

Authors

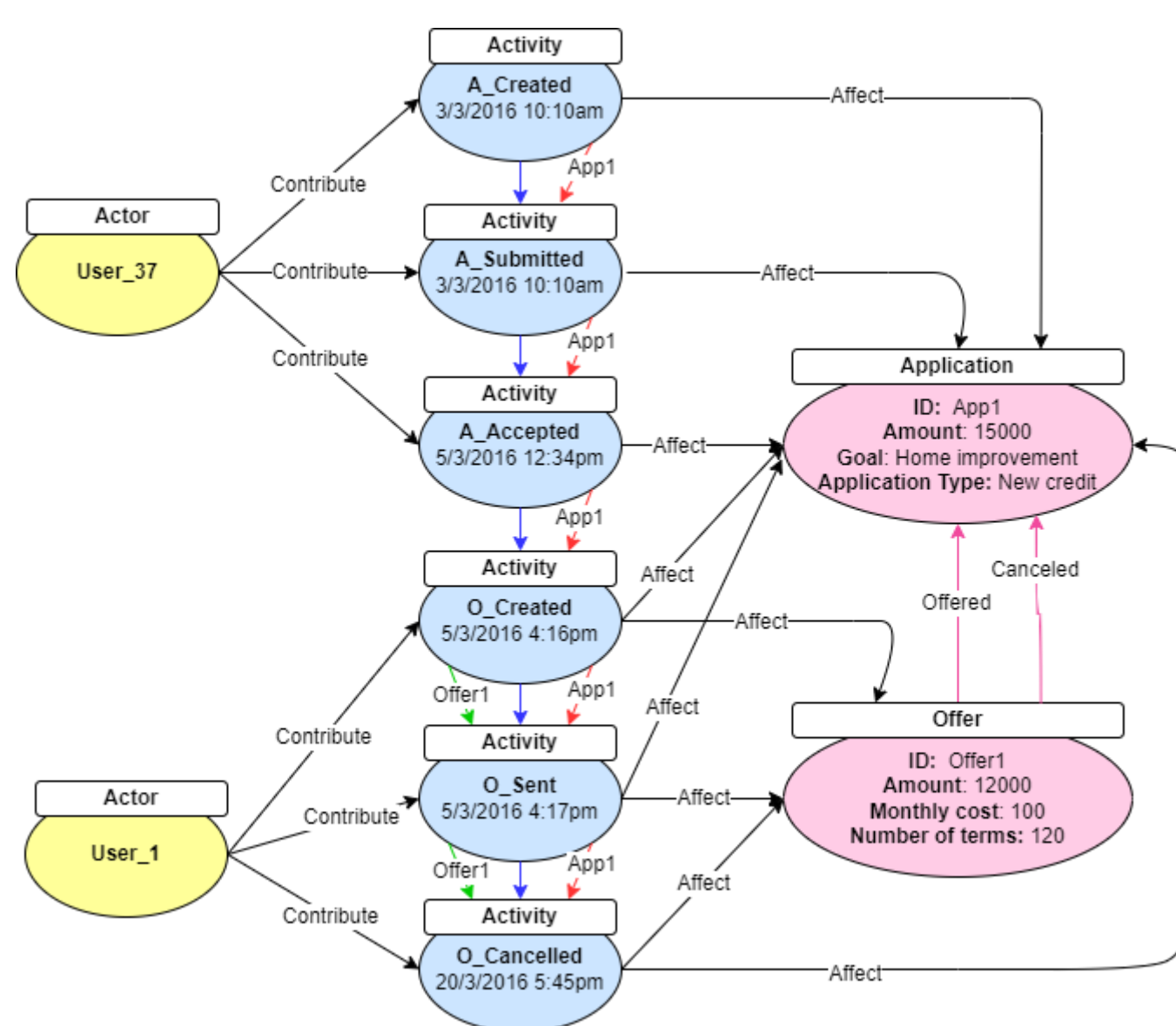
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BUSINESS PROCESS & PROCESS QUERYING

1. A business process is a set of inter-related activities involving a number of actors and data triggered by a need and leading to an outcome.
2. The execution of business processes leave data footprint, referred to as process data.
3. Process data querying allows analysts to easily explore the data with the intent of getting insights about the execution of business processes.
4. The current generation of process query languages targets data scientists.
5. There is a need to a query language to support domain analysts who may be inexperienced with database technologies.

