

# Data Ecosystem in Government

Toward the establishment of a Government Data Hub

# Background



- Many systems have been built over the years since the early 2,000's (NICI-I → SRMP);
- Public institutions produce and collect significant quantities of data and information;



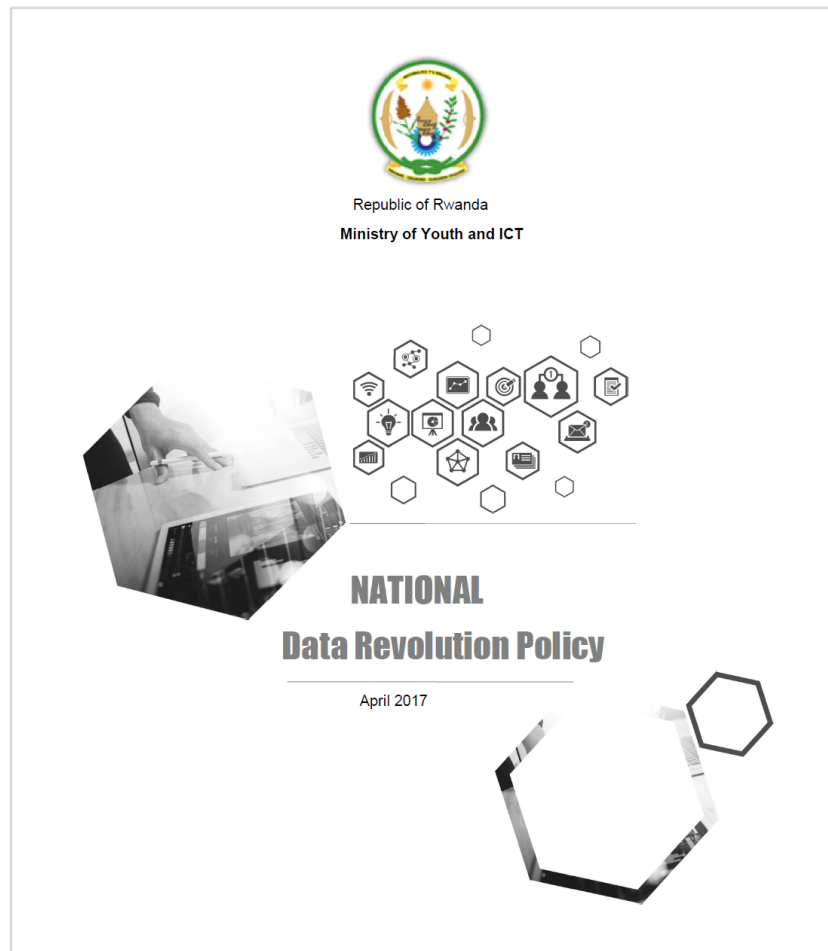
- Data is buried in legacy systems, locked in vendor applications, and scattered in different formats and technologies.
- By encouraging the use, reuse and free distribution of datasets, governments promote innovative, citizen-centric services, accountability, transparency, better policy making and new business models

# Sample Large Registries



| Sectors                         | Systems  |
|---------------------------------|--|
| Identification & E-Gov          | National Population Registry, CRVS, Irembo                       |
| Tax                             | Vehicle Registration, Customs, Company Registration, Revenue Tax |
| Land Management                 | LAIS   |
| Public Finance & Administration | IFMS, e-Procurement, IPPS  |
| Social Protection               | Health Insurance, Pension Fund Management, Ubudehe               |
| Agriculture                     | Smart Nkunganire, E-Soko, ALIS,                                  |
| Education                       | Rwanda Education Management Information Systems                  |
| Infrastructure & Transport      | Water & Electricity Registry Systems                             |
| Justice                         | IECMS, Smart NPPA, Gacaca Records                                |
| Bank and Finance                | Mobile Payment, Banks, Insurance, MFIs, Umurenge Sacco, CRB      |
| Environment                     | Weather Registry   |
| Health                          | EHMIS, ELMIS, EMR (Hospitals, Health Centers, Health Posts, CHW) |
| Telecom                         | MTN, Airtel, ISPs  |

# Data Revolution Policy



- ✓ Establishing standards & principles for data management;
- ✓ Establishing a framework to develop human capital in data sciences;
- ✓ Defining the framework for data creation-anonymization-release;
- ✓ Conducting big data analytics and business intelligence;
- ✓ Fostering data enabled technology innovations;
- ✓ Establishing data institutional governance framework;
- ✓ Addressing concerns of security-privacy and data sovereignty;
- ✓ Defining the role of private sector and partnerships;
- ✓ Establishing a data portal warehouse and developing back-end MISs among others.

# Key Milestones

1

## Government Command Center (GCC)

- Dashboards to track the indicators and projects of their ministries
- Focus on NST-1, 250+ KPIs
- Spend management
- Majority of KPIs data entered manually (Excel Uploads)

