#### CMMS / EAM Overview

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## **Managing Assets**

#### Why track asset-related data?

- Better decision making.
- Better quality.
- Better troubleshooting.
- Better justification.









## **Better Decision Making**

#### Now you will know:

- Which asset is:
  - Failing the most.
  - Costing the most.
- Which customer is:
  - Submitting the most work requests.
  - · Most dissatisfied.
- Which technician is:
  - Completing the most work orders.
  - Most customer service oriented.









## **Better Quality**

Quality starts with maintenance.

- Both internal and external customer satisfaction may be suffering, but how are you to know if assets are not tracked.
- Both assets and customers need to be satisfied to operate efficiently and profitably.









# **Better Troubleshooting**

Track historical activities.

- Can review asset history to troubleshoot new failures.
- Do not have to troubleshoot everything from scratch because others have retired or left the company without leaving valuable information behind.









### **Better Justification**

Proof is needed to justify additional purchases, investments and/or additional staff, not ideas or guestimates.









### Where to Store It?

#### Store all data in a CMMS / EAM.

- Why?
  - It is difficult to report on data that is:
    - Recorded on paper.
    - Saved in multiple spreadsheets.
    - Stored in one's memory.
- Quick and easy reports and graphs.
  - If data analysis is not quick and easy, then work shouldn't be tracked in the first place.









### What is CMMS?

#### Computerized Maintenance Management System

- Other Names
  - Enterprise Asset Management (EAM)
  - Facility Asset Management System (FAMS)
- Track, Manage, Report, and Respond from One Source of Truth
  - Assets
  - Work, including Preventive Maintenance (PMs) & Predictive Maintenance (PdM)
  - Failure Codes
  - Spare Parts and Purchasing
  - People









## Why CMMS / EAM is Needed?

#### Maintaining Assets is a Game of Chess

- Capabilities
  - When CMMS software is used to its potential, maintenance, facilities, and reliability professionals track, manage, report, and respond to CMMS data (equipment, work, failure codes, preventive maintenance (PM), spare parts, people, purchasing, etc.) to ensure customer satisfaction and to maximize the ROI of their physical assets.
- CMMS software is required to win the game and checkmate the opposing forces (costs, downtime, inventory beast, part shortages, customer dissatisfaction, etc.), enabling organizations to remain profitable and competitive.









## **CMMS / EAM is Evolving**

#### Manual Processes

- Paper: Difficult to report.
- Excel: Disjointed and often maintained by different functions.
- Legacy Systems
  - Lack technologies, open standards, upgrades, and offer limited reporting options.
- Current Systems
  - Web-Based
  - Wireless Mobility
  - Secure & Open Standards (APIs, SSO, etc.)
  - Sensor Integrations (OPC/PLC)

#### Future State

- Complementary solutions to further align functional areas.
- Artificial Intelligence (AI) and machine learning to predict pending failures and provide realtime recommendations.
- Augmented Reality (AR) & Virtual Reality (VR)