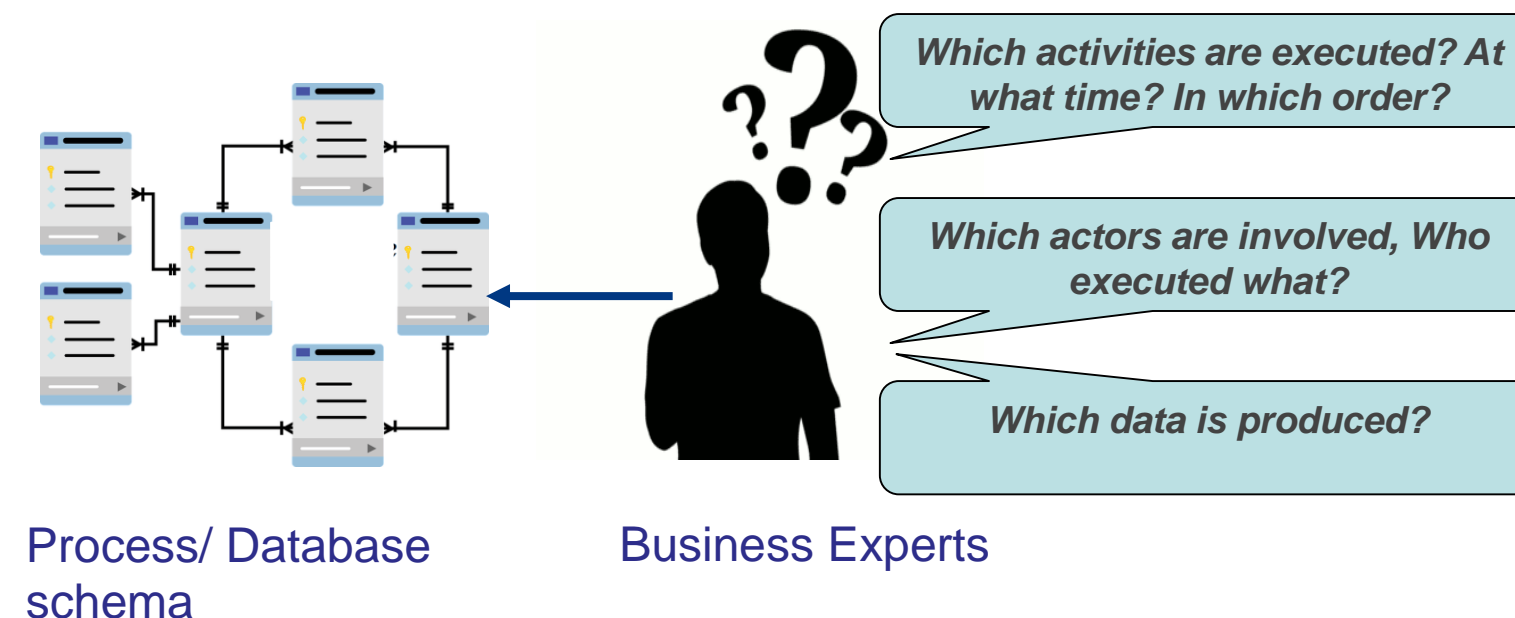


NATURAL LANGUAGE QUERYING FOR PROCESS EXECUTION DATA

HYBRID APPROACH

1. A natural language interface that assists the end-users in querying the stored event data is proposed.
2. The interface takes a natural language query from the user, automatically constructs a corresponding Cypher query to be executed over the stored event data.
3. We proposed a hybrid pipeline that takes advantages of machine-learning and rule-based approaches.
4. The pipeline is made up of two main stages.
5. In the first stage, we apply two main tasks of natural language understanding, namely intent detection and entities extraction using a machine learning model.
6. In the second stage, a rule-based approach is proposed to build the corresponding database query based on the intent and entities provided by the first stage.

