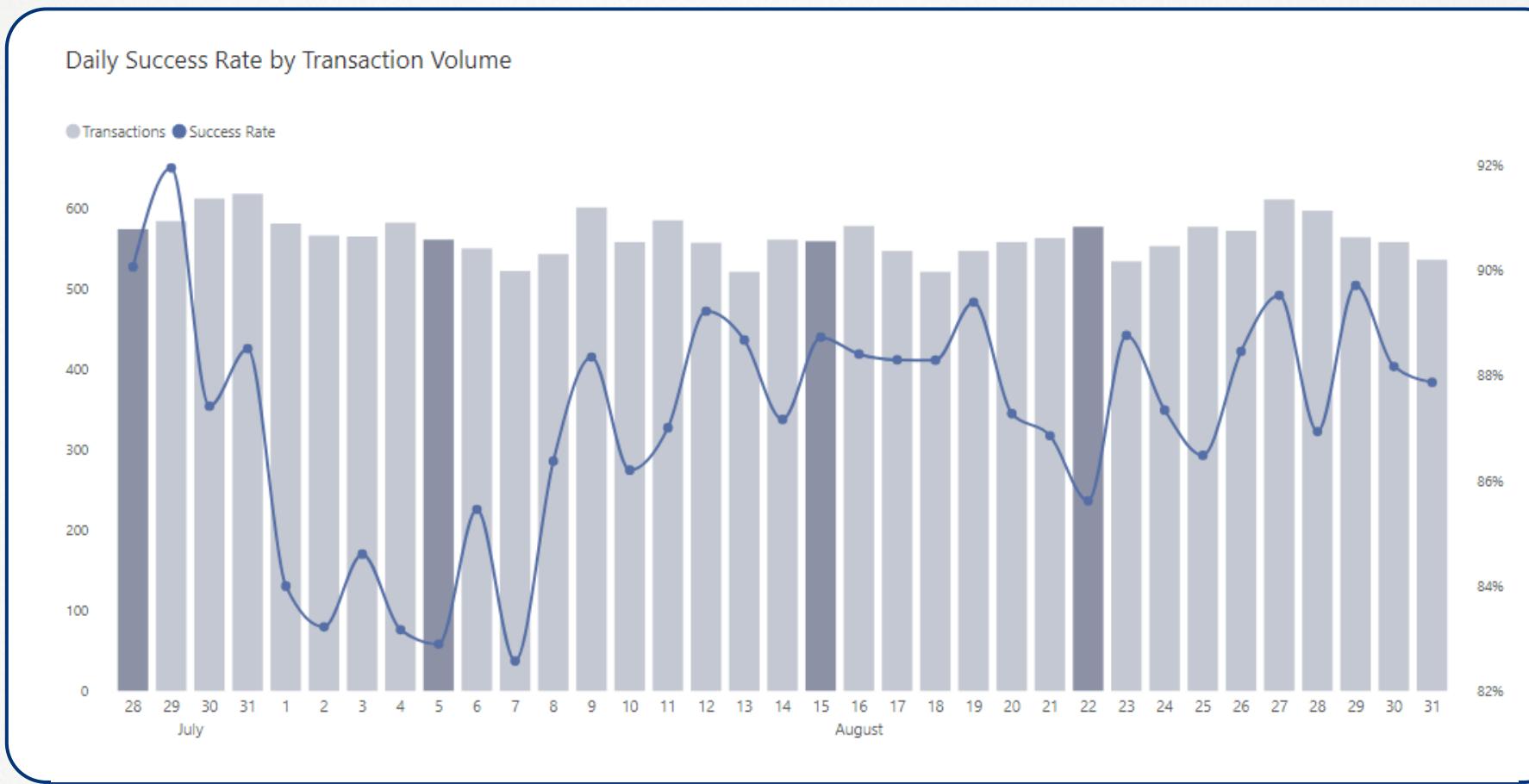
→ These shifts indicate that **recent app updates** likely **contributed to the surge** in **failed transactions** and **require further investigation**.

Methodology

ICE Framework ranks potential root causes for investigation and opts for direct solutions.

Category	Hypothesis	Impact (1–5)	Confidence (1–5)	Ease (1–5)	ICE Score
Technical	Authentication flow instability (3DS timeouts, OTP failures) is causing widespread transaction failures.	5	5	3	75
	New features (3DS) introduced in app version 3.9.6 is driving systemic failures across subsequent versions.	5	4	3	60
	Low performance or instability in backend services is contributing to intermittent success-rate drops.	4	3	3	36
Business	The new payment flow and UI redesign introduce additional friction that affects certain user segments.	3	4	3	36
User	Low-activity users experience greater authentication friction, amplifying the impact of system instability.	3	4	4	48
	User unfamiliarity with the redesigned UI increases navigation errors or abandoned flows.	2	3	4	24
Contextual Factors	System performance degrades during peak transaction hours, affecting success rate under load.	3	3	3	27

Trend Analysis



Trend Overview

Daily transaction volume **remains relatively stable** throughout the period, showing **no abnormal spikes** that could naturally explain fluctuations in system performance.

→ Despite this stable load, **the success rate exhibits repeated dips** and uneven recovery cycles, indicating that performance issues stem from **internal system behavior** rather than **traffic pressure**. This **instability** is independent of the number of transactions processed.

