UNIVERSITAT JAUME I

Towards Continuous Benchmarking:

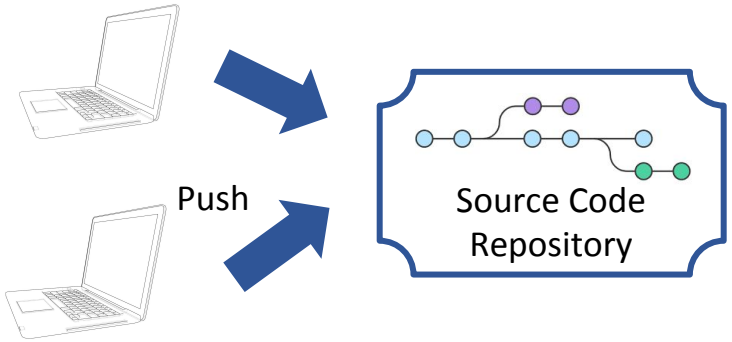
An Automated Performance Evaluation Framework for High Performance Software

Anzt, Chen, Cojean, Dongarra, Flegar, Nayak, Quintana-Ortí, Tsai, Wang

A Healthy Software Development Cycle

Developer

A Healthy Software Development Cycle



Developer

- Version control system for tracking changes and coordinating collaborative development.

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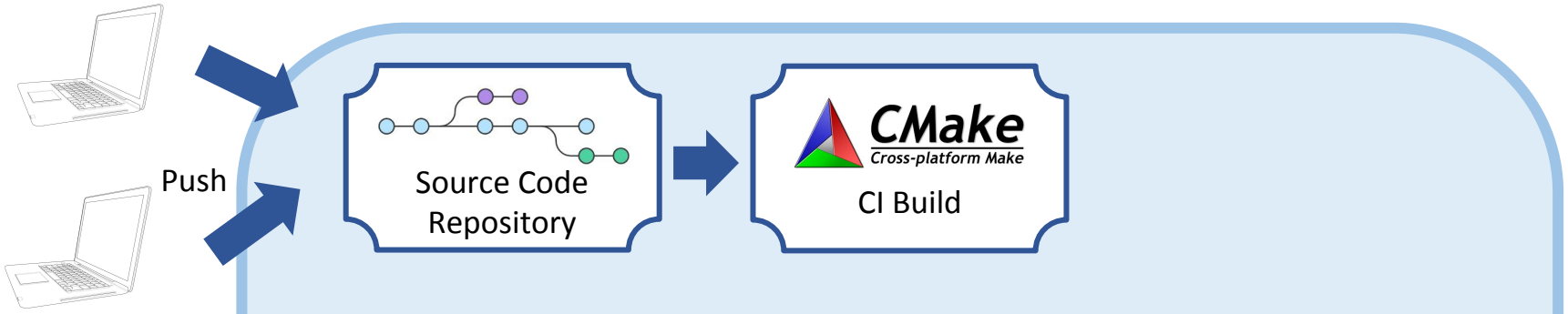

- Version control system for tracking changes and coordinating collaborative development.
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Continuous Integration (CI)

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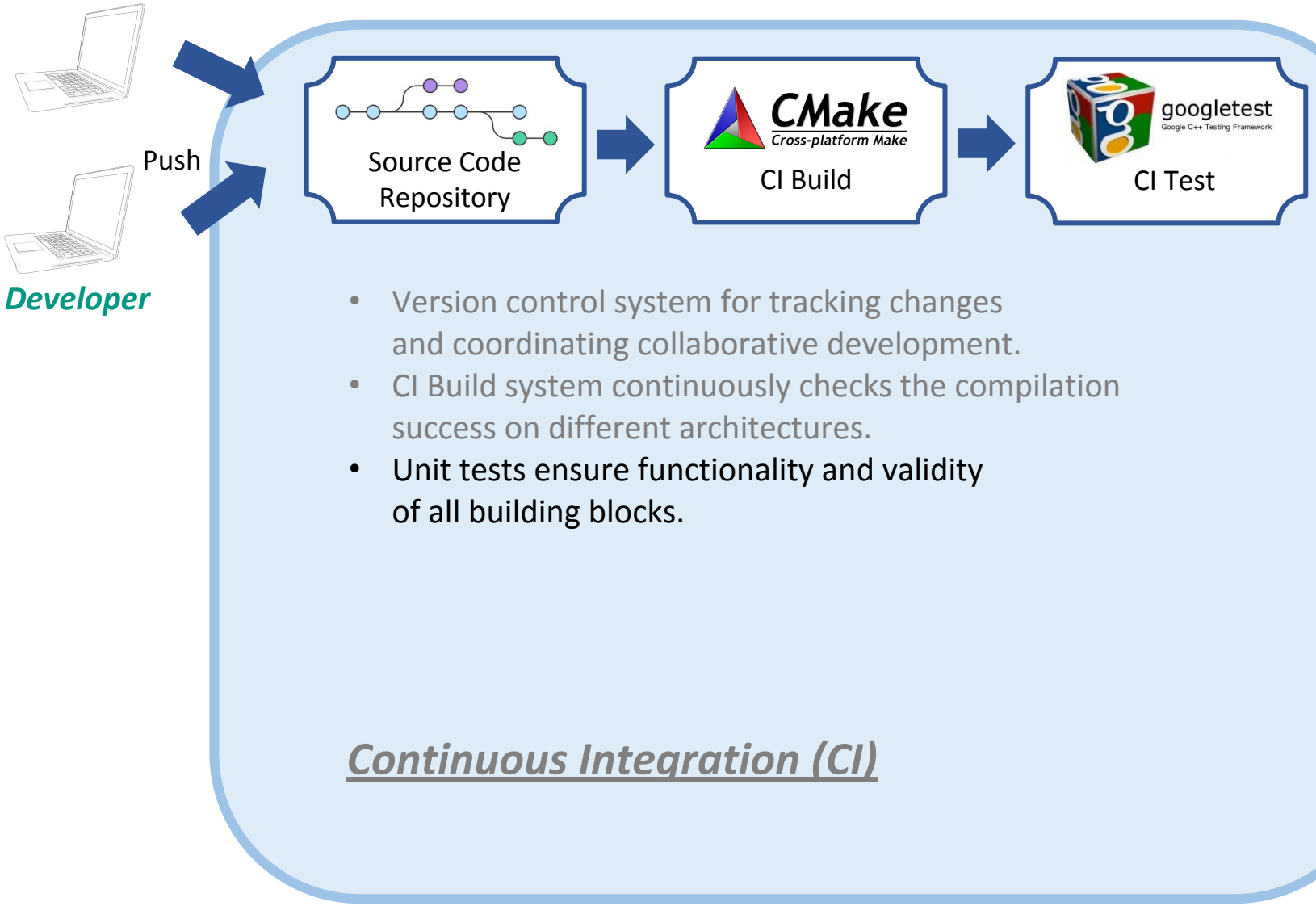

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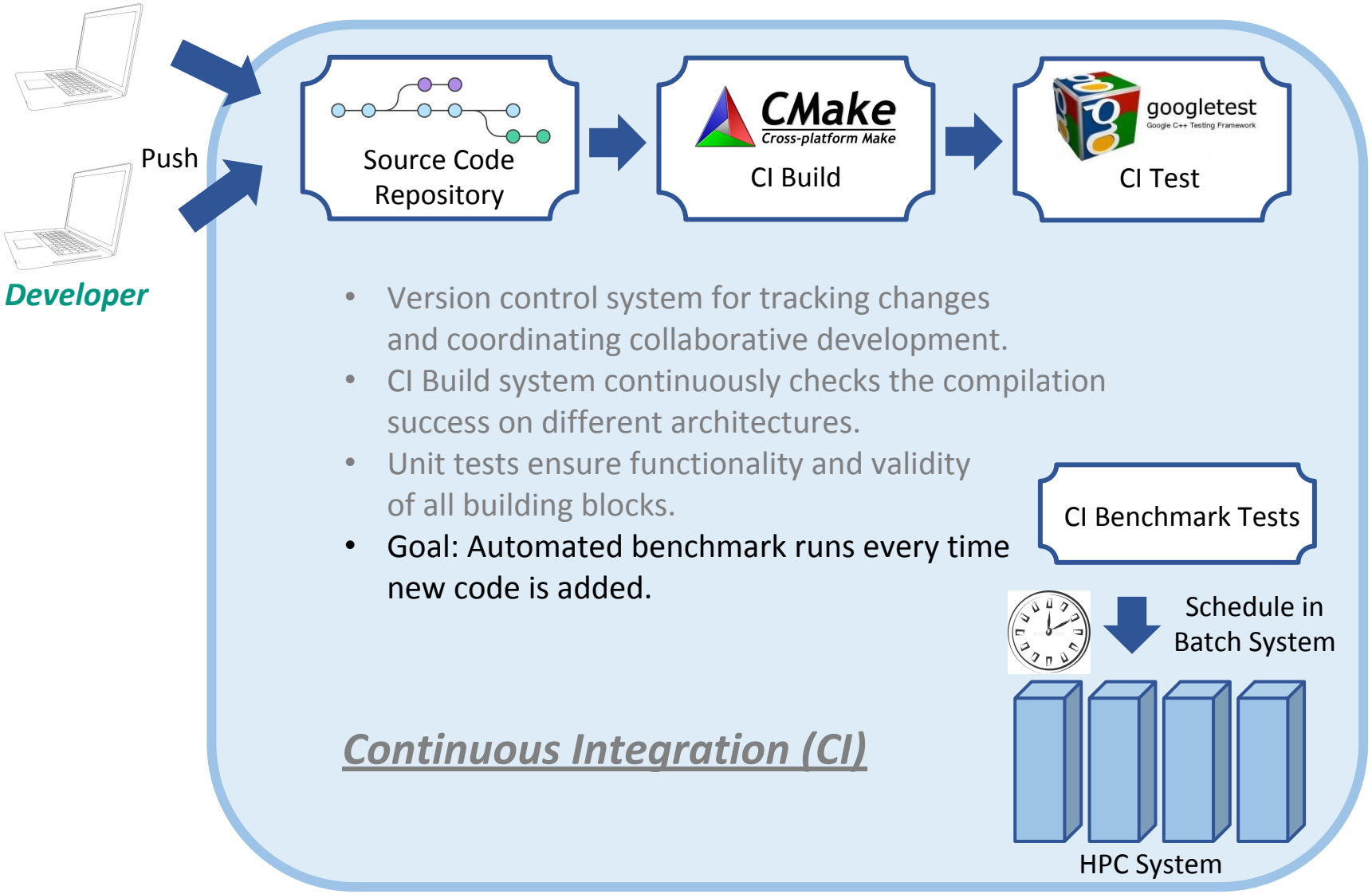

