

Give me some REST !

A Controlled Experiment to Study Effects and Perception of Model-Driven Engineering with a Domain-Specific Language



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Model Driven Engineering Languages and Systems

MODELS 24

22 - 27 September 2024
Linz , Austria

UQÀM

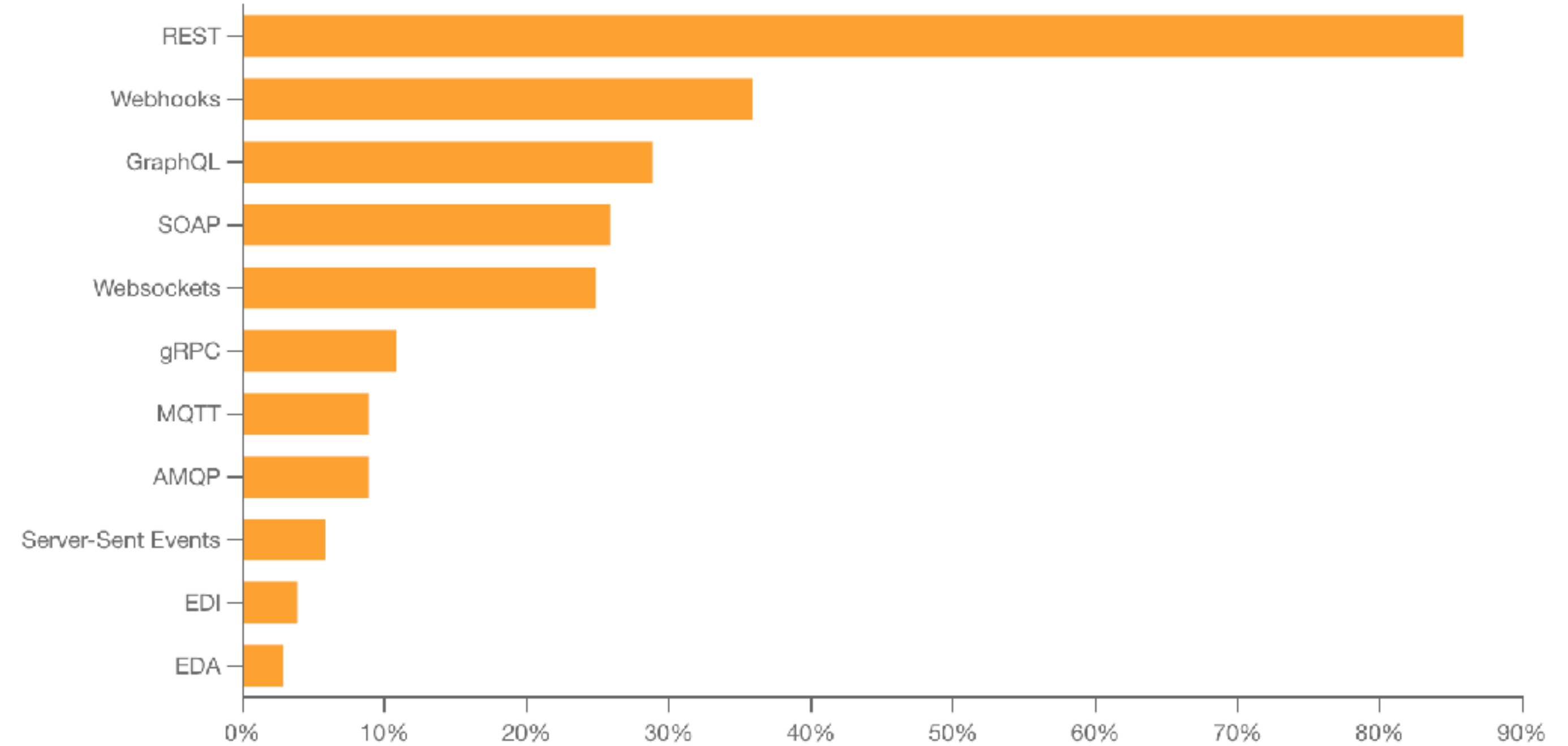
**Université du Québec
à Montréal**



