

Elevating Data Governance: Lessons from Global Federal Governments

Canada 

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Secretariat of the Executive Data Governance Steering Committee

Data hoarders

A photograph of a kitchen shelf filled with various jars and containers. The shelf is white and holds several glass jars of different sizes, some containing dry goods like pasta or grains. There are also white ceramic containers, a white pitcher, and a metal colander. The background is a plain white wall.

Data + metadata

Protected B certified

Credit: angi.com

Right-to-know

On-Premises

Cloud-based

Cyber-security

D A T A

G O V E R N A N C E

Data governance ...

... refers to a **set of processes, policies, standards, and practices** that ensure:

high data **quality**,
data **management**,
data **security**, and
compliance within an organization.

It involves the **management** and **oversight** of an organization's data assets to **maximize** their value while **minimizing risks**.

Data Policies:

Establishing clear rules and guidelines for how data is collected, stored, processed, and shared within the organization.

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US government finalizes its data center closure plans

The plan aims to reduce annual costs by 25 percent

August 02, 2016 By: Sebastian Moss [Have your say](#)



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[US government finalizes its data center closure plans - DCD \(datacenterdynamics.com\)](#)

The 2010 **Federal Data Center Consolidation Initiative (FDCCI)** and the 2014 **Federal Information Technology Acquisition Reform Act (FITARA)** led to the **closure** of more than **14,000** data centers by the **end of 2023** - with 'data center' being redefined to include tiny locations - bringing over **\$2,5 billions in savings**.

[GAO: US government closed 6,250 data centers, but still behind DCOI consolidation targets - DCD \(datacenterdynamics.com\)](#)

- Check for **missing values** (e.g., imputation - mean-median-mode -, deletion, etc.)
- **Duplicated** values
- Date **format** (e.g., Oct/03/23 vs. 03/Oct/23 ...)
- **Bias** (multiple) and **protected classes** (e.g., representative sample to balance **inequality** of minority classes)
- Etc ...

Data Policies:

Establishing clear rules and guidelines for how data



Compliance and Regulations:

Credit: roguemedic.com



Ensuring that data governance practices align with industry regulations and legal requirements such as General Data Protection Regulation (GDPR), Personal Information Protection and Electronic Documents Act (PIPEDA), Personal Health Information Protection Act (PHIPA), provincial acts and regulations, industry-specific standards, etc.

Data Catalog and Metadata Management:

Creating catalogs and metadata repositories to document and describe data assets, making it easier to discover and understand data.

Data inventory (administrative information)

Program | Prog... ▾

Subcategory | ... ▾

Ownership | Pr... ▾

Update Freque... ▾

Official Langua... ▾

Security Classifi... ▾

Storage | Stock... ▾

Keywords | Mo... ▾

BVH13 - Controlled S

Licensed Dealer Inspe

Controlled Substances Program (CSP)

Monthly | Mensuel

English | Anglais

Protected B | Protégé

Shared Drive | Disque

compliance verificatio

inspection

BVH13 - Controlled S

BVH12 - Tobacco Con

All inspection activitie

Tobacco and Vaping t

Planning and Operations Directorate: Planning and Accountability Division (PAD)

