

# Mobile Computer Cart

## Concept Generation and Selection

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ARIZONA  
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# Overview

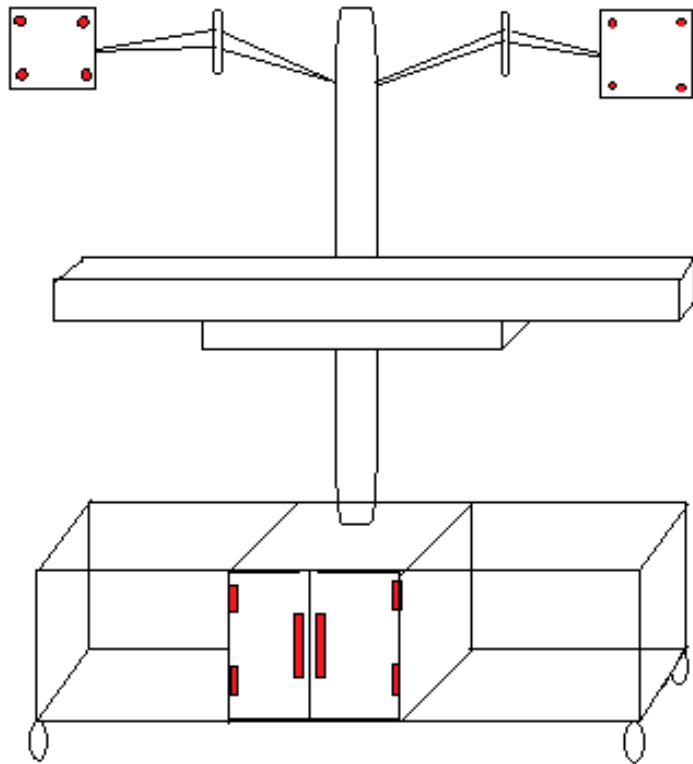
- Project Description
- Ten Concepts
- Decision Matrix
- Final concept selection
- Project Progression
- Conclusion

# Project Description

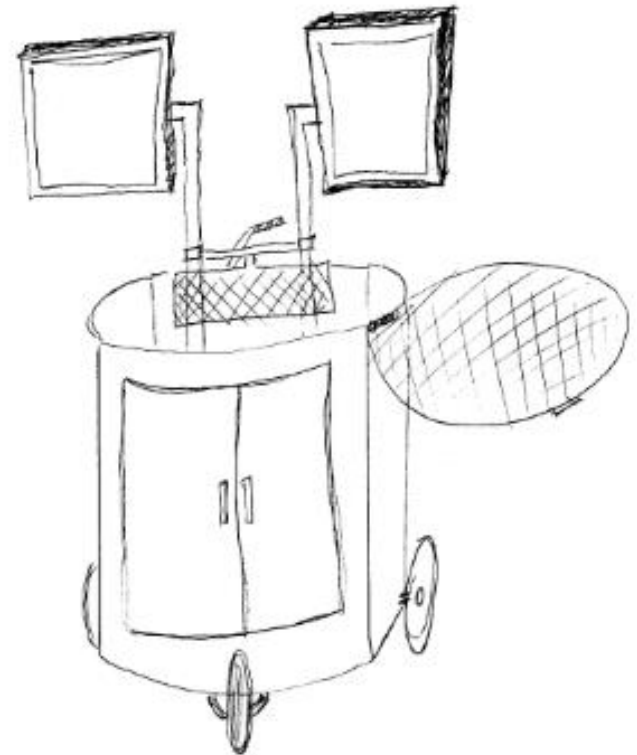
- Client : Dr. Srinivas Kosaraju
- Project: Dr. Kosaraju is currently managing multiple student teams for capstone classes at Northern Arizona University. He is requesting for two mobile computer carts capable of traveling outside to perform experiments.
  - Must be adjustable, weather proof, and each cost under \$500
- Need: The current available mobile computer carts are too expensive and are not designed for outside use.