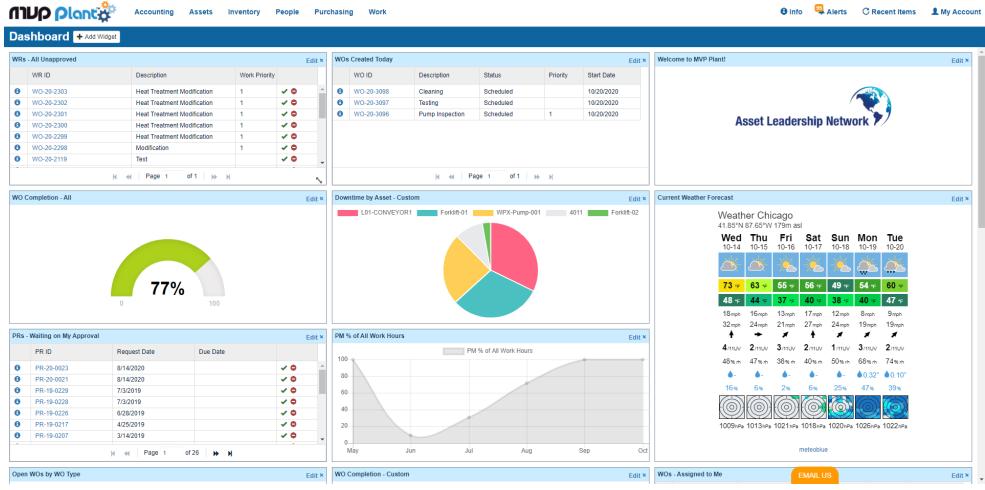








### **MVP Plant - Dashboard**



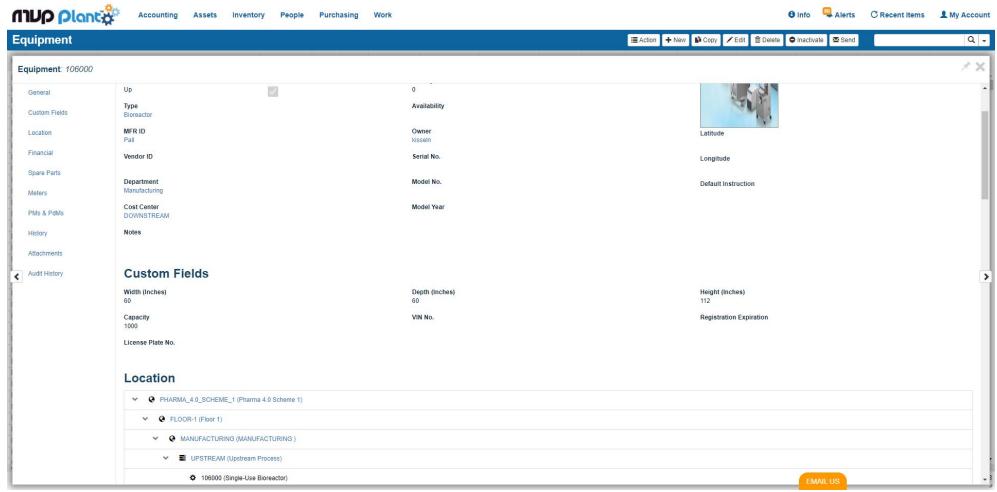








# **MVP Plant - Equipment**



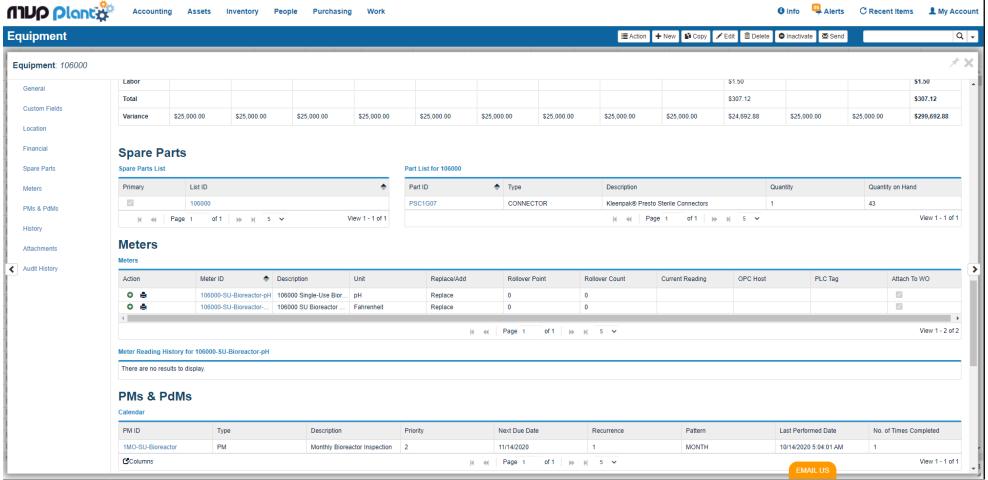








# **MVP Plant - Equipment**



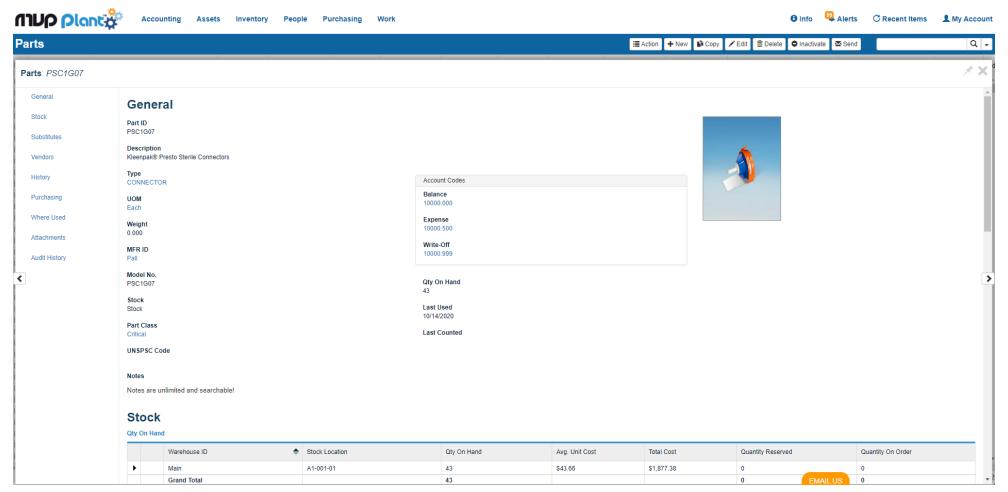








# **MVP Plant - Spare Parts**



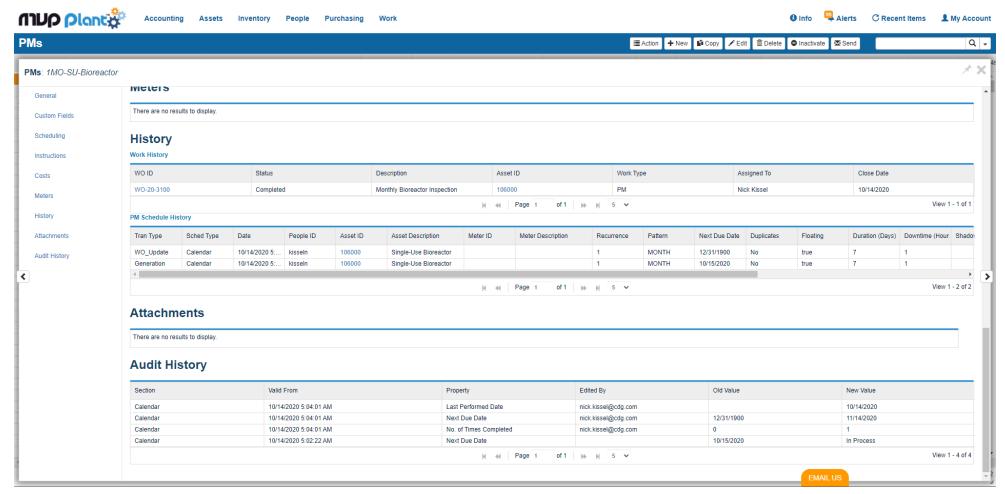








### **MVP Plant - PMs / PdMs**



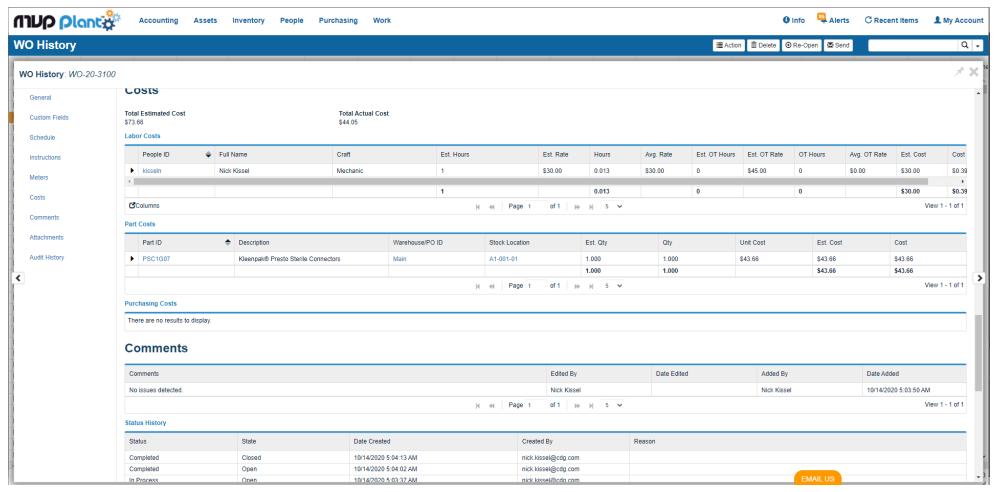








### **MVP Plant - Work Orders**











## **Verify the Data**

Electronic data collection and entry does not replace human verification.

- Work needs to be verified to ensure:
  - Completeness
  - Objective
  - Quality









## **Analyze the Data**

Collected data must be analyzed.

- If data is not going to be analyzed, then determine why it needs to be collected.
- Compare performance to industry benchmarks and organizational KPIs.
- Ensure accessible & timely reporting.
