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# Prometheus Scheduling Impacts on Chevron's S/4HANA Transformation

## Project Goals, Prometheus Partnership, Lessons Learned

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10 Years in Maintenance Planning & Scheduling

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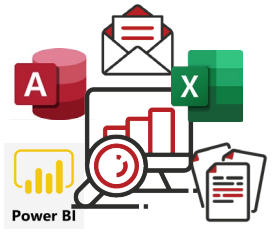
# Digital Core Project Introduction

# Project Overview Background on Digital Asset Management

- Our current legacy systems have outlived their fit to our business.
- Lack of complex scheduling solutions built in, has led the businesses to use a variety of tools from spreadsheets to custom apps.
- Original Processes tailored to the available functionality of the legacy system.
- **As effective as it is, it is not efficient.**

## Legacy System Issues

- Costly
- Architectural Complexities
- Multiple Systems of Record
- Heavy User Workloads
- No Visibility
- Systems not tailored for complex scheduling




**We Can Do Better!**

# Project Overview Background on Digital Asset Management

## Where we are now

The enterprise technologies we use to run our business are complex and nearing end of life.

## Where we are going

We want to drive technology to gain competitive advantage with one ERP.

## Why

- ☑ Improve production efficiency through improved reliability of our assets.
- ☑ Enable faster, more informed decisions.
- ☑ Simplify, automate, and innovate.

## Why now

- ☑ Current systems nearing end-of-life
- ☑ Industry can integrate technology with operations
- ☑ Competition requires faster, more informed decisions
- ☑ Workforce expects simplification, automation and innovation to improve productivity

**ALL BUSINESS UNITS TO ONE ERP**

# Project Overview Background on Digital Asset Management

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**Here's what we are delivering**

## Process

Industry standard processes for:

- Finance
- **Asset management**
- Supply chain management
- Hydrocarbon value chain

## Technology

- **SAP S/4HANA**
- **SAP IAM**
- **SAP SAM**
- **Prometheus Planning and scheduling suite / Analytics**

## Data

- Shared data standards (based on common information model)
- Data management and integration
- Up-to-the-minute, forward-looking, embedded analytics

## Governance

- Standardize business processes, data and technology at the enterprise, segment and Opco/BU levels.

# Project Overview Background on Digital Asset Management

## Components


## Deliverables

| | | | |
|---|---|---|---|
| | Functional Requirement | | Training |
| | Workflow | | Metrics / Data |
| | Process Document | | Communication Rollout |

## Team

| Product Owner | Architects | Business Units | Subject Experts | DevOps Team | SAP | System Integrator |
|---|---|---|---|---|---|---|
| | | | | | | |

# Standardized Process FIRM Is Chevron's Enterprise Asset Management Program

- Deliver business value
- Transparency on high-consequence equipment
- Scaled to asset risk
- Visibility between actions & value
- Ability to prioritize critical few
- BU Incident Prevention through Enterprise Learning

# Standardized Data

## Technical Object Type
It is a categorization based on the type of equipment units (e.g., pumps).
The SAP field is called "Object Type".
This object is often called
“Equipment Class.”

## Class
A class groups together similar objects described by the same characteristics.
The SAP field is called “Classification."
This object is often called
“Equipment Sub-Class.”

## Characteristics
A characteristic is an object that describes a property that serves to identify and differentiate among objects. E.g. operating hours, pump vibration etc.
Characteristics are created centrally and used in various classes.

## Catalog Profile
Catalog profile groups catalogs like Damage, Cause Codes etc.
This can then be assigned to technical objects and notification types accordingly.

## Equipment
Equipment are the specific maintainable items within the entire business unit such as the Motor, Pump etc.

## Functional Location
Functional Location is an organizational unit that structures the assets (Equipment) of a company. It represents the place at which a maintenance task is to be performed.

## Measuring Point
Measuring points describe the physical and/or logical locations at which a Condition of a Technical Object is described. E.g. Pump Inlet pressure.

## Bill of Material
A bill of material is a complete, formally structured list of the components that make up a product or assembly.

## Work Center
A work center is an organizational unit that identifies the person, machine or group of person/machine responsible for carrying out maintenance work.

## Planner Group
A maintenance planner group is a person or group of people responsible for planning and processing maintenance tasks in a plant.

## Linear Reference Pattern
Linear Reference Pattern (LRP) is a master data which is created to identify the exact location of various objects falling on linear asset.

