An end-to-end example with EventStoreDB

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EVENT STORE

Agenda

- An example problem space
- What benefits do I get when using event sourcing?
- An example Event Sourcing diagram
- An example Event Driven Architecture diagram
- Implementing in python
- Demo
- Downstream uses
- Next steps

An example problem space

A loan processing system is a fairly universal concept

Goal is to put together a system that will allow us to show:

- Event Storming
- Convert to Event Sourced Application
- Implement code
- Understand how to use EventStoreDB in the right way

We'll follow some simple business rules:

- A loan application contains some data fields
- A credit check is required
- If a loan application has a credit score
  - >=7, approve automatically
  - <=4, deny automatically
  - Otherwise, send it to a user to manually decide if it should be approved

Event Sourcing supports your business workflows AND your technology partners

Fully Auditable

Keep your data **unchangeable and ordered** to unlock **time travel and auditability**

Rich Context

Highly granular data retains **full business context** and **removes limits on downstream usage**

Flexible Workflows

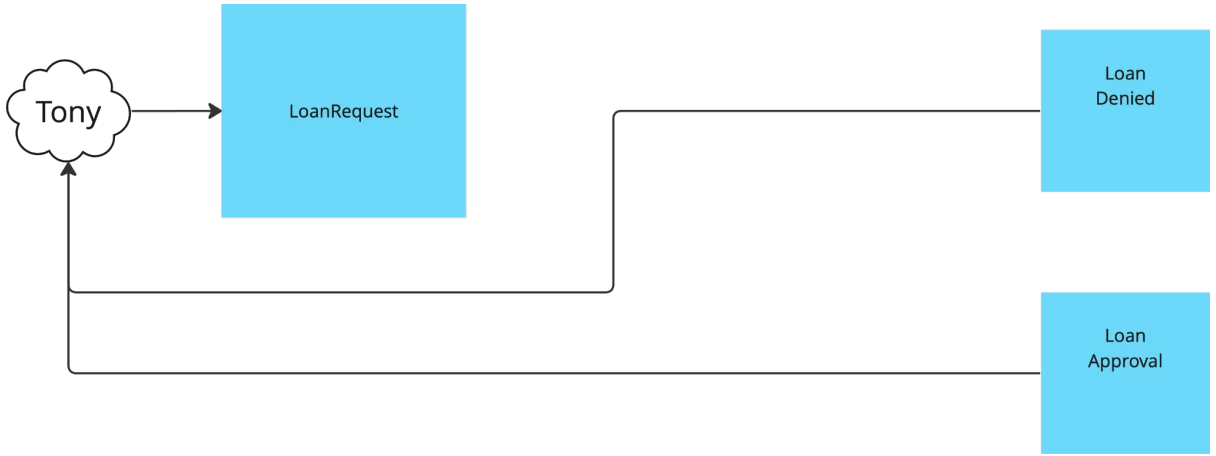
As the business **workflows evolve**, systems can **adapt and mature**

Future-Proof

Your data is **ready for use** by the **next generation of technologies** to **empower your business teams**