2

## Government Business Intelligence System (GBIS)

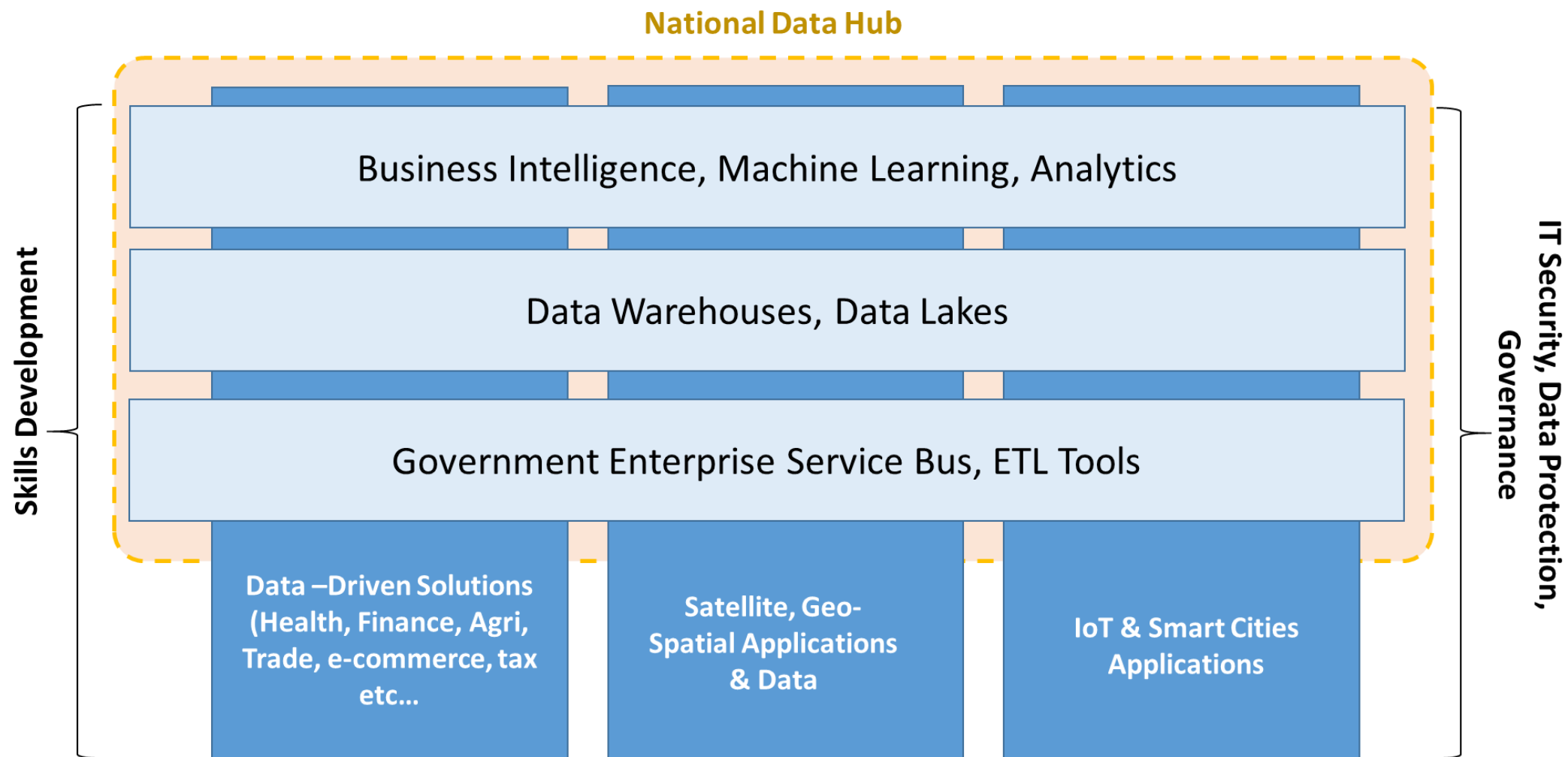
- Enhancement of GCC, modern dynamic and flexible platform based on ELK Stack
- Support both manual and automated data feed
- Beyond NST1 (More use cases are added easily)

