Data-Driven Technologies in Directorate General of Treasury

The Implementation of Data Science in the Directorate General of Treasury

Directorate General of Treasury
Belgrade, June 2024

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MINISTRY OF FINANCE
REPUBLIC OF INDONESIA

Current Public Finance and Treasury Function

INDONESIAN PUBLIC FINANCE

FISCAL

MONETARY

Bank of Indonesia

CENTRAL GOVERNMENT

- MoF as Chief Financial Officer (CFO)
- Minister as Chief Operational Officer (COO)

LOCAL GOVERNMENT

- Governor (Province)
- Mayor (City)
- Regent (Regency)

Treasury Function

Minister of Finance as State General Treasurer

MINISTRY OF FINANCE
REPUBLIC OF INDONESIA

Fiscal Management

Minister of Finance as Fiscal Manager

Budgeting	Tax	Custom	Fiscal Transfer	Fiscal Policy
DG Budget	DG Tax	DG Custom	DG Fiscal Transfer	Fiscal Policy Agency

DG Treasury

Public Exp Mgt	Cash Management	Accounting & Reporting	IFMIS	Govt Financial Statistic	Investment Mgt.
• Setting policies and guidelines for the implementation of the state budget; • Approving budget implementation documents; • Controlling the implementation of the state budget	• Arranging and managing funds necessary for the implementation of the state budget • Appointing banks and/or other financial institutions for the implementation of state budget receipts and disbursements • Safeguarding state funds; • Placing state funds	• Establishing accounting systems and financial reporting for the state • Presenting state financial information	Establishing systems for the receipt and disbursement of state funds	• Proposing government regulations on government accounting standards • Consolidated central government, local government and public institution financial report.	• Managing/investing state fund.

DG Asset

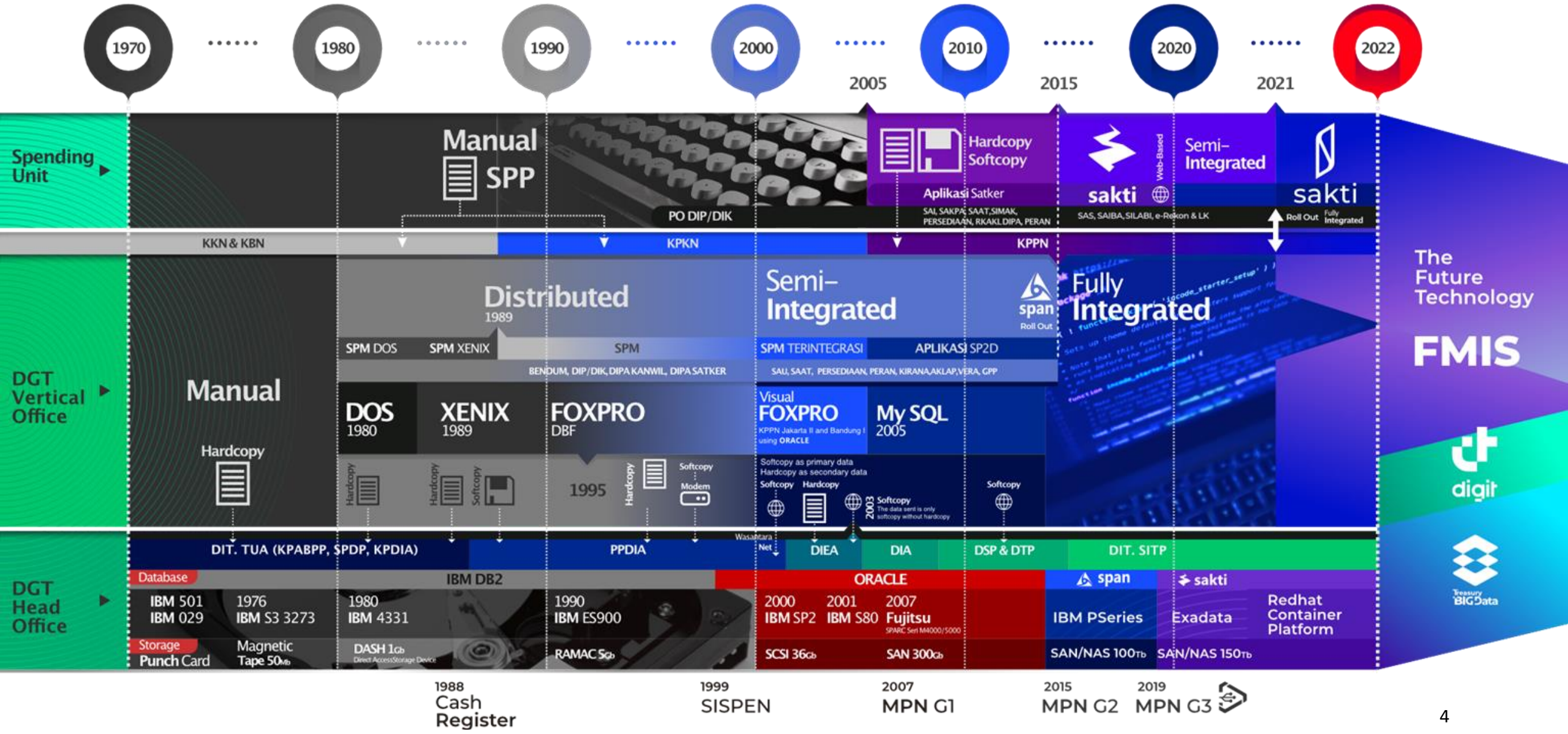
Strategic Asset Mgt
• Establishing policies and guidelines for the management and disposal of state property • Conducting state receivables collection

DG Debt

Debt Management
• Obtaining loans and providing guarantees on behalf of the government; • Providing loans on behalf of the government • managing state debts

All eight functions of the Treasury in Indonesia are under the purview of the Ministry of Finance

DG Treasury ***IT Evolution***



Two Sides of ***Indonesia PFM's Coin***

General State Treasurer
(Treasury Office)