## Task List
Task List describes a sequence of individual maintenance tasks which must be repeatedly carried out.

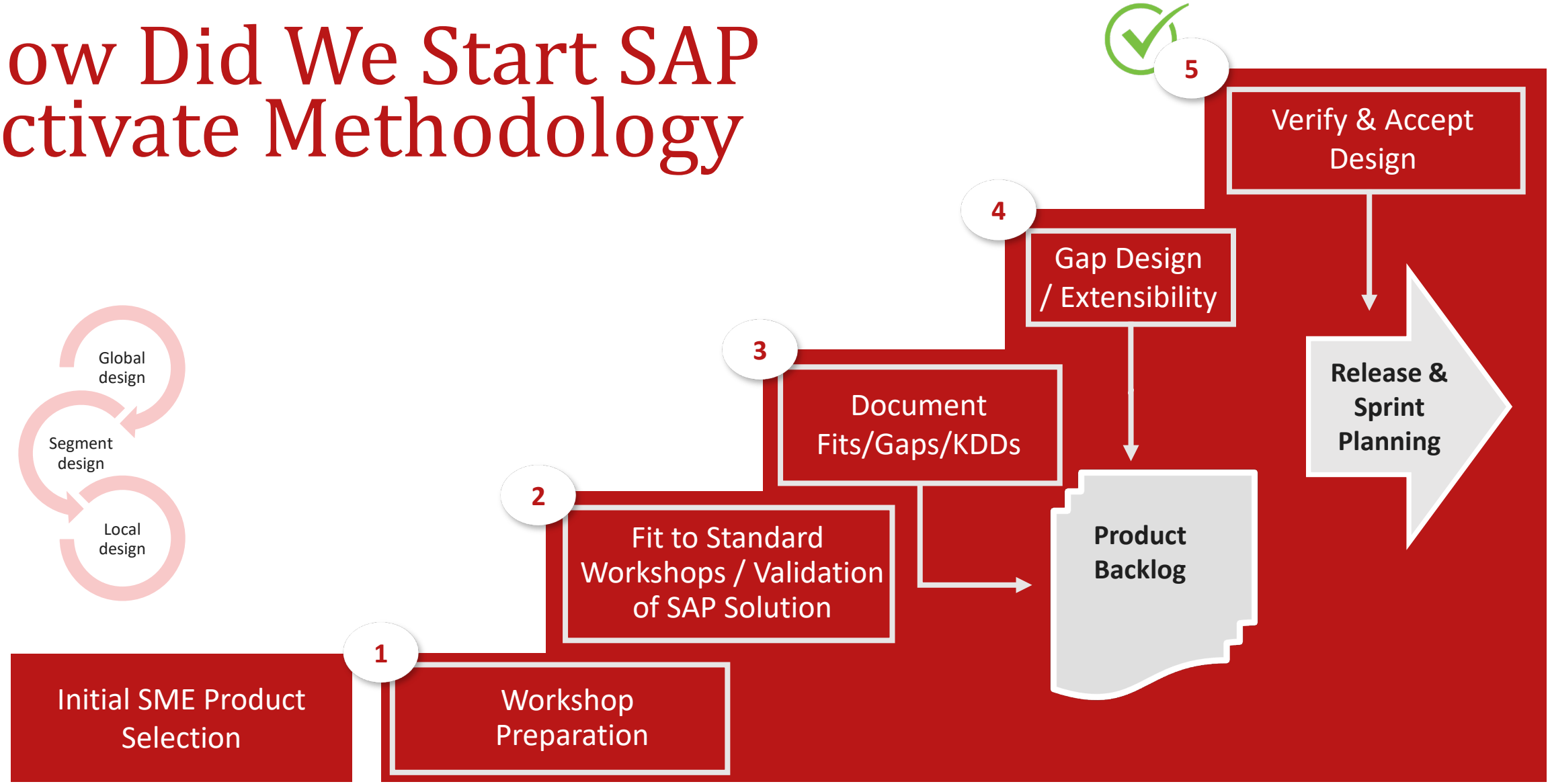
## Maintenance Plan/Item
The maintenance plans helps define a list of maintenance tasks to be performed on assets. The Maintenance Item is assigned to a Maintenance Plan and it defines the scope of work like order type, assets and maintenance activity type.

## Maintenance Strategy
A maintenance strategy defines the rules for the sequence of planned maintenance work.

## Logical Systems
A System is a logical grouping structure, grouping systems or objects with a similar functionality. A system is comprised of a set of interrelated equipment or sub-systems that regularly interact or have similar functionality.