Quarterly | Trimestrie

English | Anglais

French | Français

Protected A | Protégé

Shared Drive | Disque

administrative | admi

planning | rabotage

reporting & metrics |

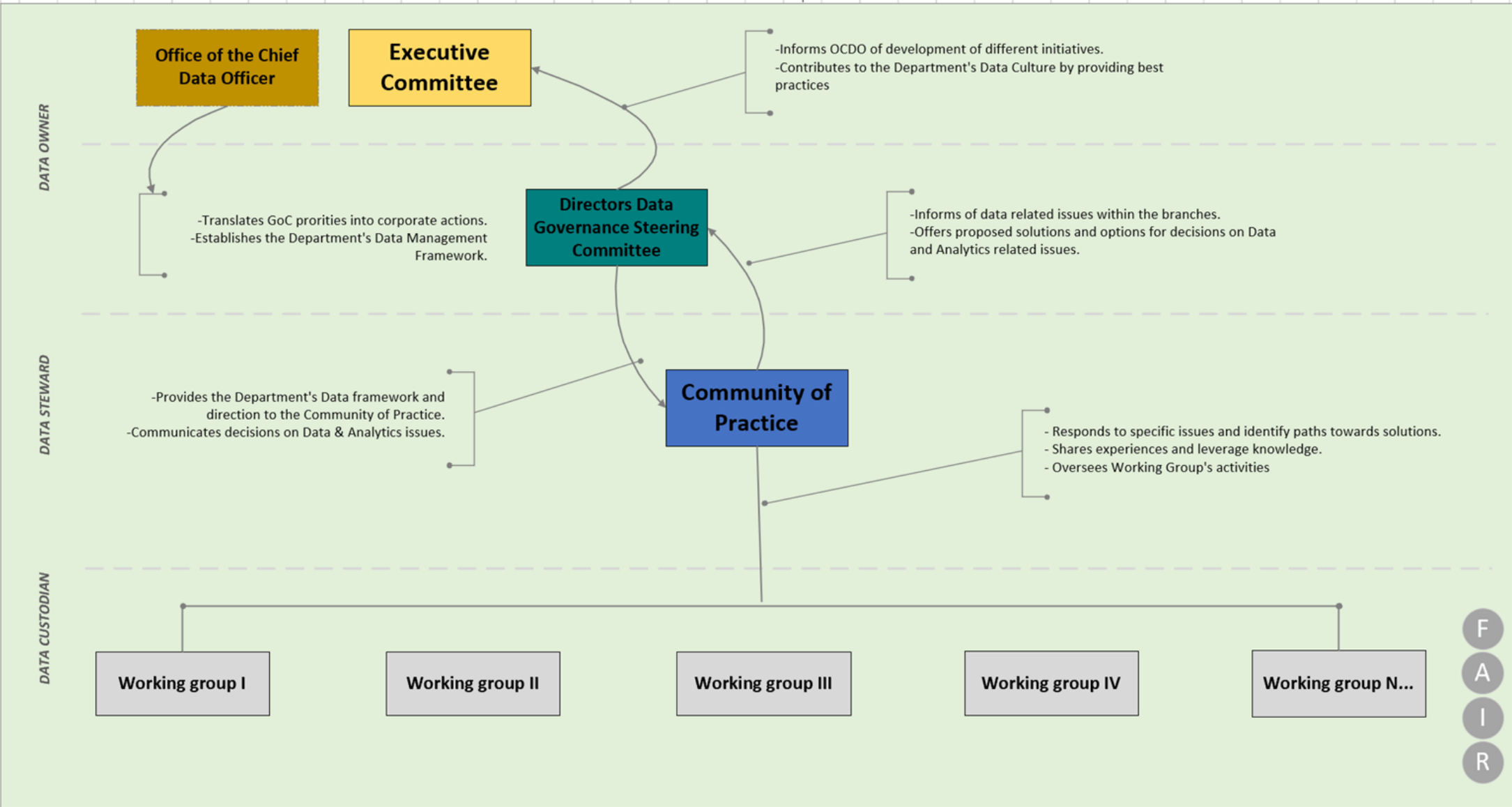
Metadata catalog (technical information)

Software:	ONYX	Enterprise Data Repository	BITS						
Data owner (name, email):	john.doe@gc.ca	john.doe@gc.ca	john.doe@gc.ca						
Data steward (name, email):	jane.doe@gc.ca	jane.doe@gc.ca	jane.doe@gc.ca						
Metadata last updated on:	September 8, 2023	September 8, 2023	September 8, 2023						
EDR Business Requests -- METADATA									
Column name	Definition	Description	Data type	Unit	Min	Max	Count	Missing val	Duplicated Values
'BR_NMBR'	business request number	unique identifier for business request	float64	Numerical	62287.0	64117.0	273,447	FALSE	FALSE
'BR_TITLE'	business request title	assigned title for BR	object	Qualitative	-	-	273,447	FALSE	FALSE
'GC_ORG_NMBR'	GoC organization number	standard organization name	float64	Numerical	1.0	9000.0	273,447	FALSE	FALSE
'RPT_GC_ORG_NAME_EN'	reporting GoC organization name ENG	derived from partner name and assigne	object	Qualitative	-	-	273,447	FALSE	FALSE
'CREATE_DATE'	create date	initially created	datetime64[ns]	YYYY-MM-DD	2023-03-13 7:45	2023-06-12 23:53	273,447	FALSE	FALSE

