WORLD STATISTICS CONGRESS 2025 THE HAGUE

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CPS 65

Empowering data access while protecting privacy:

The Brazilian NSO perspective on privacy enhancing technologies

Ms Patricia Zamprogno Tavares
IBGE - Brazilian Institute of Geography and Statistics
Wednesday 8 October, 4 p.m. - 5 p.m.

TEAM

RESEARCH GROUP

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Bruno Cortez
Henrique Tavares
Marcello Ribeiro
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Marcelo de Oliveira
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Carlos Menandro

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CONTEXT

In the production of official statistics:

DEMAND FOR DATA

Faster access to more **detailed** information

Reduce **costs** without compromising **quality**

TECHNOLOGICAL REVOLUTION

Alternative **data sources**

Guarantee **quality** and **confidentiality**

DEMOCRATIC SOCIETY

Developing, implementing and monitoring **public policies**

Transparency and reliable data to fight **misinformation**

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Restrict data access as an obstacle to scientific development statistics production public policies.

Researchers must access high-quality, detailed, and up-to-date data.

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Data is often private for a very good reason.

Safe and ethical ways for statistical production.

UN Fundamental Principles of Official Statistics

1. Relevance, Impartiality, and Equal Access
2. Professional Standards, Scientific Principles, and Professional Ethics
3. Accountability and Transparency
4. Prevention of Misuse
5. Sources of Official Statistics
6. Confidentiality
7. Legislation
8. National Coordination
9. Use of International Standards
10. International Cooperation

unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

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1. Relevance, Impartiality, and Equal Access

Statistics must be shared openly to society

> Official statistics provide an indispensable element in the information system of a democratic society, serving the government, the economy and the public with data about the economic, demographic, social and environmental situation. To this end, official statistics that meet the test of practical utility are to be compiled and made available on an impartial basis by official statistical agencies to honor citizens' entitlement to public information.

unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

6. Confidentiality

Data cannot be shared in a way that risks personal or sensitive information

> Individual data collected by statistical agencies for statistical compilation, whether they refer to natural or legal persons, are to be strictly confidential and used exclusively for statistical purposes..

unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

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Data shared openly to society

Privacy is a fundamental right

Legislation does not prevent access to sensitive data.

Encourages the development of safe methods.

- Technology
- Respects rights
- Promotes transparency and security

2018 Lei Geral de Proteção de Dados Pessoais
(General Data Protection Law - Brazil)

2022 Personal data protection as a fundamental right

unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

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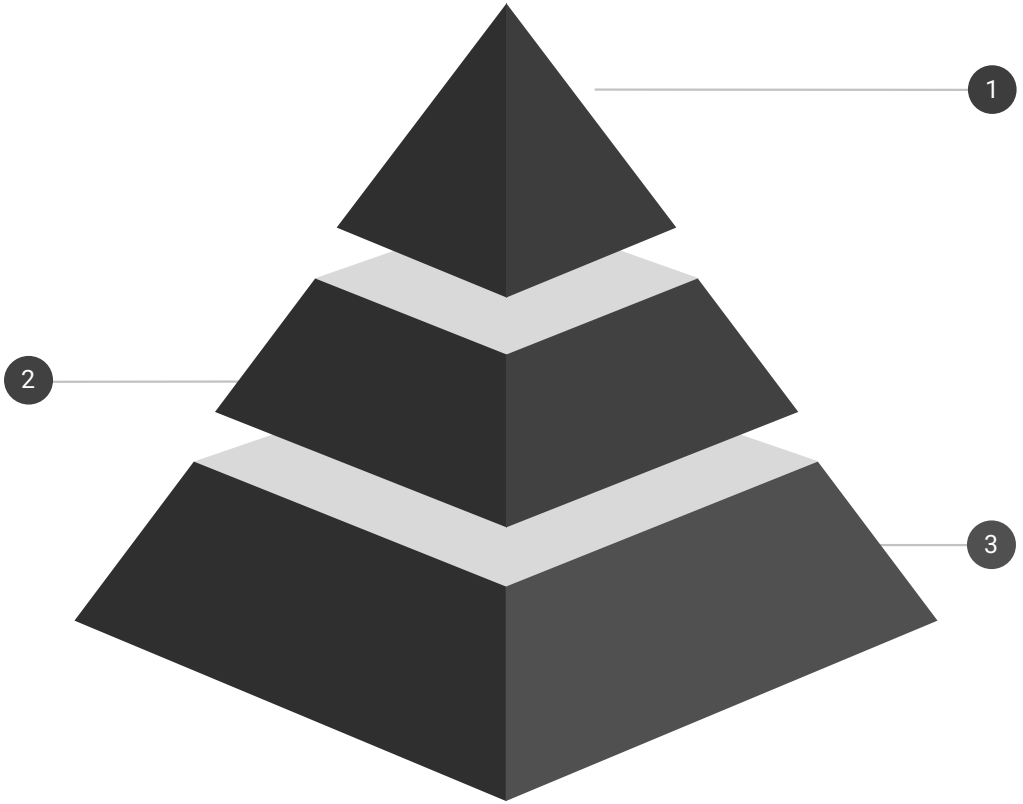
Responsible use of data.