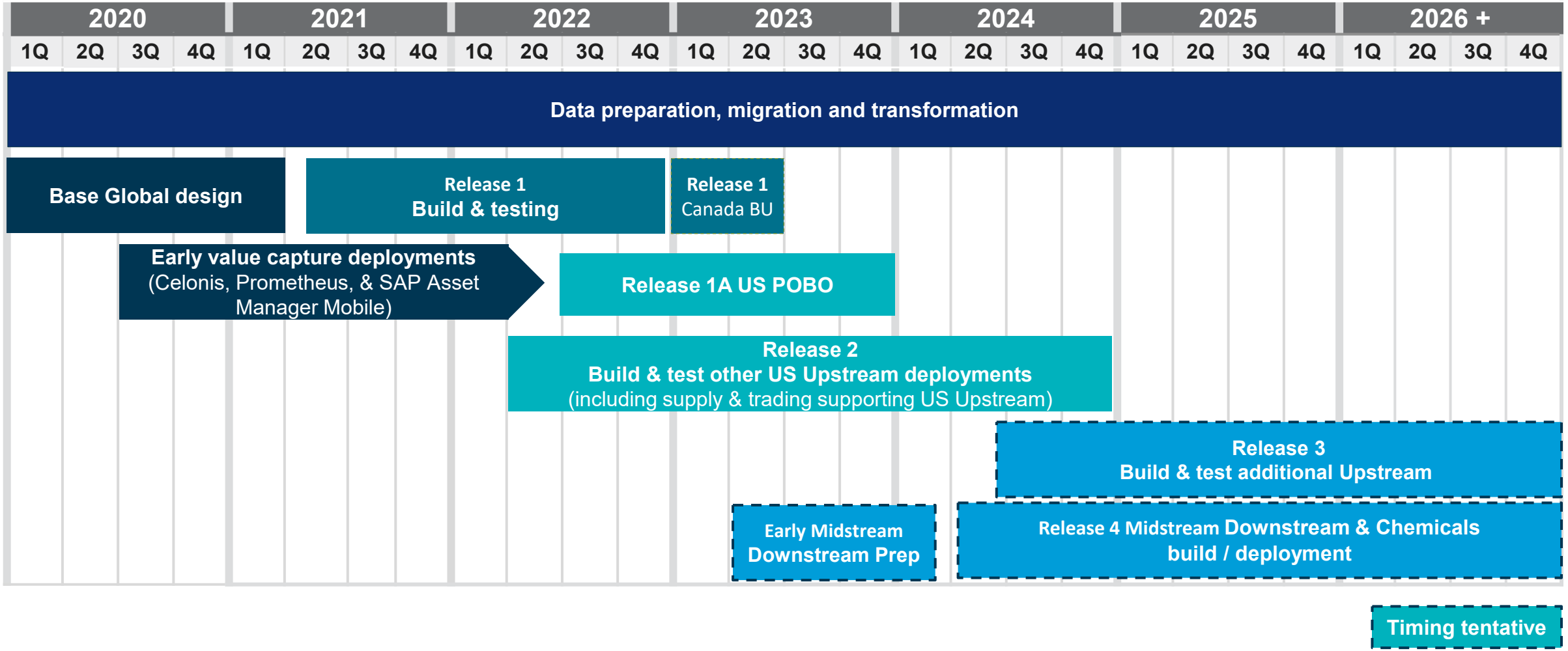
## Logical Groups
A Group can be used to logically group objects to monitor them, for analytics and structuring, or to perform mass operations on them.

# How Did We Start SAP Activate Methodology



# Where Are We Now?

Revised: Jan 10 2023



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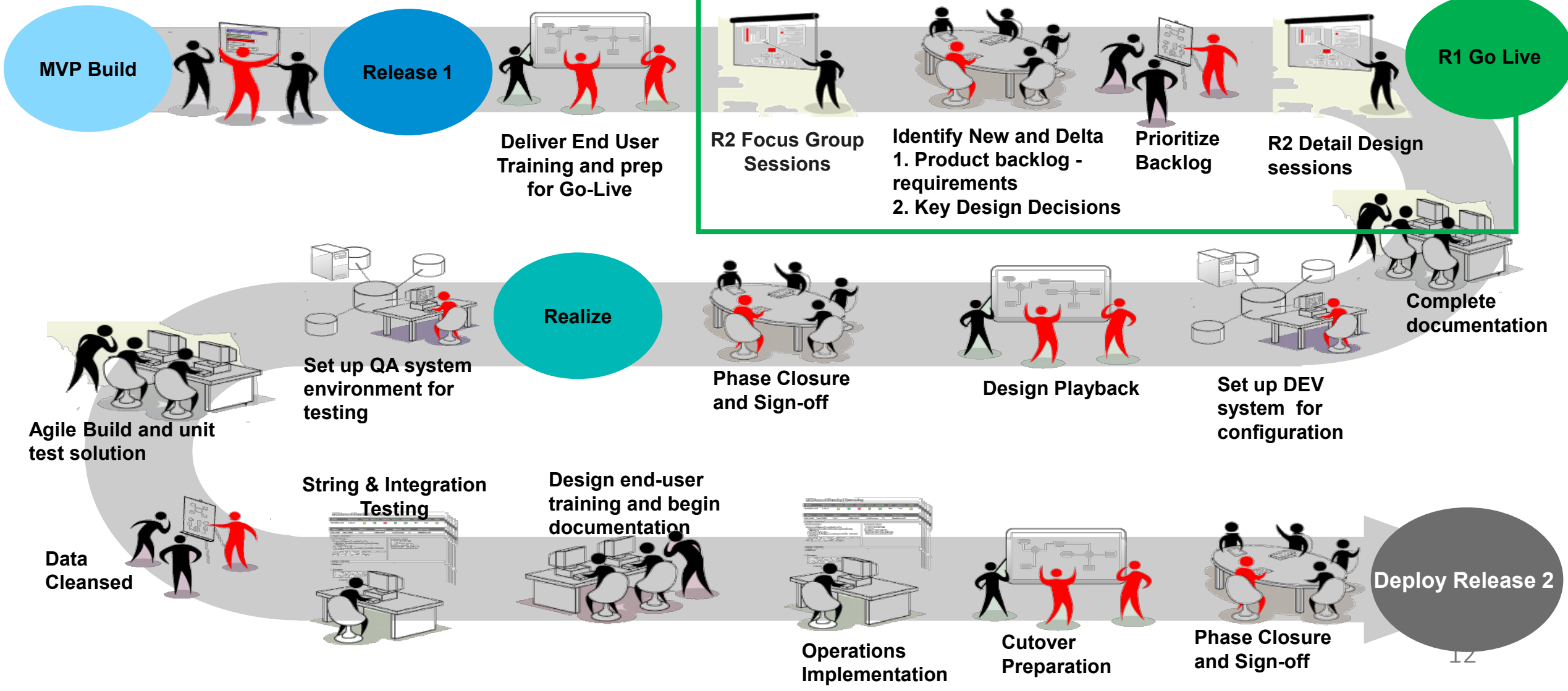


