**BeerBo Printing – Production Data Statistical Analysis Summary** **Prepared by:** Zulfiya **Date:** 4/24/2025

**Overview**  
This report summarizes the key findings from the statistical analysis of BeerBo Printing’s manufacturing data. The objective was to explore trends in downtime, production quality, and performance across different production lines, shifts, and teams using Power BI.

**Data Preparation & Cleaning**

* Tables were joined on deviceKey , quality and break\_prodmetric\_stream\_key (cleaned , modified values) to consolidate production and quality data.
* Missing values were checked and filtered where appropriate.
* Time formats were standardized and numeric fields (e.g., counts, durations) were converted to appropriate datatypes for aggregation.

**Downtime Analysis**

* **Total Planned Stop Time:** 149,490.00 minutes
* **Total Unplanned Stop Time:** 472,960.00 minutes
* **Proportion Unplanned vs Planned:** ~76% of downtime was unplanned
* **Statistical Summary (Unplanned Stop Time per Line):**
  + Line 1: Mean = 56.64, Std Dev = 92.69, Range = 640.21
  + Line 2: Mean = 53.80, Std Dev = 86.67, Range = 809.16
  + Line 4: Mean = 53.53, Std Dev = 83.92, Range = 468.44
  + Line 3: Mean = 43.32, Std Dev = 79.39, Range = 439.73
* **Top Unplanned Stop Reasons:**
  + Main B Bus
  + Electrical Fault

*Insight:* Line 1 and Line 4 showed higher variability in unplanned stops. A Pareto chart indicated that a few top reasons contributed to the majority of downtime.

**Production & Quality Analysis**

* **Overall Reject Rate:** 7.15%
* **Top Reject Reasons:**
  + Detected by Max WIP
  + Reject
  + Cosmetic defect
* **Average Good Count per Hour by Device:**
  + Line 1 performed best; Line 3 lagged behind.
* **Correlation Analysis:**
  + A positive trend was observed between unplanned stop time and reject count, suggesting quality issues may escalate during or after downtimes.

**Performance by Shift & Team**

* **Downtime by Shift:**
  + Second Shift had the highest average downtime.
* **Downtime by Team:**
  + Team 2 had more variability in performance compared to others.

*Insight:* Operational efficiency appears to vary by shift/team, hinting at opportunities for targeted process improvements or training.

**Conclusion & Recommendations**

* Focus on reducing unplanned downtime, particularly frequent causes like “Main B Bus” .
* Line 3 may benefit from performance tuning or hardware checks.
* Shifts and teams with higher downtimes could benefit from performance reviews or enhanced SOPs.
* Monitor periods of high unplanned stops closely to prevent cascading quality issues.

**Files & Visuals**

* All supporting visuals included in Power BI dashboard (see “Analytic test.pdf”).