

Introduction

Gem City Metal Technologies is a metal forming and fabrication manufacturer located in Dayton, Ohio. They specialize in creating high quality components for aerospace applications using processes such as laser cutting, hydroforming, and metal spinning, all performed by highly skilled technicians. To create these products, Gem City Metals keeps a large inventory of metal forming machines which require deliberate maintenance and care to ensure proper performance. Currently, the maintenance performed on each machine is reactive and non-standard. Only a limited preventative maintenance (PM) program exists, where lists of tasks hang on machines, to be signed off when completed. Gem City would like to convert and expand the existing PM system into a singular online database with some level of automation for tracking. Additionally, the company needs a process for identifying and documenting machine requirements for preventative maintenance tasks.

Software Selection

Rank	Category	Description	Weight
1	Information Integration	Ability to attach checklists and documentation such as equipment manuals and images	0.23
2	Tracking	Ability to track WOs, Hours, Tasks Completed, and to assign individuals or teams to tasks	0.2
3	Customer Support & Training	Customer support availability and training offered by software provider	0.15
4	Analytics/ Reports	Ability to generate/ provide analysis of trends and work done and produce reports based on tracked information	0.11
5	Heuristics/Usability	User interface evaluation	0.11
6	Spare Parts Handling	Ability to attach spare parts to PMs and equipment assets, purchase order tracking	0.09
7	Customizability	Ability to modify work order format, dashboard, etc.	0.05
8	Cost	Weighted Value based on Monthly Cost	0.04
9	Permissions	Full access for operators versus administrators can operator access be limited?	0.02
	Total		1