3

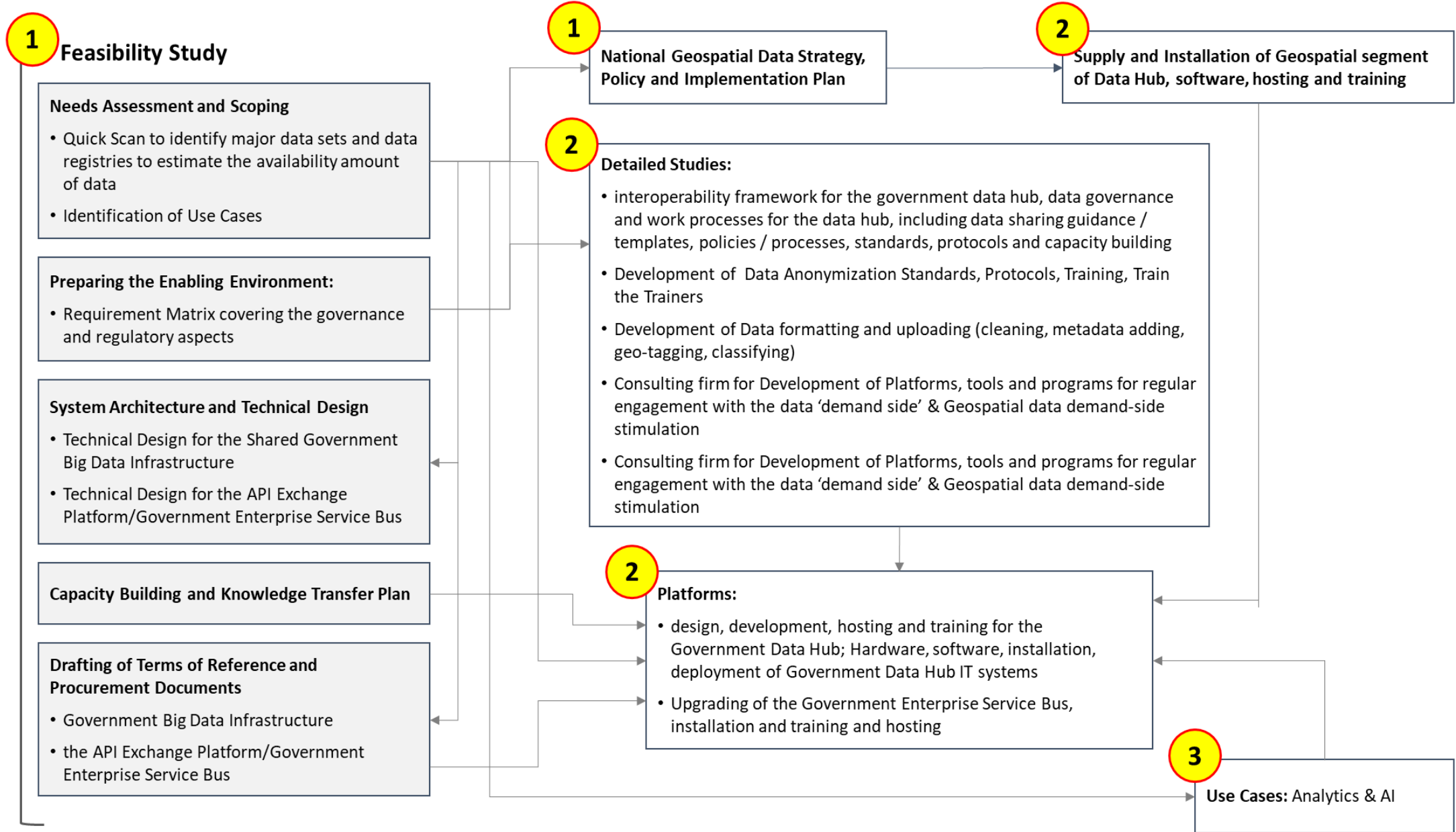
## Government Data Hub

- Unites all information sources under a single umbrella.
- Data sharing frameworks, platforms, infrastructure and enhanced big data analytics capabilities
- Enable data producers and data consumers to exchange data freely, reliably, securely and at scale

