

One SCE To Support Them All – Enabling Cross-Disciplinary Collaboration in a Modern Scientific Computing Environment

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PHUSE SDE | Basel
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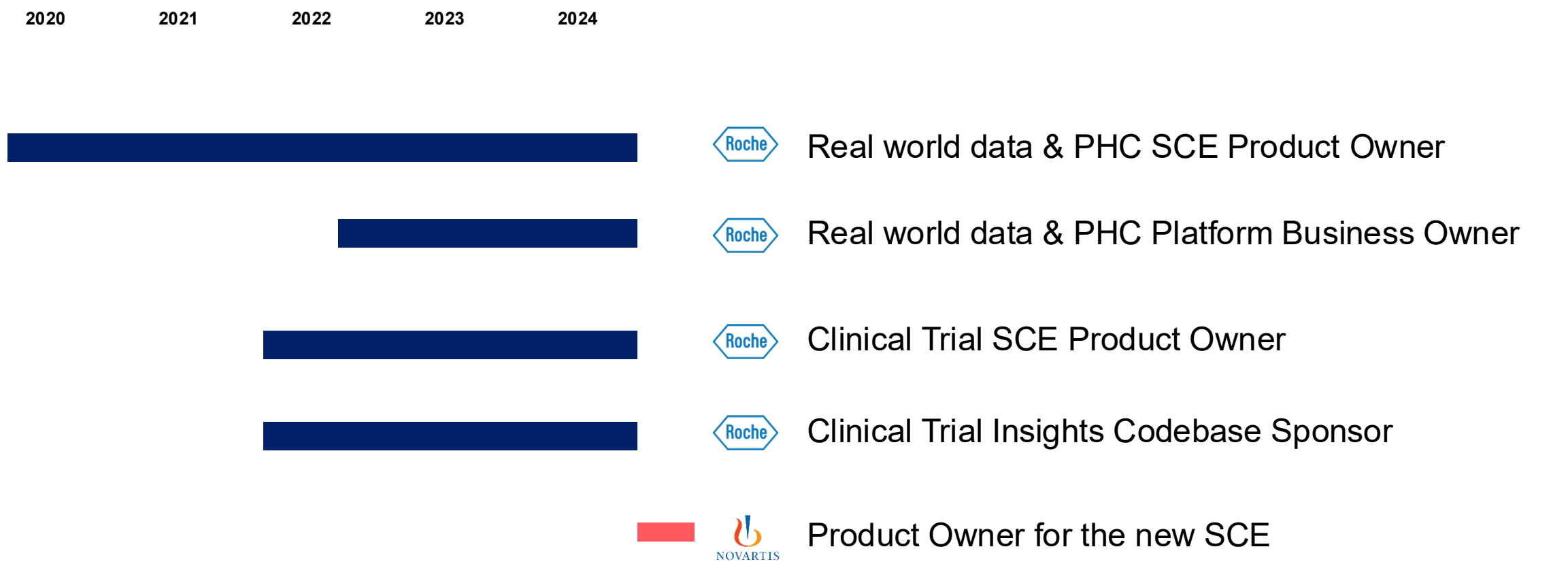


Agenda

1. Introduction
2. The evidence generation dichotomy
3. The shift to a single SCE
4. Where we're focused next
5. Q&A



My journey solving SCE challenges



Why GxP and exploratory workflows **were** siloed

GxP SCE

The 'stats programming' platform

Allows a single propriety language

Sources codebase 10-20 years old

 a common metadata store

Deep layer of abstractions present

Exploratory SCE

The 'rest of the department' platform

R/Python as the standard language

Multi-lingual and open source focused

Modern tooling like  **git**

More of the 'data science' process
exposed to users

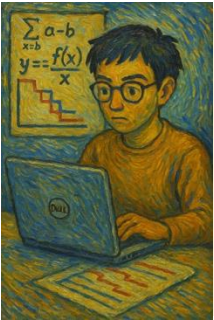
Moving between GxP and non-GxP frustrates users and divides the department

Who they are: Key roles in biometrics



Statistical Programmer

Emphasis on efficiency, quantity of outputs, auditability



Statistician

Emphasis on statistical design, data flow end-to-end



Bioinformatician or Data Scientist

Emphasis on agility, large data and high compute

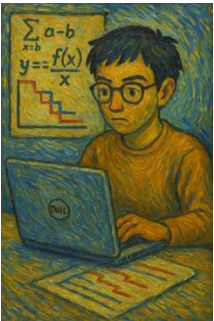
More GxP
pre-specified
analyses

Less GxP
pre-specified
analyses

How they worked: Tools and environments



Statistical Programmer



Statistician



Bioinformatician or Data Scientist



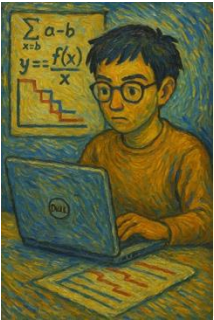
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How they worked~~ed~~: Tools and environments