Table 1: Decision Matrix Criteria

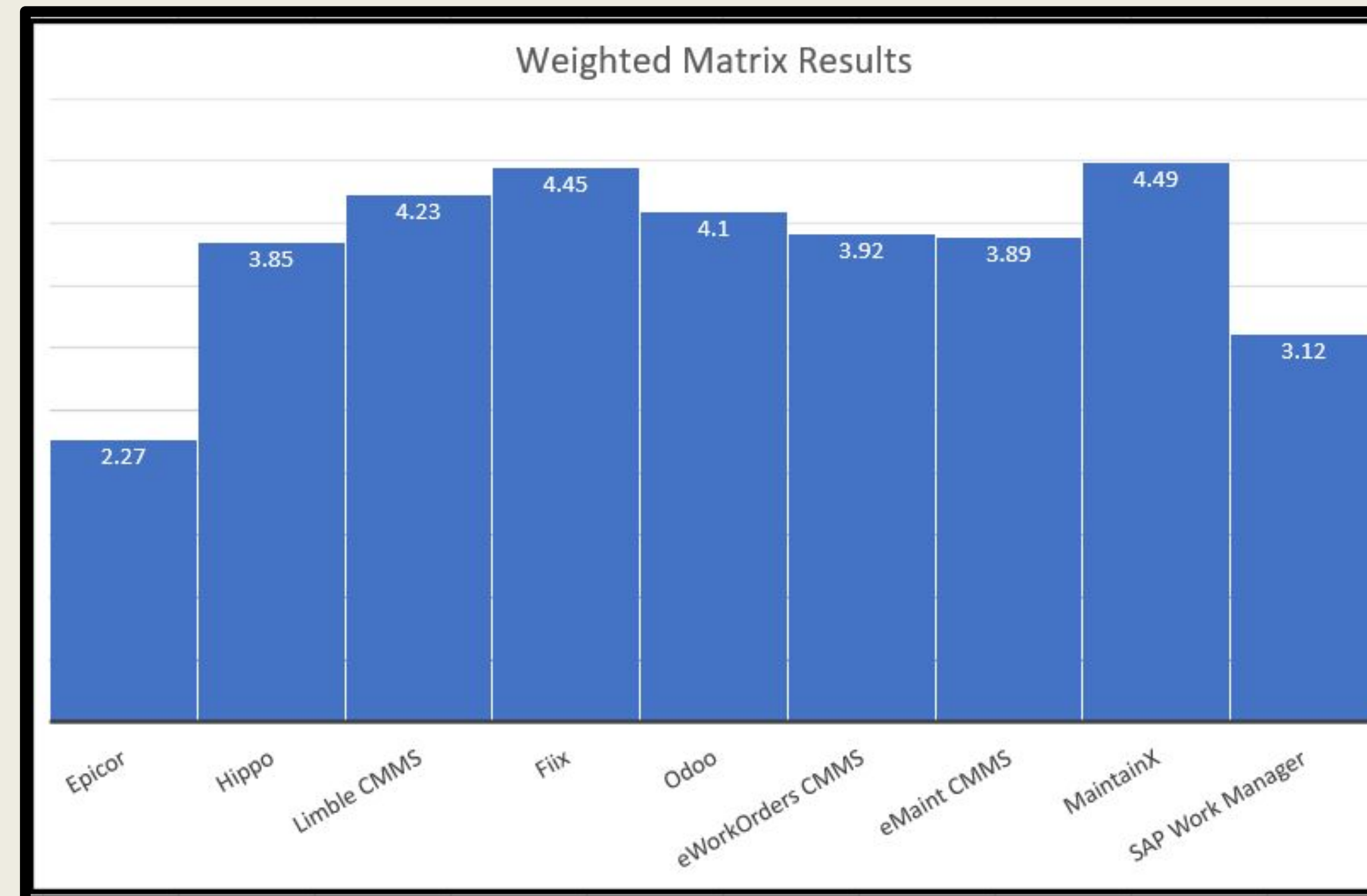


Figure 2: Software Evaluation

Software Population Cont.

Enter the To Process temperature below in degrees Fahrenheit. *

Check the pump discharge pressure on the gauge on the back panel of the chiller. Investigate further if the pressure starts to stray away from the normal operating pressure.

Figure 6: PM Task List

Preventative maintenance tasks gathered from manuals and Gem City lists entered into software which auto-generates WOs on the specified frequency. Failed tasks generate corrective action WOs and notify engineering manager.

