ETH-RAT

SDSC

SWISS DATA SCIENCE CENTER
A DIGITALIZATION JOURNEY

Prof. Edouard Bugnion

Co-Academic Director, Swiss Data Science Center

Professor & Vice-President, EPFL

Open Data in Sciences Workshop, Brussels 31.01.2018

About me

18y

vmware Industry NuOVA CISCO

14y

Academia

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE

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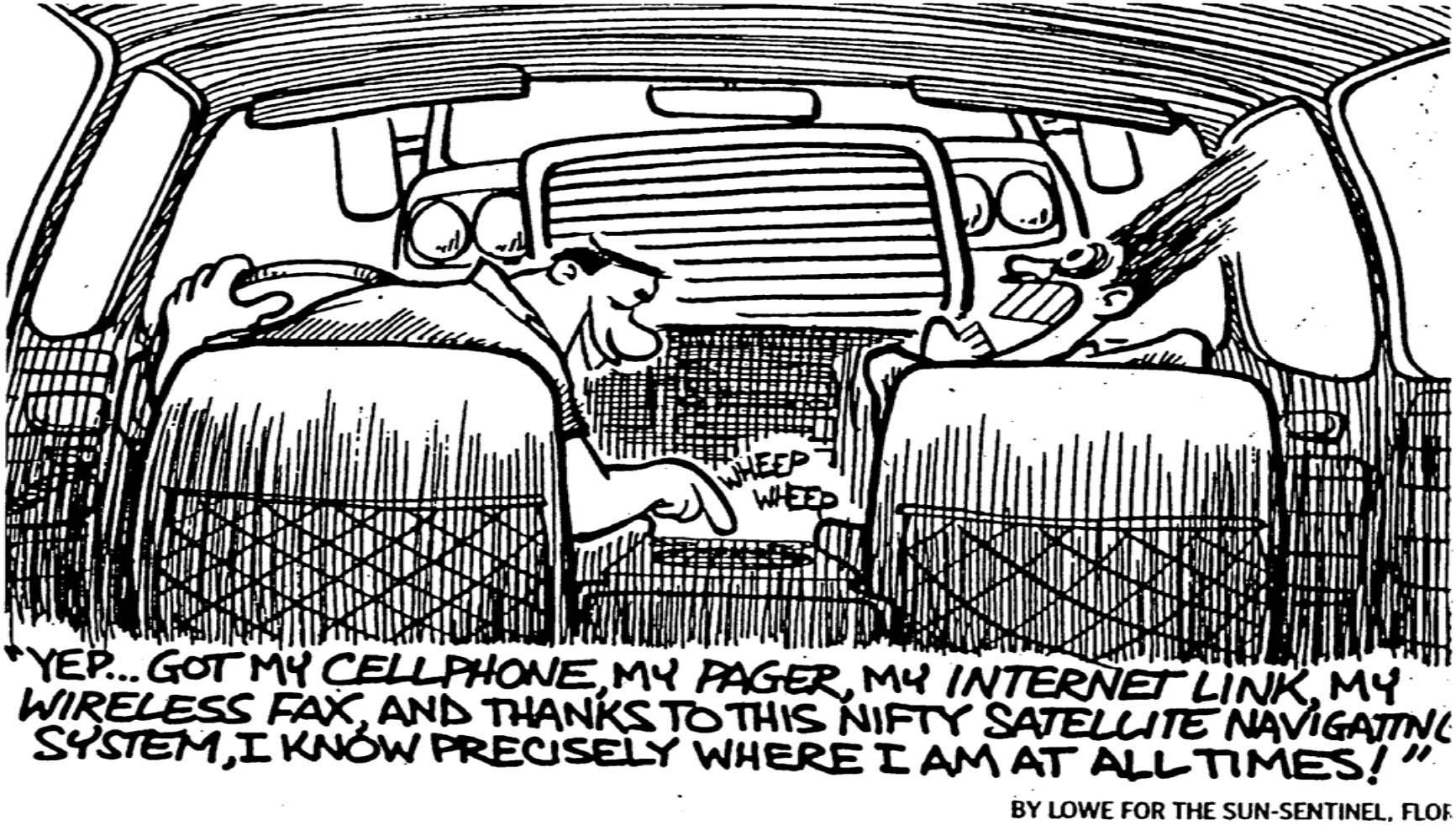
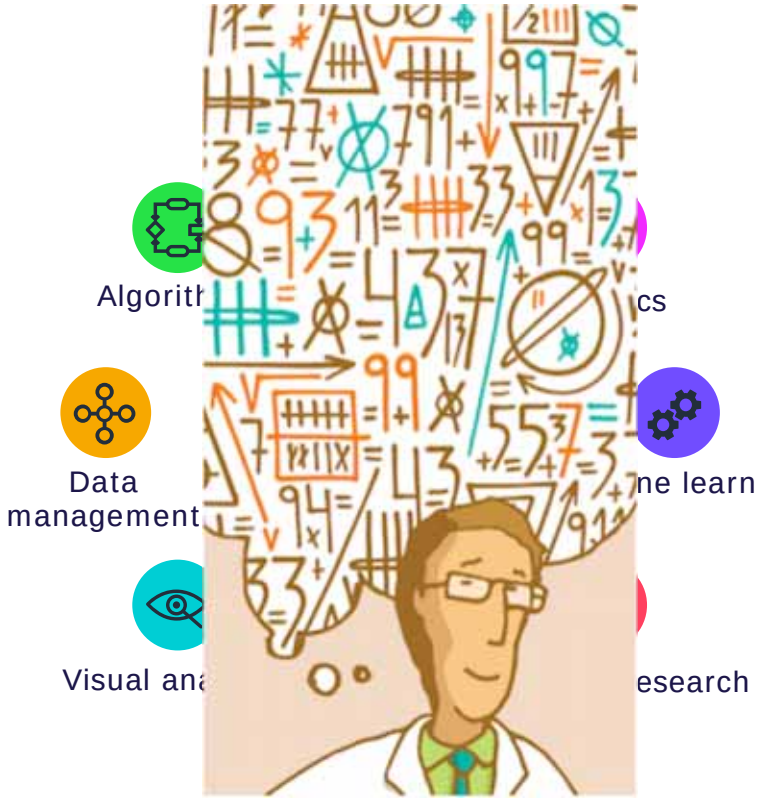
Big Data, Bad Data



A fragmented ecosystem



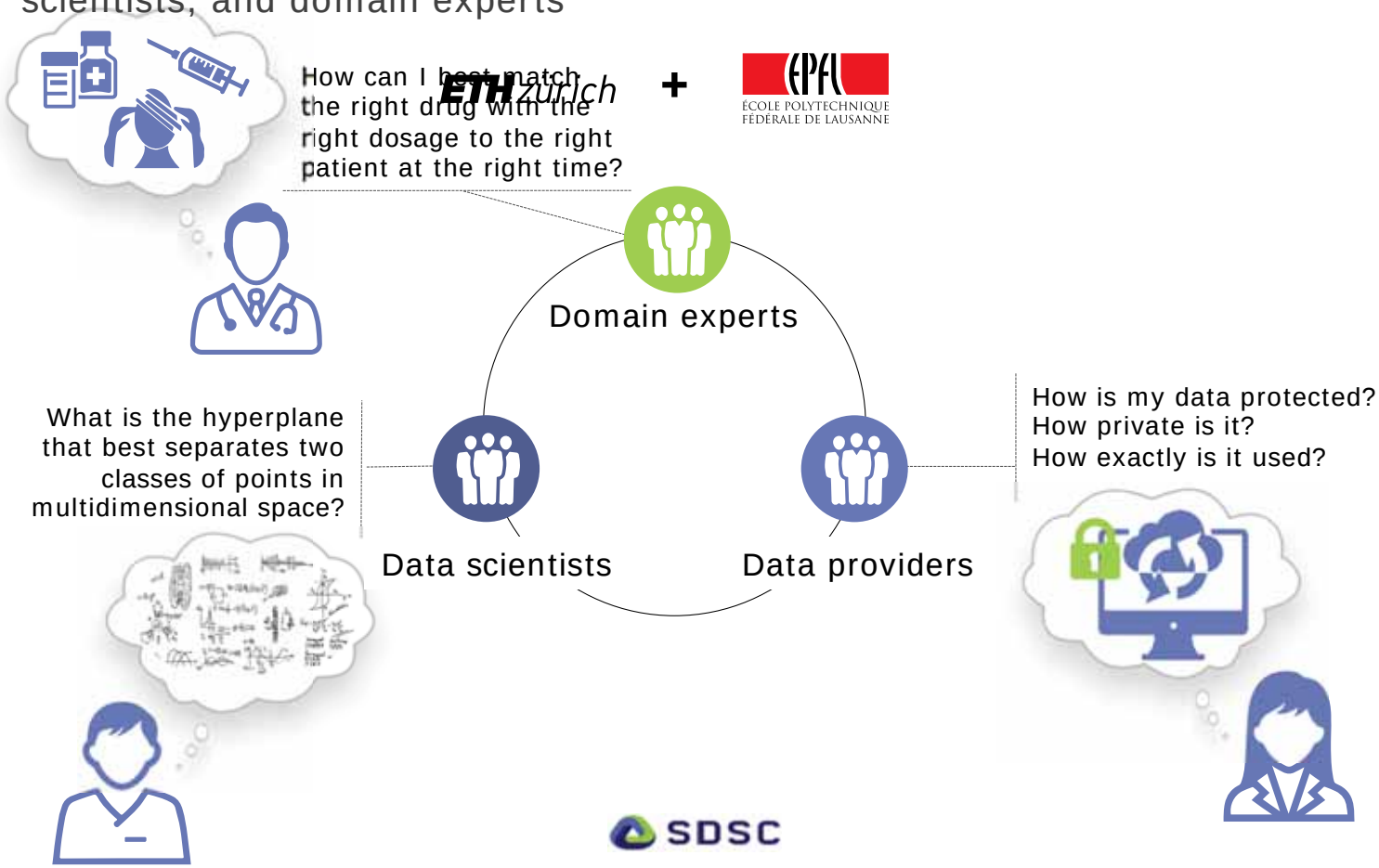
What is the hyperplane that best separates two classes of points in multidimensional space?

