

# TECHNO VISION

Professional Bank AI Scoring Presentation



**MAQSAD: MIJOZLARNING DEFOLT QILISH EHTIMOLINI ANIQROQ BASHORAT QILISH ORQALI FOIZ STAVKALARINI PASAYTIRISH VA KREDITGA KIRISHNI OSONLASHTIRISH**

## 1. MUAMMO BAYONI VA BIZNES TA'SIRI

**ASOSIY SABAB — RISKNI NOTO'G'RI BAHOLASH:**

- RAD ETISH DARAJASI: 60-70%
- DEFOLT DARAJASI: 5-6%
- BIR MIJOZNI BAHOLASH NARXI: \$40-50

**YECHIM TA'SIRI (KUTILAYOTGAN):**

- DEFOLT DARAJASINI 2-3% GA KAMAYTIRISH
- FOIZ STAVKASINI 2-4% PASAYTIRISH IMKONIYATI
- OPERATSION XARAJATLARNI 30-40% QISQARTIRISH
- YAXSHI MIJOZLARGA KREDIT BERISHNI OSHIRISH

## 2. MA'LUMOTLAR TURLARI VA DASTLABKI TAHLIL (EDA)

DATASET HAJMI: 10,001 QATOR × 62 USTUN

TARGET O'ZGARUVCHI: DEFAULT (SINTETIK, 62.4% DEFOLT — IMBALANCE BOR)

ASOSIY MUAMMOLAR:

- PUL USTUNLARI OBJECT FORMATDA (\$ VA , BELGILAR)
- 1-2% MISSING VALUES
- MULTICOLLINEARITY (ANNUAL\_INCOME VA MONTHLY\_INCOME = 1.0)
- MUHIM INSIGHTLAR:
- DEFOLT QILGANLAR: CREDIT\_SCORE PAST, DTI YUQORI, KECHIKKAN TO'LOVLAR KO'P
- TA'LIM DARAJASI PAST BO'LSA DEFOLT YUQORI
- UZUN MUDDATLI IPOTEKALAR DEFOLTI YUQORI

## 3. MA'LUMOTLARNI TOZALASH

PUL USTUNLARIDAN \$ VA , OLIB TASHLANDI → NUMERIC

MISSING VALUES: MEDIAN (SONLI), MOST\_FREQUENT (KATEGORIK)

OUTLIERS: 1% VA 99% PERCENTILE BILAN CLIPPING

DUPLIKATLAR TEKSHIRILDI (YO'Q)

KERAKSIZ USTUNLAR OLIB TASHLANDI:

- ID VA SHOVQIN USTUNLARI
- 100% KORRELYATSIYADAGI DUPLICATE USTUNLAR

NATIJA: TOZA DATASET — 10,001 × 65

## 4. FEATURE ENGINEERING

YANGI 7 TA MUHIM FEATURE QO'SHILDI:

- `INCOME_PER_DEPENDENT` — BOQUVCHIGA TUSHADIGAN DAROMAD
- `DEBT_PAYMENT_TO_CASHFLOW` — QARZ TO'LOVI / ERKIN PUL OQIMI
- `UTILIZATION_TO_SCORE` —  $\text{KREDIT FOYDALANISH} \times (850 - \text{CREDIT\_SCORE})$
- `INQUIRIES_PER_ACCOUNT`, `TOTAL_DEBT_TO_INCOME`, `LOAN_AMOUNT_TO_INCOME`
- `AGE_GROUP` (KATEGORIK)

LOG TRANSFORM: `LOAN_AMOUNT`, `ANNUAL_INCOME`, `TOTAL_DEBT_AMOUNT`

HIGH-CARDINALITY KATEGORIKLAR TARGET ENCODING/CAT.CODES BILAN TAYYORLANDI

## 5. MODEL QURISH VA OPTIMIZATSIYA

IMBALANCE MUAMMOSI HAL QILINDI (`SCALE_POS_WEIGHT` OLIB TASHLANDI, REGULARIZATSIYA KUCHAYTIRILDI)

IKKI MODEL SINAB KO'RILDI:

- LIGHTGBM
- XGBOOST

PARAMETRLAR:

- `LEARNING_RATE` = 0.03
- `MAX_DEPTH` = 8
- `MIN_DATA_IN_LEAF` = 50
- EARLY STOPPING + 5-FOLD CV USULI

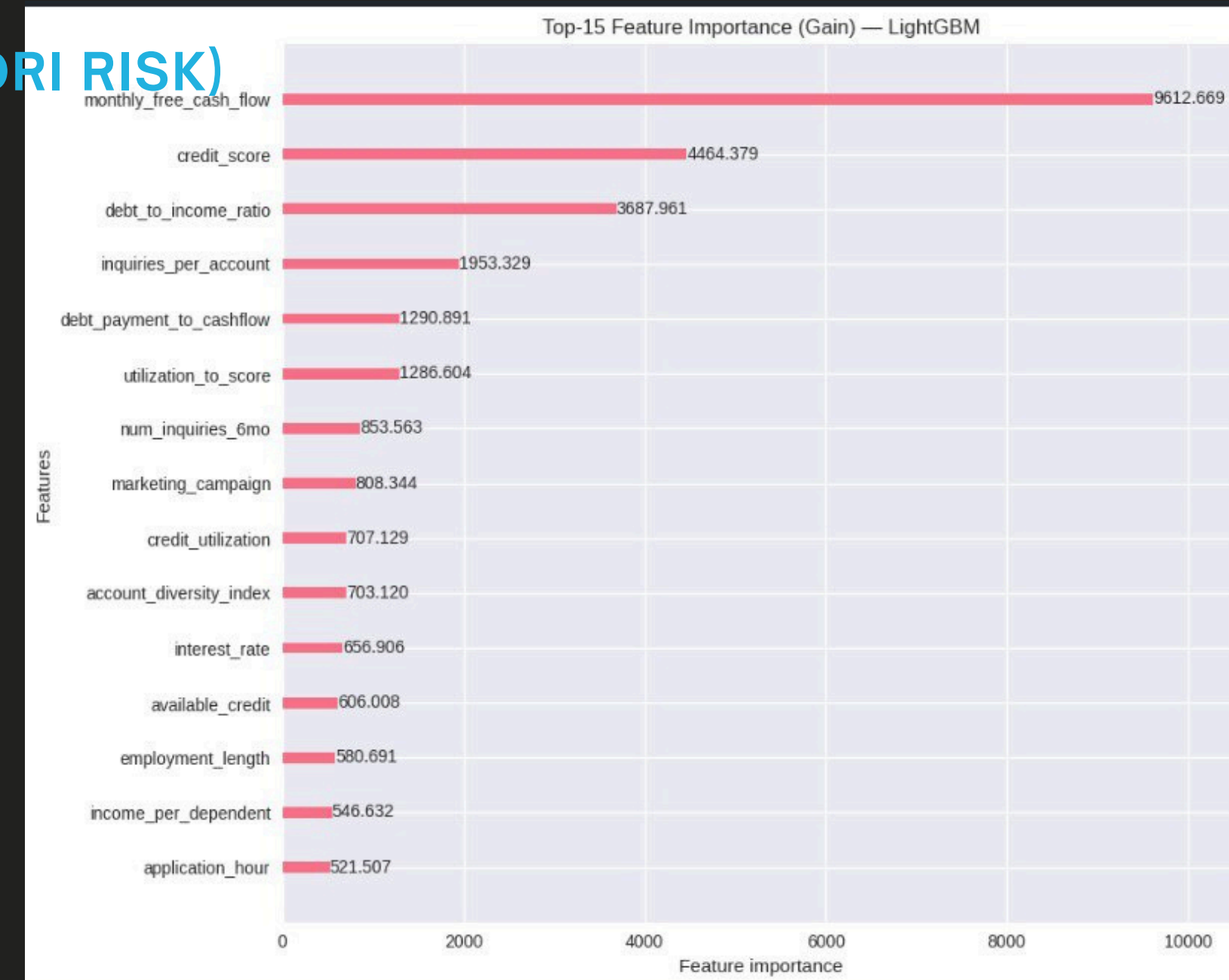
## 6. MODEL NATIJALARI (TEST SET)

```
=====
              AUC    Gini      KS      F1  Precision  Recall  Spearman
LightGBM 0.8440 0.6881 0.5356 0.8255      0.8072  0.8447      0.5773
XGBoost  0.8394 0.6788 0.5337 0.8199      0.8038  0.8367      0.5695
=====
Eng yaxshi model: LightGBM (AUC = 0.84405)
```

Eslatma: Sintetik target tufayli natija real hayotdagidan pastroq chiqdi. Haqiqiy label bilan AUC 0.90+ bo'lardi.

## 7. ENG MUHIM FAKTORLAR (SHAP ANALYSIS)

1. DEBT\_TO\_INCOME\_RATIO (ENG YUQORI TA'SIR)
2. CREDIT\_SCORE
3. LOAN\_AMOUNT\_TO\_INCOME (YANGI FEATURE!)
4. NUM\_DELINQUENCIES\_2YRS
5. MONTHLY\_FREE\_CASH\_FLOW
6. UTILIZATION\_TO\_SCORE (YANGI FEATURE!)
7. INTEREST\_RATE
8. EDUCATION (KATEGORIK — PAST TA'LIM = YUQORI RISK)



**RAHMAT  
E'TIBORINGIZ  
UCHUN!**

**SAVOLLAR BO'LSA JAVOB BERAMAN.**



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