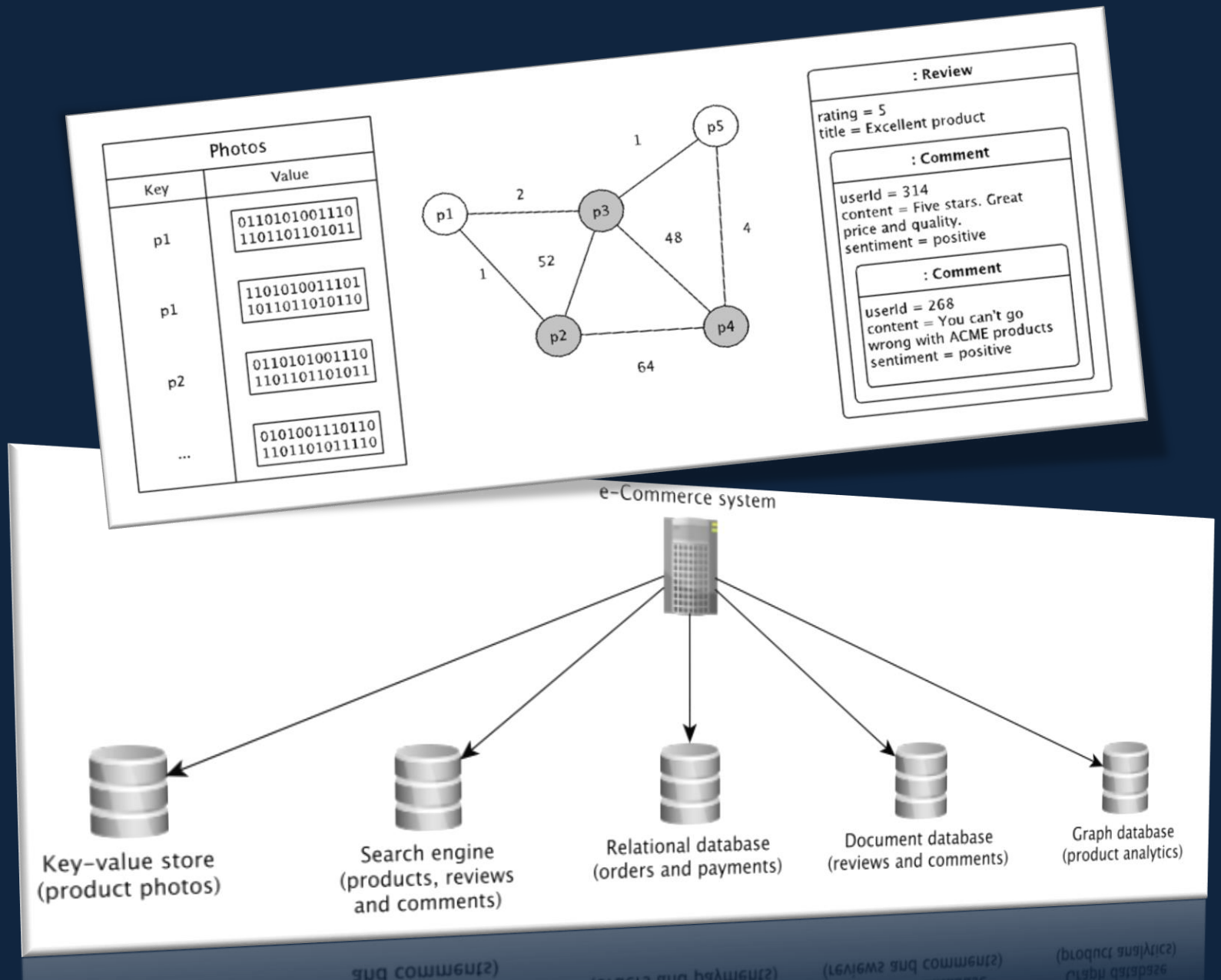
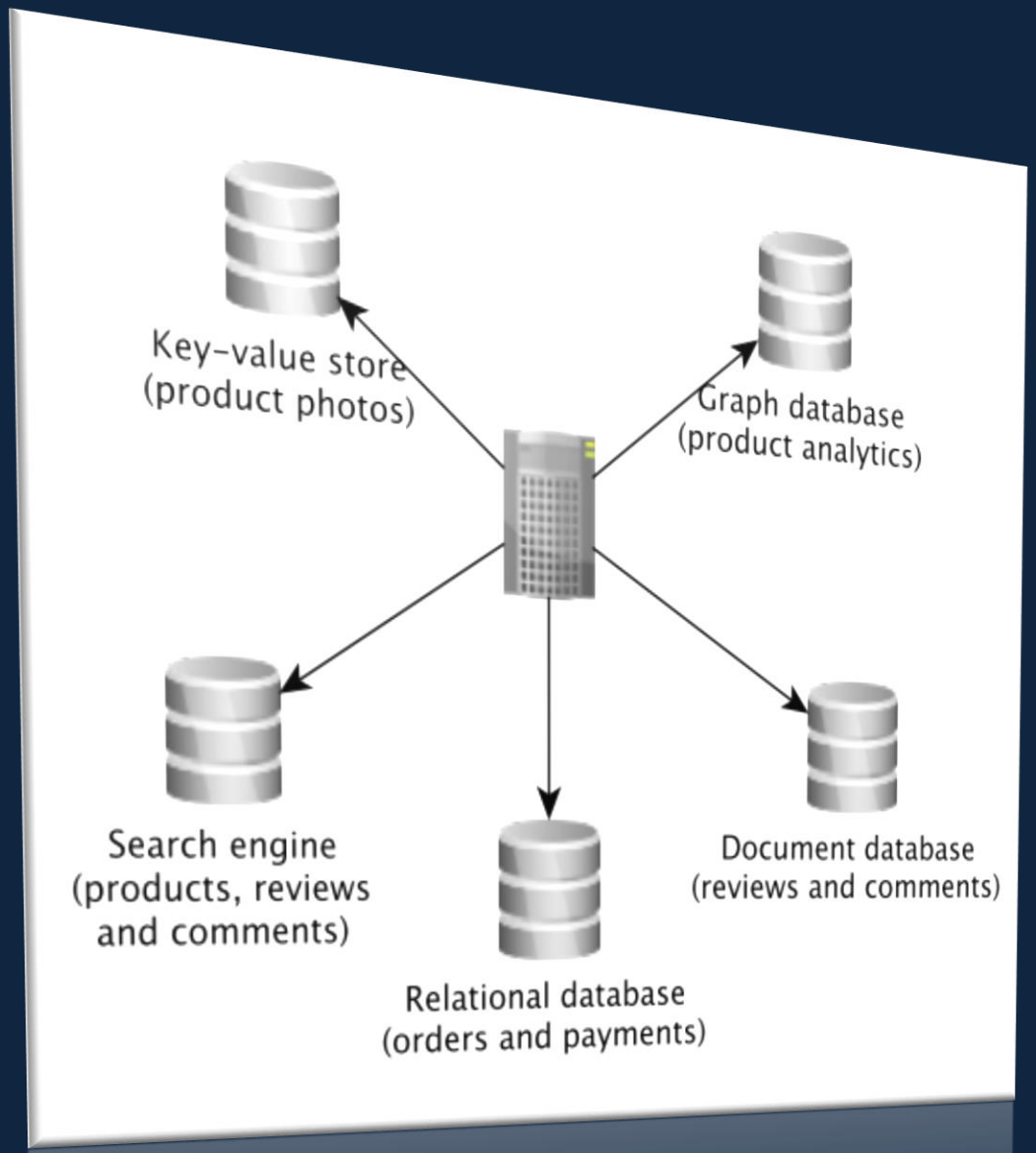
Polyglot & Hybrid Persistence Architectures for Big Data Analytics

