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Digitizing Contextual Information

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Topics

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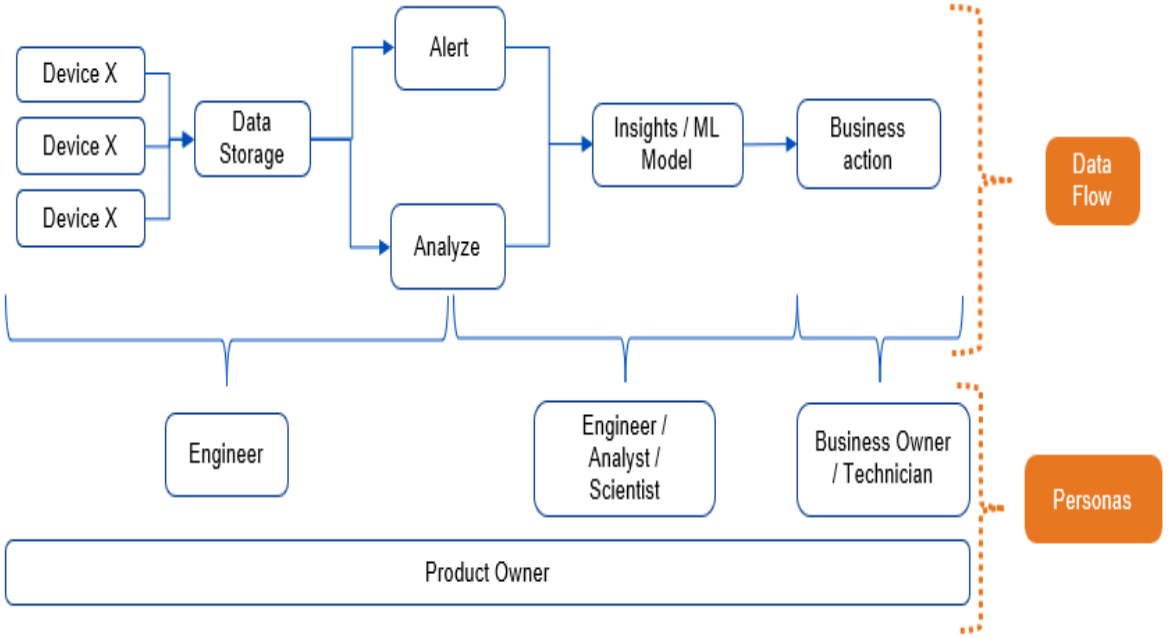
Introduction

Introduction (Sample Scenario)



- Device “X” is part of the IP network
- Provides telemetry capability
- Data insights enables business questions to be answered
- Leadership invests time and money to:
  - Ingest telemetry data
  - Store and transform data
  - Enable consumption through egress platforms
  - Enable alerts, analyze and build ML models for recommendations

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Personnel & Motivation

Personnel & Motivation

Persona	Motivation	Opposing Criteria
Business owner	• Provide high reliable service to customers • Ensure customers are satisfied with service (NPS) • Ensure low support and maintenance	• Limited budget vs. highest reliability in service possible
Product owner	• Ensure features developed can either save on cost or increase productivity • Customer success is tied to product owners' success	• Time to market vs. quality of a feature
Engineer	• Wants to maintain a reliable stream of telemetry data • Strives for low computation cost	• Low computation and storage costs vs. highest resolution in data possible
Analyst / Scientist	• Likes high quality data, data cleaning is a chore • Maximum resolution in data (wants access to everything)	• Time invested in data cleaning vs. generating insights or evaluating ML models
Network technician	• Wants low repeat maintenance • Wants high reliability in service • Wants high customer satisfaction	• Addressing ad-hoc issues due to breakdown in service vs. improving processes for faster deployment and maintenance

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Defining CI and CI exchange

Contextual Information (CI) & its nature

Contextual information includes any data that provides **Context & Perspective** to telemetry data:

- Context: Understand the data
- Perspective: How does this data fit in the overall picture

CI includes:

- Application configuration information that handles telemetry data
- Inherent limitations in the data
- Data lineage
- Data catalog
- Schemas and their versions
- Etc.,

