

Optimize Asset Management with Process Mining for Maximo



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Agenda

- Energy & Utility PoV on Intelligent Automation for Asset Management
- Process Mining For Maximo

Intelligent Automation in Utilities

Insights from Utility CIO's

- Prioritizing automation investments
- Simplifying with automation
- Measuring automation ROI
- Proving trustworthiness of automation

Intelligent automation is one of the cornerstones of an organization's digital transformation

Up to 40%

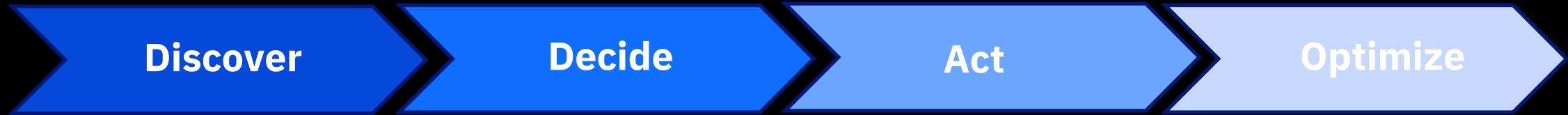
Reduction in Operations and Maintenance expense leveraging intelligent automation strategies in multiple areas



Value of Intelligent Automation

- Increase organizational efficiency and reduce operational expense
- Reduce manual work to free up human capital, and drive more innovation
- Create more resiliency in business operations
- Improve compliance
- Unlock full potential of digitization strategies

Process Mining is becoming the standard to accelerate the *identification of inefficient and long running processes* and help utilities identify the right automation strategy to implement



Process Mining uses Data and AI to help you discover as-is process, decide what to do via simulation and optimize via continuous monitoring

Automate Asset Operations to Achieve Better Performance

Automation Opportunities:

- Work Preparation: Permitting, Insurance, scheduling
- Post work administration tasks including damage claims, asset data capture
- Network Access & Outage planning
- Project Management and Work Order reconciliation
- Vendor/Contract Management processes
- Field Inspections
- Invoice Processing and Reconciliation
- Procure to Pay
- Monitor Processes for Risk & Compliance
- Regulatory Reporting
- Incident Management
- Asset Hierarchy / BOM processing
- Prescriptive Maintenance actions
- HR Processes, Time and Expenses



North American Energy Provider

Challenges:

Seeking to reduce the incidence of noncompliance with its standardized procurement processes

Solution:

IBM Process Mining

After studying the process flows drawn from its Maximo procurement data, the company was able to see where and how activities were going outside of the standard flow. The company was able to use the AI models within the solution to map out an optimized process that cuts 67% of process steps.

Results:

67%

Efficiency: eliminate by 2/3^{rds} number of process steps of standardized procurement process

80%

Improvement: In order lead time

In using real data and AI to map out our procurement process flows, we've also acquired what amounts to a potential roadmap for transforming them. It gives us a rigorous framework for understanding where to focus on improving and, where possible, automating different elements of the process flow.

Manager of Procurement,
Electric Power Provider



Challenges:

Procure to Pay process not consistent across 19 regions and operating companies

Desire to streamline and improve backoffice operations

Complicated business model involved 10 systems with SAP ECC used to orchestrate Procure to Pay workflow

Solution:

Leverage IBM Process Mining to analyze:

- Deviation and non-conformance workflows
- Monitor Maverick Orders
- Find Unexpected workflows
- Identify and Monitor
 - Payment Mismatch
 - Automation Level by Country
 - Monitor Cash Flow on Early Payment
- Meter to Cash & Record to Report also in production

Results:

65%

flows non-conformant to expected model. Results on average took 2x longer to complete

26%

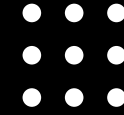
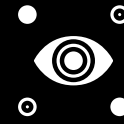
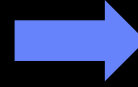
Compliance: Number of orders without a Purchase Requisition

47%

Number of orders paid early or with mis-match of payment terms. Results in potential cash flow deficit

Process Mining Journey

From the Insight to Action



Process Discovery And Optimization

algorithms for:

- As-is Process
- Task mining
- Business rules mining
- Multi-level process mining

Process Analytics

Continuous Monitoring of:

- KPI and cost
- Compliance/Deviations
- Automation
- Root cause analysis

Intelligent Automation

Optimize using:

- Simulation/What if
- ROI Analysis
- Generate Automation recommendations
 - Decision Management
 - Document Processing
 - Robotic Process Automation

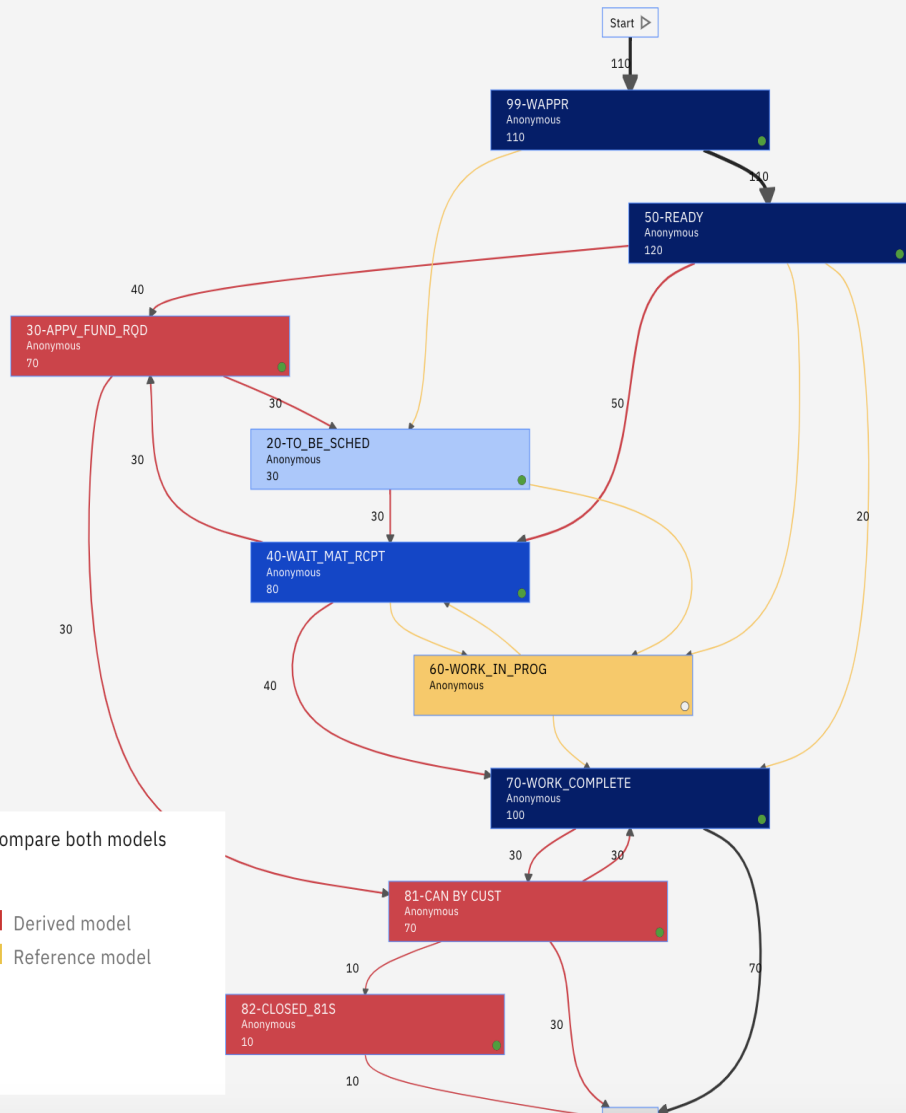


Manage the Execution thru AI Powered Automation

Automate thru:

- IBM Cloud Paks for Business Automation
- Best of Breed Automation Platforms

Viewing: Frequency, KPIs (off)



