$$(MP) \quad \min \qquad \sum_t \sum_s \text{slack}_{ts} \tag{1}$$

subject to $\tag{2}$

$$\sum_i \sum_r \text{motivation}_{its}^r \lambda_{ir} + \text{slack}_{ts} = \text{demand}_{ts} \qquad \forall t,s \tag{3}$$

$$\sum_r \lambda_{ir} = 1 \qquad \forall i \tag{4}$$

$$\lambda_{ir} \in \mathbb{Z}^+ \qquad \forall i,r \tag{5}$$

$$\text{slack}_{ts} \geq 0 \qquad \forall t,s \tag{6}$$

and the subproblems (i):

$$SP(i) \quad \min -\sum_{t,s} \pi_{ts}\text{motivation}_{ts} - \mu_i \tag{7}$$

subject to $\tag{8}$

$$mood_t + M \cdot (1 - x_{ts}) \geq motivation_{ts} \geq mood_t - M \cdot (1 - x_{ts}) \qquad \forall t,s \tag{9}$$

$$motivation_{ts} \leq x_{ts} \qquad \forall t,s \tag{10}$$

$$\sum_s x_{ts} \leq 1 \qquad \forall t \tag{11}$$

$$\alpha_{it} \sum_s x_{ts} + \text{mood}_t = 1 \qquad \forall t \tag{12}$$

$$motivation_{ts} \in [0,1] \qquad \forall t,s \tag{13}$$

$$_t \in [0,1] \qquad \forall t \tag{14}$$

$$x_{ts} \in \{0,1\} \qquad \forall t,s \tag{15}$$

$$\tag{16}$$