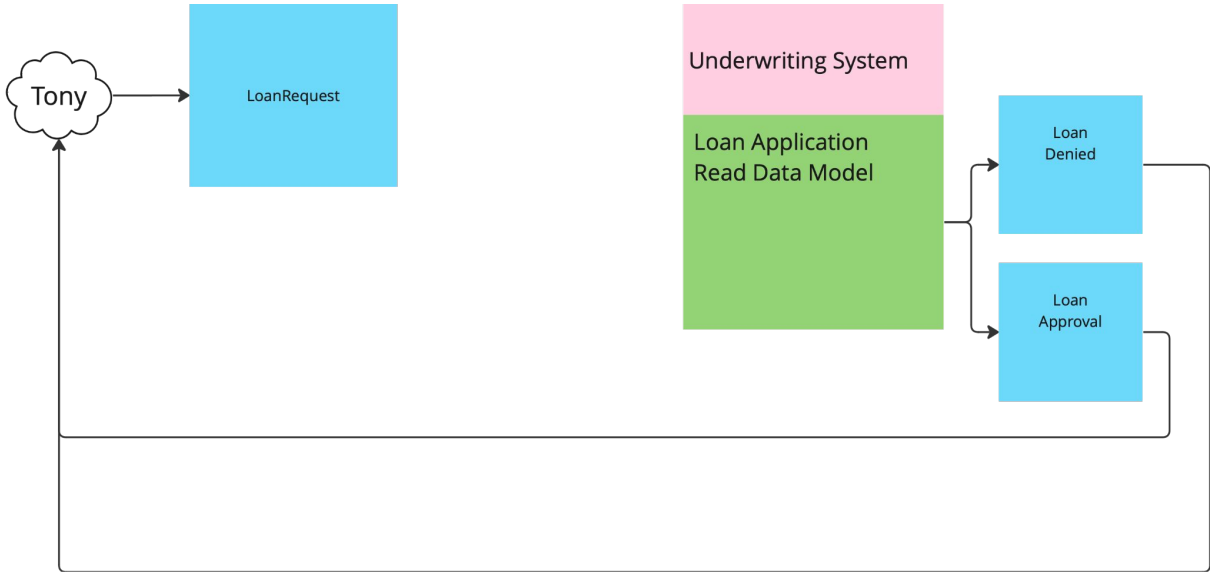
An Event Sourcing example

- Event Sourcing vs. Event Storming
- So… how do we get started?
  - **IT: On what system are we here to collaborate?**
  - **Business: We are here to develop a loan processing system**
  - **IT: Great! From a high level, what will the system do?**
  - **Business: Consumers will apply for loans. We will generate decisions to either approve or deny the loan, and notify the consumer**



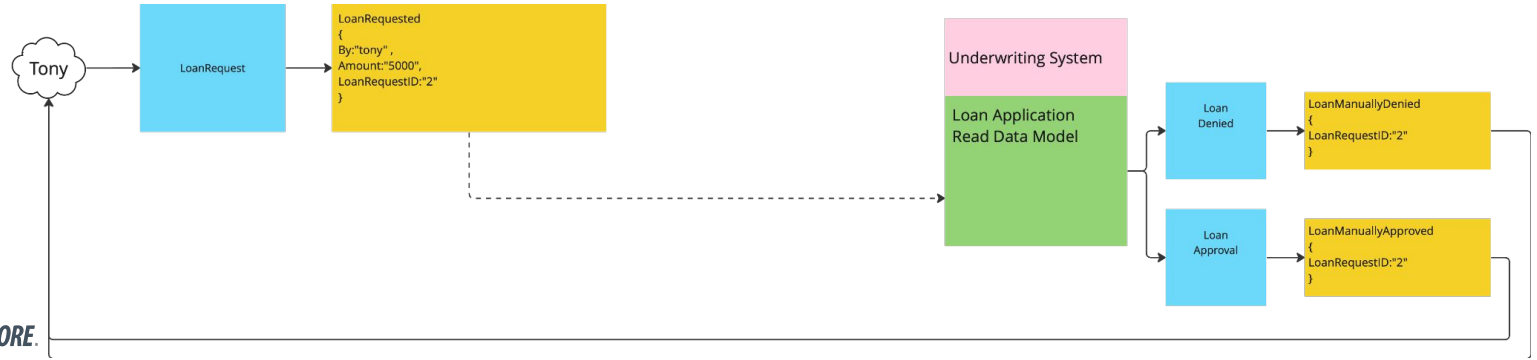
An Event Sourcing example

- How do we get from request to decision?
  - **IT: How would we determine if a loan should be approved or denied?**
  - **Business: An underwriter looks at the loan application, and the credit score of the consumer, and makes the decision**