Infocom World Conference, Athens
26 November 2019

Hybrid Data Persistence Architectures



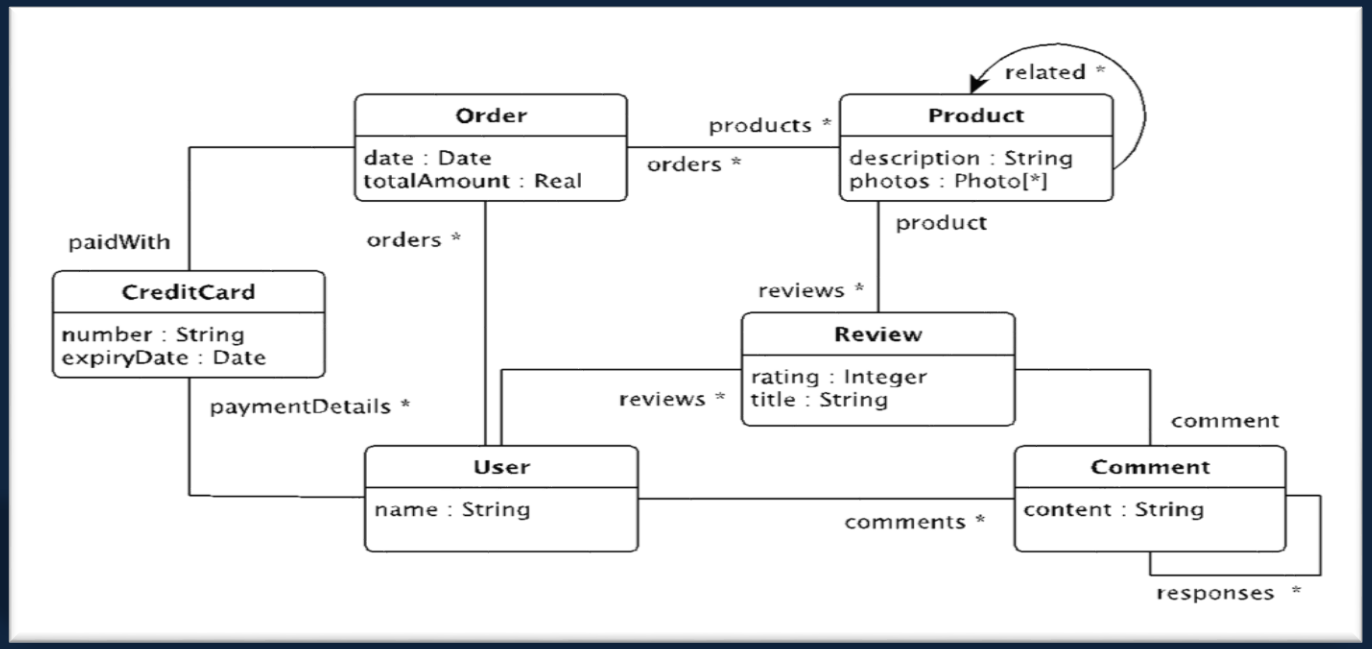
Challenges



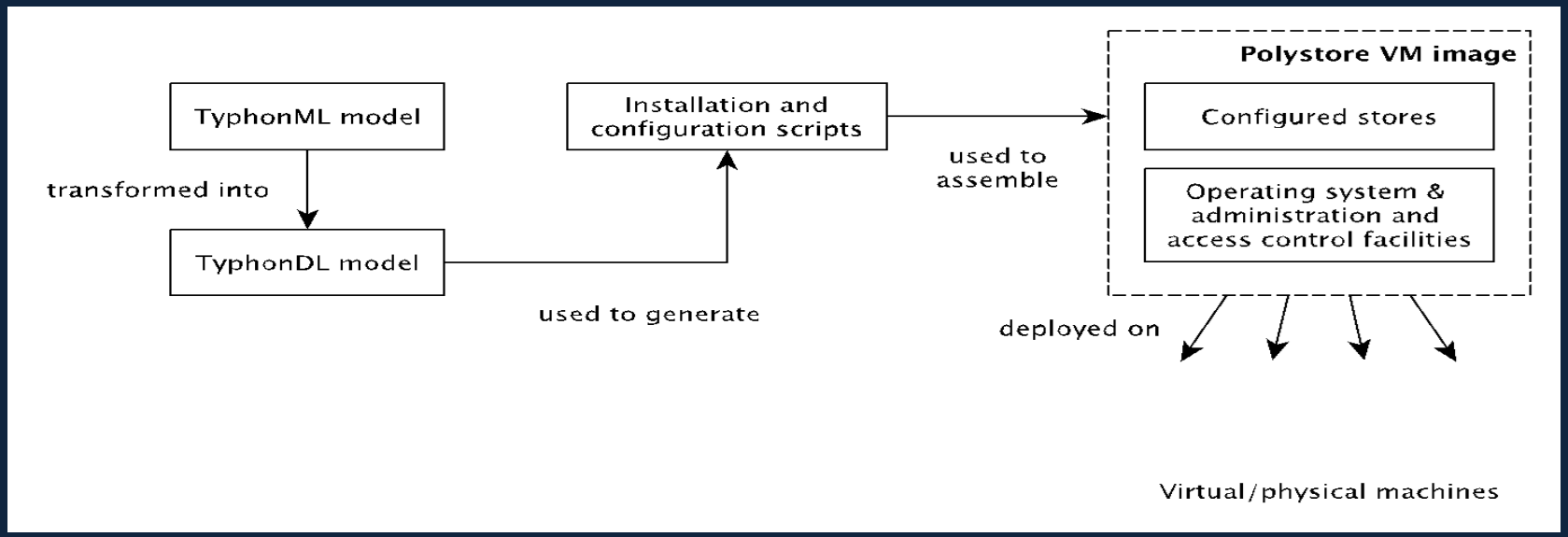
- Design
- Deployment
- Querying
- Monitoring & Analytics
- Evolution

Polystore Design

- Develop a tailored modelling language (TyphonML)
- Support for capturing availability, consistency & partitioning requirements
- Supporting modelling tools
- Extensibility to accommodate future data stores