Not just legally compliant, but ethical, legitimate and fair.

Data Privacy, Ethics and Protection: Guidance Note on Big Data for Achievement of the 2030 Agenda.
unsdg.un.org/resources/data-privacy-ethics-and-protection-guidance-note-big-data-achievement-2030-agenda

Methods of information extraction

for external users



Secure Access Facility

- In-person in the location
- Advanced users
- Identified data
- Maximum utility

Microdata

- Remote access
- Public data by FTP
- Some statistical skills is required
- Traditional SDC methods
- Intermediate utility

Cross-tabulations

- Remote access
- Public data
- No statistical skills
- Traditional SDC methods
- Limited utility

Methods of information extraction

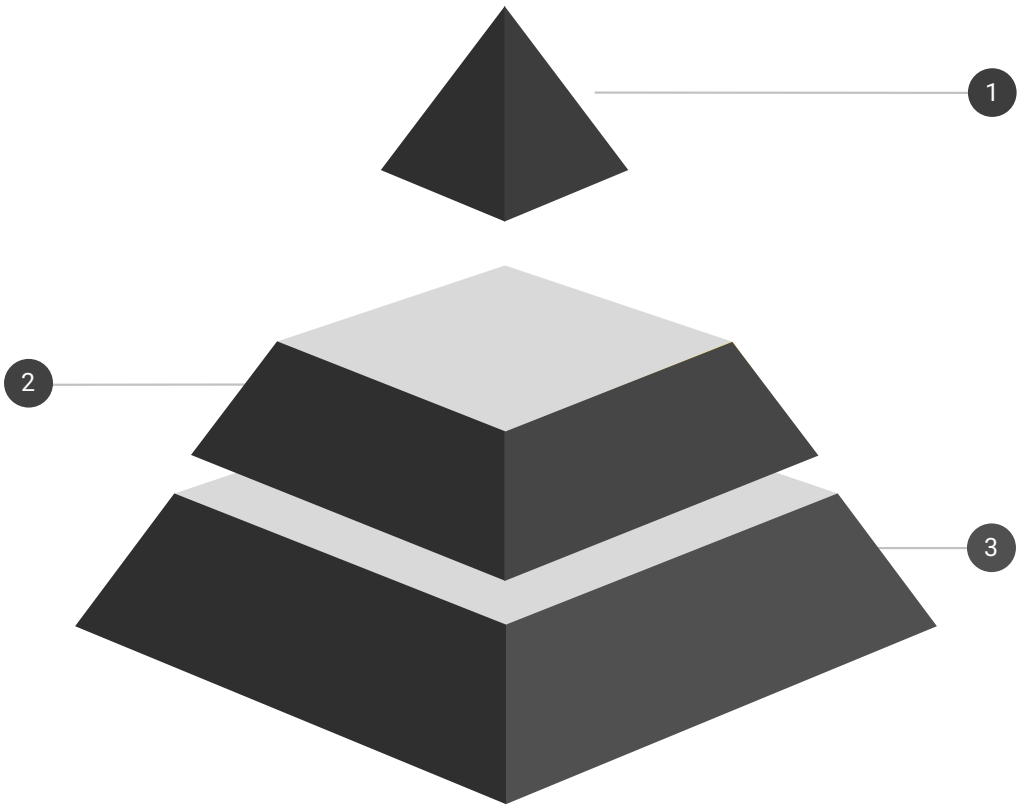
for external users

Secure Access Facility

- Local and highly restricted access
- Knowledge of specific analysis tools is required
- Identified data
- Maximum utility

