



Competence Network for Artificial Intelligence
Kompetenznetzwerk für künstliche Intelligenz
Réseau de compétences en intelligence artificielle
Rete di competenze per l'intelligenza artificiale



Data Science
Competence Center DSCC



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Bundesamt für Statistik BFS
Office fédéral de la statistique OFS
Ufficio federale di statistica UST
Federal Statistical Office FSO

Lomas: A platform for Confidential Data Analysis

Seeing Is Believing. Can We Trust What We're Not Allowed to See?

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Data Science Competence Center

Swiss Federal Statistical Office

21.02.2026

Data Science Competence Center

Mandate

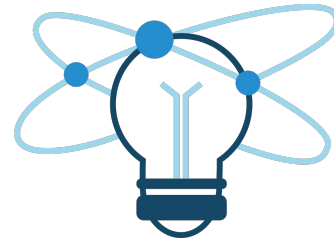
"The Data Science Competence Center provides services in the field of data innovation and promotes knowledge building in the federal administration as well as knowledge exchange with cantonal and communal administrations."

Vision

We use data science and develop skills for the public good in the whole of Switzerland.



Data Science Competence Center (DSCC) as a...



Service provider in the field of data science

for the Swiss public administration (Confederation, cantons, communes).

- Standard services.
- Consulting
- Methodological support.
- Project implementation
- Education and training

Innovation centre

- Research cooperation with Swiss universities
- Support for innovation projects in the FSO

Network and Community Developer

- Community: Data Science and AI for Public Good

Evidence-based policy making

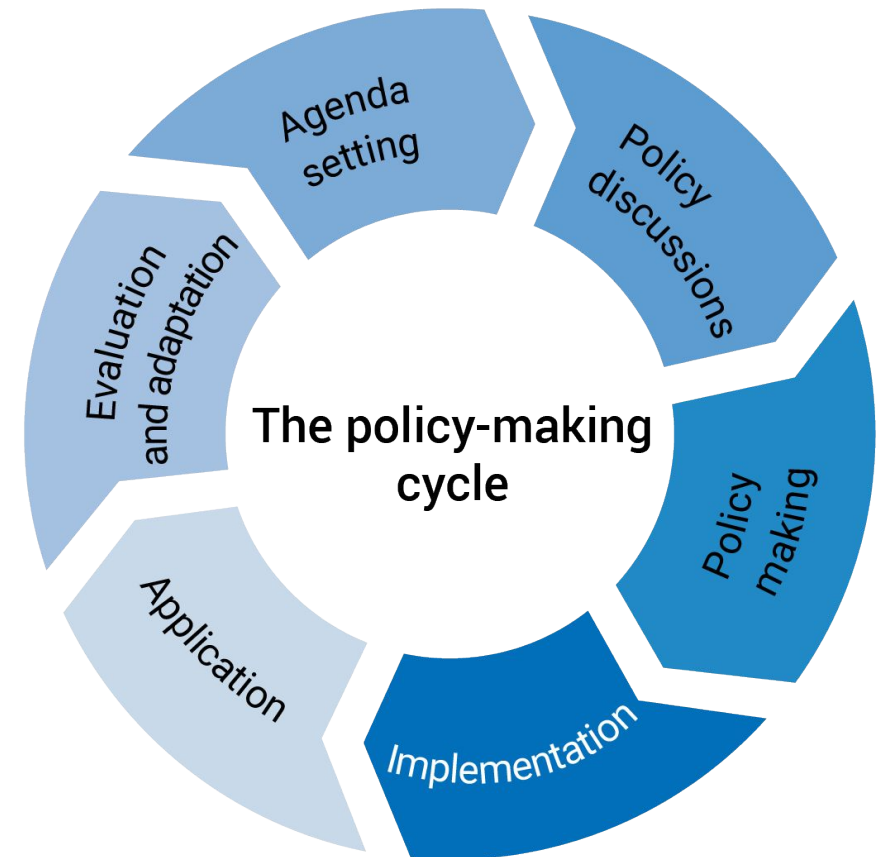
Data combined with expertise can be used to improve and accelerate the policy-making process.