GAP

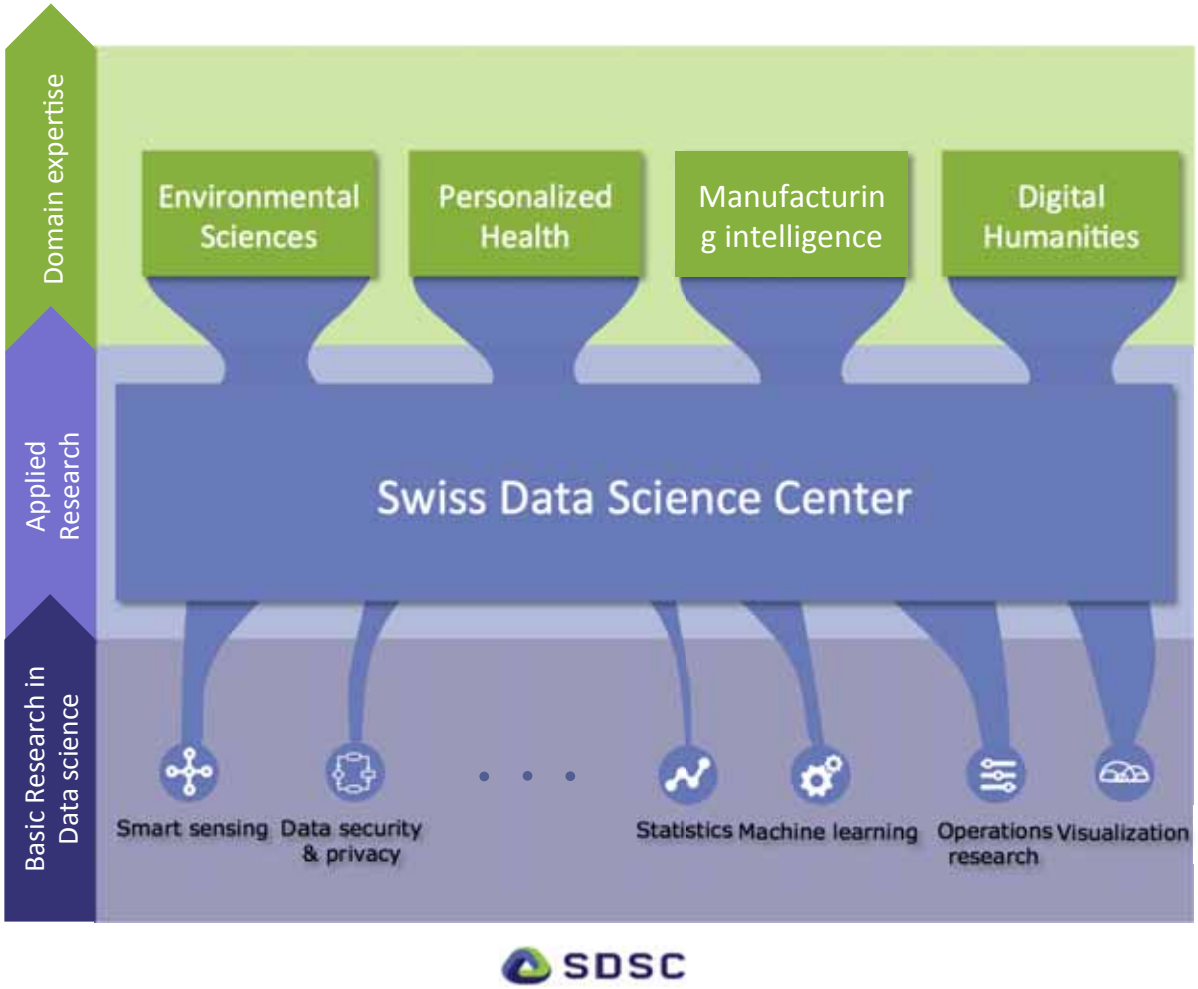
How can I best match the right drug with the right dosage to the right patient at the right time?

Swiss Data Science Center (SDSC)

Multi-disciplinary team of ~40 people from academia and industry
scientists, and domain experts



Where does SDSC fit?



What will the SDSC offer?

Embedded R&D collaboration

We engage in academic and industrial collaborations requiring large-scale distributed data processing (Big & Fast Data) and/or advanced analytics (machine learning & statistics) combined with an in-depth knowledge in select domains

Domain-specific Insights as a Service

We provide secure access to our cloud-hosted analytics platform - **RENGA**, a highly scalable open software platform offering a one-stop-shop for hosting and exploring curated, calibrated and possibly anonymized data at scale, at-rest or in-motion.

Open (Data) Science

RENGA offers user-friendly tooling and services to help with the adoption of Open Science, fostering research productivity and excellence.

SDSC Analytics Platform

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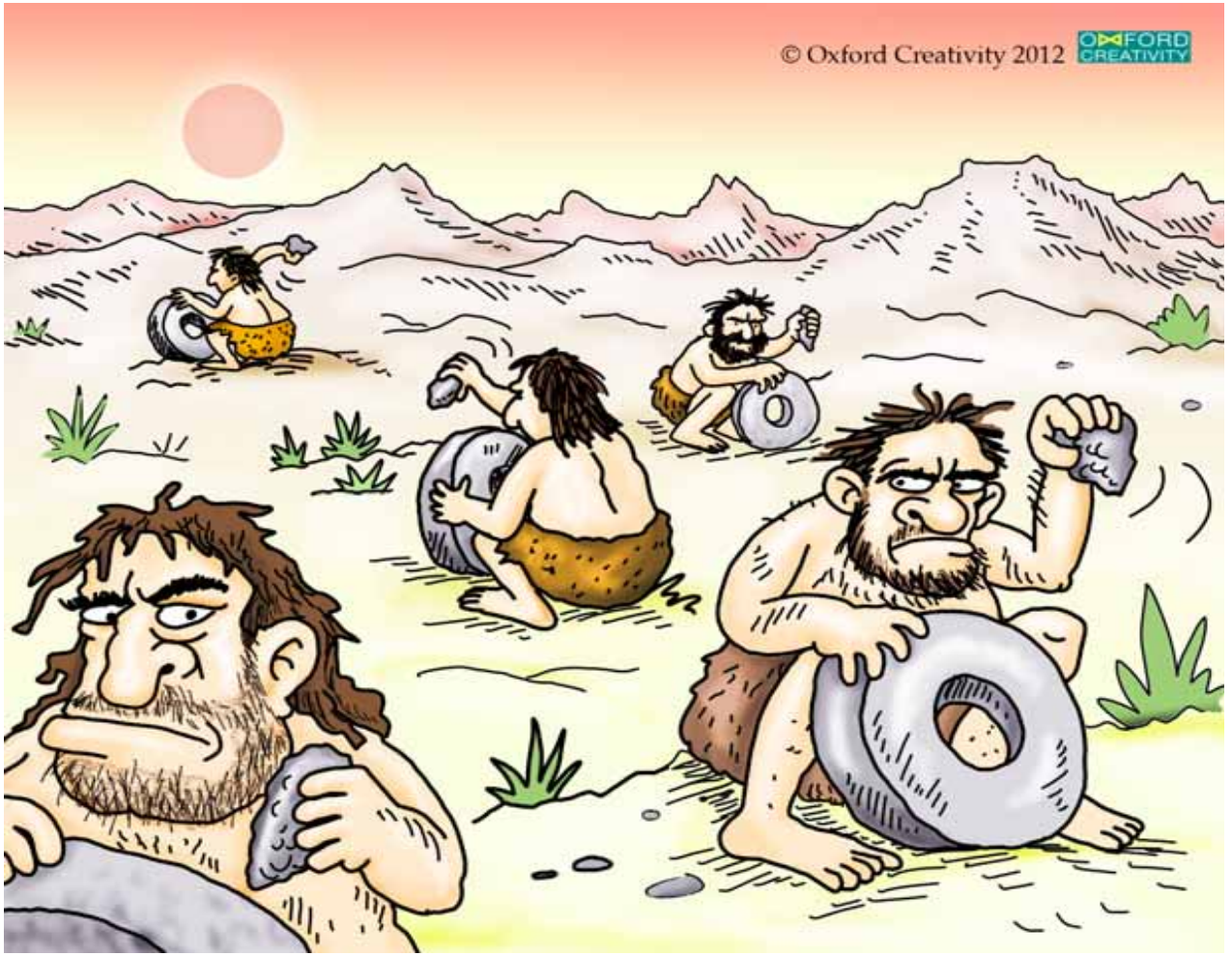
Status quo in Data Science

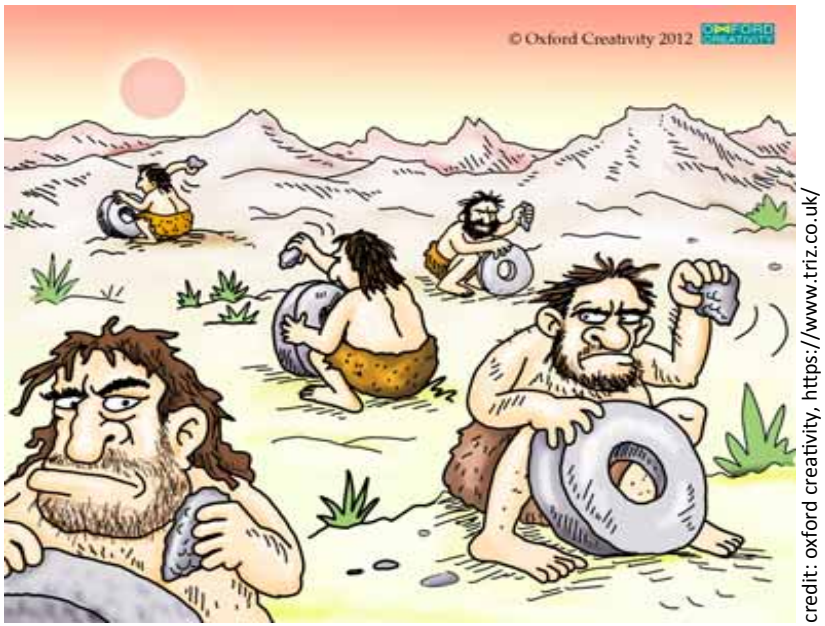


credit: oxford creativity, https://www.triz.co.uk/

Status quo in Data Science

1. Growing disconnect between actors in data science ventures
   - Work in silos, unaware of insights generated by others
   - Communication barriers, among humans & machines
2. R&D not always traceable / verifiable
   - Data and methods often not reusable