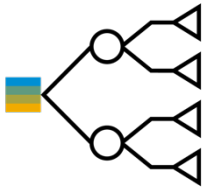
# Web Scheduler Co-Innovations

- Release 1
  - Weighted Scheduling Priority
  - Work Center Grouping
  - Phase/Subphase Support
- Roadmap
  - Mapping
  - GIS Planner Adjustments
  - Dispatch and Undispatch Reason Codes

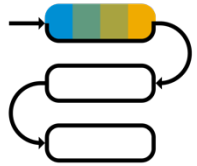
# Data Governance MDG

Centralize master data
to control access
(like create, change, approve)

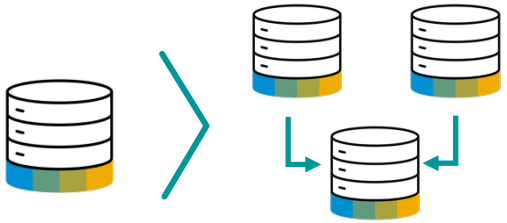

Ensure data consistency via
consolidation of master data



Extend the process
by adding business logic
or reusing existing content



Integrated Object Data Model
Delivered
Out-of-the-Box



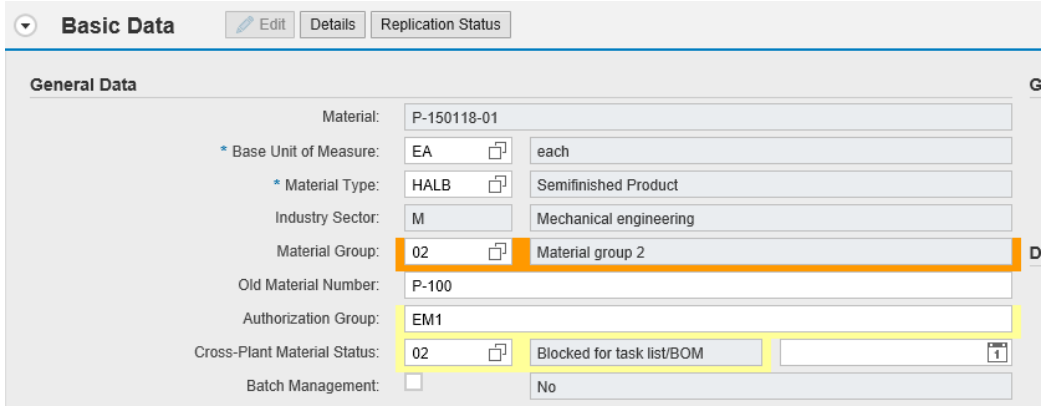
Robust Data Replication

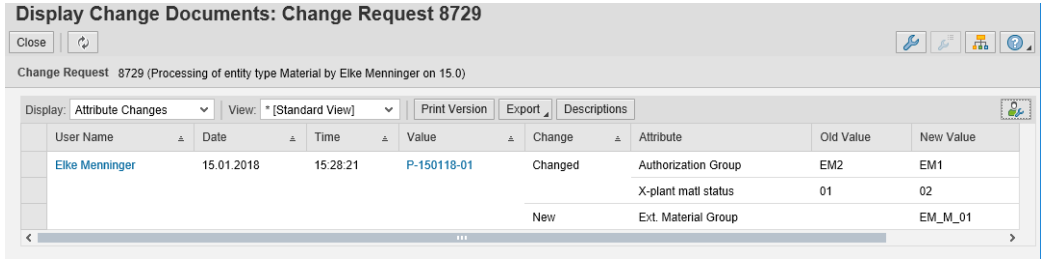
Can be adapted and tailored based
on customer needs

