

Pugh Matrix

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Pugh Matrix: Agenda

- ▶ Pugh Chart Basics
- ▶ Demo a Simple Pugh Chart
- ▶ Review a DFSS Pugh Chart
- ▶ Create Your Own Pugh Chart

Pugh Matrix

- ▶ Created and used for DFSS (Design for Six Sigma)
- ▶ Created by Stuart Pugh in the 1980's
- ▶ Also called Decision Matrix
- ▶ Flexible tool which can be customized for your design or decision needs

Pugh Matrix Example

PUGH MATRIX						
Criteria	Baseline	Alternative 1	Alternative 2	Alternative 3	Alternative 4	Alternative 5
Total Positives:						
Total Negatives:						
Final scores:						

Step One: Choose Criteria & Alternate Concepts

PUGH MATRIX						
Criteria		Trip to Vegas	European tour	Camping at Lake Superior	Disney Vacation	Staycation
Costs	Baseline					
Educational						
Days Off Work						
Fun						
Travel Time						
Total Positives:						
Total Negatives:						
Final scores:						

Step Two: Choose a Baseline Concept

PUGH MATRIX						
Criteria		Trip to Vegas	European tour	Camping at Lake Superior	Disney Vacation	Staycation
Costs	Baseline: Caribbean Cruise					
Educational						
Days Off Work						
Fun						
Travel Time						
Total Positives:						
Total Negatives:						
Final scores:						

Step Three: Rate Each Alternative

PUGH MATRIX

Criteria		Trip to Vegas	European tour	Camping at Lake Superior	Disney Vacation	Staycation
Costs						

Rating Key:

Better than Baseline: 

Worse than Baseline: 

No Difference from Baseline: 

Travel Time	Baseline: 0					
Total Positives:						
Total Negatives:						
Final scores:						

Step Three: Rate Each Alternative

PUGH MATRIX

Criteria		Trip to Vegas	European tour	Camping at Lake Superior	Disney Vacation	Staycation
Costs	Baseline: Caribbean Cruise	+	-	+	○	+
Educational		-	+	-	○	-
Days Off Work		○	-	+	○	+
Fun		-	+	-	○	-
Culture		○	+	-	-	-
Total Positives:						
Total Negatives:						
Final scores:						

Step Four: Sum the Scores

PUGH MATRIX						
Criteria		Trip to Vegas	European tour	Camping at Lake Superior	Disney Vacation	Staycation
Costs	Baseline: Caribbean Cruise	+	-	+	○	+
Educational		-	+	-	○	-
Days Off Work		○	-	+	○	+
Fun		-	+	-	○	-
Culture		○	+	-	-	-
Total Positives:		1	3	2	0	2
Total Negatives:		2	2	3	-1	3
Final scores:		-1	1	-1	-1	-1

Step Five: Choose the Best Alternative

PUGH MATRIX						
Criteria		Trip to Vegas	European tour	Camping at Lake Superior	Disney Vacation	Staycation
Costs	Baseline: Caribbean Cruise	+	-	+	○	+
Educational		-	+	-	○	-
Days Off Work		○	-	+	○	+
Fun		-	+	-	○	-
Culture		○	+	-	-	-
Total Positives:		1	3	2	0	2
Total Negatives:		2	2	3	-1	3
Final scores:		-1	1	-1	-1	-1

Pugh Matrix: Design Example

PUGH CONCEPT SELECTION METHOD

Engineering Characteristics		Weights	a) Standard Stryform cup	b) Rigid injection- molded cup with a handle	c) Paper cup with a cover sleeve	d) Paper cup with pull-out handle	e) Paper cup with a cellular wall
1	Temperature in the hand	4	D A T U M	+	S	+	+
2	Temperature of the outside of the cup	3		+	S	+	-
3	Material environmental impact	4		-	S	-	+
4	Indenting force of the cup wall	2		+	+	+	+
5	Puroosity of the cup wall	2		S	-	-	-
6	Manufacturing complexity	3		-	-	-	-
7	Ease of stacking the cup	2		-	S	-	S
8	Ease of use by the customer	2		+	+	+	+
9	Temperature loss of the coffee over time	2		-	+	-	+
10	Estimated cost for manufacturing the cup in large quantities	3		-	+	-	+
TOTAL +			0	3	4	4	6
TOTAL -			0	5	2	6	3
OVERALL SCORE			0	-2	2	-2	3
WEIGHTED TOTAL +			0	11	9	11	17
WEIGHTED TOTAL -			0	14	5	16	8
WEIGHTED OVERALL SCORE			0	-3	4	-5	9

Pugh Matrix: Group Practice

- ▶ Break up into groups of 3 to 4 people
- ▶ Create Pugh Matrix for types of food to eat at monthly ASQ Meetings
- ▶ Baseline of Lasagna dinner
- ▶ Someone from the group will review results