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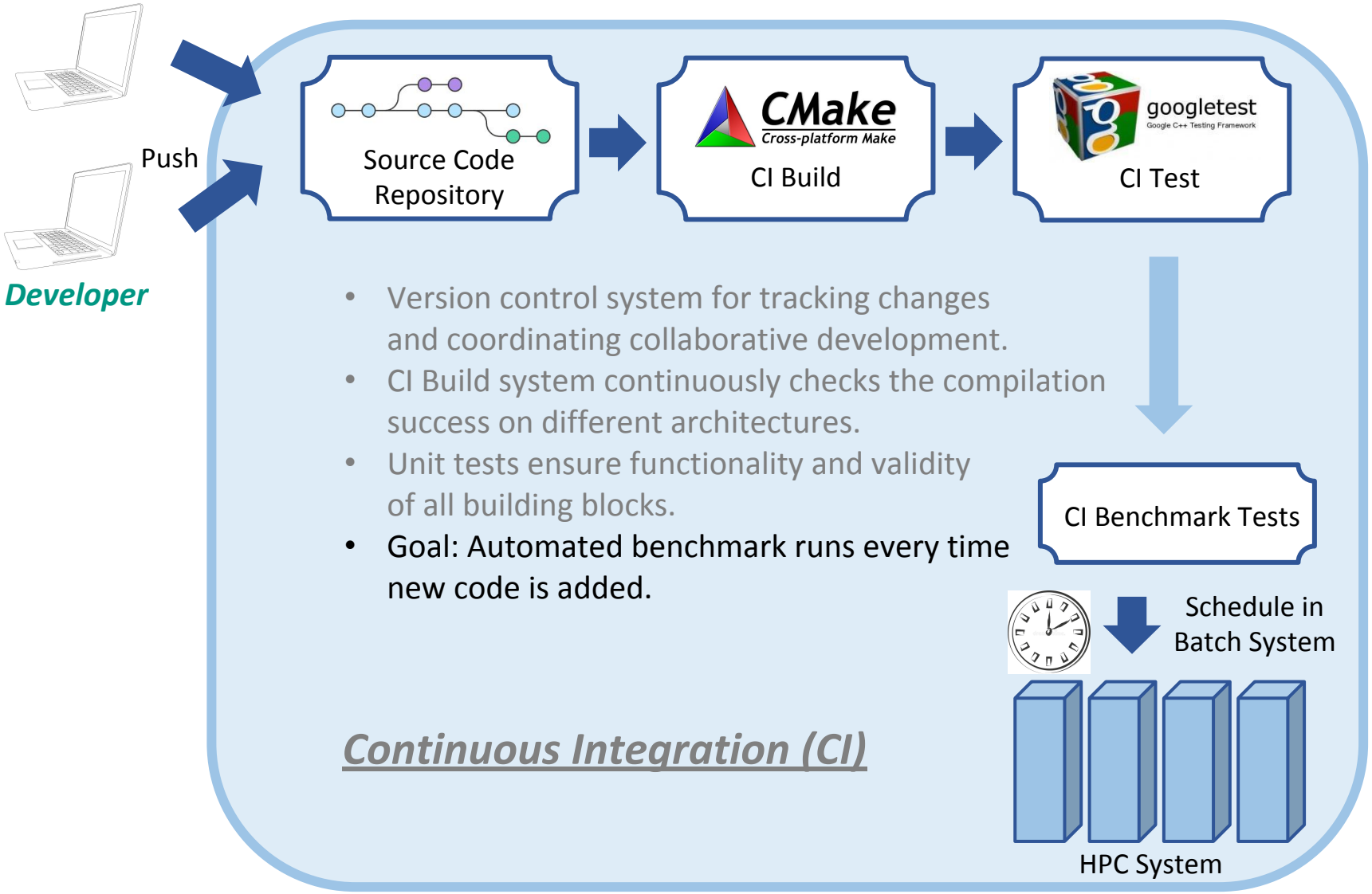

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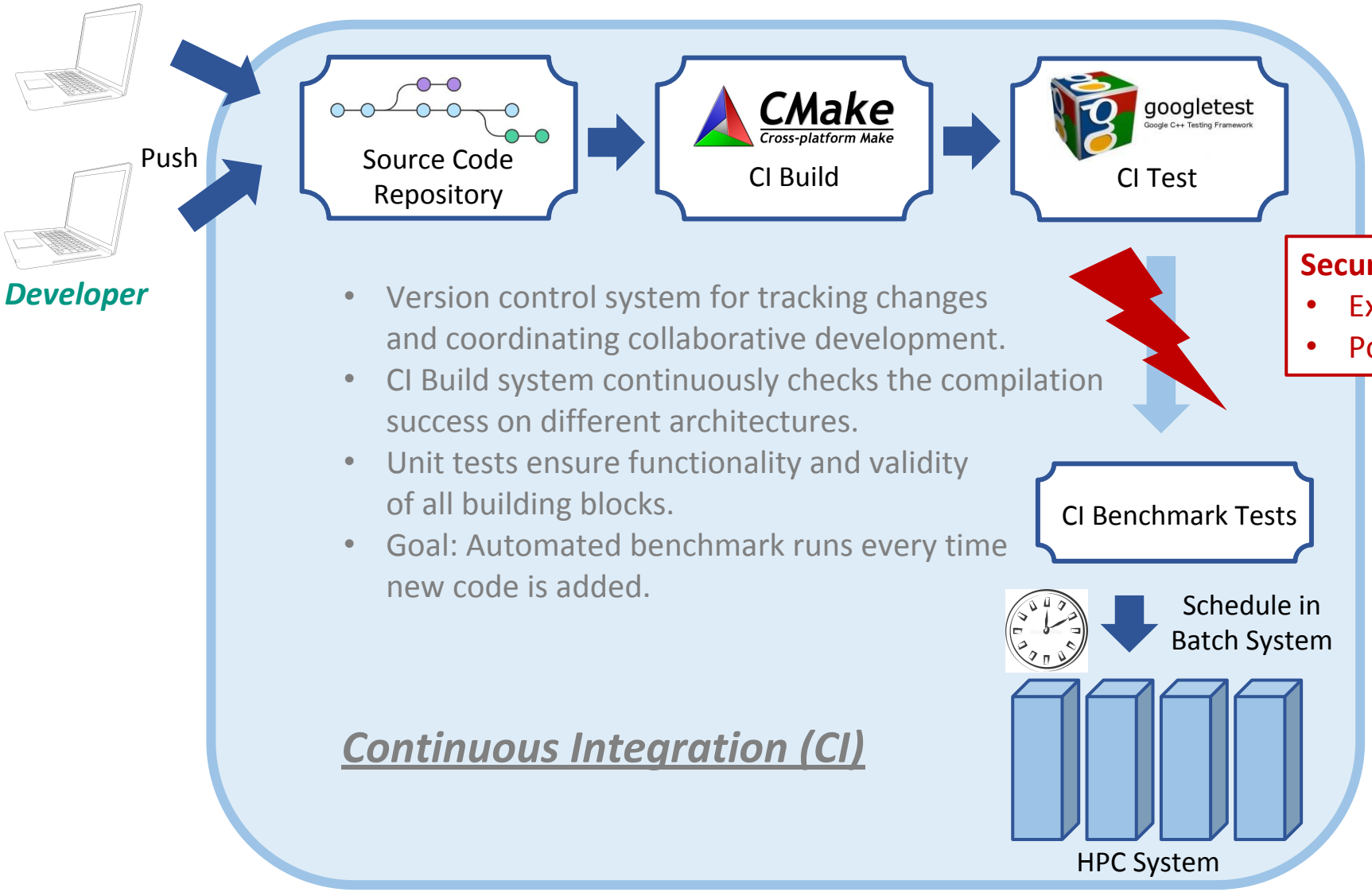