Microdata

- Remote access
- Publicly available
- Knowledge of an analysis tool is required
- Traditional SDC methods
- Intermediate utility



Cross-tabulations

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Methods of information extraction

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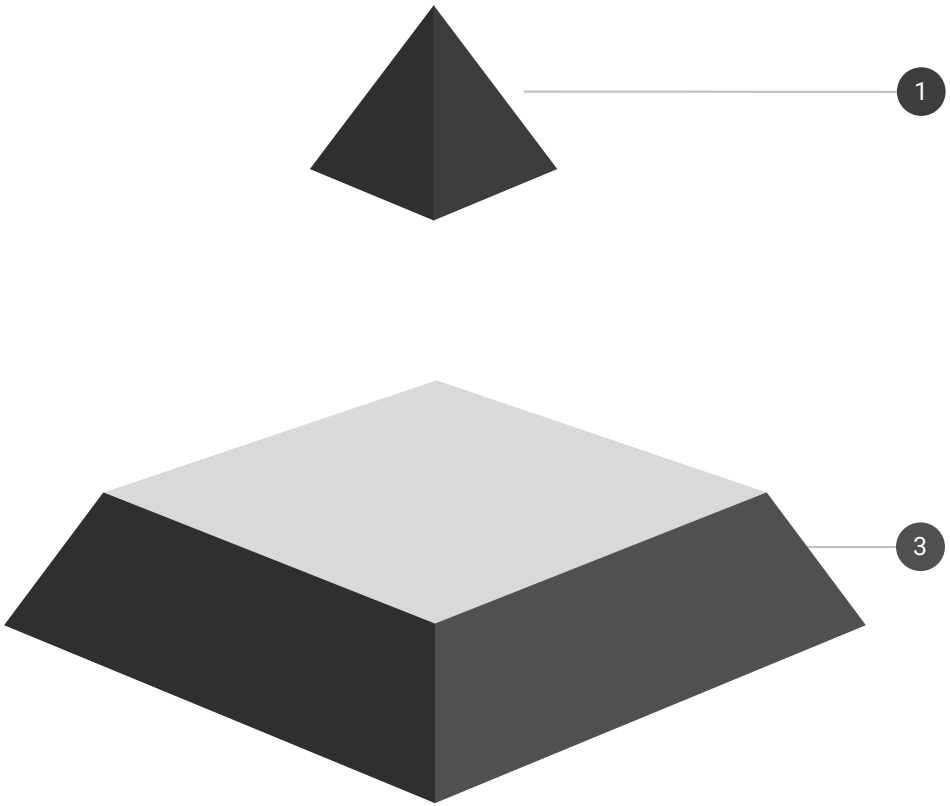

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Privacy Enhancing Technologies (PETs)

Extract relevant information from sensitive data, preserving the privacy of the individuals represented therein.

unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

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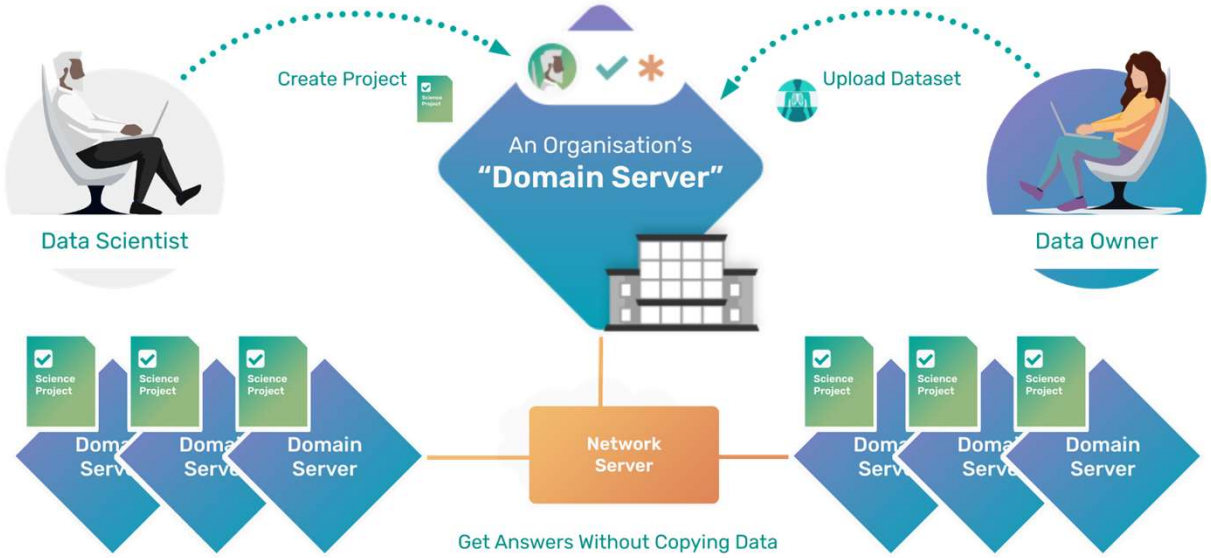
Privacy-Preserving Data Science

PySyft



UN PET Lab
United Nations Privacy Enhancing Technologies Lab

OpenMined

UNBigDataRegional Hub in Brazil

IBGE
Instituto Brasileiro de Geografia e Estatística

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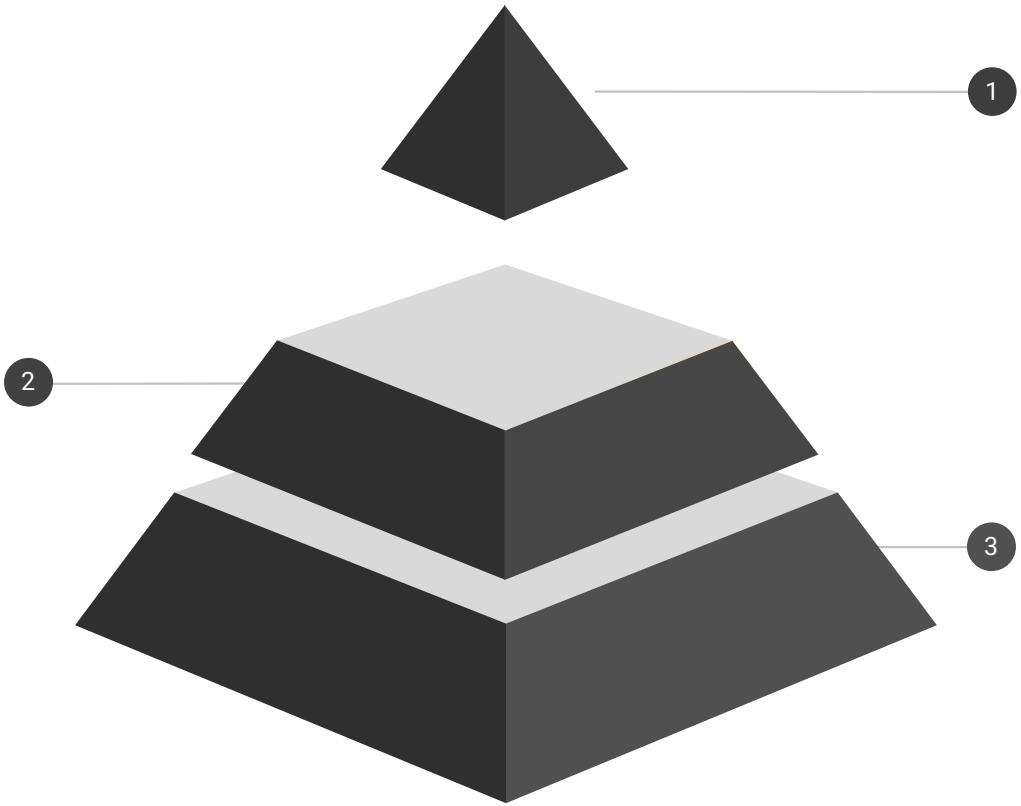