Statistical Programmer



Statistician



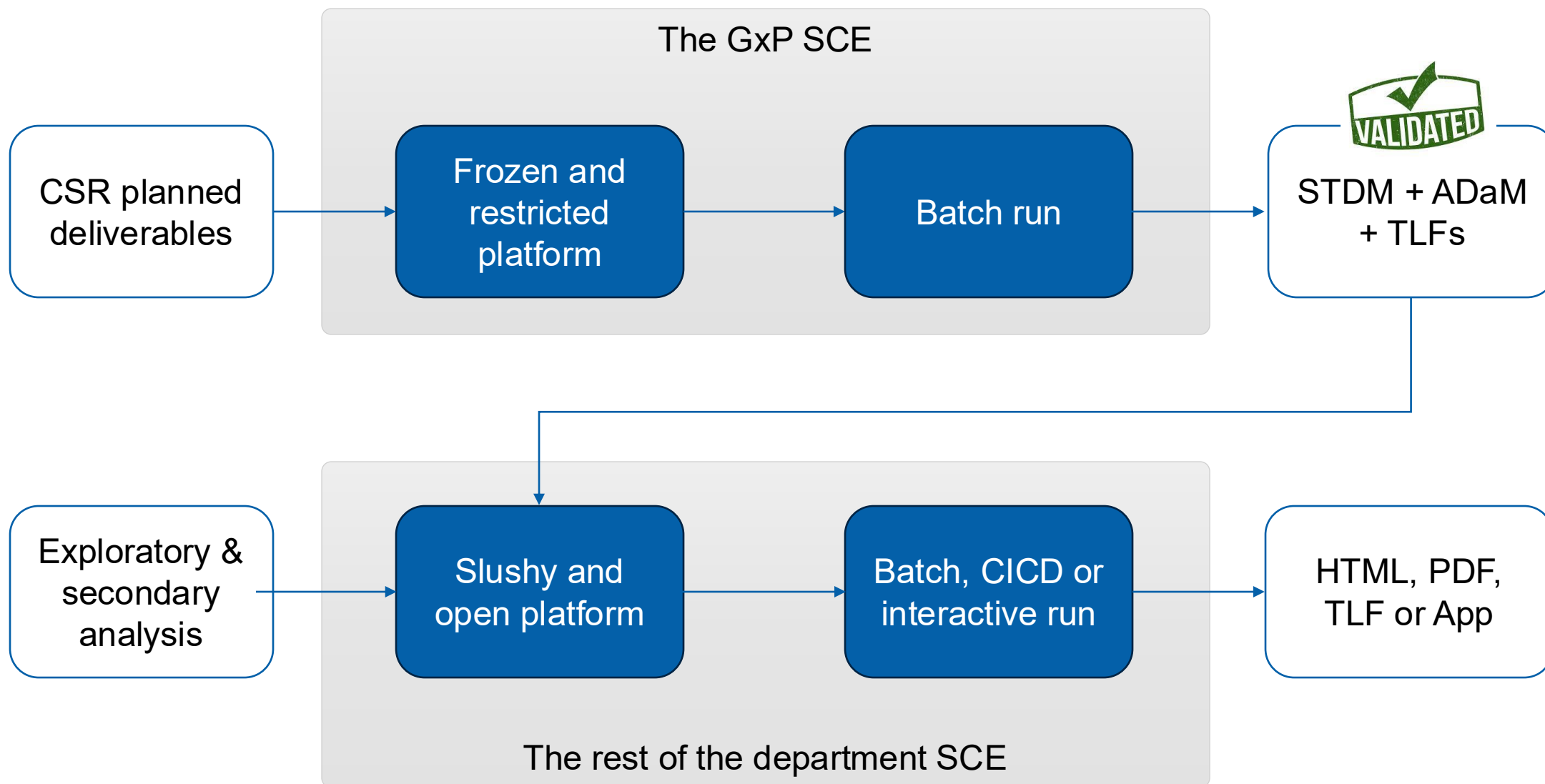
Bioinformatician or Data Scientist



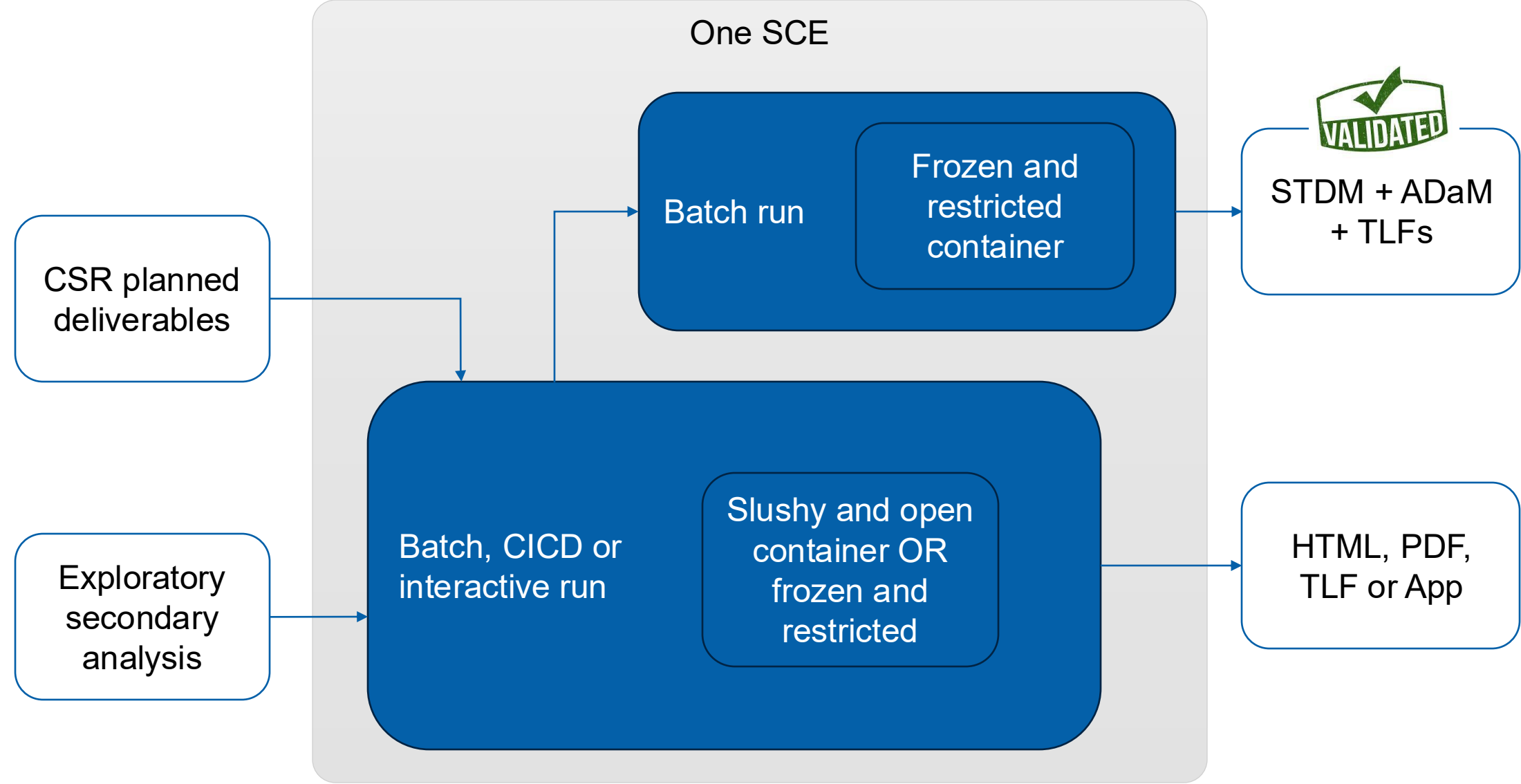
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Legacy SCEs: Fragmented workflows, frustrated teams



A blueprint for one unified SCE

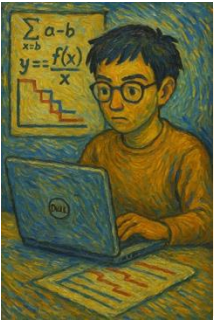


What they gain: Value of unified SCE



Statistical Programmer

Easily execute GxP deliverables in a controlled, compliant environment without reworking code or moving between tools



Statistician

Develop and iterate in an open, flexible environment, with a seamless path to validated, production-ready outputs