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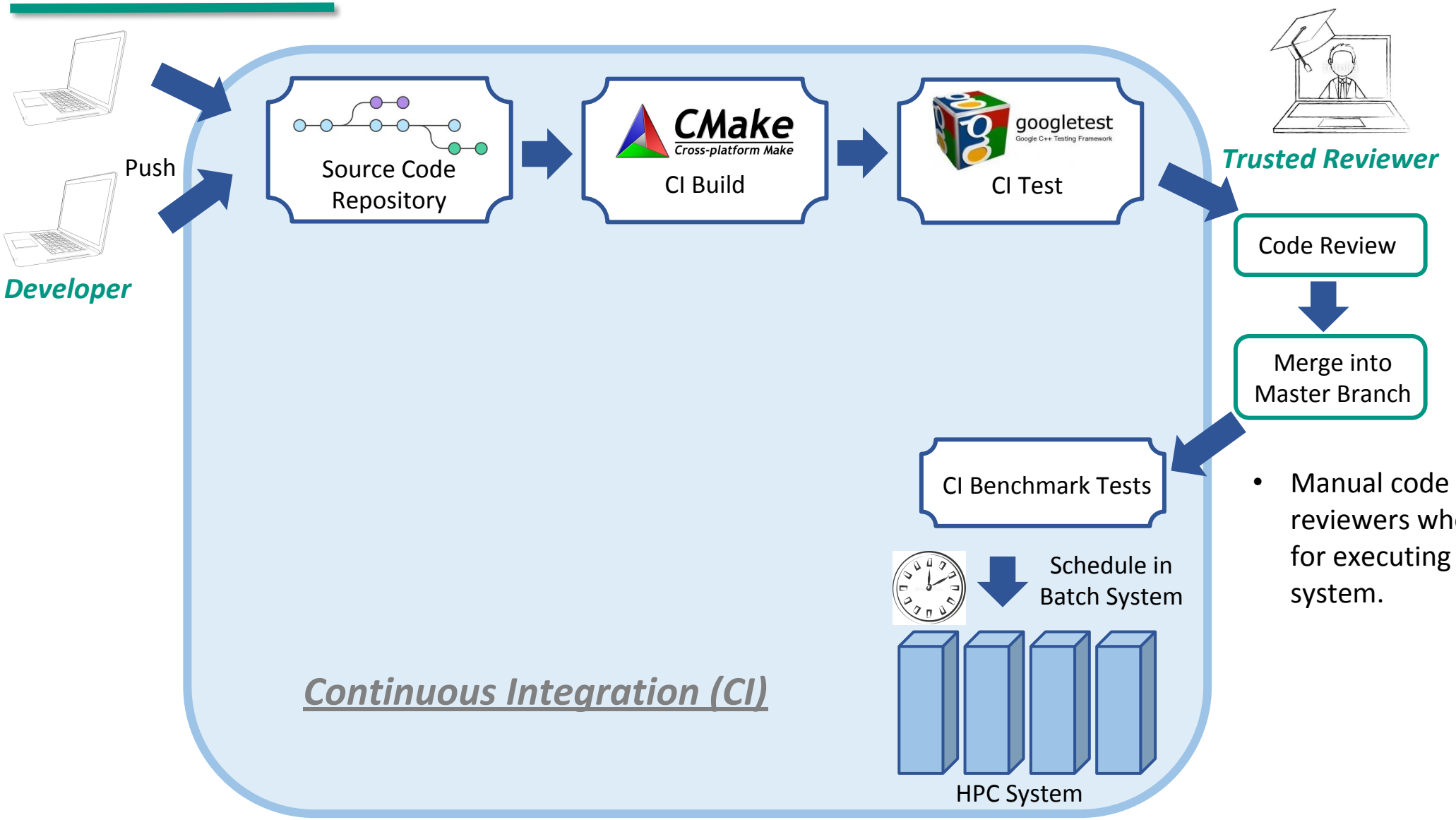

- Manual code reviews by trusted reviewers who take responsibility for executing code on the HPC system.

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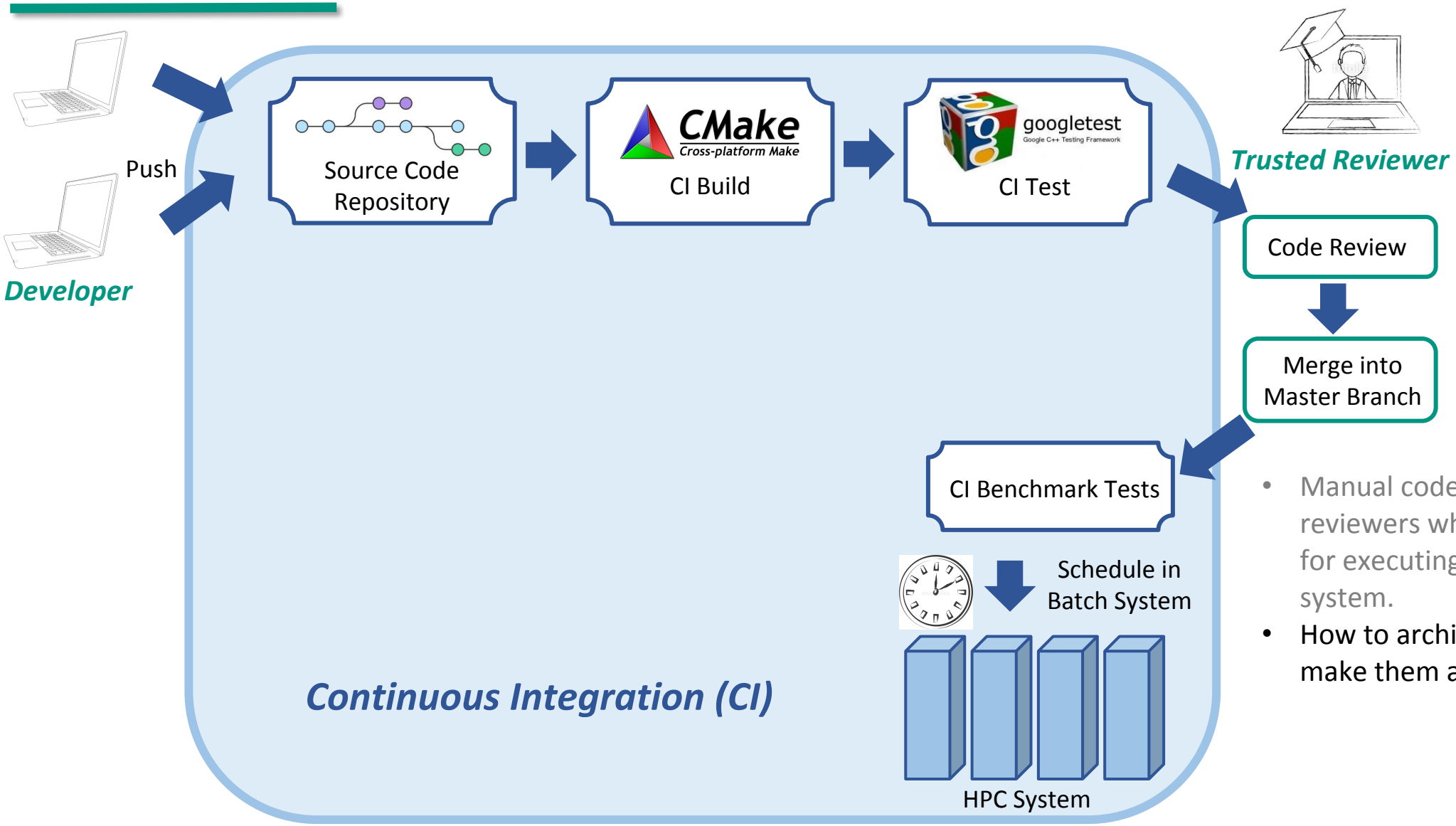

- Manual code reviews by trusted reviewers who take responsibility for executing code on the HPC system.
- How to archive the results and make them accessible?