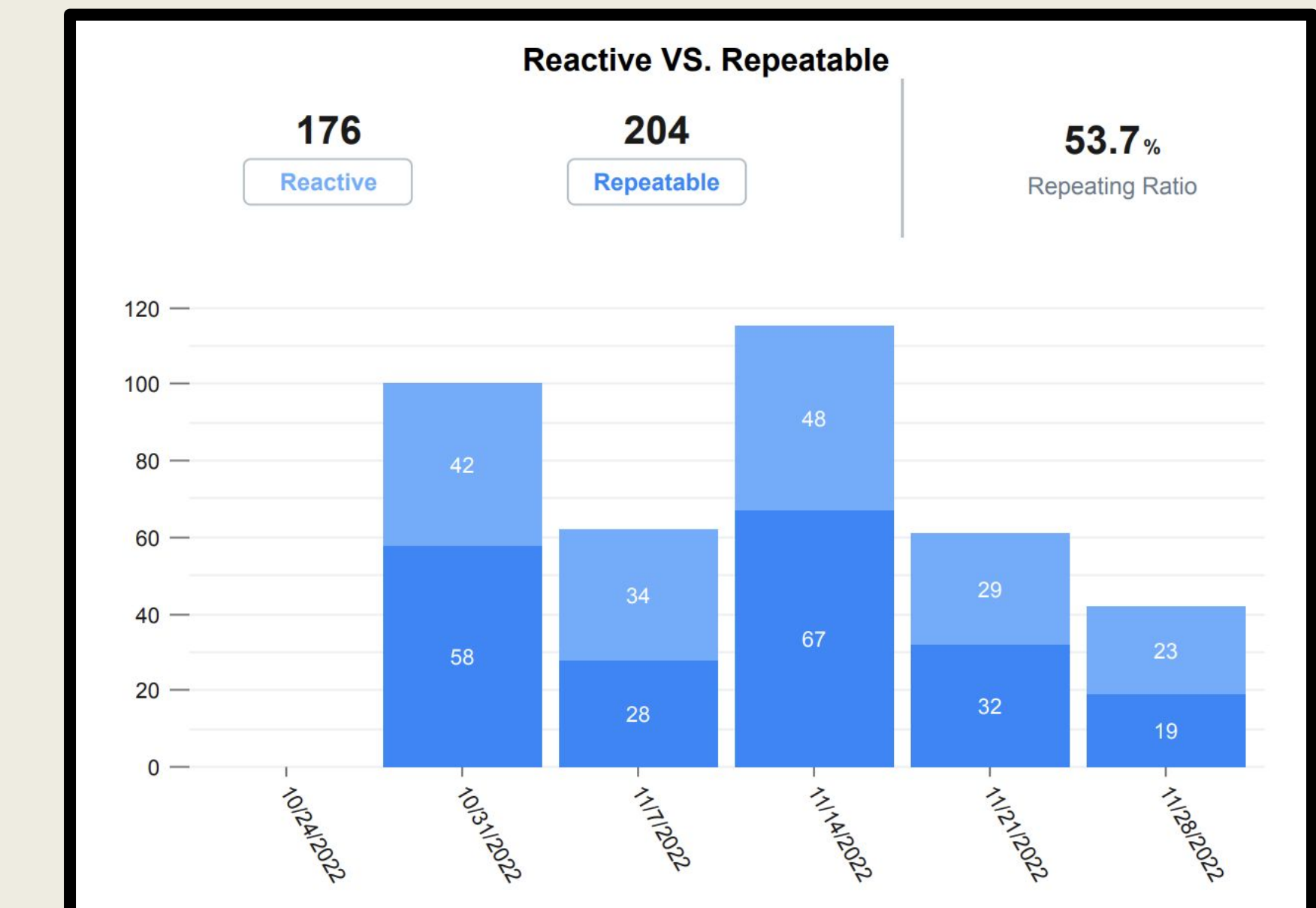


Figure 7: Work Order Type Report

Information Gathering

Name	Model Number	Serial Number	Manual (y or n)	PM List (y or n)	Gem City PM (y or n)
ThermalCare Cooler	NA20C4LXF	IB739011608	Y	Y	N
Sciaky Spot Welder	PMCO3ST-150-36-5	8219	N	N	N
SCHMALZ Vacuum Master Crane Head	MOD-VM-Basic-125/250	12.02.11.00098/0	Y	Y	N
Prima Power Laser Cutter	Laserdyne 430 BD	430.227	Y	Y	N
Pfannenberg Cooling Unit	DTS3141	S16410806749	Y	Y	N
Mitsubishi Laser Processing Machine	ML3122VZ20	643VZ20100	N	N	Y
IPG Photonics Laser	YLS-3000-CUT	PL1725923	Y	Y	N
IPG Photonics Chiller	LC 170.01-A.3.5/6	PC1702264	Y	Y	N
Cincinnati Brake		50534	N	N	N
Koolant Coolers	KV 3000	15157	N	N	N
Koolant Coolers	HCV15_000PR-NF-FILT-H	21685	N	N	N
Mitsubishi	ML3015NX-F40		Y	N	N
Mitsubishi CO2 Laser Processing System	ML40CF-R	6440DRD121	N	N	N
Cincinnati Incorporated CNC Laser Center	CL-7A	53261	Y	Y	N
Cincinnati Incorporated Electrical System Control Panel	811717	53261	N	N	N
Mitsubishi	FMSCIP63015F		N	N	N

Figure 1: Laser Bay Equipment

The graphic above lists all the assets located in the laser bay of the Gem City Metals facility. The group compiled manuals and PM documents available from Gem City and reached out to individual equipment manufacturers to obtain additional documentation.

Additionally, the team communicated with representatives from various maintenance software programs to gather more information about each option. This information featured into the decision matrix and helped the team decide which choice to pursue.

