

INSTRUCTIONS: Each highlighted cell or set of highlighted cells in the first decision matrix contains an error. Can you identify each one? (There are approximately 20.)

EML2322L Decision Matrix Training Example - With Errors

BALL RELEASE MECHANISM			Design 1			Design 2		
Objective	Weighting Factor	Parameter	Mag.	Score	Value	Mag.	Score	Value
Material Cost	0.20	\$	17.0	6.00	1.2	8.5	10.0	2.00
Release Speed	0.20	ft/sec	0.333	10	2	1.2	2.78	0.56
Modularity	0.25	fasteners	17.4	3.4	0.9	6.0	10.0	2.5
Manufacturing Time	0.20	experience	good	8.0	1.6	good	9.0	1.8
Lifting Time	0.20	seconds	4.50	10.00	2.00	9.00	7.5	1.5
Overall value								

EML2322L Decision Matrix Training Example - Corrected

BALL RELEASE MECHANISM			Design 1			Design 2		
Objective	Weighting Factor	Parameter	Mag.	Score	Value	Mag.	Score	Value
Material Cost	0.15	\$	17.00	5.0	0.8	8.50	10.0	1.5
Release Time	0.25	seconds	7	2.8	0.7	2	10.0	2.5
Modularity	0.15	fasteners	8	7.5	1.1	6	10.0	1.5
Manufacturing Time	0.20	hours	1.8	3.3	0.7	0.6	10.0	2.0
Lifting Time	0.25	seconds	5	10.0	2.5	9	5.6	1.4
Overall value								

Qualitative Score Assignments:

great	10
good	8
okay	6
fair	4
poor	2

INSTRUCTIONS: Each highlighted cell or set of highlighted cells in the following decision matrices contain an error. Can you identify each one? (There are approximately 10.) the objective definitions are on the following page.

EML2322L Decision Matrix Training Examples - Bad Objectives & More

MOBLIE PLATFROM			Design 1			Design 2		
Objective	Weighting Factor	Parameter	Mag.	Score	Value	Mag.	Score	Value
Speed	0.25	feet / sec	2.3	10.0	2.5	2.3	8.1	2.0
Width	0.25	inches	19	10.0	2.5	23	8.3	2.1
Modularity	0.15	fasteners	36	6.1	0.9	22	10.0	1.5
Manufacturing Time	0.20	hours	8.4	10.0	2.0	9.1	9.2	1.8
Material Cost	0.15	\$	43.20	9.2	1.4	19.86	10.0	1.5
Overall value					9.3			8.9

Mobile Platform

Objectives Definitions

Speed is defined as the maximum linear velocity of the loaded mobile platform on flat ground. A target velocity of 1.8 ft/sec was determined through testing. The design with the closest score to the target velocity scores 10 out of 10 possible points.

Width is defined as the distance between the drive wheels on the mobile platform. The design with the narrowest design scores 10 out of 10 possible points.

Modularity is defined as the ease with which a mobile platform assembly can be assembled and reassembled. Modularity is quantified by the number of fasteners in each design. The design with the least amount of fasteners scores 10 out of 10 possible points.

Manufacturing Time is defined as the estimated amount of time (in minutes) required to fabricate, assemble, and modify all parts for the mobile platform. The design with the least amount of time scores 10 out of 10 possible points.

Material Cost is defined as the total cost of materials (in US dollars) that need to be purchased to fabricate the mobile platform. The design with the highest cost scores 10 out of 10 possible points.

Bucket Manipulator

Objective Definitions

Speed is defined as the velocity of the bucket manipulator (in feet per second). The design with the fastest bucket manipulator velocity scores 10 out of 10 possible points.

Controlability is defined as the ability for a driver to control the bucket manipulator. Controlability was assessed through testing and operating the manipulator on a mobile platform at a reasonable rate. The design that is most controllable scores 10 out of 10 possible points.

Accuracy is defined as the bucket manipulator's ability to acquire a bucket. The design that was able to acquire the most amount of buckets through testing scores 10 out of 10 possible points.

Weight is defined as the sum of the weight of all individual components of the bucket manipulator (in pounds). The bucket manipulator with the lowest weight scores 10 out of 10 possible points.

Reliability is defined as an overall assessment of how a design would perform based off of the other objectives. The design is either going to work or not and the designs that will work scores 10 out of 10 possible points.