Activity frequency

- 0
- 24
- 48
- 72
- 96

Compare both models

- Derived model
- Reference model

Model conformance

Model view options

- Data derived model
- Reference model
- Compare both models

Similarity

67%

Fitness

96%

Maximum fitness

100%

Minimum fitness

91%

Conformant cases

0 conformant cases

Steps per case

Case cost

Average case lead time

110 non-conformant cases

Steps per case

Case cost

Average case lead time

5

EUR 15.33

146 days 3 hours

Reference model deviations

Displaying: 3 Deviations

81-CAN BY CUST
54.55% (60 cases)

Average number of steps

Average case cost

Average case lead time

6

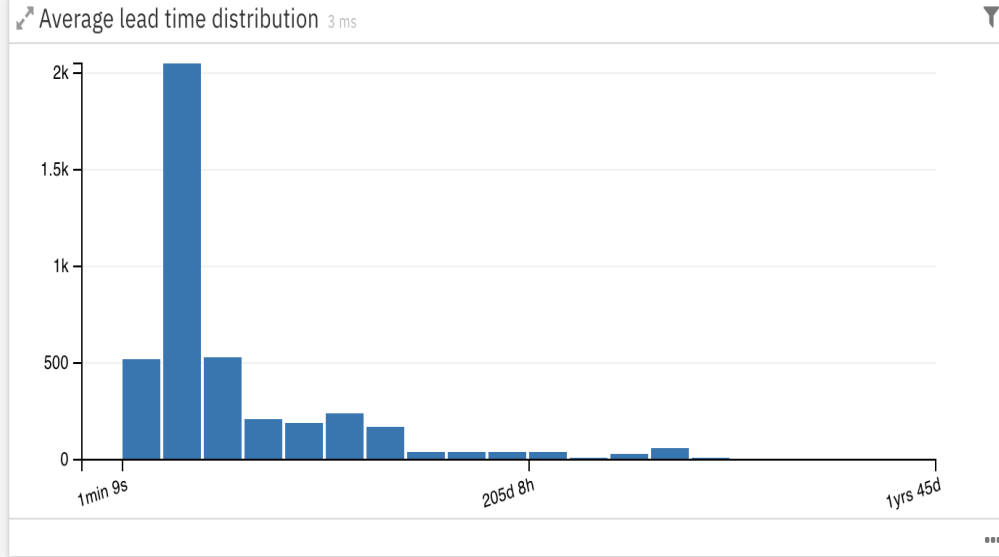
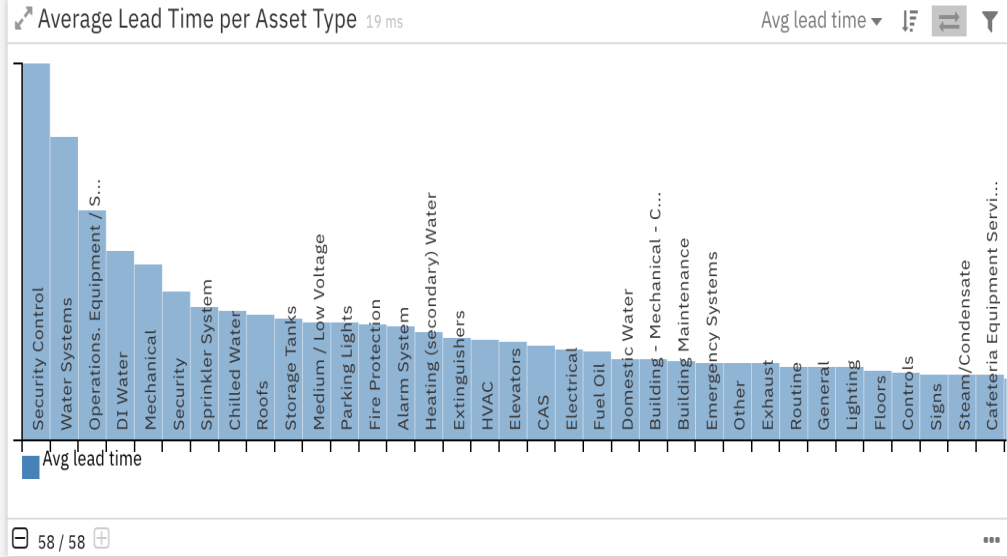
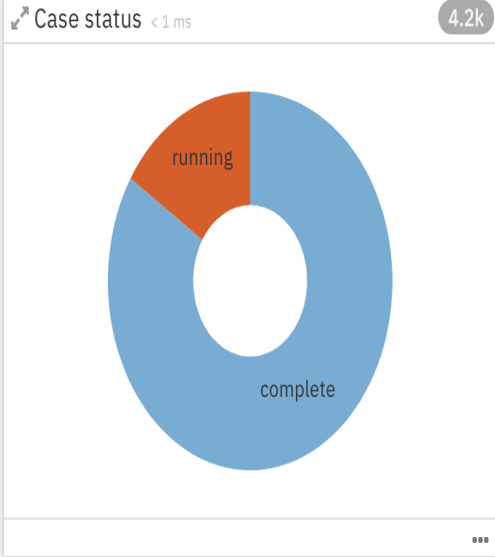
EUR 16.50