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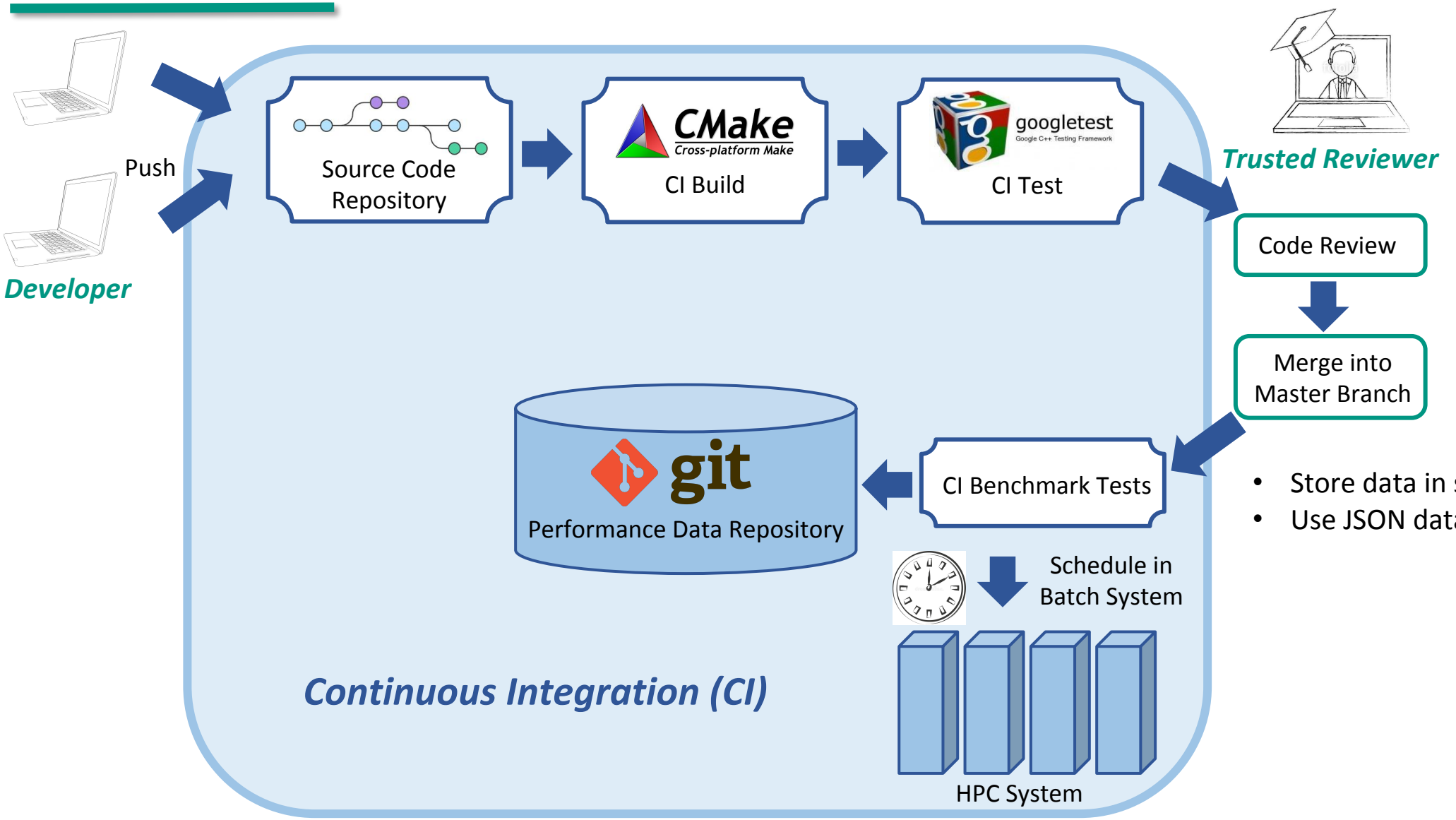

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- Use JSON data exchange format.

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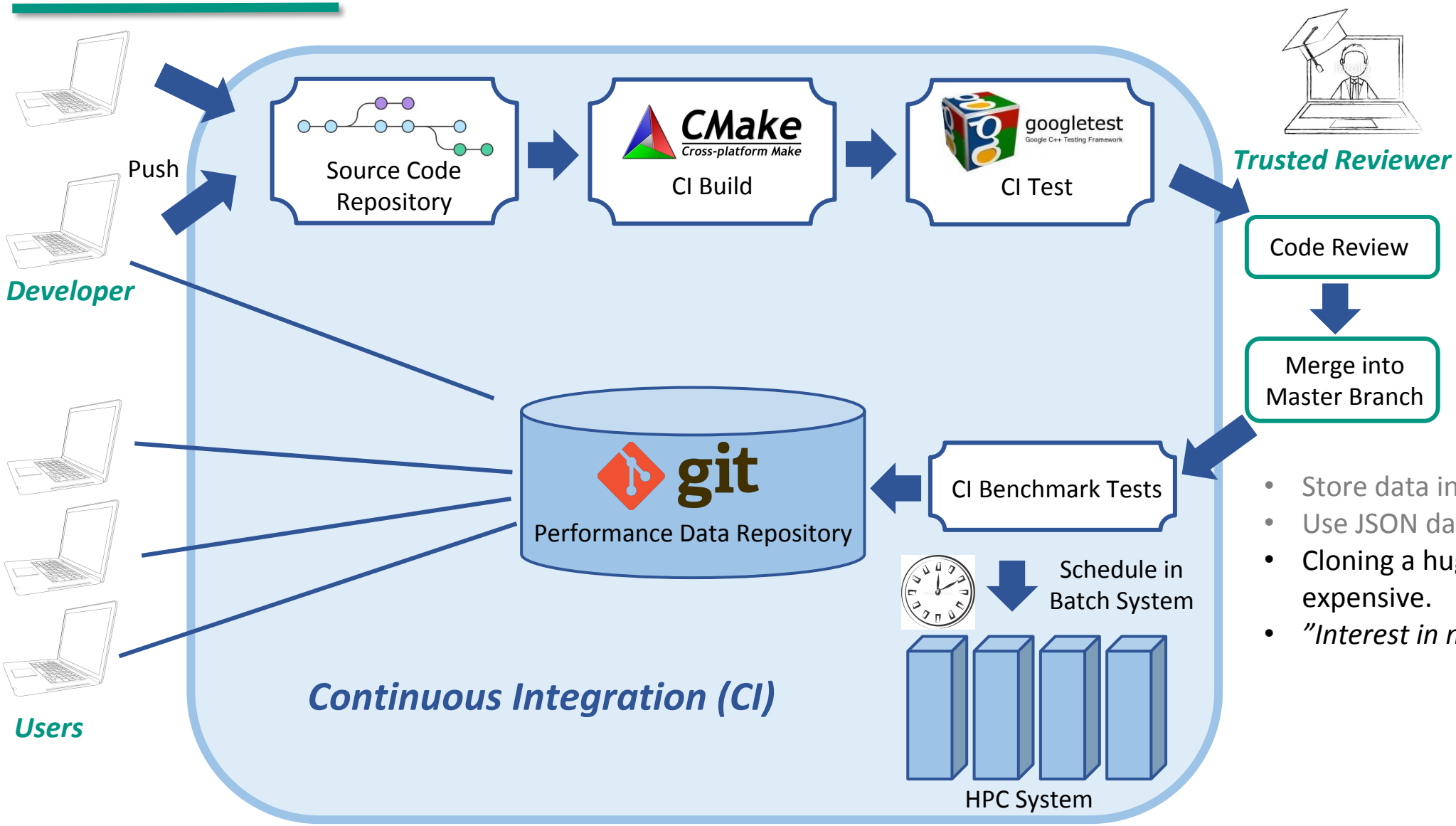