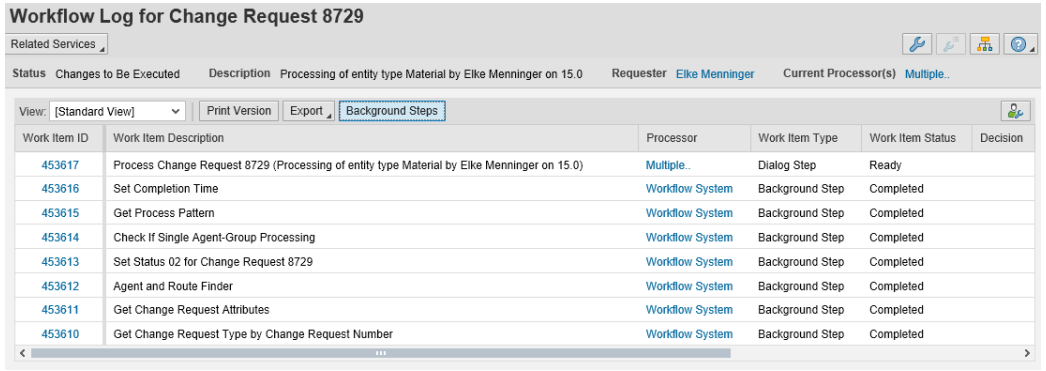
Share responsibilities across various
business units

# Governance, Collaboration, and Data Quality

- **Showing what was changed via complete audit trail**
  - Changes by earlier processors and own (unsaved) changes in two colors
  - Previous, changed, and last saved value per attribute
  - Available for all fields, including table cells, rows, navigation elements, ...
- **Transparency on what has happened earlier**
  - Change documents provide information on who changed which attribute from what value to what other value by when
  - Workflow logs tell who was involved in the change request process and who approved which data change
- **Helps people to do their job**
  - Supports the processor to decide on their next action
  - Supports approvers to quickly spot what they will approve
  - Supports auditors to easily see what was changed

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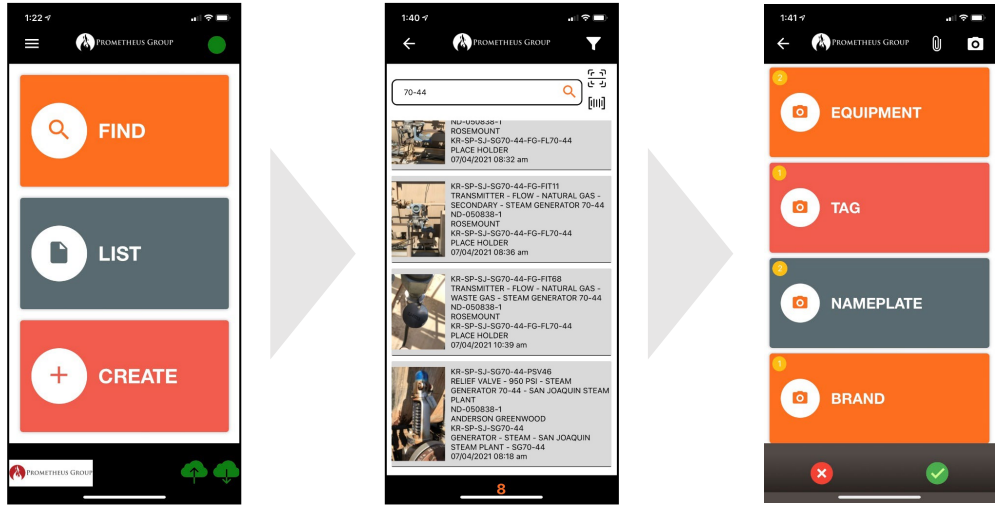
# Field Data Capture at the Site Level

## Pilot Goals

1. Prove the effectiveness of the Prometheus Group (PG) method for collecting, extracting, and enhancing data (a.k.a. Digital Walkdown)
2. Determine the skillsets required to effectively execute field data collection and prove 100 asset per person a day pace
3. Determine the demand on Chevron OC to effectively support PG and field data collections resources
4. Revise budget guidance and scope for field data collection efforts to support Digital Core

## Concept

- **Instead of manually capturing nameplate data, we used a mobile app to capture and catalog nameplate photos**
- Vendor used their proprietary process to acquire data from photos using OCR, object detection / recognition, crowd sourcing and got two points of validation for each data point
- Vendor further enhanced data and provides a formatted load file that is used to update systems of record

