

# SEFS Concept Selection

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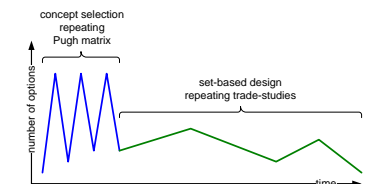
## Abstract

Concept selection is useful at many levels, from the customer application to the technology concept for specific functions. The Pugh matrix is a lightweight decision matrix facilitating early phase concept selections. When the design is crystallizing out, then trade-off analysis provides a more specific insight in the relation between specification and design parameters.

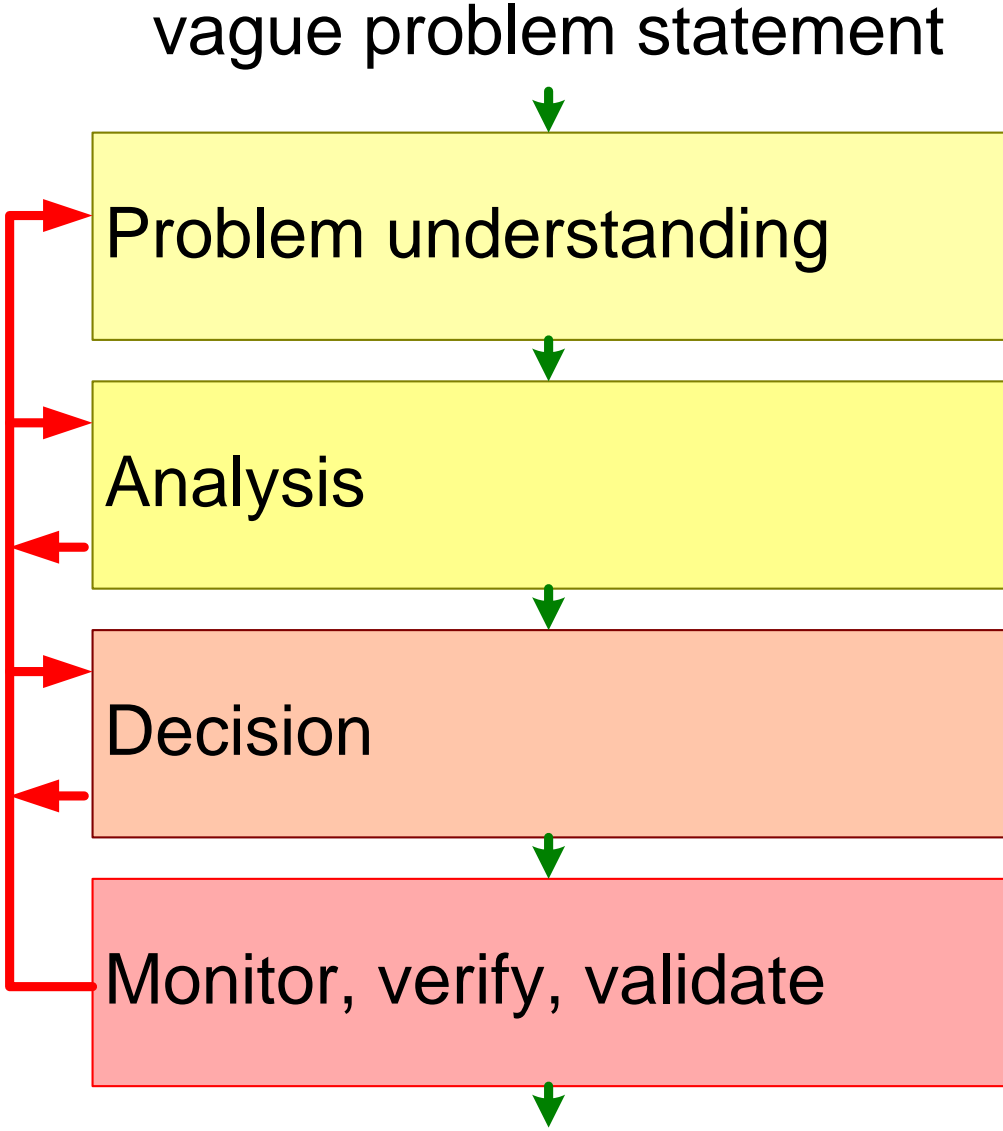
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# Exploration and Analysis Flow of Concepts



