



d-wise™

Accelerate to the Speed of Life

The evolution of SCEs

Preparing for a Quantum leap in
Statistical Computing Environments

Ali Dootson & Andy Ratcliffe, **d-wise**

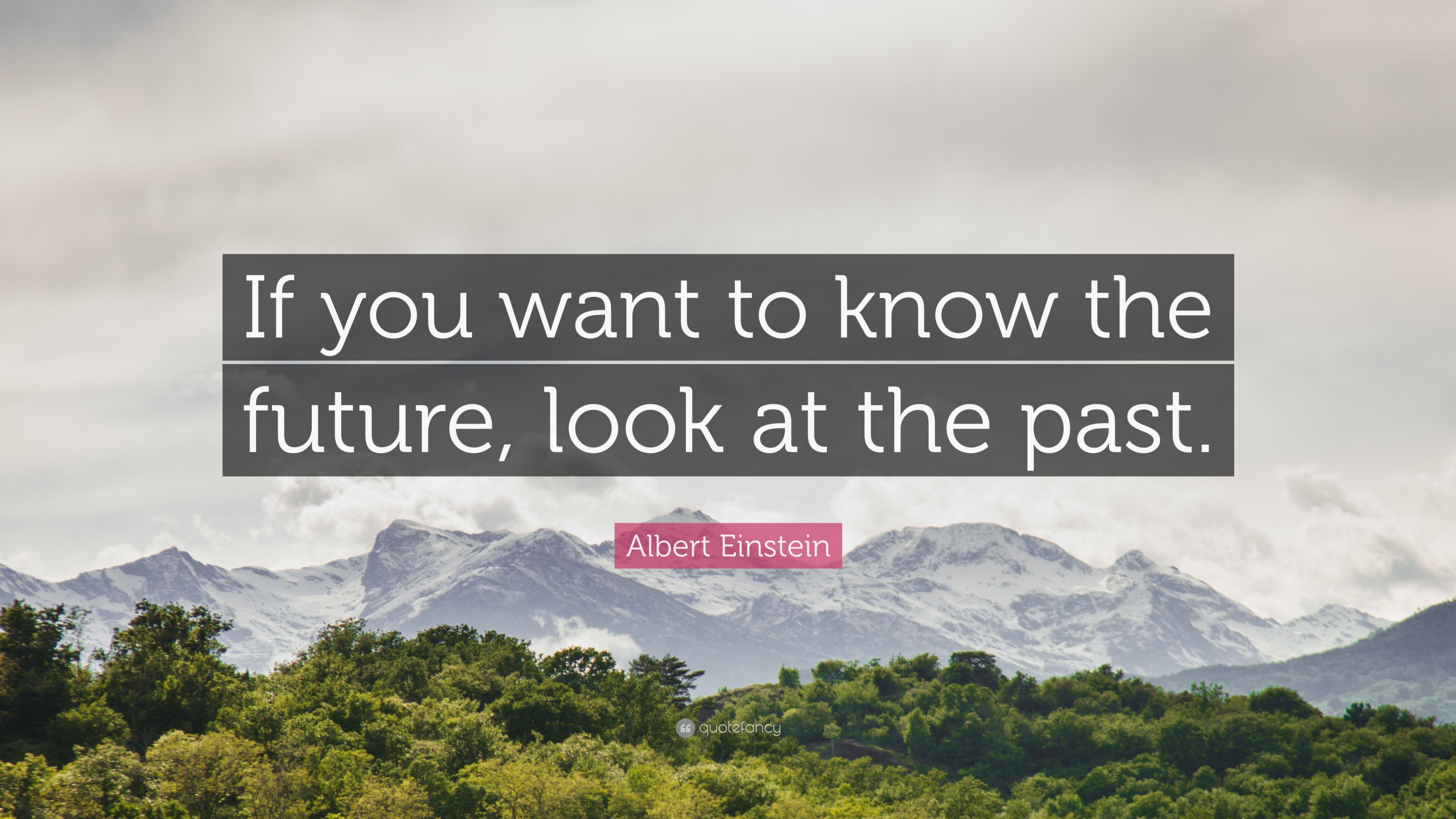


PHUSE EU Connect 2020

Statistical Computing Environments







If you want to know the
future, look at the past.

