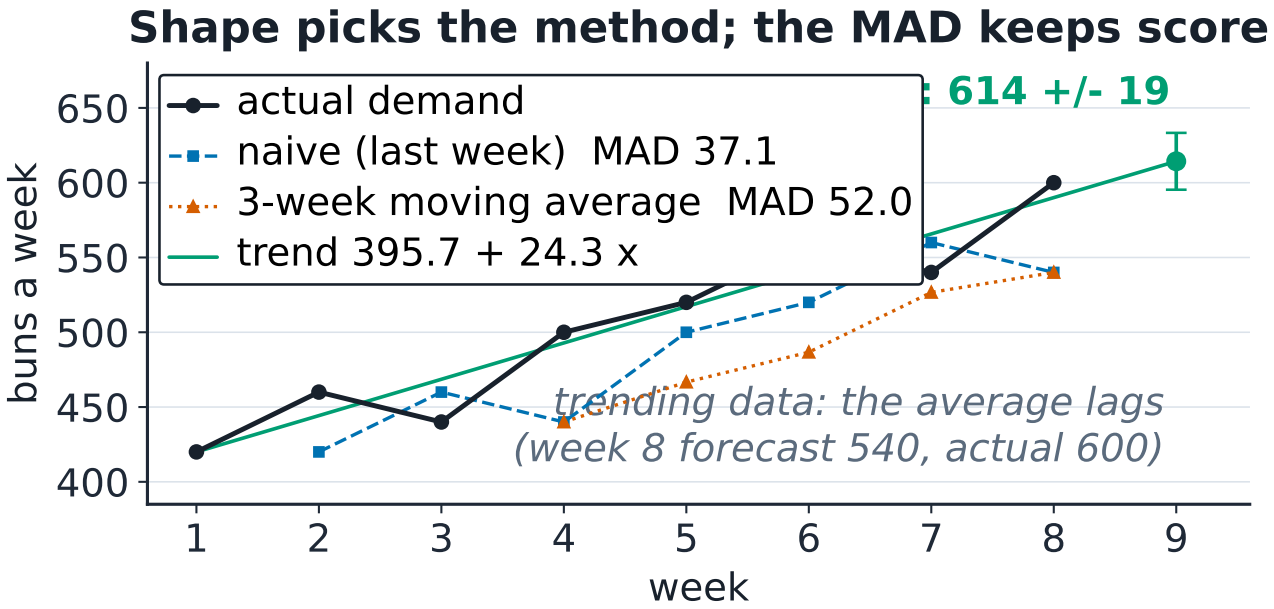
Exercise walk-through

10.2 Quality

University Business

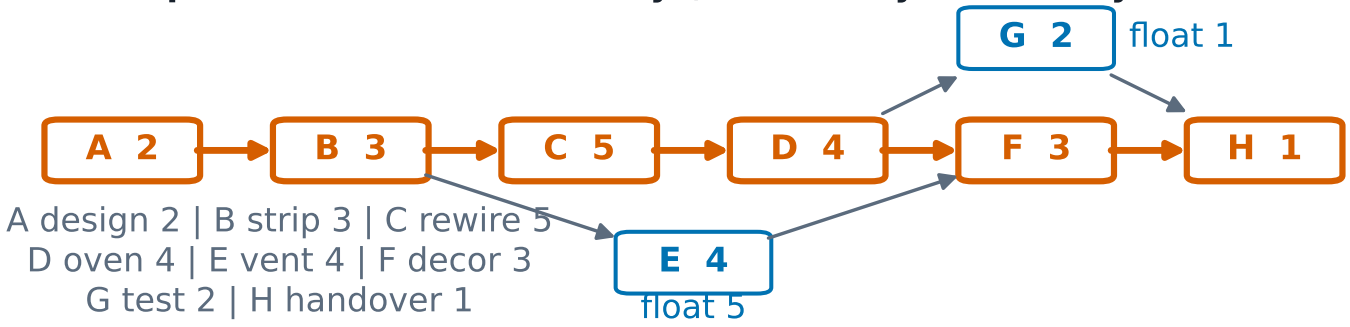
Forecasting: shape picks the method



The trend line beats the averages: week 9 forecast 614 +/- 19.

