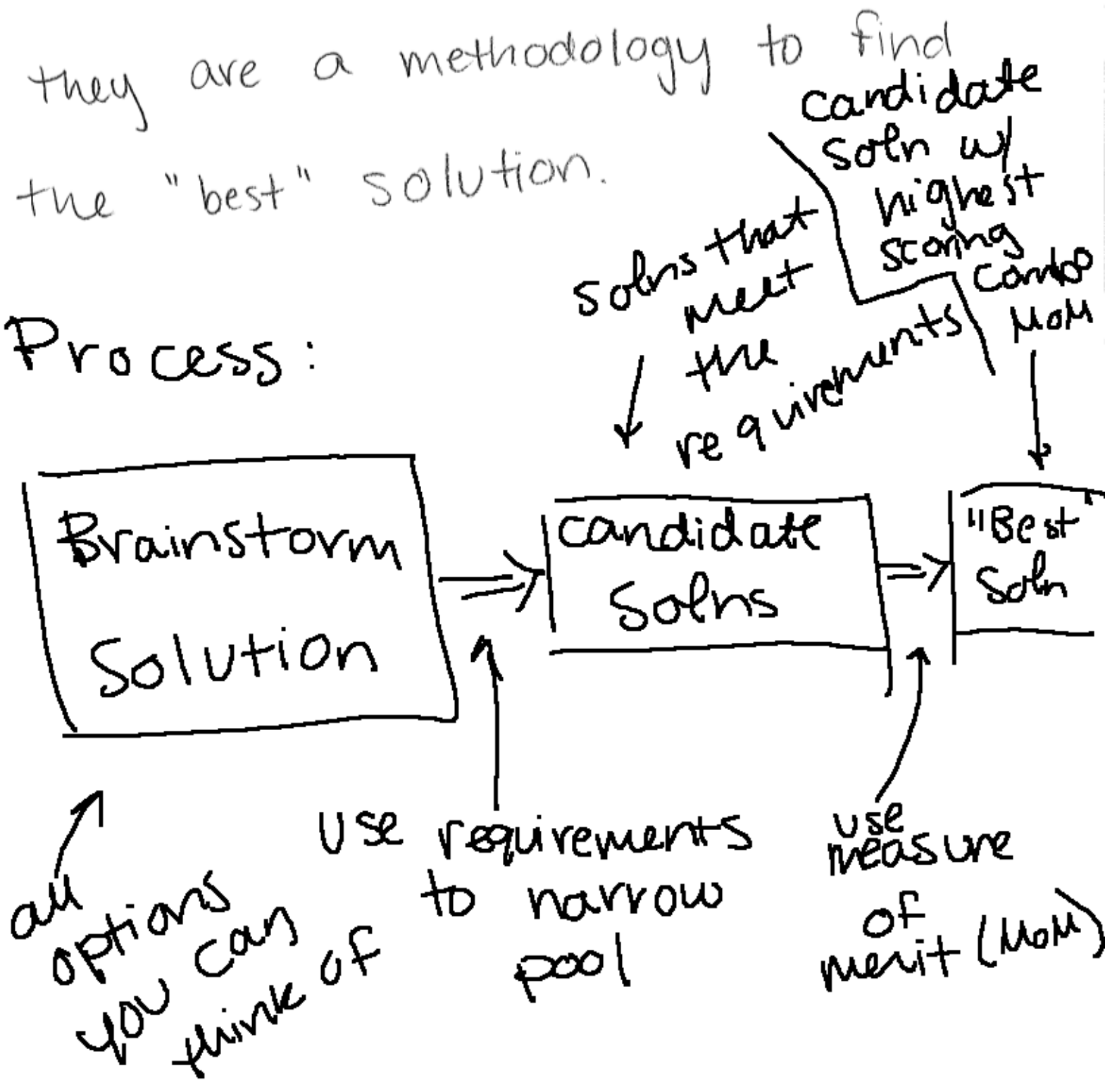


Trade Studies

Also referred to as design matrices, they are a methodology to find the "best" solution.

Process:



Example:

Buying an airplane ticket
from PHX to DEN

Requirements:

Bad

Flight should
leave at a
reasonable
time

Flight should
arrive at a good time

Ticket should
be cheap.

Good

Flight shall leave
after 9 am MST
from PHX.

DEN arrival
shall be before
8 pm MDT.

Ticket shall
be less than \$200

Flight	Cost \$	PHX Dep.	DEN Arr.	Total Trip Time (hr)
A	60	15:00	17:48	1.75
B	90	19:35	22:34	2
C	146	13:15	21:35	7.2
D	95	6:30	9:15	1.75
E	60	12:16	15:06	2
F	107	10:31	15:24	4

Which fail requirements:
D B

Measures of Merit

weight		40%	30%	20%	10%
		COST (\$)	Dept Time	Arr Time	Total Time
SCORE	5	$C \leq 70$	$D \leq 10$	$A \leq 12$	$T \leq 2$
	4	$70 < C \leq 80$	$10 < D \leq 12$	$12 < A \leq 14$	$2 < T \leq 3$
	3	$80 < C \leq 90$	$12 < D \leq 14$	$14 < A \leq 16$	$3 < T \leq 4$
	2	$90 < C \leq 100$	$14 < D \leq 16$	$16 < A \leq 18$	$4 < T \leq 5$
	1	$100 < C$	$16 < D$	$18 < A$	$5 < T$

Must have reasoning for weights + measure of merits!

Decision Matrix (Trade study)

	45°/0		30°/10		20°/10		10°	
	Cost		Dept Time		Arr Time		Total Time	
	\$	score	time	Score	time	Score	time	score
A	60	5	15:00	2	17:48	2	1.75	5
E	60	5	12:16	3	15:06	3	2	5
F	107	1	10:31	4	15:24	3	4	3
C	146	1	13:15	3	21:35	1	7.2	1

Overall Score

$A = 3.5$
 $E = 4$
 $F = 2.5$

$C = 1.6$