

Creating Operator Scheduling Tool for Volatile Processes

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Industry Partner: LM Wind Power

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Project Scope

LM Wind Power facility located in Little Rock, Arkansas, faced the challenge of adequately scheduling workers for their post molding process. The post molding area is composed of three sub processes: cut and grind, finishing and assembly. The challenge was recognized by the excessive amount of overtime required by workers, along with idle time and the current nonstandard method of scheduling.

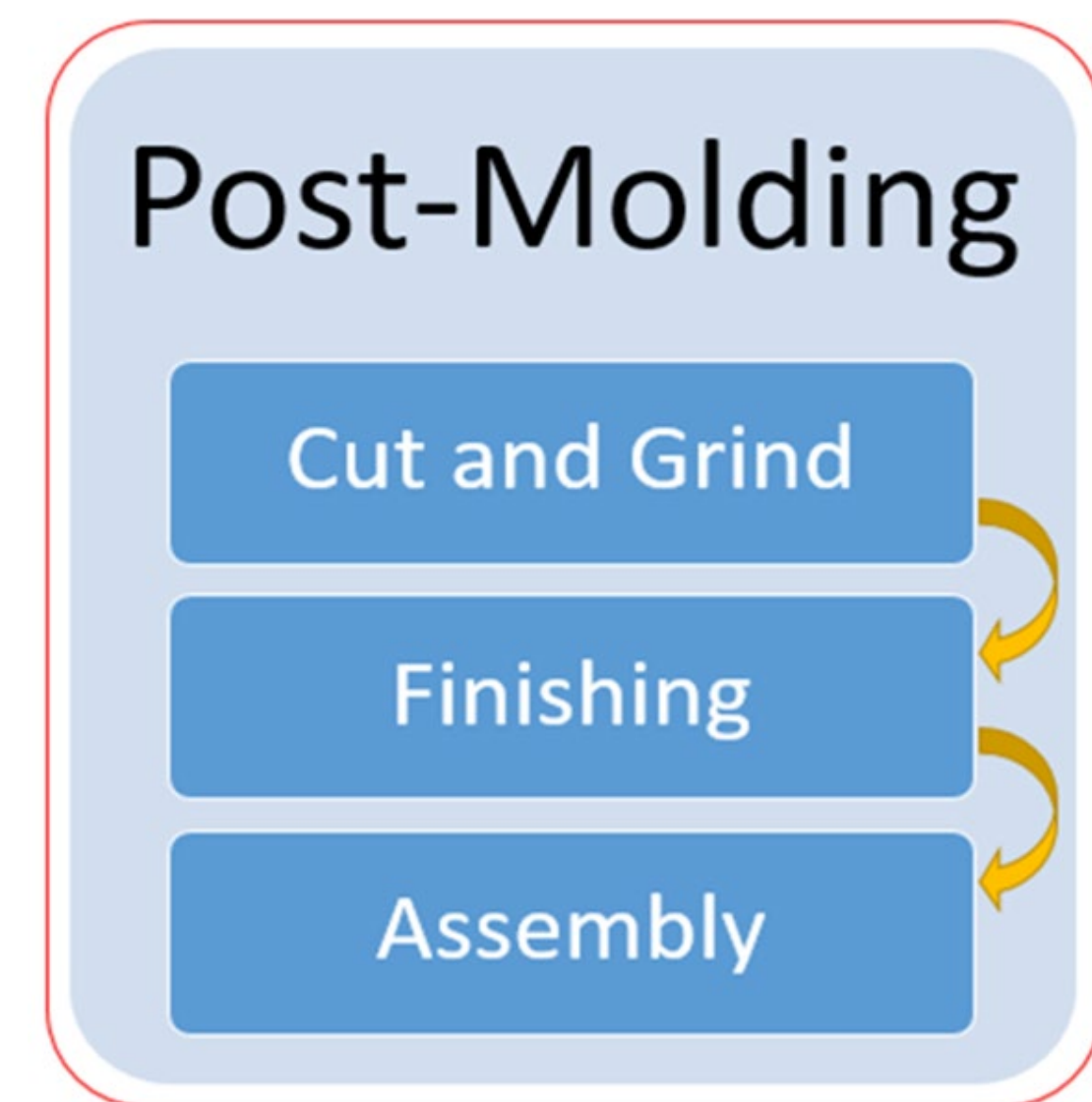


Figure 1: Subsystems of the system of interest

Economic Analysis

A cost analysis comparing our scheduling tool and the current state of the Post Molding process over a 3-month period was developed to observe the differences in labor, benefits, and overtime costs.