# Data Hub – Illustrative Architecture

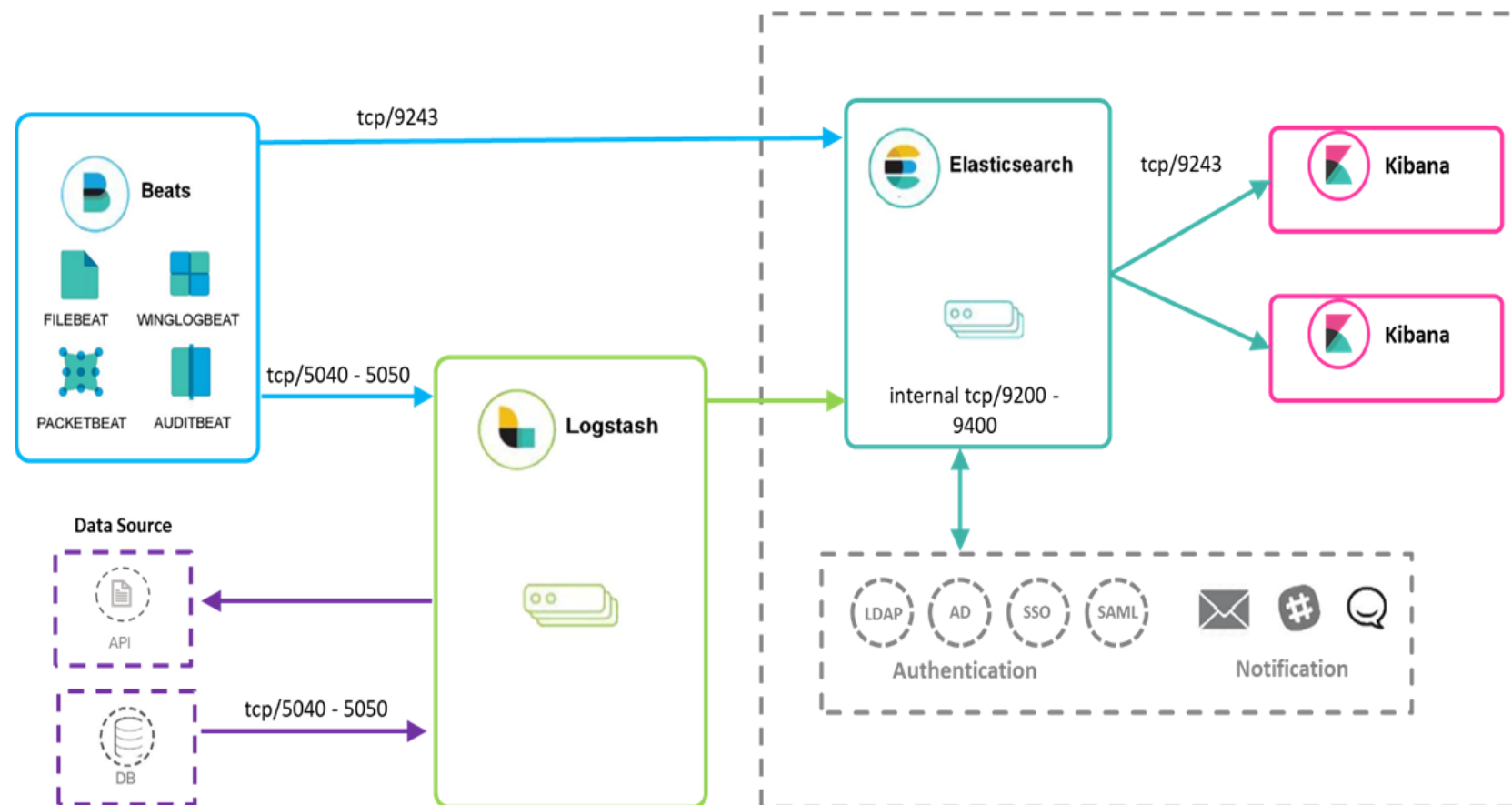


# Data Hub – Implementation Approach (RDAP)



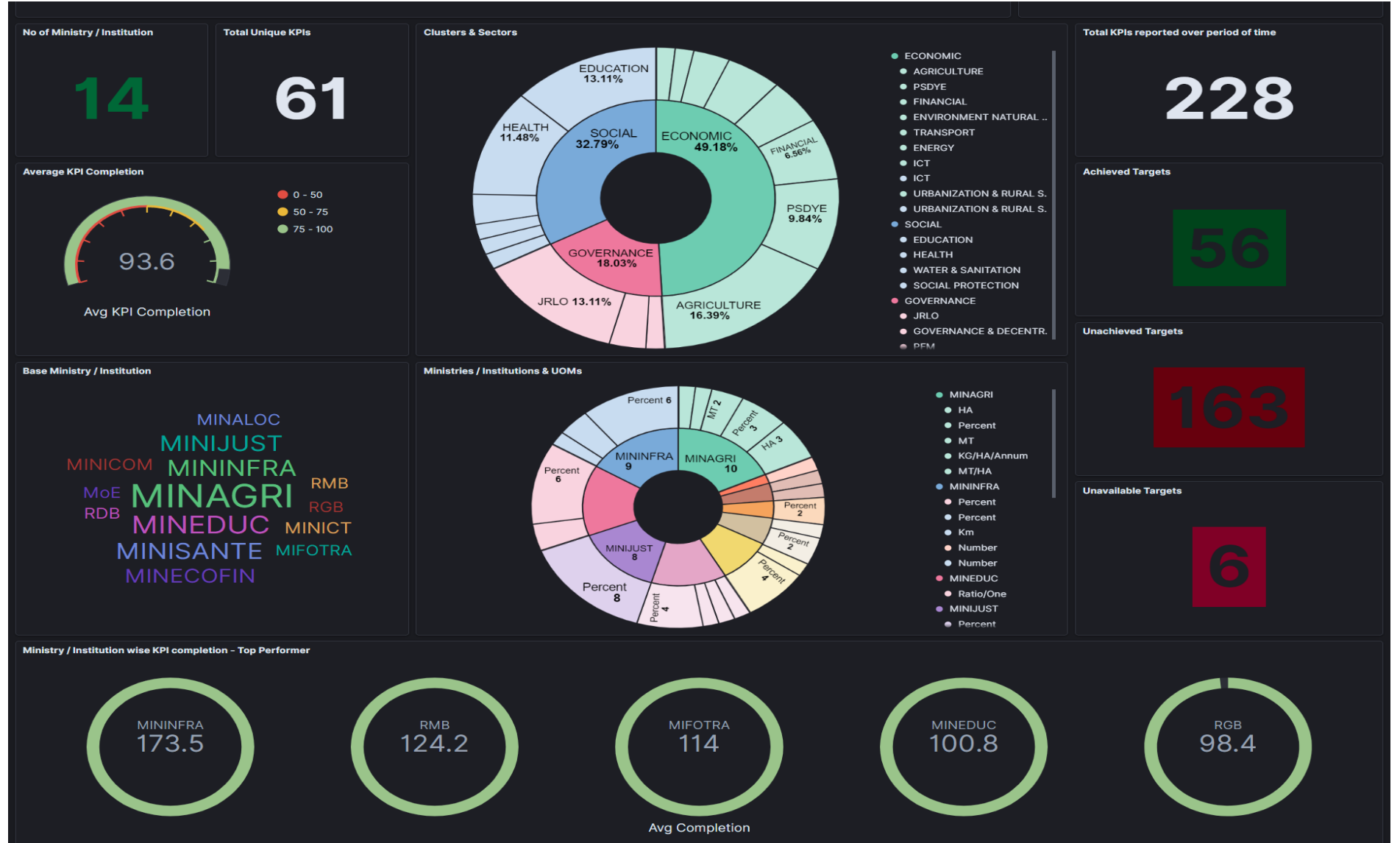
# Ongoing Activities (GBIS)

- Using Logstash for ETL which in turn uses the JDBC method to connect to data sources
- Elastic Search is used to create a data mart and Kibana is used for creating dashboards/Reports/Analytics

