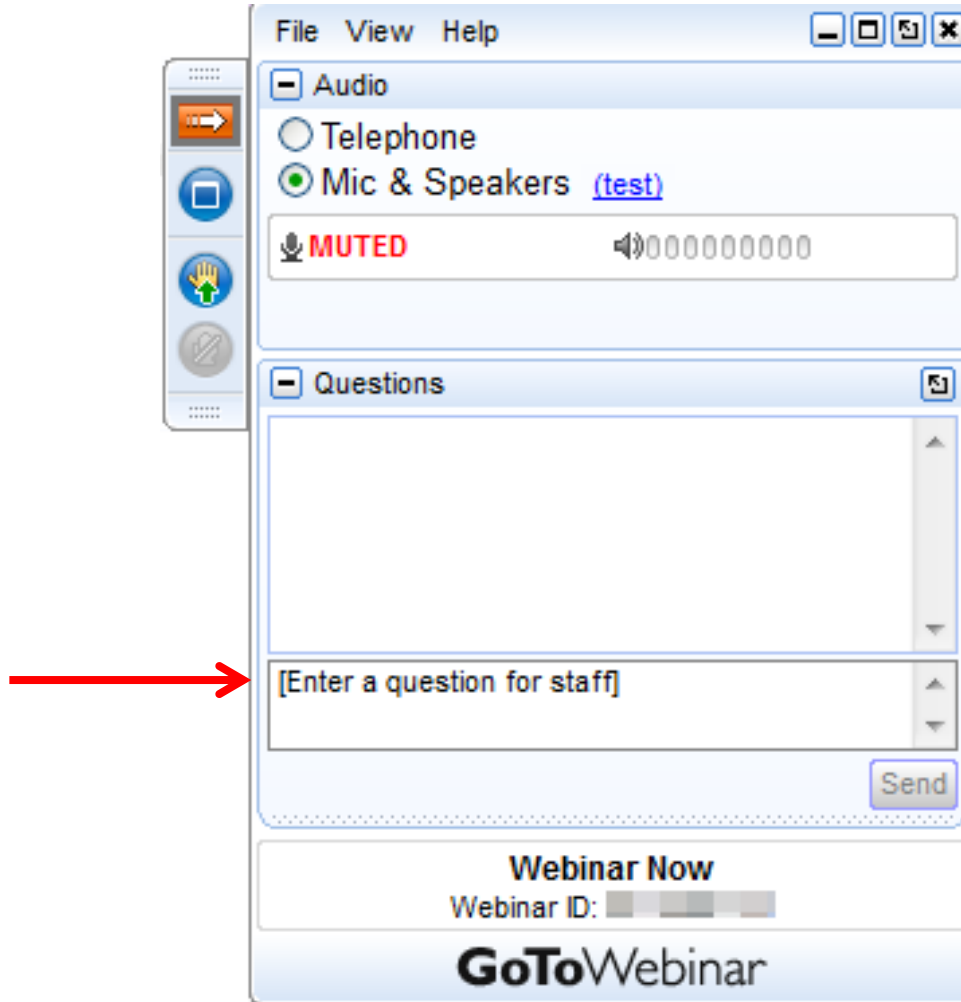




Trade off study webinar

Žilvinas Strolia, 2018 February

Q&A: Type your questions here



Outline



- What is a trade-off study
- Trade study with tool (live)
- Questions & Answers

What is a Trade-Off Study?



- A Trade Study is a study that identifies a preferred solution among a list of qualified solutions.
- The trade study will examine these solutions against criteria such as; cost, schedule, performance, weight, system configuration, complexity, the use of Commercial off-the-Shelf (COTS), and many others.
- Trade Studies are performed from concept development through system design phases.
- In systems engineering, they're primarily used to determine operational and system level requirements.