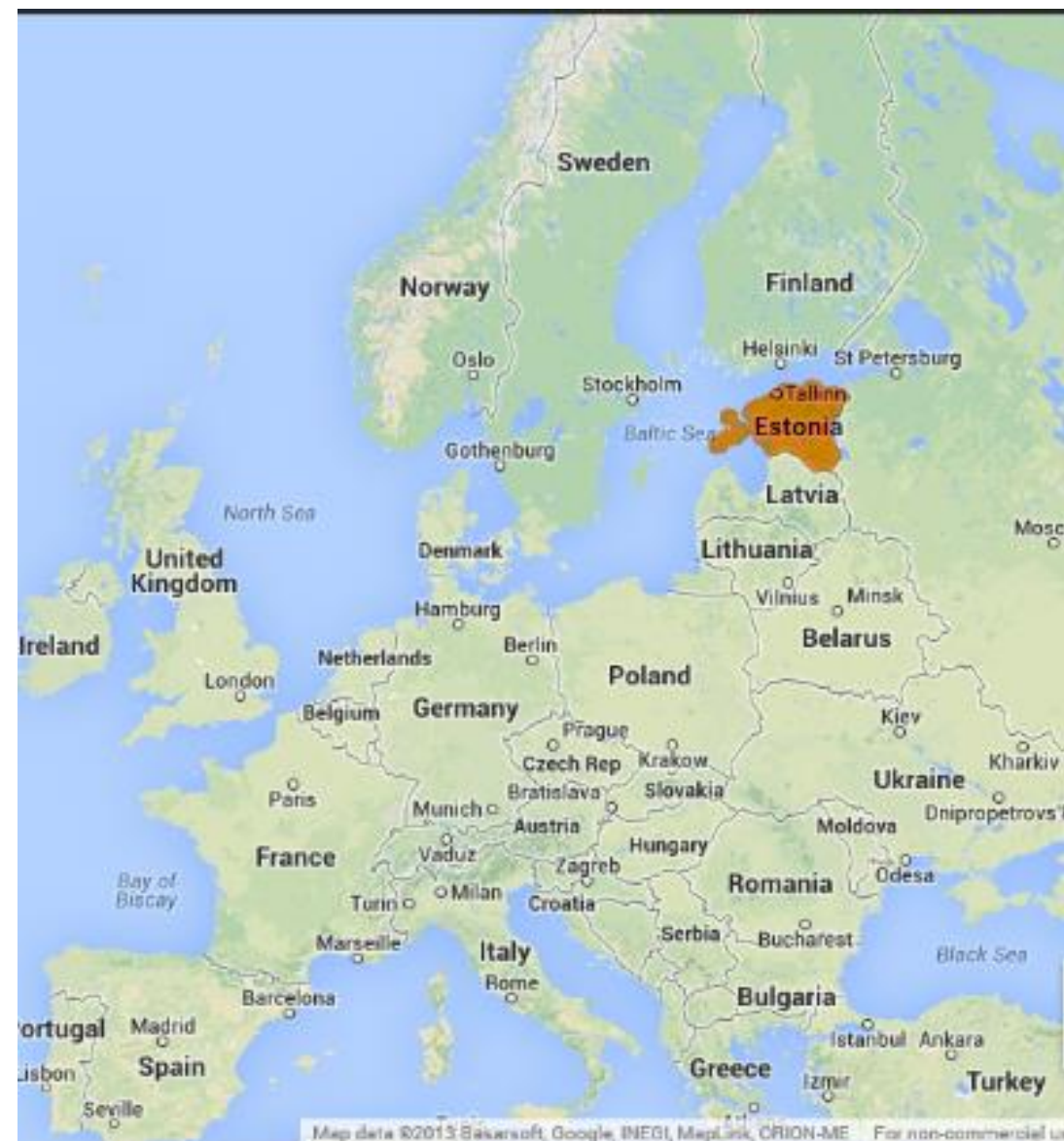
9

Data Governance Council (Executive Steering Committee):

Establishing a group responsible for defining and enforcing data governance policies and resolving data-related issues.