Impact of App Version Releases

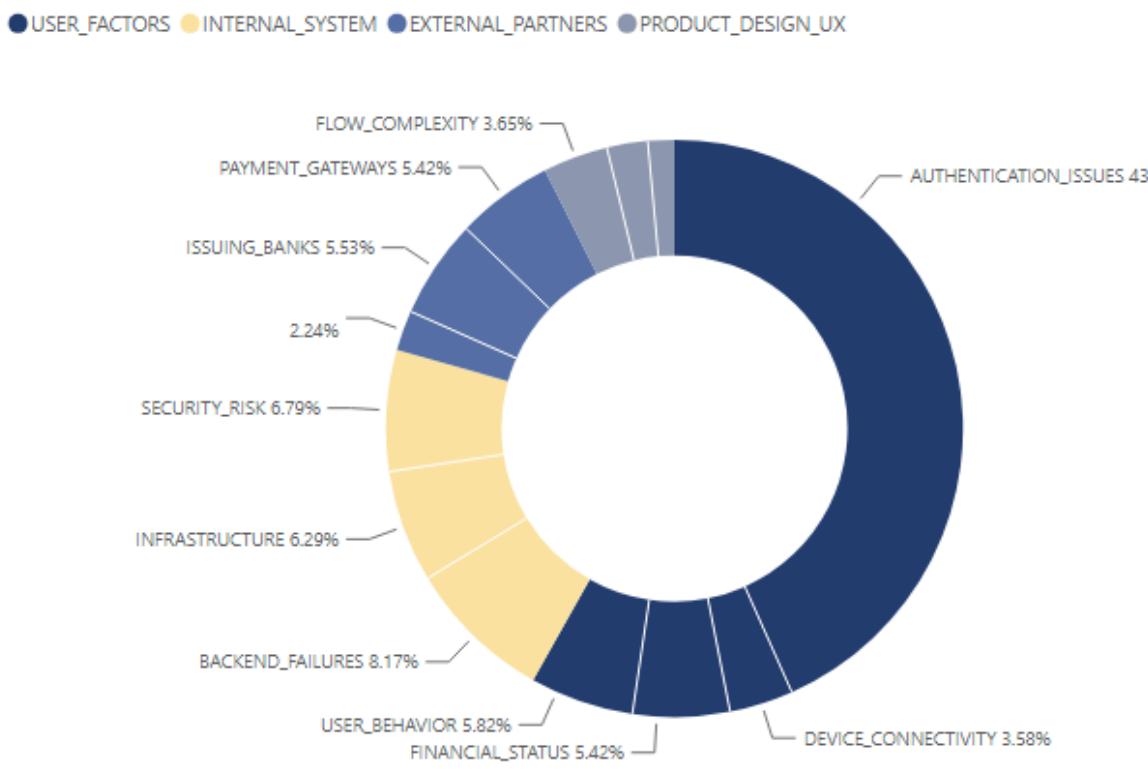
- **Version 3.9.6** aligns with the sharpest and most prolonged decline, suggesting significant regressions or unexpected bugs.
- **Versions 3.9.7 and 3.9.8** show smaller but still clear performance dips, implying the not fully-stabilized system.
- **Version 3.9.9** marks the first release after which the success rate becomes steadier, indicating effective remediation of earlier issues.

Error Taxonomy

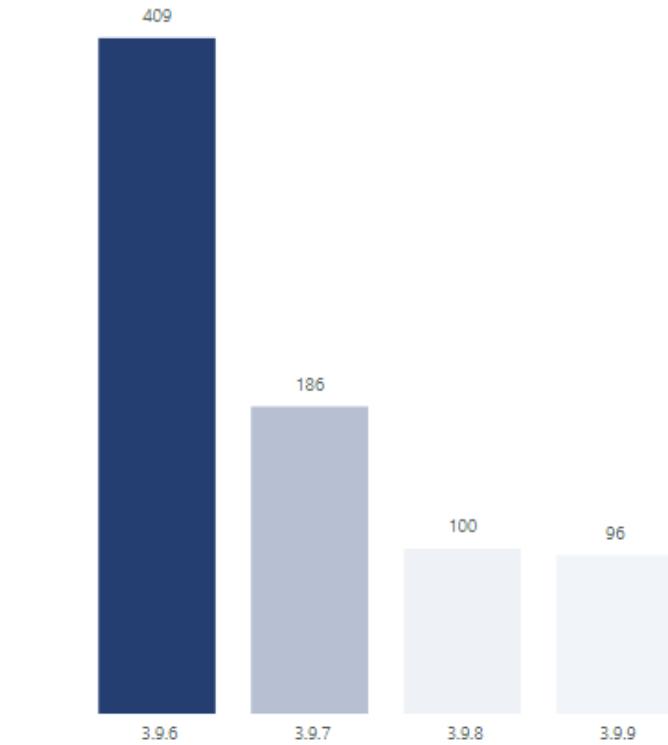
Authentication-related failures account for nearly **half of all errors**, causing the **overall system instability**.

→ **The core problem** lies at **the final point of the user journey**, not earlier in the transaction process.

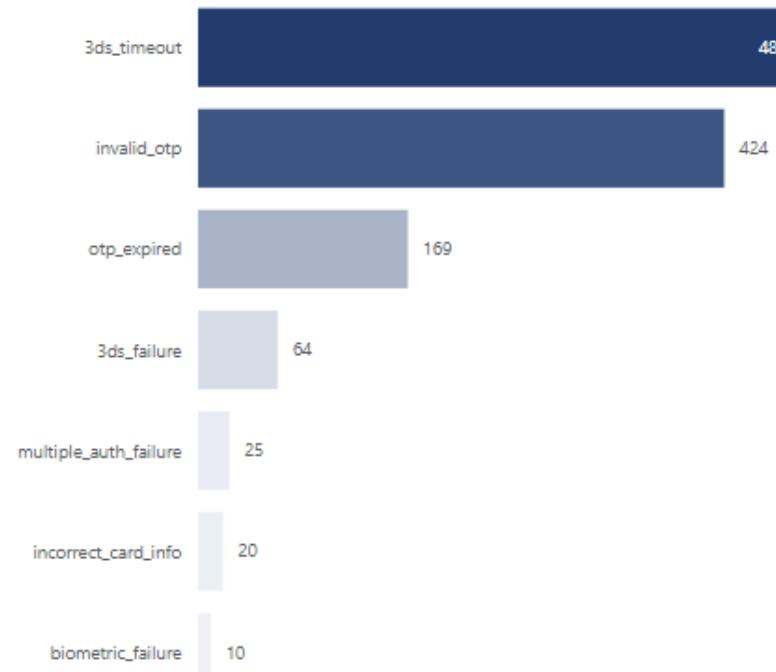
Error Category Breakdown



Authentication Issues by App Version



Authentication Issues Breakdown



Authentication errors peak sharply in **3.9.6** and drop progressively in **later versions**.