Albert Einstein

The simple times...



THE
POWER
TO KNOW[®]





**ONE SIZE
FITS ALL**

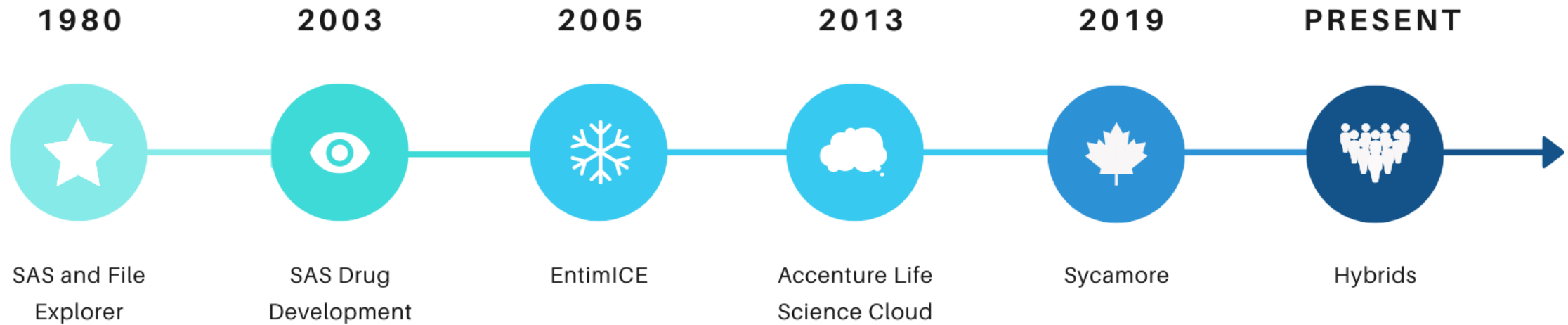


**MADE TO
MEASURE**



A BRIEF HISTORY

Does one size fit all?



KLONDIKE OUTFITS

FRASCH,
CIGARS.



