Minimize:

$$\sum_{w\in W(\tau)} \sum_{p\in P(\tau)} strategic\_value_{wp}(\tau) \cdot \alpha_{wp}(\tau) \tag{1}$$

$$+ \sum_{p\in P(\tau)} \sum_{r\in R(\tau)} strategic\_penalty \cdot \epsilon_{pr}(\tau) \tag{2}$$

$$- \sum_{p\in P(\tau)} \sum_{w1\in W(\tau)} \sum_{w2\in W(\tau)} clustering\_value_{w1,w2} \cdot \alpha_{w1p}(\tau) \cdot \alpha_{w2p}(\tau) \tag{3}$$

Subject to:

$$\sum_{w\in W(\tau)} work\_order\_work_{wr} \cdot \alpha_{wp}(\tau) \leq resource_{pr}(\tau) + \epsilon_{pr}(\tau) \quad \forall p \in P(\tau) \quad \forall r \in R(\tau) \tag{4}$$

$$\sum_{w\in W(\tau)} \alpha_{wp}(\tau) = 1 \quad \forall p \in P(\tau) \tag{5}$$

$$\alpha_{wp}(\tau) = 0 \quad \forall (w,p) \in exclude(\tau) \tag{6}$$

$$\alpha_{wp}(\tau) = 1 \quad \forall (w,p) \in include(\tau) \tag{7}$$

$$\alpha_{wp}(\tau) \in \{0,1\} \quad \forall w \in W(\tau) \quad \forall p \in P(\tau) \tag{8}$$

$$\epsilon_{pr}(\tau) \in \mathbb{R}^+ \quad \forall p \in P(\tau) \quad \forall r \in R(\tau) \tag{9}$$

$$\tau \in [0,\infty] \tag{10}$$

The objective function (1), (2), and (3) minimizes the total weighted delay of all work order assignments together with the penalty *strategic_penalty* for exceeding the resource capacity given in constraint (4). The thrid term of the model contains the $clustering\_value_{w1,w2}$ which turns the model into a quadratic problem. This term optimizes the value of putting two work orders