

Optimization Model for Scrum-Based Software Development

Decision Variables

- x_1 : Sprint length in days (DV1),
- x_2 : Team size (DV2),
- x_3 : Budget allocation for project (DV3),
- x_4 : Maximum story points per sprint (DV4),
- x_5 : Features per release (DV5),
- x_6 : Concurrent sprints (DV6),
- x_7 : Tasks per sprint backlog (DV7),
- x_8 : Number of QA engineers (DV8),
- x_9 : Buffer time percentage (DV9),
- x_{10} : Backlog items per sprint (DV10).

Objective Function (Multi-Objective)

- $\max (f_1(x) = \text{Increase Team Velocity}),$
- $\max (f_2(x) = - \text{Minimize Defects}),$
- $\max (f_3(x) = \text{Maximize Customer Satisfaction}),$
- $\max (f_4(x) = - \text{Minimize Time to Market}),$
- ...

Constraints

- C1: $x_1 \geq 7,$ $x_1 \leq 30,$
- C2: $x_2 \geq 3,$ $x_2 \leq 10,$
- C3: $0 \leq x_3 \leq 10000000,$
- C4: $20 \leq x_4 \leq 60,$
- C5: $1 \leq x_5 \leq 10,$
- C6: $1 \leq x_6 \leq 3,$
- C7: $10 \leq x_7 \leq 100,$
- C8: $1 \leq x_8 \leq 3,$
- C9: $0 \leq x_9 \leq 20,$
- C10: $5 \leq x_{10} \leq 30.$