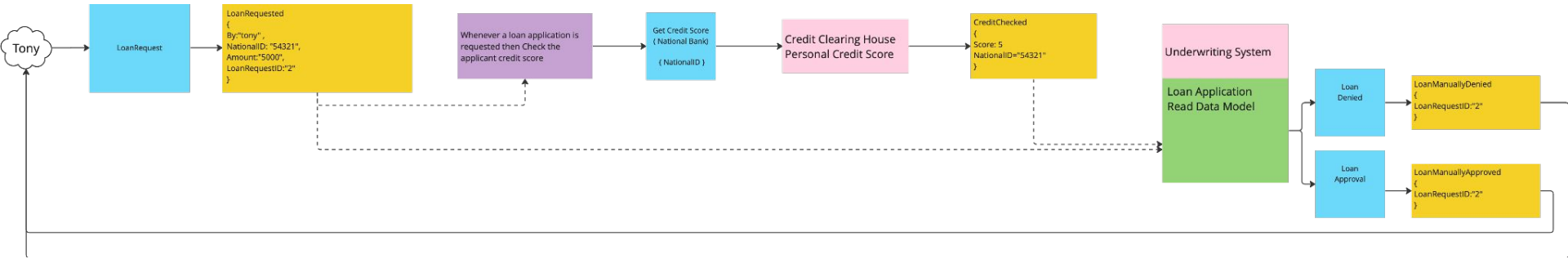
An Event Sourcing example

- What about the data that the underwriter would need to make their decision
  - **IT: What information does an underwriter need to issue a loan decision?**
  - **Business: To protect a consumer's privacy, we collect as little information as possible. We request their name, address, and the amount of the loan they want**
  - **IT: How do you keep applications separate from each other?**
  - **Business: Each loan has a unique ID number, so consumers can apply for more than one loan, and each loan is kept separate for privacy and approval reasons**
  - **IT: How is the loan request ID generated?**
  - **Business: We don't care so long as it is unique**



An Event Sourcing example

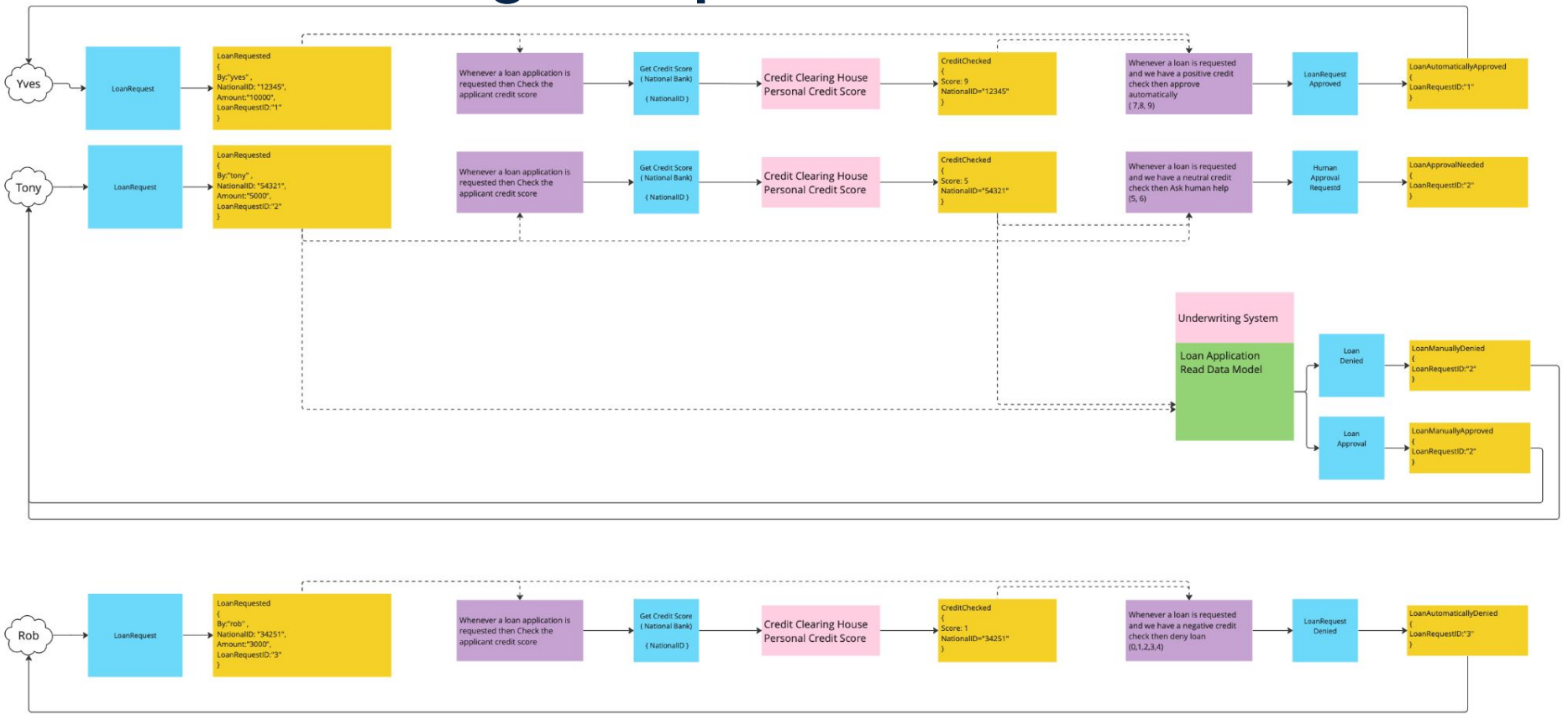
- How do we obtain the credit score?
  - **IT: And how do you get a consumer's credit score?**
  - **Business: We use their National ID number to check their credit score with a credit clearing house**
  - **IT: So we should also collect the National ID number as part of the application?**
  - **Business: Yes, sorry we forgot that part**