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Migration to REST

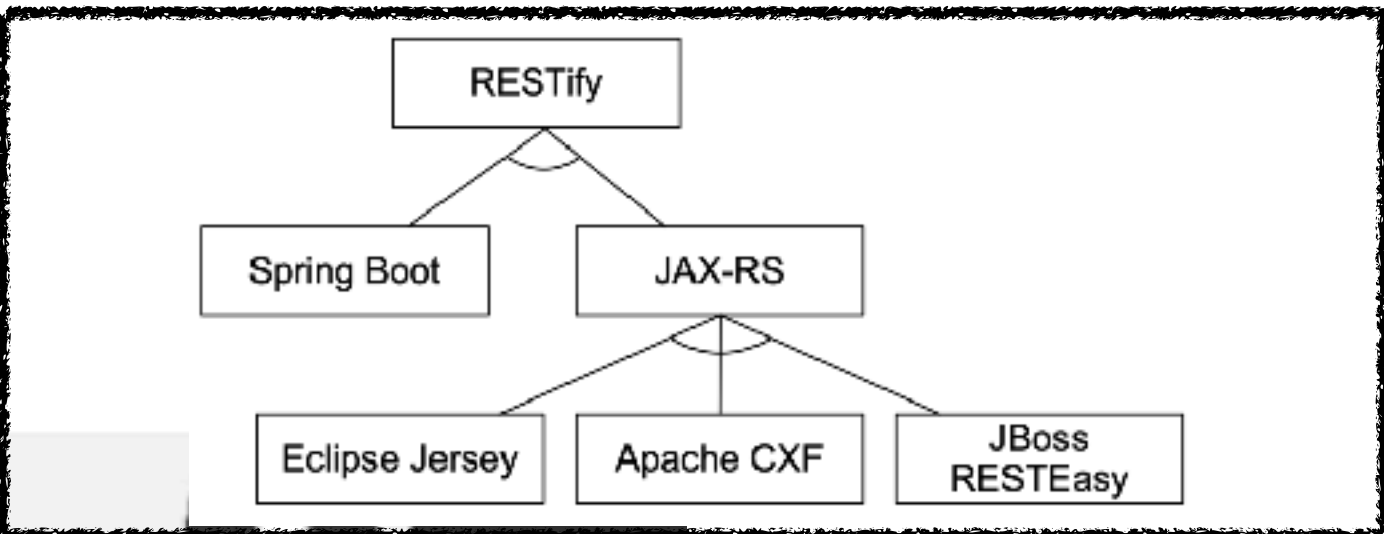
- Popular in industry
- Cloud API paradigm (abstraction)
- Annotation syntax



```
@PostMapping(🌐"/bookstore/stocklocations/{stocklocation}/{isbn}")  
public void setStock(  
    @PathVariable("stocklocation") String city,  
    @PathVariable("isbn") Long isbn,  
    @RequestBody Integer amount) {...}
```

Toolchain (1)

[1]