Population	1,374,687 (2024)
Growth rate	+2.6% (2022)
Birth rate	8.63 births/1,000 population (2022)
Death rate	12.84 deaths/1,000 population (2022)
Life expectancy	79.0 years (2023)
• male	74.5 years
• female	83.1 years
Fertility rate	1.31 children born/woman (2023)
Infant mortality rate	2.20 deaths/1,000 live births
Net migration rate	+5.29 migrant(s)/1,000 population (2021)
Age structure	
0–14 years	16.35%
15–64 years	63.22%
65 and over	20.43%
Sex ratio	
Total	0.91 male(s)/female (2021 census)
Under 15	1.05 male(s)/female
65 and over	0.54 male(s)/female
Nationality	
Nationality	Estonian
Major ethnic	Estonians (67.8%)
Minor ethnic	Russians (22.0%)
Language	
Official	Estonian
Spoken	Estonian, Russian, English



E-Governance



Truth by design approach

The screenshot shows a web application interface. On the left is a sidebar with navigation options: Personal data, Notifications settings, Applications and statements, Mailbox, Data tracker (highlighted), and Logout. The main content area is titled 'Choose registry' and shows a dropdown menu with 'Population Registry' selected. To the right of the dropdown is a 'Filter results' button. Below this is a table with three columns: Date, Query performed by, and Title. The table contains ten rows of data. At the bottom of the table is a pagination control showing '2 3 4' and navigation arrows.

Date	Query performed by	Title
17.12.2019, 10:46	Riigiportaal: 48904252748	KODANIKU PÄRING ISEENDA KOHTA RAHVASTIKUREGISTRIST
17.12.2019, 10:44	Riigiportaal: 48904252748	KODANIKU PÄRING ISEENDA KOHTA RAHVASTIKUREGISTRIST
17.12.2019, 10:44	Riigiportaal: 48904252748	KODANIKU PÄRING ISEENDA KOHTA RAHVASTIKUREGISTRIST
16.12.2019, 12:15	Riigiportaal: 48904252748	ISIKU AADRESSI PÄRING ISIKUKOODI JÄRGI
16.12.2019, 12:15	Riigiportaal: 48904252748	ISIKU AADRESSI PÄRING ISIKUKOODI JÄRGI
14.12.2019, 18:14	EESTI TÖÖTUKASSA	ISIKUKOODI ALUSEL ISIKUANDMED
12.12.2019, 04:54	EESTI HAIGEKASSA	ISIKUANDMED ISIKUKOODIDE ALUSEL
12.12.2019, 01:18	TALLINNA LINNAPLANEERIMISE AMET	ISIKUANDMED ISIKUKOODIDE ALUSEL
11.12.2019, 22:01	TALLINNA HARIDUSAMET	ISIKU PÕHIINFO PÄRING ISIKUANDMETE JÄRGI
11.12.2019, 09:24	Tervise ja Heaolu Infosüsteemide Keskus	ISIKU LAIENDATUD INFO PÄRING ISIKUKOODI JÄRGI

Estonian use case: Digital ID

The data governance guidelines contain recommendations and requirements based on best practices, focusing on three sub-themes:

- data governance management within an institution (data governance framework)
- preparation and management of data descriptions (data description guidelines)
- data quality management (data quality guidelines).

Data description guidelines include an annex that contains the Data Description Standard which sets the requirements for interoperable data descriptions.

[Guidelines](#) | [Kratid](#)

e-Estonia

[e-Estonia story](#)

[e-state building blocks](#)

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e-Identity

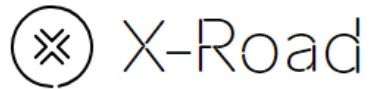
All Estonians, no matter where they happen to live, have a state-issued digital identity. This electronic identity system, called eID, has existed for 20 years and is the cornerstone of the country's e-state. e-ID and the ecosystem around it is part of any citizen's daily transactions in the public and private sectors. People use their e-IDs to pay bills, vote online, sign contracts, shop, access their health information, and much more.

Estonians can use their e-ID via state-issued identity or ID-card, using Mobile-ID on their smartphones, or the application Smart-ID. Holders of a digital identity need not be Estonian residents anymore however. Since 2014, Estonia has also offered a program called e-Residency for anyone who wishes to become an e-resident of Estonia and access its diverse digital services, regardless of citizenship or location.