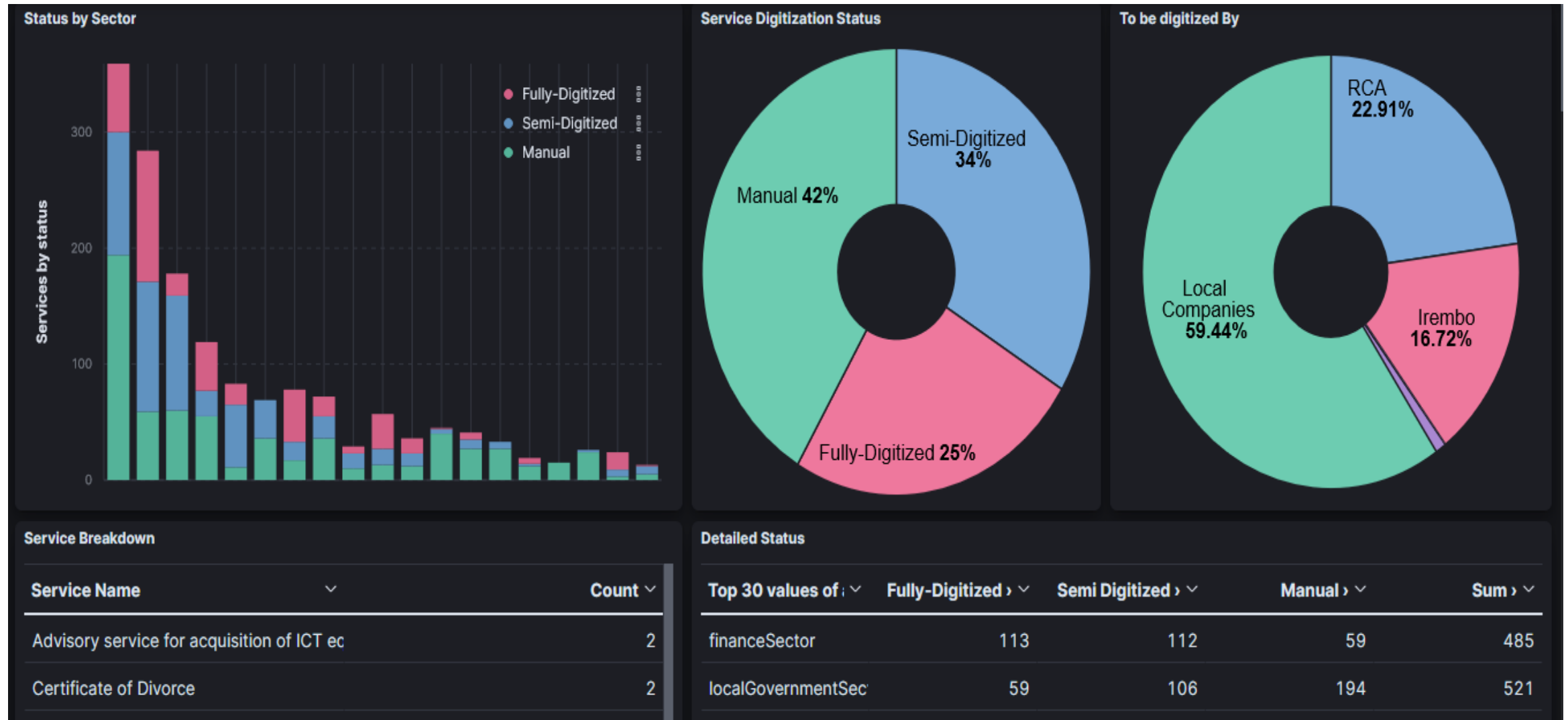




# Sample Dashboard: Government Wide KPIs (NST-1)



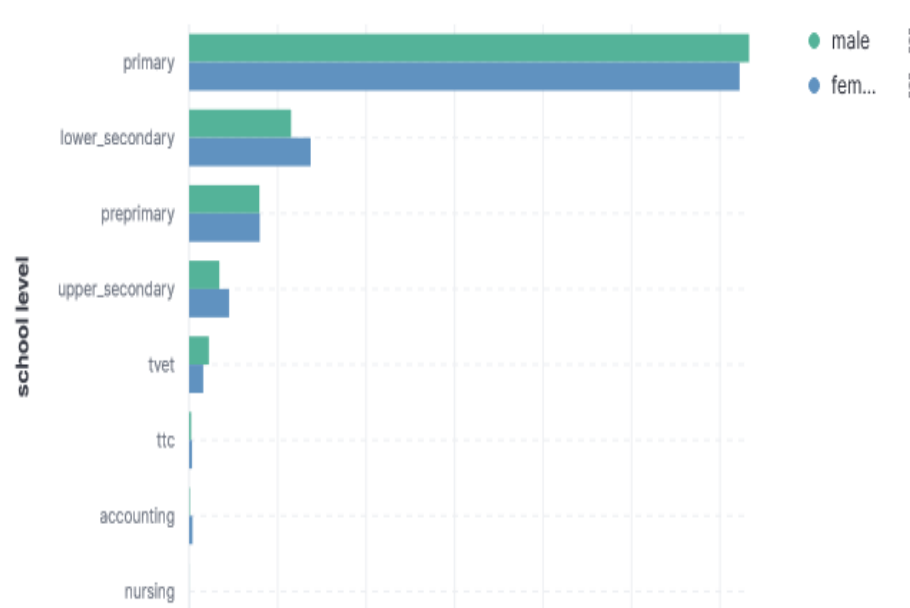
# Sample Dashboard: Specific Sector (MINICT)



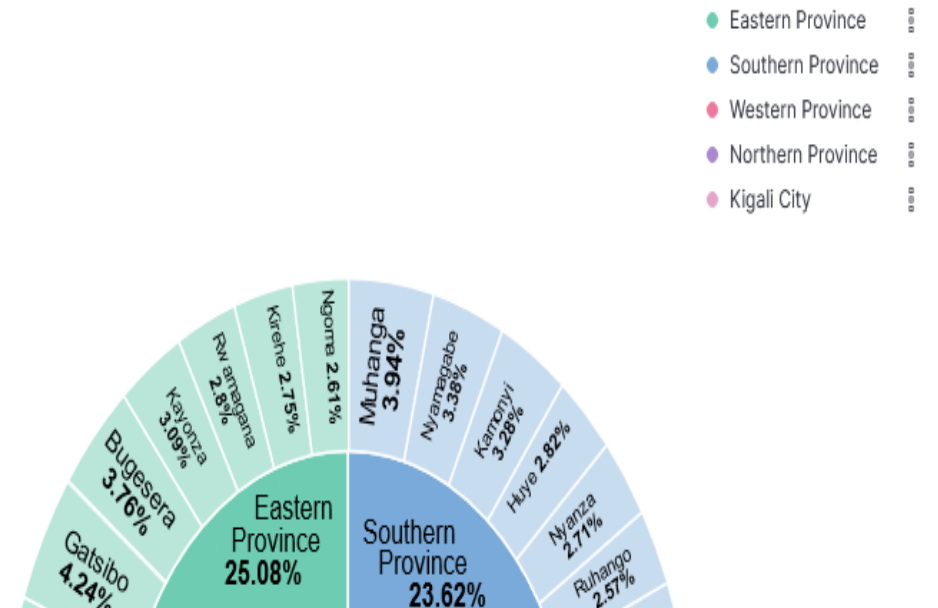
# Sample Dashboard: Specific Sector (Education)