Concern Reuses

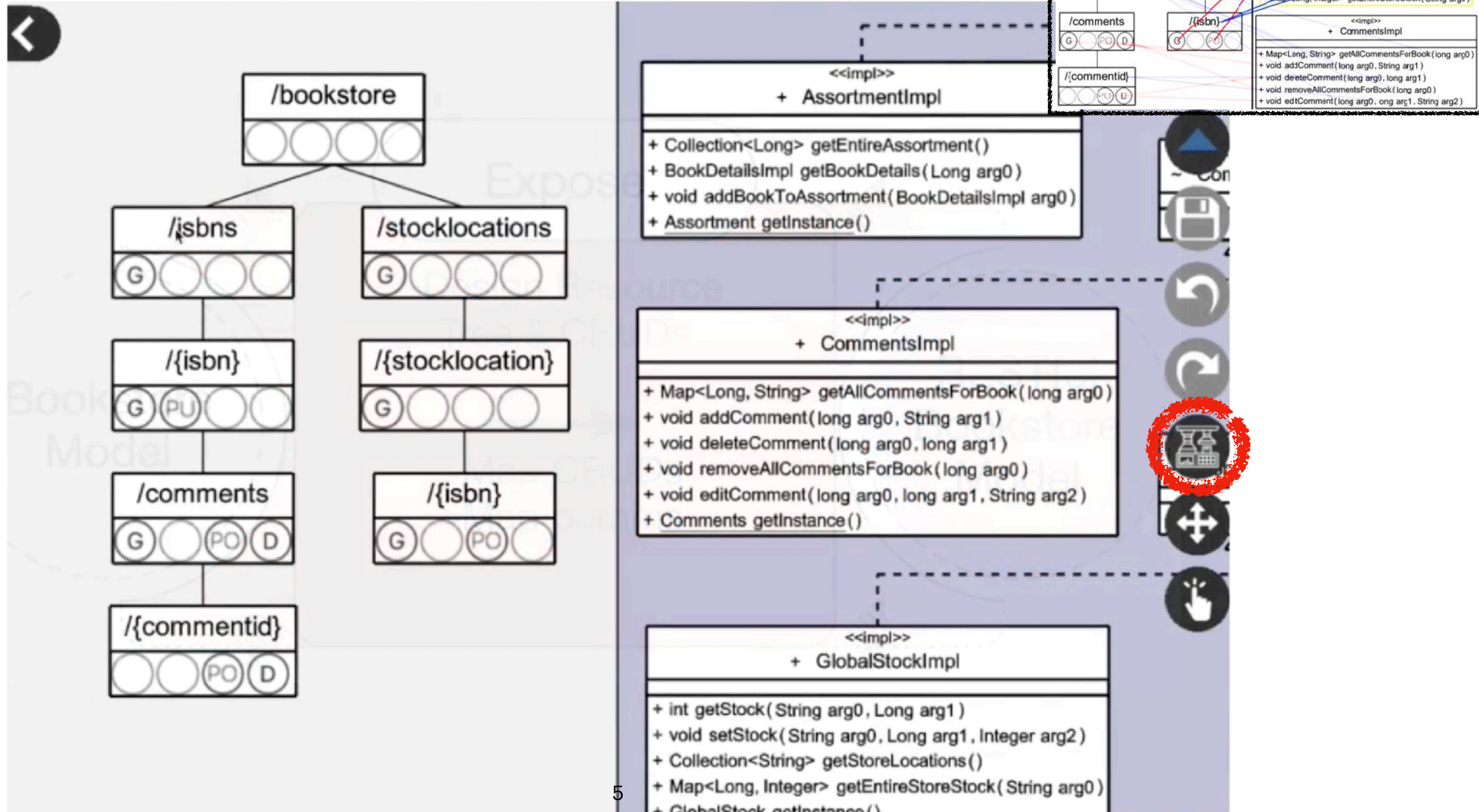
```
graph TD; RESTify[RESTify] --> SpringBoot[Spring Boot]; RESTify --> JAX[JAX]; JAX --> EclipseJersey[Eclipse Jersey]; JAX --> JBossRESTEasy[JBoss RESTEasy]; JAX --> ApacheCXF[Apache CXF];
```

Goals

Increase Security: 0.0
Maximize Throughput: 0.0
Minimize Memory Use: 0.0

Legend

Toolchain (3)