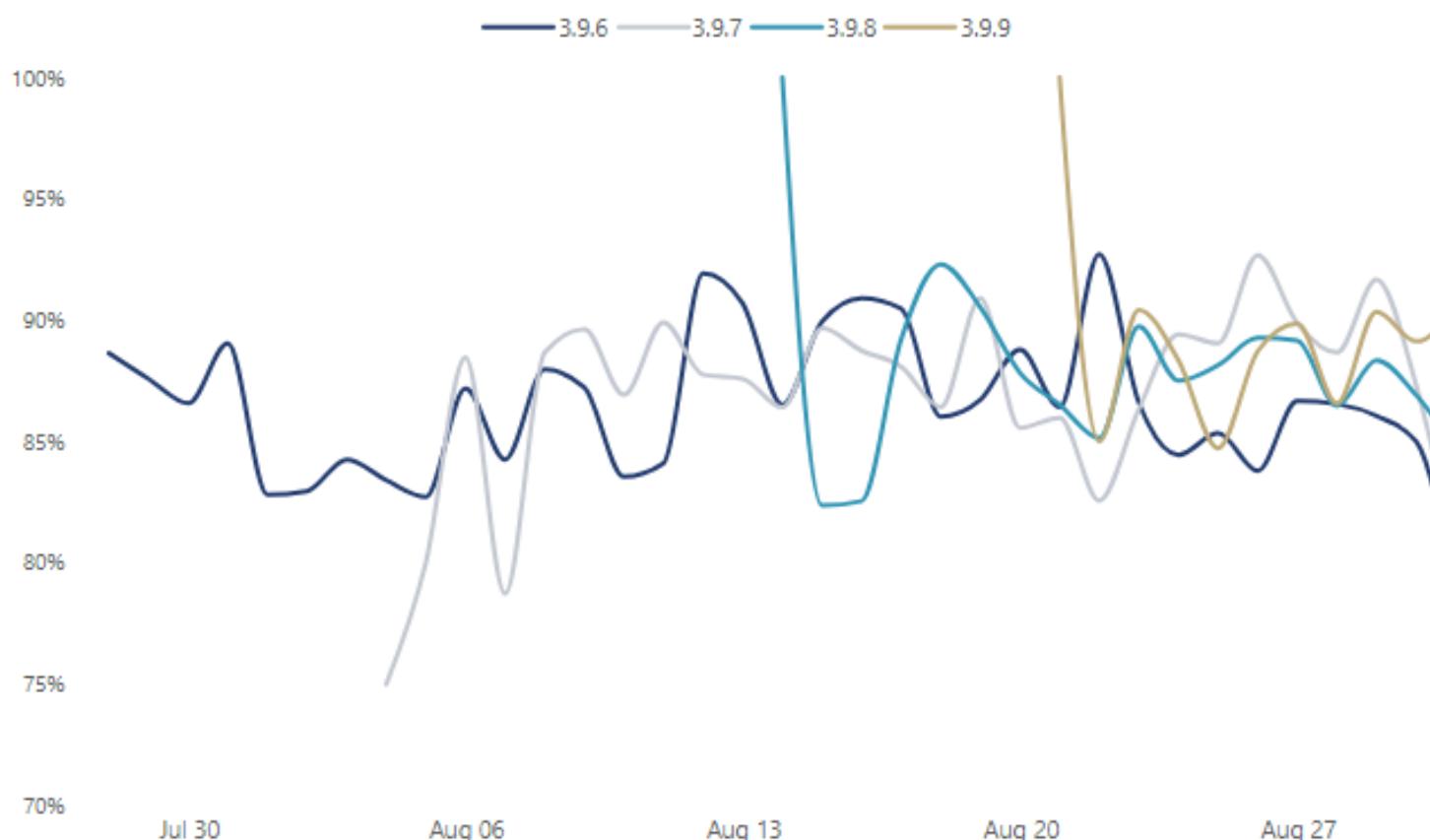
→ New stricter security requirements introduced in **3.9.6** triggered the **high failure rate**. Subsequent releases appear to mitigate this issue.

3ds timeout and **invalid OTP** make up the bulk of authentication errors. This narrows the likely root causes to:

- Unstable or slow **3DS** authentication flow, and
- Issues in **OTP delivery** or **validation** (*latency, UX confusion, or backend logic*).

Technical Segmentation

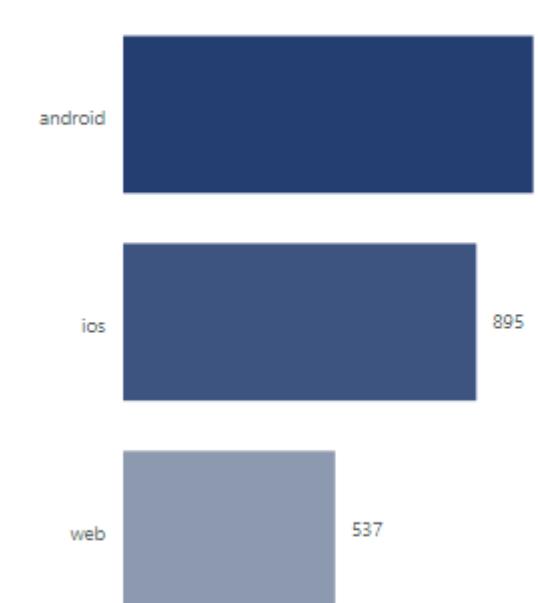
Success rate by App version



Success Rate by App Version Highlights Version-Specific Instability:

- Each version shows a distinct **success-rate pattern**, reinforcing that performance issues are not system-wide but version-dependent.
- Version **3.9.6** consistently *underperforms*, aligning with the spike in authentication issues identified earlier.
- Later versions (**3.9.8** and **3.9.9**) *stabilize* but still show *residual volatility*, indicating partial recovery rather than full resolution.