	January	February	March	Q1 Total
Actual	57	48	46	151
Goal	53	54	56	163
Assembly Hours	983.07	930.19	1006.36	2919.62
Cut-Grind Hours	3909.14	3297.86	3408.30	10615.30
Finishing Hours	10525.70	9706.52	10812.14	31044.36
Total Hours	15417.91	13934.57	15226.80	44579.28
Assembly Overtime	402.69	356.66	336.13	1095.48
Cut-Grind Overtime	933.49	639.34	433.29	2006.12
Finishing Overtime	3801.34	3370.84	3780.93	10953.11
TOvertimeal Overtime	5137.52	4366.84	4550.35	14054.71
Total Reg Hours	15417.91	13934.57	15226.80	44579.28
Total Overtime Hours	5137.52	4366.84	4550.35	14054.71
Labor & Benefits Cost	\$ 427,161.76	\$ 386,065.00	\$ 421,866.95	\$ 1,235,093.72
Overtime Cost	\$ 213,506.77	\$ 181,478.59	\$ 189,104.96	\$ 584,090.32
Total Cost	\$ 640,668.53	\$ 567,543.60	\$ 610,971.92	\$ 1,819,184.04

Figure 2: Labor costs incurred over the first quarter of 2017 were calculated.

Cut & Grind Operators	20
Finishing Operators	12
Assembly Operators	8
Cost/shift	\$ 5,691.84
Shifts/day	3
Days in run	90
Cost for run	\$ 1,536,796.80

Table x: Labor costs associated with 1 alternative of the scheduling tool were generated for the same length of time as the first quarter of 2017.

Data Analysis

The data analysis focused on the relative time spent on Post Molding operations among all factories over the course of a year. The percentage of overtime hours incurred was also observed for the first quarter of 2017.