Bioinformatician or Data Scientist

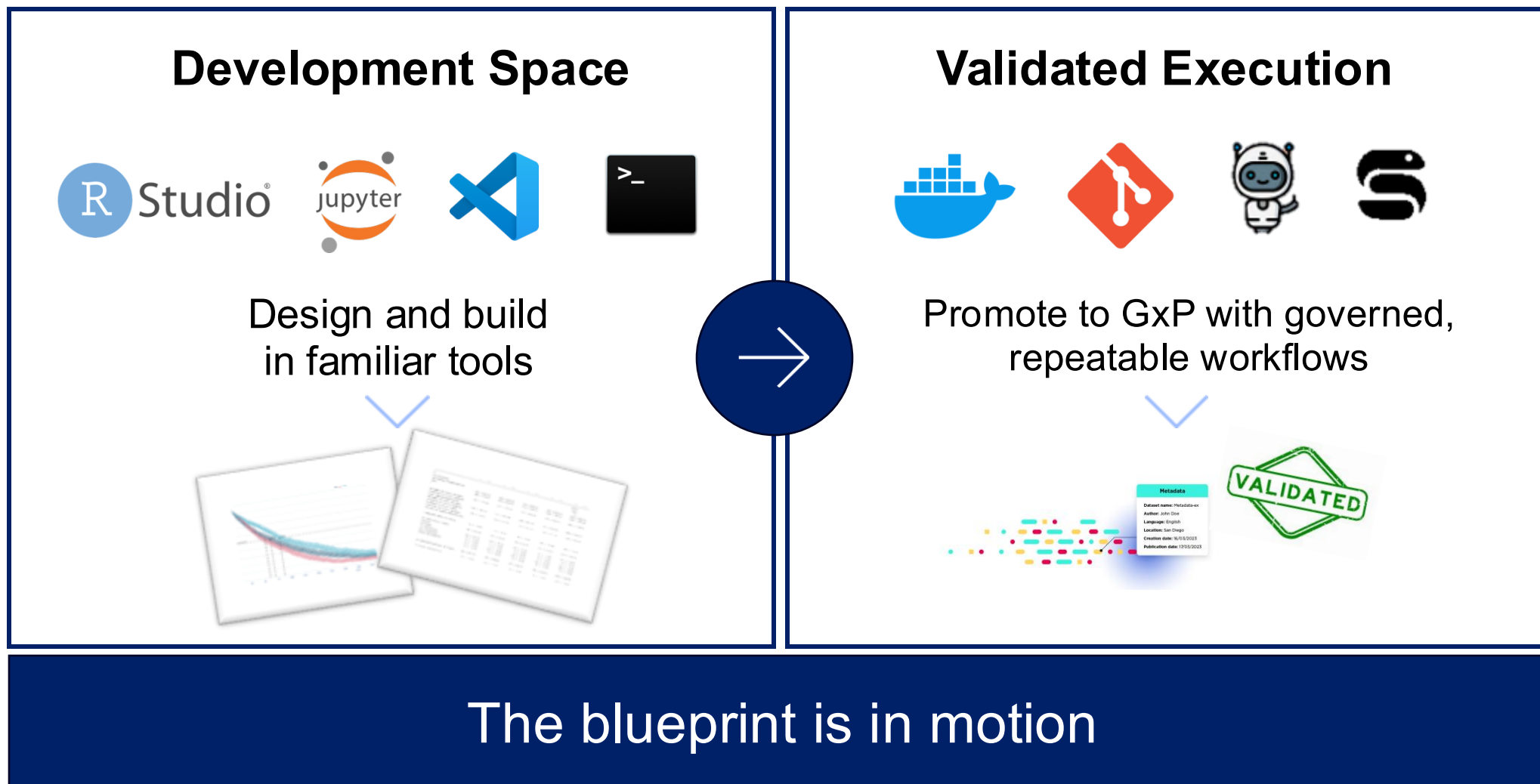
Work in modern, high-performance tooling without hitting compliance roadblocks when work transitions to production

Consolidation

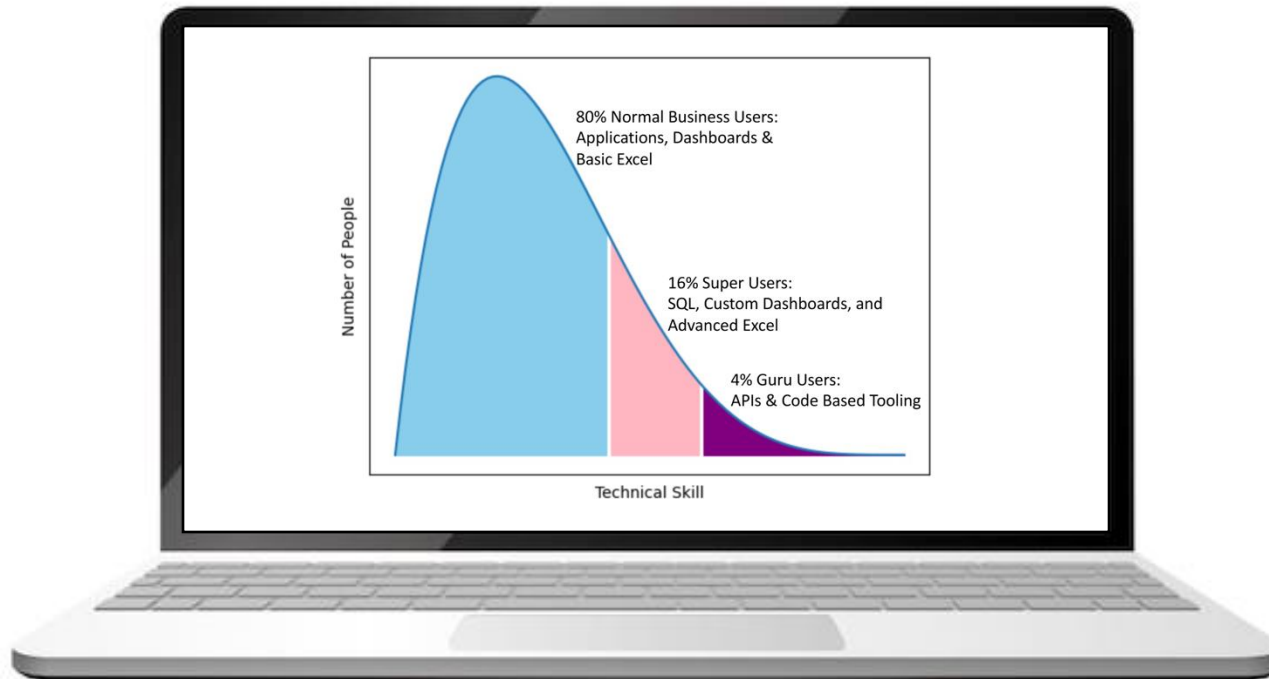
Simplification

Harmonized
Training

Innovation and compliance can coexist in a unified SCE



Why abstractions matter: Experts build, systems control



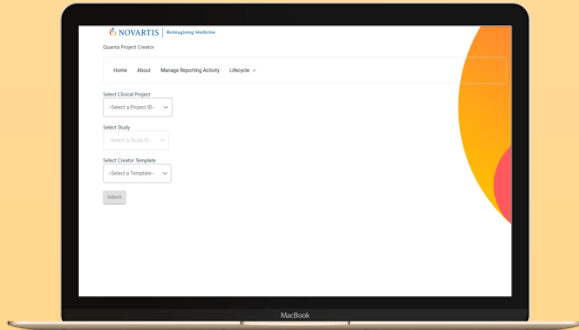
[It's Abstractions All the Way Down... - YouTube](#)

