Definition (Design problems with implementation as monotone functions). Suppose that \mathbf{F} , \mathbf{R} are posets. A *design problem with implementation* is a monotone map (a **Set**-enriched profunctor) $\langle \mathbf{I}_d, \mathsf{prov}, \mathsf{req} \rangle : \mathbf{F} \longrightarrow \mathbf{R}$, where \mathbf{I}_d is a set, prov and req are functions from \mathbf{I}_d to \mathbf{F} and \mathbf{R} , respectively

$$\mathbf{F} \stackrel{\mathsf{prov}}{\longleftarrow} I \stackrel{\mathsf{req}}{\longrightarrow} \mathbf{R},$$

and $\langle \mathbf{I}_d, \mathsf{prov}, \mathsf{req} \rangle : \mathbf{F} \longrightarrow \mathbf{R}$ is given by

$$\langle \mathbf{I}_d, \mathsf{prov}, \mathsf{req} \rangle : \mathbf{F} \longrightarrow \mathbf{R} : \mathbf{F}^\mathsf{op} \times \mathbf{R} \rightarrow_{\mathbf{Pos}} \mathscr{P}(\mathbf{I_d})$$

$$\langle f^*, r \rangle \mapsto \{ i \in \mathbf{I_d} : (f \leq_{\mathbf{F}} \mathsf{prov}(i)) \land (\mathsf{req}(i) \leq_{\mathbf{R}} r) \},$$

where the partial order on $\mathcal{P}I$ is given by subset inclusion.