

EML2322L Decision Matrix

MOBILE PLATFORM			Design 1			Design 2			Design 3			Design 4			Design 5		
Objective	Weighting Factor	Parameter	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value
Modularity	0.10	fasteners needed to remove	14	4.3	0.4	12	5.0	0.5	14	4.3	0.4	6	10.0	1.0	14	4.3	0.4
Speed	0.15	ft/sec	3.9	8.0	1.2	3.9	8.0	1.2	4.9	10.0	1.5	0.6	1.2	0.2	1.9	3.9	0.6
Cost	0.20	\$	33.23	10.0	2.0	33.10	10.0	2.0	33.15	10.0	2.0	56.45	5.9	1.2	33.15	10.0	2.0
Maneuverability	0.35	experience	fair	4	1.4	okay	6	2.1	okay	6	2.1	fair	4	1.4	great	10	3.5
Manufacturing Time	0.20	hrs	8.9	9.7	1.9	8.6	10.0	2.0	8.8	9.8	2.0	16.3	5.3	1.1	8.8	9.8	2.0
Overall value			6.9			7.8			8.0			4.8			8.5		

BUCKET MANIPULATOR			Design 1			Design 2			Design 3			Design 4			Design 5		
Objective	Weighting Factor	Parameter	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value
Reliability	0.20	Experience	N/A			okay	6.0	1.2	good	8.0	1.6	N/A			great	10.0	2.0
Cost	0.15	\$				10.30	8.1	1.2	8.35	10.0	1.5				9.20	9.1	1.4
Manufacturing Time	0.10	Hrs				3.1	10.0	1.0	3.2	9.7	1.0				3.2	9.7	1.0
Motor Controllability	0.35	Experience				poor	2	0.7	great	10	3.5				great	10	3.5
Manipulation Time	0.15	Seconds				0.1	10.0	1.5	4.0	0.2	0.0				8.0	0.1	0.0
Size	0.05	in ³				179.2	3.7	0.2	66.4	10.0	0.5				68.4	9.7	0.5
Overall value			5.8			8.1			8.3								

BALL HOPPER / DISPENSER			Design 1			Design 2			Design 3			Design 4			Design 5		
Objective	Weighting Factor	Parameter	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value
Capacity	0.25	Max # of balls	8	4.4	1.1	18	10.0	2.5	18	10.0	2.5	N/A			18	10.0	2.5
Cost	0.15	\$	13.77	4.8	0.7	10.50	6.3	0.9	6.61	10.0	1.5				13.77	4.8	0.7
Manufacturing Time	0.15	hrs	2.9	2.8	0.4	0.8	10.0	1.5	2.6	3.1	0.5				2.9	2.8	0.4
Dispensing Stability	0.35	experience	great	10	3.5	fair	4	1.4	okay	6	2.1				great	10	3.5
Size	0.10	in ³	120.1	9.6	1.0	232.1	5.0	0.5	114.9	10.0	1.0				120.1	9.6	1.0
Overall value			6.7			6.8			7.6						8.1		

BALL MANIPULATOR			Design 1			Design 2			Design 3			Design 4			Design 5		
Objective	Weighting Factor	Parameter	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value	Mag.	Score	Value
Cost	0.10	\$	8.86	5.2	0.5	11.10	4.2	0.4	4.61	10.0	1.0	40.11	1.1	0.1	N/A		
Manufacturing Time	0.15	Hrs	4.9	5.5	0.8	2.7	10.0	1.5	4.7	5.7	0.9	13	2.1	0.3			
Manipulation Time	0.20	Seconds per ball	0.1	10.0	2.0	0.1	10.0	2.0	1.7	5.9	1.2	10.5	1.0	0.2			
Versatility	0.20	Number of ball locations	5	10.0	2.0	3	6.0	1.2	4	8.0	1.6	4	8.0	1.6			
Size	0.10	in ³	172.0	10.0	1.0	261.5	6.6	0.7	295.7	5.8	0.6	505.4	3.4	0.3			
Motor Controllability	0.25	Experience	poor	2	0.5	poor	2	0.5	great	10	2.5	great	10	2.5			
Overall value			6.8			6.3			7.7			5.1					

Qualitative Score Assignments:	
great	10
good	8
okay	6
fair	4
poor	2