Risk: relevant data and expertise are not used in policy making, resulting in the adoption or maintenance of ineffective or detrimental policies.

Objective: Support policy makers by evaluating policies and assessing the impact of alternative policy scenarios.

The DSCC offers expertise in the following areas:

- Causal inference
- Risk assessment
- Use of big data from non-traditional sources



Source: Zukunftskunst.eu



Privacy-preserving Data Science

Swiss citizens entrust the Swiss Confederation with sensitive personal data.

Risk: Sensitive data, such as health data or income, are passed on to third parties, e.g. insurance companies or banks.

Objective: to maintain citizens' trust by ensuring data protection.

The DSCC offers expertise in the following areas:

- Algorithms for machine learning with encrypted data
- Decentralised data analysis
- Protective measures against reidentification attacks



Source: FSO



Secondary Use of Data for Research

The Federal Statistical Office compelled by law to use data only for the purpose for which it has been collected.

... except ...

Ordinance on Statistical Surveys

- Secondary use allowed for **research, planning or statistics**.
- Data is **anonymized** and data subject **not identifiable**.



Data Confidentiality

Disclosure control

Controlling the risk that original data is disclosed through the **voluntary publication** of a data product.

Confidentiality

Keeping data **secret**.

Security

Preventing **unauthorized** access to data.



Lomas : A Platform for Confidential data analysis and AI on Sensitive data

Objective

Enabling the use of sensitive data without ever sharing or exposing the data itself.

Current situation

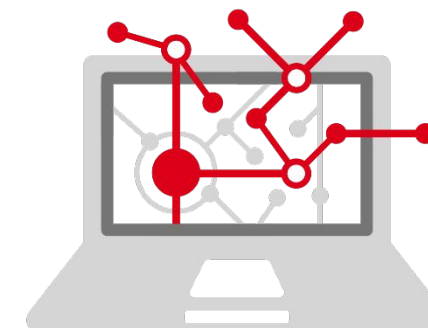
- Open data (e.g. OGD): catalogued, accessible and usable..
- Sensitive data: possibly referenced in a catalogue, but not directly usable.

New solution

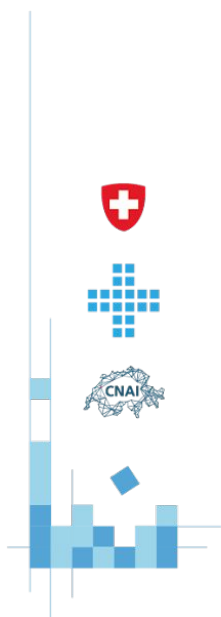
Applying differential privacy methods to enable analysis on sensitive data.

