

GQM+Strategies Design Principles

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Design Principle Name	ID	Relation	Model	Reason
Grammar	P1	Achievement Relation		<ul style="list-style-type: none"> Relationship between a Goal and a Strategy. Strategies connecting a Goal should be the same level. Goal and its Strategy should be the same level.
	P2			<ul style="list-style-type: none"> The fundamental grammar used to create GQM+Strategies. The goal should always connect to the strategy with a single line. AR stands for AchievementRelation and indicates the relationship between Goal and Strategy.
	P3			<ul style="list-style-type: none"> Always connect Goal and Strategy in the Achievement Relation class. Don't connect the same objects with each other.
	P4			<ul style="list-style-type: none"> If the Organizational Unit is equal, the same Strategy may be shared. Organizational Units of a Goal must be equal to share the same strategy.
	P5	Delegation Relation		<ul style="list-style-type: none"> It shows relationship between a Strategy and a Sub Goal. Sub Goals connected with the same Strategy are at the same level.
	P6			<ul style="list-style-type: none"> Relationships between a Strategy and a Sub Goal should not be connected with two or more lines.
	P7			<ul style="list-style-type: none"> Always connect a Goal and its Strategy in the Delegation Relation class. Don't connect the same objects with each other.
	P8			<ul style="list-style-type: none"> If the Organizational Unit of Strategies is equal, the same Goal may be shared. In this case, Sales department manages the Promotion department.

Constraint	No.	Relation	Model	Refinement Model	Reason
Acyclic Dependencies Principle	P9	Achievement Relation			<p>Acyclic Dependencies Principle: Relationship between Goal and Strategy must not be circular. (A Goal cannot take a higher level Strategy.) This grid makes the next Goal to be achieved unclear. Because the way to achieve the top goal is unclear, the grid needs to be recreated to remove fundamental conflicts.</p>
	P10	Delegation Relation			<p>Acyclic Dependencies Principle: Relationship between a Goal and a Strategy must not be circular. (Strategy cannot take a higher level Goal as a Sub Goal.)</p> <p>Because this grid makes the next Goal to be achieved unclear, how to achieve the top goal is also unclear.</p>
	P11	Achievement			<p>Hierarchical Abstraction Principle: Strategy leading under Goal must be same level with each other.</p> <p>This connection makes road of achieving top level Goal unclear. In addition, it is expected that the quality of the strategy is decline due to the difference in particle size because the hierarchy of the strategy is not unified.</p>
	P12				<p>(2) Relationship between a Goal and a Strategy using the Achievement Relation Branch for different Organizational Units</p> <ul style="list-style-type: none"> -All strategies to achieve the Goal are managed by the same Organizational Unit. Thus, the Goal of Sales Unit is independent of the Strategy of Promotion Unit. -Considering the level of the Strategy connecting the Goal of Sales Unit, which depends on different level strategies, conflicts with the Hierarchical Abstraction Principle. <p>The quality of the strategy may deteriorate due to the difference in particle size because the hierarchy of the strategy is not unified.</p>

Hierarchical Abstraction Principle	P13	Relation			<p>(1) Relationship between a Goal and a Strategy using the Achievement Relation Branch for same Organizational Unit</p> <ul style="list-style-type: none"> Levels of the Strategies connected under the Goal differ. In the figure, the Goal focuses on sharing a Strategy derived from the upper level Goal. In this case, this grid can be revised to connect the Strategy to the lower level Goal. <p>This connection isn't effective because the same strategy is implemented twice.</p>
					<p>(2) Relationship between a Goal and a Strategy using the Achievement Relation Branch for the same Organizational Unit</p> <ul style="list-style-type: none"> Basically, this connection is impossible from the viewpoint of the matching level of each Strategy connecting the same Goal. If the same Organizational Units are applied, this connection is not allowed. <p>The quality of the strategy may deteriorate due to the difference in particle size because the hierarchy of the strategy is not unified.</p>
	P15	Relation			<p>Hierarchical Abstraction Principle: The Goal under a Strategy must be same level.</p> <p>This connection shows that how to achieve the top-level Goal unclear. The quality of the strategy may deteriorate due to the difference in particle size because the hierarchy of the strategy is not unified.</p>
			P16	Delegation Relation	
	P17	Delegation Relation			

	P18				<p>(2) Relationship between a Goal and a Strategy using the Delegation Relation Branch for the same Organizational Unit</p> <ul style="list-style-type: none"> -This connection is impossible because the Strategy connects a higher level Goal as a Sub Goal. However, if the same Organizational Units are applied, this connection is not allowed. <p>The quality of the strategy may deteriorate due to the difference in the particle size of the Goal.</p>
	P19	Achievement Relation			<p>(2) Relationship between a Goal and a Strategy using the Achievement Relation Branch for different Organizational Units</p> <ul style="list-style-type: none"> -Goal can't connect higher level Organizational Unit Strategies. <p>This grid cannot match the organization structure.</p>
Responsible Unit Principle	P20				<p>(1) Relationship between a Goal and a Strategy using the Delegation Relation Branch for different Organizational Units.</p> <ul style="list-style-type: none"> -Strategy can't connect higher level Organizational Unit Goals as Sub Goals. <p>This grid cannot match the organization structure.</p>
	P21	Delegation Relation			<p>(3) Relationship between Goal and Strategy using the Delegation Relation Branch for different Organizational Units.</p> <ul style="list-style-type: none"> -Setting Sub Goals beyond the hierarchy is possible. If this connection violates other principles, the grid structure should be changed to create a new Sub Goal and a Strategy in the Unit directly under and connect them indirectly to the final Goal. <p>In this case, the Strategy for the Goal of SalesZ Unit is shared with the Strategy of SalesG. So, this relationship is forbidden.</p> <p>This grid cannot match the organization structure.</p>

Constraint	No.	Relation	Model	Refinement Model	Reason
Sharing Unit Principle	P22	Achievement Relation	<pre> graph TD U1[Unit1] --> G1[Goal1] U2[Unit2] --> G2[Goal2] G1 -- AR --> S1[Strategy1] G1 -- AR --> S2[Strategy2] G2 -- AR --> S2 </pre>	<pre> graph TD U1[Unit1] --> G1[Goal1] U2[Unit2] --> G2[Goal2] G1 -- AR --> S1[Strategy1] G1 -- AR --> S2[Strategy2] G2 -- AR --> S2 G2 -- AR --> S2p[Strategy2'] </pre>	<p>• Different Organizational Units share a Strategy. In this case, the organization responsible for sharing the strategy is not clearly defined. Solution examples: "Determined by each company's policies or dividing into two Strategies", "Delegate the responsibility to either one of the organization." Its implementation is for only detection, and the author of the grid must decide the determination method.</p>
	P23	Delegation Relation	<pre> graph TD U1[Unit1] --> G1[Goal1] U2[Unit2] --> G2[Goal2] G1 -- AR --> S[Strategy] G2 -- AR --> S S -- DR --> G3[Goal3] S -- DR --> G4[Goal4] </pre>	<pre> graph TD U1[Unit1] --> G1[Goal1] U2[Unit2] --> G2[Goal2] G1 -- AR --> S[Strategy] G2 -- AR --> S S -- DR --> G3[Goal3] S -- DR --> G3p[Goal3'] S -- DR --> G4[Goal4] </pre>	<p>Each Goal is specific to the unit. Thus, different Organizational Units do not share the Goal. In this case, the grid should be improved immediately. Responsible Unit for the Goal isn't clear.</p>