SAPOLIO
PLUG CLIMAX

For Rent
Close by



HART
HOME MADE
BREAD

Good Goods
at lowest prices
with delivery

Imported
Swiss Cheese
At a Special Price





Industry Trends

- Tables / Columns
- Provenance

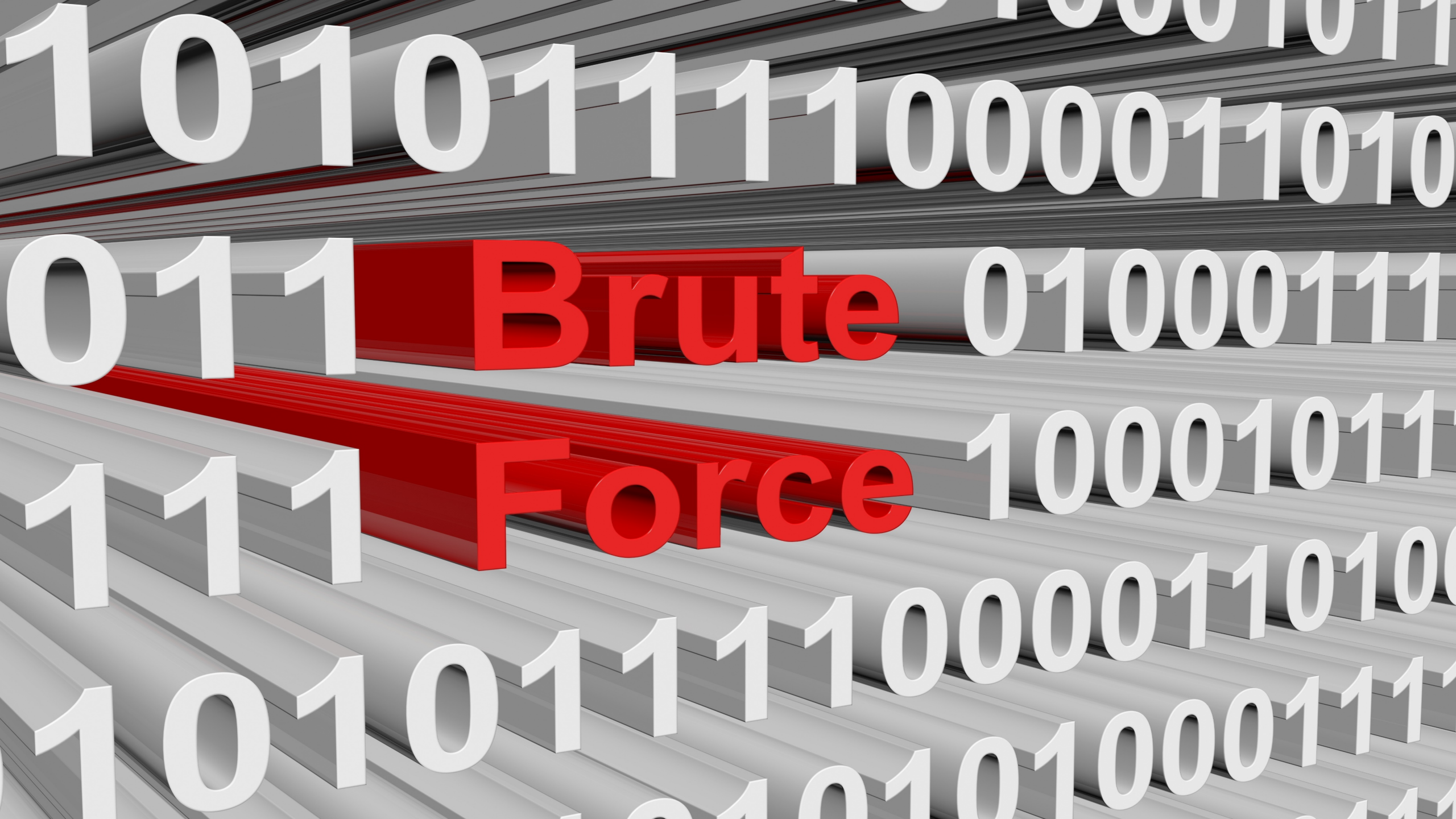


- **Non-unary approach to languages**
 - Re-balancing of the use of SAS
 - Focus on R, Python and other open source tools
- **Renewed desire to capture / use metadata**
 - To automate
 - To increase quality (consistency, reproducibility)
 - To reduce (human) effort
- **Re-focus on security**
 - Demonstrably in control
 - What happened vs what could/might have happened?
- **Cloud and virtualisation**
 - Elasticity (reduced cost)
 - Agility (new and updated versions)
 - Reproducibility
- **DevOps**
 - Continuous improvement
 - Automated testing; improved quality
 - Reproducibility
 - Application code
 - TLFs
- **Non-Clinical Groups**
 - Data sharing
 - Platform sharing
 - Sub-set of requirements

And... ML / AI

- **Searchability**
 - Findability
 - Flat structure; tagging, labelling
- **Enhanced COTS products (SCE, CDR)**
 - SAS LSAF, Sycamore
- **Continued investment in custom applications**
 - Built with / out-sourced to partners
- **Continued delivery as static CSR**
 - Data, TLFs, code
- **Increasing interest in exploratory tools**
 - e.g. R Shiny applications
 - For in-house use
 - Potentially for regulatory use
- **Recognition that clinical statistical programmers' needs are a super-set of those for data scientists**
 - Security
 - Auditability
 - Traceability
 - Workflow (QA, promotion)
 - Software development lifecycle (SDLC)
 - Study Plan





Brute

Force





Explorer

Contents of 'SAS Environment'



Libraries



File Shortcuts

Favorite
Folders

This PC

Log - (Untitled)

```
10 PROC SGPlot DATA = Olympic1500;  
11     LOESS X = Year Y = Men / NOMARKERS CLM NOLEGCLM;  
12     REG X = Year Y = Men;  
13     LABEL Men = 'Time in Seconds';  
14     TITLE "Olympic Times for Men's 1500 Meter Run";  
15 RUN;
```

NOTE: Writing HTML Body file: sashtml.htm

NOTE: PROCEDURE SGPlot used (Total process time):

real time	3.34 seconds
cpu time	0.67 seconds

NOTE: There were 28 observations read from the data set WORK.OLYMPIC1500.