An Event Sourcing example

- Perhaps the workflow could be partially automated to increase productivity
  - **IT: Are there times that an underwriter would automatically approve / deny a loan?**
  - **Business: In practice, a consumer with a credit score of four or below is always denied, and a consumer with a credit score of seven or above, is always approved**
  - **IT: So if we introduce some business logic to auto approve or deny based on specific ranges of credit score, would that be acceptable?**
  - **Business: Yes, that would take some work away from our underwriters whom are already quite busy**

An Event Sourcing example



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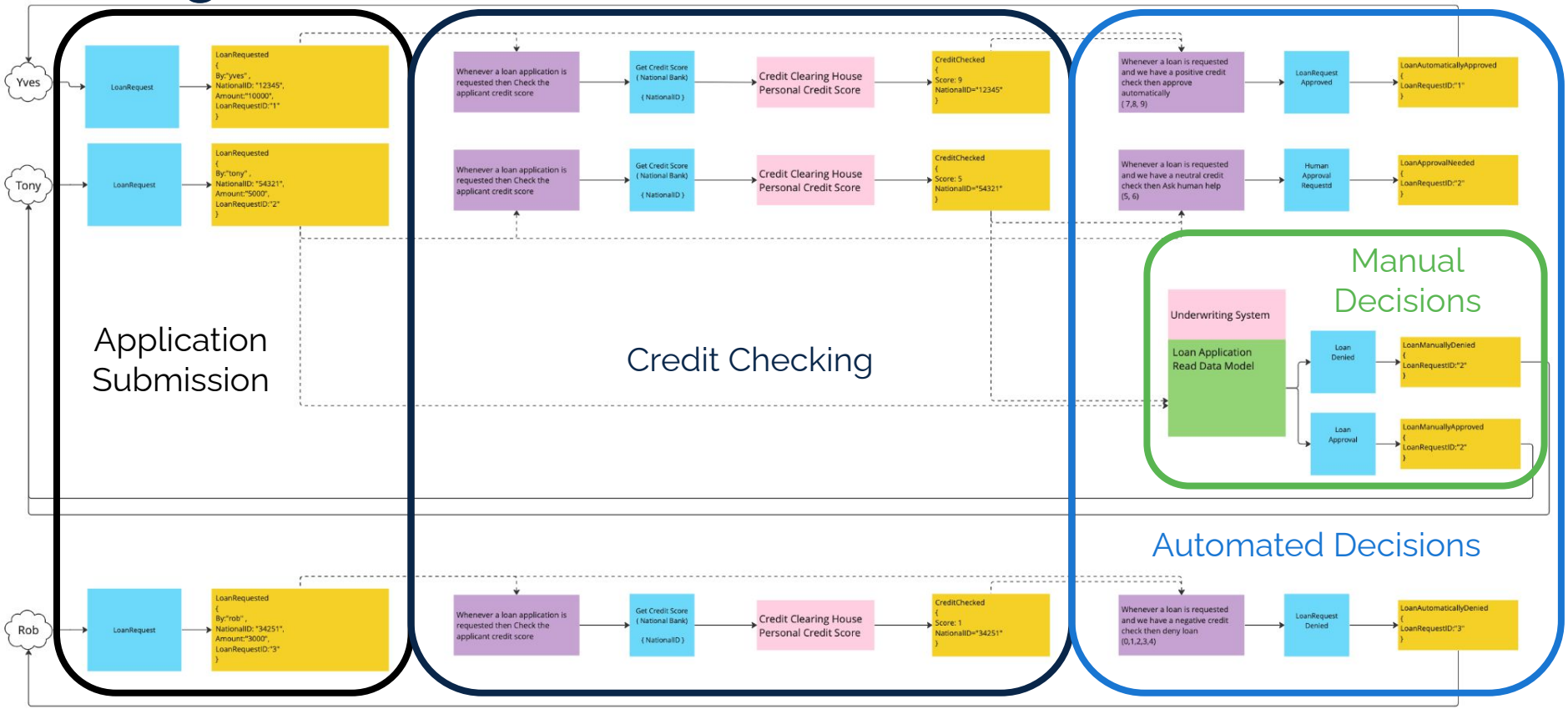
Moving towards architecture