JD's assertions

- *The single biggest value of data science is it led to code written by domain specific experts*
- *Abstractions will leak, so abstractions should be permeable for debugging*
- *80 / 16 / 4 rule*

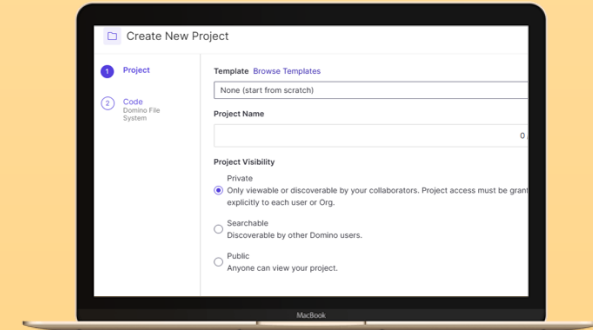
Project creation made simple and governed

Abstraction for Reporting Activity



- Automation (create git repo and project with naming scheme)
- Governance (default to specific validated workspaces)

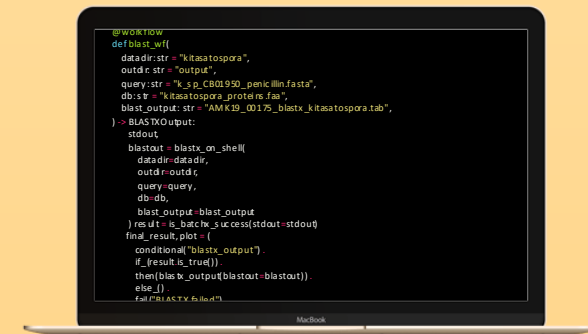
Generic project creator for data science



- Full flexibility to configure projects
- Manually configure data, permissions, etc.

Orchestration

Native Flow (Flyte) for orchestration

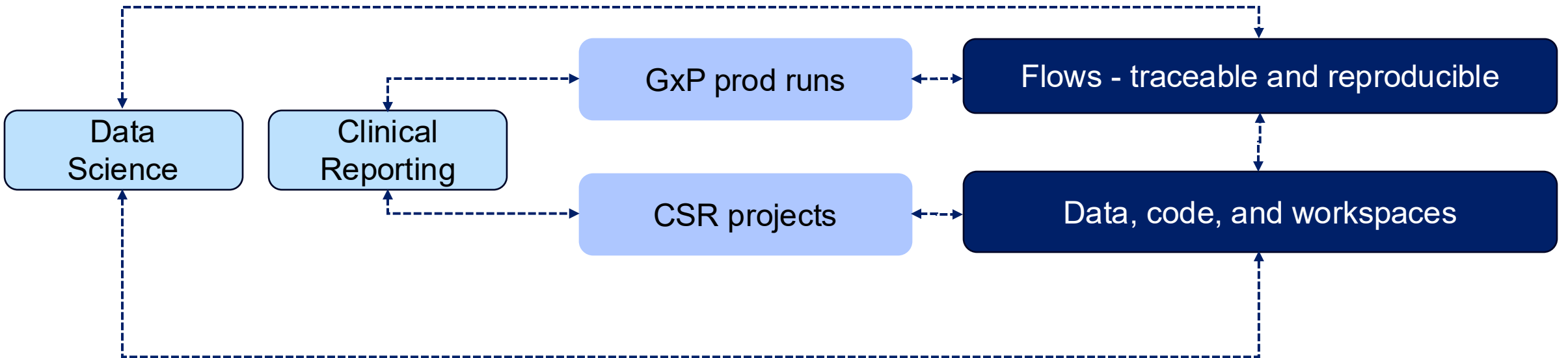


- Powerful and extensible
- Requires basic understanding of Python
- Expectation users conceptualize DAGs