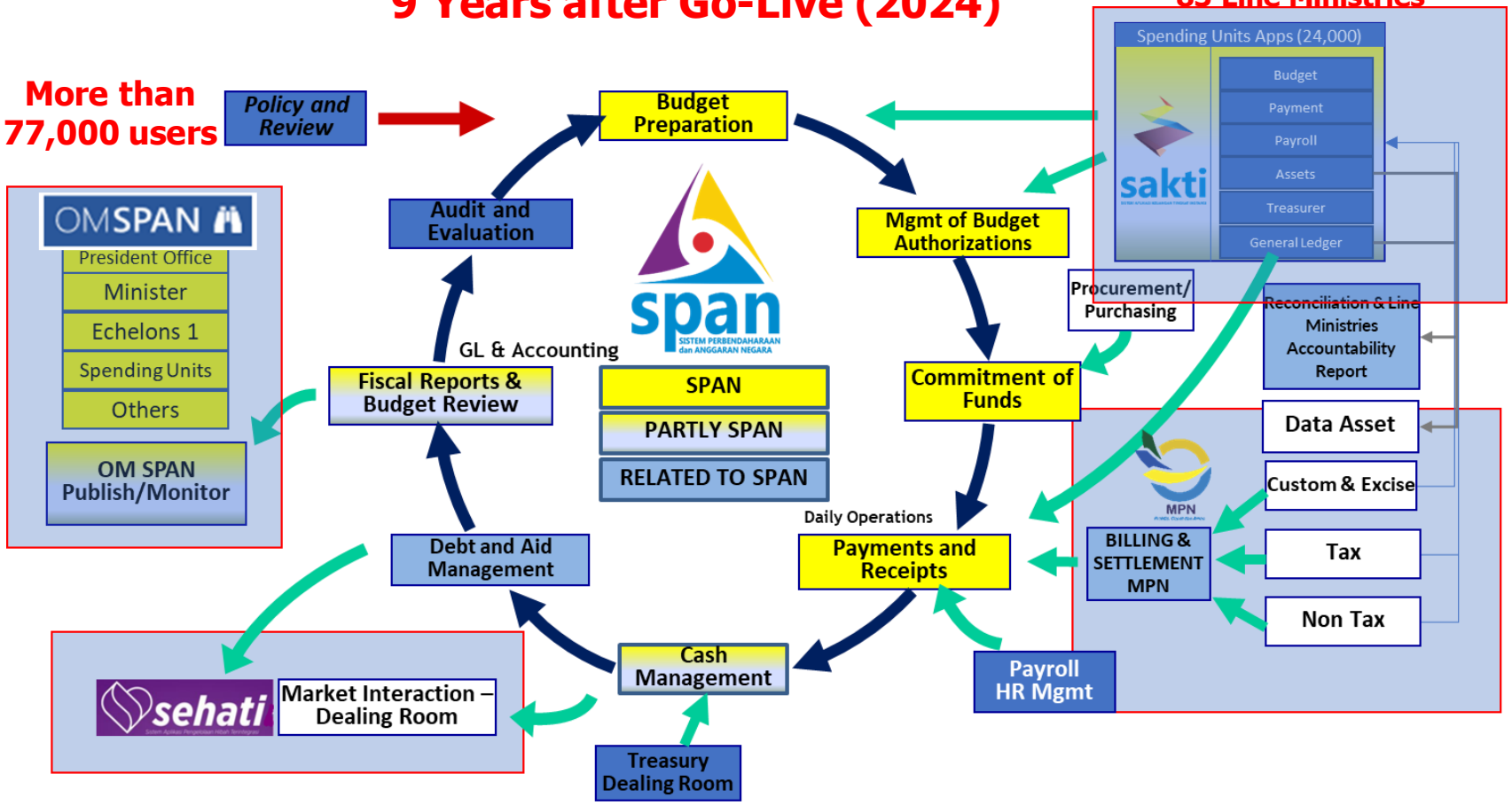
Budget Users
(Spending Units)

FMIS in Indonesia: SPAN and Surrounding Systems

9 Years after Go-Live (2024)

More than 77,000 users

24,000 Spending Units
83 Line Ministries



DG Treasury			DG Budget
8 Directorates	33 Regional Offices	182 Local Treasury Offices	8 Directorates