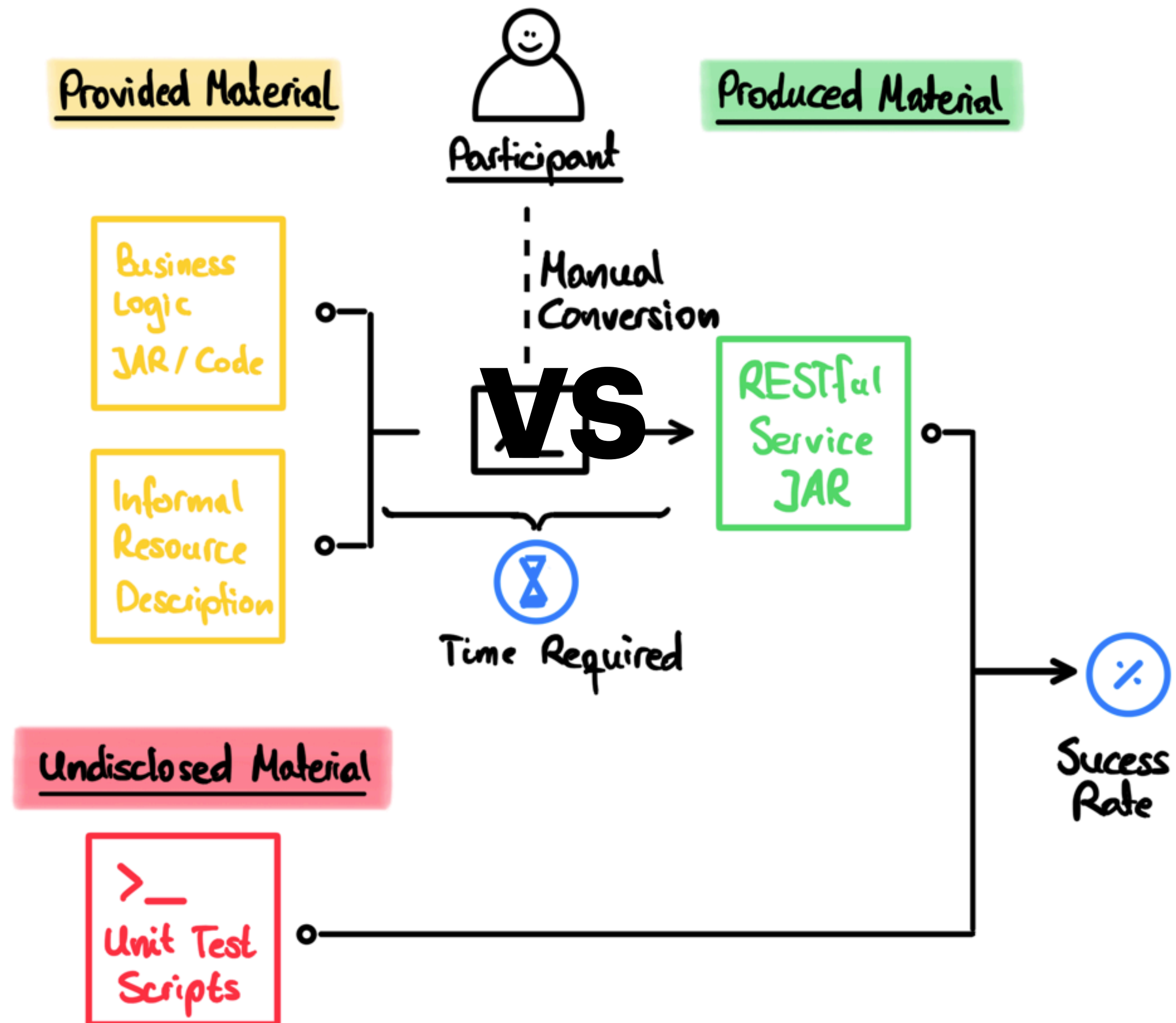


**"Using our tool, everything gets better,
and practitioners will love it."**

(That's a hypothesis)

