

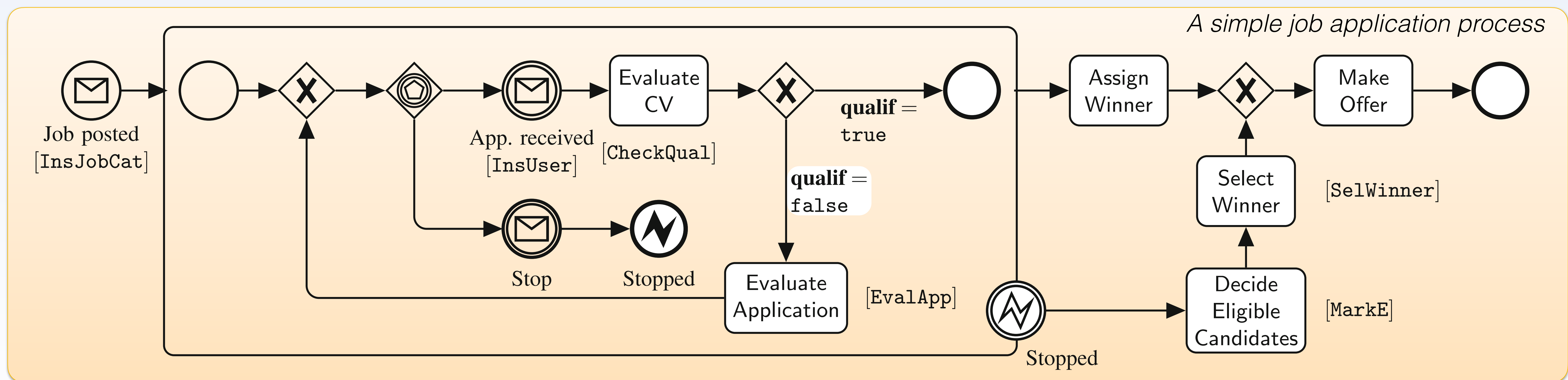
Make Business Processes great again... ... using Formal Methods (=^ ∪ ^=)

Andrey Rivkin

section of Software System Engineering



Business Process



Processes consist of control-flows organised amongst activities in order to reach company goals. Activities and decision logic are arbitrarily complex, and can access and manipulate company's **databases**.

Formal Methods

“Mathematical” approaches to software and system development which support the rigorous **specification**, **design** and **verification** of complex systems.

Examples of interesting tasks:

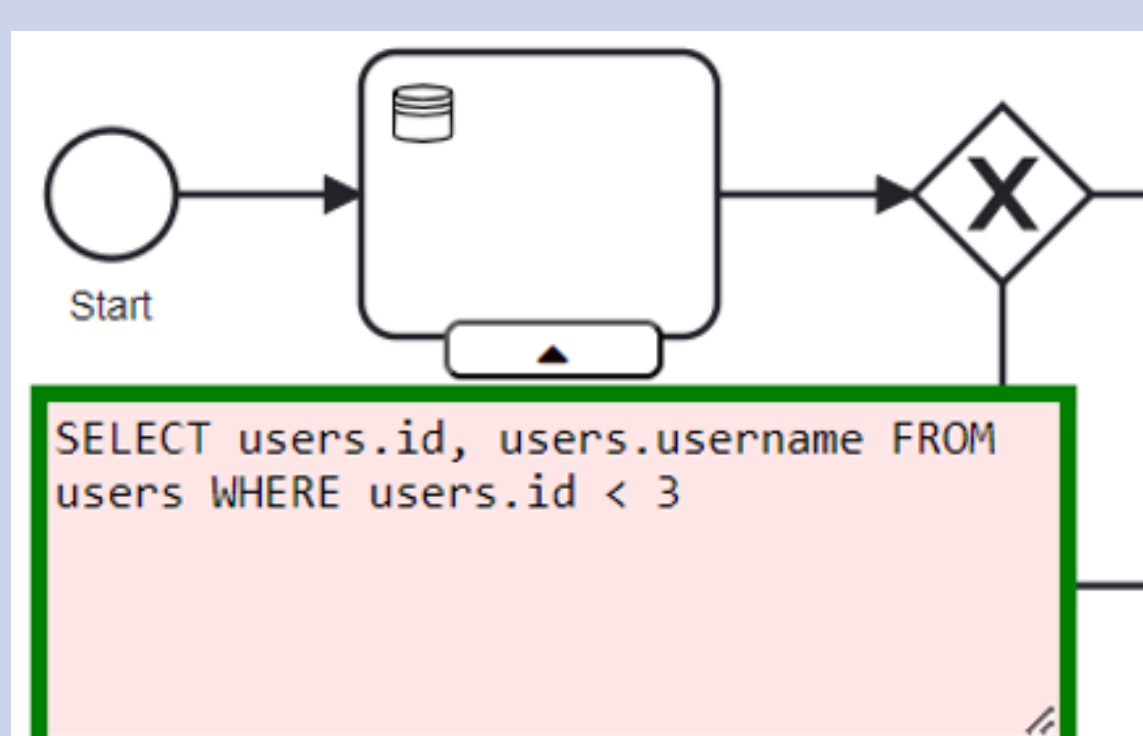
- understand and rigorously specify the system (abstraction)> **Modeling**
- be able to analyse the system executions> **Simulation / Monitoring**
- guarantee that the original system design is respected, desired correctness properties are met and the system can run correctly> **Verification**
- make system specifications executable> **Enactment**