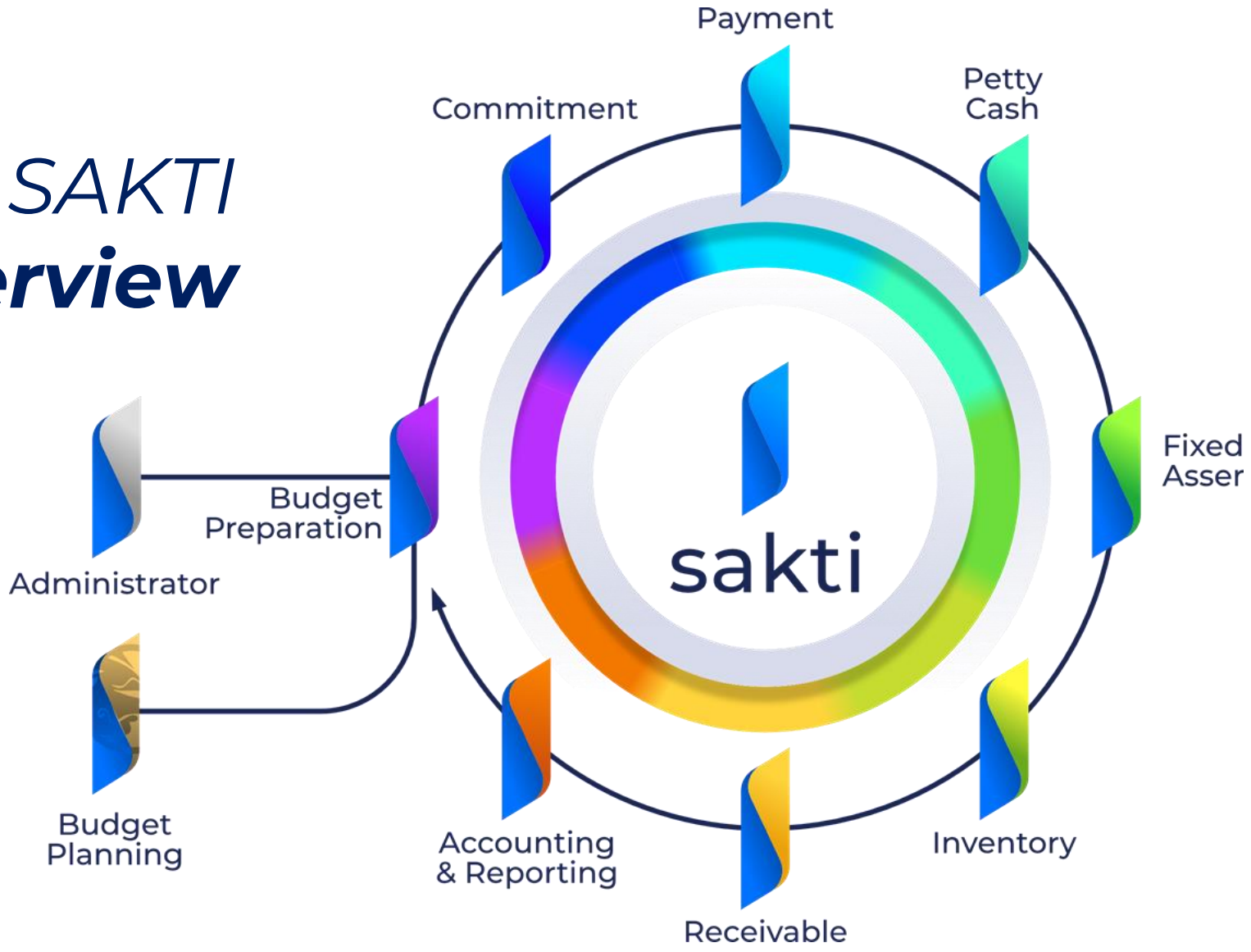
SPAN Core Application

SPAN is a COTS-based software use by MoF for budget and treasury functions

The systems surrounding SPAN Core Application include:

- **SAKTI**, an application developed by MoF being used by LMs and Spending Units to perform financial management (Budgeting, Disbursement as well as Reporting)
- All data entered into SPAN under the criteria of CoA is shared across sub-modules within SPAN as a mean of sequential/partial validation and integration
- Both SPAN and SAKTI use the same CoA and data structure to support interconnection
- **OM SPAN** is a monitoring application accessed by LMs and Spending Units to monitor disbursements and transfer of funds to local governments

SAKTI
Overview



INTEGRATED
Process

Horizontal

Vertical

MASSIVE
User

>240k users of >19k Spending Units across Indonesia and 130 Countries

MODERN
Technology

- Automated
- Real time
- Online
- Multiplatform
- Interoperable
- Secure

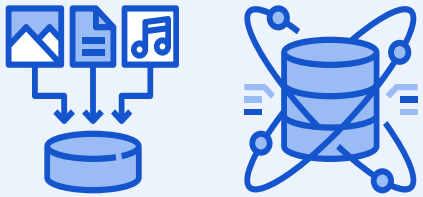
Introduction

Background

Within the context of the Directorate General of Treasury, Data Science and Artificial Intelligence are being leveraged to improve financial management, decision-making, and operational efficiency within the organization.

The implementation of data science using advanced analytics techniques to analyze financial data, identify patterns, forecast trends, optimize processes, and make data-driven decisions.

Structure



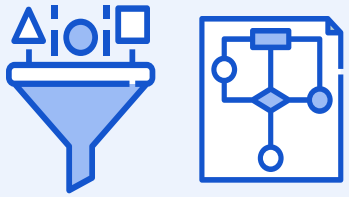
Data Source

INTERNAL

- SPAN
- SAKTI
- DIGIT
- Data Survey Region Office/KPPN
- Other Internal Data

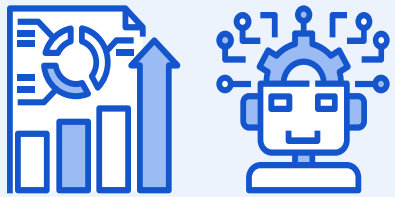
EKSTERNAL

- Statistical Bureau
- Bloomberg Data
- Other Source



Data Process

- Data Collection
- Data Validation
- Data Cleansing
- Data Aggregation
- Data Transforming



Output

- Visualization Dashboard
- Open Data
- Facility to Download Data (Transaction and/or Agregation)
- Artificial Intelligence For Decision Making

Case Development Approach

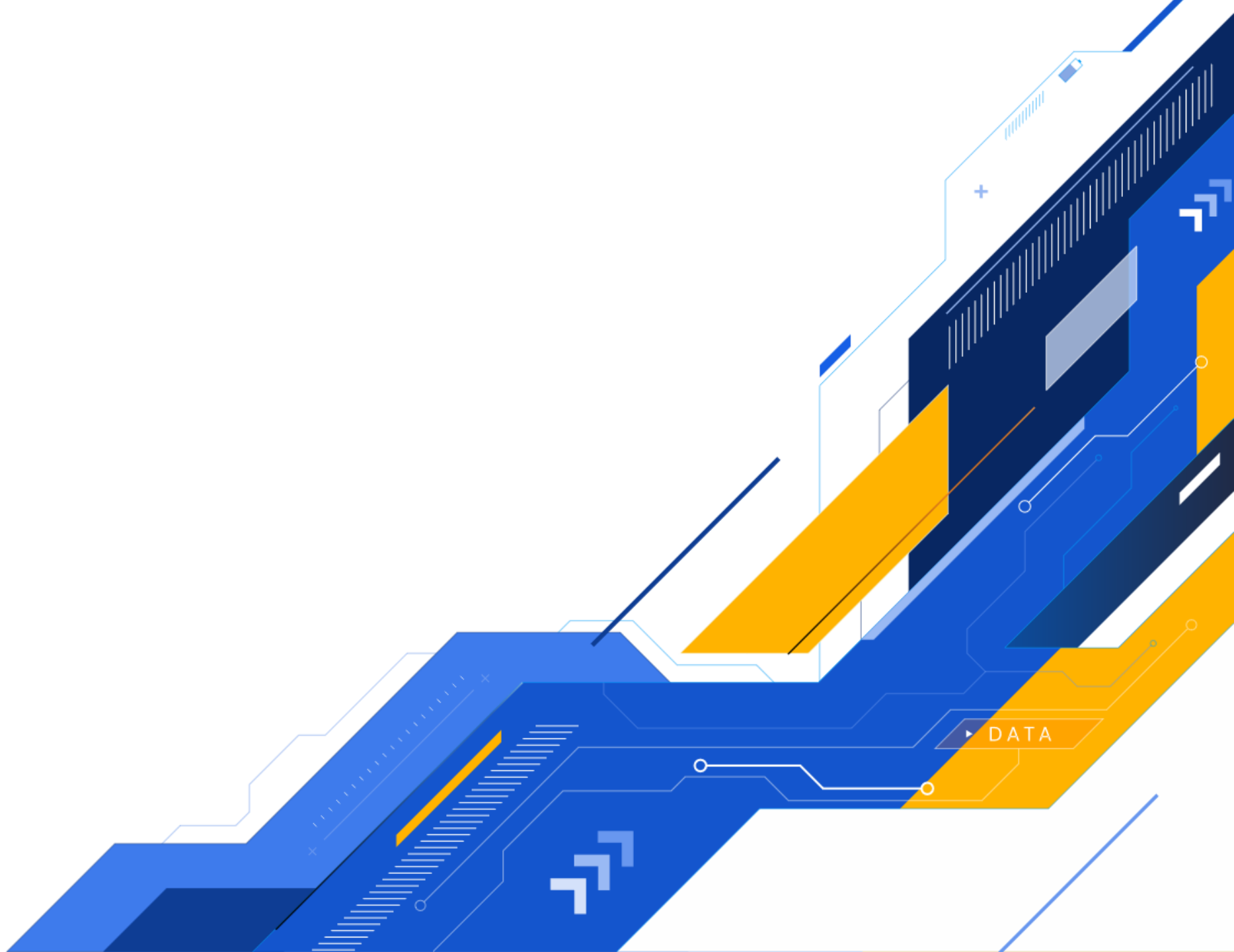
Use Case ?