Polystore Deployment

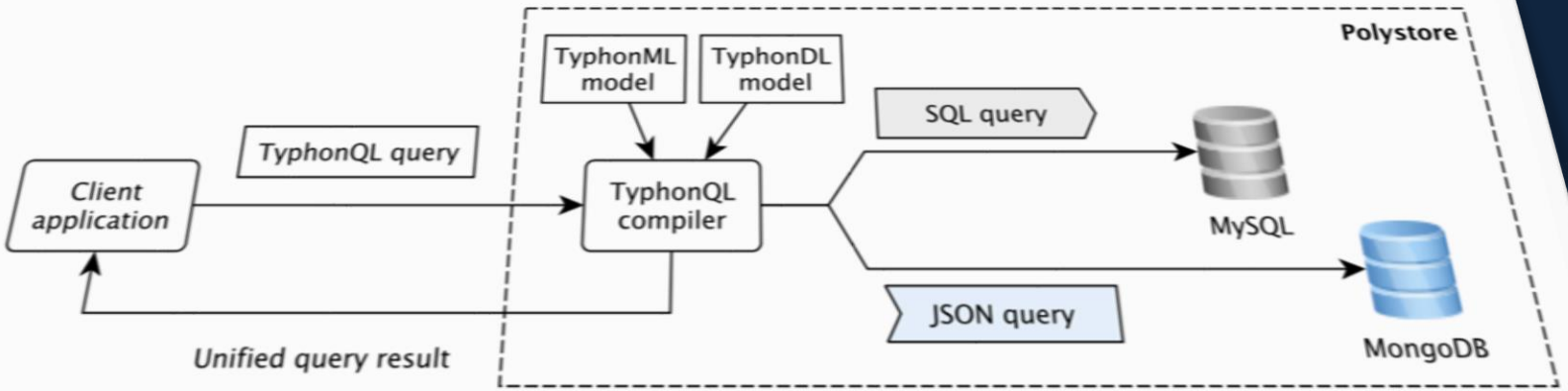


- Develop a language for modelling hybrid polystore deployments (TyphonDL)
- Develop automated TyphonML→TyphonDL transformations
- Develop automated transformations of TyphonDL models to installation & configuration scripts

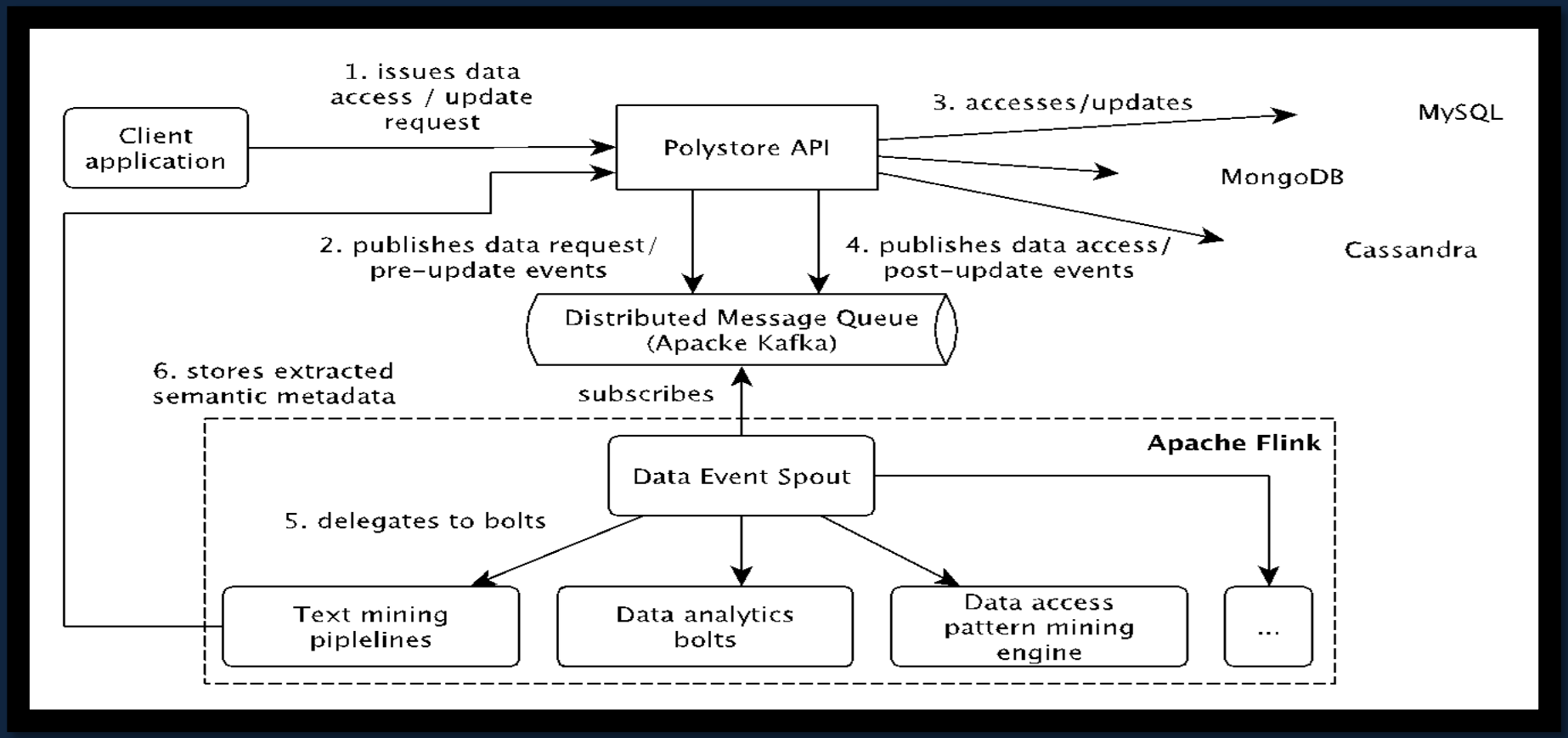
Polystore Querying

- Unified language for querying data in polystores
- Compilation to native querying facilities
- Static analysis, lazy loading and prefetching

```
find c:Customer where
c.orders.totalAmount.sum() > 1000 and
c.reviews.comment.responses.size() > 20
```