Cross-tabulations

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Methods of information extraction

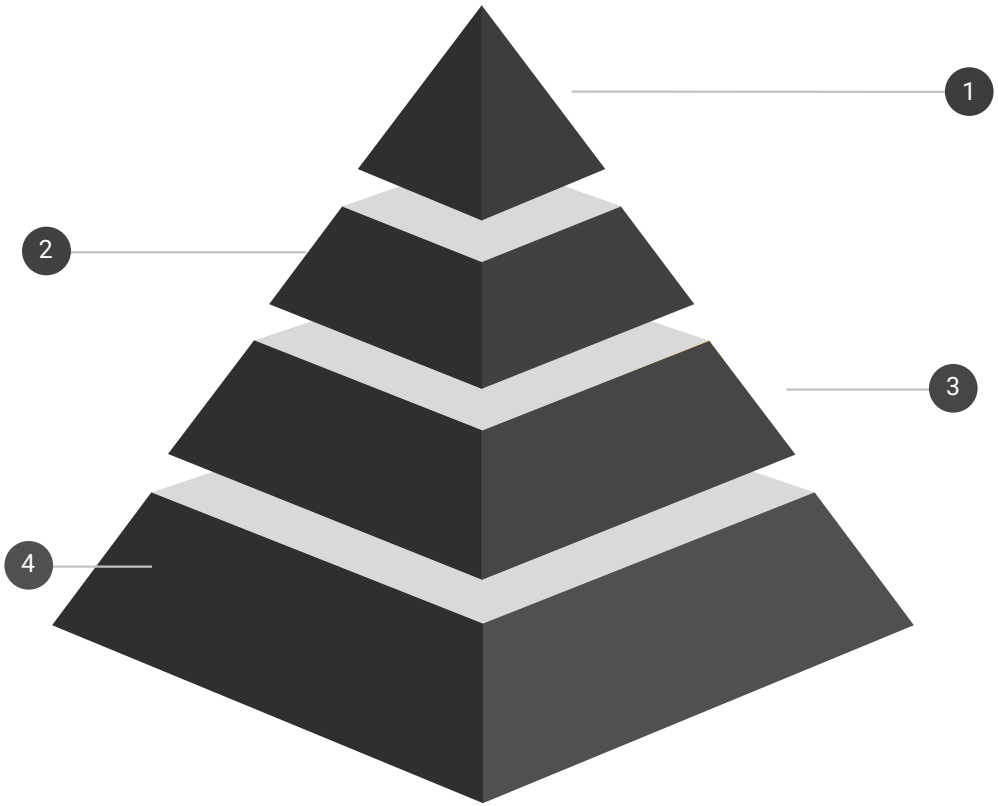
for external users

Secure Access Facility

- Local and highly restricted access
- Knowledge of specific analysis tools is required
- Identified data
- Maximum utility

Privacy-Preserving Data Science

- Remote access
- Knowledge of specific analysis tools is required
- SDC + PETs
- High utility
- Multiple data sources integration