Transaction Failure by Device



OS Compatibility Performance

Platform	No. Transactions	Fail Transactions	% Success	% Authentication Error
android	8575	1039	87.88%	3.70%
	1013	199	80.36%	13.43%
	11	229	88.41%	2.28%
	12	293	89.18%	2.47%
	13	179	89.68%	2.02%
	10	139	87.84%	2.97%
ios	7315	895	87.76%	4.66%
	1279	250	80.45%	14.23%
	1070	110	89.72%	2.52%
	13	144	89.40%	1.99%
	14	138	88.58%	3.73%
	15	138	89.13%	2.36%
web	1269	115	89.82%	2.65%
	3346	537	83.95%	8.79%
Total	19236	2471	87.15%	4.95%

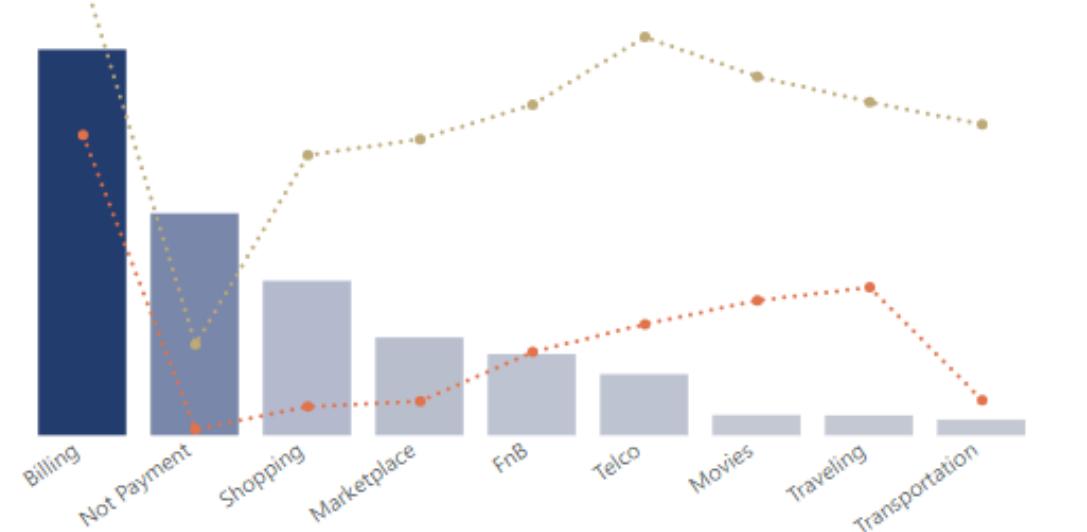
Platform & OS Segmentation Reveals Device-Specific Vulnerabilities

- Android** contributes the **highest number of failed transactions** (1,039), outperforming iOS and Web in both volume and severity of errors.
- Older OS versions amplify the issue:
 - Android 10** shows significantly **lower success rate (80.36%)** and a **high authentication error rate (13.43%)**.
 - Legacy iOS** versions (12–13) also **perform worse than their newer counterparts**.
→ **Device fragmentation** and **outdated OS** magnify **authentication** and **3DS** failures.