Scientific progress hampered by frequent re-inventions of the wheel

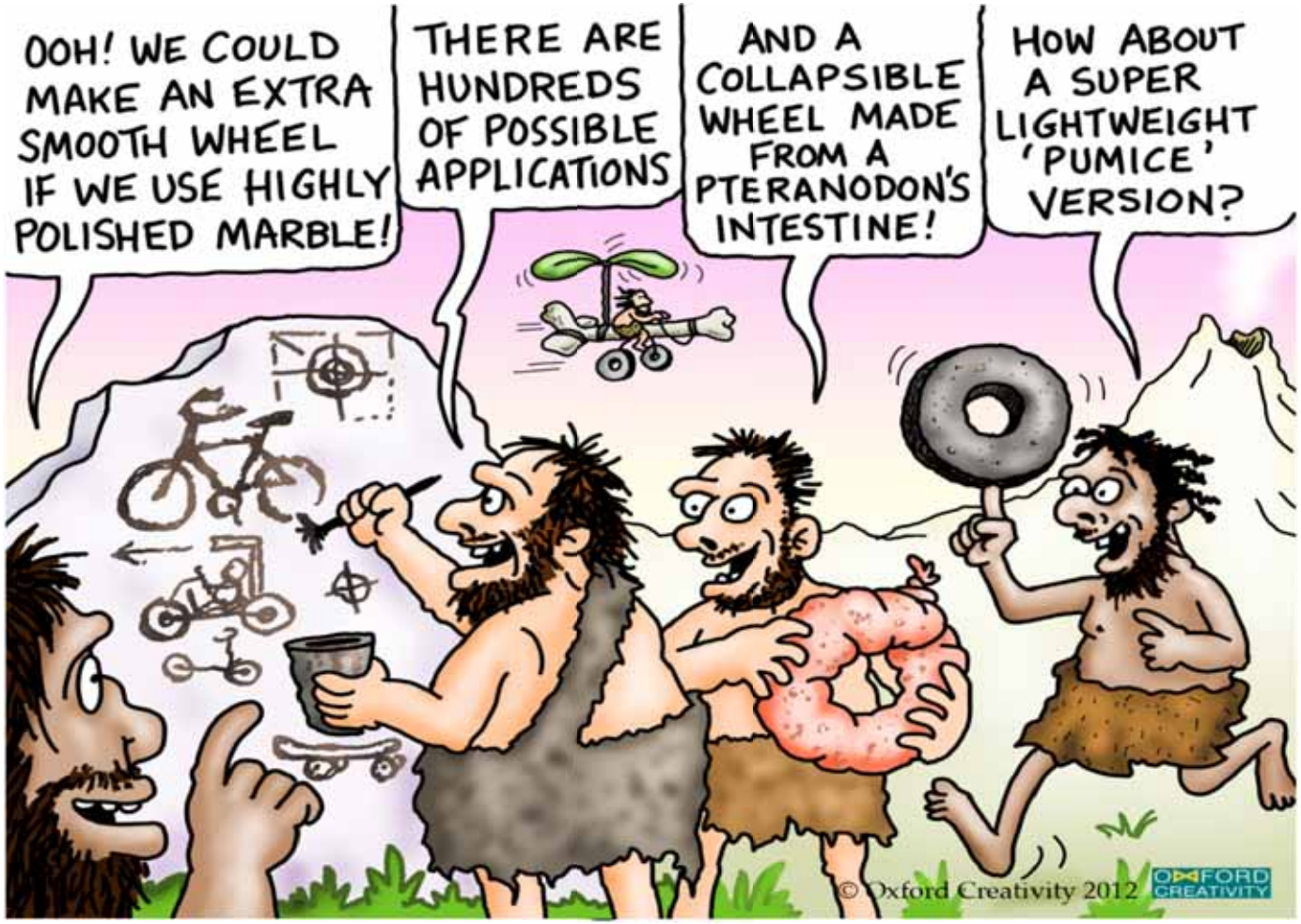


credit: oxford creativity, https://www.triz.co.uk/

Facilitate communication to foster innovation

credit: oxford creativity, https://www.triz.co.uk/

Foster multidisciplinary collaborations



credit: oxford creativity, https://www.triz.co.uk/

RENGA – SDSC Analytics Platform

Renga (連歌), *plural* **renga**, *a genre of Japanese linked-verse poetry in which two or more poets supply alternating sections of a poem linked by verbal and thematic associations.*

—Encyclopædia Britannica

- RENGA is a highly-scalable & secure open software platform designed to foster multidisciplinary (data) science collaborations across mutually untrusted academic / industrial institutions
- The platform allows practitioners to:
  - Securely manage, share, find and process large-scale data across untrusted parties operating in a federated environment
  - Collaborate, recommend, share and discover new insights
  - Capture complete lineage automatically up to original raw data for detailed traceability and reproducible research
  - Adhere to FAIR principles and DMP mandate

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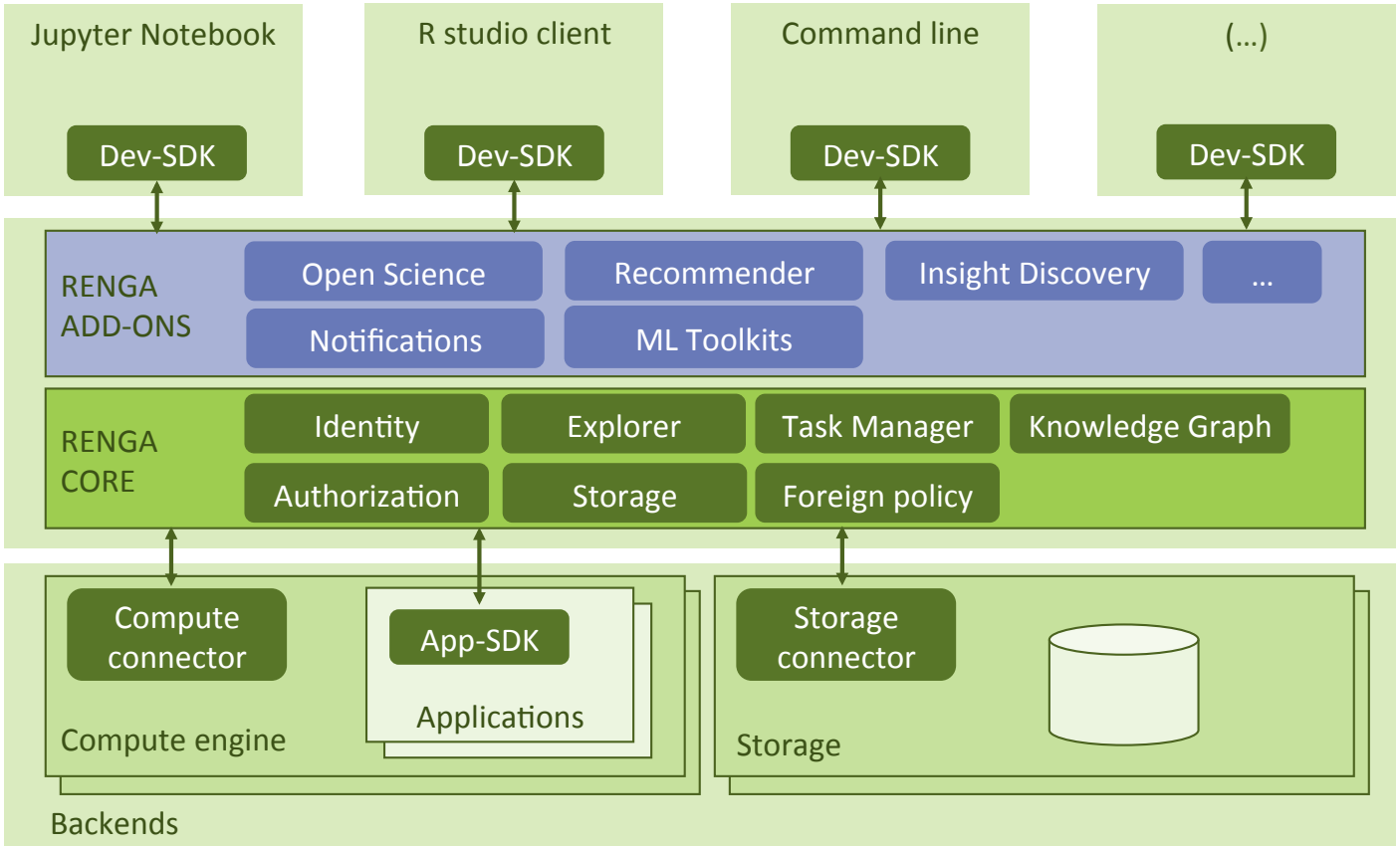
RENGA – Highly Modular Architecture



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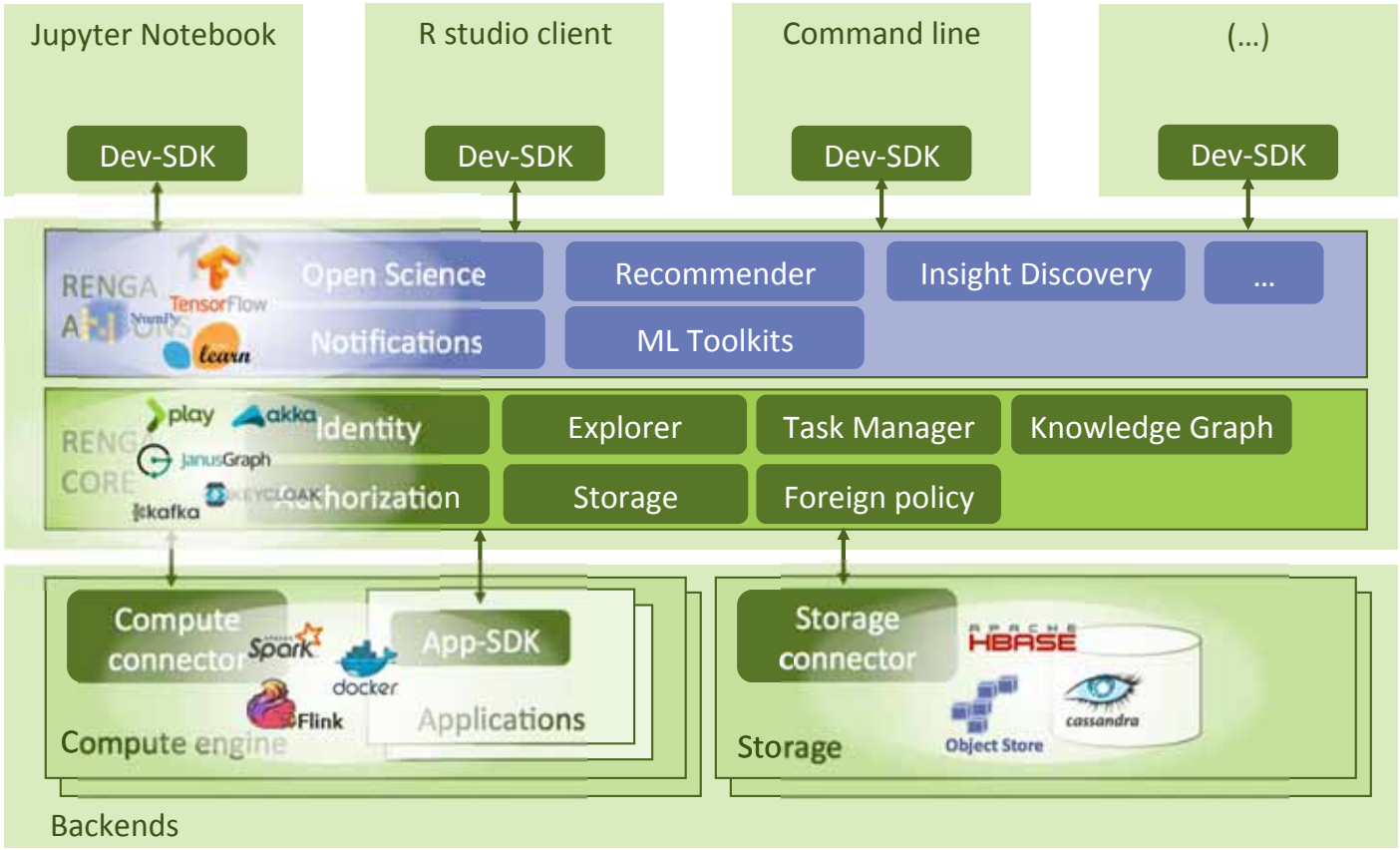
RENGA – Built on Proven Technology