Polystore Monitoring & Analytics



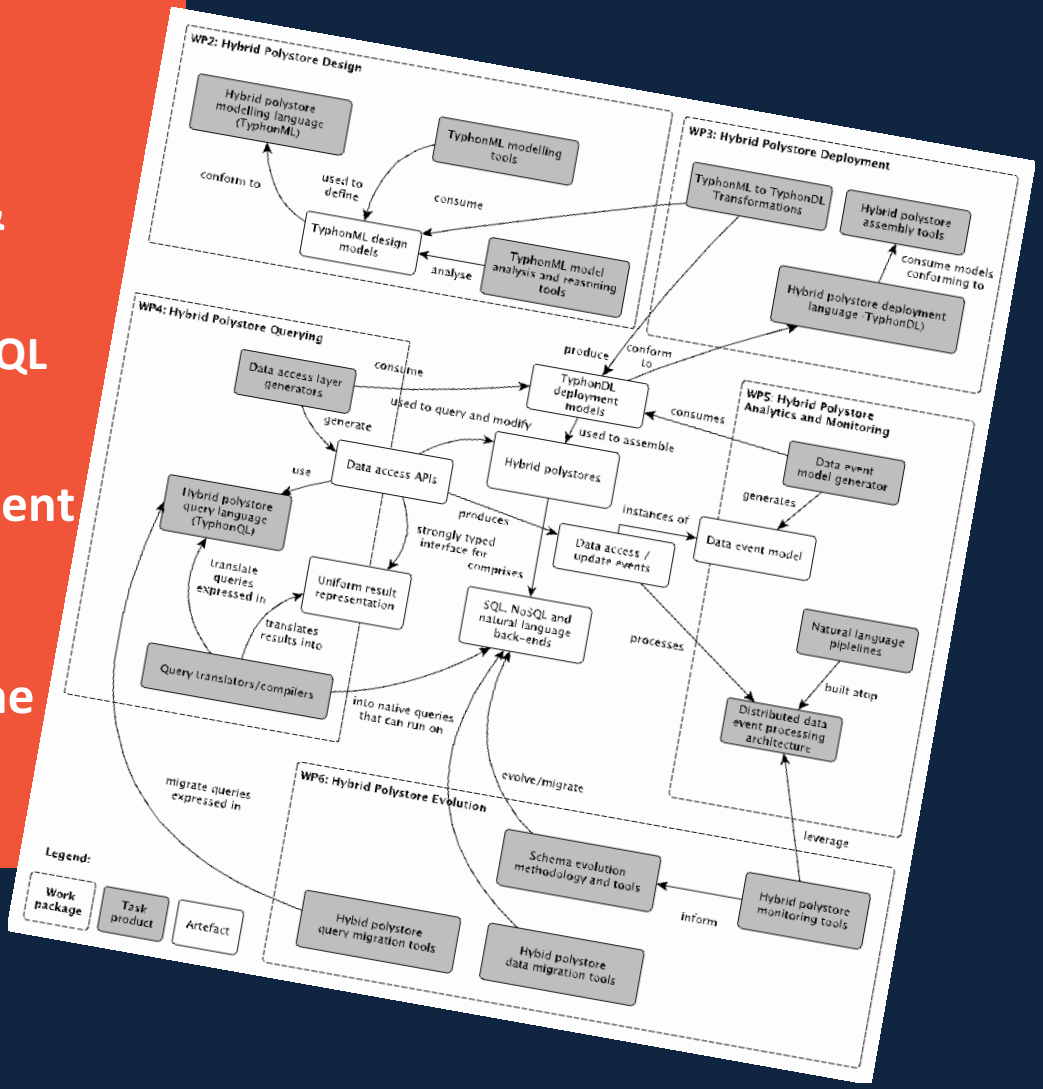
- Record data access and update events
- Publish data events to distributed ledger
- Facilitate subscription-based data analytics & text mining pipelines

Polystore Evolution

- Support for schema evolution
- Support for internal data migration
- Query migration tools
- Data usage monitoring tools to recommend evolutions

Technology Stack

- Java as the main programming language
- Eclipse as the base modelling & development platform
  - TyphonML, TyphonDL, TyphonQL editors & tools
- Docker for container management
- OpenAPI for REST APIs
- Open-source software under the Eclipse Public License 2.0