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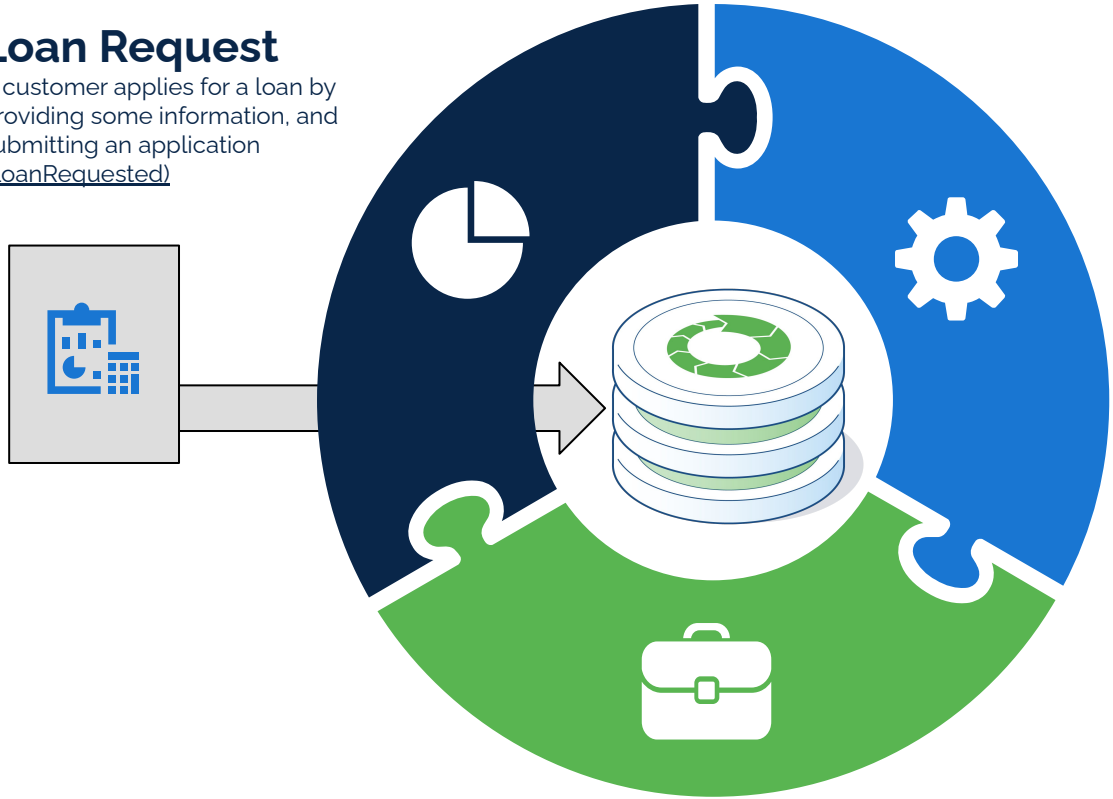
An example loan processing architecture

Loan Request

A customer applies for a loan by providing some information, and submitting an application (LoanRequested)



1

Credit Check

Enrich the loan application with a credit check (score) from an external system (CreditChecked)

2

Loan Decider

Implement a business rule; can we automatically process this loan application? (LoanAutomaticallyApproved, LoanAutomaticallyDenied, LoanApprovalNeeded)

