

GENERAL DEPARTMENT OF TAXATION OF MONGOLIA

# DIGITALIZATION OF GOVERNMENT OPERATIONS

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# DATA ANALYSIS STRATEGY 2020-2022 APPROVED AND IMPLEMENTED





#### МОНГОЛЫН ТАТВАРЫН АЛБА

# **CONDITIONS and OPPORTUNITIES** are being to use Big Data in the Tax administration









## **TABLEAU – INTERGRATED DASHBOARD**





## **KNIME – MACHINE LEARNING**



Risk scoring model: **14 scoring workflows,** Average operating time of a flow : ~ **5- 10 minutes** 





МОНГОЛЫН ТАТВАРЫН АЛБА

#### FORECASTING TAX FILINGS BY ECONOMIC SECTOR

# **KNIME – MACHINE LEARNING**

Data base

ase

TAX

Algorithm

Risk report

Taxpayer's economic sector. Taxpayer's segment. Gross domestic product Percentage of Hidden economy CIT filings.

- Sales revenue
- Expenses
- Taxable income
- Taxes imposed



Outlier deetection



- Салбар, сегментийн дундаж тооцох
- Linear Regression
- Decision Tree Regression
- Simple Gradent Boost Regression

#### Assess risk in discrepancies, and evaluation



Estimate sales revenue and expenses using a point forecast





# Criteria for risk scoring

Concealed the income and increases the expenses (Low-income High expenses)

- Increased expenses by more than or equal to income (Revenues and expenditures are high, concealing income)
- The forecast difference in point forecast is lower than the average of the economic sector and segment of the enterprise

|          | Income differences  |                            |                                 | Expense differences    |                             |                                  |         | Text messages, emails<br>/1462 taxpayers/                   |
|----------|---------------------|----------------------------|---------------------------------|------------------------|-----------------------------|----------------------------------|---------|---|
| Segments | Number of taxpayers | Total income<br>difference | Average<br>income<br>difference | Number of<br>Taxpayers | Total expense<br>difference | Average<br>expense<br>difference | Amendec | Amended filings /152 taxpayers/                             |
| Micro    | 1835                | 39,099.0                   | 21.3                            | 1138                   | 143,797.7                   | 126.4                            |         | []<br>[   |
| Small    | 714                 | 191,799.0                  | 268.6                           | 439                    | 774,114.2                   | 1,763.4                          |         | Revenue increased /55 taxpayers<br>148.0 billion MNT/       |
| Medium   | 21                  | 5,296.4                    | 252.2                           | 9                      | 115,796.1                   | 12,866.2                         |         |   |
| Lage     | 10                  | 6,330.9                    | 633.1                           | 4                      | 90,615.8                    | 22,653.9                         |         | Expenses decreased /79 taxpayers 48<br>billion MNT /        |
| нийт     | 2,580               | 242,525.4                  | 1,175.2                         | 1,590                  | 1,124,323.7                 | 37,409.9                         |         |   |
|          |                     |                            |                                 |                        |                             |                                  |         | Assessed tax increased /29 taxpayers<br>194.6 billion MNT / |













### TAX AUDIT MODEL (AVERAGE)

## **KNIME – MACHINE LEARNING**



# Analysis of 200 thousand customers and related people





**Related parties** 

# **NEO4J – RELATED PARTIES**



#### Version 2.0 "NEO4J"







# THANK YOU FOR YOUR ATTENTION