OTE’s Contribution in Typhon

❖ Data for Predictive Maintenance and QoS

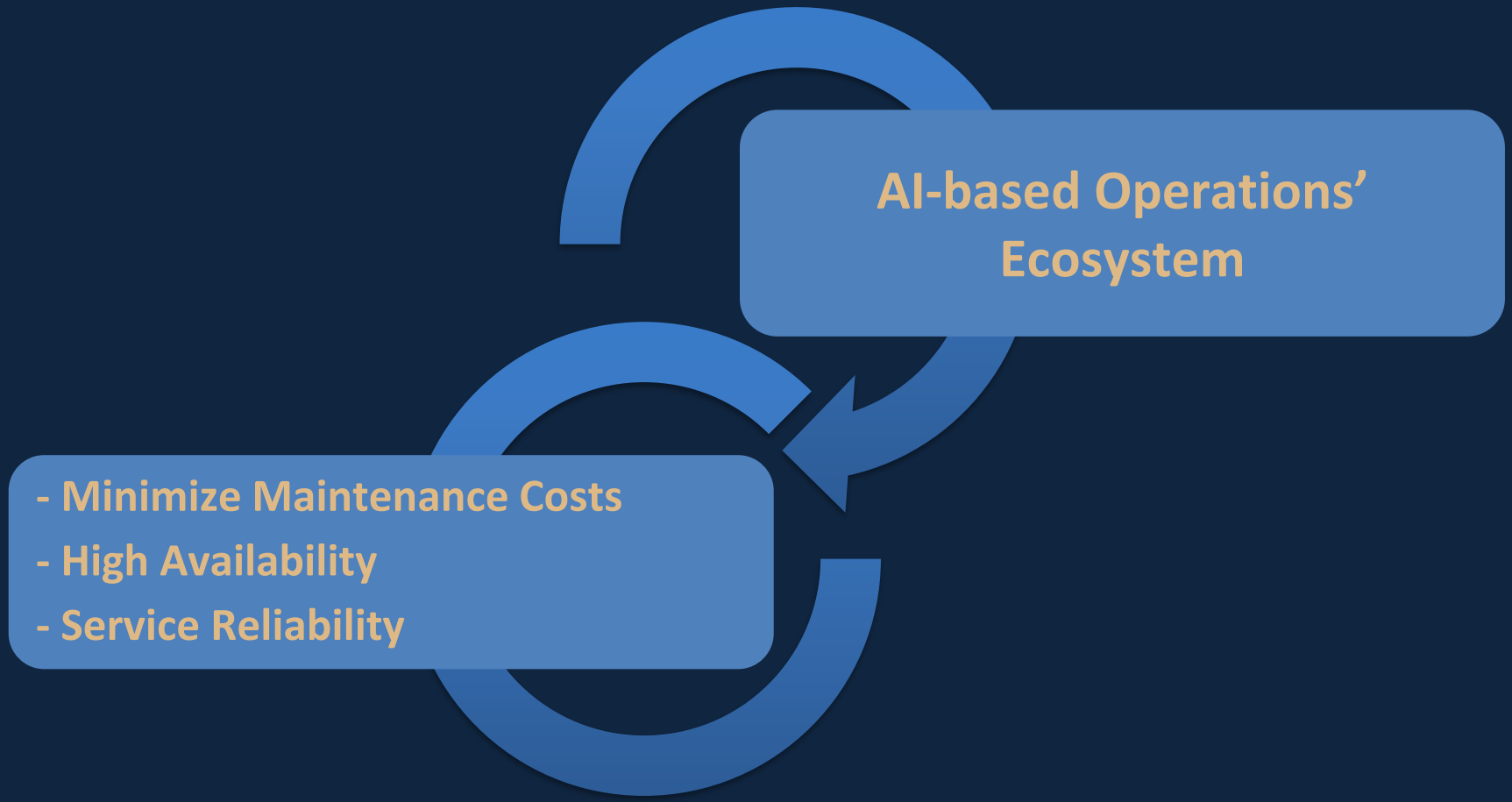
- Technology Requirements Designation
- Big Data Provision