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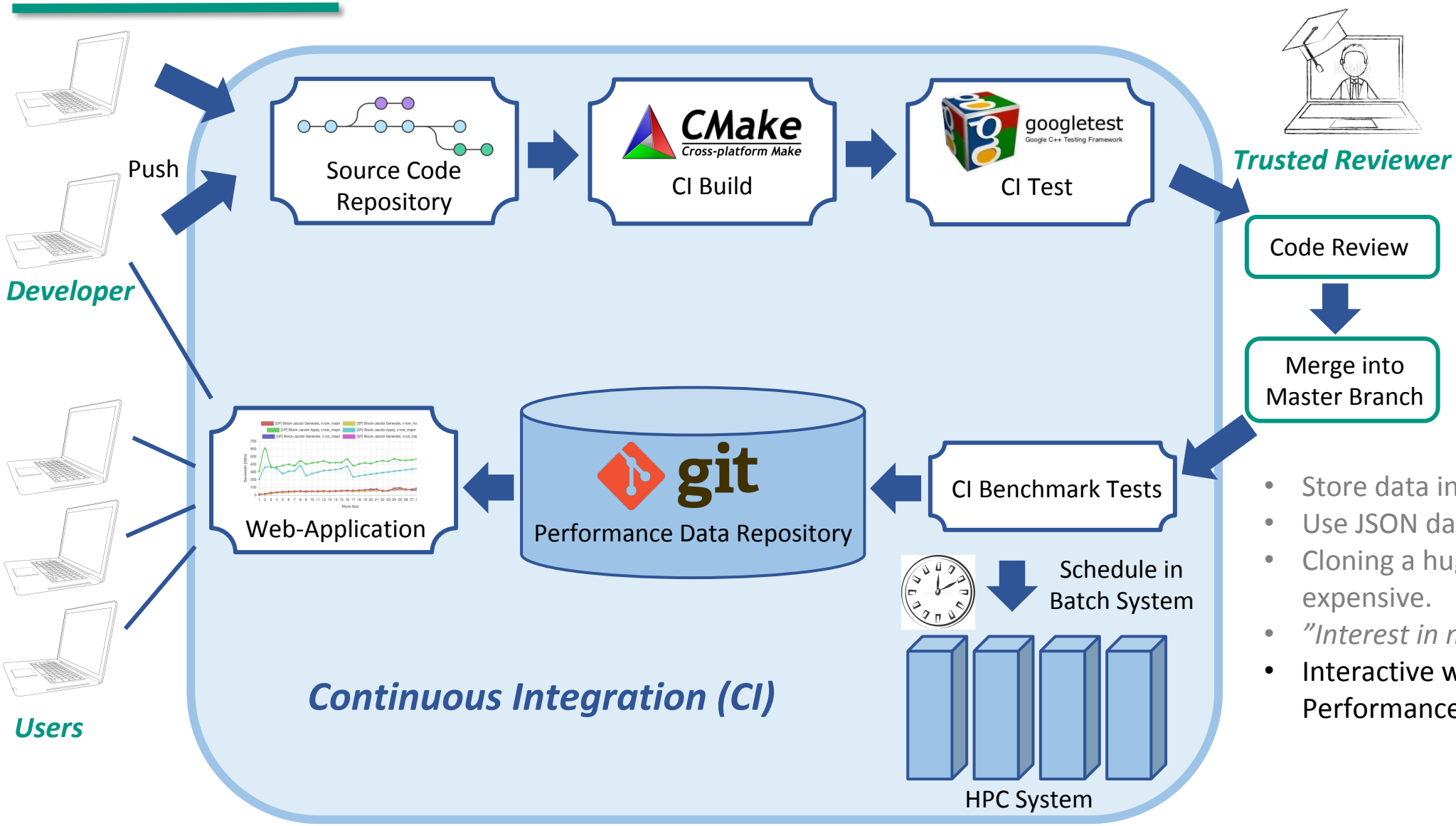

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- Interactive web-based Ginkgo Performance Explorer (GPE).

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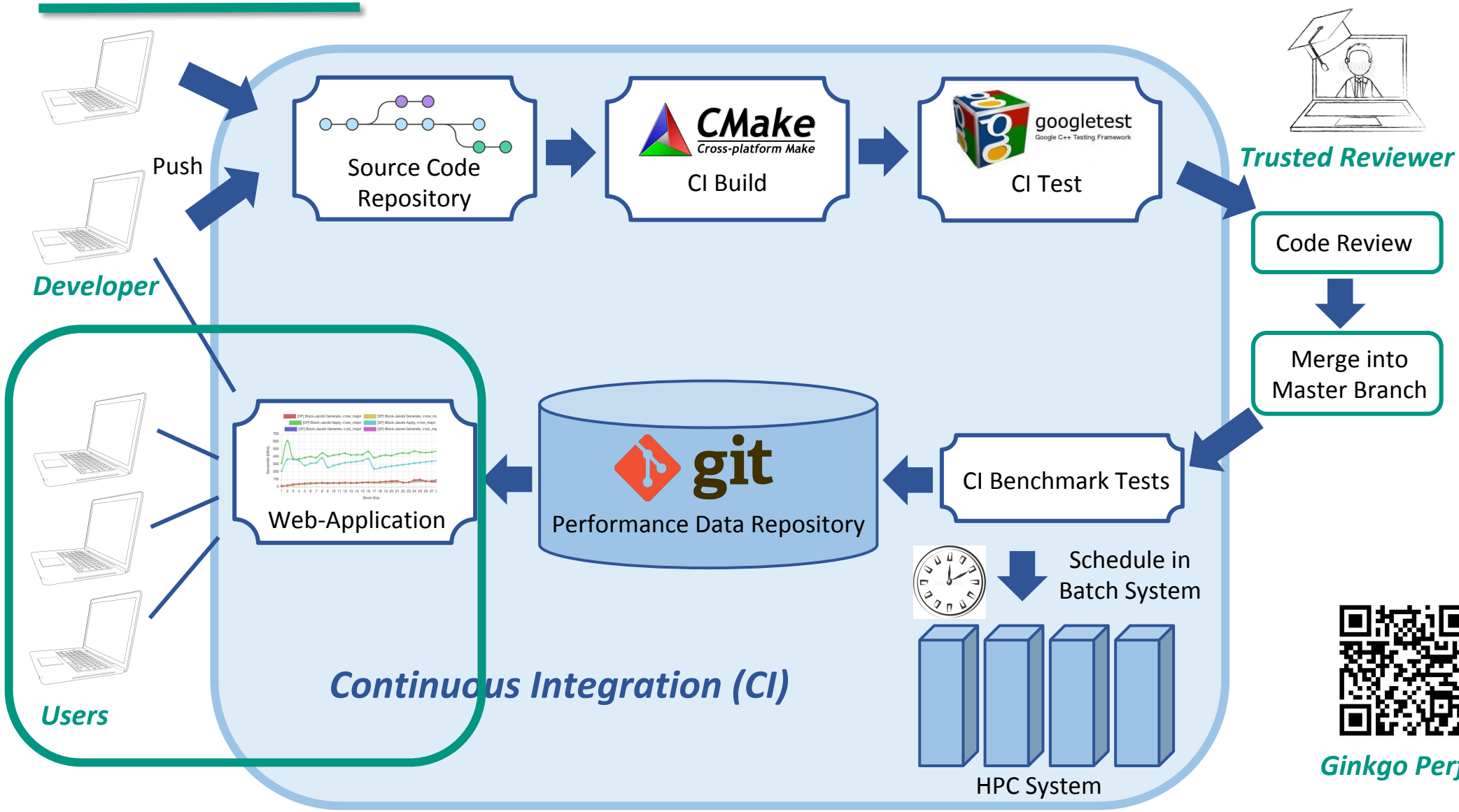


GPE

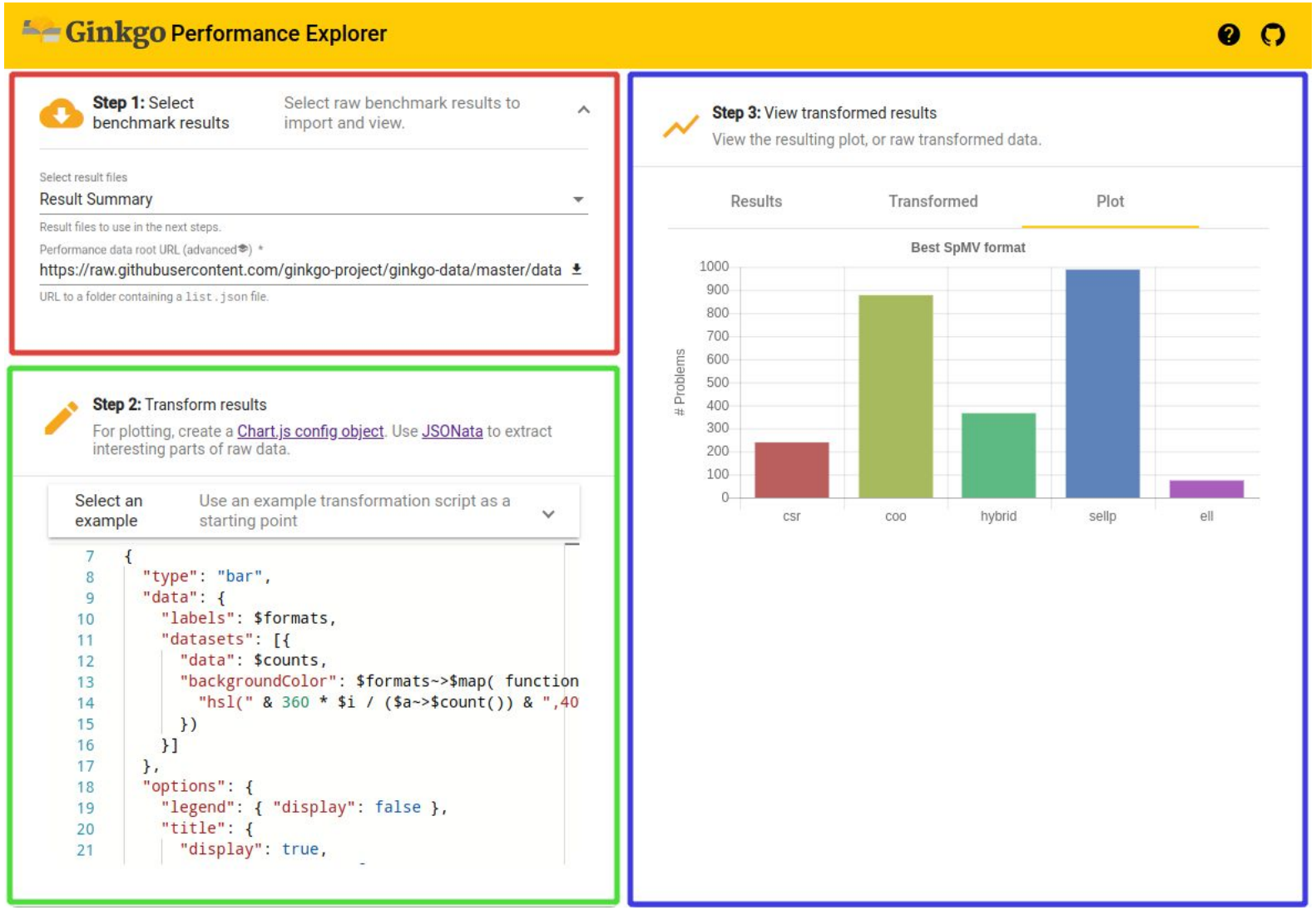
Ginkgo Performance Explorer

Ginkgo Performance Explorer (GPE)

