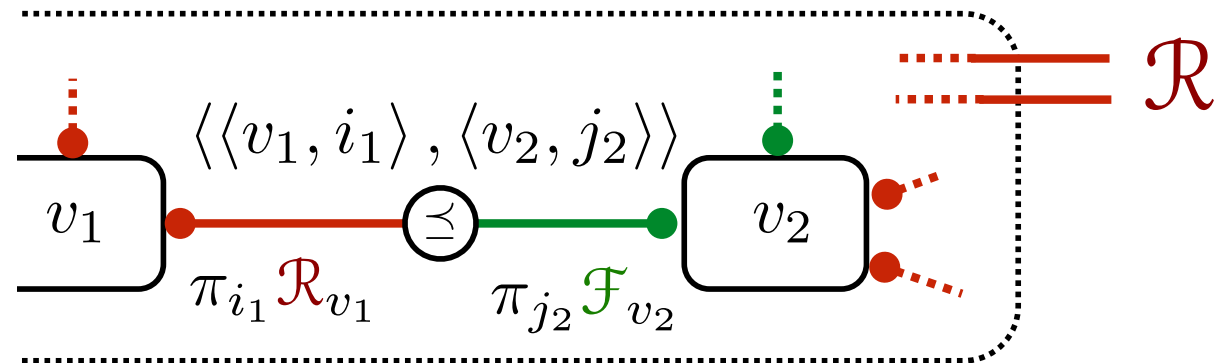


**Definition** (Co-design problem with implementation). A *Co-Design Problem with Implementation* (CDPI) is a tuple  $\langle \mathbf{F}, \mathbf{R}, \langle \mathcal{V}, \mathcal{E} \rangle \rangle$ , where  $\mathbf{F}$  and  $\mathbf{R}$  are two posets, and  $\langle \mathcal{V}, \mathcal{E} \rangle$  is a multigraph of DPIs. Each node  $\mathbf{d} \in \mathcal{V}$  is a DPI  $\mathbf{d} = \langle \mathbf{F}_{\mathbf{d}}, \mathbf{R}_{\mathbf{d}}, \mathbf{I}_{\mathbf{d}}, \text{prov}_{\mathbf{d}}, \text{req}_{\mathbf{d}} \rangle$ . An edge  $e \in \mathcal{E}$  is a tuple  $e = \langle \langle \mathbf{d}_1, i_1 \rangle, \langle \mathbf{d}_2, j_2 \rangle \rangle$ , where  $\mathbf{d}_1, \mathbf{d}_2 \in \mathcal{V}$  are two nodes and  $i_1$  and  $j_2$  are the indices of the components of the functionality and resources to be connected, and it holds that  $\pi_{i_1} \mathbf{R}_{\mathbf{d}_1} = \pi_{j_2} \mathbf{F}_{\mathbf{d}_2}$  (??).



**Figure 0.1:**

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