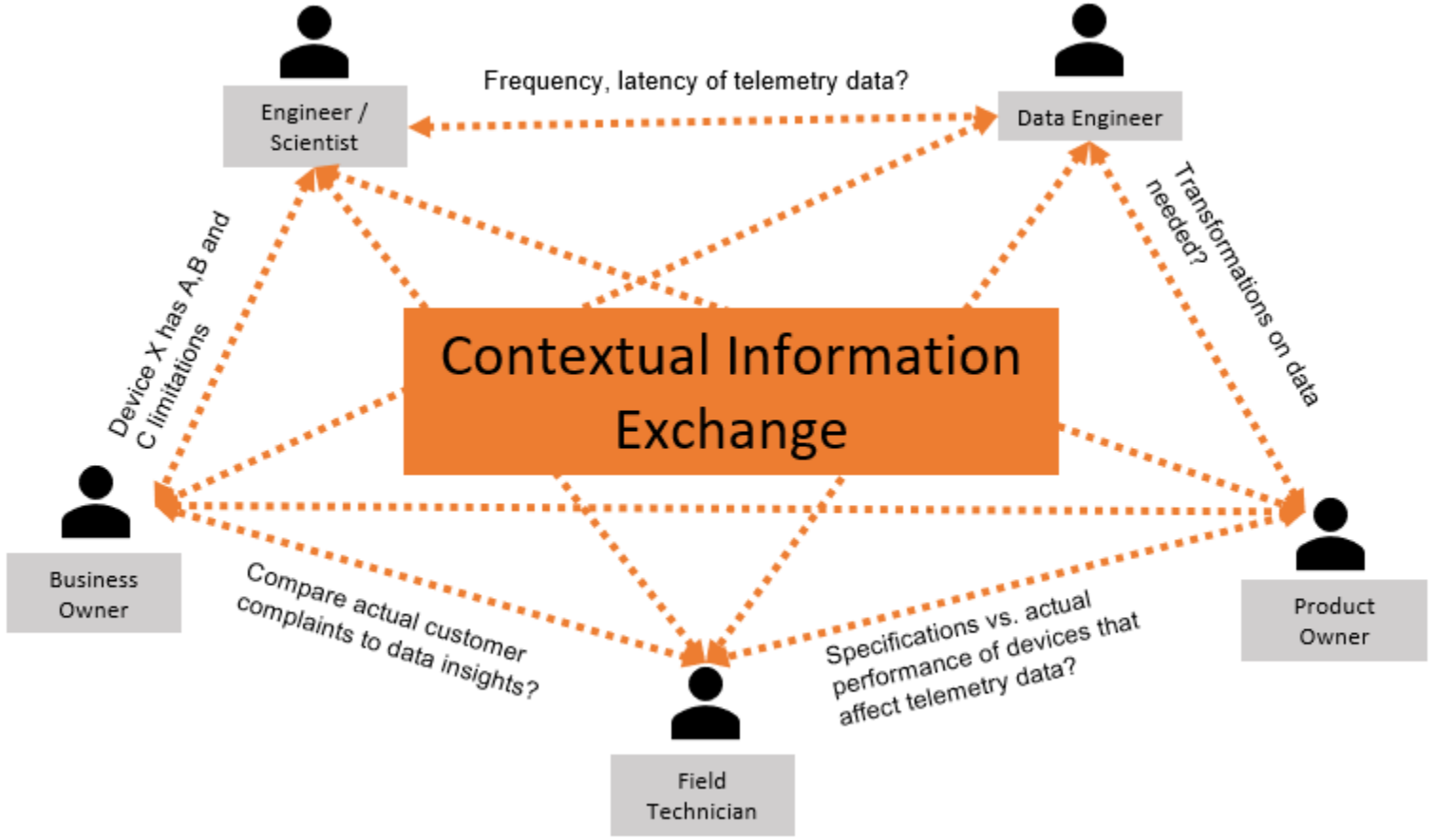
CI is usually distributed in its nature and is hard to discover or interface with:

- Hardware / software challenges
- Varying cloud environments
- Varying feature capabilities
- No interfaces for digitization etc.,