Data Selection Tab

Transformation Script Editor

Data and Plot Viewer



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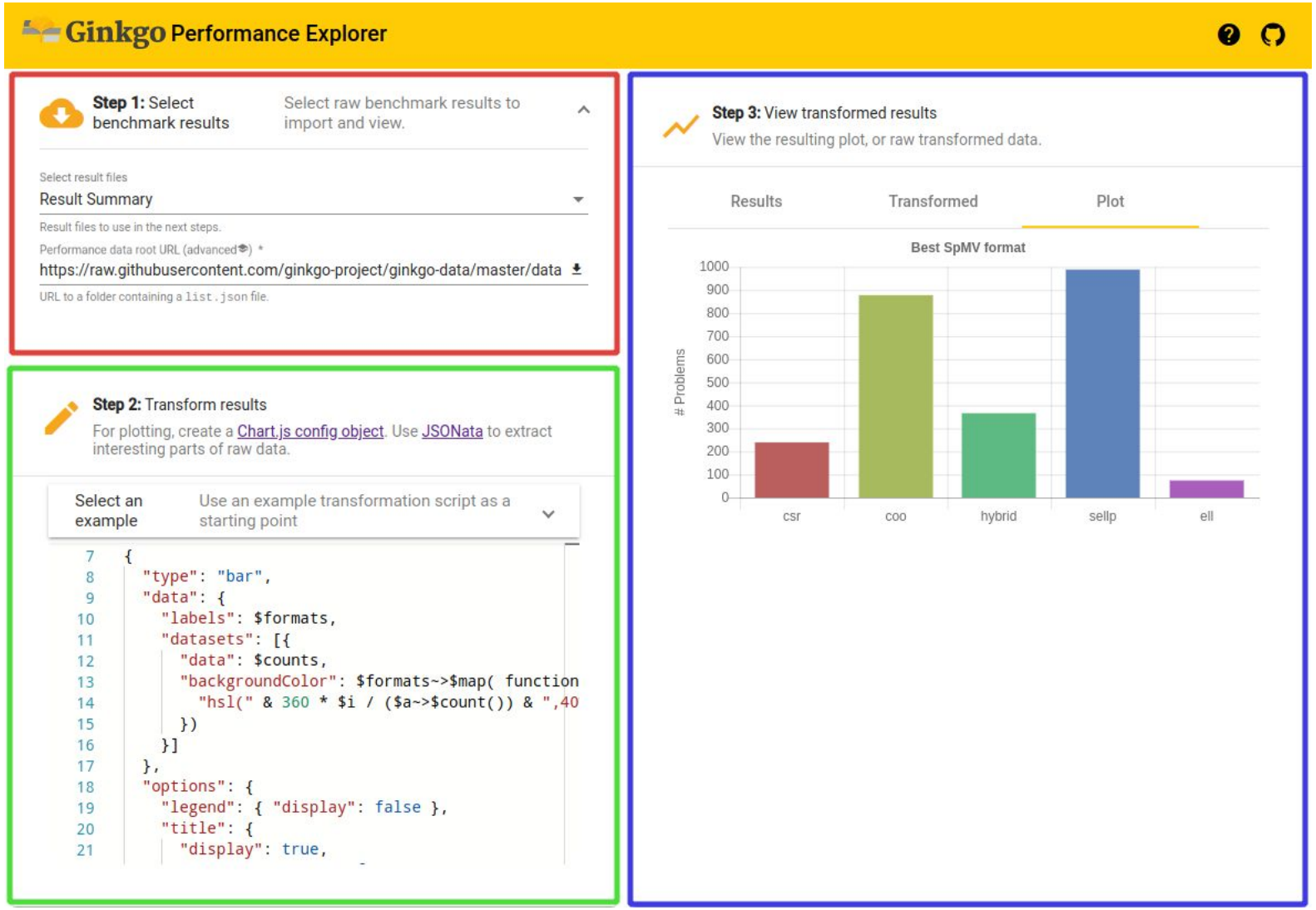

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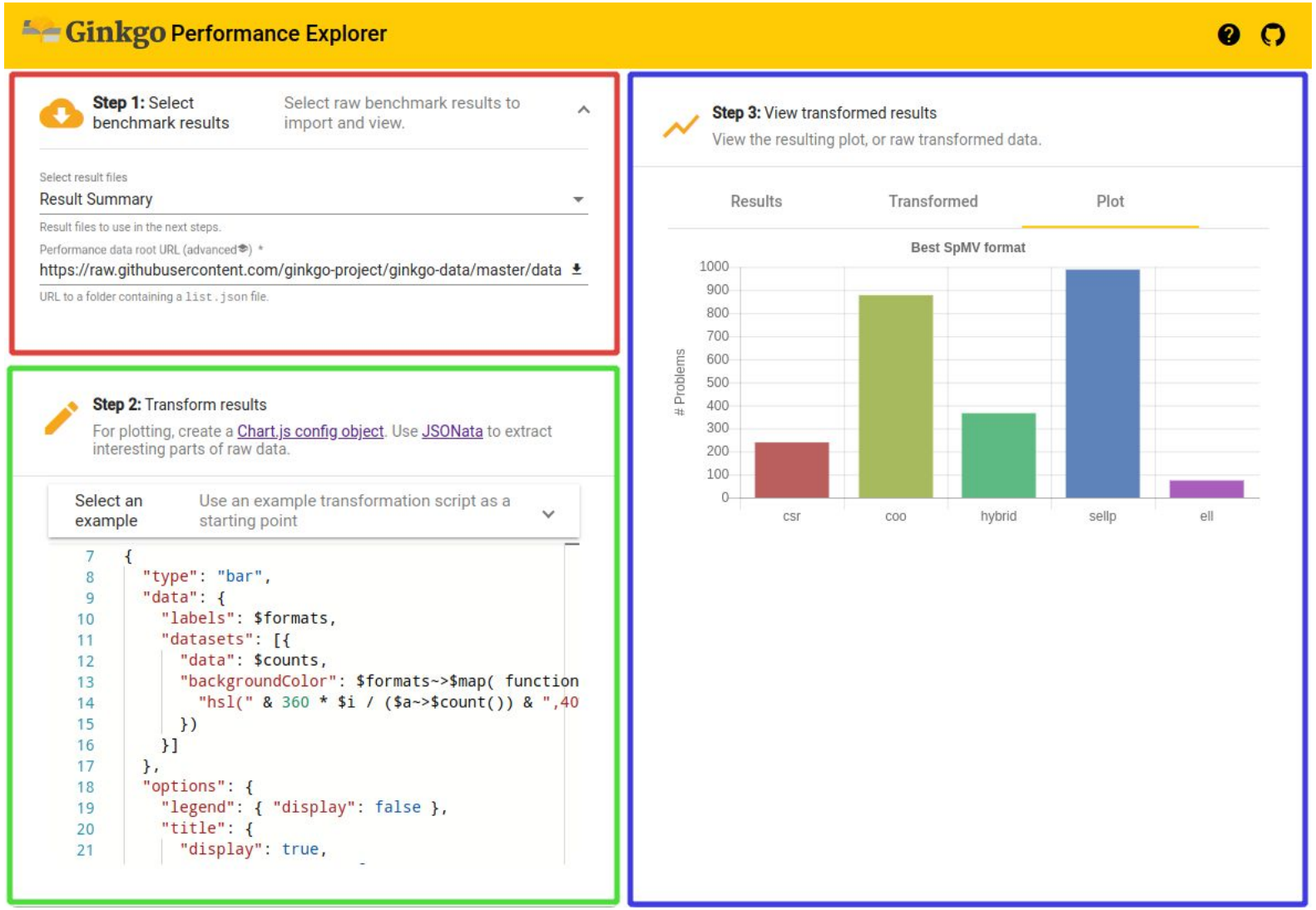