- Typhon’s Technology Deployment/Evaluation

❖ Dissemination and Communication Activities

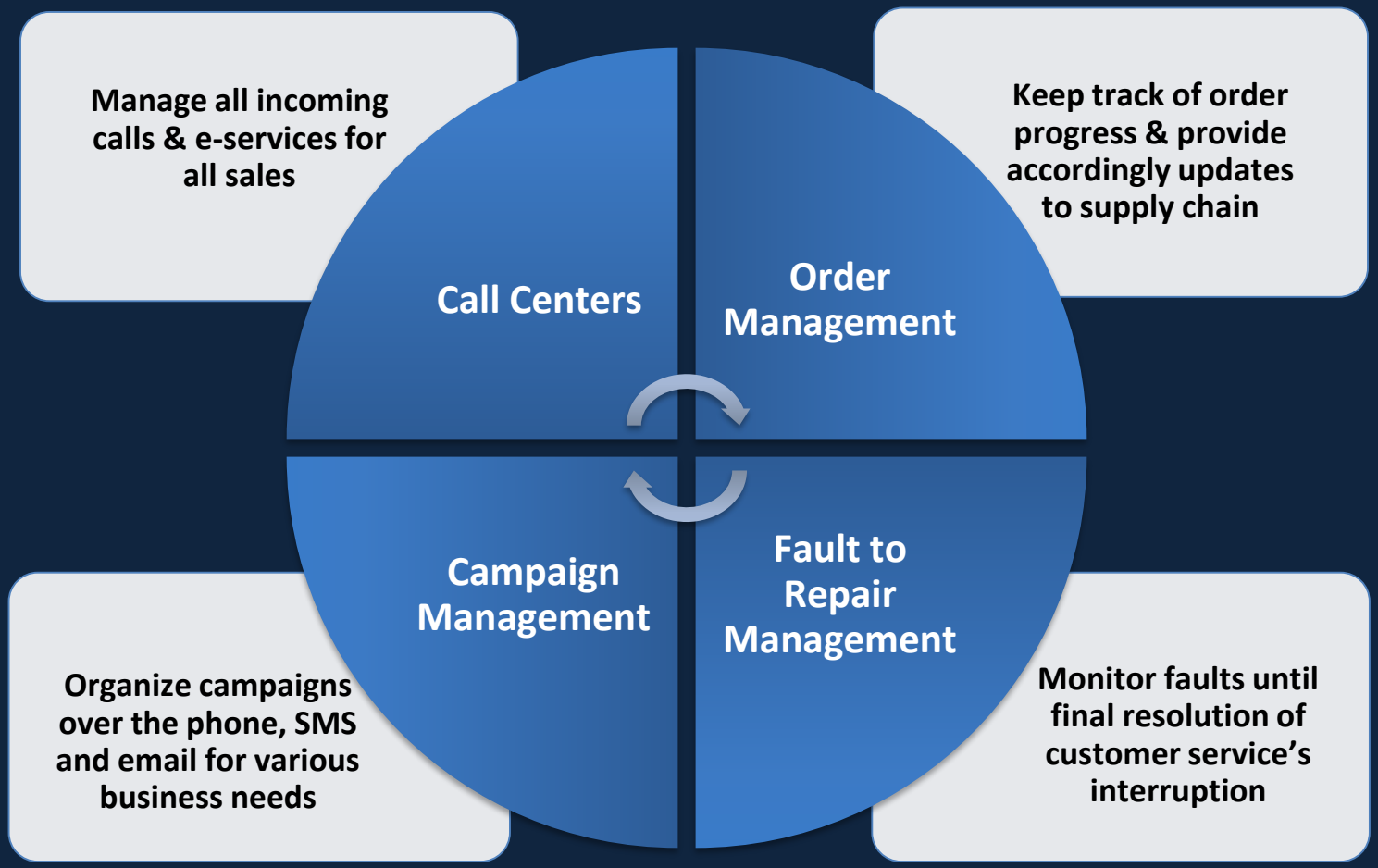
- Publication of project news in internal networks