Estonian use case: Digital ID

Interoperability services



X-Road®, an open-source software and ecosystem solution that provides unified and secure data exchange between private and public sector organisations, is the backbone of e-Estonia. Invisible yet crucial, it allows the nation's various public and private sector e-service information systems to link up and function in harmony.

Estonia's X-Road environment "X-tee" — where the name of X-Road derives from — includes a full range of services for the general public, and since each service has its own information system, they all rely on X-Road. To ensure secure transfers, all outgoing data is digitally signed and encrypted, and all incoming data is authenticated and logged.



REPUBLIC OF ESTONIA
INFORMATION SYSTEM AUTHORITY

State information system ▾

Cyber security ▾

Authority, news and contact ▾

War in Ukraine

PEOPLE-CENTRED DATA
EXCHANGE

Data tracker

Consent service

🏠 > State information system > People-centred data exchange > Consent service

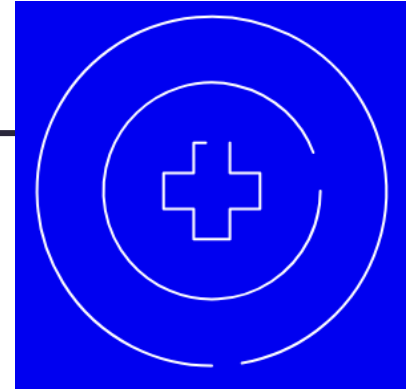
Consent service

The consent service is an e-service developed by the Information System Authority which allows a person to give permission to the state to share their personal data with a certain service provider.

Consent service | RIA

Estonian use case: Unified e-Health records

Population < 2,000,000



- e-Health Record
- e-Ambulance
- e-Prescription

e-Health Record

The Electronic Health Record (e-Health Record) is a nationwide system that integrates data from Estonia's different healthcare providers to create a common record that every patient can access online.

Functioning very much like a centralized, national database, the e-Health Record actually retrieves data as necessary from various providers, who may be using different systems, and presents it in a standard format via the e-Patient portal. A result is a powerful tool for doctors that allows them to access a patient's records easily from a single electronic file. Doctors can read test results as they are entered, including image files such as X-rays even from remote hospitals.

KSI Blockchain technology is used to ensure the integrity of retrieved electronic medical records as well as system access logs.

e-Health Record - e-Estonia

Population	▲ 203,080,756 (2022 census) ^[1]
Density	▲ 22.5/km2
Growth rate	▼ 0.52% (2022 census)
Birth rate	▼ 10.96 births/1,000 population (2022 est.)
Death rate	▲ 6.81 deaths/1,000 population (2022 est.)
Life expectancy	▲ 77.76 years
• male	▲ 74.29 years
• female	▲ 81.23 years
Fertility rate	▼ 1.562 children born/woman (2022 est.)
Infant mortality rate	▼ 10.31 deaths/1,000 live births
Net migration rate	▲ -0.19 migrant(s)/1,000 population (2022 est.)

Age structure

0–14 years	▼ 19.77%
15–64 years	▲ 69.72%
65 and over	▲ 10.51% (2023 est.)

Sex ratio

Total	0.97 male(s)/female (2023 est.) ^[2]
At birth	1.05 male(s)/female
Under 15	1.04 male(s)/female
15–64 years	0.98 male(s)/female
65 and over	0.75 male(s)/female

Nationality

Nationality	Brazilian
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Language