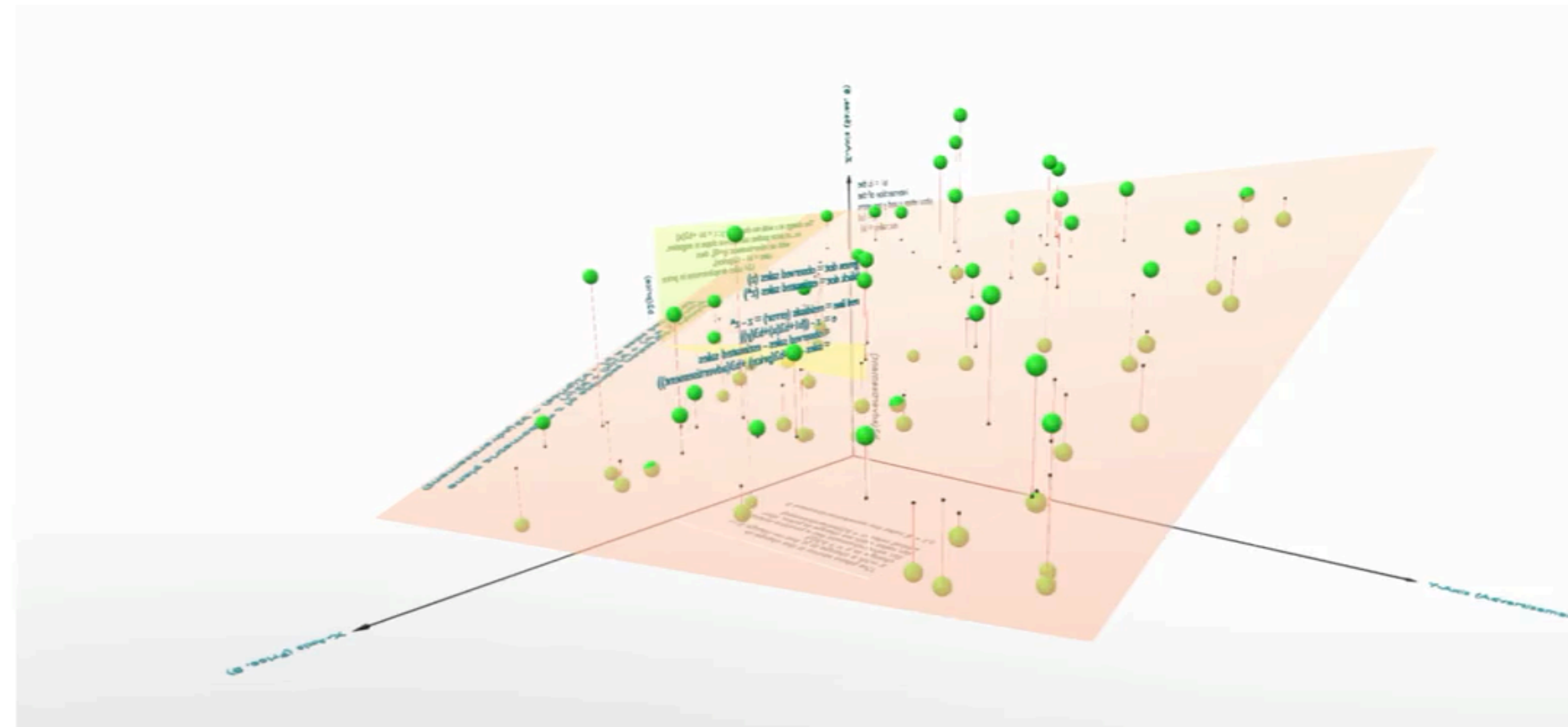


(Controlled) Experiment



General Linear Model

- All samples
- All variables (dimensions)
- Linear regression

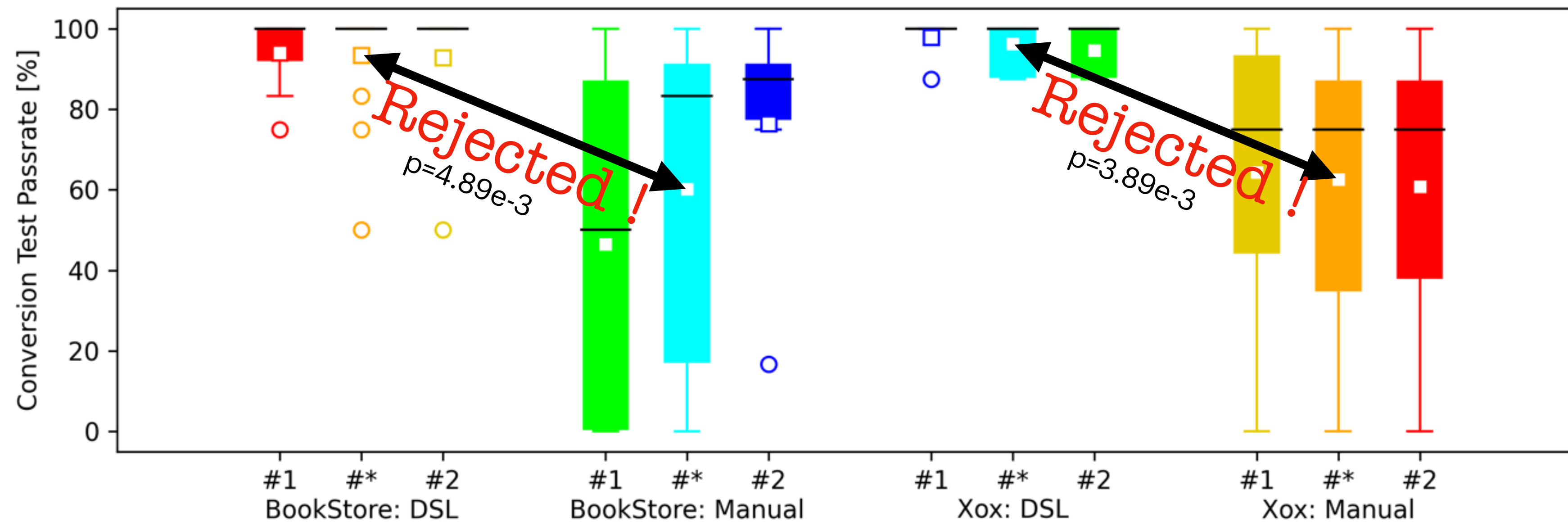


General Linear Model Illustration
Source: <https://sketchfab.com/>

Performance

Test Passrates

