



Semester : VIII

Subject : AIFB

Academic Year: 2024-2025

Decision tables are a structured way to model decision logic by laying out all possible conditions and the corresponding actions. In fraud analysis, they help in systematically detecting fraudulent activity by mapping known behavior patterns and responses in a clear, tabular form.

What is a Decision Table?

A decision table consists of:

- Conditions (inputs): e.g., transaction amount, location, time, device used, etc.
- Rules: combinations of condition states (e.g., high amount + foreign location).
- Actions (outputs): the system's response (e.g., flag as fraud, allow, alert customer).

Why Use Decision Tables in Fraud Detection?

- Makes complex decision logic clear and auditable
- Useful for both rule-based systems and hybrid AI-rule systems
- Easily maintained and updated by compliance/risk teams
- Can be automated into fraud detection engines

Sample Decision Table for Transaction Fraud Analysis

Rule #	Amount > \$5000	Location = Foreign	Time = Odd Hour	Device = New	Action
1	No	No	No	No	Allow transaction
2	Yes	No	No	No	Send OTP
3	Yes	Yes	No	No	Flag as suspicious
4	No	Yes	Yes	Yes	Block transaction
5	Yes	Yes	Yes	Yes	Flag as high-risk
6	No	No	Yes	Yes	Send alert to user

Use Cases in Banking Fraud

- Credit card fraud – Rules based on spending pattern, merchant, IP address
- Account takeover – Location + Device ID + Password reset requests
- Loan application fraud – Application time + document anomalies + duplicate data
- Mobile banking fraud – SIM swap detection + device fingerprint mismatch



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AI + Decision Tables Hybrid

- AI models can generate **risk scores** as inputs to decision tables.
- Decision tables can define the **thresholds and follow-up actions** based on these scores.

Example:

Risk Score	Location	Action
> 0.9	Foreign	Auto Block
0.6–0.9	Local	Send OTP + Log
< 0.6	Any	Approve transaction



Benefits of Using Decision Tables in Fraud Analysis

Benefit	Description
Transparency	Easy to audit decisions
Maintainability	Business teams can modify rules easily
Efficiency	Fast evaluation of transactions
Hybrid Integration	Works with AI for explainable decisions