Project management: the critical path is the project

Critical path A-B-C-D-F-H = 18 days; crash C by 2 and D by 1 to reach 15

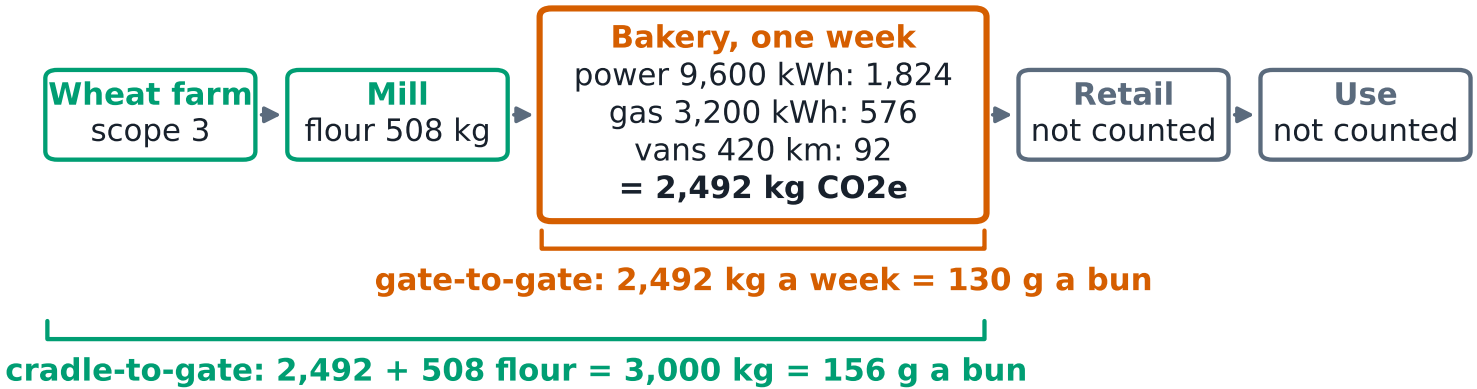




Critical path 18 days; at day 10, CPI 0.824 and EAC 72,800.

Sustainability in operations: the boundary is the claim

Same bun, two footprints: the boundary is the claim



renewable tariff at 0.06 kg/kWh cuts electricity 1,824 to 576: the site week halves to 1,244; the flour does not move

2,492 kg a week gate-to-gate; 3,000 kg with the flour counted.

Exercises 2.1–2.2

2.1 Jam jars: process mean 250 g, sd 3 g, samples of 4. The X-bar limits. [3]

2.2 For $n = 4$, $d_2 = 2.059$ and $D_4 = 2.282$. The average range and the R-chart upper limit. [3]

Exercises 2.1·2.2

2.1 Jam jars: process mean 250 g, sd 3 g, samples of 4. The X-bar limits. [3]

2.1

- $3\sigma/\sqrt{n} = 3 \times 3/2 = 4.5$ g.
- Limits 245.5 and 254.5 g.

2.2 For $n = 4$, $d_2 = 2.059$ and $D_4 = 2.282$. The average range and the R-chart upper limit. [3]

2.2

- $\bar{R} = 2.059 \times 3 = 6.18$ g.
- $UCL_R = 2.282 \times 6.18 = 14.1$ g.

Exercises 2.3·2.4

2.3 Defects this week: cracked 38, under-filled 27, label 15, lid 12, other 8. The Pareto ranking, the total, and the share of the top two. [4]

2.4 Cost of quality: prevention 900, appraisal 1,500, internal failure 4,200, external failure 6,400 on sales of 80,000. The total, the failure share, and the share of sales. [4]

Exercises 2.3·2.4

2.3 Defects this week: cracked 38, under-filled 27, label 15, lid 12, other 8. The Pareto ranking, the total, and the share of the top two. [4]

2.3

- Order as given: 38, 27, 15, 12, 8; total 100.
- Top two $65/100 = 65\%$ - cracking and filling are the vital few.

2.4 Cost of quality: prevention 900, appraisal 1,500, internal failure 4,200, external failure 6,400 on sales of 80,000. The total, the failure share, and the share of sales. [4]

2.4

- Total $900 + 1{,}500 + 4{,}200 + 6{,}400 = 13{,}000$.
- Failure $10{,}600/13{,}000 = 81.5\%$; of sales $13{,}000/80{,}000 = 16.3\%$.