Software Population

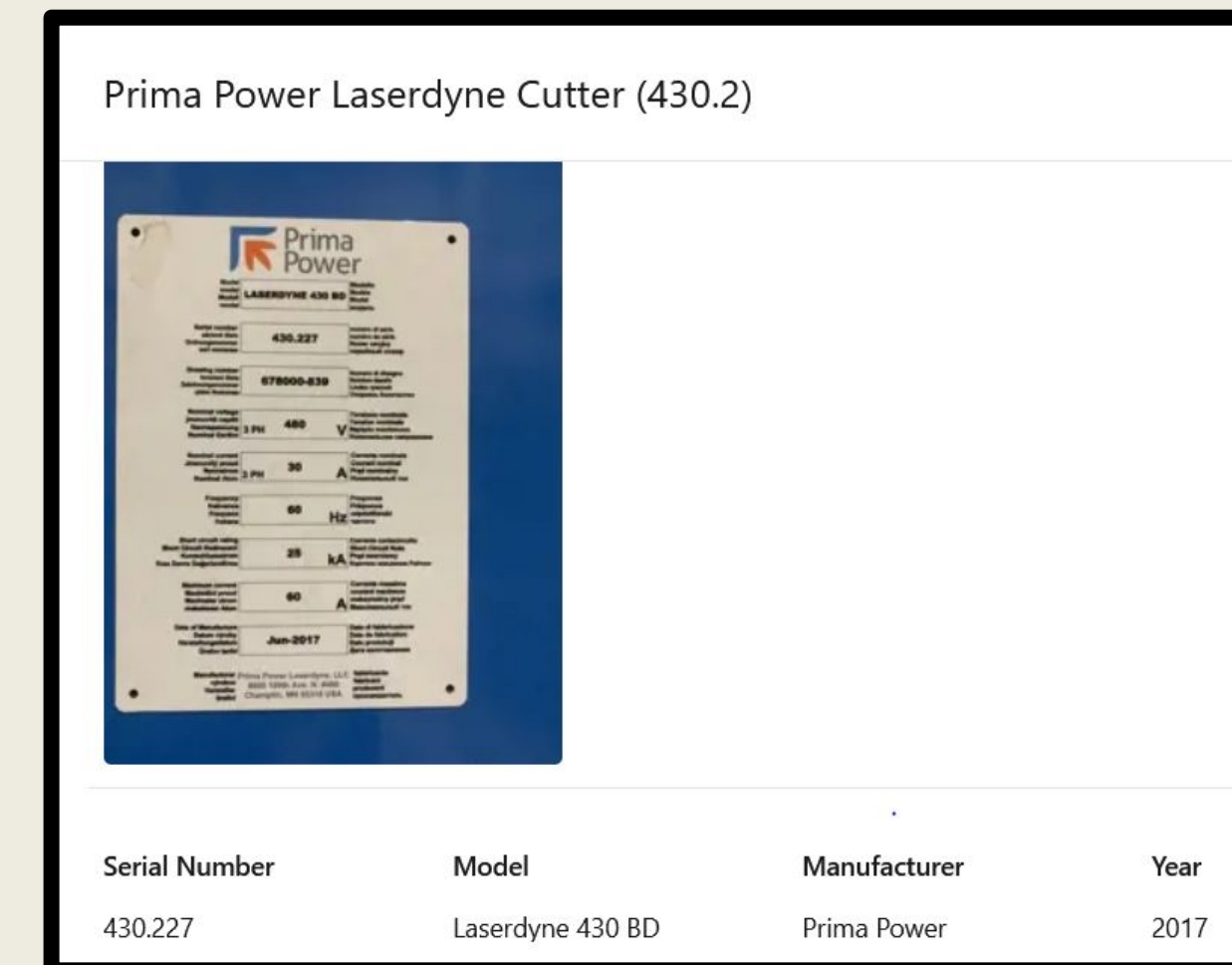


Figure 3: Example Asset

Each asset is entered according to a standard template with nameplates and manuals attached for reference. Related assets are nested under their parent asset and parts can be attached to each asset. QR codes generated for each asset.