opendata.swiss 

LINDAS .admin.ch



I14Y



Lomas : A Platform for Confidential data analysis and AI on Sensitive data



UN PET Lab
United Nations
Privacy Enhancing Technologies Lab



Lomas

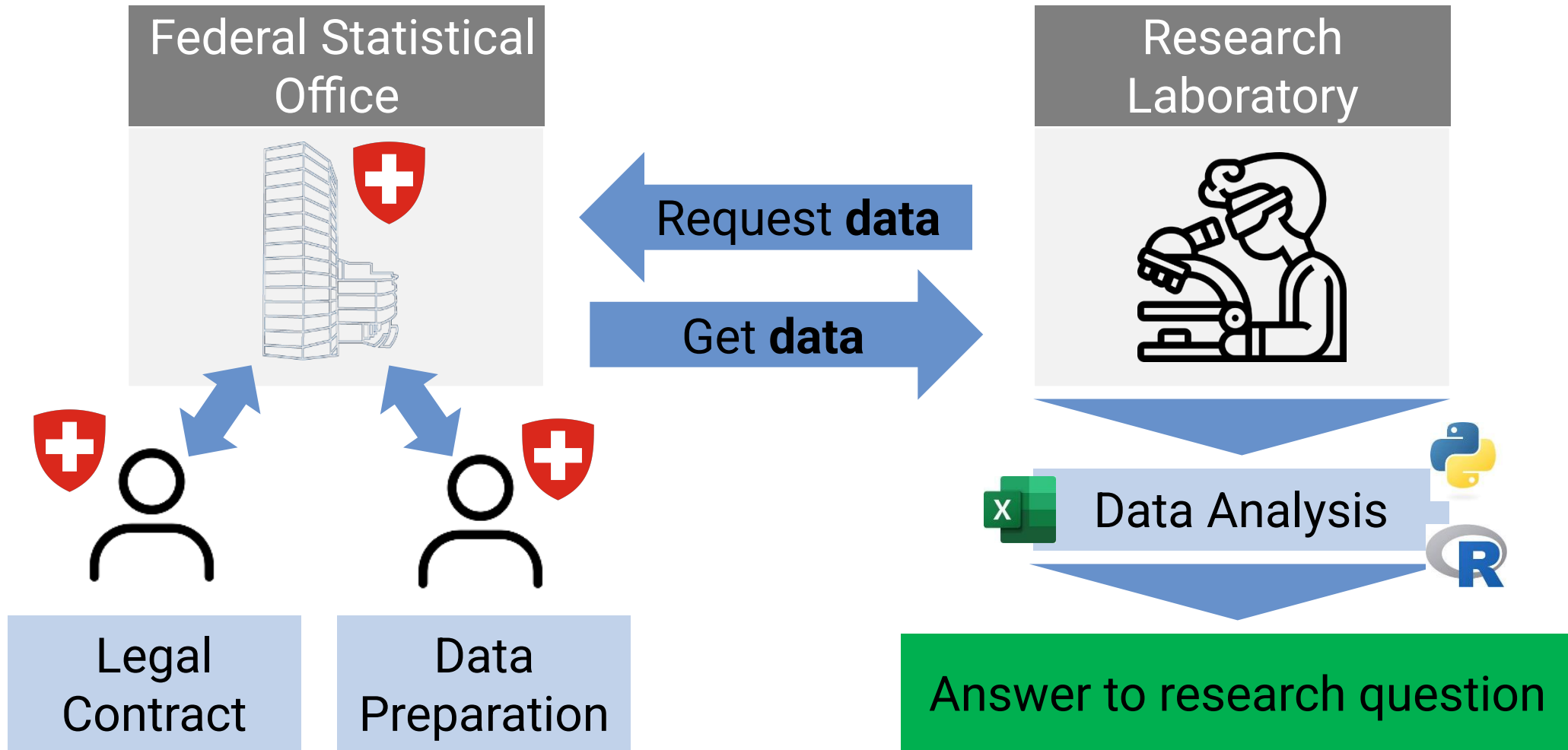


HARVARD
UNIVERSITY



Centre de compétences
en science des données DSCC

Traditional Process: Data delivery



Limits of Traditional Process

Federal Statistical Office

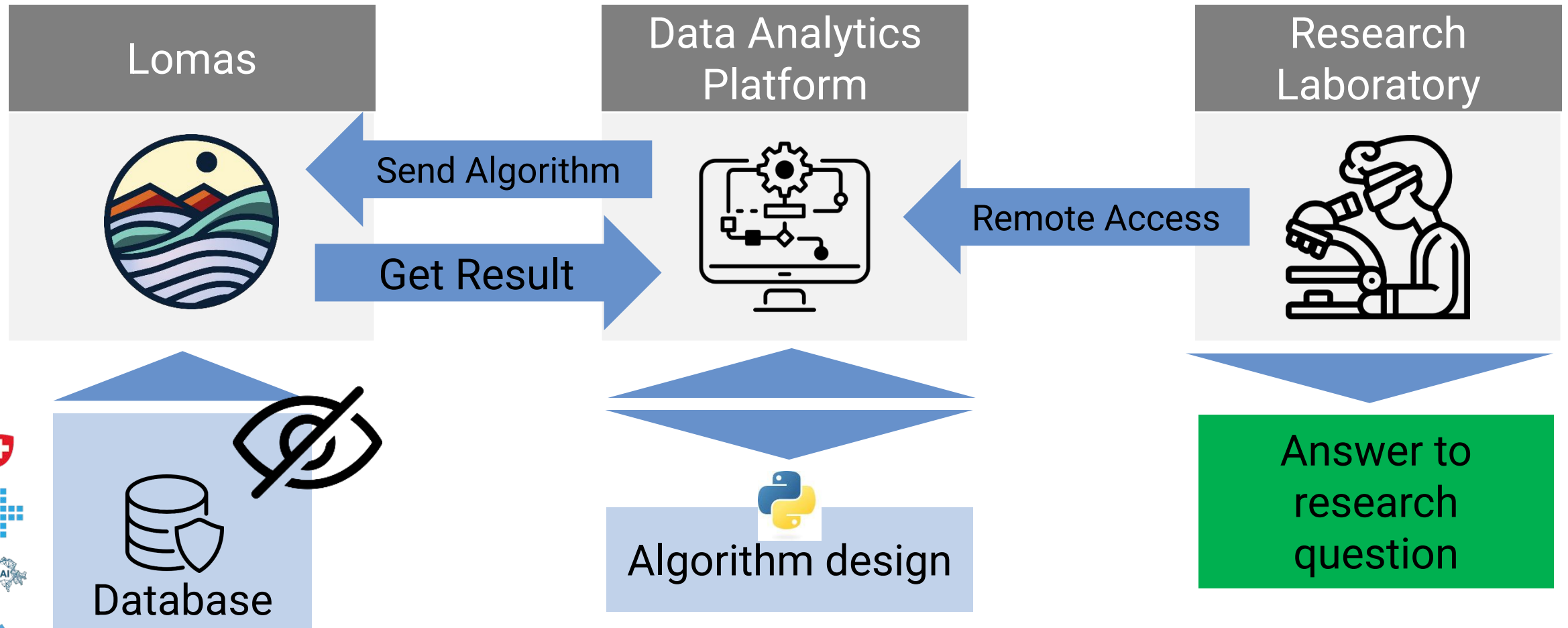
- Costly (legal and technical staff).
- Cannot scale to increasing demand.
- Data protection relies on
 - responsibility transfer,
 - pseudonymization.
- Reputational risk.

Research Laboratories

- Slow process.
- Scope of data delivered is limited.



New Process: «Eyes-off» Data Science



Advantages of «Eyes-off» Data Science

Federal Statistical Office

- Minimal human intervention.
- Can scale with infrastructure.
- Reputational risk is limited as no direct access to data.