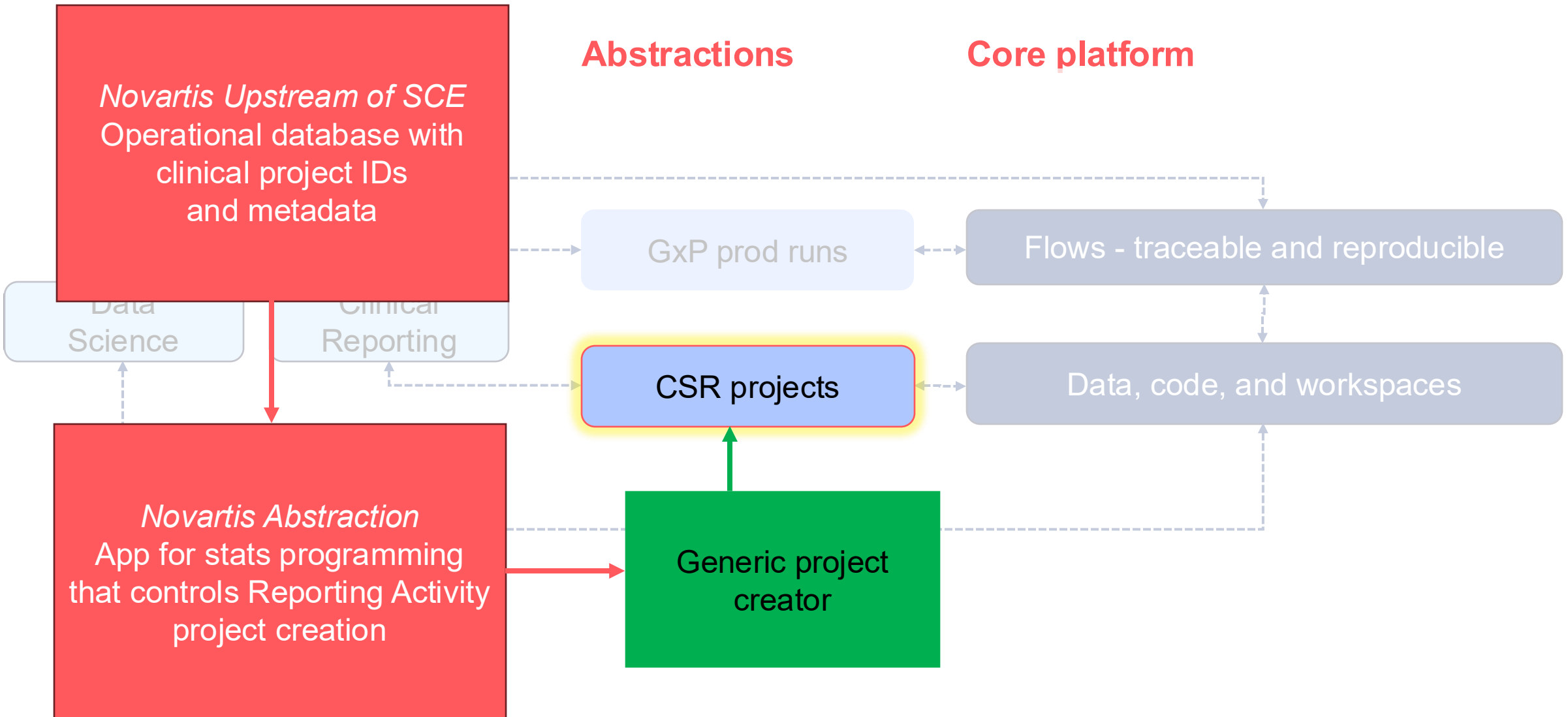
How abstractions enable 'data science under one roof'