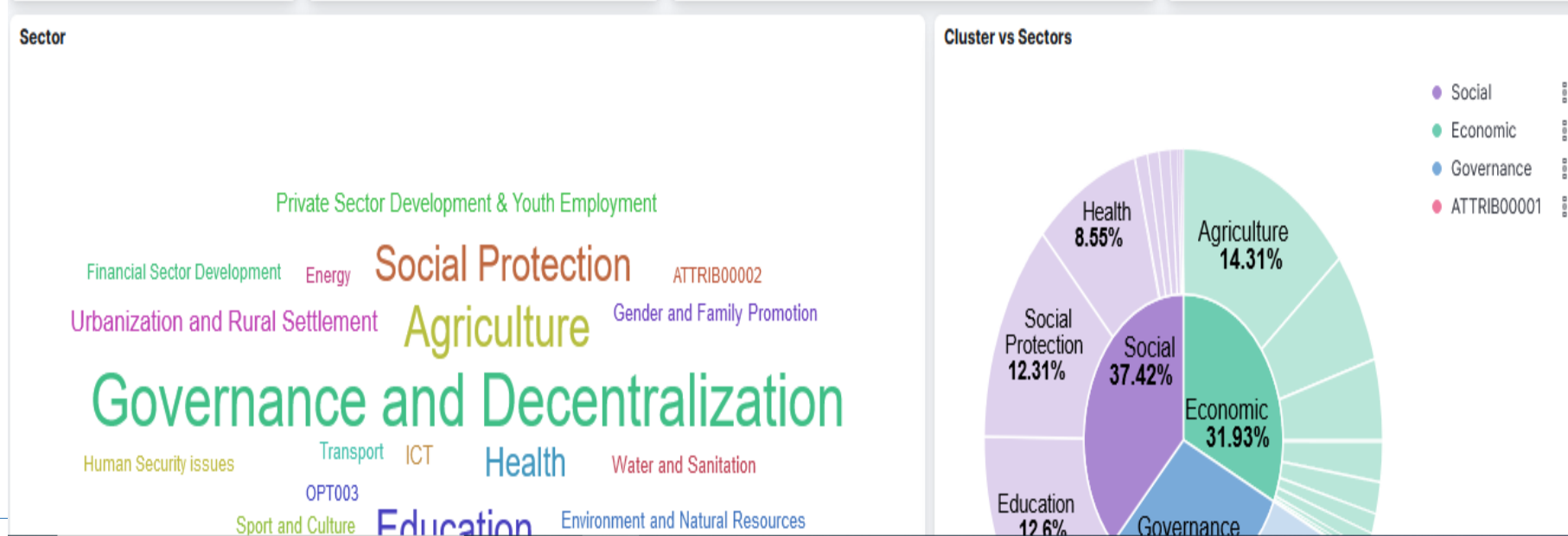
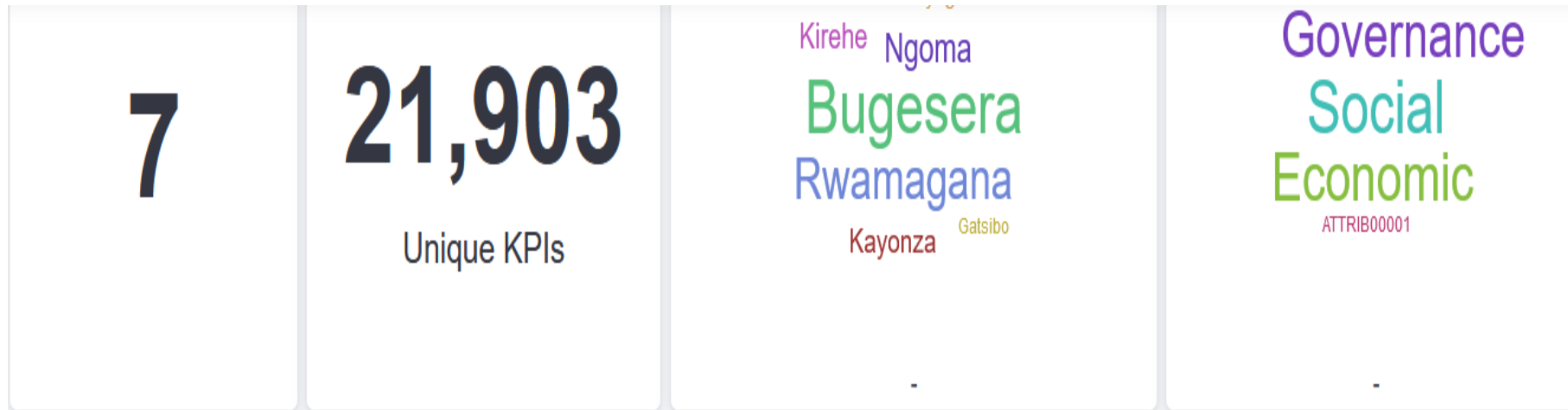
school levels gender parity



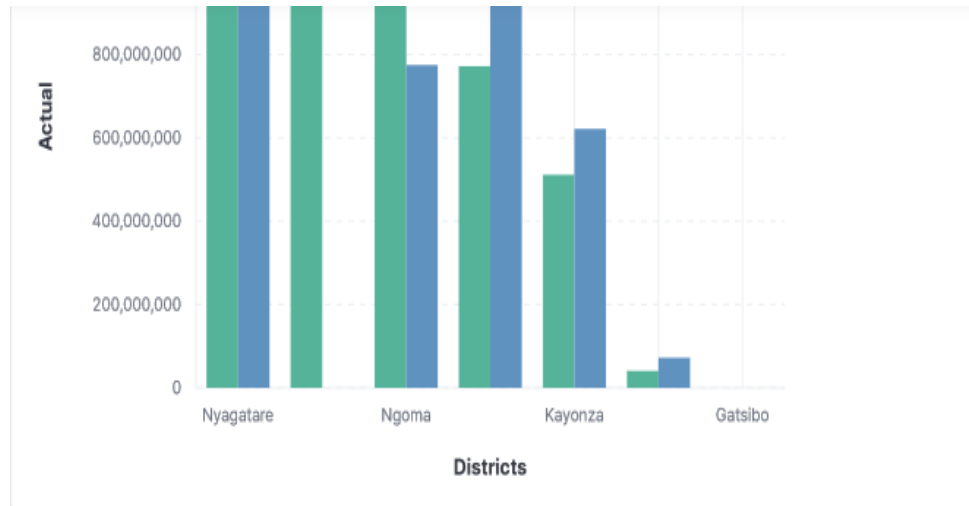
school per district



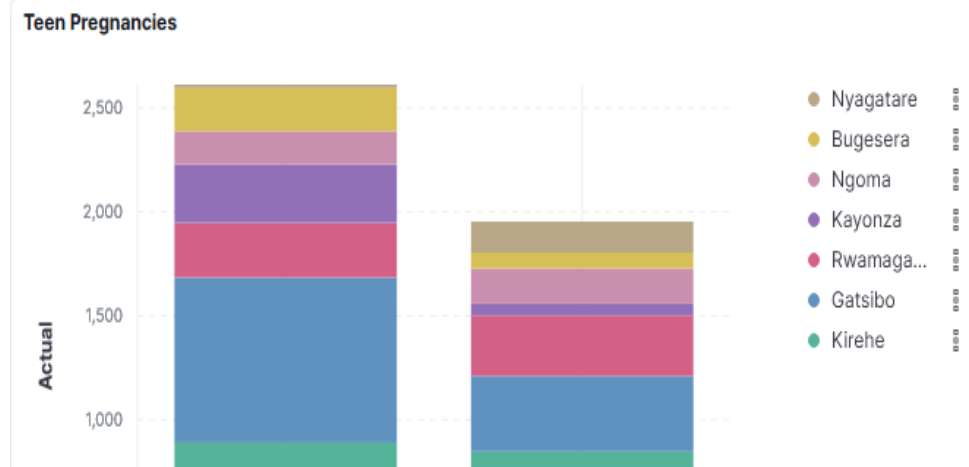
# Sample Dashboard: Specific Sector (Eastern Province)