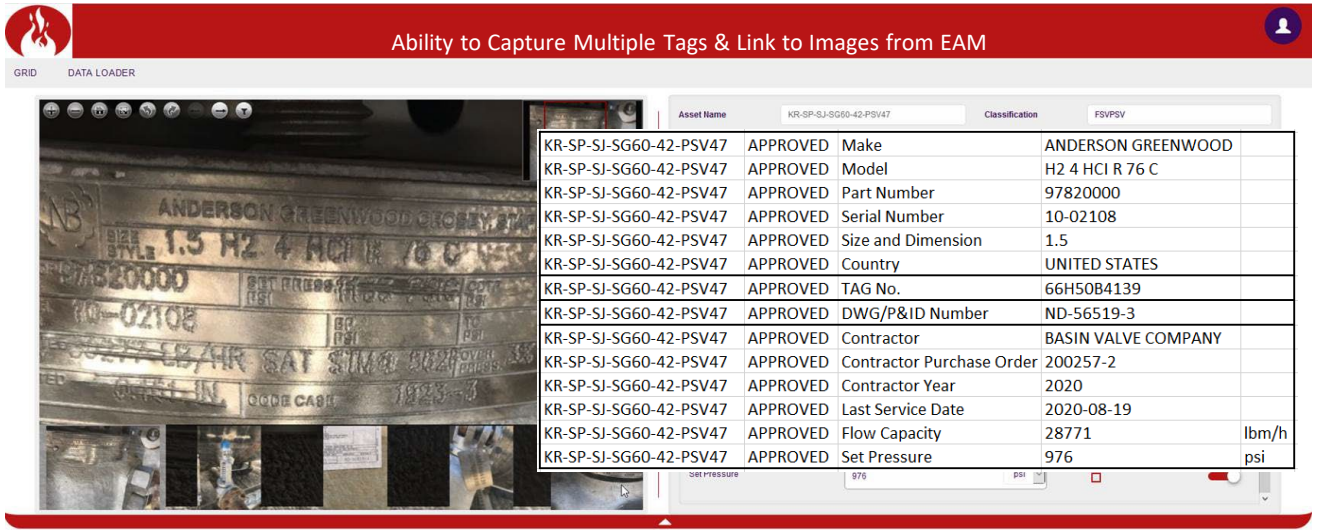




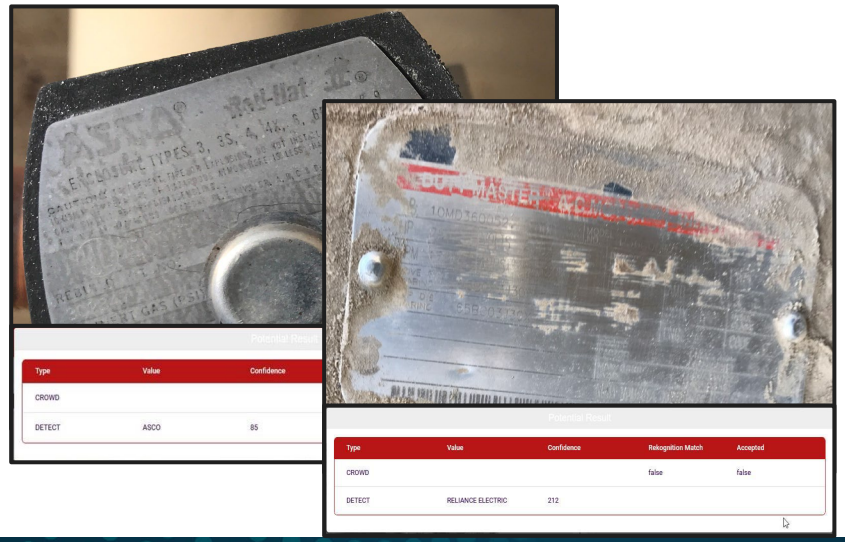
| | | |
|---|---|---|
| Make | ANDERSON GREENWOOD | |
| Model | H2 4 HCI R 86 C | |
| TAG No. | 66H50B8117 | |
| Inspector | BASIN VALVE COMPANY | |
| Inspection Model | HCI R 86 C | |
| Last Inspection Date | 2020-09-10 | |
| Flow Capacity | 28771 | lbm/h |