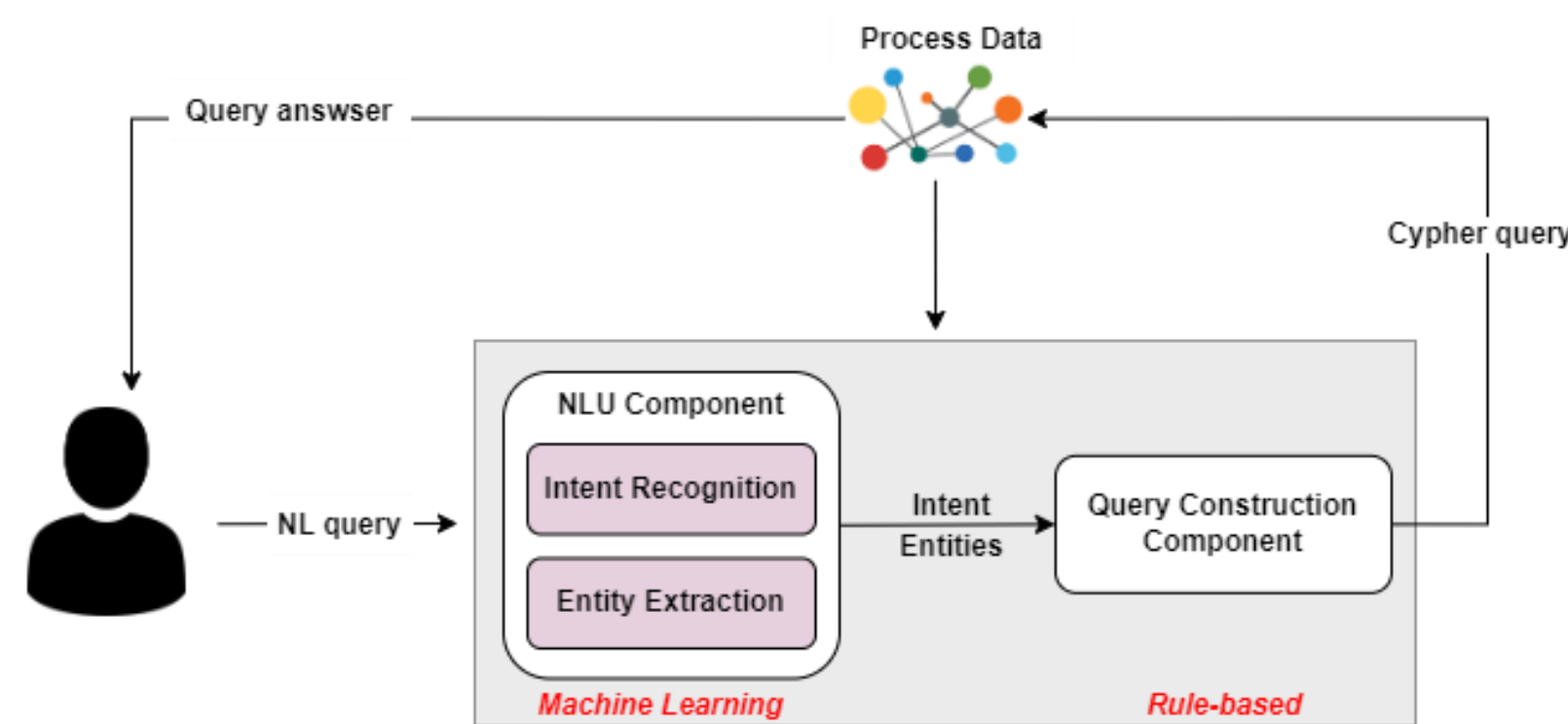
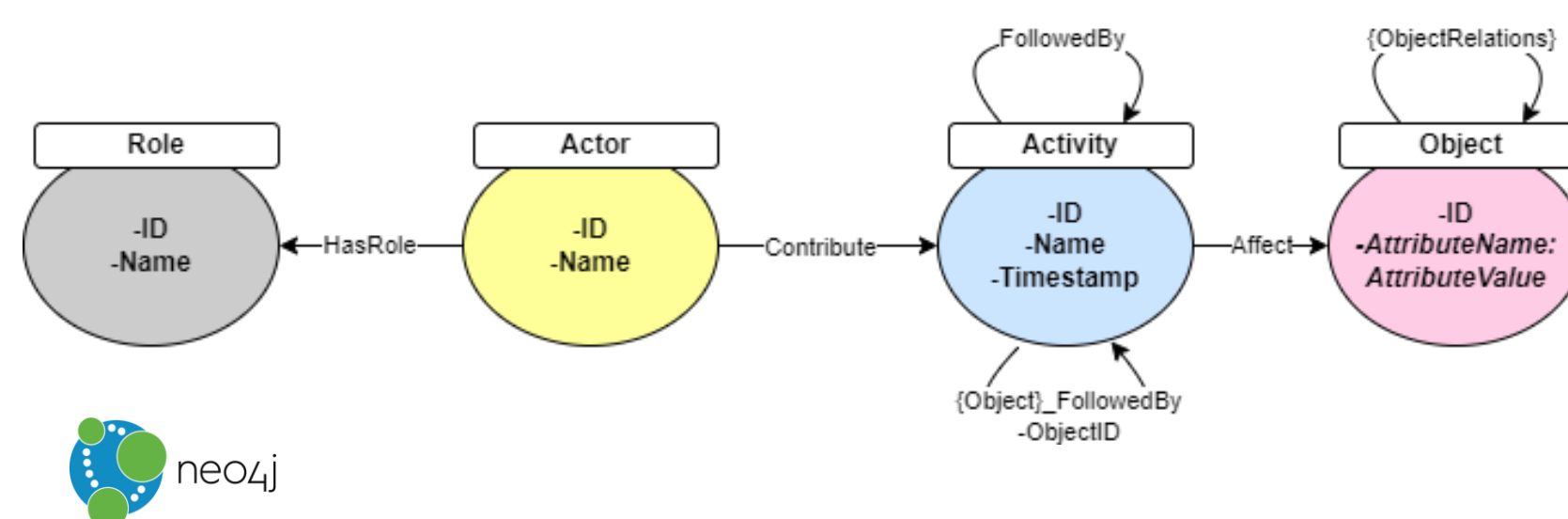
Event log Querying (fine-grained level of analysis)



PROCESS DATA STORAGE

LABELED PROPERTY GRAPH

1. We propose to store process data in a graph database based on labeled property graphs and use the Cypher language to query process data.
2. Process execution data is multi-dimensional and object-centric in nature and process querying requires relationship analysis. Graph based storage allows for explicit relationships representation.



Which **applications** are **validated** by **John** ?

Entity Type: Node Entity Value: Application Entity Type: Node.Attribute.Value Entity Value: Activity.Name.'A_validated' Entity Type: Node.Attribute.Value Entity Value: Actor.name.'John'

Intent: Application_Affect

```
MATCH (actor:Actor)-[:Contribute]-(activity:Activity),
      (activity)-[:Affect]-(app:Application)
WHERE actor.name='John' AND activity.name='A_validated'
RETURN (app)
```

"An Intent-based Natural Language Interface for Querying Process Execution Data"
Accepted at ICPM (2021).
"Natural Language Querying of Process Execution Data"
Accepted at Information System Journal – Special issue ICPM best papers (2022)- **Class: A***.