1. Request from business process owners;
2. Benchmarking from other Countries/ Agencies;
3. Obtained from data analytics competitions;
4. Workshop/ Focus Group Discussions.

Data Analytics Competitions

This Data Analytics Competition is aimed at adapting the skill sets possessed by the DG of Treasury Regional Office (Kanwil DJPb)/State Treasury Services Office (KPPN) employees to be able to complete several new tasks assigned to them.

Projects



Treasury Big Data (Products)

Open Data

Download | Upload | Request

Dynamic Dashboard

Descriptive, Predictive, and Prescriptive Analytics.

Artificial Intelligence

Natural Language Processing;

Digital Assistance (BOT);

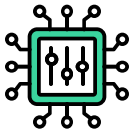
Detection and Recognition.

Data Analytics

Government Expenditure;

Cash Management;

Government Invesment.



Machine Learning

Revenue Trajectory;

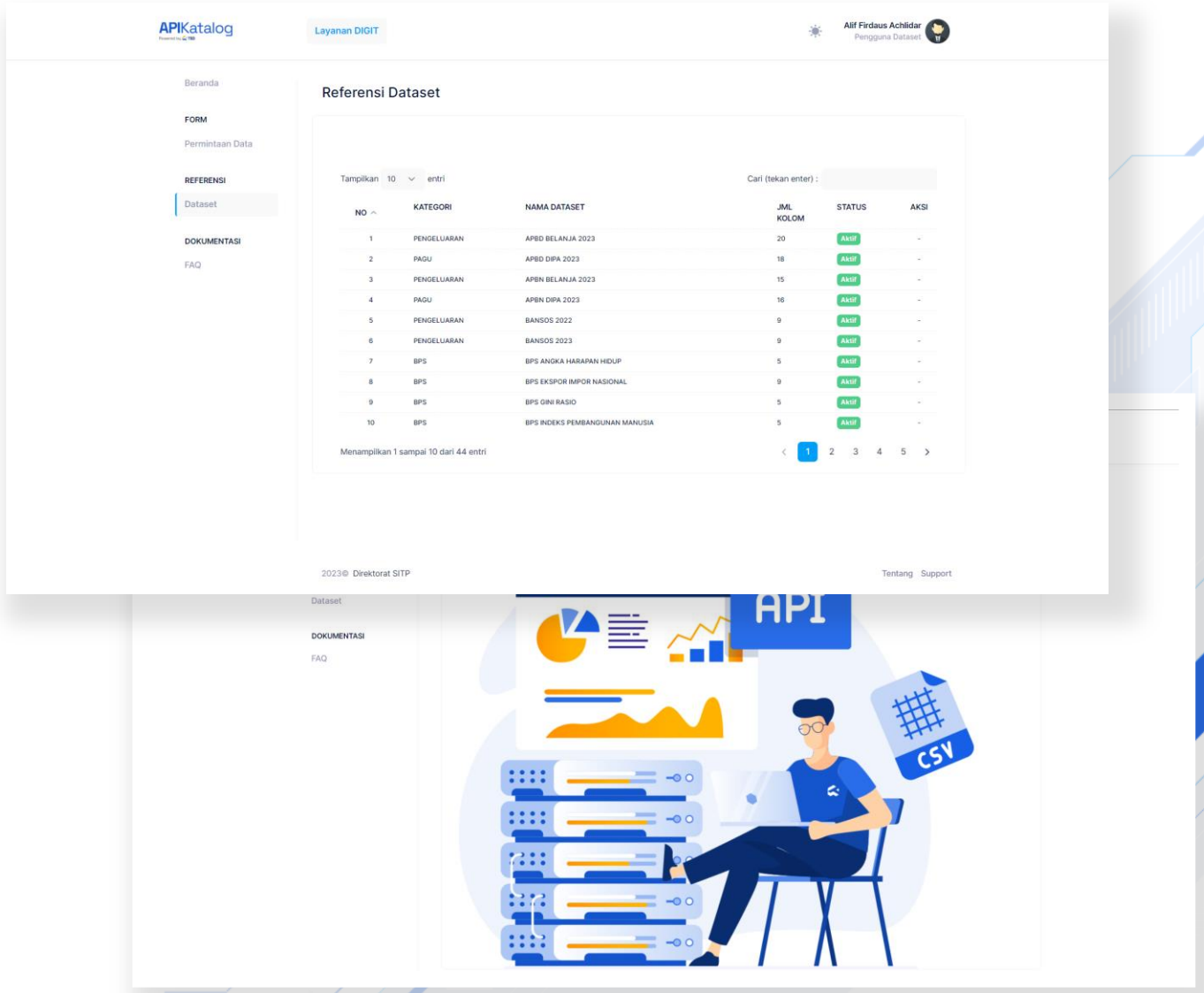
Optimum Cash Buffer (on progress);

Data Labelling on Payments (on progress).

Open Data

Development Background

1. Data needs by stakeholders (Kanwil DJPb & KPPN)
2. The role of Kanwil DJPb as Regional Chief Economist and Financial Advisor
3. Data is scattered from various sources (OM SPAN, MONSAKTI, BPS, Simtrada/SIKD, SIKRI, BI, Regional Government, SIKP, MPN, etc.)
4. Routine data requirements (weekly/monthly), short data preparation time
5. The need for data access both via the internet and intranet



Open Data

Concept

1. Programming interface for data sharing that uses data on Treasury Big Data.
2. Users can choose the required data themselves.
3. The output can be an API link or a CSV/XLS file.
4. Data can be streamed to the system or humans.
5. Can be accessed via the internet or intranet.