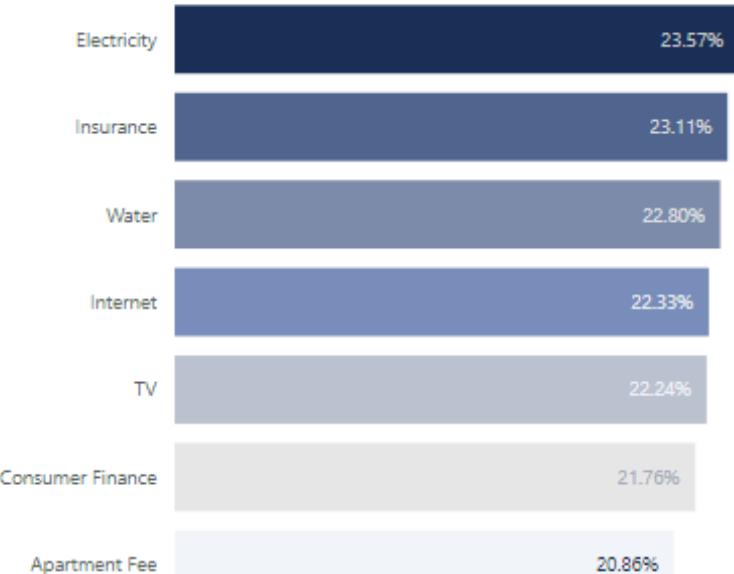
Business Segmentation

Failed Transactions and Fail Rate across Category

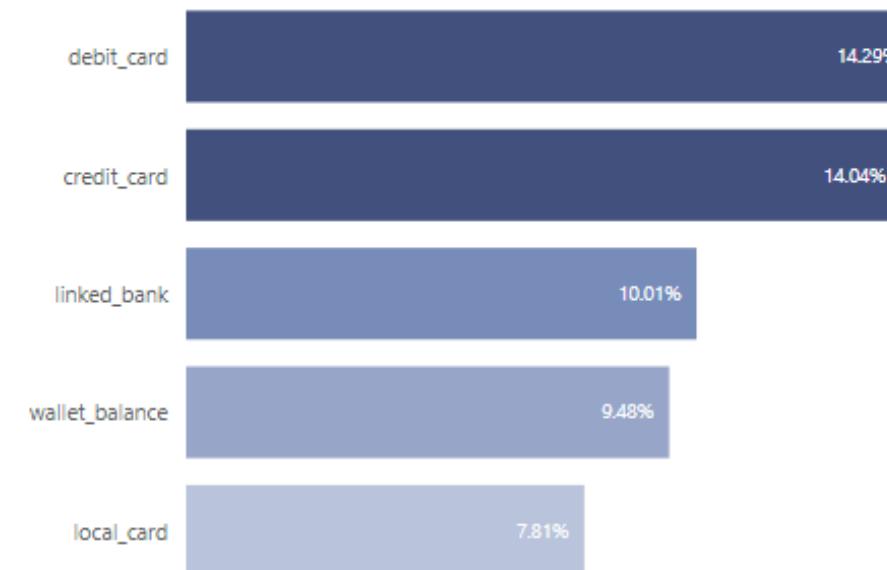
● Fail Transactions ⚡ Fail Rate ⚡ Fail Rate Change MoM (pp)



Fail Rate by Billing Sub-categories



Fail Rate by Payment Method



Billing accounts for the largest volume of failures and shows a noticeable **month-over-month increase in fail rate**.

→ Issues identified at the **authentication** level are clearly reflected in high-frequency, high-dependency billing flows.

Sub-category breakdown indicates failures are concentrated in **essential, recurring services**, while they rely heavily on external partners and **3DS/OTP** flows.

Card-based payment methods show the highest fail rates:

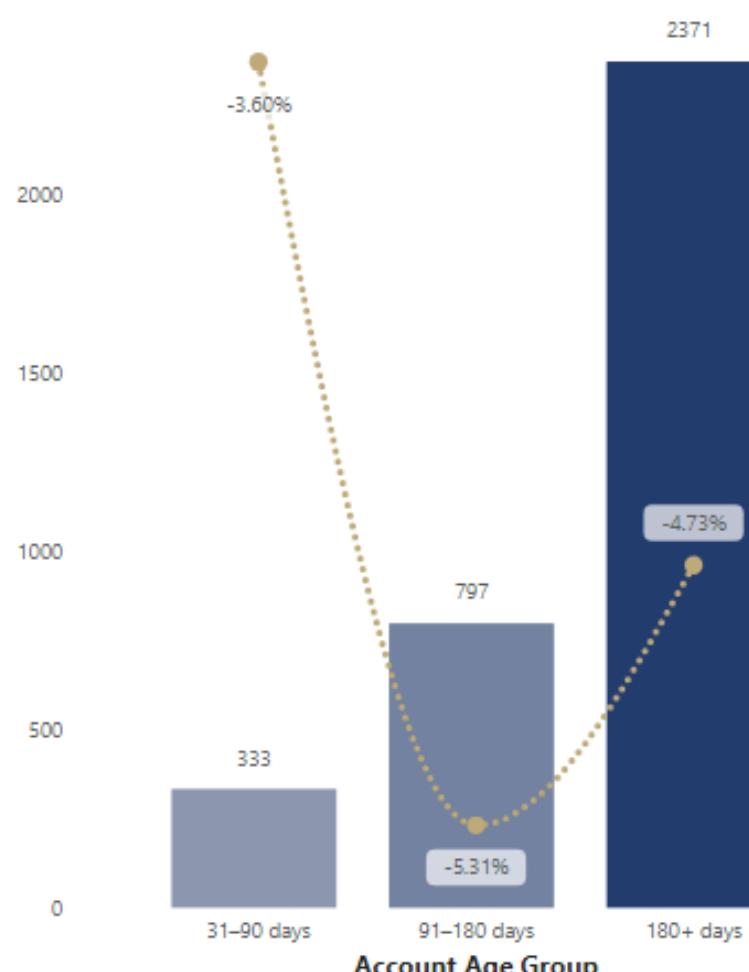
Debit and **Credit** cards (~14% fail rate) significantly underperform compared to **linked bank** or **wallet** methods (**under 10%** fail rate).

→ The bottleneck lies in **new payment flow**.

