Christmas Ornament Display Structure

Team 7:

Dolores Gallardo

Ryan Palmer

Miles Roux

Retrieved from mystarofbethlehem.com/home

Northern Arizona University
Department of Mechanical Engineering

Topics

- Problem Statement
- Concept Generation
- Concept Selection
- Project Timeline
- Conclusion
- References

Problem Statement

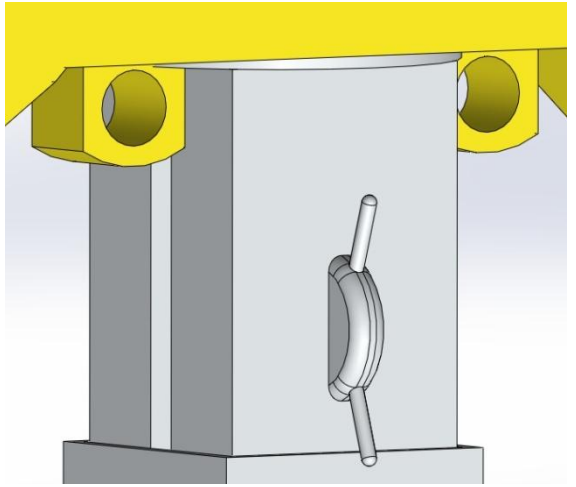
Need: My Star of Bethlehem LLC does not have an aesthetically pleasing way to display their products at multiple venues.

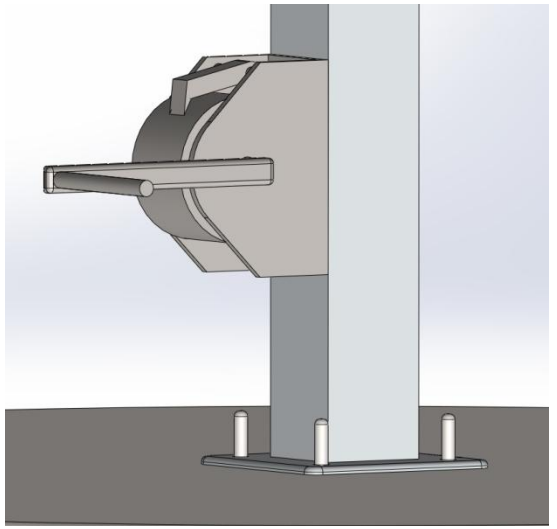
Goal: Design a better way to display the Christmas ornaments of My Star of Bethlehem LLC when marketing their products.

Concept Generation

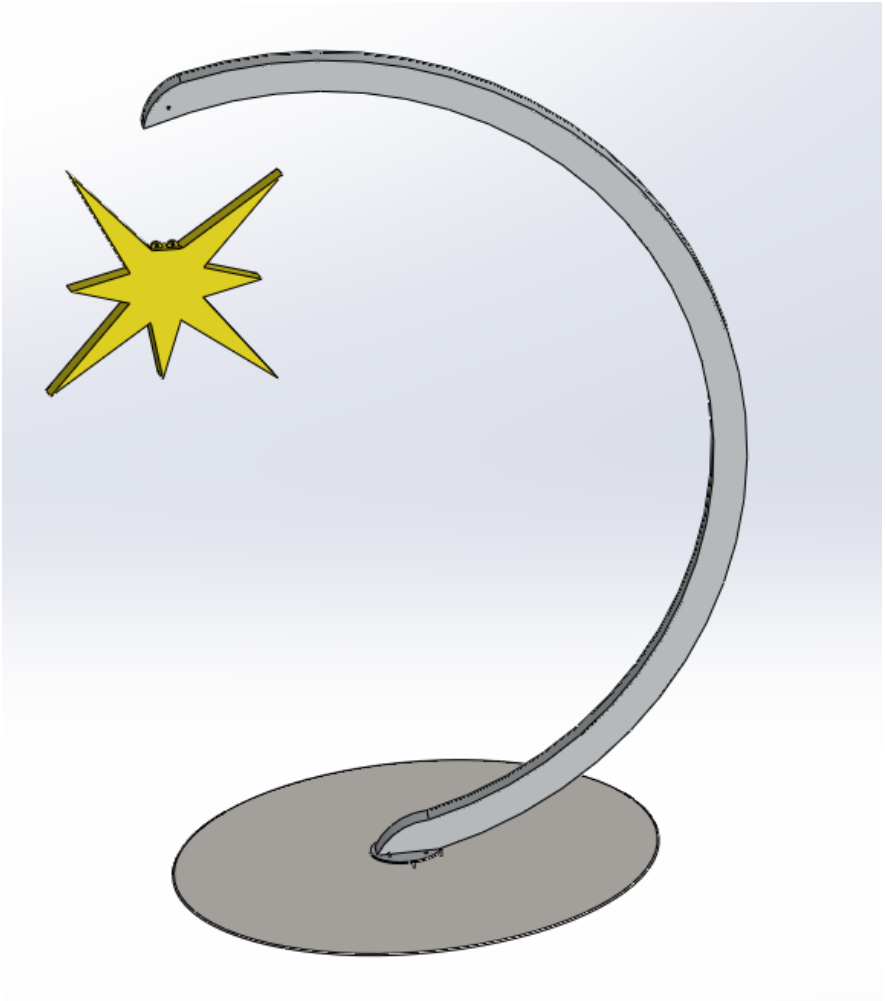
- Brainstorming
- Creativity
- Practicality
- Viable Design Options