Types of CI

Contextual Information	Probable Storage System
Object identifiers, descriptions, limitations, possible values etc.,	Libraries published by device vendors
Data resolution, Data frequency	Application configuration
Quality of datasets – raw, enriched, transformed, aggregated etc.,	Wiki pages, word documentation, schemas within DB's, segregation by paths in an object store
Data catalog	Schemas within DB's, segregation by paths in an object store, wiki pages
Application information	Service catalog
Application code and versioning	Version control, code repository
Change information	Tools that support CI/CD such as Concourse

Exchange of contextual information (CI)



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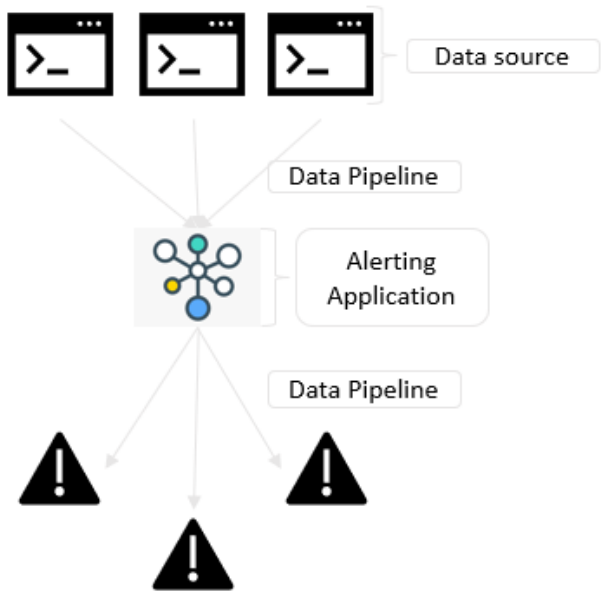
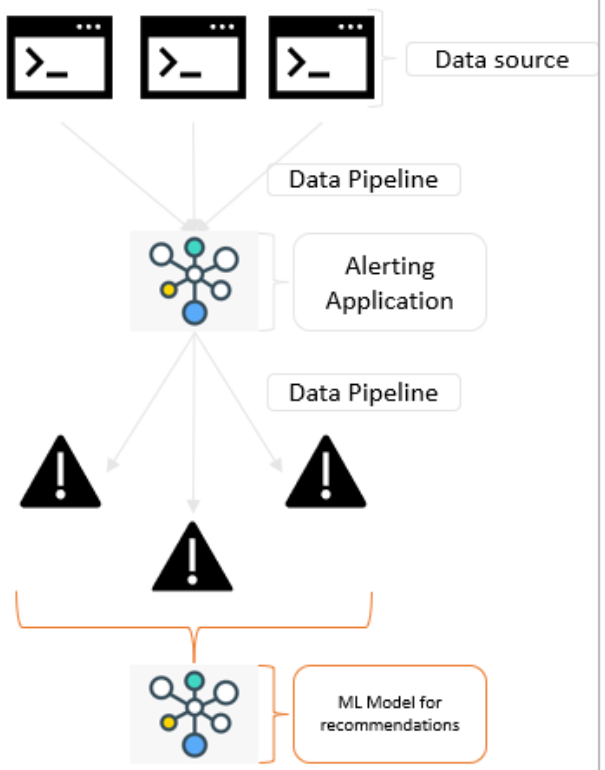
Non-digitization of CI