170 days 10 hours

Tickets
110

Average Lead Time
158d

Average Cost
€ 16.57



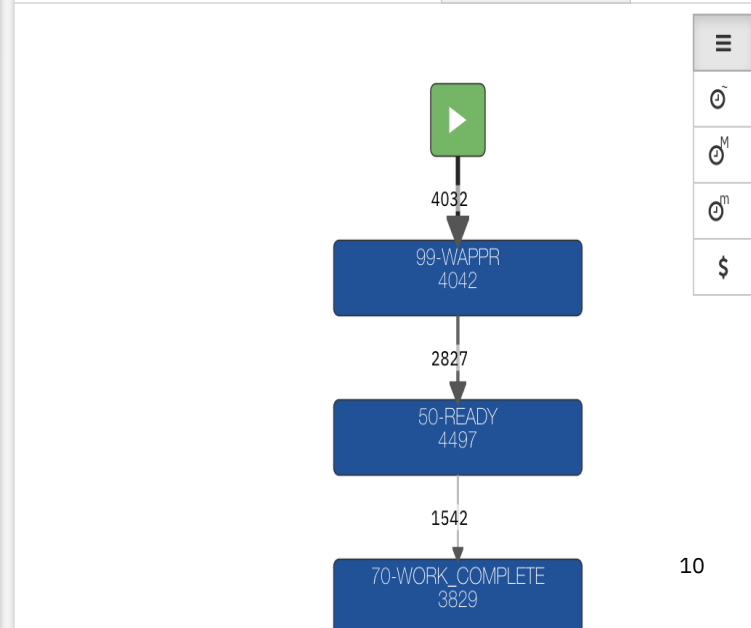
Case variants < 1 ms

100

Frequency	Events	Lead Time	Rep.	First Event	Last Event	Avg. Cost	Tot. Cost
28.24% (1,186)	3	30d 19h	0	03/06/2021 6:30 AM	03/29/2022 3:54 PM	€ 3.36	€ 3,983.60
6.17% (259)	6	41d 5h	2	03/12/2021 1:25 PM	04/13/2022 12:06 PM	€ 11.99	€ 3,104.50
5.74% (241)	6	77d 7h	2	05/13/2021 6:14 PM	06/02/2022 11:25 AM	€ 19.49	€ 4,696.50
3.36% (141)	4	64d 18h	0	03/11/2021 2:25 PM	05/12/2022 3:30 PM	€ 10.09	€ 1,422.10
3.1% (130)	5	40d 6h	0	04/05/2021 2:53 PM	01/20/2022 5:24 PM	€ 14.80	€ 1,924.00
3.1% (130)	5	85d 6h	0	03/22/2021 8:26 PM	03/28/2022 1:17 PM	€ 14.80	€ 1,924.00
3% (126)	6	47d 3h	4	03/18/2021 10:39 AM	03/18/2022 1:45 PM	€ 15.65	€ 1,972.50
2.62% (110)	5	96d 1h	2	03/12/2021 6:32 AM	12/17/2021 2:54 PM	€ 7.60	€ 836.00
2.5% (105)	7	35d 9h	4	03/21/2021 9:09 AM	09/30/2021 11:25 AM	€ 15.50	€ 1,627.50
2.17% (91)	4	119d 22h	0	03/08/2021 4:03 PM	11/03/2021 4:45 PM	€ 10.08	€ 917.10