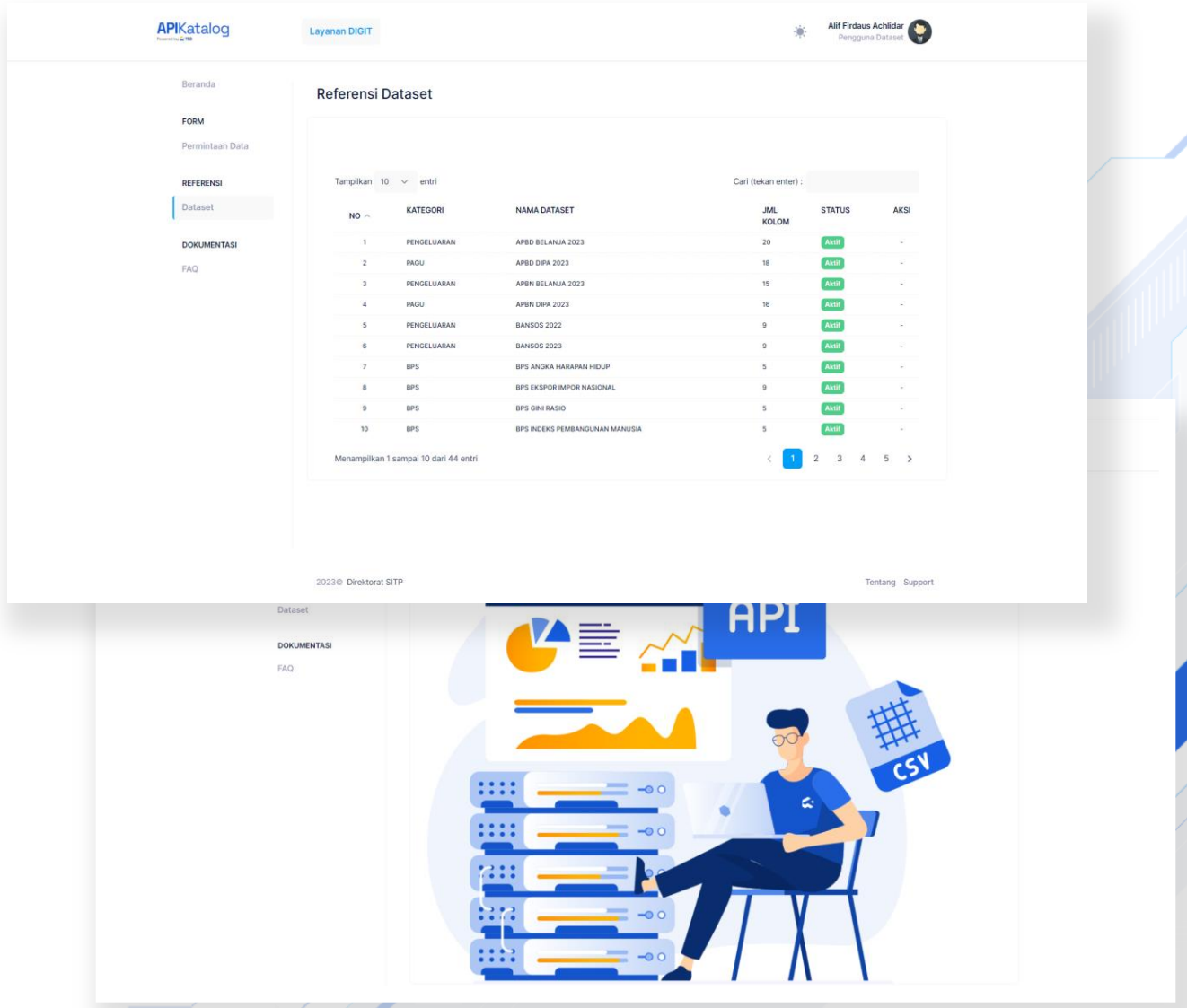
Benefit

Supporting data needs quickly and independently for both internal Ministry of Finance (KPPN, Kanwil DJPb, other Directorates, and Echelon 1) and external to the Ministry of Finance.*

*Adapts to Ministry of Finance regulations

Features

Download Data **Upload Data** **Request Data**



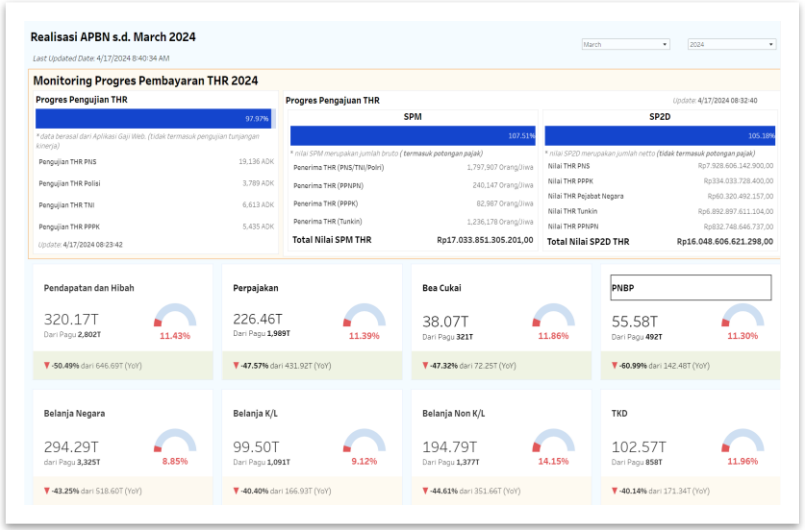
Dynamic Dashboard

Description

Dynamic dashboard used by leaders to monitor the latest business process developments and used by leaders for decision-making.

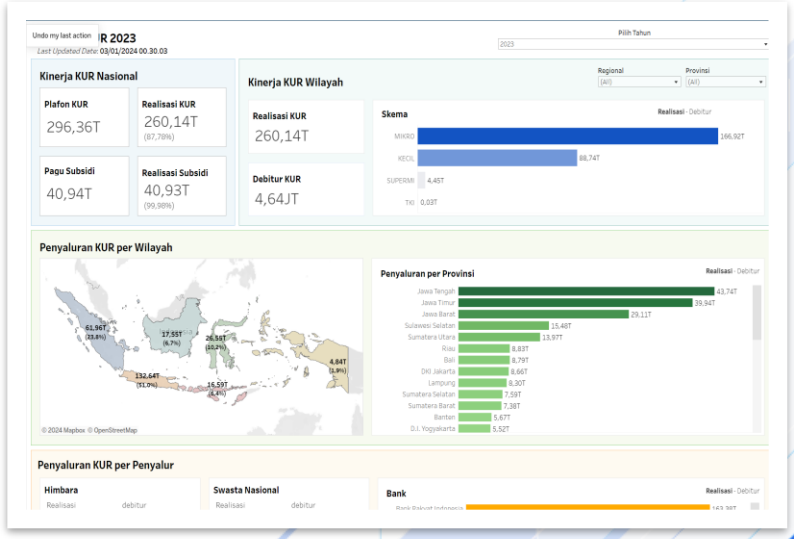
Objectives

The objectives of this dynamic dashboard are to help leaders monitor business process activities and help leaders make more accurate decisions



Leadership Dashboard - APBN realization

Dashboard used by the Director General of Treasury to monitor the realization that has occurred in the year concerned



Government Subsidy

Dashboard used by leaders at the Directorate General of Treasury to see the realization of Government subsidies distribution in the current year on a national and regional scale.