Official	Portuguese
Spoken	Languages of Brazil



Brazilian use case: Bolsa Familia

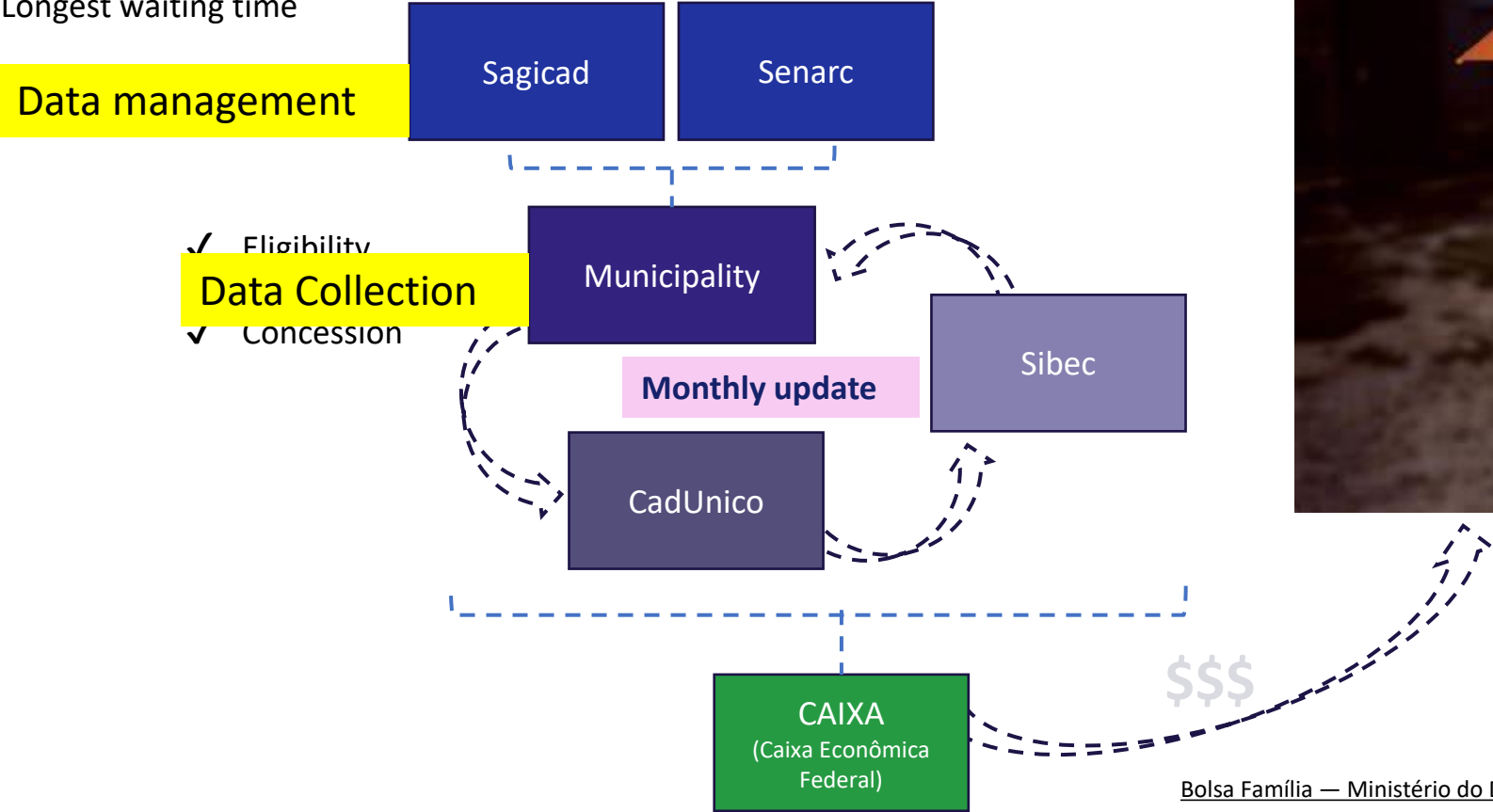
Population > 216,400,000

Requisites:
Annual Income <= CAD 720.00

Ministry of Development and Social Assistance

- Priority:**
- 1. Food insecurity (rank of risk) – **Census data**
 - 2. Largest number of children per family
 - 3. Longest waiting time

Interoperability (F.A.I.R.)



Effective data governance **helps** organizations:

- ✓ make **informed decisions**,
- ✓ maintain data **accuracy**,
- ✓ reduce **risks**,
- ✓ enhance data **security**, and
- ✓ achieve **compliance** with relevant regulations.

It also promotes data as a **valuable organizational asset**, leading to improved **data-driven** insights and overall **business performance**.

Data collection (process or software)

Raw data

Imputation, synthetic, sampling

Data transformation

Data Analyst

Data repository

B.I. software

Evidence-based decision-making

Coffee pot

Water

Coffee beans

Filter

Filter holder

Coffee mug

Coffee support

Black Coffee