Process model < 1 ms

1 variants selected 4.1k



- Create new
- Process landscape 0
- Application landscape 0
- Organization landscape 0
- Process 1
- Simulations 6

- local
 - maximo
 - Adding AI
 - Business Analysis Work Ord...
 - Site 13
 - Site 15 Demo
 - Site 15 Improvements
 - Site 15 Resource Action

- DMN 0

Current lead time
145d 10h 51min 26sec

Estimated lead time
86d 11h 42min 52sec

Current cost
€ 15.33

Estimated cost
€ 8.23

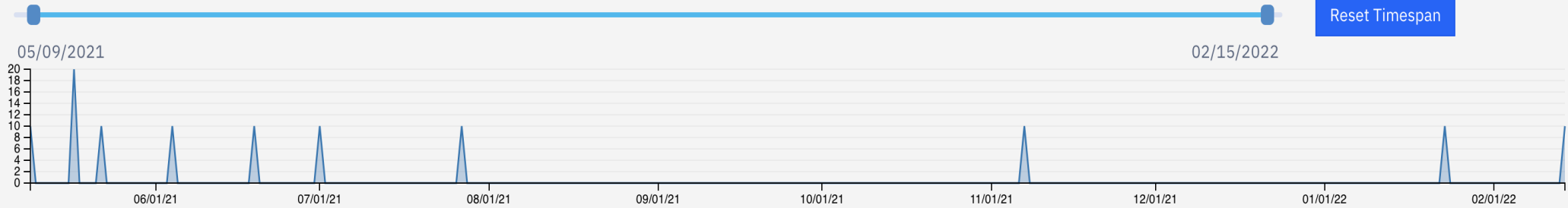
Run Simulation Versions

Save View Results Edit BPMN Delete

Arrival Distribution

historical

Historical distribution chart



Activities

Reset waiting times search activity

⚠ 99-WAPPR | Avg throughput time: 15min, Executions: 110, Weight: 1

Settings Scheduling RPA Waiting times

FTE 4,714.29

Staff availability 1

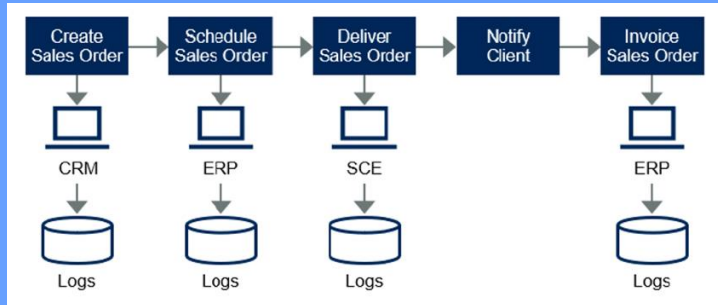
Service time 0 0 0 (days hours minutes)

Working time 0 0 15 (days hours minutes)