3

Underwriting

For those loans that require a manual decision, ask a human to intervene (LoanManuallyApproved, LoanManuallyDenied)

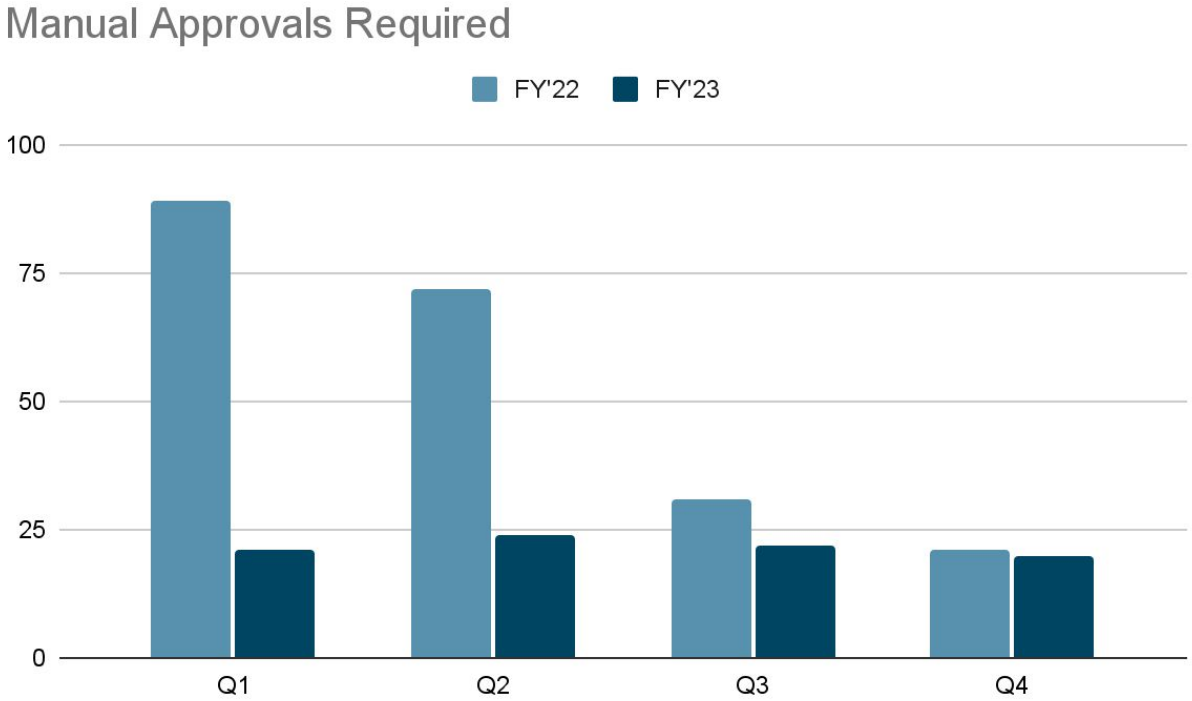
Implementing in Python

- We're going to use EventStoreDB - the event native database - as our data store
- Fully supported python client
- Many other client languages supported

- Sample code: https://github.com/EventStore/samples/tree/main/LoanApplication/Python

Demo

Downstream Consumption



Analytics and Reporting

Stream, transform, and summarize, events downstream to enable analytics and reporting

Downstream Consumption

ML

Stream events to train ML models, in real-time

"Based on loan size and loan default history, consider automatically approving all loans of $10,000 or less with a credit score of 5 or above"

"Applicants with higher credit scores that apply for larger loans, default at the same rate as applicants with lower credit scores"

"Over the last 3 months, loan applications have increased significantly from those with high credit scores in California, Texas, and Nevada, but so have defaults. Consider performing manual underwriting for applicants with a credit score of 8 or higher from Nevada, California, and Texas"

Next Steps

- Learn about Event Sourcing, Event Storming, and EventStoreDB
- Check out our GitHub sample repo:
  - https://github.com/EventStore/samples/tree/main
- Check out our Quick Start Video Series:
  - https://www.youtube.com/@EventStoreLtd
- EventStoreDB - the event native database:
  - https://www.eventstore.com
- Engage with us on DIscuss, Discord, Twitter, and more!:
  - https://www.eventstore.com/community

Thank You for Joining!