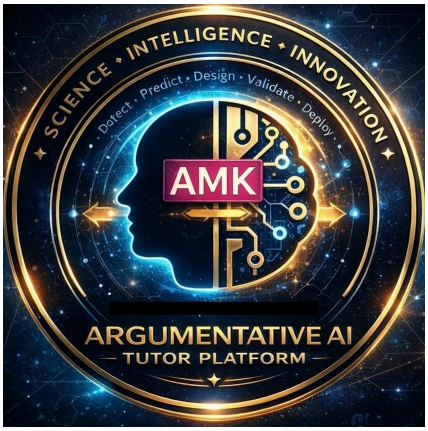

AMK RESEARCH LAB

Science • Intelligence • Innovation

Benchmark Lecture Note 20

Banking App Automation:

Pending vs. Completed Transactions, Human Oversight, Governance, and ROI

Teaching focus:

AI-assisted transaction classification, bounded automation, fraud and compliance controls, human oversight, operational trust, and ROI.

This lecture note uses a mobile-banking transaction screen as a practical teaching real-world example for AI certification students. It shows how an AI agent can assist with transaction classification and prioritization while still operating under policy gates, settlement checks, human review, auditability, and business-value controls.

1. Practical Application Context

A banking app offers a clear real-world example of governed automation. Some transactions appear as Pending, while others appear as completed and are visually marked in green. These labels are not merely cosmetic; they represent different control states inside the transaction lifecycle. In a mature system, AI can assist with classification, anomaly scoring, and queue prioritization. But the final transaction state depends on settlement, policy rules, compliance checks, and, when necessary, human intervention.