Artificial Intelligence

Development Background

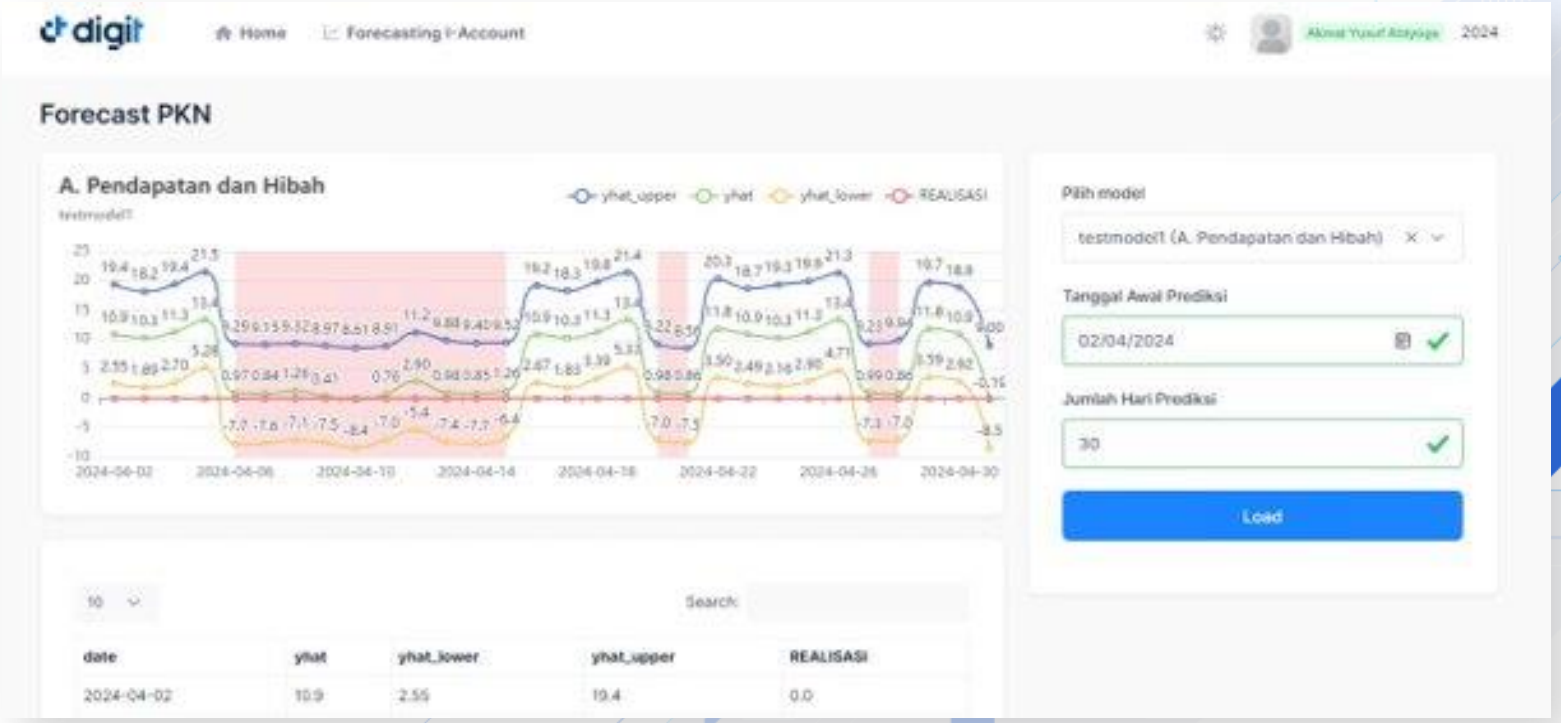
The Ministry of Finance is facing challenges in managing government cash due to the complexity of its duties and the abundance of financial data. With manual analysis becoming more difficult, decision-making is impacted, and it's leading to increased uncertainty and risk. Timely and accurate decisions are vital for financial stability and efficient public services, considering economic changes and political dynamics.

Description

A simulation system that can produce projections of APBN realization based on predetermined scenarios. This includes projections of income, expenditure and other main items in the APBN

Objective

Implementing an IT-based treasury system for APBN simulation, facilitating rapid financial data processing and strategic decision support to maximize government cash management efficiency.