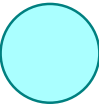

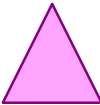






# Pugh Matrix: a Light-Weight Decision Matrix

Define at least 3 concepts

Define 7 to 10 criteria for selection

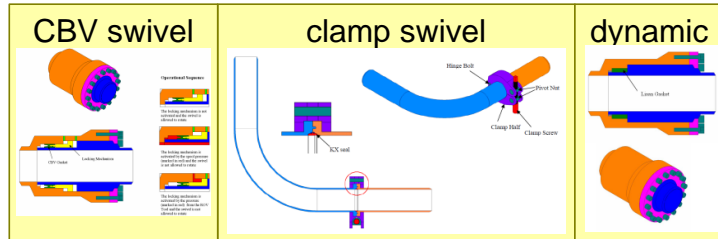
Score the concepts against the criteria, for example using a scale from 1 to 5: 1 = very poor, 5 = very good

Recommend a concept with a rationale

	concept 1 	concept 2 	concept 3 
critterion 1			
critterion n			
			recommended, because ...

# Examples of Pugh Matrix

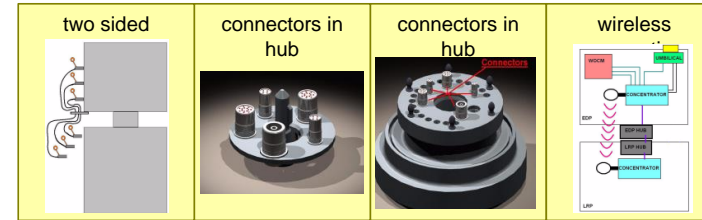
## Swivel concept selection



evaluation criteria	weight	CBV		clamp		dynamic		
Maturity	10	5	50	2	20	2	50	
Development level								
Cost	20	4	80	2	40	5	100	
Hardware cost								
Development cost		5	100	2	40	2	40	
Design robustness	25							
Design life								
swivel cycles		5	125	3	75	3	75	
pressure cycles		5	125	4	100	5	125	
Pressure range								
internal		4	100	4	100	4	100	
external		2	50	5	125	2	50	
Temperature range		4	100	4	100	4	100	
Installation	20							
Initial installatio/retrieval			2	40	3	60	4	80
Connection/disconnection		2	40	4	80	5	100	
Operation	25							
Swivel resistance			1	25	4	100	5	125
Spool Length Short			1	25	4	100	5	125
Spool Length Long			3	75	5	125	5	125
Hub loads			2	50	4	100	5	125
$\Sigma$ points			985		1165		1290	