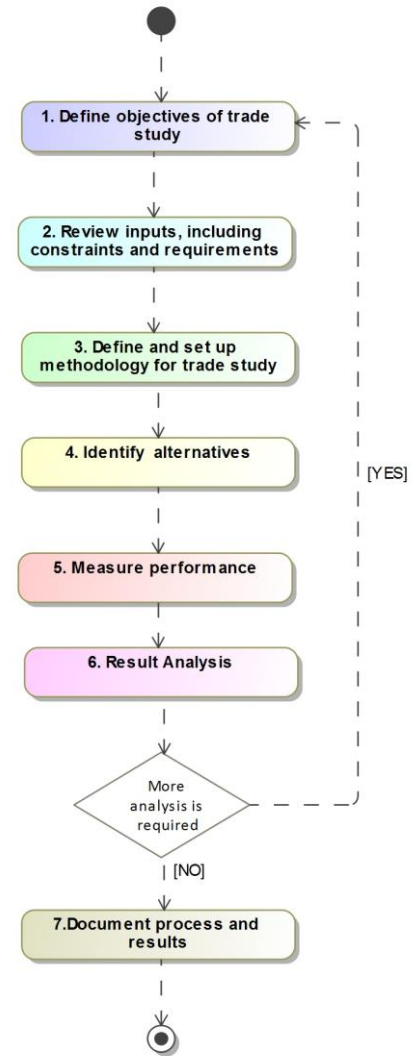
Trade studies depend upon having criteria for making decisions based on *measures of effectiveness* (voice of the customer) and *measures of performance* (voice of the engineer).

- **Measure of Effectiveness (MOE)** - A measure of how well mission objectives are achieved. MOEs are implementation independent - they assess ‘how well’ not ‘how’.
- **Measure of Performance (MOP)** - A quantitative measure that, when met by the design solution, will help ensure that an MOE for a product or system will be satisfied. There are generally two or more measures of performance for each MOE.
- **Objective Function (OF)** - An objective function (optimization or cost function) is used to determine the overall value of an alternative in terms of weighted criteria or/and moe’s.

Typical process for Trade-Off Analysis



1. Define the objectives of the trade study
2. Review inputs, including the constraints and assumptions
3. Choose the evaluation criteria and their relative importance
4. Identify and select the alternatives
5. Assess the performance of each option for each criteria
6. Compare the results and choose an option
7. Document the trade study process and its results



Variability points



- Components variability - selection of a component out of an existing library
- Topological variability - selection of which components are connected to which
- Geometrical variability - selection of specific location for each component
- Relational variability - selection of specific components based on the existence or non-existence of others

Trade-off study for the webinar





Pad Variants. 02.02.2018

width	thickness	centerlength	frictionCoeff	peakFrictionRatio
0.038	0.008	0.076	0.586	1.2
0.038	0.0084	0.076	0.586	1.2

Caliper Variants. 02.02.2018

width	thickness	partNumber	springForce	frictionForce	pressure	diameter
0.038	0.008					
0.038	0.00836					
0.05	0.009					
0.06	0.01					
0.042	0.00836	Cobra C2	200	130	6.2	0.026
0.042	0.00836	Cobra C3	230	135	6.4	
0.042	0.00836	Cobra C5	280	135	6.5	
0.042	0.00836	Cobra C7	300	140	6.8	
0.038	0.01	Cobra C2A	200	130	6.2	
0.04	0.01	Cobra C3A	230	135	6.4	
0.038	0.0112	Cobra C5B	280	135	6.5	
0.04	0.0115	Cobra C7B	300	140	6.8	
0.038	0.008	Boss 810	220	130	6.9	
0.038	0.009	Boss B12	220	140	7.1	
		Boss B15	240	150	7.3	
		Boss B18	240	150	7.7	
		Boss C10	220	130	6.9	
		Boss C12	220	140	7	

Rotor Variants. 02.02.2018

partNumber	outerDiameter
Rotus 25	0.25
Rotus 26	0.26
Rotus 275	0.275
Rotus 30	0.3
Brembo 25549	0.25
Brembo 26549	0.26
Brembo 27549	0.275
HR4476	0.27
HR5174	0.27
HR4305	0.27
HR5155	0.27

Constraints



- Braking at 100 kilometers per hour shall generate less than 53 kW of heat at each wheel.
- Brake pads shall have a projected life of at least 57500 kilometers under normal driving conditions, as per industry standard assumptions.
- The tires shall have 22-inch rolling diameter
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- Etc.

