ML Use Cases for Fraud Detection:

Problem Framing:

<table>
<tr><th></th><th>Qualitative</th><th>Quantitative</th><th></th></tr>
<tr><td>Current State</td><td>Too Many Fraud cases => Low Customer Investment Sentiment => Lower Cash flow + Direct Revenue losses through Fraud => Lower Bank revenue</td><td>5% Fraud Cases => 8-10% decrease in cash flow + 2% direct loss(depending on fraud size) => 12-15% loss in revenue</td><td>What is the current problems we are facing in the initial state, and why do we need to rectify them.</td></tr>
<tr><td>Objectives</td><td>Build a model that can spot fraud cases efficiently within a short span of the fraudulent transaction Decrease Fraud Cases => Improve Customer Sentiment => Higher Cash flow => Improve revenue</td><td>Reduce fraud cases by 60% (5% to 2%) => 6% increase in cash flow => 9% increase in revenue</td><td>What is it that we are doing and why? (Improve Bank Revenue in this case)</td></tr>
<tr><td>Cost/Benefit Analysis</td><td>FP – Normal Bank transactions misidentified as fraudulent => doesn’t affect user experience much => no significant impact on revenue
FN – Fraud remains undetected => Low user trust => Loss in bank revenue
TP – Fraudulent cases detected => Higher Bank reliability => more Cash flows => Higher Bank Revenue
TN - Normal transactions classified as non-fraud => maintained bank user experience => No significant impact</td><td>Cost-Benefit Matrix<table><tr><td>C(TP)</td><td>C(FP)</td></tr><tr><td>C(FN)</td><td>C(TN)</td></tr></table>
1% TP => 0.5% increase in cash flow => 0.5% revenue increase

1% FP => -.05% cash flow due to customer harassment causing decline in user experience => -.1% loss in bank revenue

1% FN => 0.6% risk of direct lump sum loss =>4% cash flow loss => 7% loss in revenue

1% TN => no significant impact on bank.</td><td>What are the cost, benefits of correct predictions and why?</td></tr>
<tr><td>Constraints</td><td>Can afford a very small percent of FN => Small percentage of loss in cash flow => Limited loss in revenue.</td><td>At most 5% FN => 3% risk of lump sum loss => acceptable for 9% increase in revenue.</td><td>What are the acceptable risk margins and why?</td></tr>
<tr><td>Final State</td><td>Benefits: significantly lesser fraud =></td><td>At least 60% decrease in Fraud cases</td><td>What is the desired outcome</td></tr>
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	Significantly better user experience => Generates more circular cash flow => More bank revenue Costs:- Cant allow too many FN's => limited risk of direct loss + loss through lower customer sentiment => limited loss in revenue	At most 5% FN allowed => 3% of risk of lump sum loss => 5% risk in revenue loss.	that we want to see?