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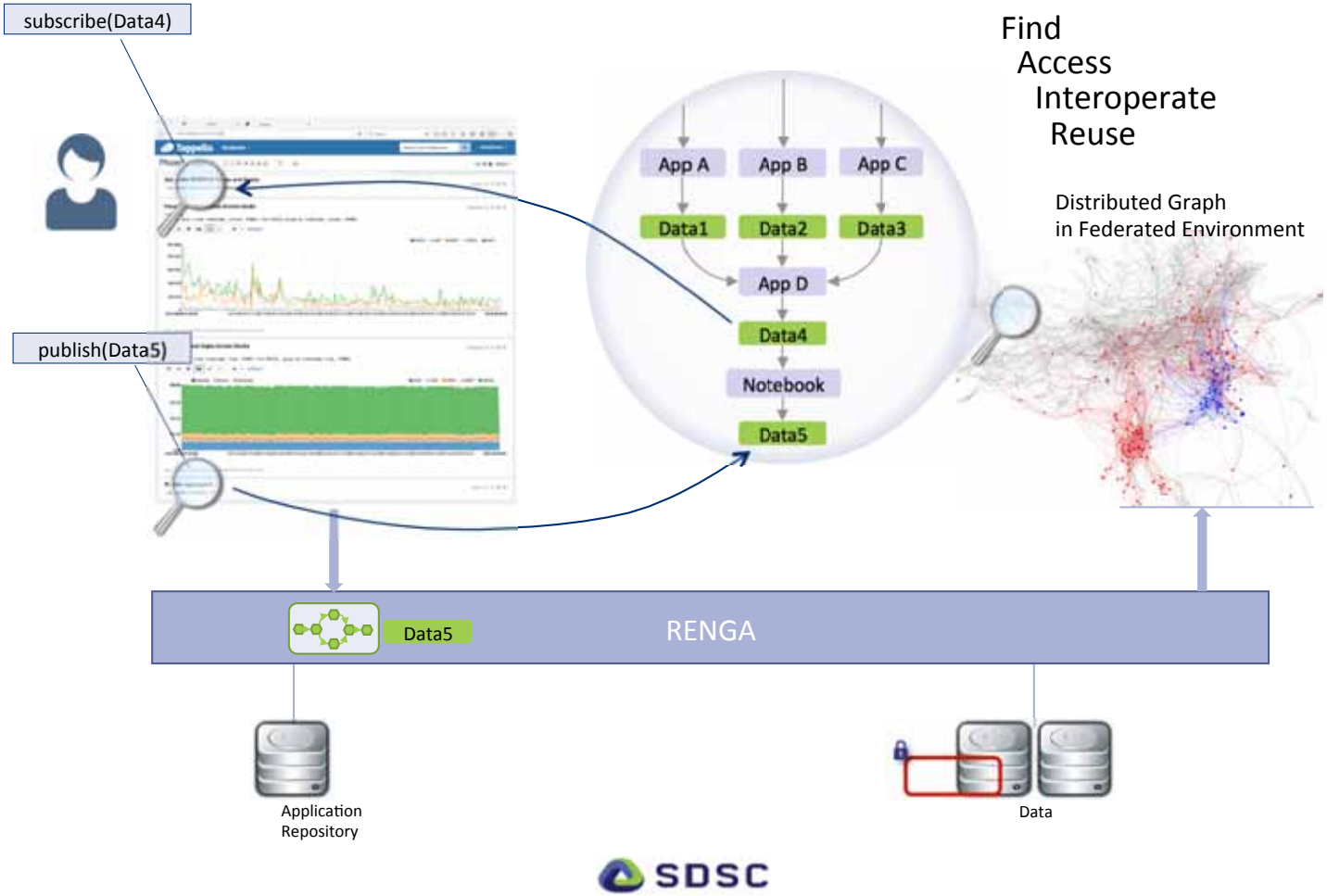
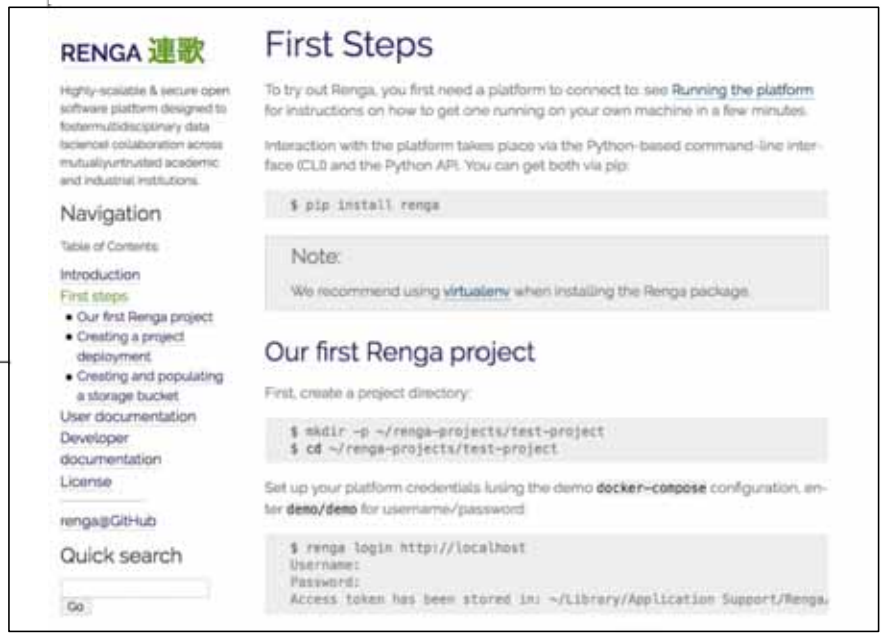
Lineage in Data Science



Available as Open Source (Apache v2)



http://get-renga.io

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Roamap – FEDERATED RENGA

- Open (Data) Science in an privacy-conscious world
- Controlled data sharing

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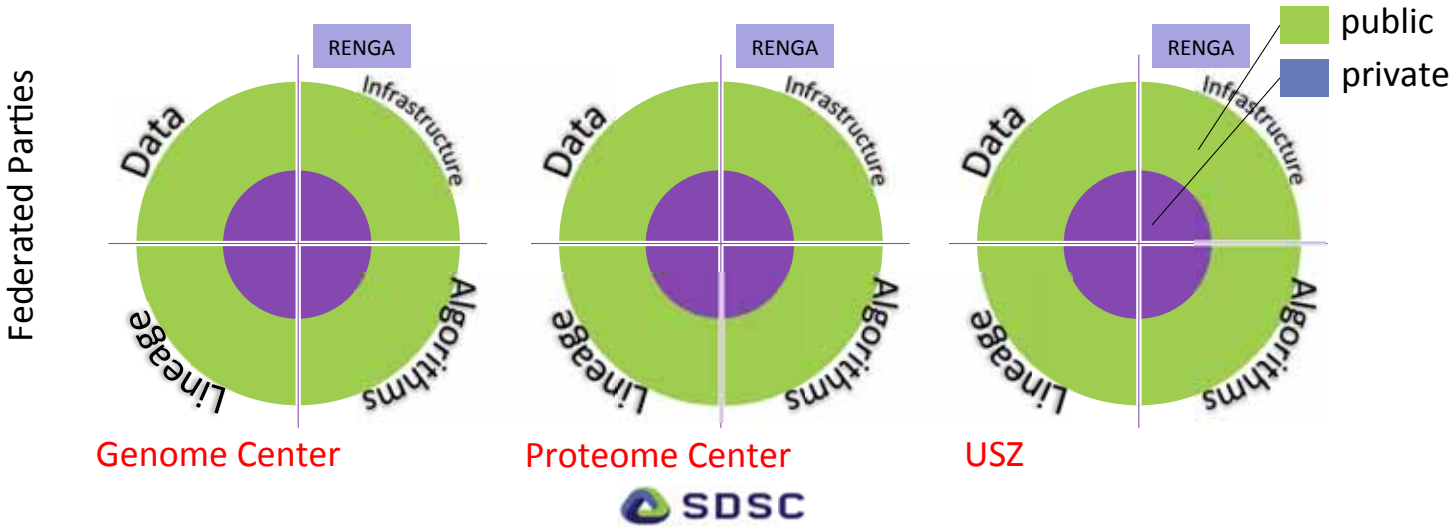
Use Case in Biomedical Research