  - Automate report generation to reduce or eliminate manual imports/exports.









## **Analyze the Data**

#### **Standard Reports**

- Assets
  - Costs
  - Downtime
  - Utilization
  - PM Effectiveness
- Work
  - Summary Report
  - Project Report



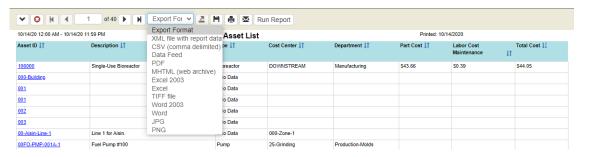






## **MVP Plant - Reporting**

#### Costs



#### Downtime

10/14/2020 12:00:00 AM - 10/14/2020 11:59:59

#### **Downtime**

PM		Scheduled Downtime ↓↑	Actual Downtime Hours	Downtime Overage ↓↑	
	106000 - Single-Use Bioreactor	1.000	0.050	(0.950)	
	Total for Plant:	1.000	0.050	(0.950)	

Downtime

#### Utilization

10/14/2020 12:00:00 AM - 10/14/2020 5:17:35 AM			Asset Utilization			Printed: 10/14/2020	
	Asset ID ↓↑	Parent Location ↓↑	Description ↓↑	Asset Type ↓↑	Uptime ↓↑	Availability Uptime	E
EQ	106000		Single-Use Bioreactor	Bioreactor	5 Hour(s) 17 Minute(s)		i
Asset Utilization						Page 1 of 1	

#### PM Effectiveness

10/14/2020 12:00:00 AM - 10/14/2020 11:59:59 PM			PM Effectiveness			Printed: 10/14/2020
Type ↓↑	Asset ID ↓↑	Description ↓↑	# of PM's ↓↑	# of WO's ↓↑	MTB Follow Up WO's 11	Avg. # Follow Up WO ↓↑
EQ	106000	Single-Use Bioreactor	1.00	1.00	0.00	1.00
			PM			Page 1 of 1









## **Share Knowledge for Quality Results**

Remove information silos by sharing collected data to let other departments know your:

- Strengths Positives create positives and are good for morale.
- Weaknesses Feedback may offer solutions.









### Respond to the Data

Any inefficiency found must be eliminated or minimized.

- If data is not going to be responded to, then reevaluate why it's being collected in the first place.
- Identified weaknesses are areas of opportunity whereas unidentified weakness remain weaknesses.









# Summary

In today's market, information is power and the better your:

- Information is, the better your decisions will be.
- Responses are, the more competitive your company will be.