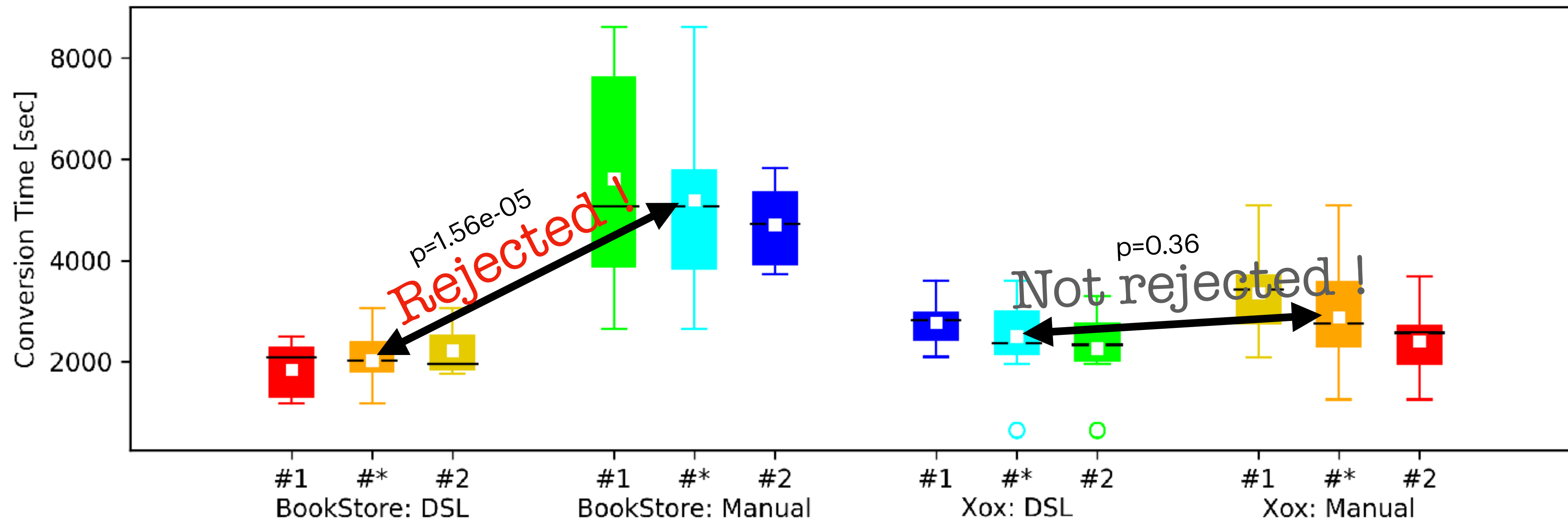
- Wilcoxon Rank Sum (Non-parametric, robust for low sample size)
- Null Hypothesis: *"The distributions are the same (*)"*



Performance

Conversion Time

- Wilcoxon Rank Sum (Non-parametric, robust for low sample size)
- Null Hypothesis: *"The distributions are the same (*)"*