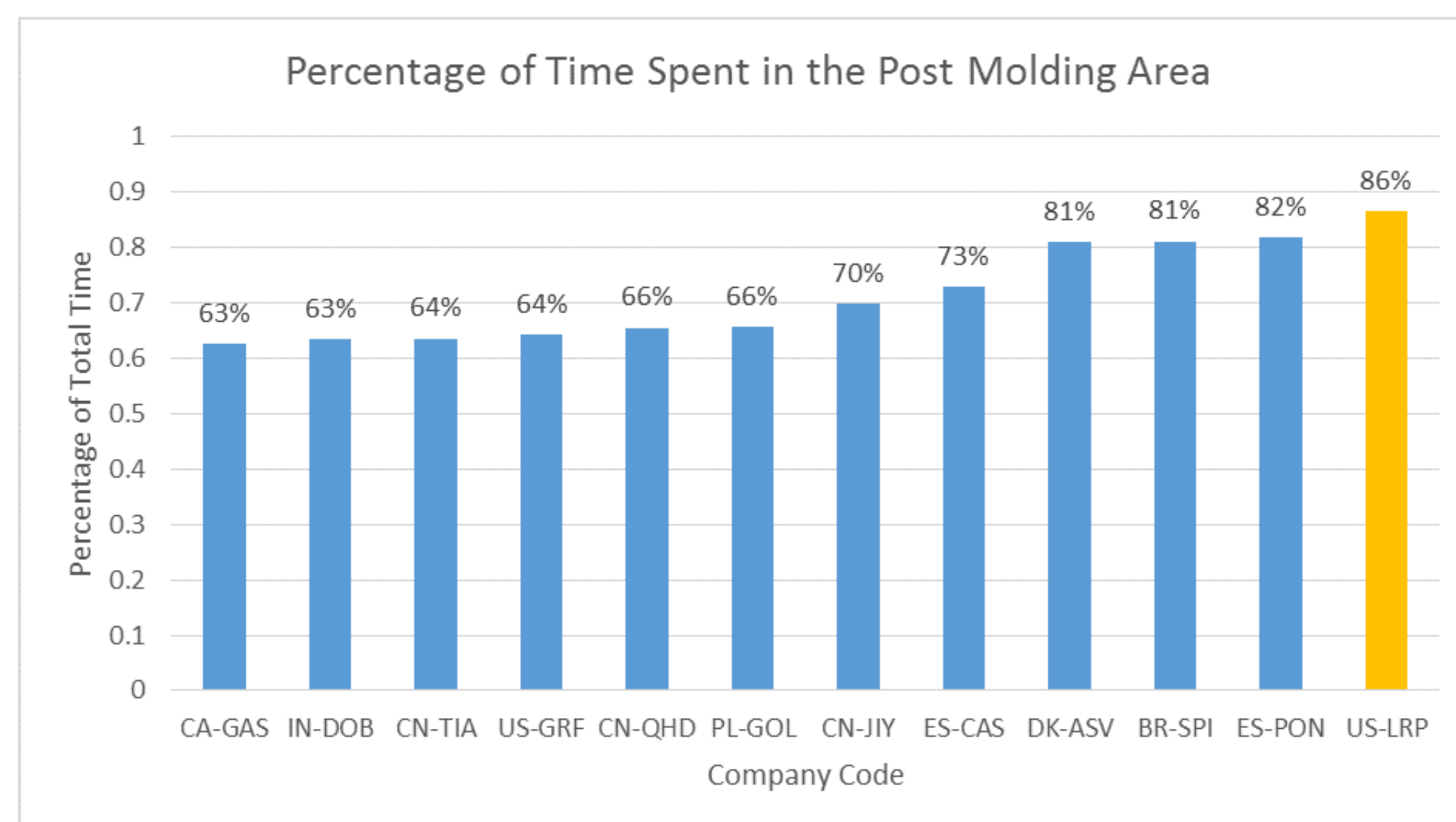


Figure 3: Percentage of time each factory spends in Post Molding Operations.