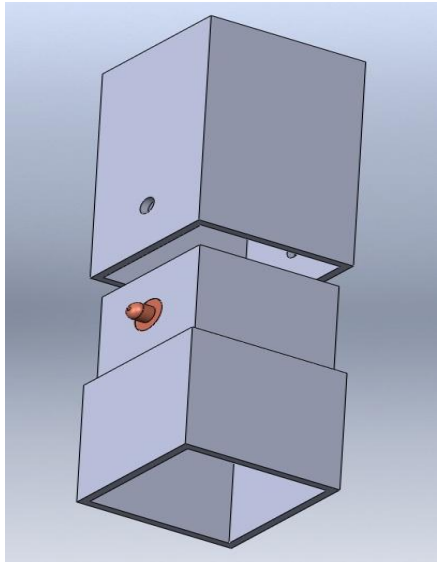
Design 1: Telescoping Light Post

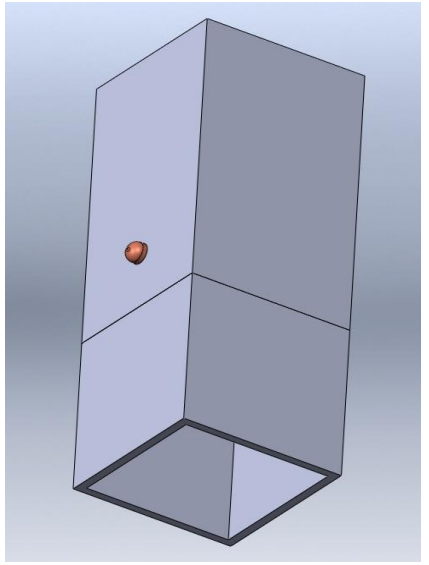


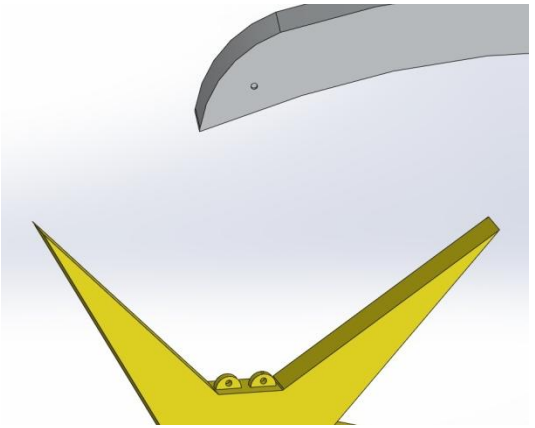


Design 2: Sideways Arch

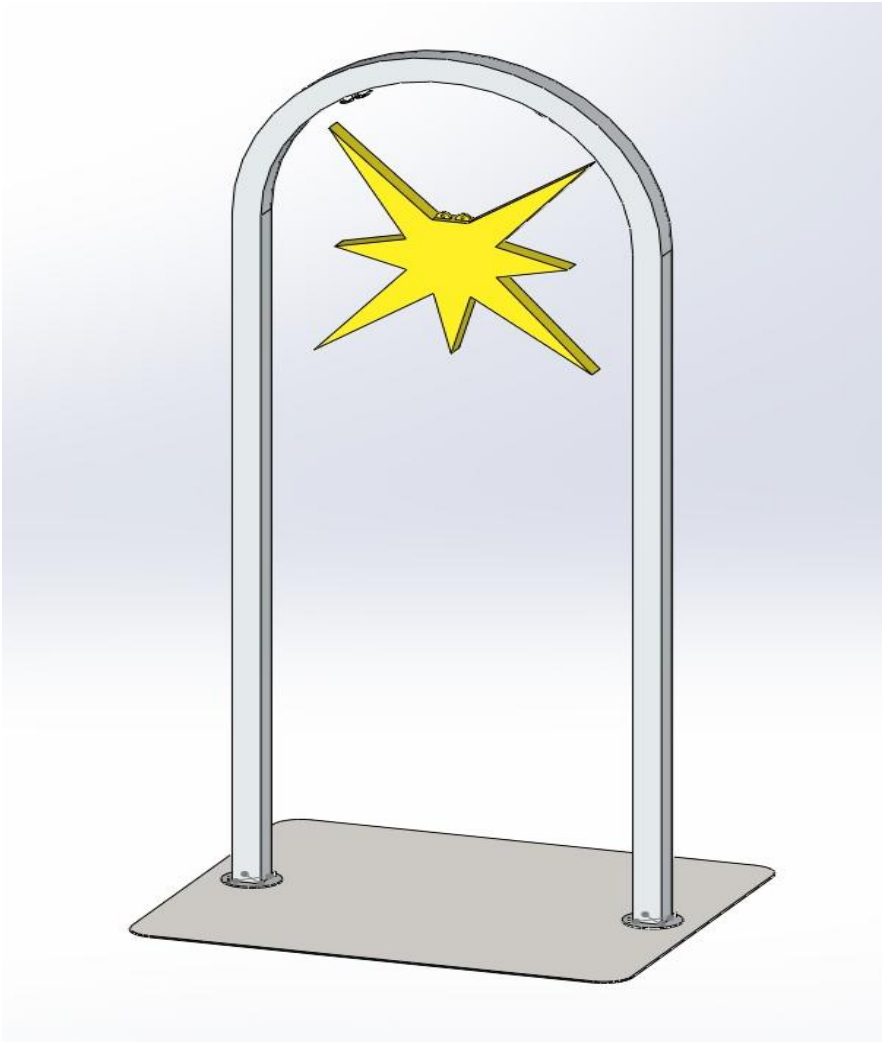


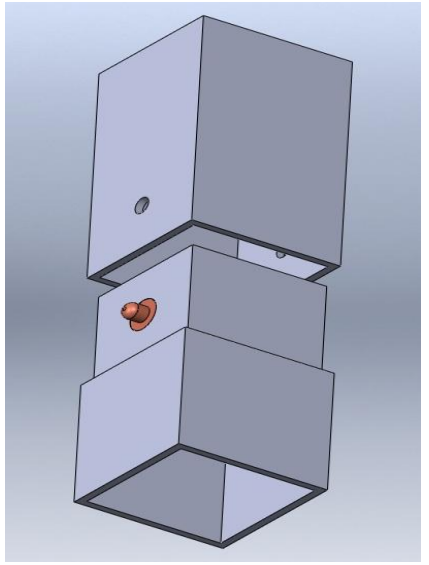


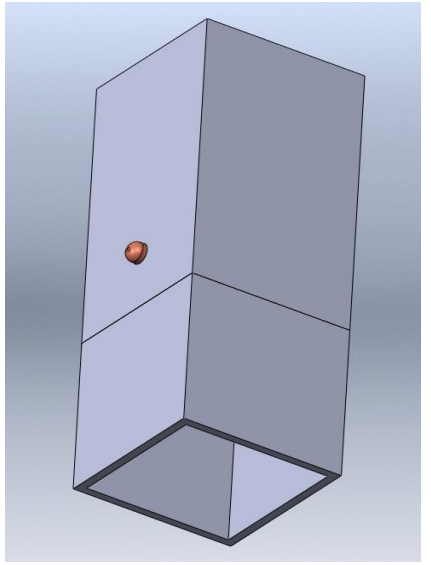


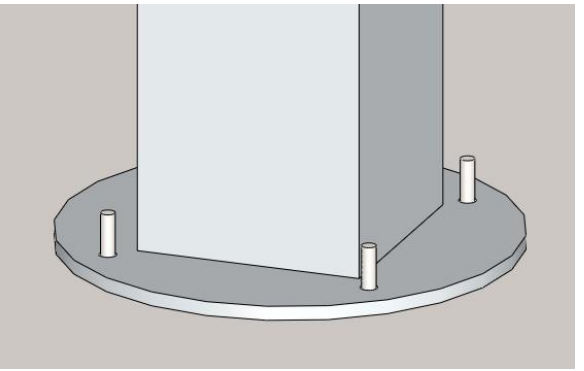


Design 3: Festive Arch









Ranking Design Options

Design Option	Criteria							
	Assembly/Disassembly	Compact	lightweight	Height	Cost	Damage to Ornament	Life Expectancy	Recyclability
Telescoping Light Post	1	2	3	4	6	7	5	5
Sideways Arch	5	3	6	4	1	2	7	7
Festive Arch	5	3	6	4	1	2	7	7

Where 1 = most important and 7 = least important. Designs ranked by row.

Design Option	Criteria							
	Assembly/Disassembly	Compact	lightweight	Height	Cost	Damage to Ornament	Life Expectancy	Recyclability
Telescoping Light Post	1	1	1	2	1	1	1	2
Sideways Arch	3	2	2	1	3	1	2	1
Festive Arch	2	3	3	1	2	1	2	1

