$$\mathbf{X}_{H}^{(1)} \cdots \mathbf{X}_{H-1}^{(M_{H-1})}$$
 \downarrow
 $\mathbf{X}_{1}^{(1)} \cdots \mathbf{X}_{1}^{(M_{1})}$
 \downarrow
 $\mathbf{X}_{1}^{(1)} \cdots \mathbf{X}_{1}^{(M_{Y})}$