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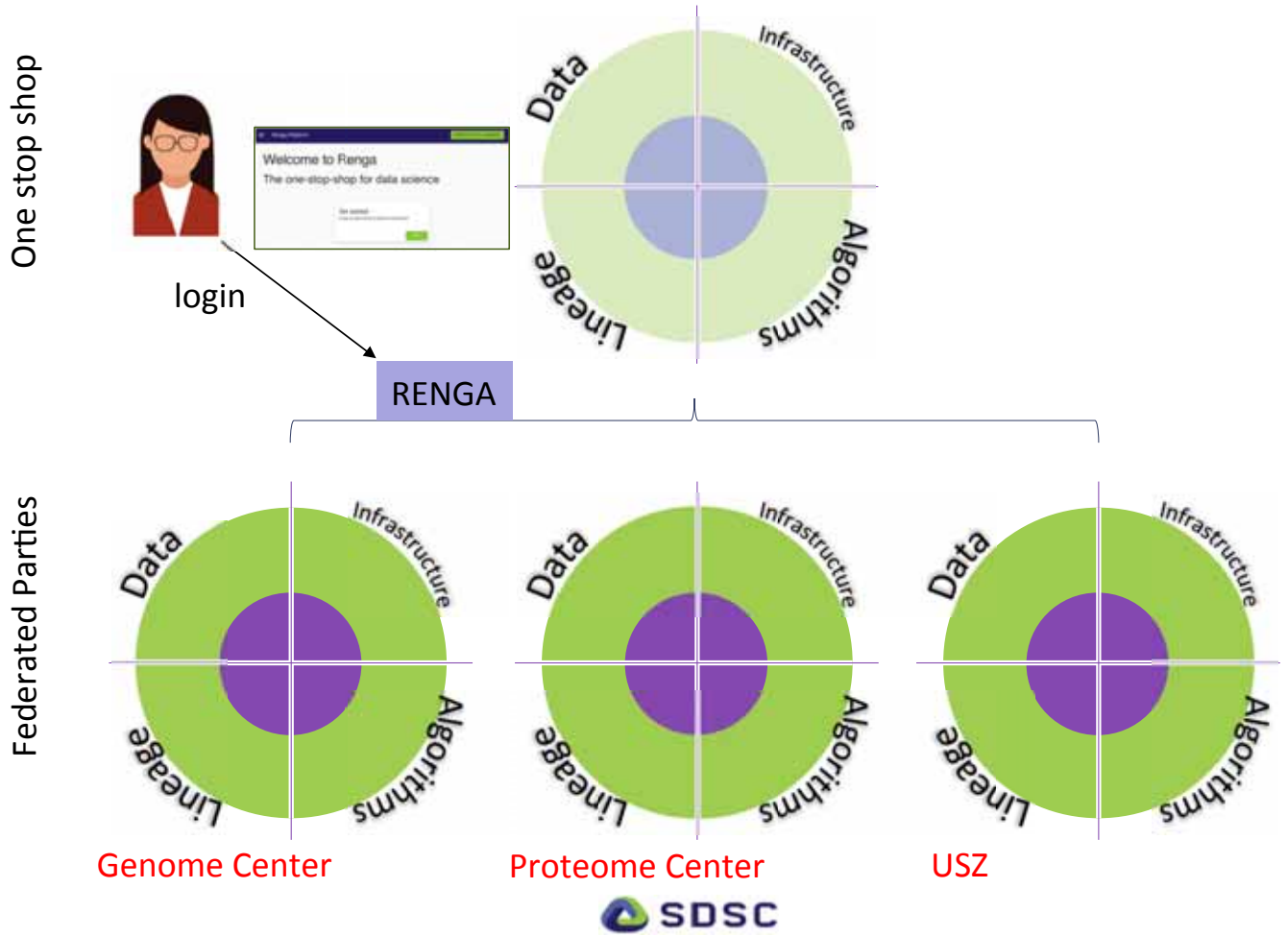

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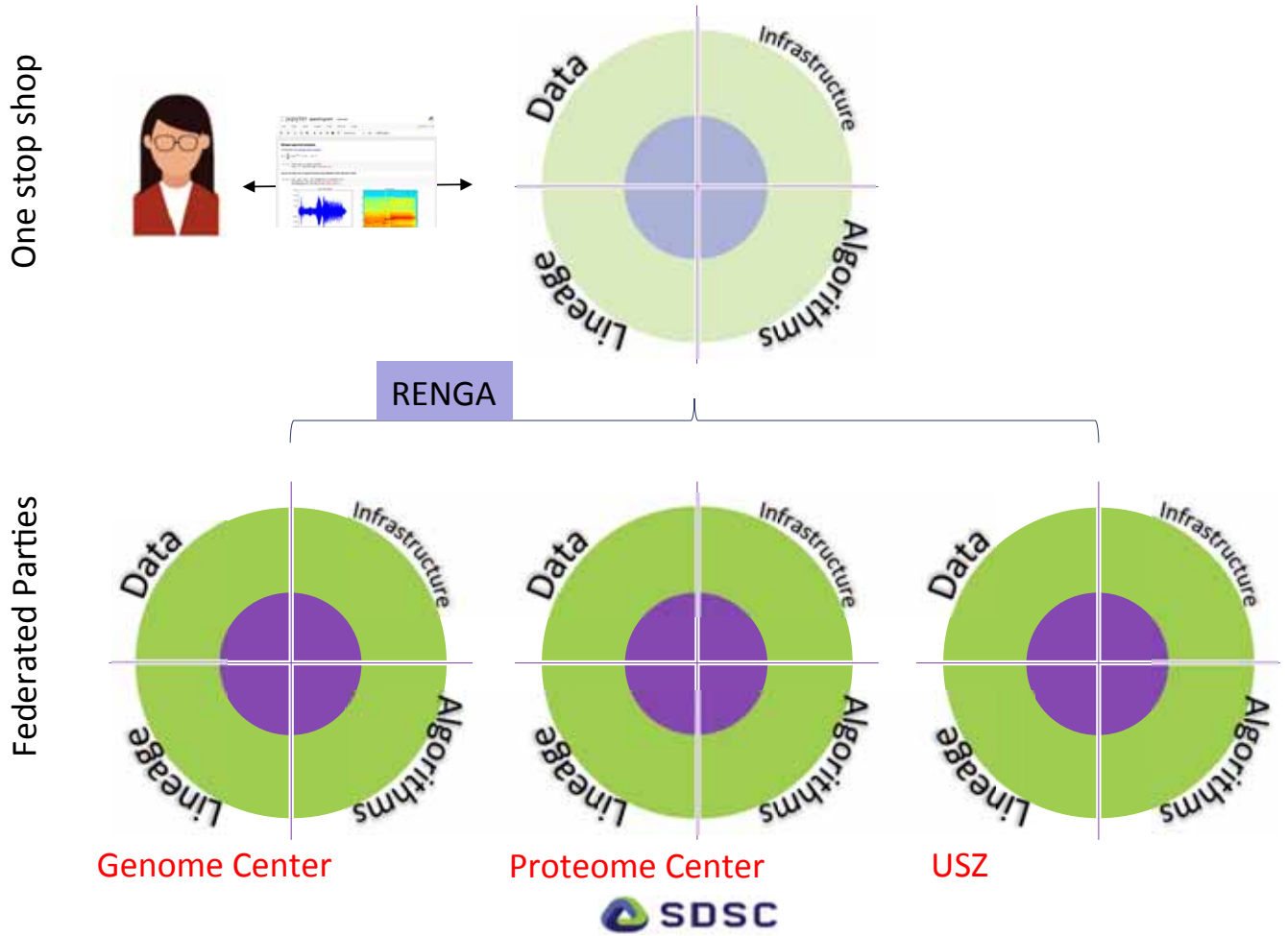

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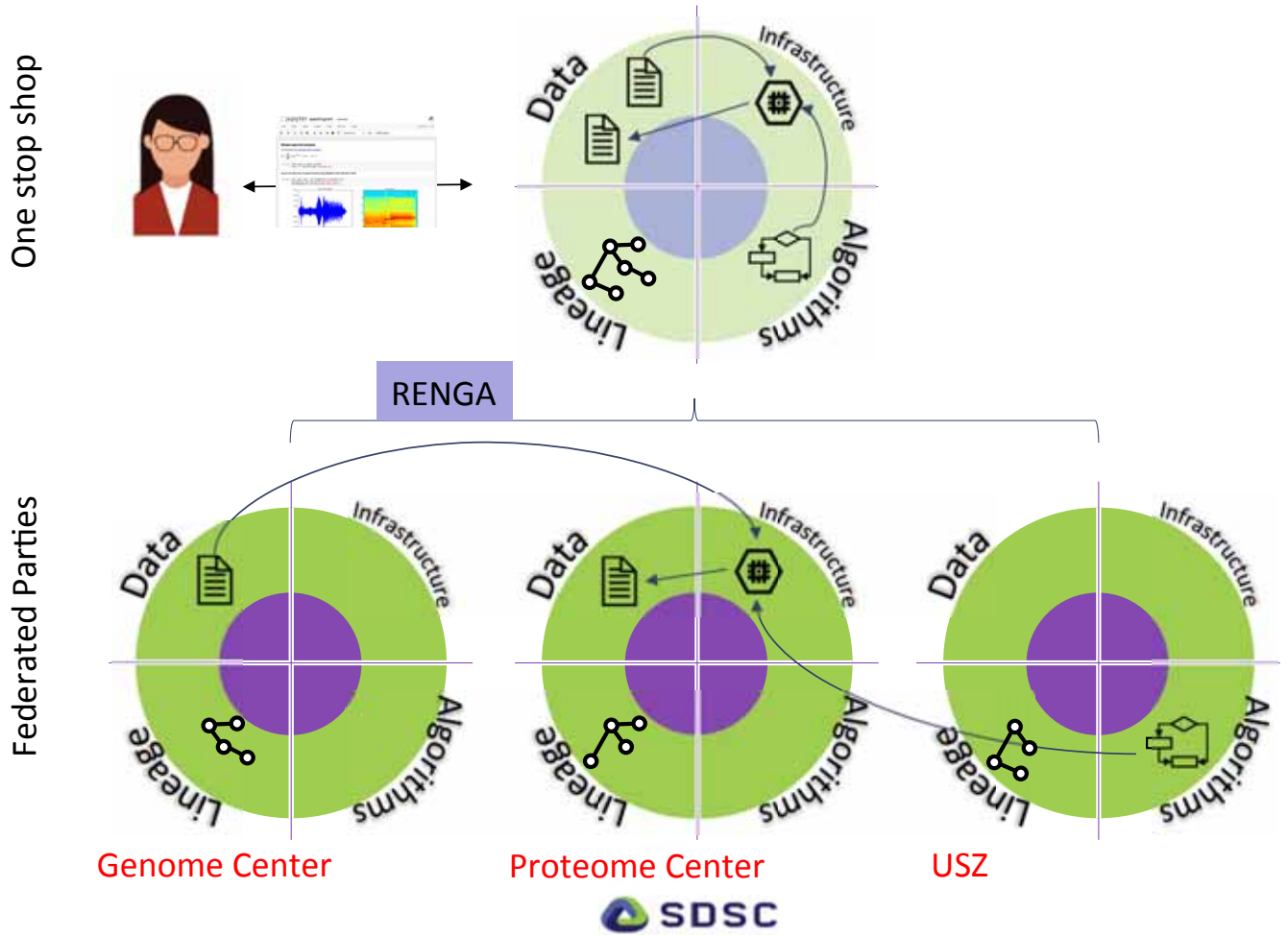

