

Design of Experiments (DOE) – Improve Phase

Project Title: Reducing Supply Chain Disruptions Due to Dispatch Documentation Errors

Tool: Design of Experiments

Overview and Purpose

A Design of Experiments (DOE) approach was used to simulate the impact of two proposed interventions on documentation error rates:

1. Implementation of a standardized documentation checklist.
2. Mandatory document review prior to packet handoff to drivers.

The goal was to measure how each change, individually and in combination, affects the average number of documentation errors per day.

Experimental Design

A 2x2 factorial design was simulated with the following factors and levels:

- Factor A: Checklist (On / Off)
- Factor B: Mandatory Review (On / Off)

Each condition was tested over five simulated days, and error counts were recorded. The outcome measured was the average number of documentation errors per condition.

Results Summary

The results of the simulated test are as follows:

- No checklist, no review: Avg. 6.2 errors/day
- Checklist only: Avg. 4.1 errors/day
- Review only: Avg. 3.8 errors/day
- Both checklist and review: Avg. 2.3 errors/day

The combination of both improvements led to the greatest reduction in errors, confirming a strong interaction effect between interventions.

Conclusion

The DOE confirmed that implementing both the checklist and mandatory review processes has a significant positive effect on reducing documentation errors. These findings support moving forward with full implementation of both interventions.

Visual: Interaction Plot

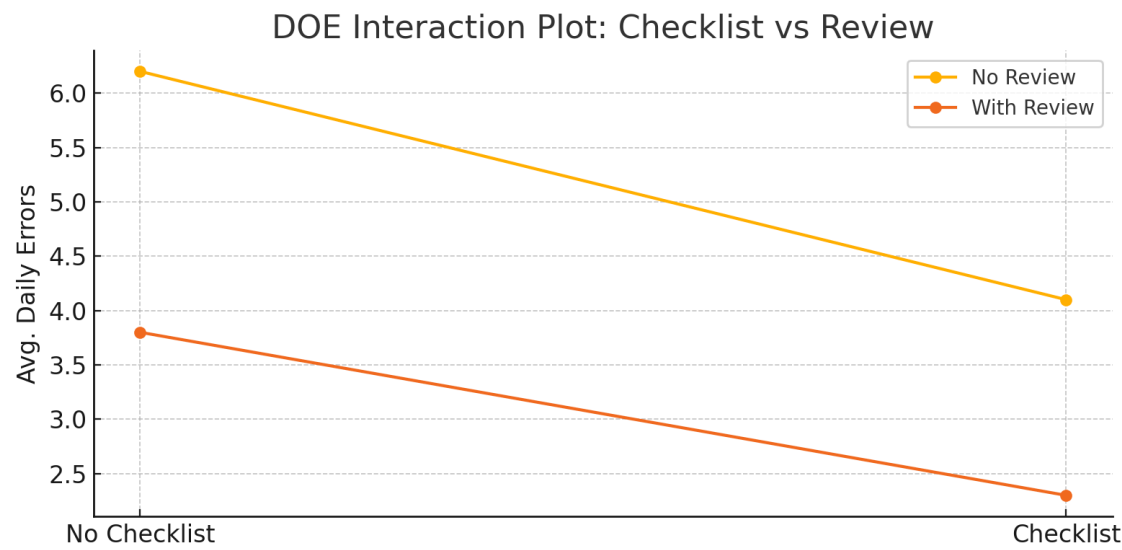


Figure 1. Interaction plot showing error reduction effects of checklist and review combinations.