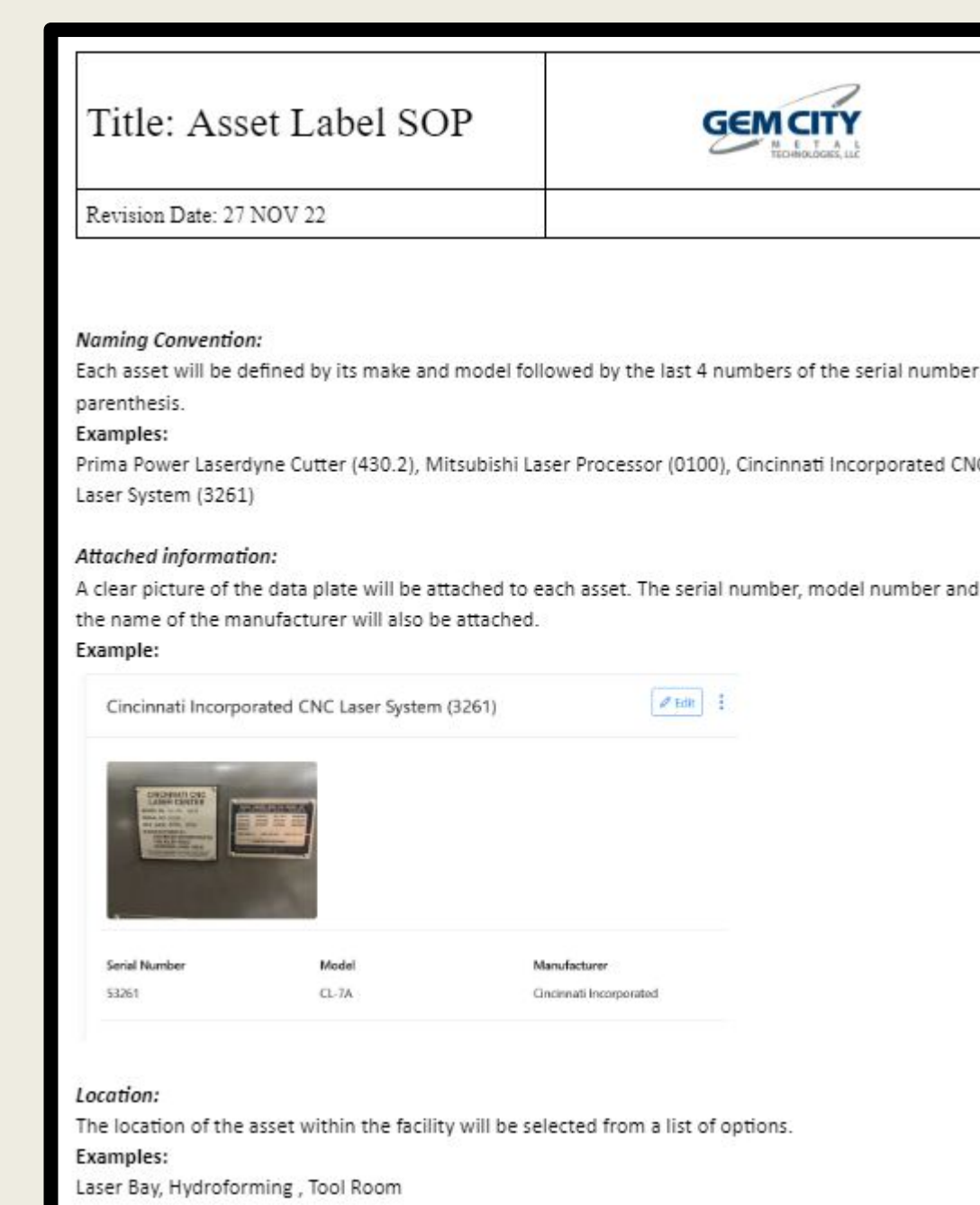


Figure 4 (above): Asset SOP
Figure 5 (left): QR Code for Asset

Conclusion

After an initial visit to the Gem City Metal Facility and a discussion with the customer, the project team selected the Laser Bay as the focus of the CMMS, PM improvement project. The team took to research and information gathering, accumulating as much maintenance and manual information as possible for the 16 Laser Bay equipment pieces. Next, 9 CMMS systems were researched and evaluated through Likert Scale ratings, provider meetings, and heuristic analysis and reasoning. This led to the selection of the MaintainX software as the optimal CMMS solution for Gem City Metals. Utilizing the found manuals and provider support, the team created preliminary assets, procedures, and work orders within a trial of the MaintainX software. Standard Operating Procedures were additionally created for the use and expansion of this software outside of the Laser Bay area within the Gem City Metals plant. The preliminary content created can be directly given to and utilized by the Gem City Team, should they decide to proceed with MaintainX as their CMMS software. This software will assist in reducing downtime, scheduling PM, and tracking the currently untracked reactive maintenance. These statistics can inform spare parts purchasing, scheduling, and provide accountability and documents for yearly audits. With this information we are confident that the Gem City Metals team will be able to make the best choice possible for the plant and the company as a whole.