User Segmentation

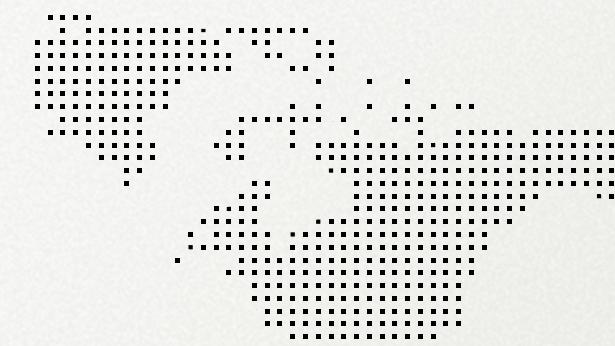
Success rate Change on User Tenure

● Fail Trans ● Success Rate Change MoM



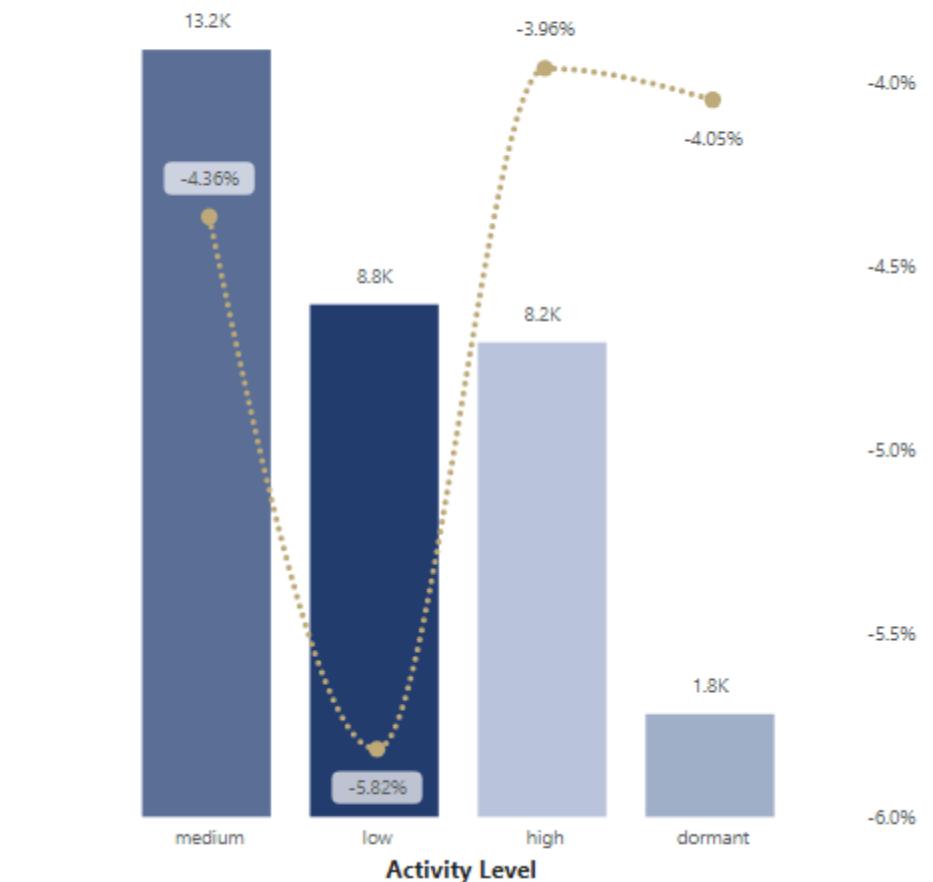
- **Newer users** (31–90 days) show a milder decline, indicating that the problem cannot be explained by onboarding difficulties or lack of user experience.
- Both **mid-tenure** and **long-tenure** users experience *the most significant drops*, users who are already familiar with the app were still **heavily affected**.

→ This pattern rules out user behavior as the primary driver and points toward **UI redesign** and **new payment flow**.



Success Rate Change by User Activity Level

● Transactions ● Success Rate Change MoM



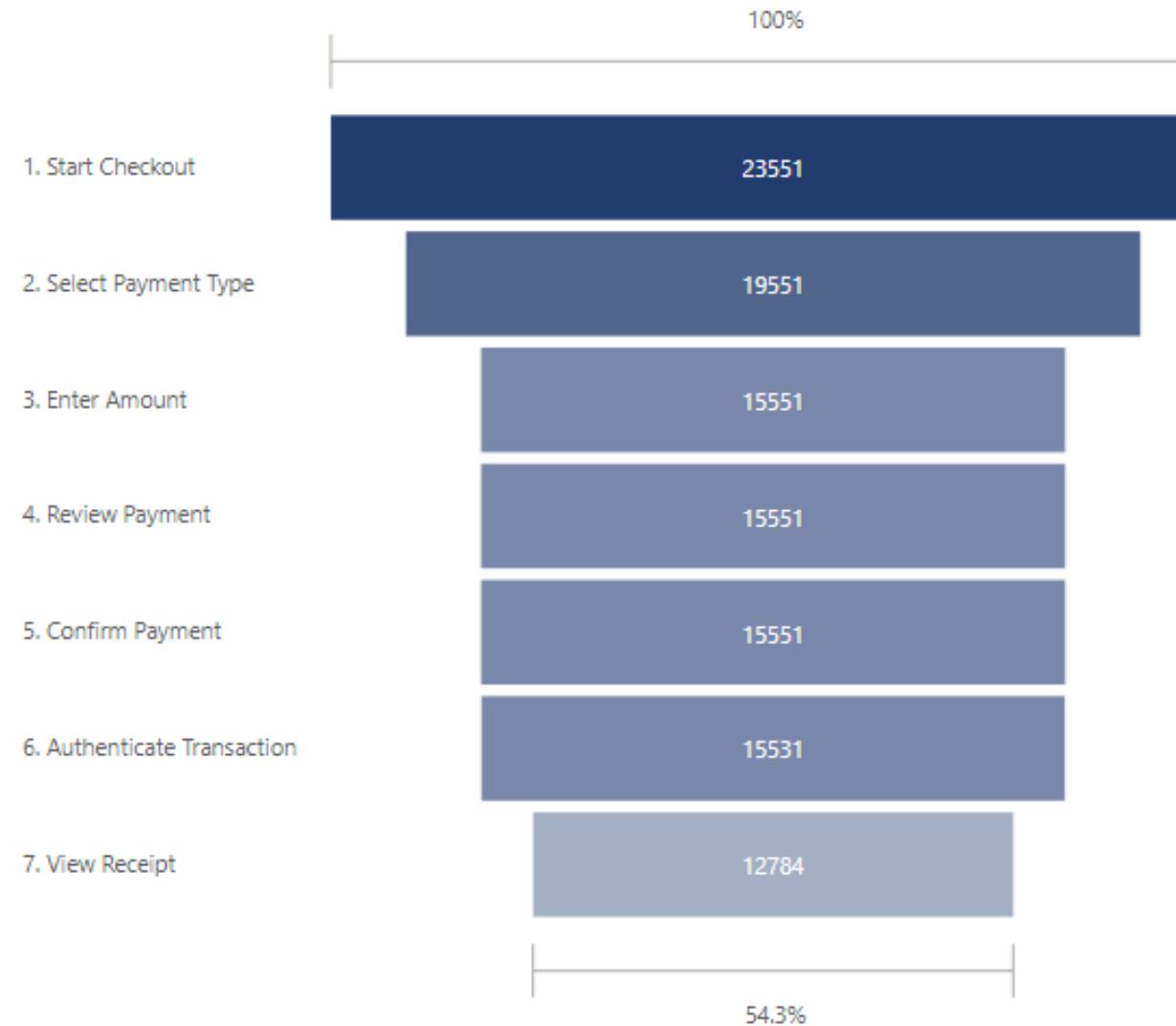
- **Infrequent users** are more sensitive to changes in navigation and authentication steps → Causing critical success rate decline.
- **Medium** and **high-activity users** also decline, indicating that *the issue extends beyond UX unfamiliarity* → **New payment flow** affected even highly-accustomed users.