Data Analytics

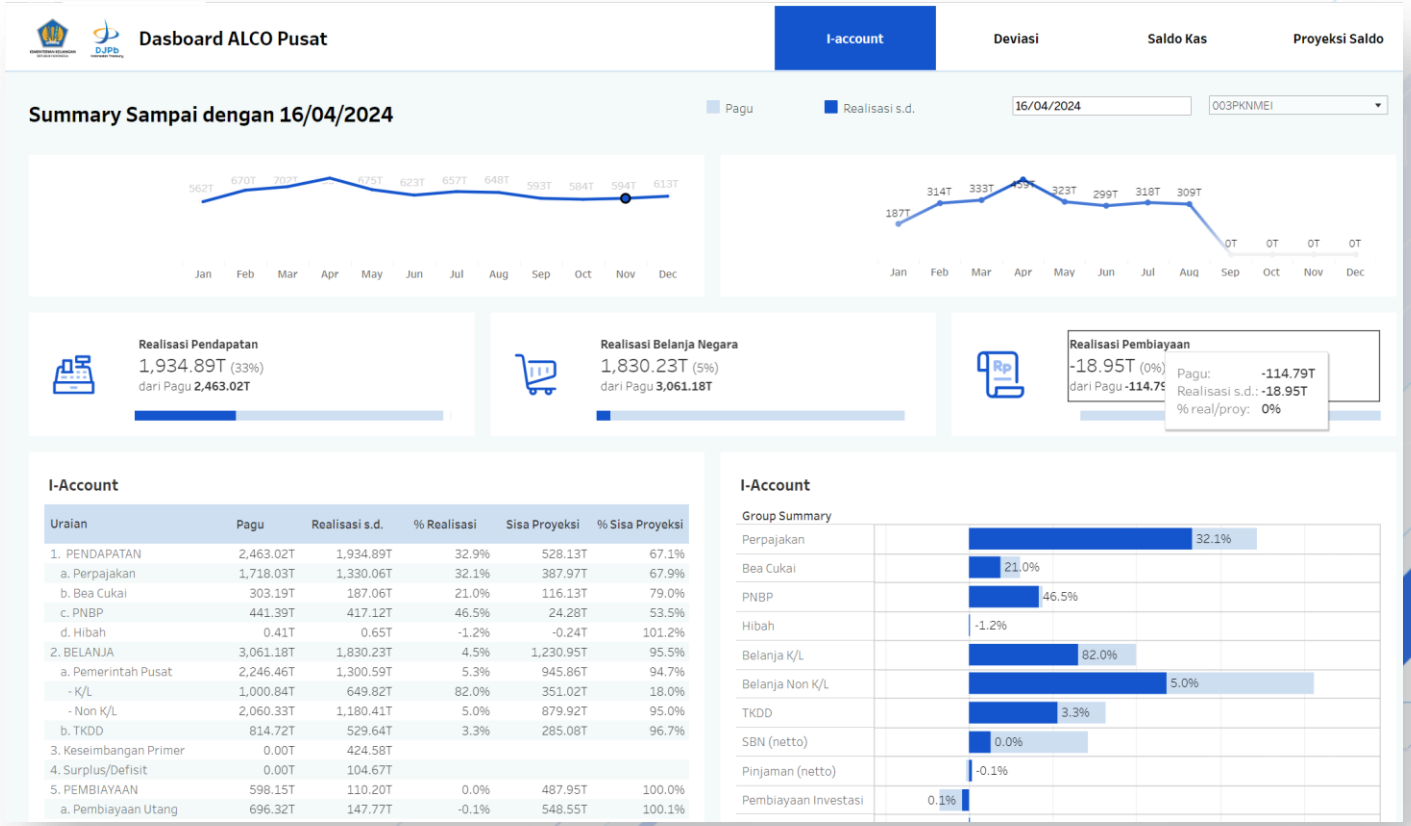
Asset Liability Committee's Dashboard

Development Background

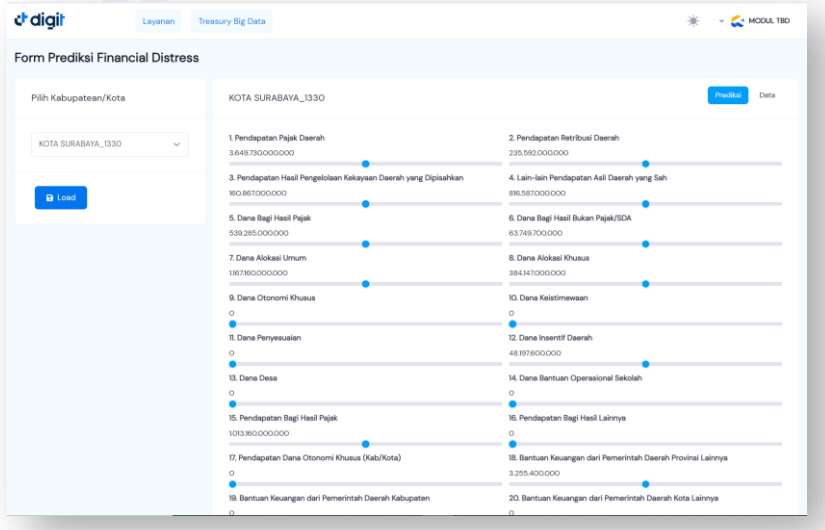
1. Data presentation is still static and does not answer decision-making needs.
2. Preparation of reports to support decision-making is still manual (using Microsoft Excel)
3. There are no projections yet prepared using a Machine Learning (ML) approach

Objective

Providing devices (systems) that provide flexibility in presenting actual and projected data and producing projections using a Machine Learning approach so that they are able to provide input in decision making

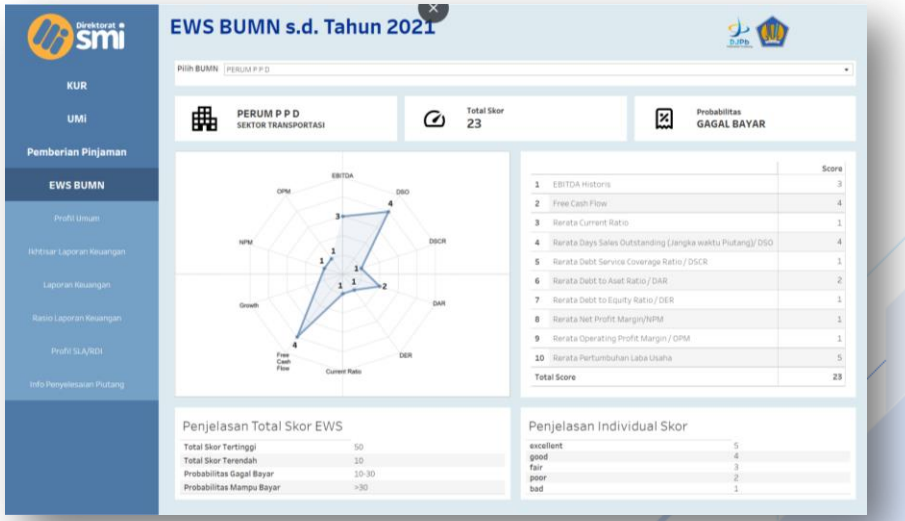


Machine Learning



Financial Distress Pemda

Using machine learning as a risk mitigation effort in predicting debtor (local government) failure to pay. The user selects the name of the Province/City and then adjusts the existing financial components so that the user can predict whether the debt can be paid or not

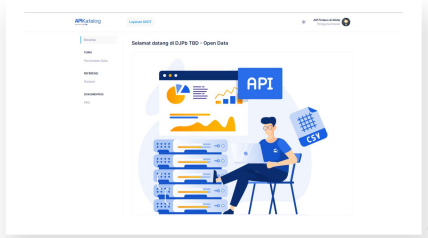


Early Warning System For State-Owned Enterprise

Platform to determine the payment capacity of state-owned enterprises as a step to prevent payment failures of state-owned enterprises.