# Data Capture for Cleansing

## Extraction

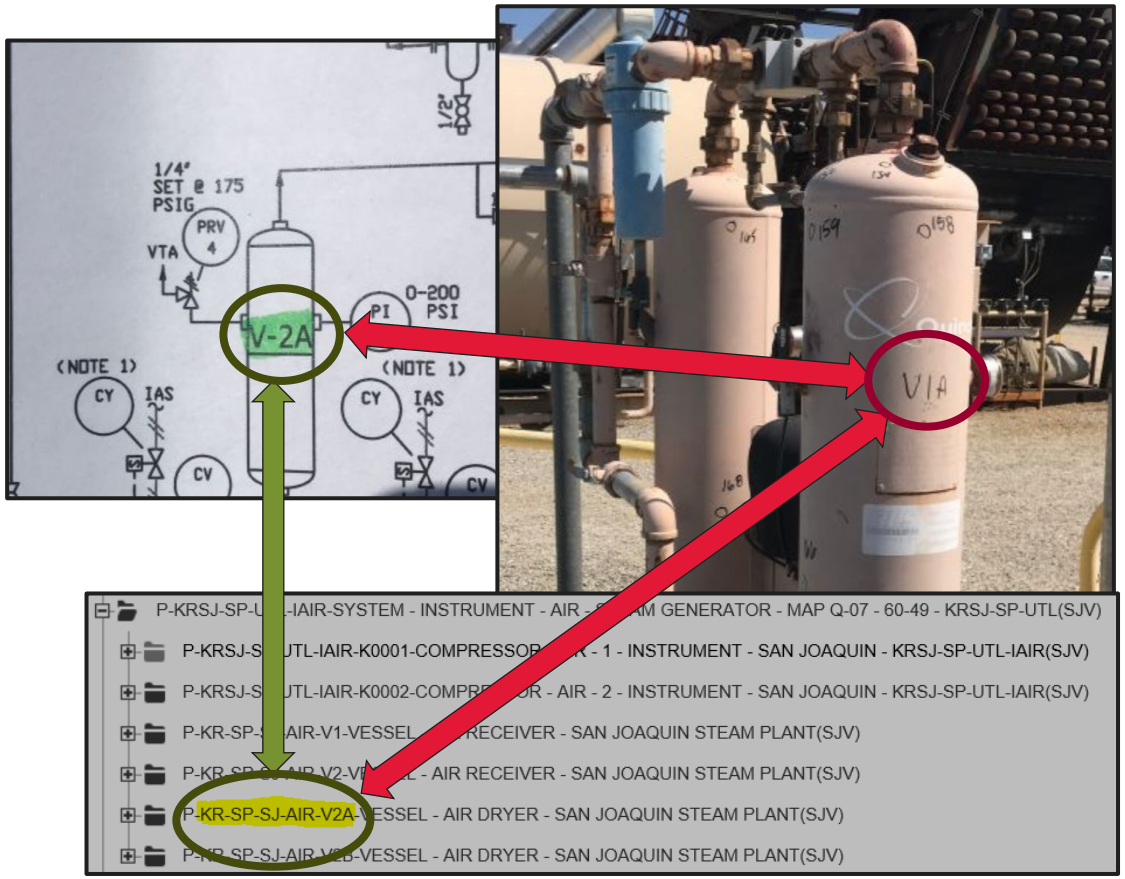



| | | | | |
|---|---|---|---|---|
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Make | ANDERSON GREENWOOD | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Model | H2 4 HCI R 76 C | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Part Number | 97820000 | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Serial Number | 10-02108 | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Size and Dimension | 1.5 | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Country | UNITED STATES | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | TAG No. | 66H50B4139 | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | DWG/P&ID Number | ND-56519-3 | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Contractor | BASIN VALVE COMPANY | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Contractor Purchase Order | 200257-2 | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Contractor Year | 2020 | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Last Service Date | 2020-08-19 | |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Flow Capacity | 28771 | lbm/h |
| KR-SP-SJ-SG60-42-PSV47 | APPROVED | Set Pressure | 976 | psi |