Cascading failures due to non-digitization of CI

Day – 1



Day – 2



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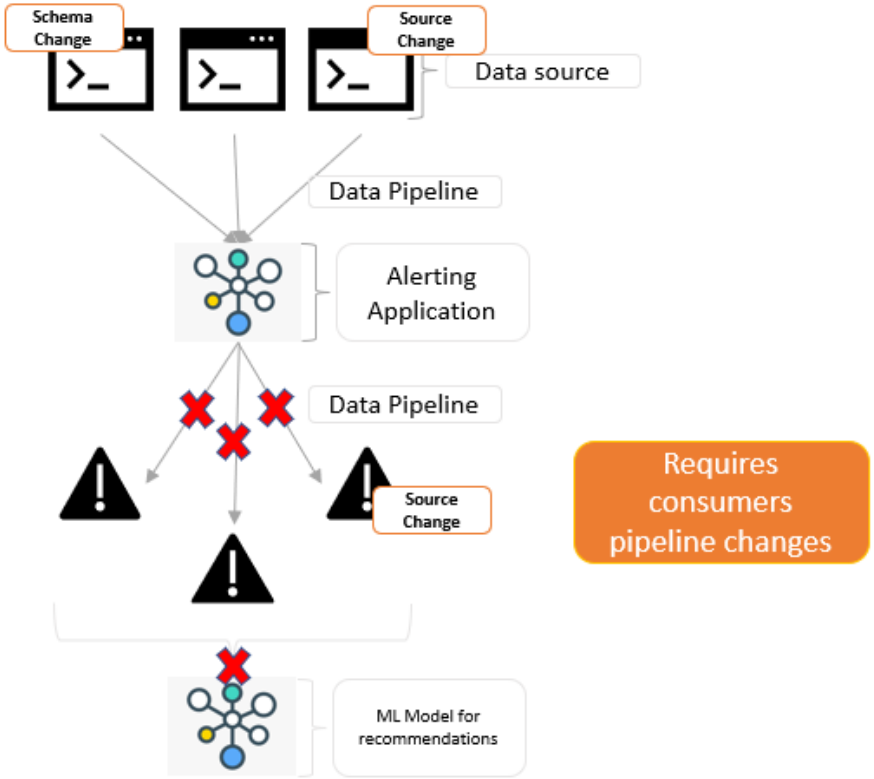

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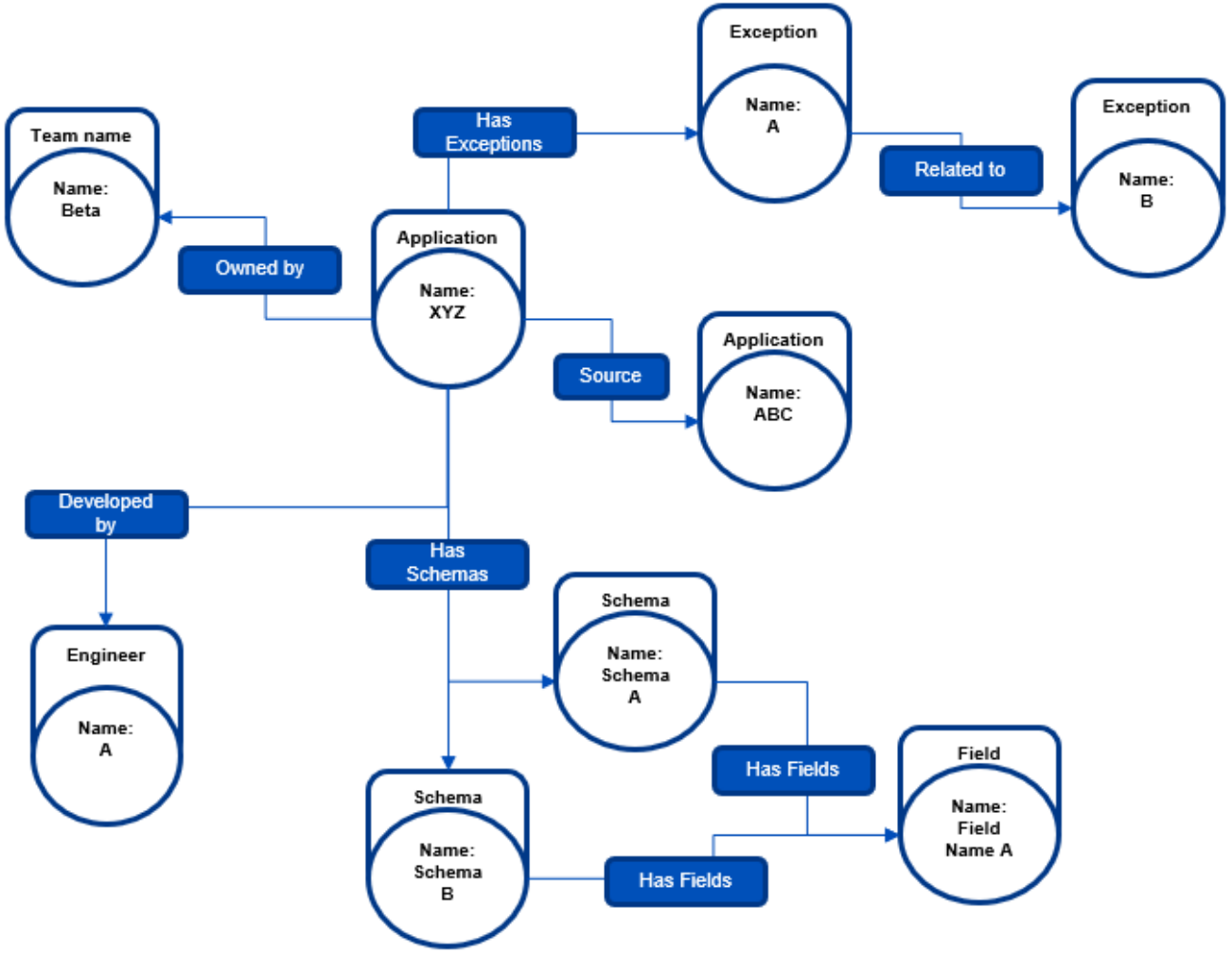
Solution