# Sample Dashboard: Specific Sector (Eastern Province ...)



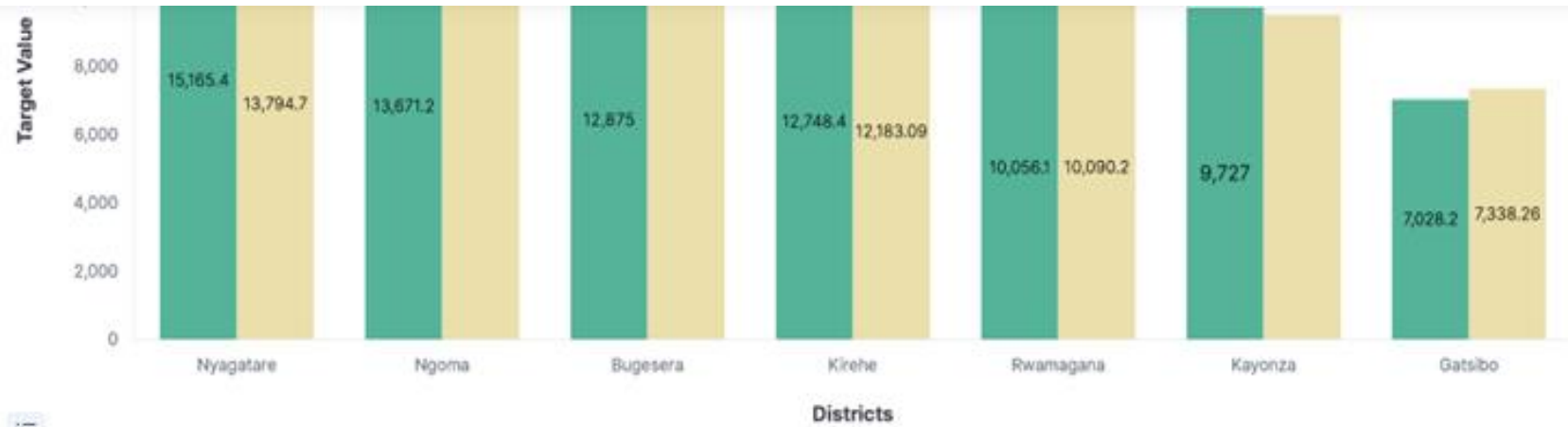
|          |                     |   |       |   |
|----------|---------------------|---|-------|---|
| Bugesera | Average number o    | 0 | 216   | - |
| Bugesera | Causes identified i | 0 | 5     | - |
| Bugesera | GBV cases receive   | 0 | 1     | - |
| Bugesera | Number of Childre   | 0 | 321   | - |
| Bugesera | Number of HH ber    | 0 | 8,577 | - |
| Bugesera | Number of HH ber    | 0 | 7,651 | - |
| Bugesera | Number of HHs afi   | 0 | 103   | - |



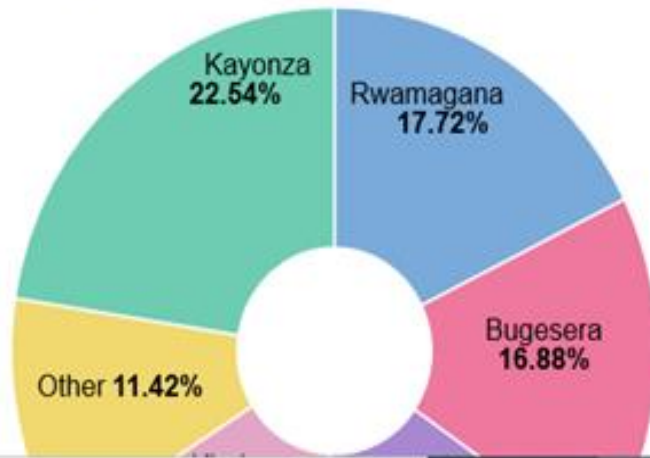
| ↑ District | ▼ kpi name  | ▼ Actual |
|------------|---|----------|
| Bugesera   | Number of teen pregnancies identified and reported  | 208      |
| Bugesera   | Number of teen mothers identified in the community  | 191      |
| Bugesera   | Number of teen mothers identified in the community  | 172      |
| Bugesera   | Number of Interventions realized to support teen mo | 141      |
| Bugesera   | Number of Men involved in teen pregnancies identifi | 114      |