Future Works

Integrated Platforms



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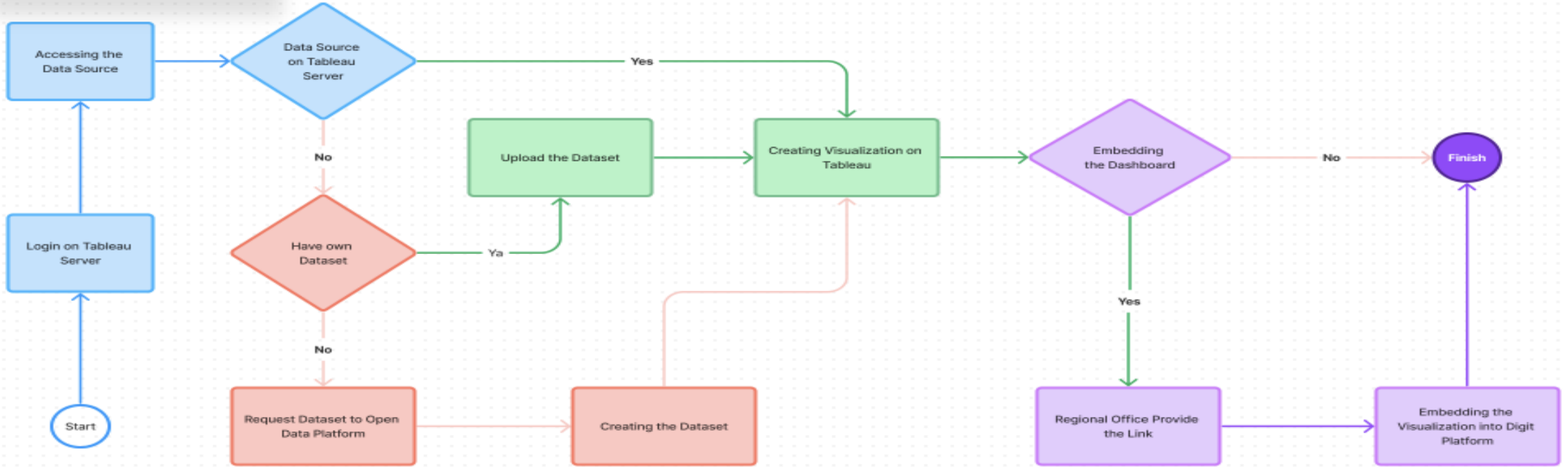
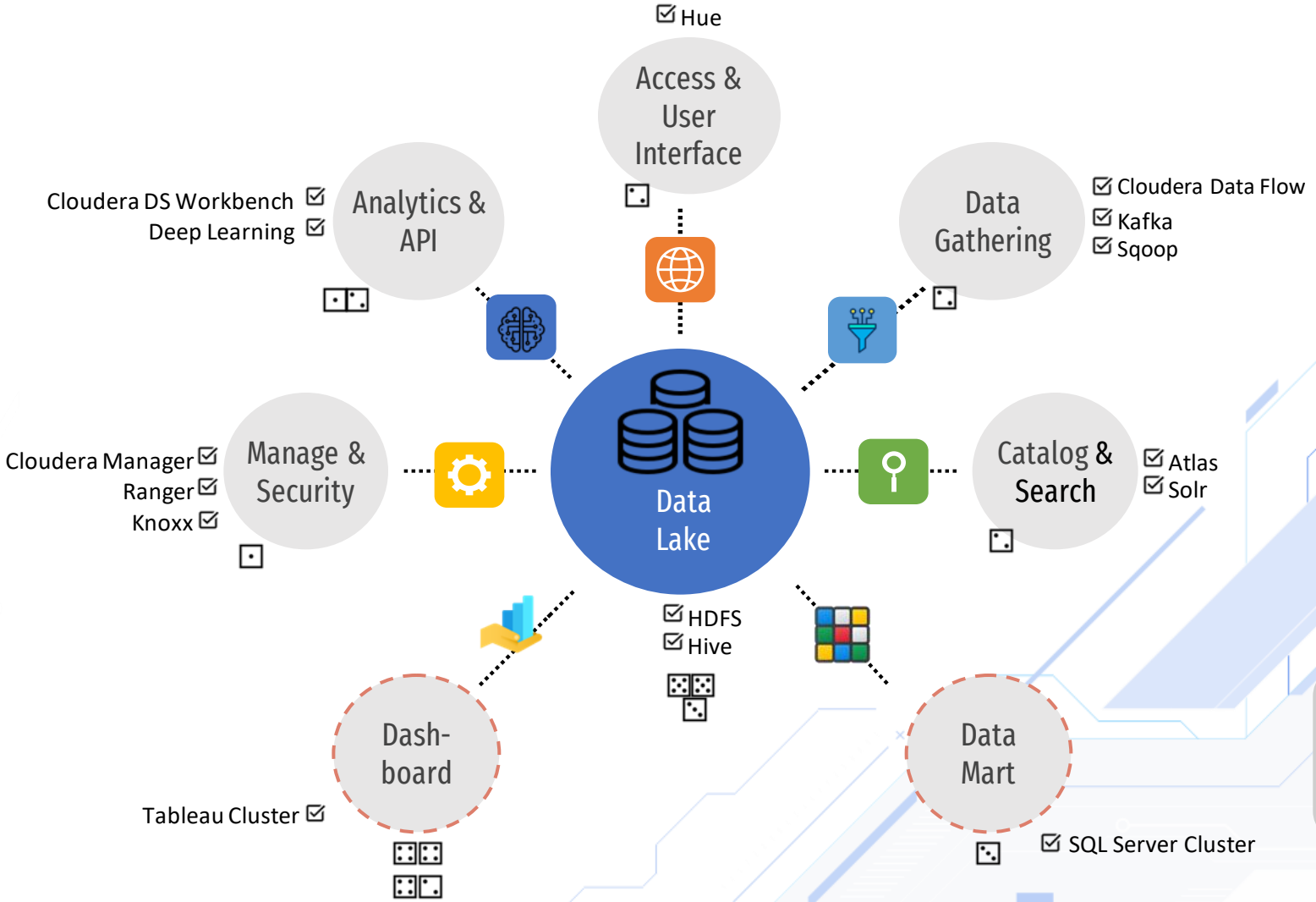


Developing an integrated platform that will be used by the Regional Office of the Directorate General of Treasury (Kanwil DJPb) and the State Treasury Services Office (KPPN).

Enhancing Treasury Big Data Environment for the Next Data Science Projects



THANK YOU

DJPb
Indonesian Treasury

KEMENKEU MELAYANI LEBIH BAIK