IBM Process Mining

Understand real work done by employees to improve business efficiency

Data: Logs from Maximo and other Systems



Extract and Prepare Data Set

Workers using business applications



Task Mining

Automate & Optimize

Intelligent Automation

Current lead time 129d 17h 20min 41sec Estimated lead time 129d 17h 20min 41sec

Run Simulation Versions

Simulation Settings

Version: 1

Description: Adding a bot for order approval

Number of instances: 3000

Analytics



Discovery



Data Source File: combines formatted event log data

Req_Head	Req_Line	Req_ID	PO_Head	activity	datetime	user	role	mandt	usertype	Requisite	Requisite	Order_Am	Requisite	Invoice_A	Paid_Amc	conseqna	conseqna	conseqna	pay_delay	pay_type	Req_Req
10213660	10	0010213660_10		Requisitic	2018-02-26 0:00	DST110		600	HUMAN	Direct	Infocorrc	0	IT01	0	0	0	0	0	0	0	VND07998
10203161	10	0010203161_10		Requisitic	2018-01-02 0:00	USR00586		600	HUMAN	Indirect	N.A.	0	IT01	0	0	0	0	0	0	0	
10203200	10	0010203200_10		Requisitic	2018-01-03 0:00	BIB03		600	HUMAN	Indirect	N.A.	0	IT02	0	0	0	0	0	0	0	
10203221	10	0010203221_10		Requisitic	2018-01-03 0:00	USR00586		600	HUMAN	Indirect	N.A.	0	IT01	0	0	0	0	0	0	0	
10203301	10	0010203301_10		Requisitic	2018-01-03 0:00	MKT81	Secretary	600	HUMAN	Indirect	N.A.	0	IT01	0	0	0	0	0	0	0	
10203267	10	0010203267_10		Requisitic	2018-01-03 0:00	USR00010	Secretary	600	HUMAN	Indirect	N.A.	0	IT01	0	0	0	0	0	0	0	
10203271	10	0010203271_10		Requisitic	2018-01-03 0:00	USR00010	Secretary	600	HUMAN	Indirect	N.A.	0	IT01	0	0	0	0	0	0	0	
10203306	10	0010203306_10		Requisitic	2018-01-03 0:00	MKT81	Secretary	600	HUMAN	Indirect	N.A.	0	IT01	0	0	0	0	0	0	0	

Import Data Set

IBM Process Mining Accelerator for Maximo - Overview

Objectives

- Dramatically **reduce time-to-value** of process mining insights for Maximo clients and process areas
- Provide **ready-to-use** framework to **automate** data extraction, transformation and insights generation for **common use cases in asset management**
- Enable **flexible configuration** for customized asset deployments and **artifact-centric approach** to transform to process mining models

Development approach

- Initial technology incubation by IBM Research
- Grow and validate and with early client adopters
- Harden as part of IBM Process Miner Accelerator framework



THANK YOU

Intelligent Automation Capabilities for Asset Operations



Process Mining

Using data to quickly discover fact-base process model of Maximo “centric” processes

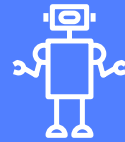
- Auto generates Maximo process maps, leveraging purpose-built connector.
- Surface opportunities, with ROI analysis, to deploy automation services that improve conformance, compliance, reduce cycle time and improve operational efficiency
- Robotic Process Automation bot generation



Process Modeling

Map existing or new asset management processes

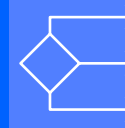
- Collaborate with stakeholders on process design for Asset Management process flows
- Import/Export process maps to/from IBM Process Mining.
- Enables process redesign to support operational efficiency and build resiliency



Robotic Process Automation

Automate manual and repetitive tasks that act on AI insights

- Accelerate productivity and reduce errors from manual work
- Example Maximo use cases
- Data entry of BOMs for construction
 - Project Management/Work Order reconciliation
 - Create automated work packages for planned outages
 - IT: Password Reset



Decision Management

Automate operations and maintenance decisions with business rules

- Reduce Labor costs from 10-40%
- Increase consistency and auditability of executing maintenance policies
- Rapidly adapt to evolving network operations, market dynamics, and regulatory frameworks.

Intelligent Automation Capabilities for Asset Operations



Document Processing

Capture, classify, and extract data from content

- Speed extraction of information from key documents and automate data entry to Maximo
- AI automatically detects and corrects errors or enrich extracted data
- Improves data quality in Maximo
- Gain insights from unstructured documents leveraging NLP



Content Services

Unify business content and asset management processes to speed decision making

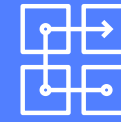
- Connect engineering, design, construction, installation, and regulatory content to asset management processes
- access to enterprise content from anywhere
- Create/maintain accurate secure and reliable records
- Assure governance and regulatory compliance



Operational Intelligence

Provide insights into Asset Operations process performance

- Capture events and aggregate to meaningful KPIs. Present via low code dashboards
- Supports additional analysis and insights leveraging AI and Machine Learning
- Correlate events and data across business automation services



Workflow Services

Design and manage start-to-finish workflows

- Enable workflow for asset management processes external to Maximo.
- Improve consistency across asset operations and increase visibility
- Reduce cycle time and Increase straight-through processing