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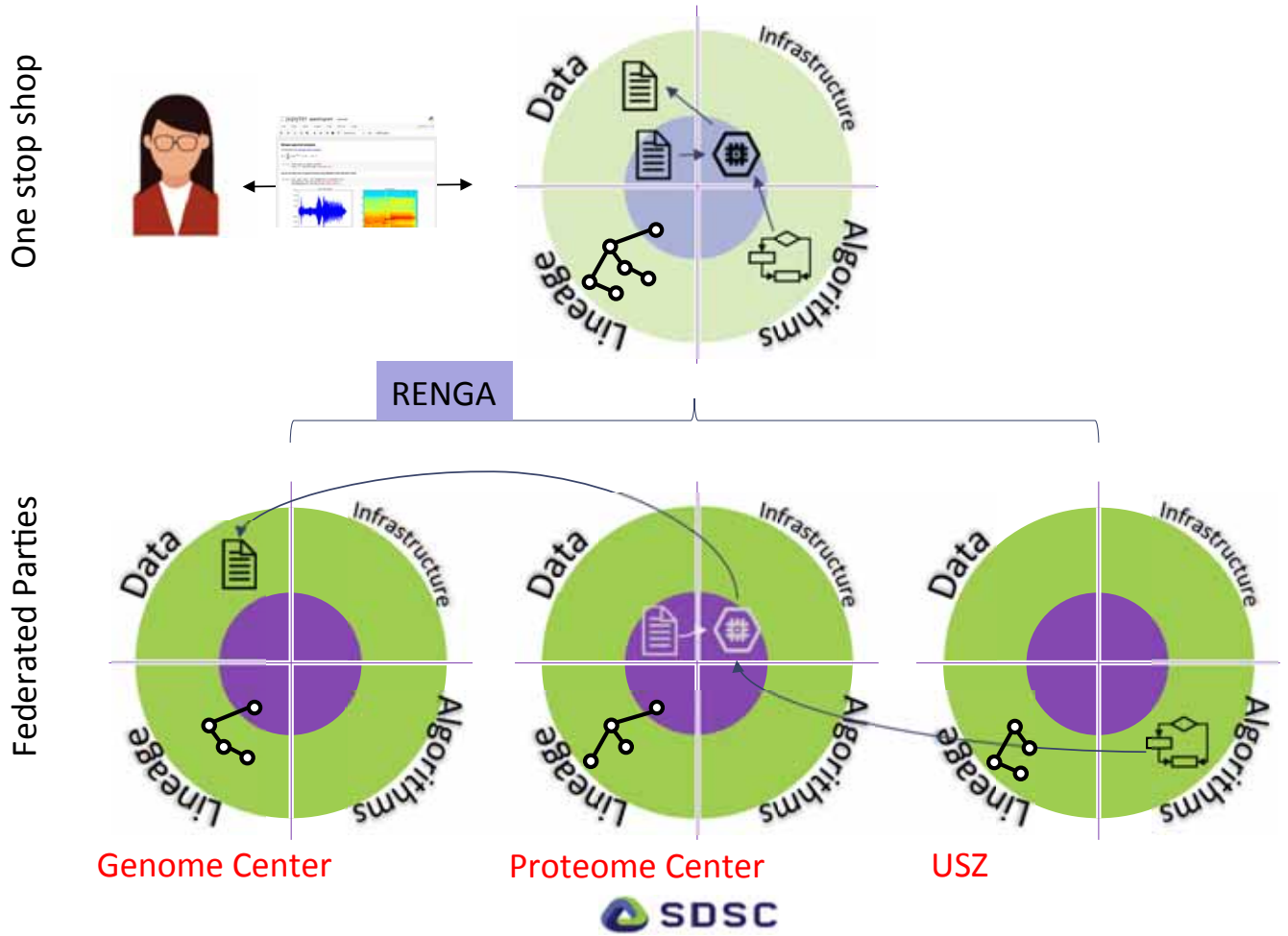

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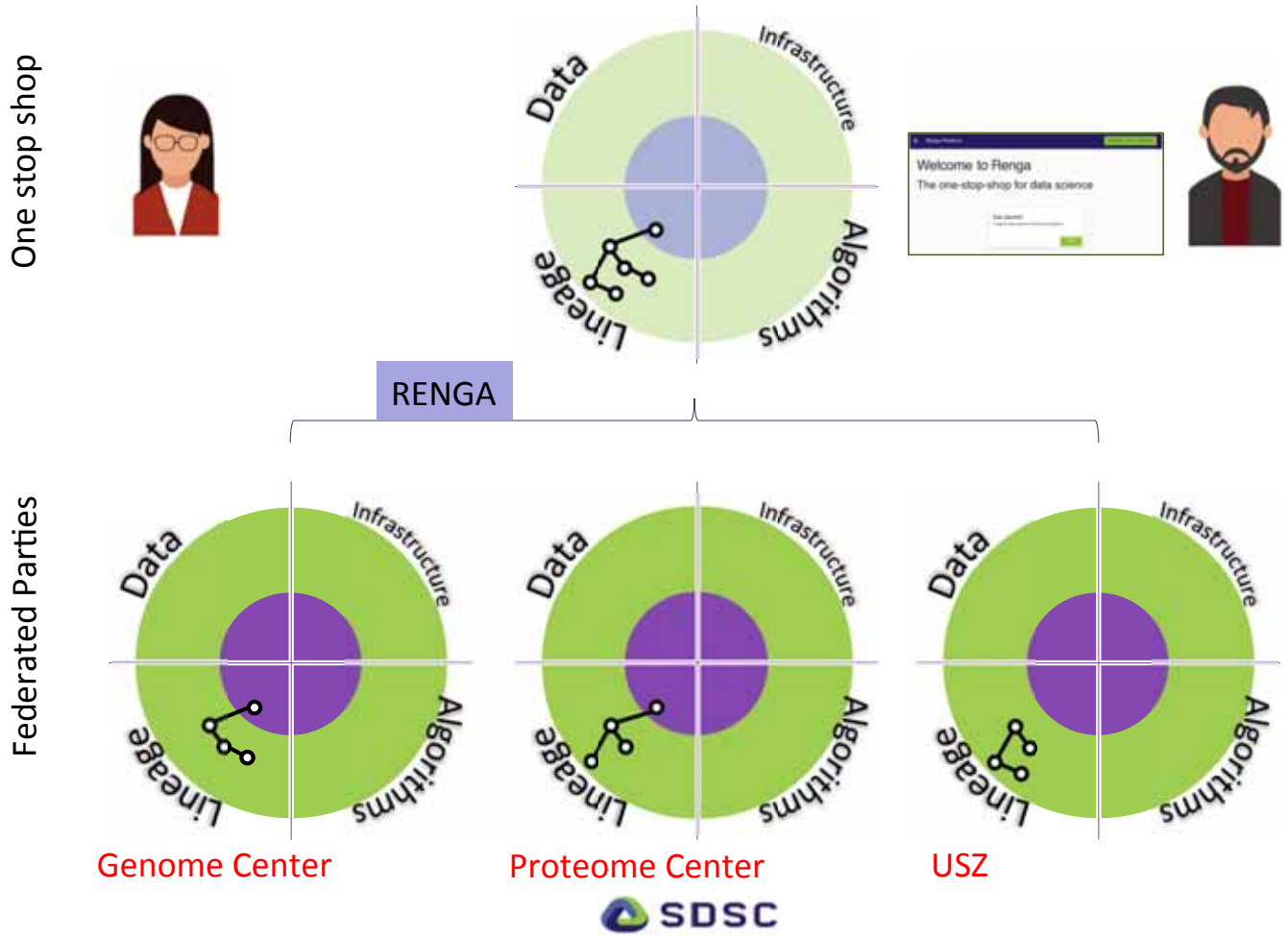

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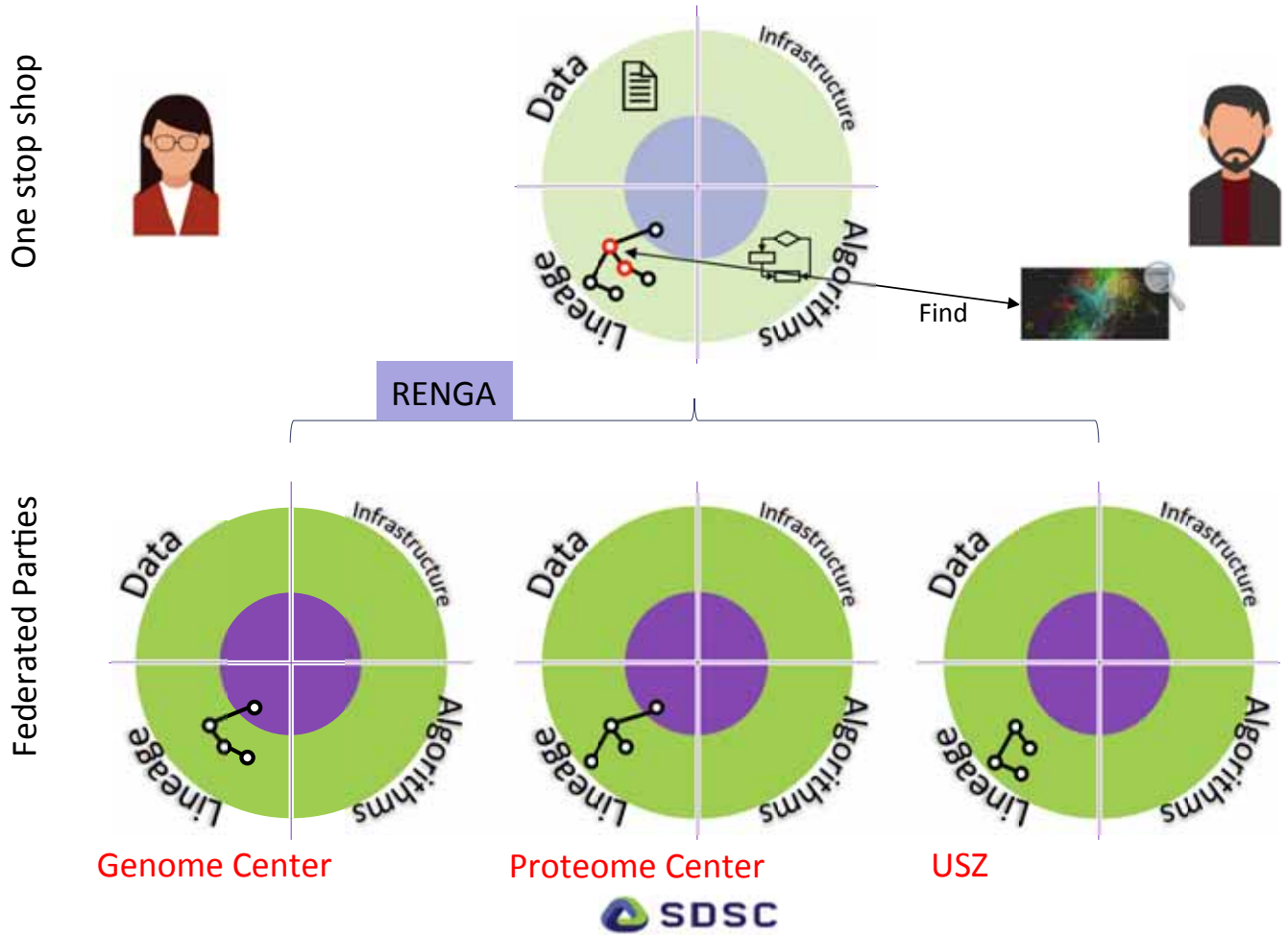