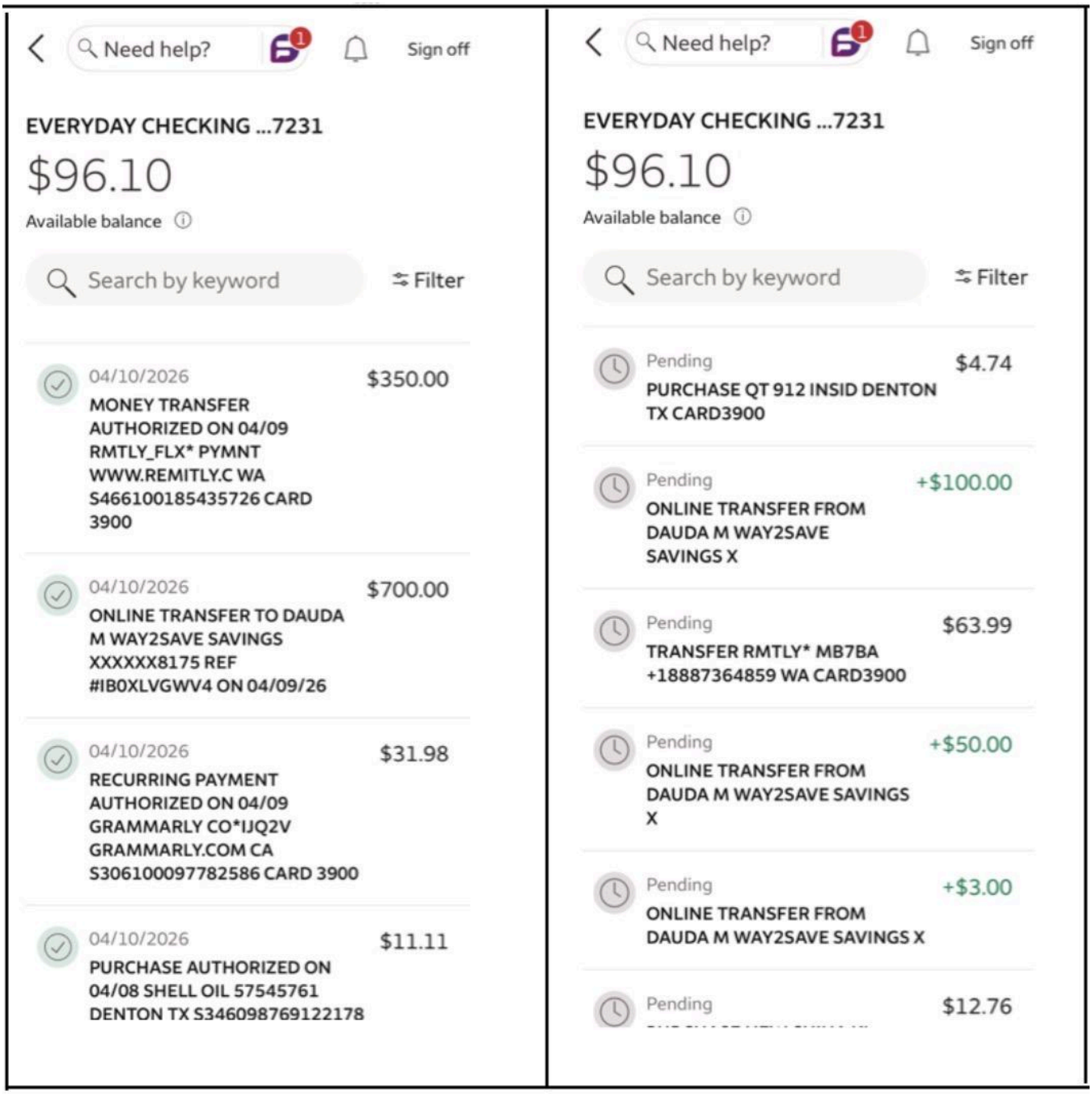

Figure 20.1. Example banking transaction screens used for teaching control states in an AI-assisted financial workflow. Pending items remain inside the governed workflow, while completed items represent control-cleared operational states.

2. Why Transactions Are Marked Pending

A transaction marked Pending should be interpreted as a controlled uncertainty state. The app has recorded the event, but the bank has not yet completed all required actions for final posting, settlement, or risk acceptance. This can happen because external settlement is still in progress, merchant confirmation has not yet arrived, a fraud or anomaly screen is still running, a rules engine has requested additional verification, or the amount, destination, or behavior pattern requires extra review.

Teaching interpretation: Pending means the workflow has started, but the transaction has not yet cleared all settlement, risk, and policy gates.

3. Why Completed Transactions Are Marked in Green

Transactions shown as completed in green typically indicate that the control chain has finished successfully. Settlement or posting has been confirmed, core validation checks have passed, no additional escalation is required, and the bank can treat the entry as operationally complete. In governance terms, the item has moved from observation and review into a control-cleared final state.

4. Governance Flow for an AI-Assisted Banking Transaction

Customer action captured: Customer initiates a purchase, transfer, or recurring payment.

AI / rules assessment layer: The system classifies the transaction, scores anomaly or fraud signals, compares behavior with past activity, and prioritizes the item.

Control gate: Settlement status, policy thresholds, compliance checks, and exception logic determine whether the transaction can be finalized automatically.

Output states: Possible states include Pending, Escalated, Completed, or Blocked/Rejected depending on risk and workflow status.

ROI and trust impact: Safe automation improves efficiency, reduces fraud loss, supports customer trust, and protects long-term return on investment.

5. Transaction-State Governance Table

State	Meaning	AI Role	Human / Control Role
Pending	Not yet fully cleared	Score, classify, detect anomalies	Wait for settlement, rules, or review
Escalated	Requires deeper review	Flag exception patterns	Human or specialist review
Completed	Passed checks and posted	Support fast low-risk routing	Confirmed by control chain
Blocked/ Rejected	Failed policy or risk gates	Detect suspicious or invalid activity	Policy enforcement and investigation

6. ROI as One of the Basis for Safe Automation

Students should understand that ROI in banking AI does not come only from faster automation. It comes from safe automation. A well-governed system improves ROI by reducing manual review workload for routine items, accelerating low-risk processing, focusing investigators on high-risk cases, lowering fraud loss, and improving customer experience. Governance also protects ROI by reducing false approvals, regulatory exposure, reputational damage, customer disputes, and staff time wasted on poor-quality alerts.

Positive ROI drivers	Governance-protected ROI
Lower manual effort, faster low-risk processing, better fraud prioritization, better customer experience, stronger operational efficiency.	Fewer false approvals, lower regulatory risk, fewer disputes, better auditability, stronger trust preservation.

7. Python Logic for Teaching Control States

```
from dataclasses import dataclass

@dataclass
class Transaction:
    amount: float
    anomaly_score: float
    settlement_confirmed: bool
    compliance_flag: bool
    confidence: float


def decide_transaction_state(tx: Transaction) -> str:
    if tx.compliance_flag or tx.anomaly_score > 0.85:
        return 'ESCALATED'
    if tx.confidence < 0.75:
        return 'PENDING'
    if not tx.settlement_confirmed:
        return 'PENDING'
    return 'COMPLETED'
```

8. Key Takeaway for AI Certification Students

In a governed banking AI system, Pending represents a controlled uncertainty state, while Completed represents a control-cleared final state. AI helps classify and prioritize transactions, but human oversight, settlement logic, fraud checks, and compliance controls determine when a transaction is safe to finalize. The most defensible ROI comes from automation that is efficient, auditable, and trustworthy rather than merely fast.

References

NIST AI Risk Management Framework (AI RMF 1.0): https://nvlpubs.nist.gov/nistpubs/ai/nist.ai.100-1.pdf

NIST Cybersecurity Framework (CSF) 2.0: https://nvlpubs.nist.gov/nistpubs/CSWP/NIST.CSWP.29.pdf

OECD AI Principles: https://www.oecd.org/en/topics/ai-principles.html