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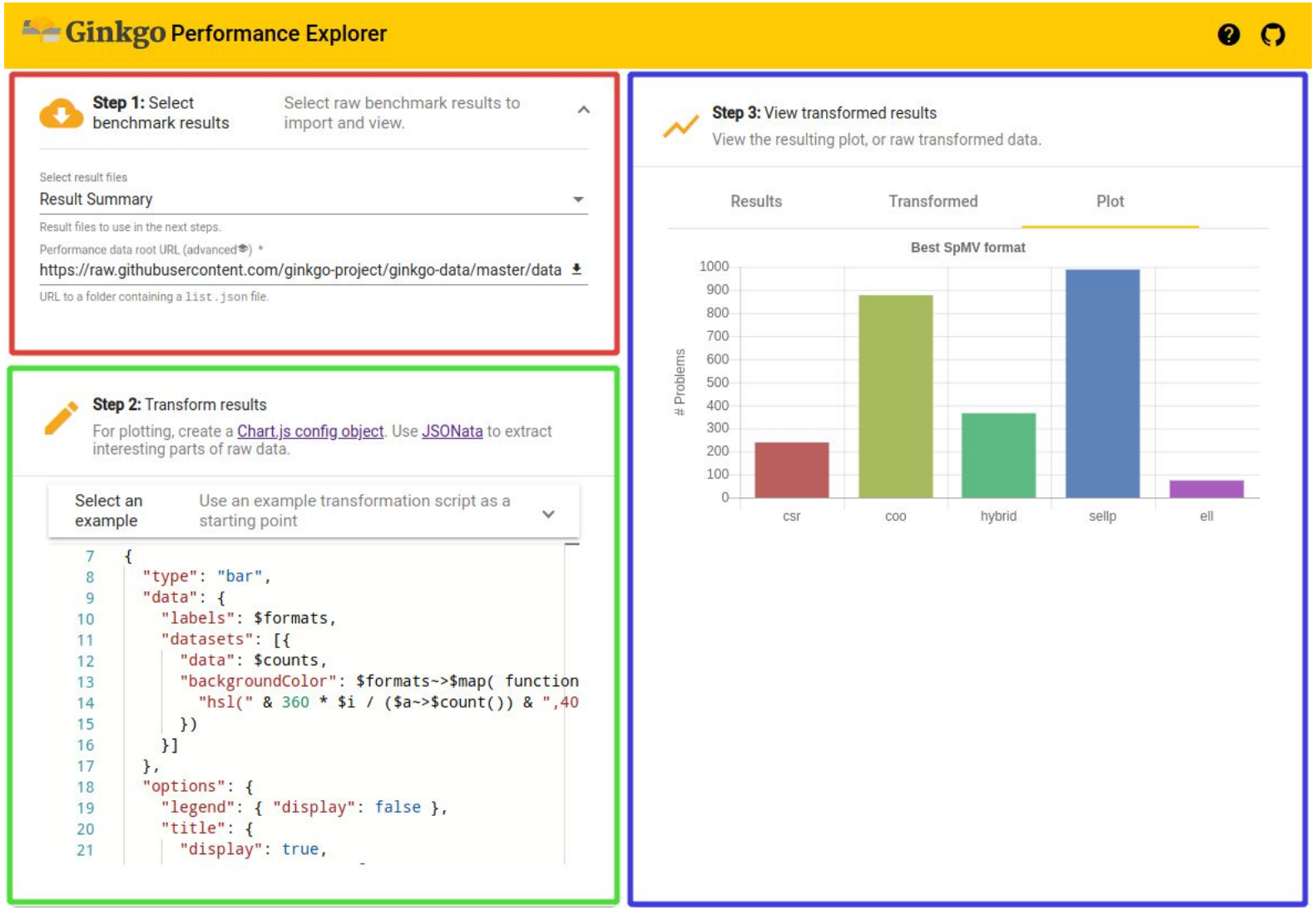

Data and Plot Viewer

3.
Analyze data visually.

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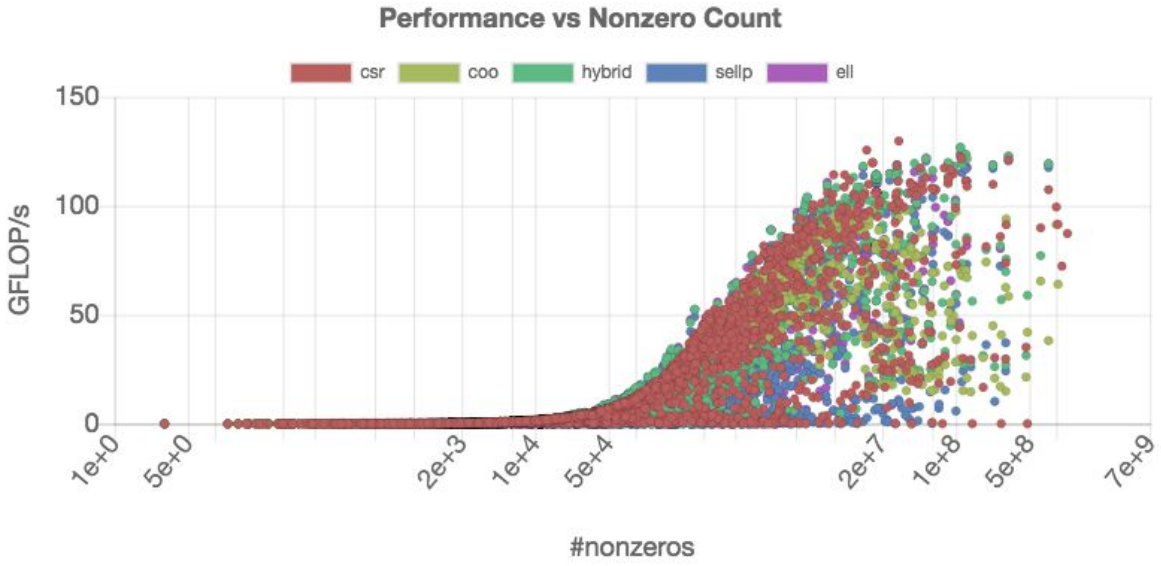

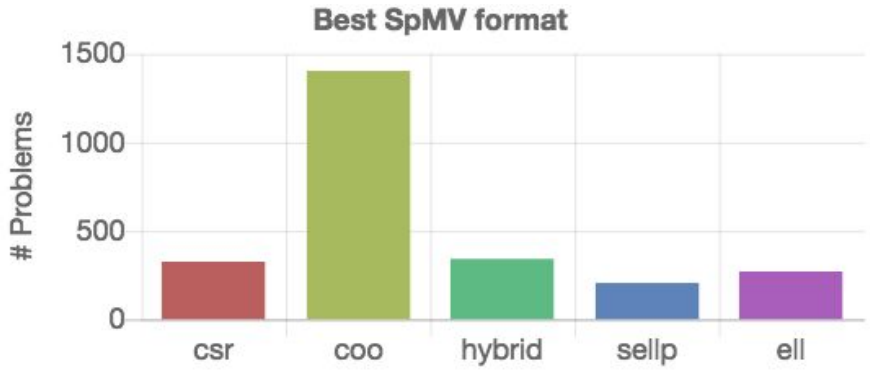

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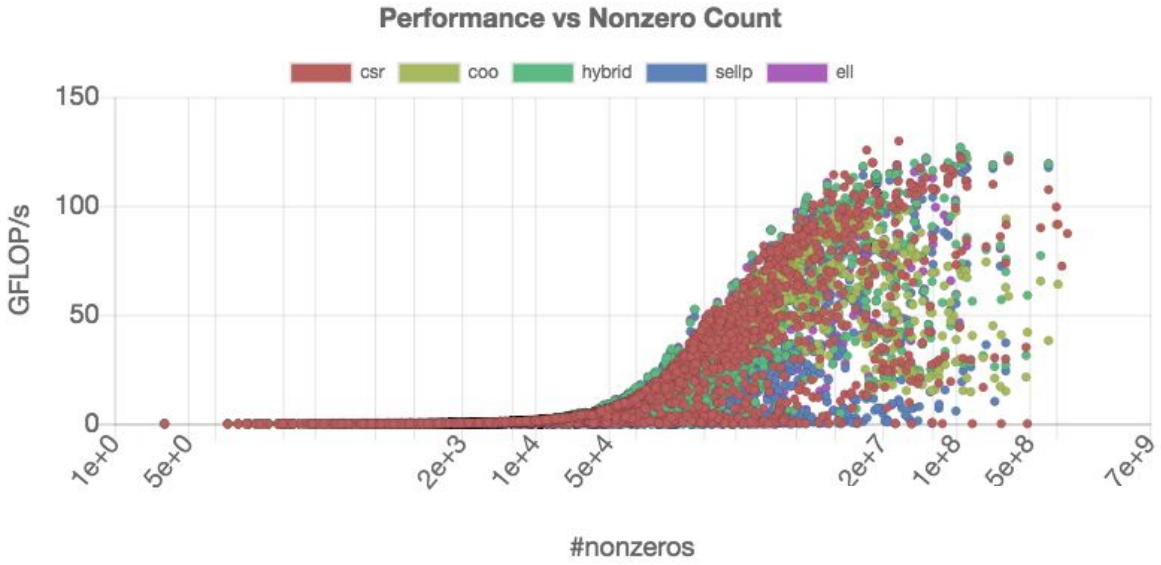