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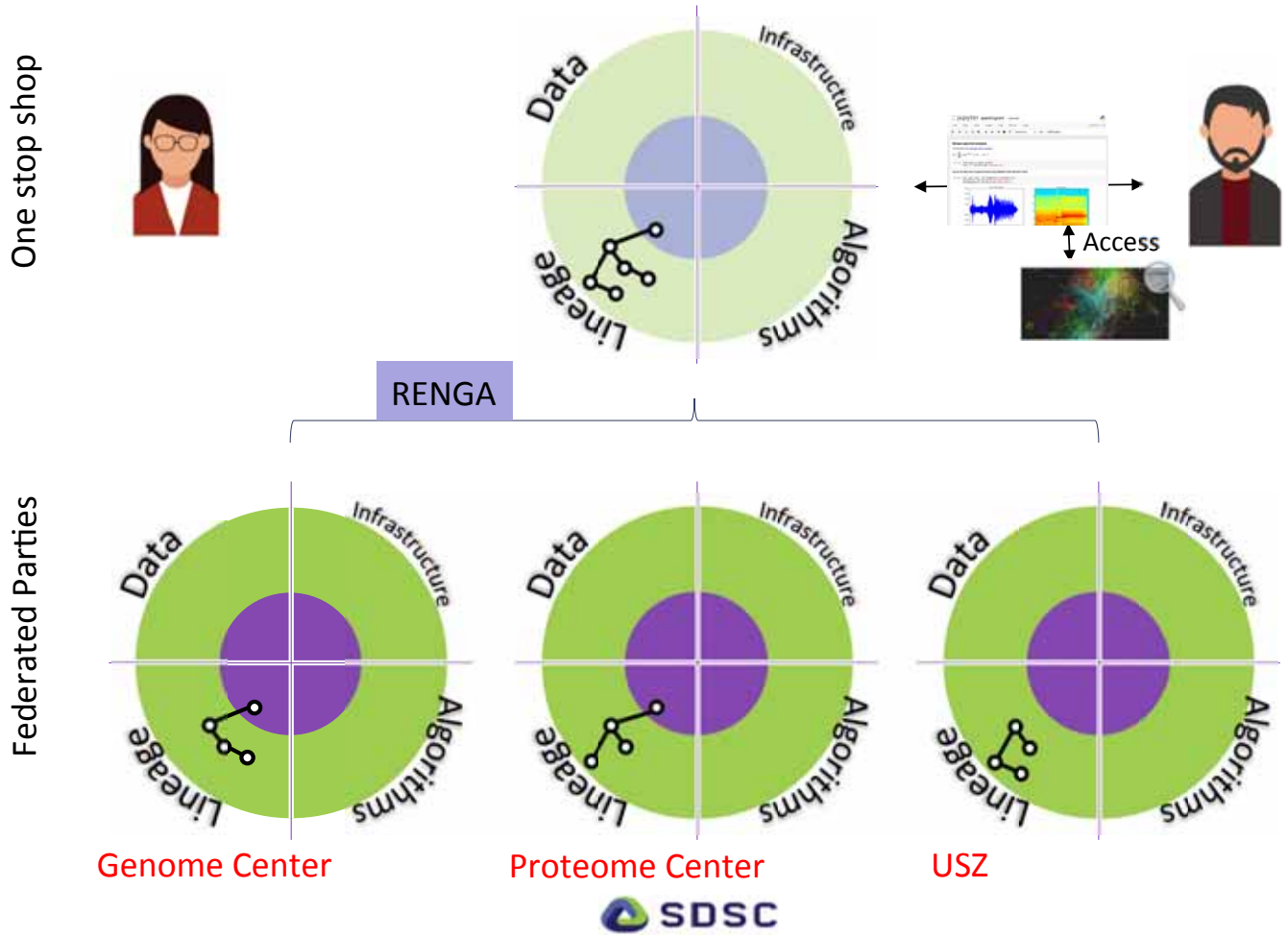

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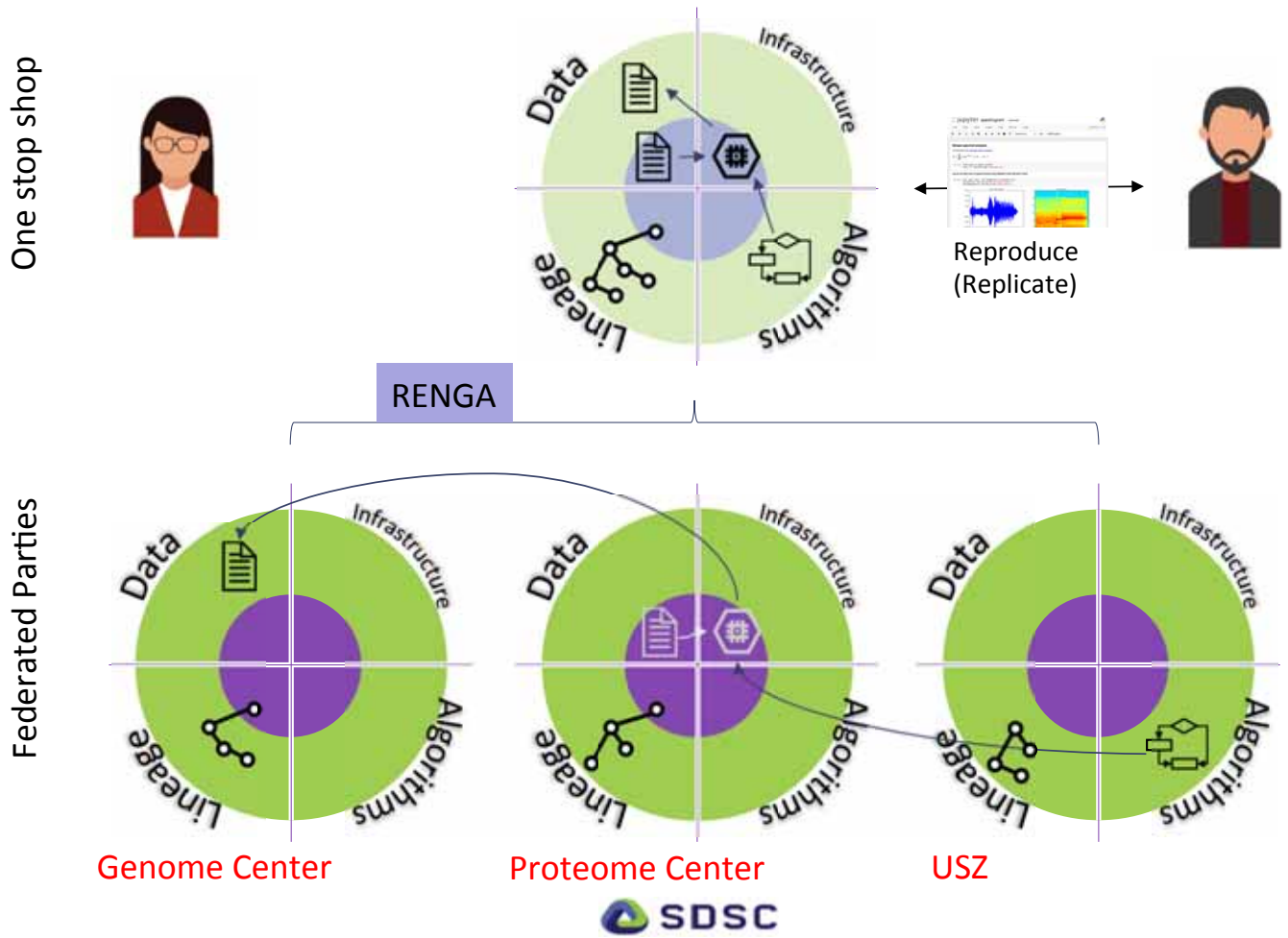