→ Both **UI and payment flow changes** increased **user flow friction** and exposed the new **payment process's systemic issues**.



User Journey

Funnel Analysis - Payment Flow



There is no abnormal drop between functional steps, suggesting that users are successfully completing the payment interaction.

→ The funnel shows a major drop only at the final stage (**54% retention**), while all other steps maintain **~66% retention**.

→ Low drop-off through the funnel indicates the issue is **not caused by user abandonment**.

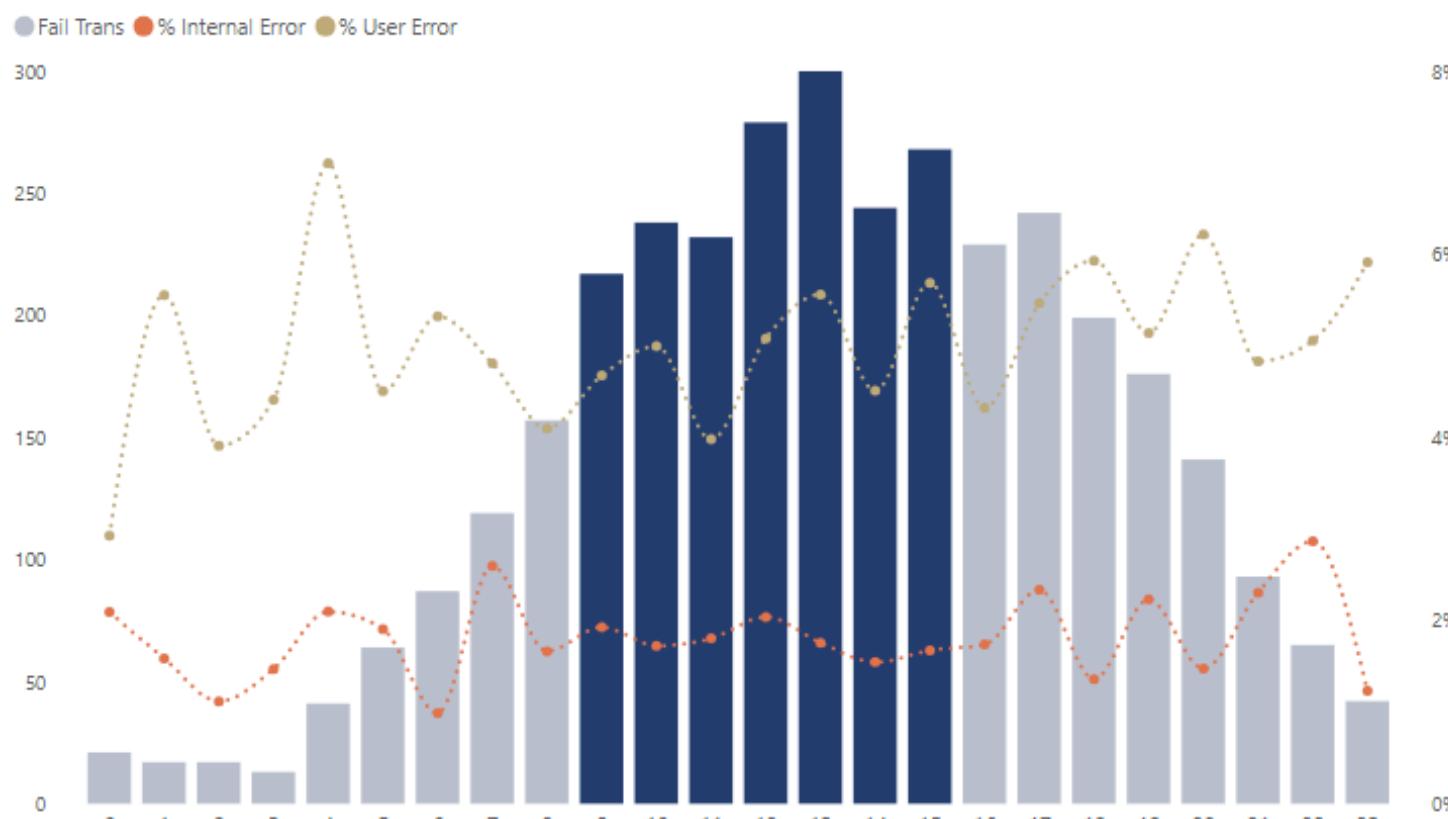
StageName	Stage Count	Percent of First	Percent of Previous	Avg Time From First Step	Avg Time From Prev. Step
1. Start Checkout		100%		0.00	
2. Select Payment Type		83%	83.0%	5.49	5.49
3. Enter Amount		66%	79.5%	28.80	23.28
4. Review Payment		66%	100.0%	42.69	13.98
5. Confirm Payment		66%	100.0%	71.61	28.79
6. Authenticate Transaction		66%	99.9%	97.12	31.63
7. View Receipt		54%	82.3%	141.53	27.68

Time-to-progress provides an overview on end-to-end session

- Sharp increase in processing time escalates from **Confirm Payment** to **Authenticate Transaction**, with cumulative delays of **97s** and **141s**.
- The drop at **View Receipt** is non-critical (post-payment), meaning failures occur after Confirm/Authenticate.
- Long processing times in **authentication** steps strongly indicate *backend or provider-side performance degradation*:
- These delays are consistent with authentication/gateway latency, which are potentially caused by **3DS timeouts and OTP issues**.