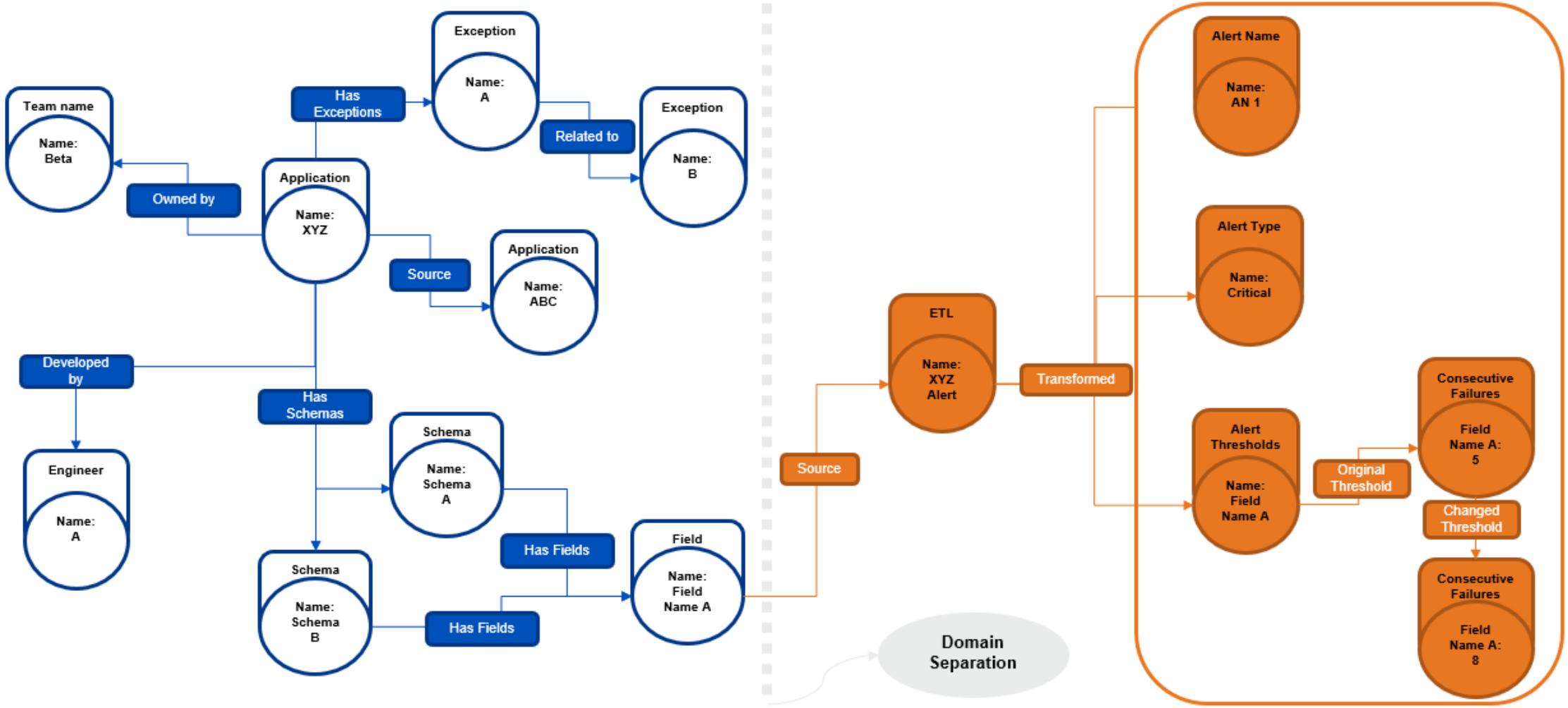
Start with standardizing a CI list..