Some success stories

Modeling

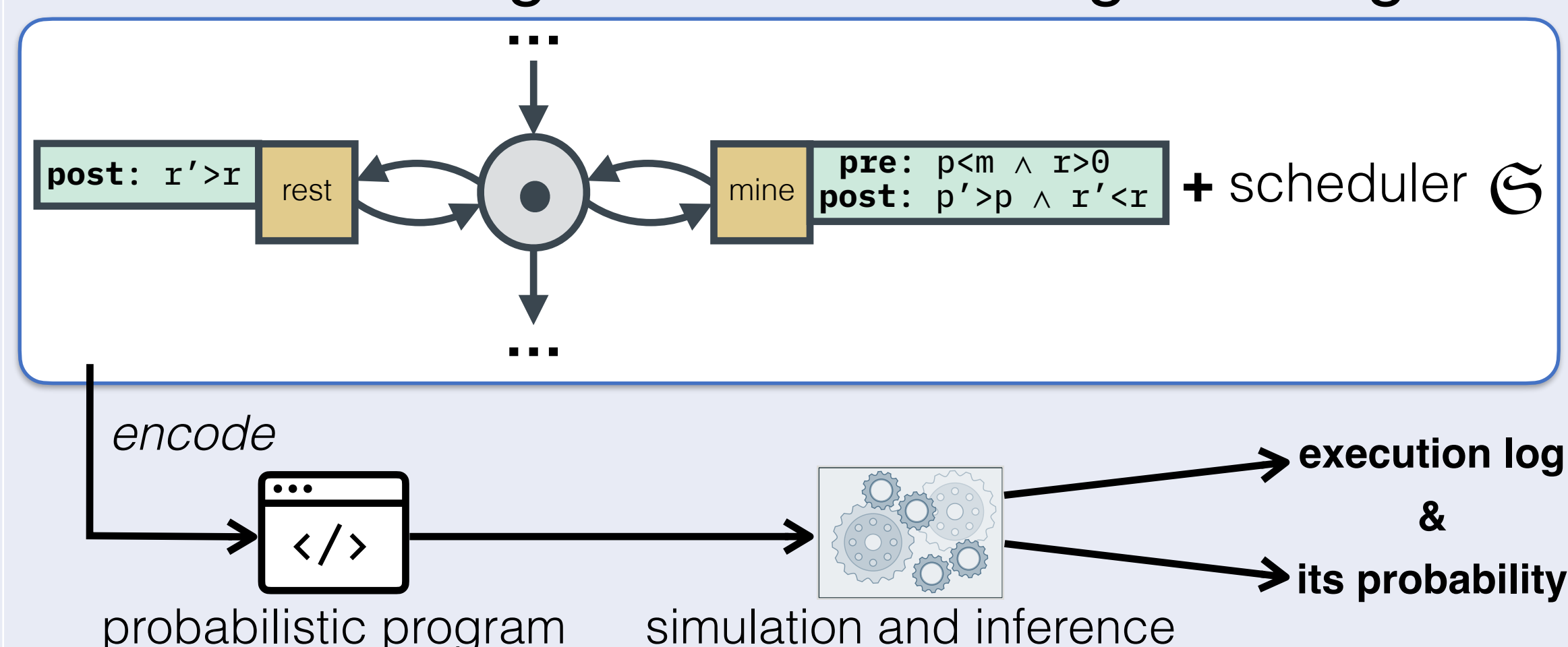
Formalisation of data-aware processes → proper execution semantics for BPMN with CRUD support

- BPMN.io extension
- PDMML support (a process-aware SQL dialect)
- DB dynamic linking



Simulation

Simulation of Data Petri Nets with probabilistic schedulers using Probabilistic Programming



What is missing?

General claim:

- Prototypes for modeling, simulation, monitoring, verification and enactment
- Studying adoption in practice
- Benchmarks

Specifically for YOU:

- Interactive modeling tool for DPN simulation using Probabilistic Programming engines (e.g., WebPPL)
- Simulator for data-aware BPMN building on an available prototype