# Sample Dashboard: Specific Sector (Eastern Province ...)

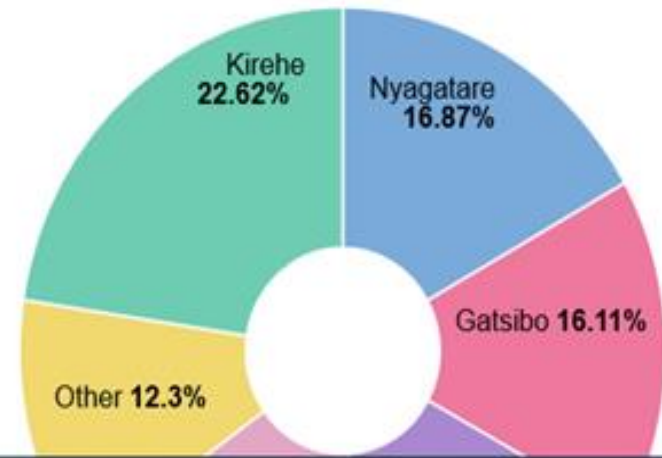
68



Quantity of fertilizers used by farmers per District

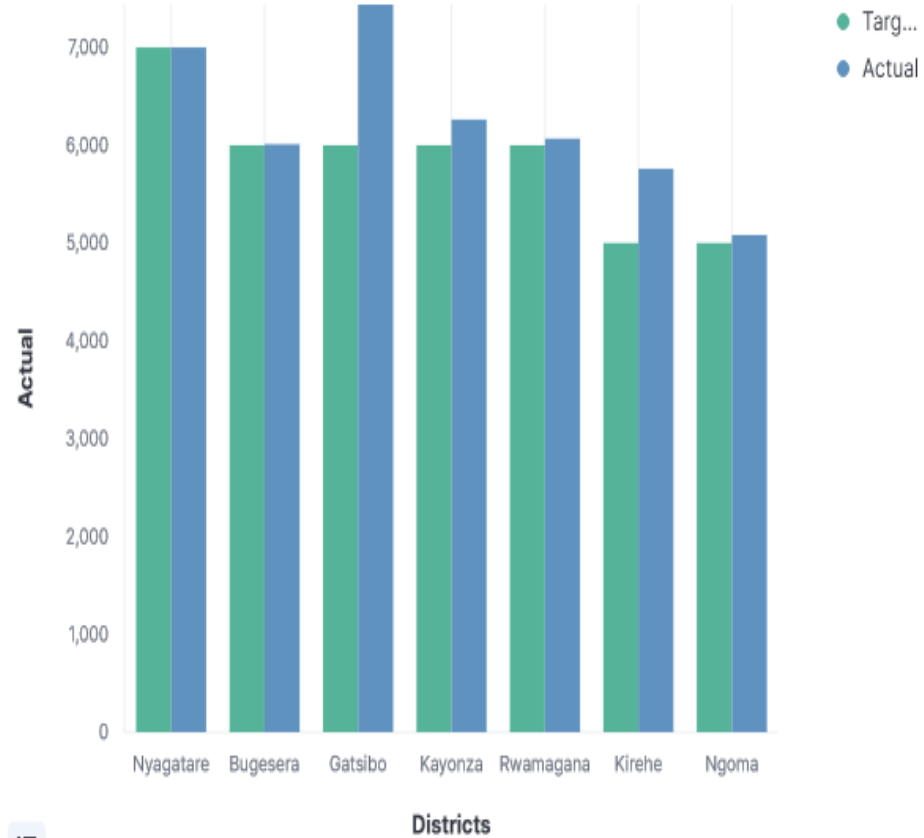


Quantity of improved seeds used by farmers

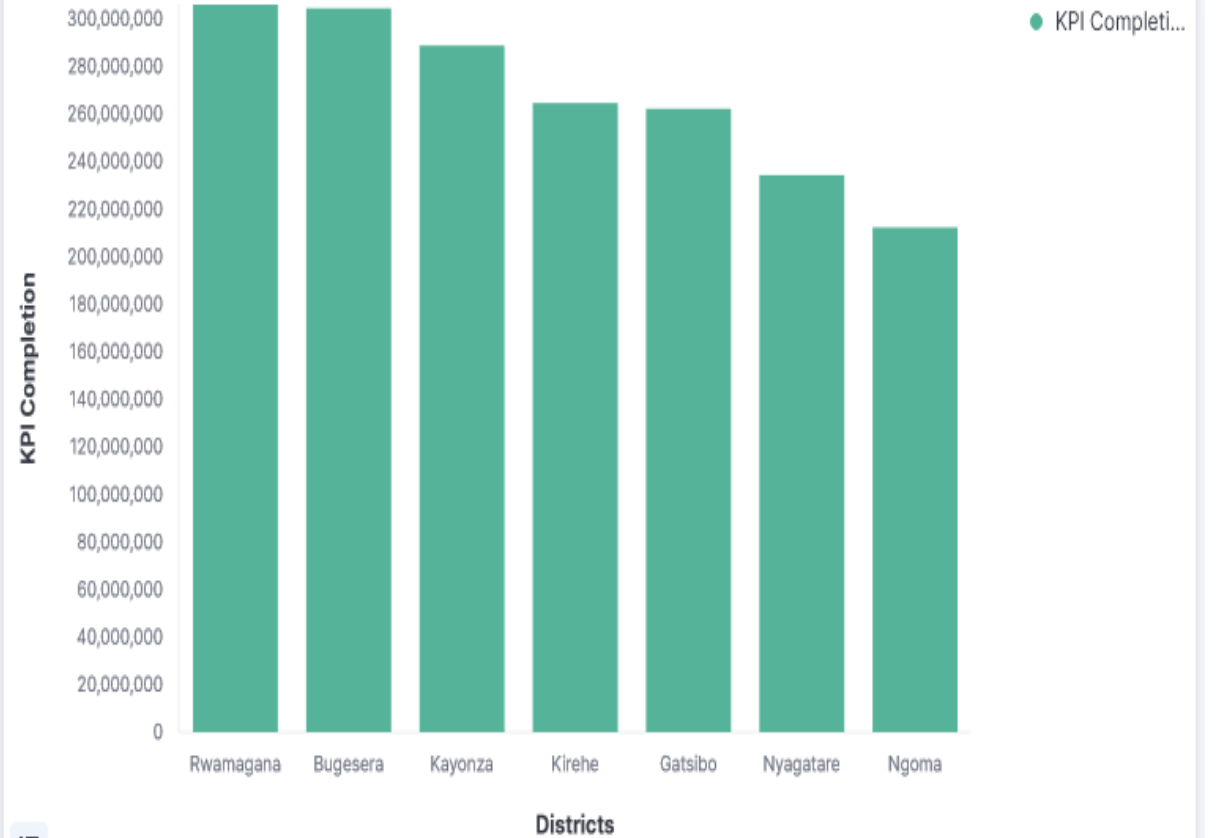


# Sample Dashboard: Specific Sector (Eastern Province ...)

Number of productive jobs created



Amount of money saved in Ejo Heza



# Key Challenges

- **Talent:** Project Managers, Data Engineers, Data Scientists (RISA, Sectors), Data Analysts, Community (Producers & Users)
- **Uptake:** Data Discovery, Data Quality, Awareness and trainings for adoption, Culture and Incentives
- **Governance:** Data sharing, Data Standardization, Data Catalogues
- **Time:** Procurement process (RDAP)



End