Contextual Factors

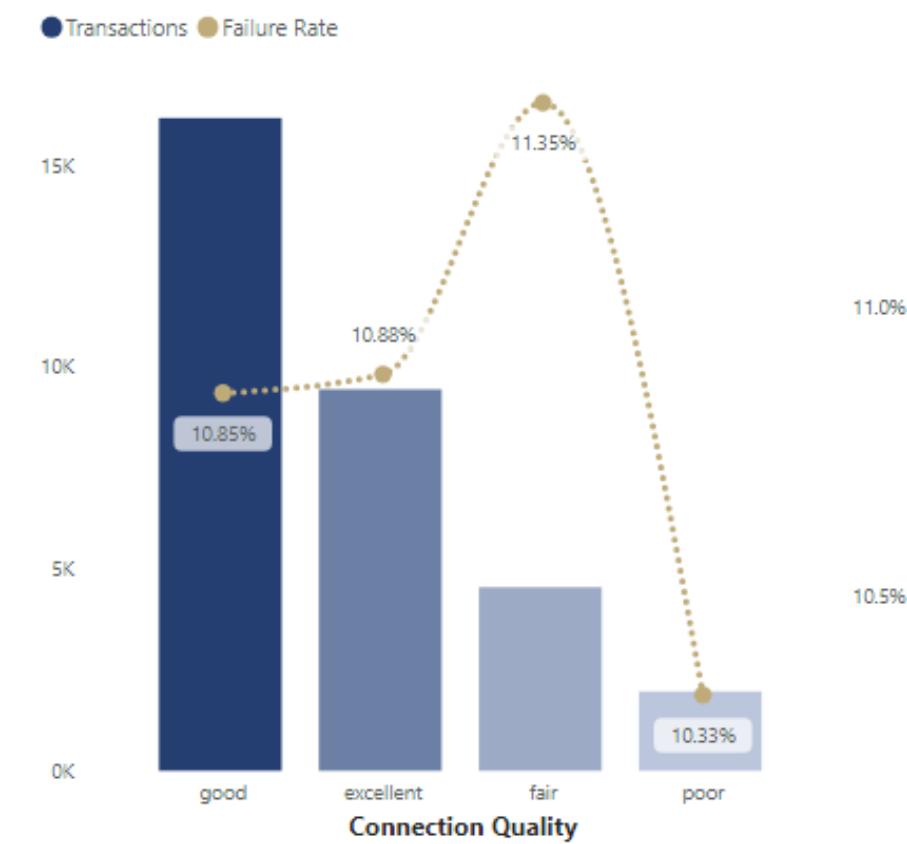
Peak Hours Performance



Failure volume spikes sharply between **10:00** and **15:00**, aligning with transaction peaks. However, the **% Internal Error** does not follow a clear upward trend in these hours while **% User Error** remains relatively stable → Peak failures are mainly due to **volume scale**.

Unusual error spikes occur during low-traffic hours (**2–4 AM**): both error types show abnormal rises in early-morning hours → Potentially linked to **internal** or **partner-related** issues.

Connection Quality Impact on Failure Rate



Connection quality explains only a small subset of failures:

- Most users fall within the **good** or **excellent** categories, and their failure rates remain stable (~**10%**).
- The very *low volume* in the **poor** segment causes lower fail rate. → Caused by specific cases (3DS, OTP delays) but not the primary driver.



Root Causes Summary

Solutions

Primary Root Causes

- **v3.9.6** introduced **3DS** for the first time, drastically changing the authentication mechanism.
- **Authentication** errors (3DS timeout, invalid OTP, OTP expired) represent 43% of all failures, the largest failure group.
- Funnel timing shows unusually long delays (**97-141s**) in the **Confirm → Authenticate** step, consistent with **3DS handshake** and provider latency.
- **v3.9.8** introduced a **UI redesign + new payment flow**, altering user navigation, payment steps, and backend state transitions.

Secondary Root Causes

- **OS-level** patterns (Android 10/11 showing higher auth errors) reinforce the hypothesis that the new **3DS** integration behaves inconsistently across environments.
- Long processing times and timeouts derived from **Authentication Provider/Gateway Latency** directly increased authentication failures.

Non-contributing Factors

- **Traffic load:** No correlation between peak hours and internal error spikes.
- **Network quality:** Failure rate stable even under “good/excellent” conditions.
- **Biller/sub-category:** All billing sub-types show similar fail rates
- **User behavior:** MoM decline consistent across all user levels & tenures.

Short-Term (0-7 days)

- Patch **3DS + payment flow** issues introduced in v3.9.6–3.9.8.
- Increase authentication **timeouts**, add **retry** for **3DS and OTP**.
- Work with **3DS / gateway / SMS** providers to reduce latency.
- Fix **redirect/callback errors** caused by new UI flow.

Mid-Term (1-6 weeks)

- Stabilize the new Payment flow (**v3.9.8**)
- Refine **3DS integration** to align with new UI/payment flow.
- Patch **older OS versions & WebView** compatibility issues.
- Improve **OTP** delivery reliability & validation logic.

Long-Term (6-24 weeks)

- Re-architect **payment flow** for resilience & recoverability.
- Enhance UX robustness for interrupted or delayed authentication.

THANK YOU!!!