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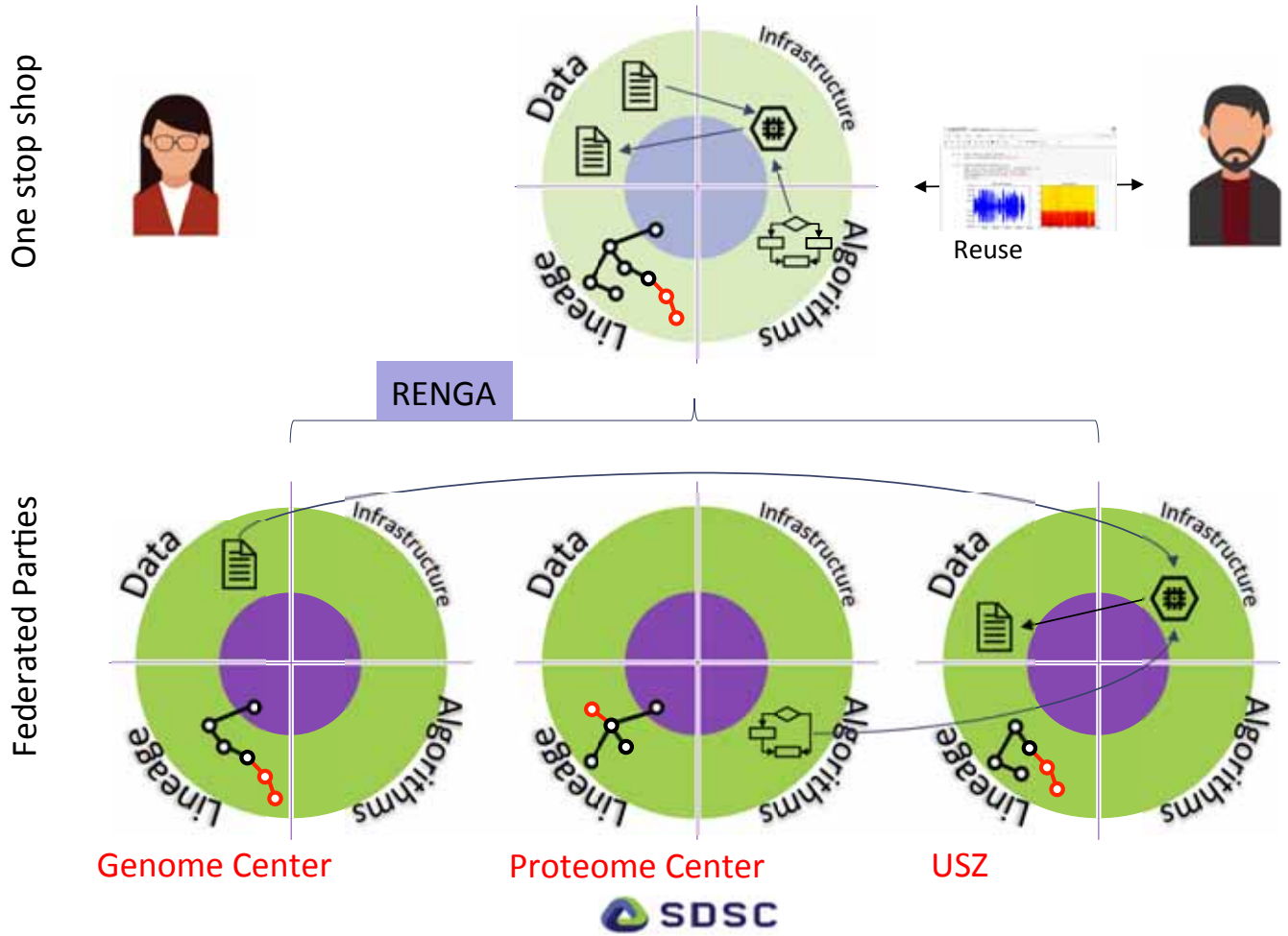

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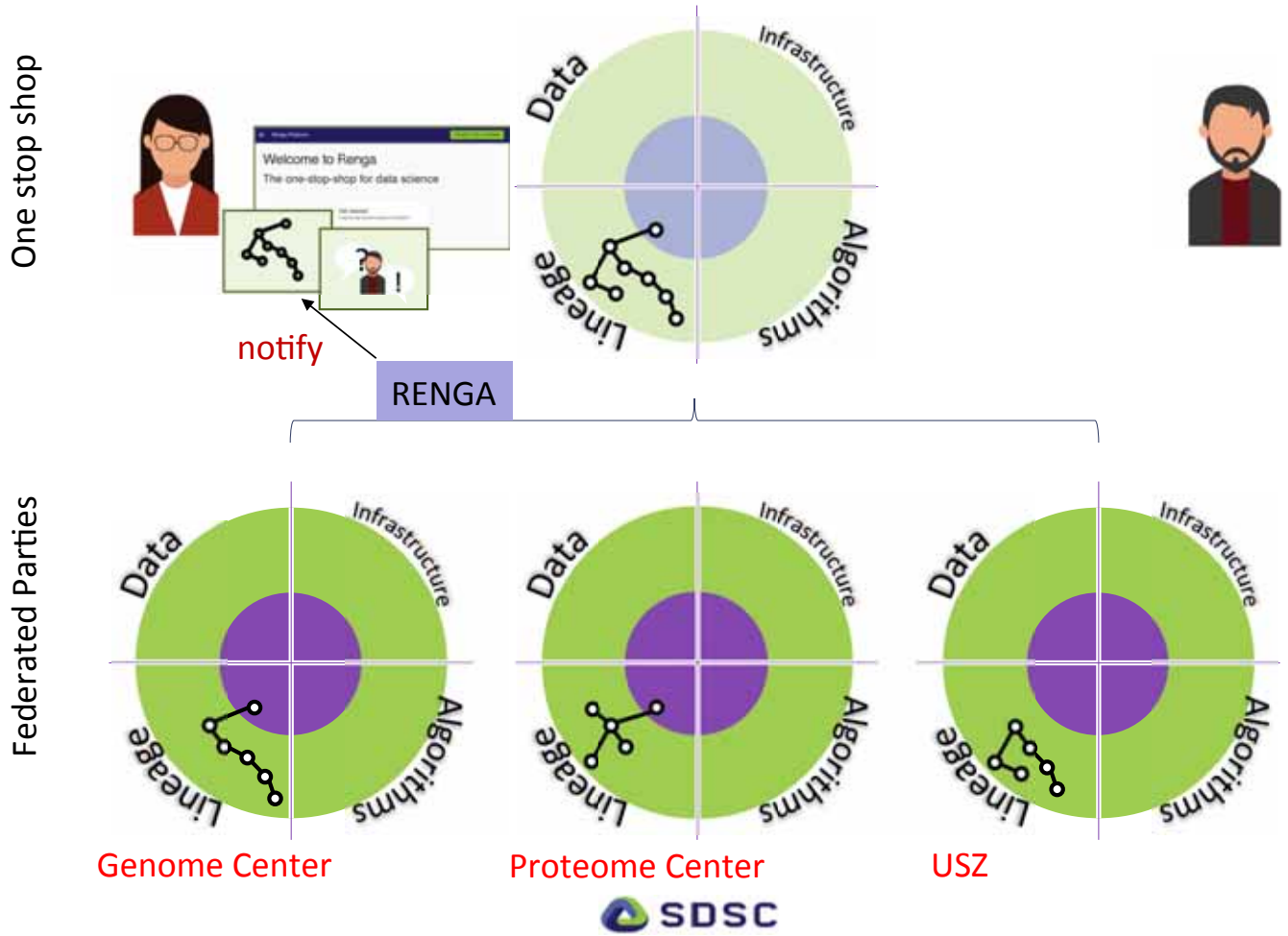
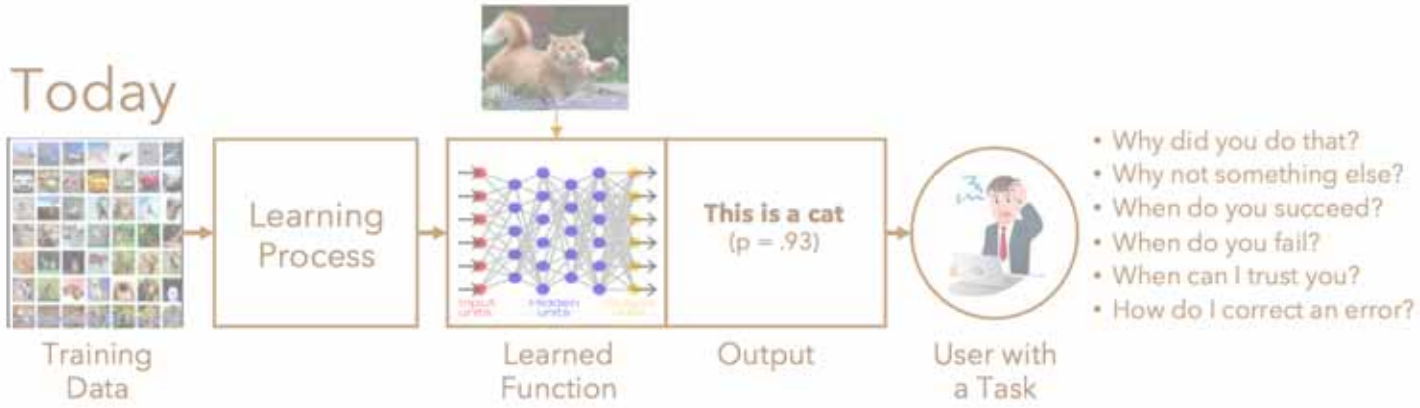
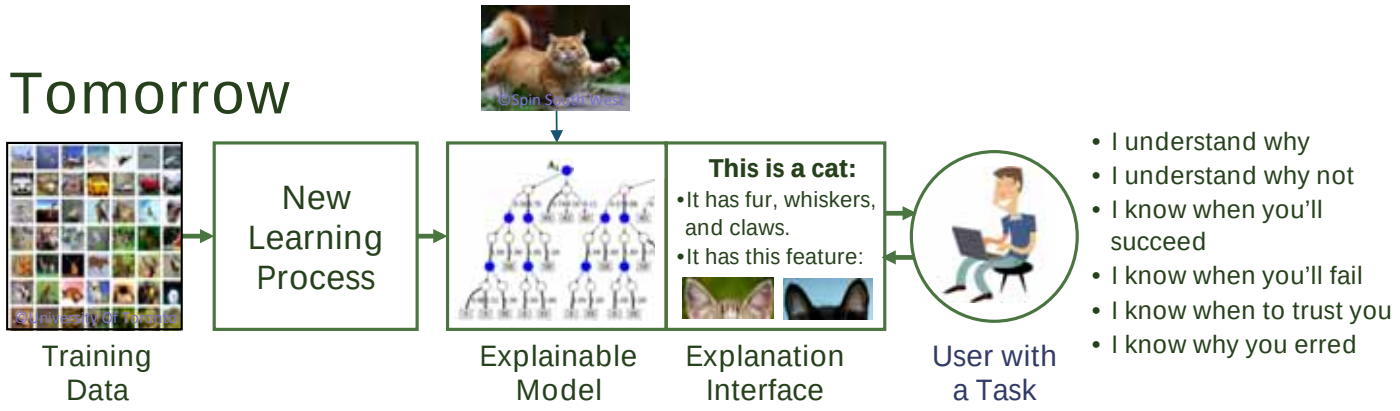


Explainable AI – What Are We Trying To Do?





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THANK YOU!

http://www.datascience.ch

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