The Use Case …

Why Predictive Maintenance and QoS?



The System
(Use Case Description – CRM System Functionality)



Use Case Objectives

Breakdown

Descriptive Reporting for Prediction Accuracy

Predictive Maintenance for improved QoS

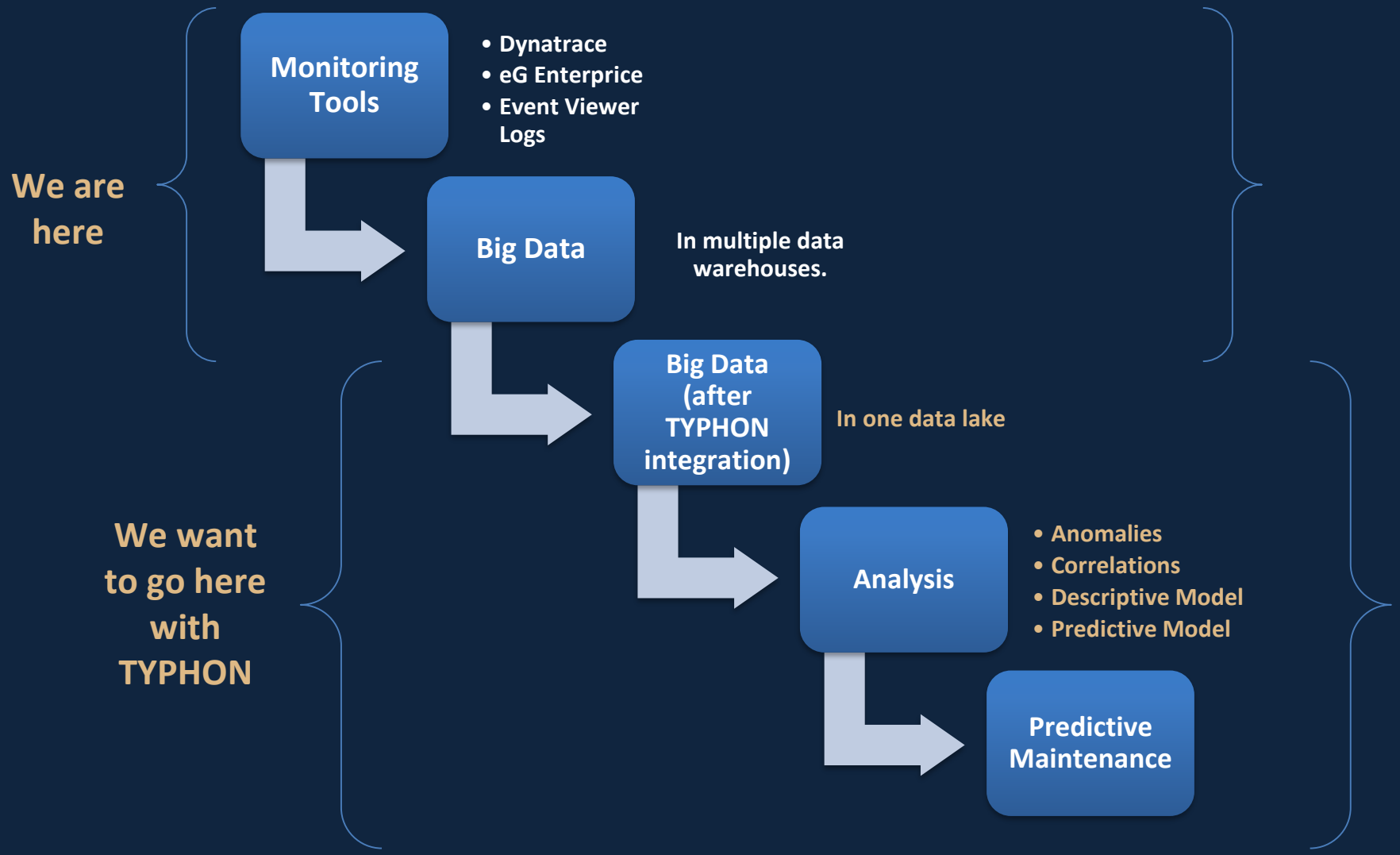
Identification of:

- Quantitative Variables
- Categorical Variables
- Correlations
- Anomalies

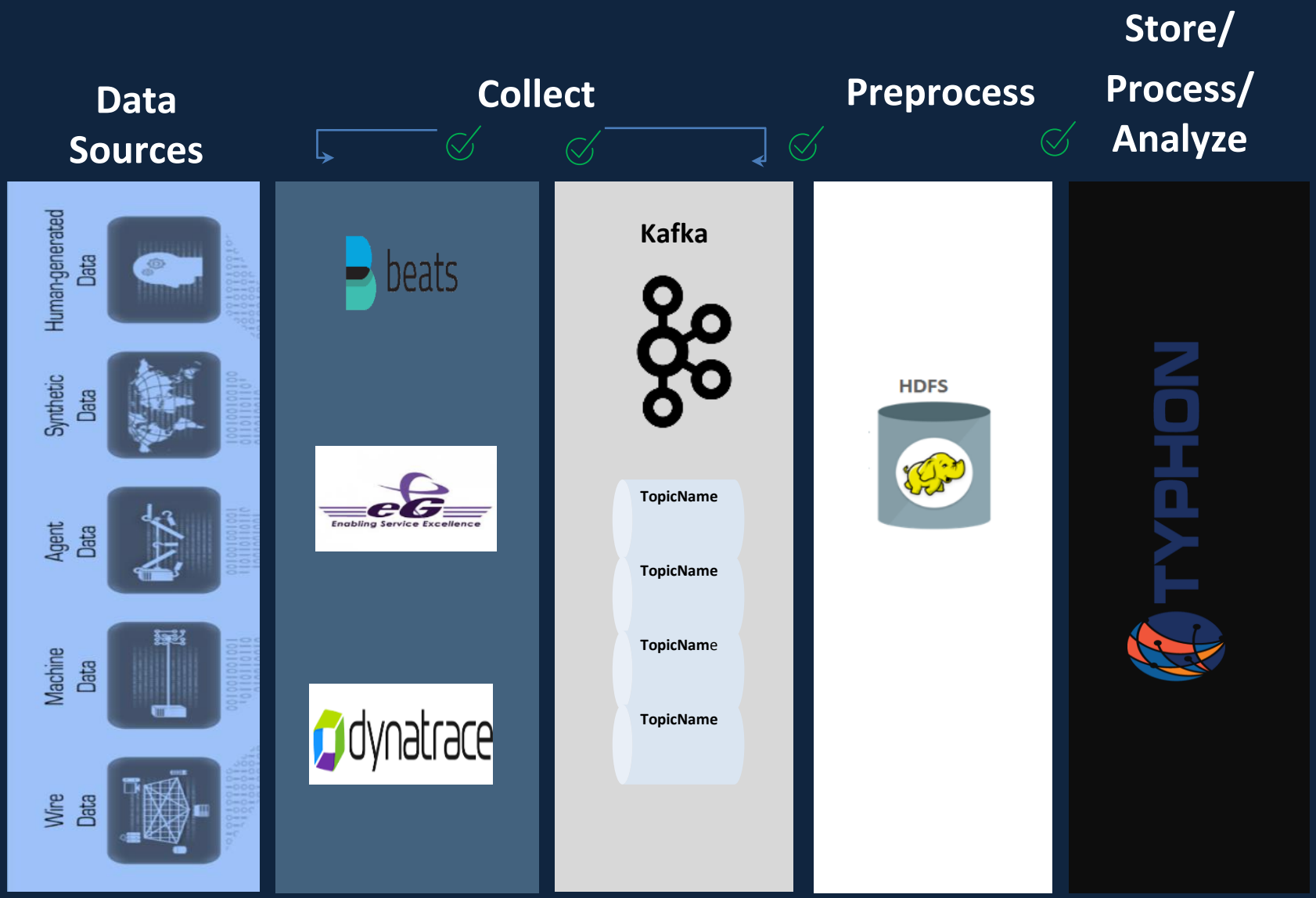
Implementation of:

- Prediction Models
- Training/Testing
- Evaluation

Our Approach … in *Steps*



Information Flow



OTE @ TYPHON EU Project


Thank you!