BUT

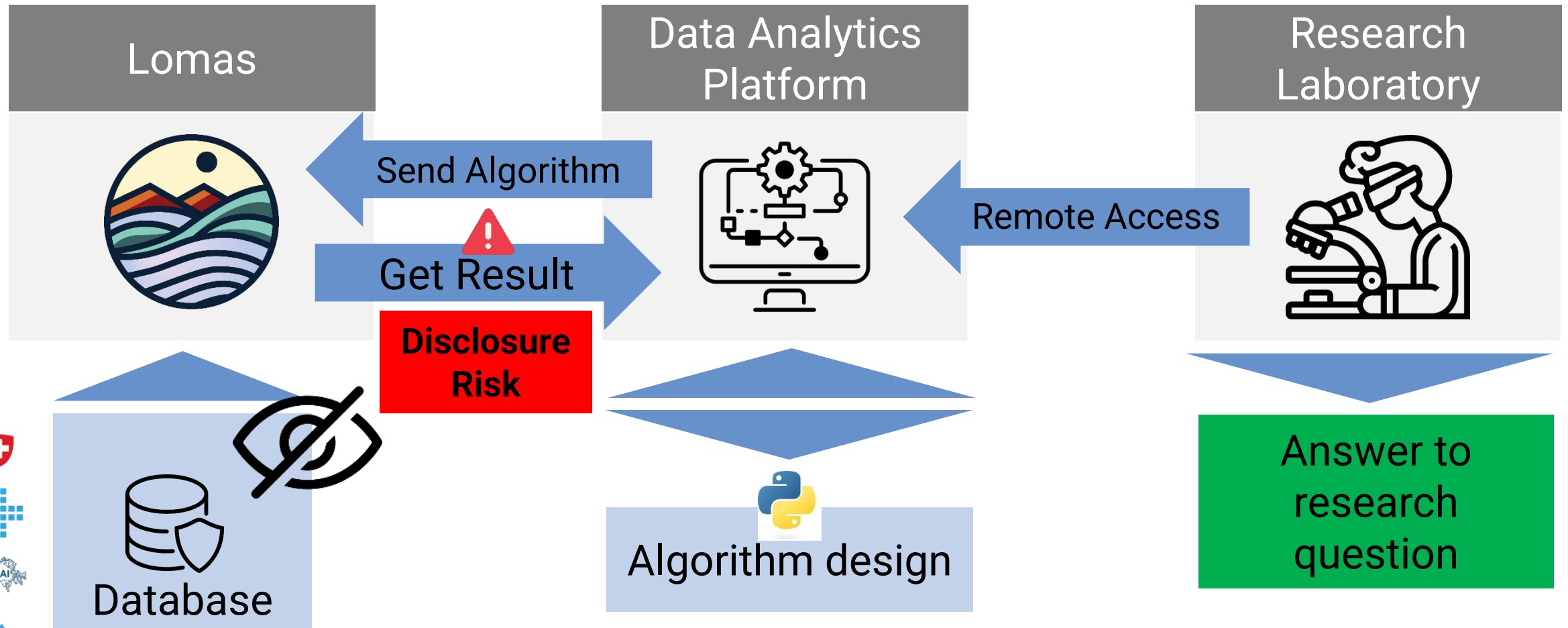
- Necessitate to quantify and track disclosure risk of results.

Research Laboratories

- Faster process (starting to prototype is a matter of days).
- Wider access to data.
- Offers a standard environment for replicability and (statistical) reproducibility.



New Process: «Eyes-off» Data Science



Differential Privacy: Principle

Sex	Region	...	HIV?
M	1005		Positive
F	2012		Negative
F	8038		Negative
M	1503		Negative
F	1220		Positive
M	3807		Positive

Database D_{HIV+}

Differential Privacy Mechanism

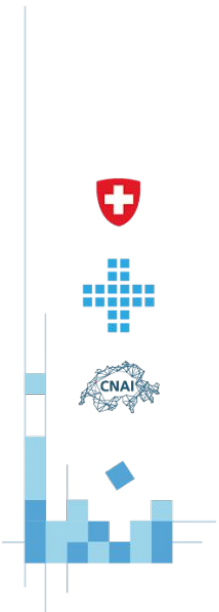
Query q

q : «How many individuals are HIV positive in Bern?»

DP Mechanism Q

$$Q(D_{HIV+}) = q(D_{HIV+}) + \mathbf{Noise}(\epsilon)$$

Public Release
(Adversaries)

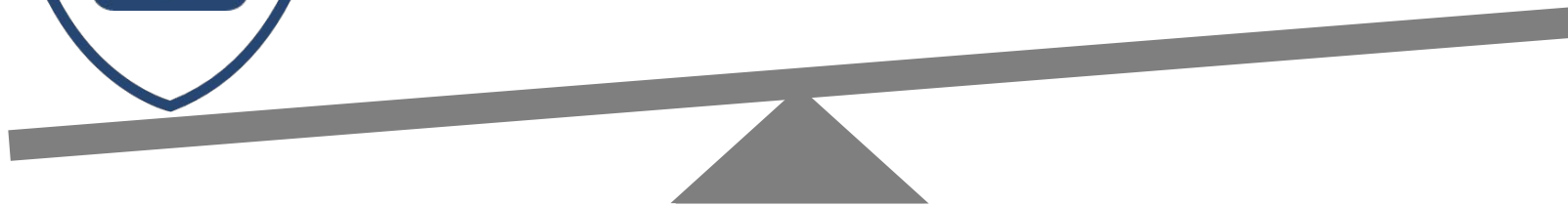
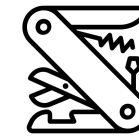