Abstractions

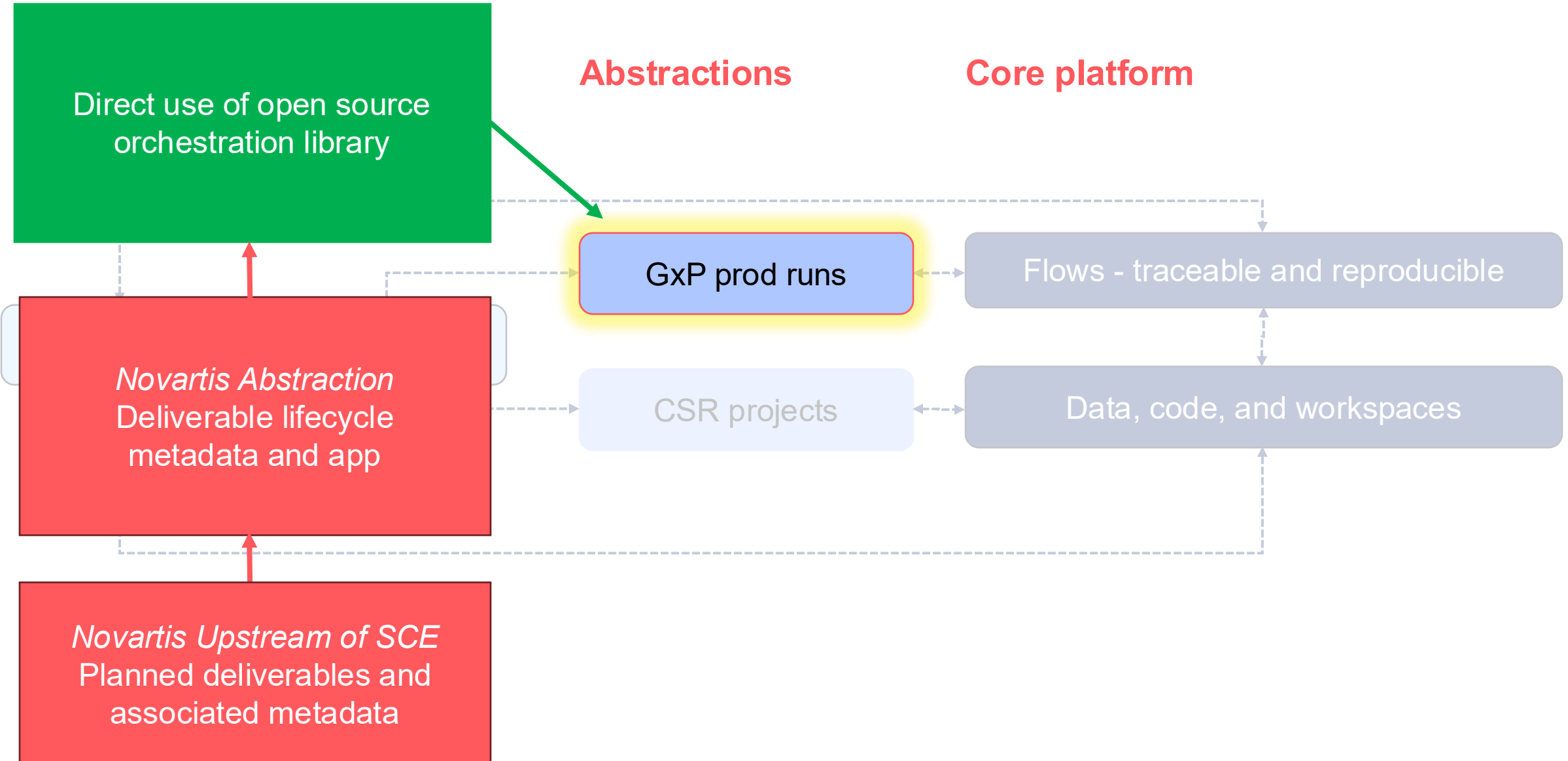
Core platform



How abstractions enable unified workflows



How abstractions enable unified workflows



A path forward

- Bridging GxP and exploratory work in one SCE

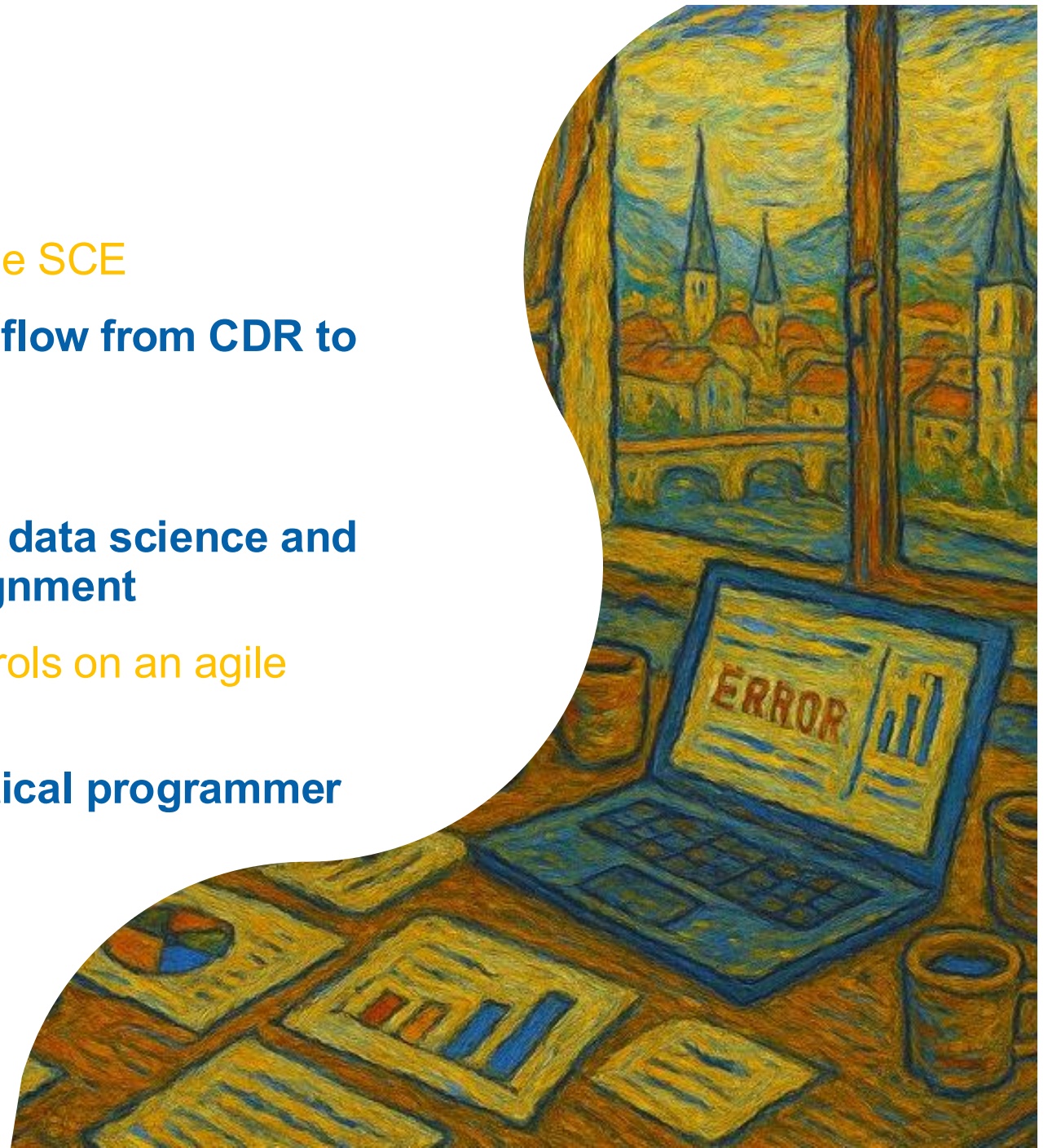
Focusing controls and validation on the flow from CDR to decision ready output