OlympicMens1500.sas

```
RUN;  
PROC SGPlot DATA = Olympic1500;  
    LOESS X = Year Y = Men / NOMARKERS CLM NOLEGCLM;  
    REG X = Year Y = Men;  
    LABEL Men = 'Time in Seconds';  
    TITLE "Olympic Times for Men's 1500 Meter Run";  
RUN;
```



Results



Explorer



Output - (Untitled...)



Log - (Untitled)

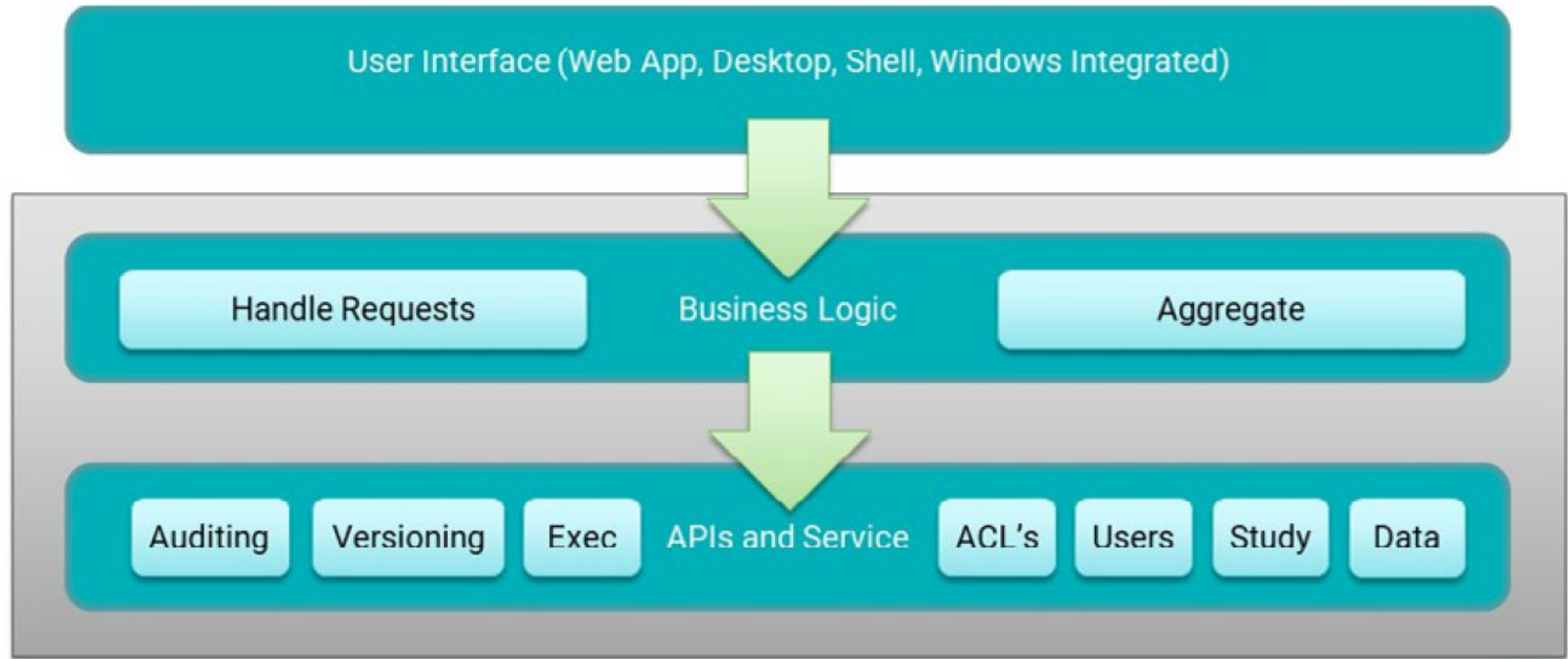


OlympicMens1...