Privacy-Utility Trade-off

Confidentiality



Utility



Differential Privacy is a tool to control the privacy-utility trade-off.

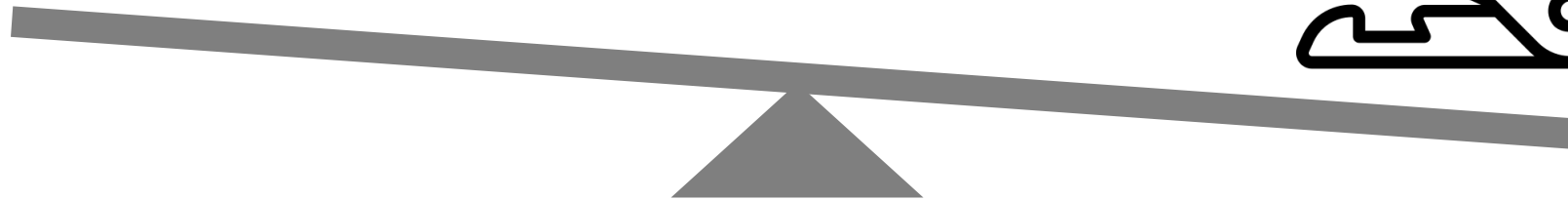
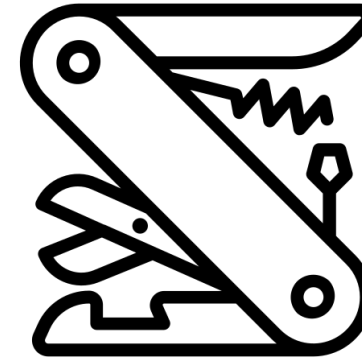


Privacy-Utility Trade-off

Confidentiality



Utility



Privacy loss Budget ϵ

Differential Privacy is a tool to control the privacy-utility trade-off.



Statistical Reproducibility

Does noise addition prevent reproducibility?

Statistician's Answer

- Noise addition can be taken into account.
- Numbers are not reproducible but conclusion of the experiment is.

Pragmatic Answer

- Conclusion could be verified on data without noise.
- Only noisy results are published.
- Offer possibility to reviewers to reproduce the experiment without noise.



Lomas: a Public Good

Lomas is a public good, meant to be shared and reused!

- Open source
- Based on standard tools and libraries



Lomas for secondary use of data

Pilot project on real health data (hospitalization):

- Partnership with 3 Swiss universities.
- Research questions using FSO's health data answered with Lomas.
- Secure deployment on federal infrastructure.

Aim

Demonstrate the FSO's ability to create and operate a platform for the secondary use of sensitive data.



Research Project 1: Unisanté

Childbirth practices in Switzerland

The project aims to analyze the evolution of **cesarean section** (CS) practices based on various demographic, socioeconomic, and temporal factors. In particular, we aim to determine whether these **practices vary on weekends and public holidays**, which could be linked to fluctuations in hospital resource availability in Switzerland.

- Is there a pattern of reduced births on weekends and public holidays, and to what extent is this influenced by CS scheduling practices or individual characteristics?
- How do CS delivery patterns respond to school admission thresholds, and are these patterns influenced by individual characteristics?



Research Project 2: UZH

Multiple Sclerosis

The project aims to understand how the frequency, nature, and reasons for hospitalizations change in the years before and after a **Multiple Sclerosis (MS) diagnosis**.

