



INTRODUCTION

- Operations:** Strong foothold of defense and commercial aerospace sectors of the global industry, in US & Canada
- Mission:** Manufacture helicopter and aircraft parts
 - Products & Services:* Rotorcraft drive systems, machine parts, and repair, & overhaul of aircraft transmission components
- Customers:** Boeing, Bell Helicopter, GE & Rolls Royce



PROBLEM STATEMENT

Develop visual controls to analyze variation of production processes throughout the plant, allowing for further analysis and improvements

Background:

NSA has a high-mix low-volume manufacturing plant. With many manufacturing processes and machines, there is a lot of room for bottlenecks. The processes are divided up into 3 main sections; Shop A, Shop B, and Shop C.



SYSTEM MODEL

Assumptions:

- Parts pass through “milestones” (operations) as they go through the manufacturing process
- There are 23 milestones included in the 3 Shops
- Parts are split up into 5 part types

Current Support



Updated Support

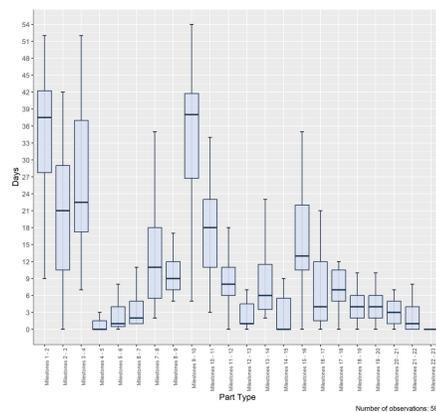


R-Script:

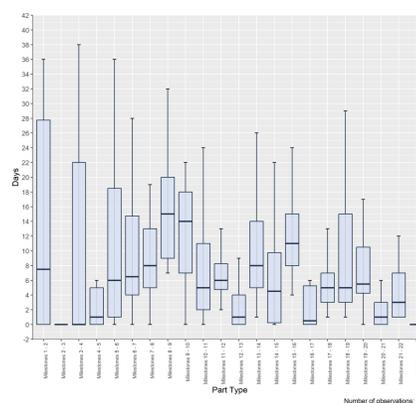
- Given historical dates on when parts complete each milestone, the R-script calculates the amount of time the parts spend in each milestone

Box Plots of Variability:

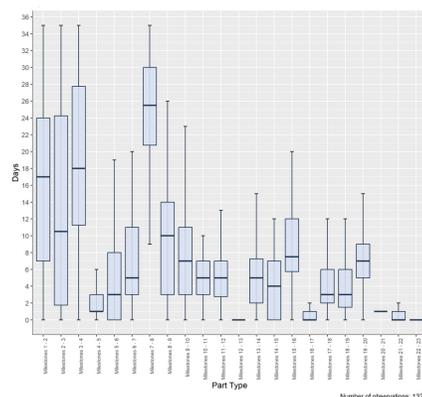
Part A



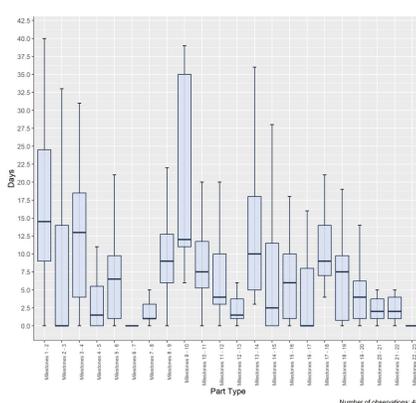
Part B



Part C

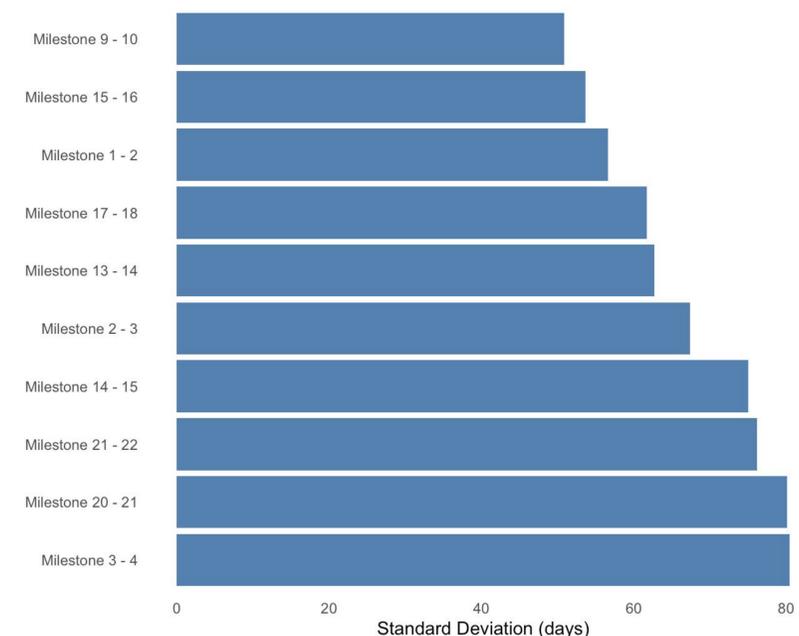


Part D



RESULTS

Variability by Milestones



the database was updated to the new historical data

- Helps understand where the largest bottlenecks are between milestones
- Can help improve the efficiency of the process when targeting areas of high variability

IMPACT

- Future and existing shops can be analyzed provided data is put into excel document
- Outputs give data distribution, timelines and schedules to help the client plan their future operations more efficiently
- Creates a foundation for future data analytics within the factory

FUTURE STEPS

- Connect R script with new/current ERP system to update with live data on manufacturing facility displays
- Apply to different datasets and part families within manufacturing facility