- Speaking the same language

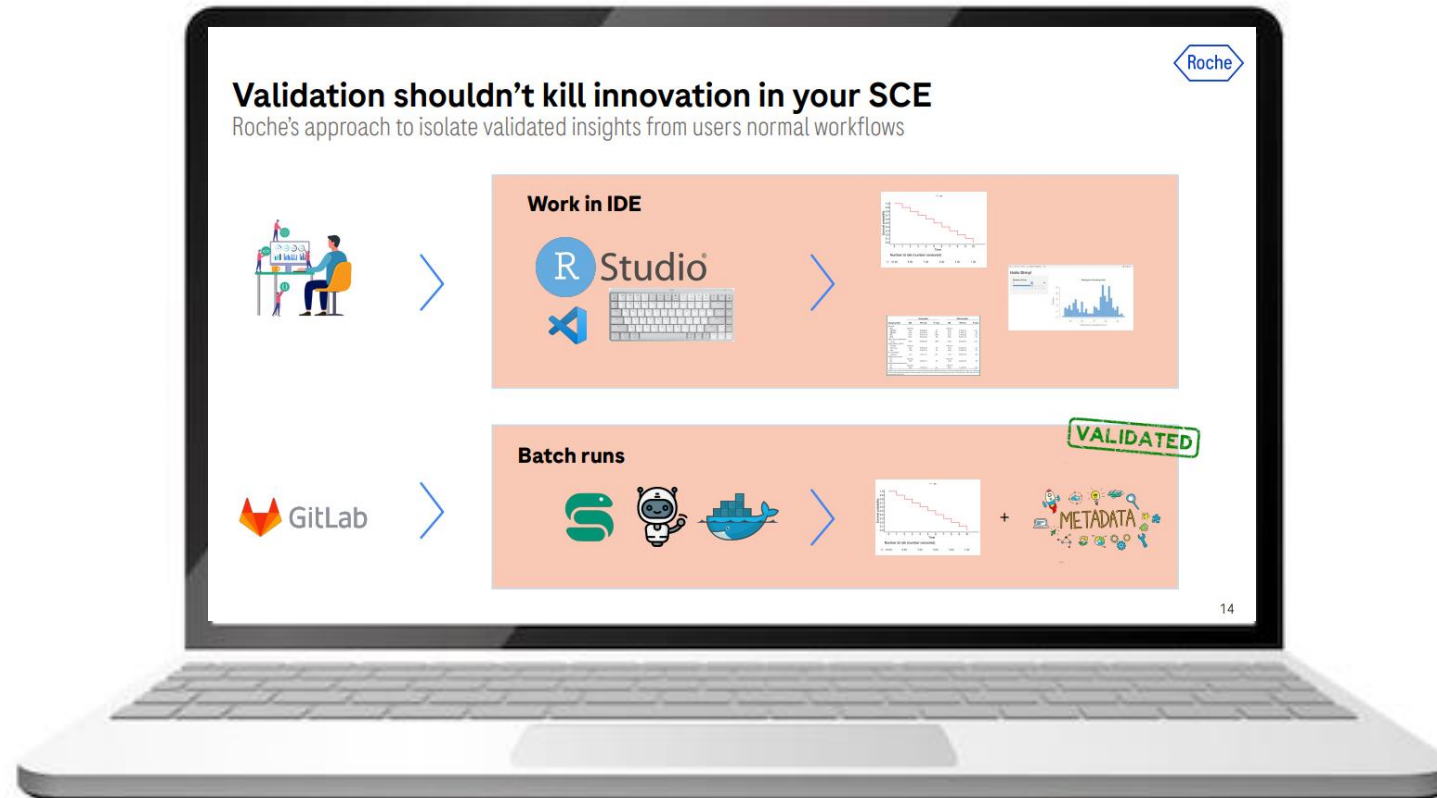
Building shared understanding between data science and quality teams to accelerate trust and alignment

- Abstractions provide a way to layer controls on an agile platform

Enabling a bioinformatician and a statistical programmer to happily co-exist in one SCE.



A de-coupling of development from GxP output creation exists beyond Novartis



Source: The importance of the SCE in enabling our shift from proprietary programming to open-source data science (James Black) R/Pharma 2023

Key takeaways

- A unified SCE unlocks both innovation and compliance
- Abstractions make scale possible without adding burden
- Focus validation where it matters most

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Q&A