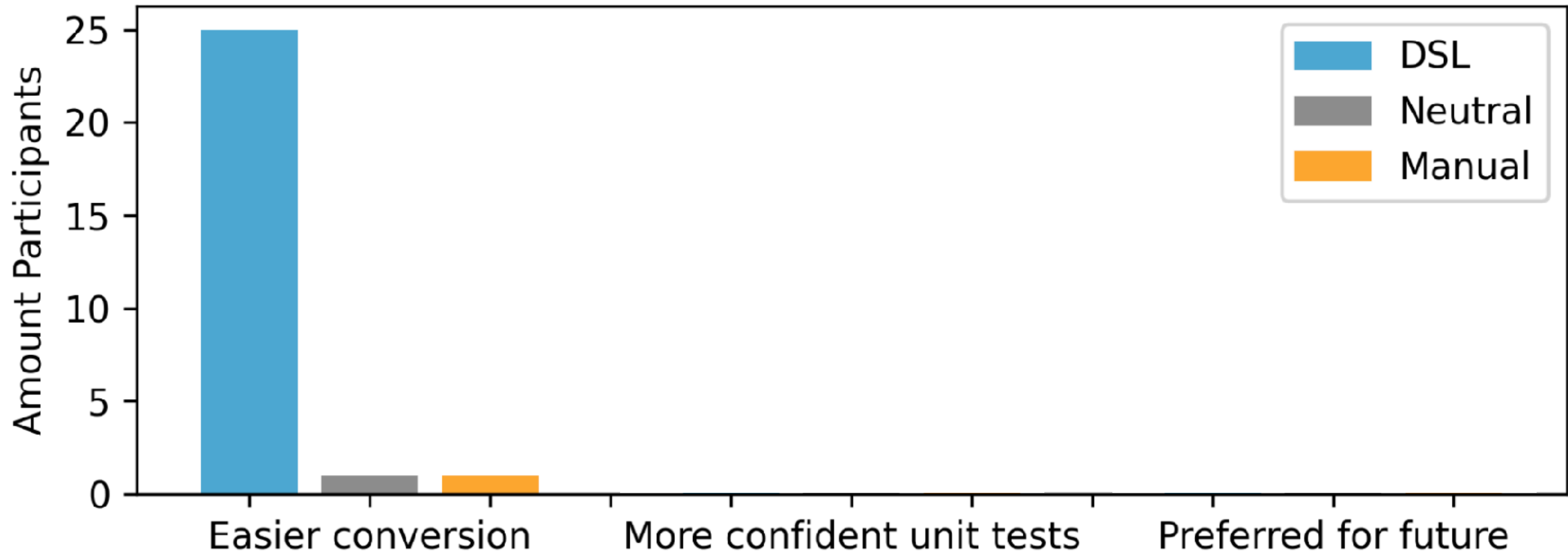


"Using our tool, everything gets better,
and practitioners will love it."

(That's a hypothesis, too)

Feedback Forms

Participant Feedback



Green Unicorn: “(I prefer) the manual solution, because it gives more control over the source code.”

Green Turtle: “I will most likely stick with IntelliJ as I feel more comfortable coding everything manually where I have more control.”

Yellow Turtle: “Because the code generation process is unknown to me, I’d be more confident in the manual methodology [...], where I had total control and knew the code that would run against the tests.”



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Abstract

Domain-Specific Languages (DSLs) are an efficient means to counter accidental complexity and are therefore a key technology for Model-Driven Engineering (MDE). Despite DSLs' potential, there is a lack of empirical research regarding the practical effects and developer perception of DSL-driven tools. In this paper, we present a controlled experiment with 28 participants around a previously developed DSL-based toolchain, which assists the migration of legacy software to REST. A direct comparison of developer performance

1 Motivation

Domain Specific Modelling language since the early days [42]. B domain in the language, DSLs and consequently, DSLs are often purpose languages (GPLs) to de Although the integration of DLs binning it with the remainder of t common [22, 26, 47], a systematic



- Replication package:
 DOI [10.5281/zenodo.12555385](https://doi.org/10.5281/zenodo.12555385)
- (Almost) all the data !
- All the tools !
- Easy to reuse !