- What is the number of MS diagnosis per year?
- What is the mean number of hospitalization per year before and after diagnosis?
- What are the comorbidities 5 years before versus after a diagnostic of MS?



Research Project 3: ZHAW

Prostate Cancer and Radical Prostatectomy (RP)

The project aims to understand the evolution of the practice of **radical prostatectomy** as treatment for prostate cancer and its impact on survival and subsequent treatments.

- What is the evolution of the inpatient treated prostate cancer prevalence?
- What is the evolution of prostate cancer treated with RP in Switzerland?
- What is the mean/median survival after RP?
- What are the subsequent outpatient treatments after RP?



Resources

Lomas [documentation](#) provides extensive explanations for researchers, with detailed tutorials and explanation for all the supported DP libraries and queries.

All the code and other resources are available on [GitHub](#).



Governance Framework

- Data use is approved by «project».
- Explicit experimental design are requested at application time.
- If the corresponding disclosure risk is deemed reasonable, then the project is approved and access granted.

Utility-first

Determine the minimal privacy-loss budget that needs to be spent to ensure that reliable conclusion can still be drawn.



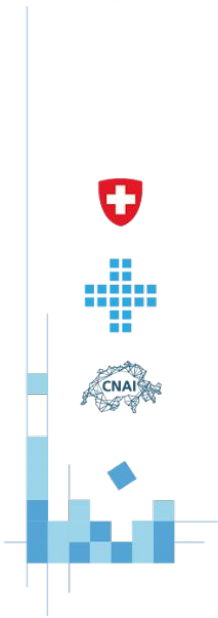
DigiSanté: Förderung der digitalen Transformation im Gesundheitswesen

Sekundärnutzung: Microdata Center (MDC)

Das volle Potenzial von Daten des BFS und der Bundesverwaltung sowie deren Verknüpfung mit externen Daten soll durch ein weiterentwickeltes Angebot für die Sekundärdatennutzung (Microdata Center) ausgeschöpft werden.

Dauer: 2025 - 2029

Projektgrösse: XL



Ziele

- Aufbau und Betrieb eines Microdata Center (MDC) am BFS
- Verknüpfung von externen und internen Daten
- Einsatz von gesicherten virtuellen Arbeitsumgebungen und Differential Privacy ermöglichen die datenschutzkonforme Analyse der Daten bei Fernzugriff
- Erfahrungswerte zur Weiterentwicklung der gesetzlichen Grundlagen für die Sekundärnutzung von Daten in der Schweiz

Source :

<https://www.digisante.admin.ch/de/sekundaernutzung-microdata-center>

Lomas & DigiSanté: Microdata Center (MDC)

Context Switzerland's national programme for digital transformation in healthcare (2025–2029).

Objective

- Build and operate a Microdata Center at the FSO
- Link FSO data with external datasets
- Enable privacy-compliant remote analysis using Differential Privacy

How Lomas fits in

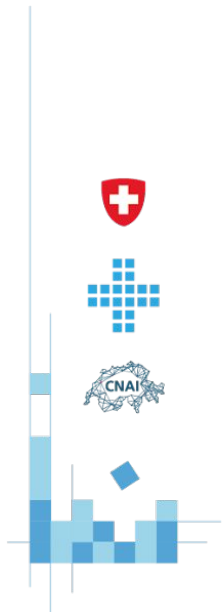
Lomas provides the Differential Privacy layer – researchers run analyses on sensitive health data without ever accessing it directly.

Benefits

- Data stays under FSO control
- Scales to growing research demand
- Verifiable privacy, not a black box

New solution

Applying differential privacy methods to enable analysis on sensitive data.



Can We Trust What We're Not Allowed to See?

Data feeds models. Models inform decisions. Decisions shape public policy.

Sensitive data cannot and should not be widely accessible.

So how do we ensure trust?

Eyes off the data.


Eyes on the methods and the infrastructure.





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Thank you for your attention. Thanks to the DSCC team for their support in putting this presentation together.



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