Where 1 = Best, 2 = Better, and 3 = Good. Designs ranked by column

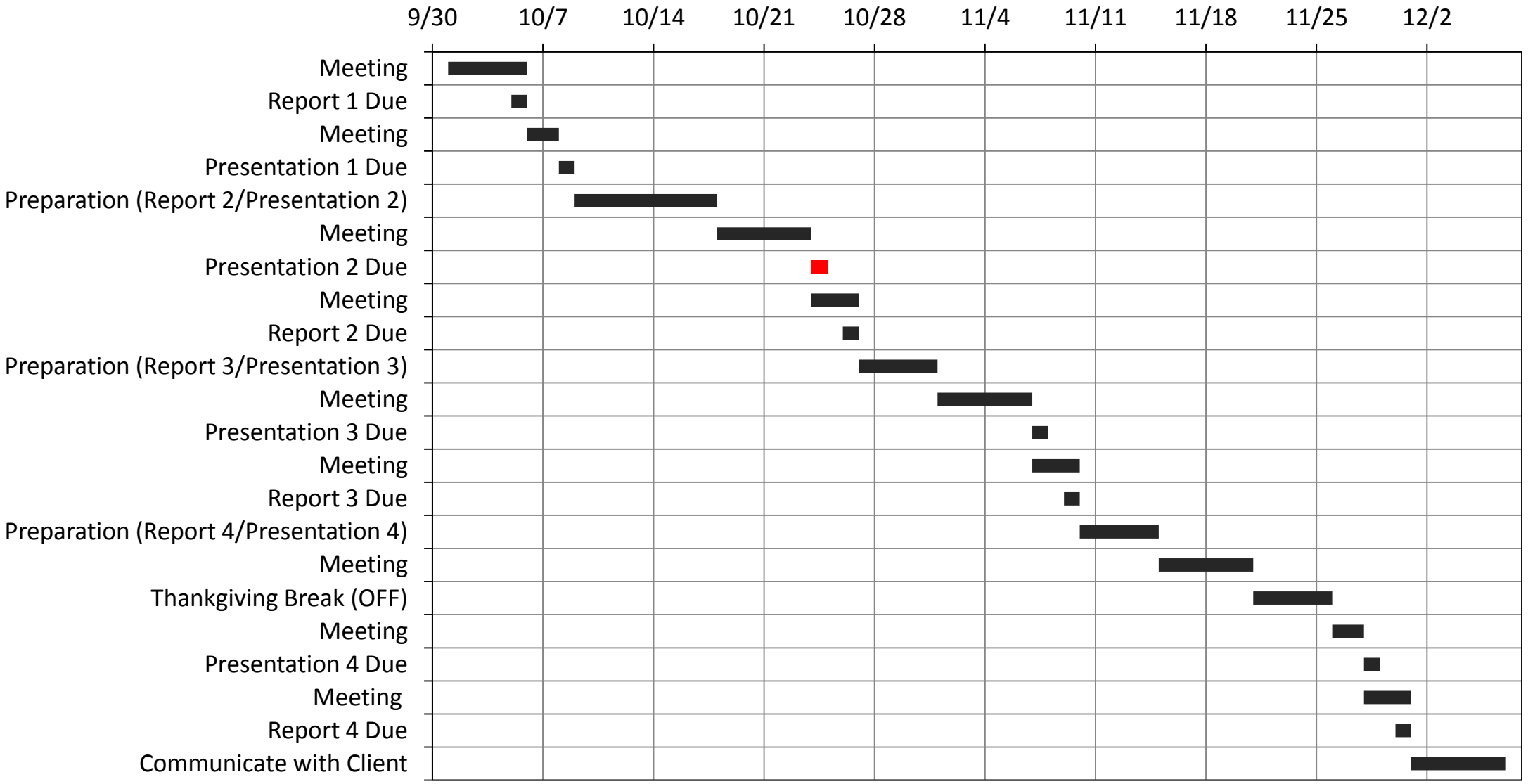
Criteria Metrics Table

Performance Level	Criteria Metrics								
	Value	Assembly/Disassembly [min]	Compact [ft^3]	Lightweight [lb]	Height [ft]	Cost [$]	Damage to Ornament [$]	Lifetime [yr]	Recyclability [%]
Perfect	8	< 10.0	< 1.5	< 20.0	12.0	< 300	0.00	10.0	90
Very Good	7	< 12.0	< 1.8	< 25.0	11.0	< 350	< 3.00	9.0	80
Good	6	< 15.0	< 2.0	< 30.0	10.0	< 400	< 5.00	8.5	70
Satisfactory	5	< 20.0	< 2.2	< 35.0	9.0	< 450	< 8.00	8.0	60
Adequate	4	< 25.0	< 2.5	< 40.0	8.0	< 500	< 10.00	7.5	50
Tolerable	3	< 28.0	< 2.8	< 45.0	7.0	< 600	< 15.00	7.0	40
Poor	2	< 30.0	< 3.0	< 50.0	6.0	< 700	< 20.00	6.5	30
Inadequate	1	> 30.0	> 3.0	> 50.0	5.0	> 800	> 40.00	< 5.0	20

Decision Matrix

Criteria	Units	Design Option					
		Telescoping Light Post		Sideways Arch		Festive Arch	
		Raw Score	Value on Std. Scale	Raw Score	Value on Std. Scale	Raw Score	Value on Std. Scale
Assembly/ Disassembly	min	15	6	25	4	20	5
Compact	ft^3	1.5	8	2.8	3	3.9	1
Lightweight	lb	43	3.5	45	3	49	2.1
Height	ft	10	6	12	8	12	8
Cost	$	500	4	400	6	450	5
Damage to ornament	$	0	8	0	8	0	8
Lifetime	yr	10	8	10	8	10	8
Recyclability	%	90	8	90	8	90	8
Total			51.5		48		45.1
Normalized Total			0.356		0.332		0.312

Projected Project Timeline



Conclusion

- Problem Statement
- Concept Generation
- Concept Selection
  - Ranking Criteria
  - Criteria Metrics
  - Decision Matrix
- Project Timeline

References

[1] Otte, Dieter. (2012). *My Star of Bethlehem*;
The Star That Keeps on Giving.
Retrieved from http://mystarofbethlehem.com

[2] Dr. Dieter Otte
Department of Computer Science, NAU
Assistant Professor
Phone:928-523-0876
Email: Dieter.Otte@nau.edu