from master paper Halvard Bjørnsen, 2009

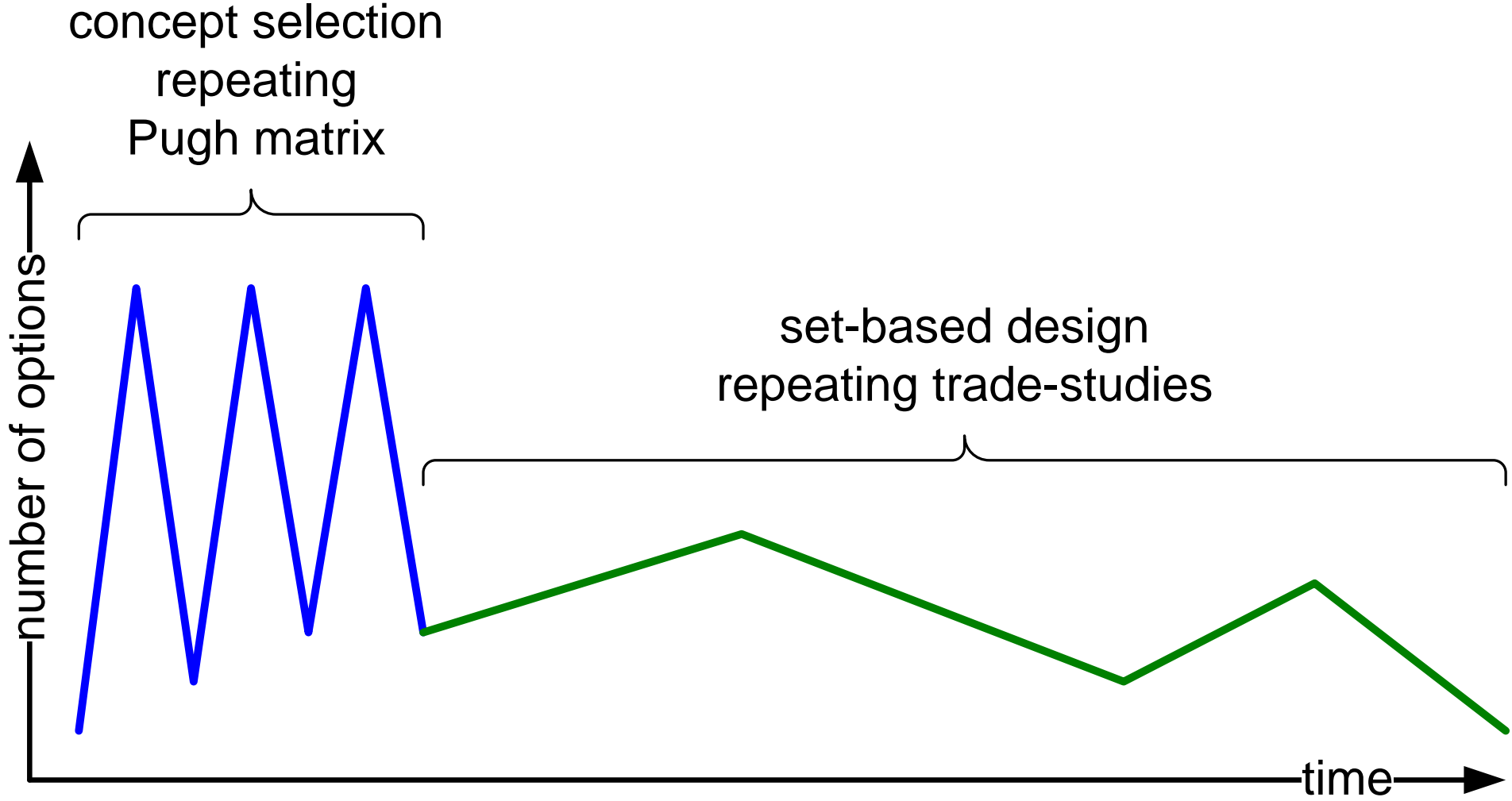
## EDP-LRP connection



Evaluation Criteria	Score	Concepts			
		1	2	3	4
Time to connect					
Need for ROV		-	+	+	+
Design		-	+	+	+
Robustness					
Connector design		-	S	S	+
Number of parts		-	-	+	+
Handle roll-off		+	-	S	+
Influence other		+	S	-	S
Redundancy					
Design		+	-	-	S
Interchangeability		+	-	-	-
Cost					
HW cost		-	-	-	-
Manufacturing cost		S	S	-	S
Engineering cost		+	-	S	-
Service cost		-	+	+	+
Maturity		-	-	S	+
$\Sigma$ -		7	7	5	3
$\Sigma$ S		1	3	4	3
$\Sigma$ +		5	3	4	7
Pos.		3	4	2	1

from master paper Dag Jostein Klever, 2009

# Repeated Divergence and Convergence



# Set-based Design

