

Six Sigma Numerical Example Handout

Six Sigma Numerical Example — Step-by-Step Explained (Handout)

1. Process Description

A company processes invoices manually. Each invoice must pass 3 checks:

1. Customer information
2. Invoice amount
3. Authorization signature

Opportunities per invoice: 3

Total invoices: 2,000

Total Opportunities = $2,000 \times 3 = 6,000$

2. Count the Actual Defects

80 invoices had 1 defect each.

40 invoices had 2 defects each.

Total Defects = $(80 \times 1) + (40 \times 2) = 160$ defects.

3. Calculate DPMO

$DPMO = (\text{Defects} / \text{Opportunities}) \times 1,000,000$

$DPMO = (160 / 6,000) \times 1,000,000 = 26,667$

4. Sigma Level

26,667 DPMO \approx 3.3 sigma.

5. Yield

Defect Rate = $160 / 6,000 = 0.0267$

Yield = $1 - 0.0267 = 0.9733 = 97.33\%$

6. Improvement Actions

After process improvements, defects reduced to 30.

7. New DPMO

$$\text{New DPMO} = (30 / 6,000) \times 1,000,000 = 5,000.$$

8. New Sigma Level

$$5,000 \text{ DPMO} \approx 4.1 \text{ sigma}.$$

9. New Yield

$$\text{New Defect Rate} = 30 / 6,000 = 0.005$$

$$\text{New Yield} = 1 - 0.005 = 0.995 = 99.5\%$$

10. Summary

Before → After:

Defects: 160 → 30

DPMO: 26,667 → 5,000

Sigma: 3.3 → 4.1

Yield: 97.33% → 99.5%