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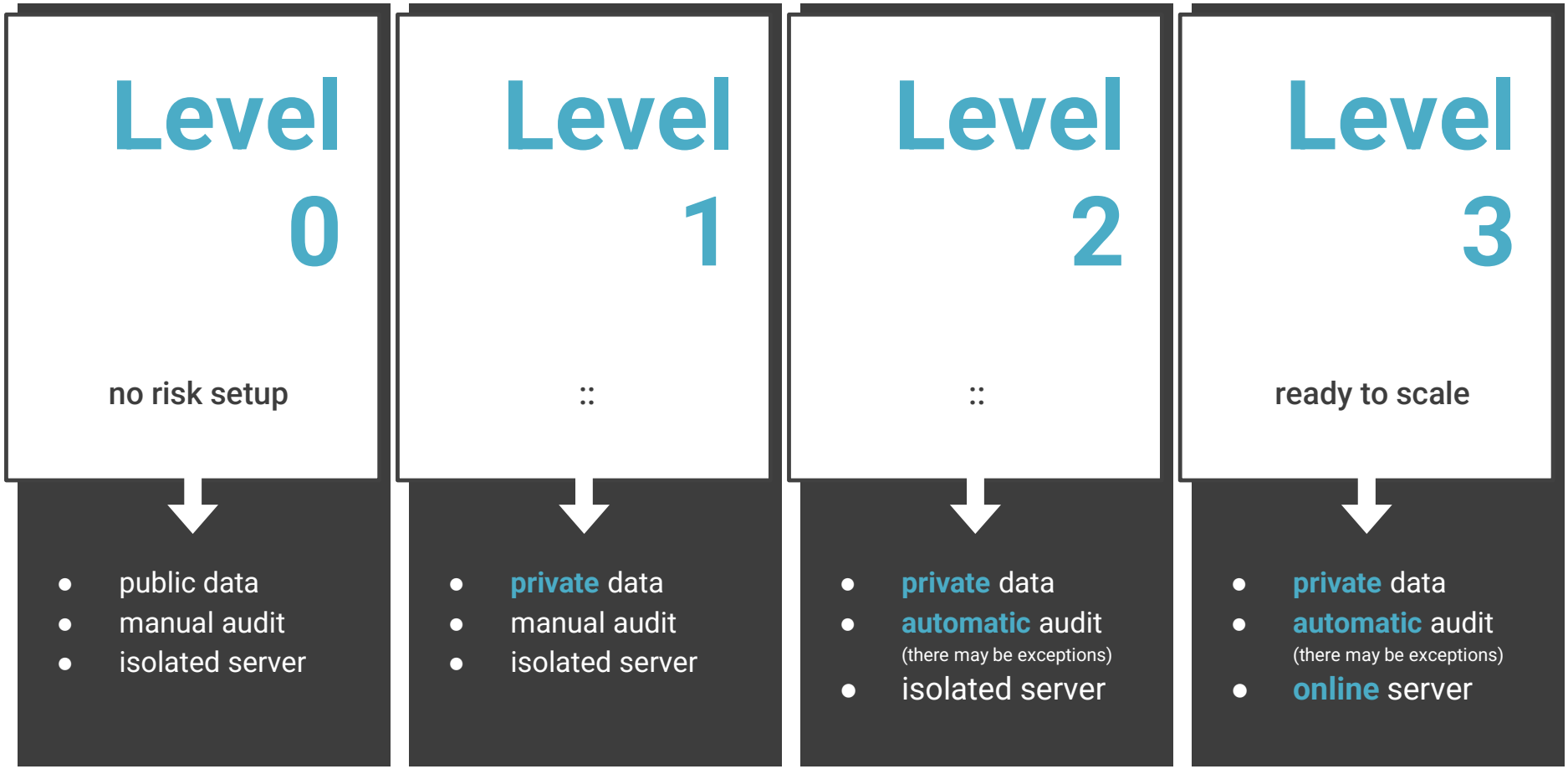
Level 0
no risk setup
public data
manual audit
isolated server
Level 1
::
private data
manual audit
isolated server
Level 2
::
private data
automatic audit
(there may be exceptions)
isolated server
Level 3
ready to scale
private data
automatic audit
(there may be exceptions)
online server

Proof of Concept (PoC)

2017 Brazilian Agricultural Census Data

censoagro2017.ibge.gov.br

- → Conducted since 1920
- → It is the most comprehensive statistical and territorial investigation of Brazilian agricultural production
- → Gross value around US$215 billion (R$1.14 trillion) in 2023
- → Environmental and climate issues
- → No publicly available microdata

Proof of Concept (PoC)

Women from rural areas

https://www.embrapa.br/busca-de-noticias/-/noticia/50779965/mapa-embrapa-e-ibge-apresentam-os-dados-sobre-mulheres-rurais

1) Brazilian Agricultural Research Corporation (Embrapa)
2) Ministry of Agriculture and Livestock (MAPA)
3) Brazilian Institute of Geography and Statistics (IBGE)

→ Term of commitment
→ Special cross-tabulations
→ 2+ months

INSIGHTS

PROS

Optimization: data utility and data privacy

Benefits for external users (bureaucracy)

Simplify processes for internal teams

CONS

Python knowledge

Adapt current infrastructure

Adapt current internal processes

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THANK YOU!

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