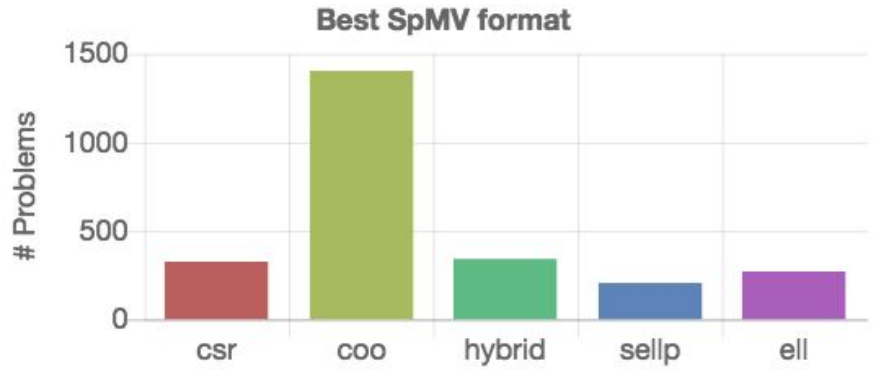

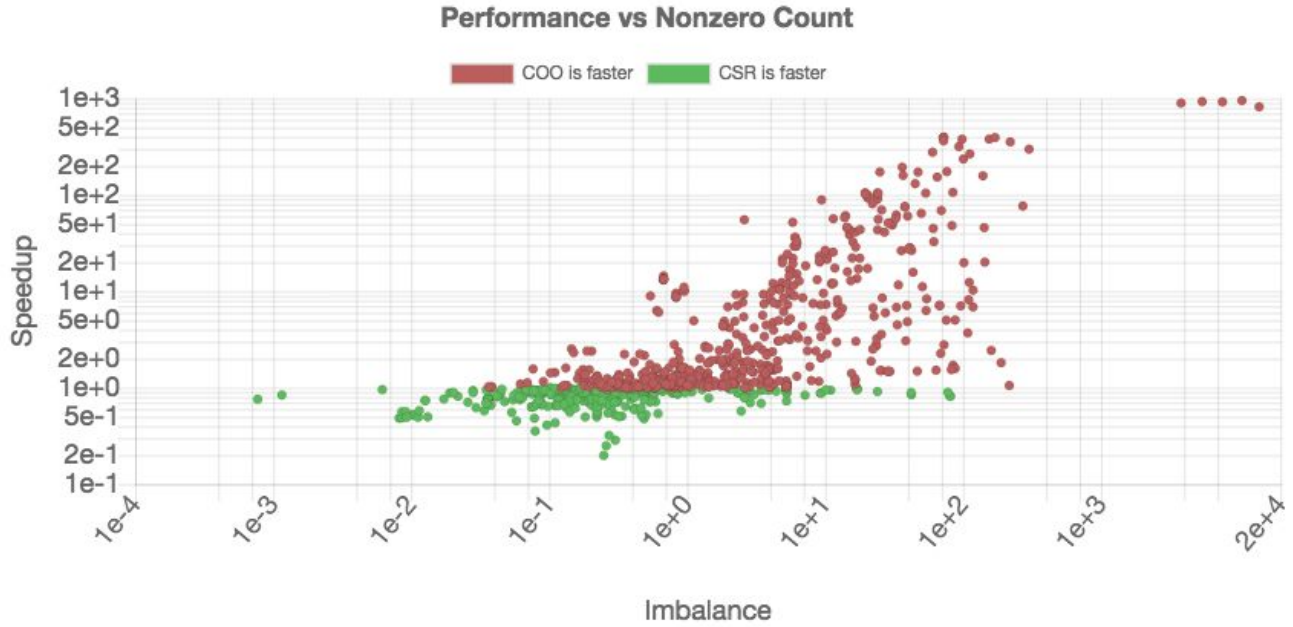

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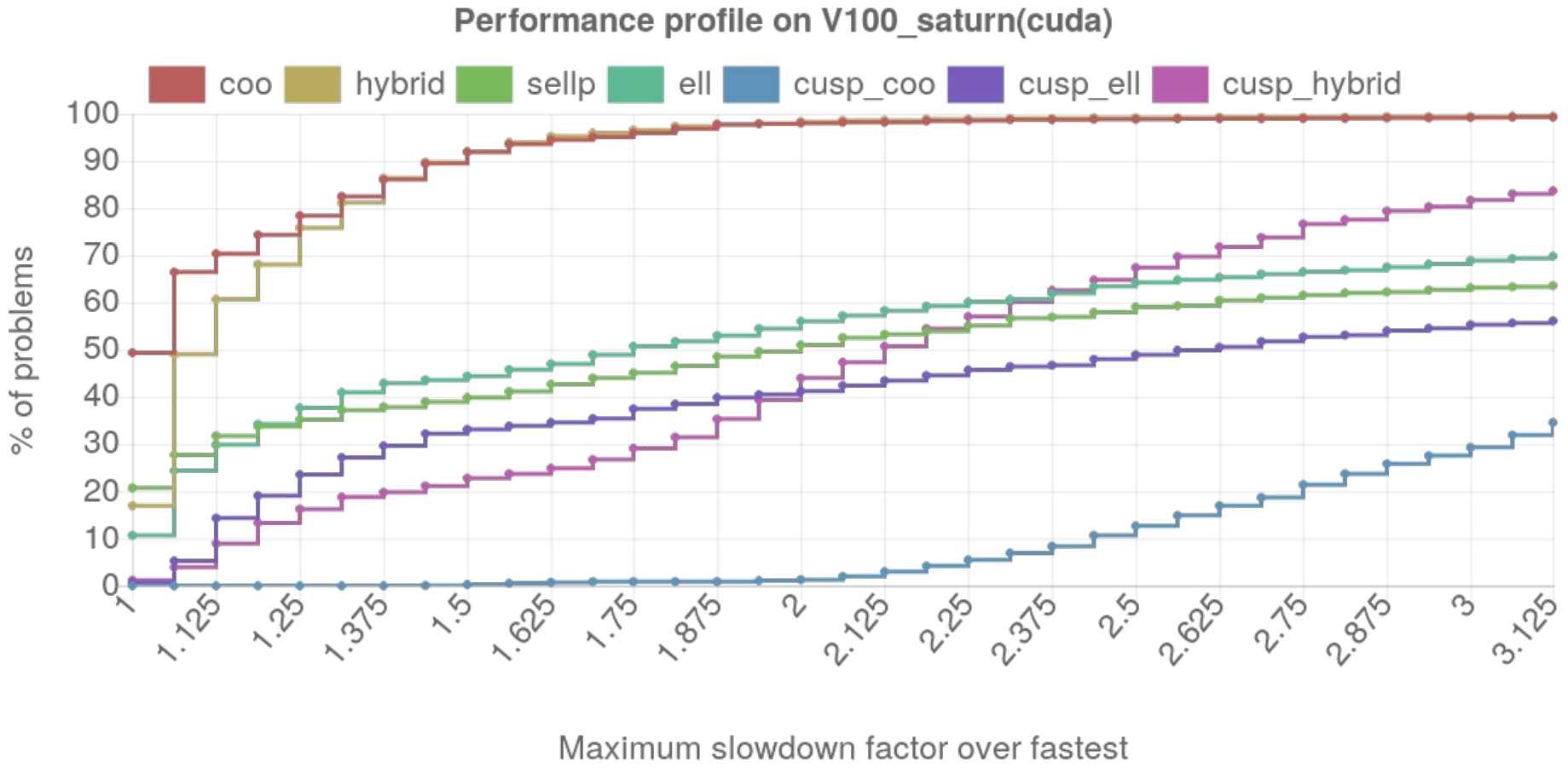

Dolan & More: Benchmarking optimization software with performance profiles

Ginkgo's Performance Evaluation Framework

Continuous Benchmarking Benefits

- Archiving performance data along with execution parameters ensures **full benchmark reproducibility**.
- **Comparing** the performance results over the code lifetime identifies **performance degradations**.
- **Ease of use**: the setup allows to launch benchmark with few clicks.

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Ginkgo Performance Explorer (GPE) Benefits

- The design of GPE efficiently realizes the analysis as **web service**, removing the need for downloading performance data to local disk or installing additional software.
- **External developers** without access to HPC systems can test and engineer **their codes on HPC resources**.
- **Extensibility**: Option to **compare** performance with **other software** libraries.