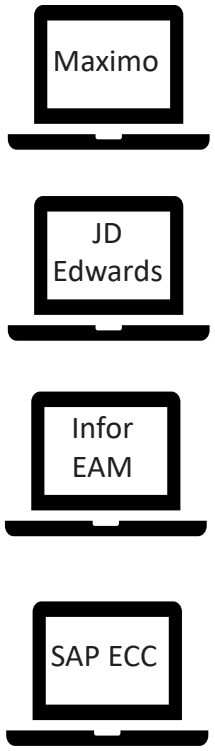

## Object Detection

## SoR Gaps



# No Need To Wait for the Value of Prometheus

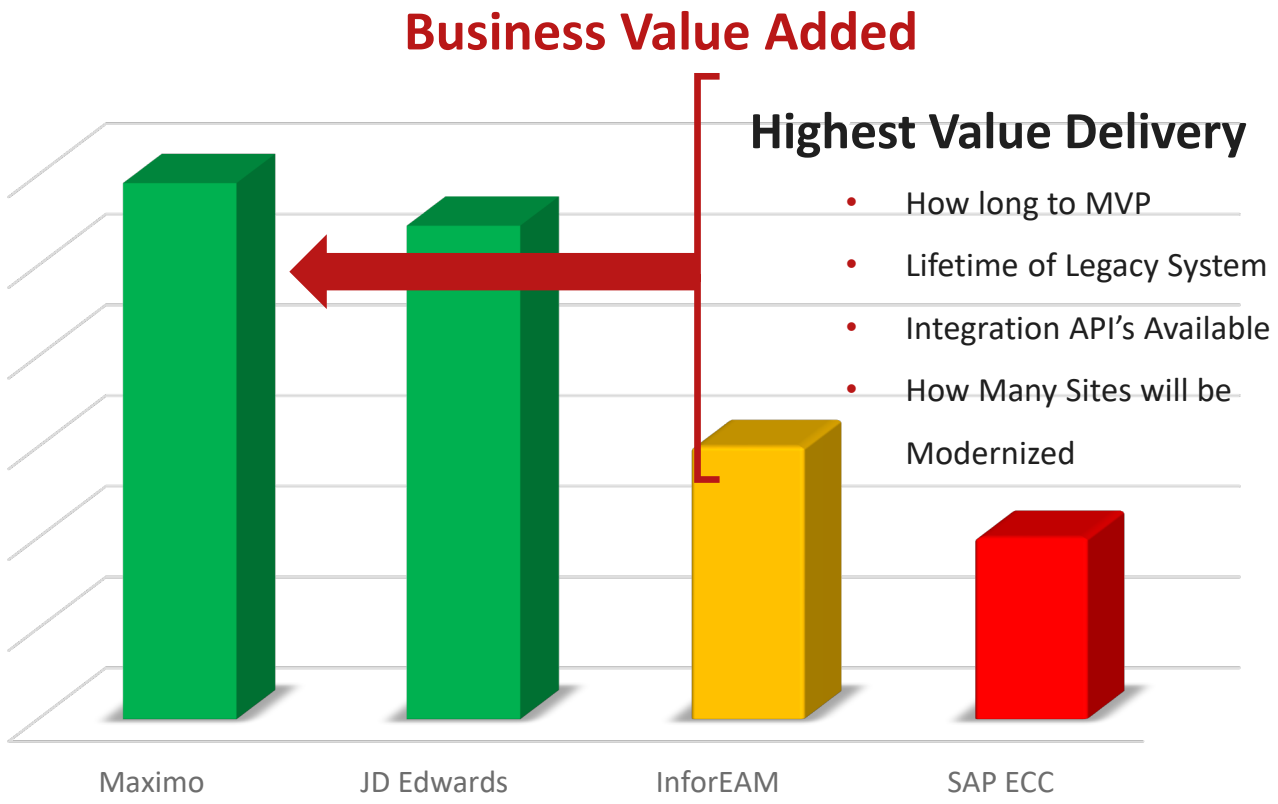
**Integration to Legacy Systems**




- What problems are we solving
- Technical Complexities
- Lifetime of Legacy System
- Number of Sites Modernized
- How Long to MVP Deployment
- Volume of Work Orders
- Available API's
- Current Scheduling solution

# No Need To Wait for the Value of Prometheus Final Prioritization

- After delivering the focus to Prometheus.
  - They began the process of configuring the MVP Pilot:
    - What Problems are We Solving
    - Lifetime of Legacy System
    - How long to MVP Deployment
    - Available API's
    - Technical Complexities
    - Volume of Work Order
    - Current Scheduling Solution



# Legacy Systems - Where Are They Now


Fully Deployed to MFG System

4 out of 5 Refineries in use, 1 left to transition over


Positive feedback from MFG led JDE Users to request early deployment

Currently in Build Process 2023 target Deployment

# Lessons Learned Legacy Systems

- **Early Partnership Technical Issues**
  - Prometheus partnership in early design was critical to identifying Upgraded designs different from out-of-the-box released versions of ERP Systems.
  - Connection to Legacy Systems were delayed due to heavy customizations that couldn't be undone. 6-8 weeks to 6-8 months
  - Custom Object Structures and Logic are still proving to be a hinderance with Prometheus Out-of-the-Box Functionality.
  - Prometheus uncovered tons of bad Data that needed attention (user input errors) that the Business is still working to clean up.
  - Working around the customizations is limiting the tool to its scheduling basics. Still a great value to business, but not to its full potential.  Early deployment proved the need for standardization.

# Lessons Learned Legacy Systems

- **BCM Feedback right After Deployment**
  - Sometimes, the system doesn't work how I expect – it glitches and I must go back and try the same thing over again.
  - Slight user errors have caused big issues in the EAM system.
  - We are struggling with trusting the data – there is a data cleanup issue.
  - Not being able to find things myself easily are what's making me want to go back and use my old tool, because I know how it works.
  - We don't have time to try trouble shooting with a new tool while we're trying to get our work done.
  - Because Excel added so much freedom of "custom" for us, custom functions were requested. But we had to stay within the future boundaries.

# Lessons Learned Legacy Systems

- **User Feedback After 1 Year**
  - Has greatly improved our scheduling ability to provide a more consistent product to Operations.
  - It has greatly improved our overall productivity by providing Operations a clear path forward of how Maintenance will be working and has greatly reduced delays due to equipment not being ready/ available.
  - Prometheus, is many times better and more efficient for scheduling than our old process.
  - Prometheus has saved time with building schedules and preparing schedules to be sent out.
  - We currently have much shorter Optimization meetings — the OMCs and Scheduler spend many hours behind the scenes doing most of this work before the meeting.
  - Developing schedules and scheduling are much easier.

# Lessons Learned Digital Transformation

- **Prometheus**
  - Prometheus Web Scheduler is a flexible tool that fits an Enterprise Model of Businesses well.
  - Prometheus is a superstar in partnership for Chevron Digital Core, always willing to co-innovate and look for ways to add value in a competitive digital environment.
  - Business Units are Excited to see the Prometheus User Interfaces sleek and simple menus.
  - Prometheus being a preferred partner with SAP has proven to be value added as the S4hana product evolves the connected tools provided by Prometheus are also adapted in a timely manner.

# Questions?