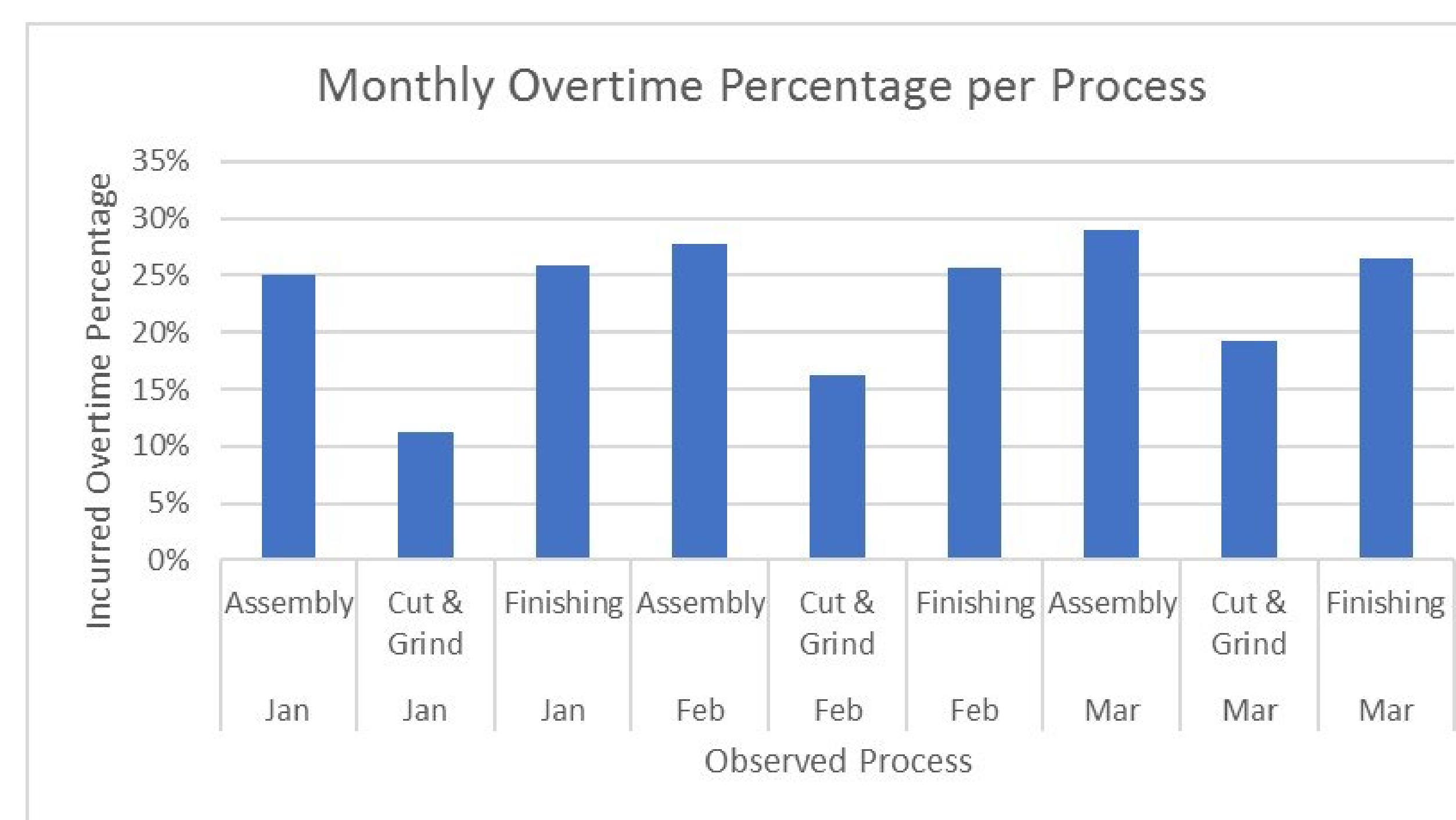


Figure 4: Overtime percentage of total incurred man hours from first quarter of 2017.

Suggestions for Future Development

Suggestions of focus areas for capturing data were created to foster more efficient use of the scheduling tool as well as improved control and monitoring of the process moving forward.

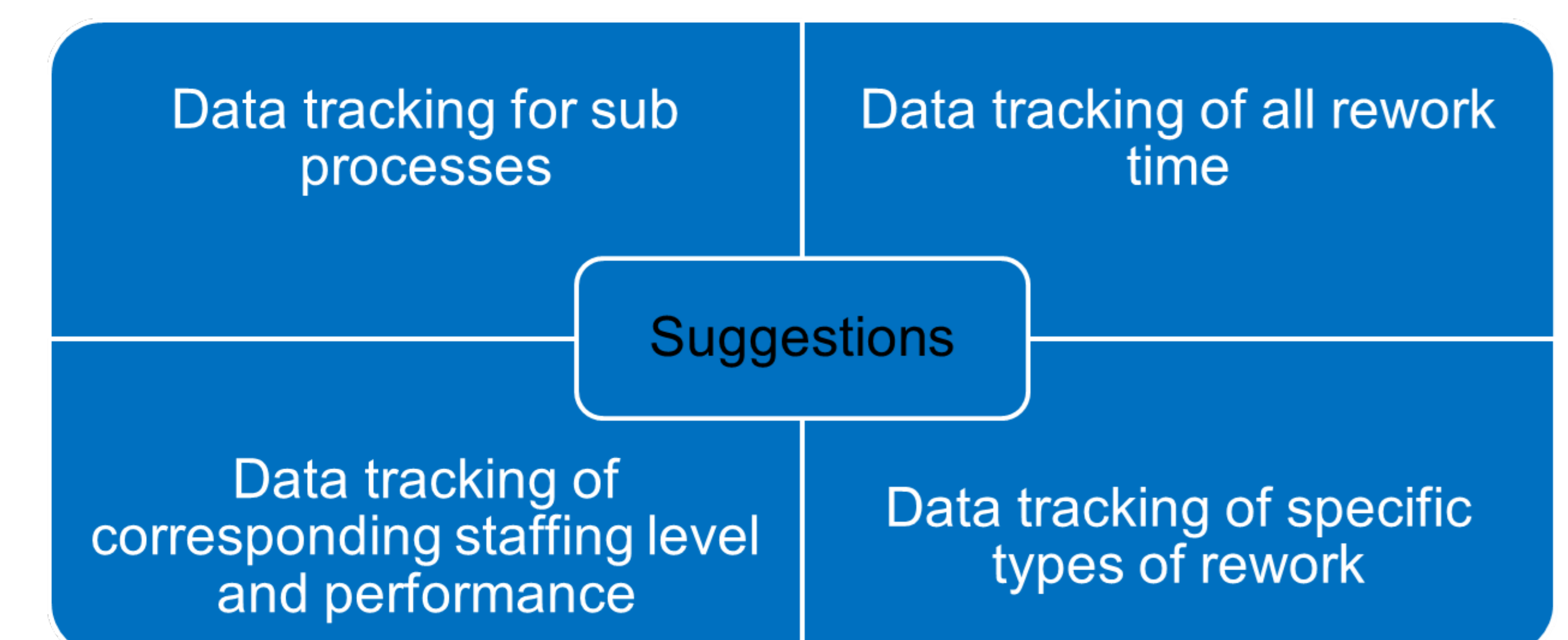


Figure 5: Suggestions of focus areas for improvement opportunities.

See computer for tool design

See computer for simulation