Sample CI standardization	Description
Source system	Refers to the device, application etc., providing the telemetry data
Target system	Refers to the storage layer, application etc., where data is persisted after transforming the telemetry data
Application owner	Owner of the application here can be a team, an individual etc.,
Data lineage	The source system/application where the data originated, got transformed, stored etc.,
Data description	Describes the telemetry data and can include field descriptions, value explanations, value limitations etc.,
Data schemas	Structure of the data
Data catalog	If more than one stream in the telemetry data, then list or catalog of those datasets
Exceptions	Exceptions when data might not be transmitted, transmitted with errors etc.,
Transformations applied	Changes to the datasets applied between source to destination

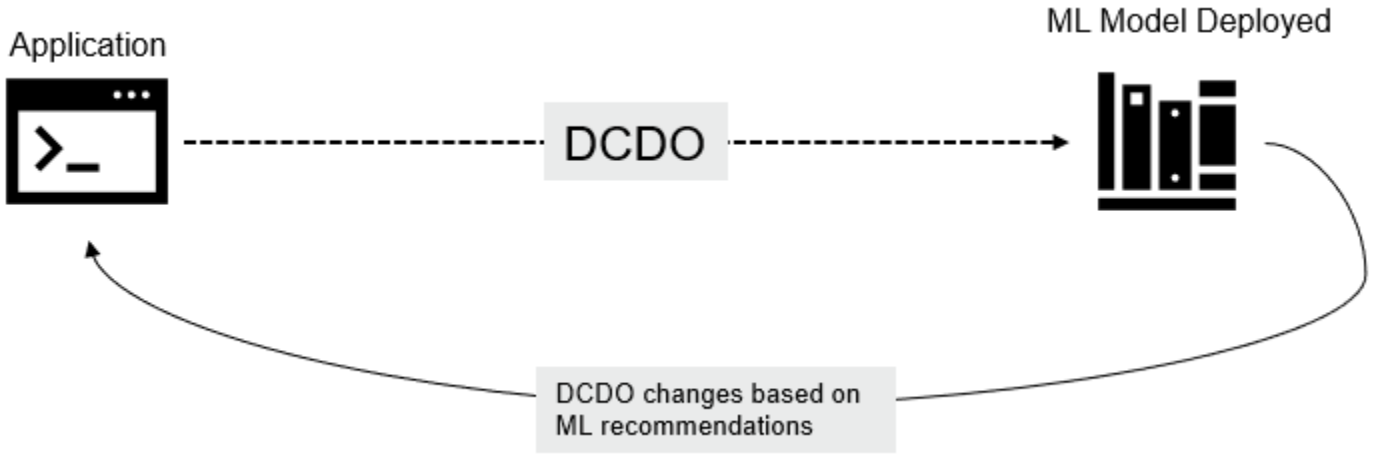
CDO enabling an application within a domain



CDO evolving into a DCDO when used cross domain



Domain contextual data objects powering automation



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Value summary

Value of digitizing contextual information

- Makes information “findable”
  - Reduces discovery time and increases productivity
- Enables or sets a stage for true automation with ML
  - Without digitization of contextual information, it is hard to imagine ML truly scaling
  - Allows applications to be controlled based on ML recommendations and
  - Creates a cyclical effect of optimization

- DCDO’s enables reusability of contextual data for various domain functions within an enterprise
  - Domains interact within an enterprise to achieve variety of goals
    - These domains need a way to exchange contextual information
- Digitizing CI is one way of turning billions of telemetry events into an asset
  - Contextual information brings perspective to telemetry data
- As DCDO’s move through the enterprise, they add on more contextual information within them

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Thank You!

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