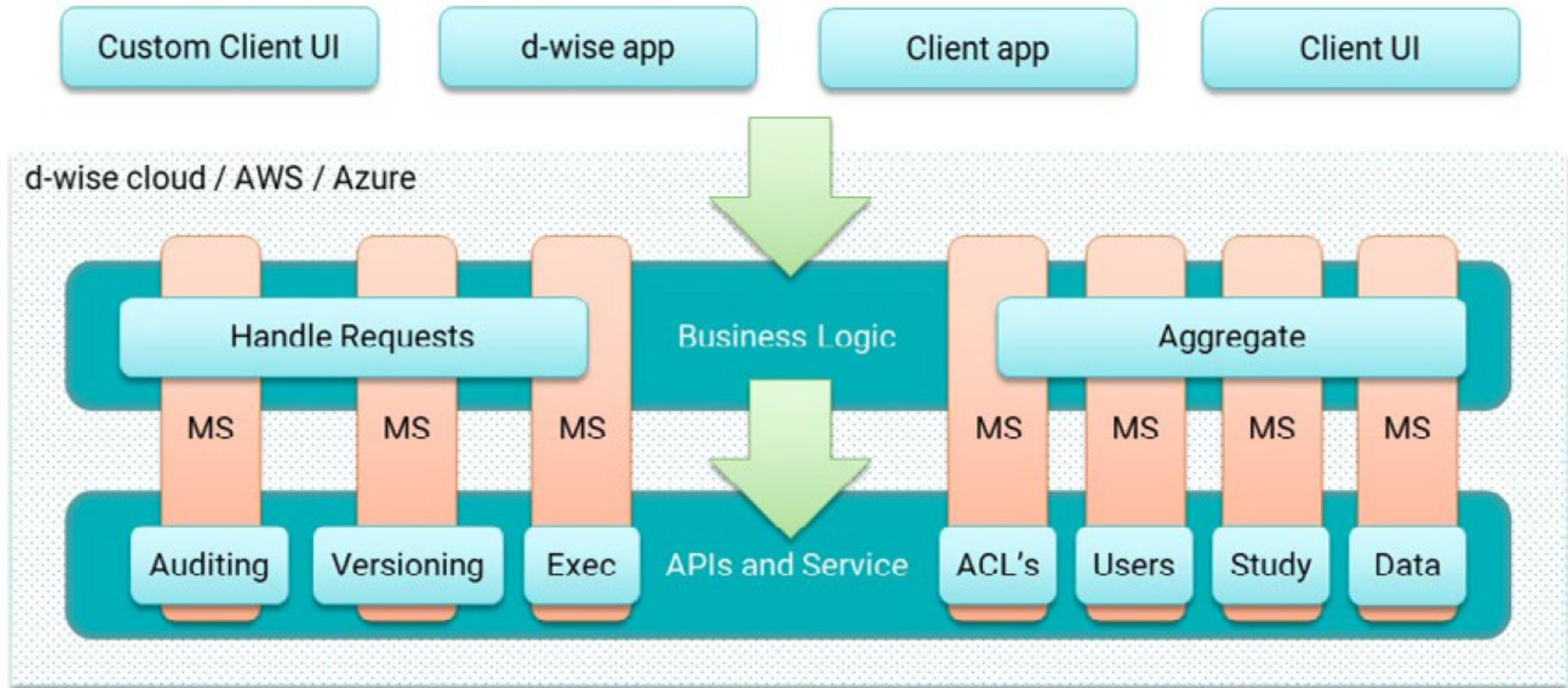


Results Viewer - ...

Traditional SCEs



Services Platform, per Sponsor



Stocky Stocky
UNITED BY WINTER
FRIENDS



Think Open and Extensible

- Validated, cloud-agnostic deployments
- API support for traditional clinical service needs
- Traditional file store support
- Personal, and controlled, compute environments



Think Open and Extensible

- Extensibility
- Horizontal scaling via bursting
- Programming libraries
- Clinically-oriented offerings of public APIs
- Orchestrated workloads





Aspire
Clinical Analytics Framework

www.d-wise.com/aspire

“If your dreams do not scare
you, they are not big enough.”
-Ellen Johnson Sirleaf





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About the authors

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