# Concepts 1-2

**Design #1**

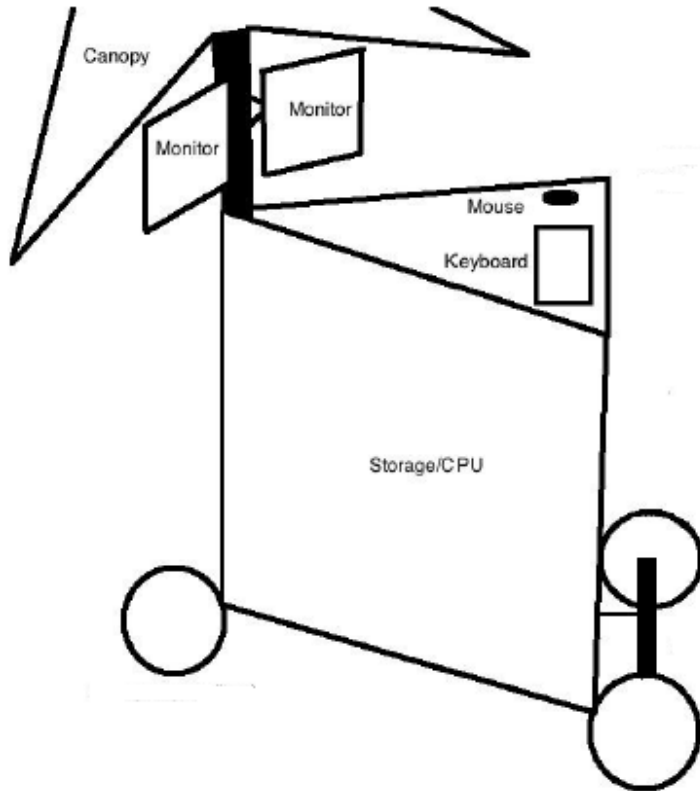


**Design #2**

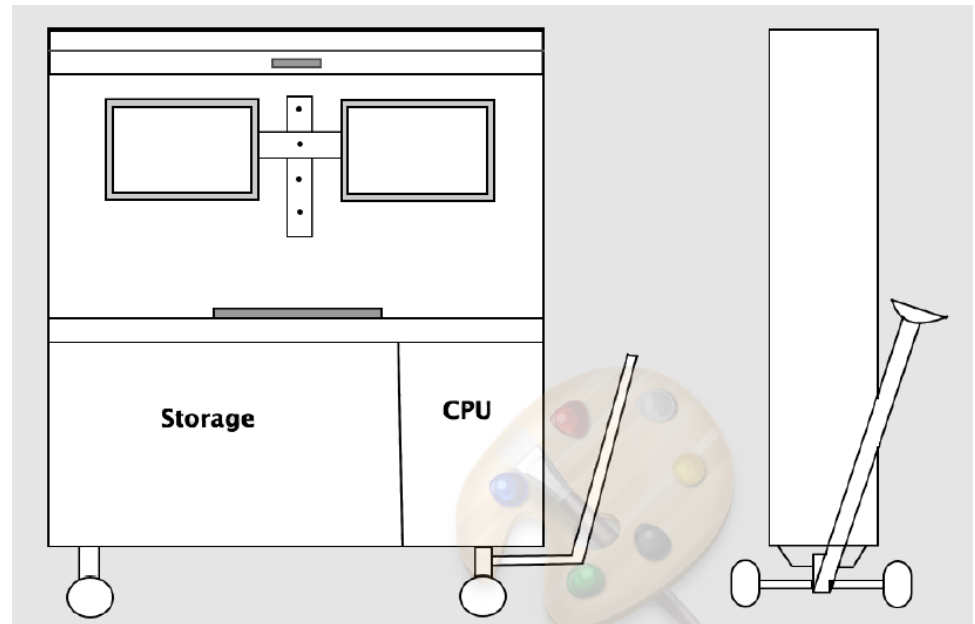


# Concepts 3-4

## Design #3

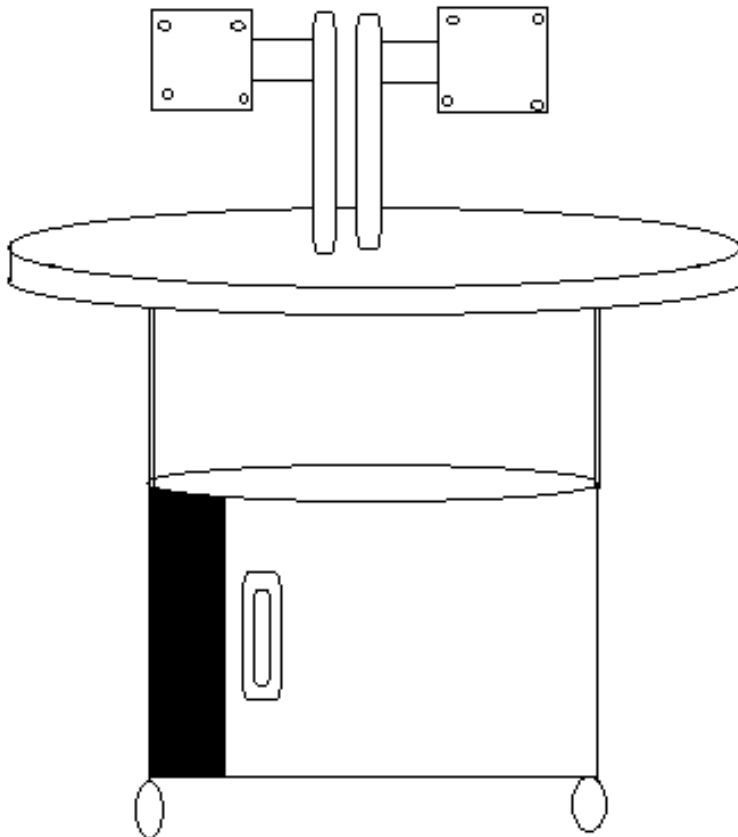


## Design #4

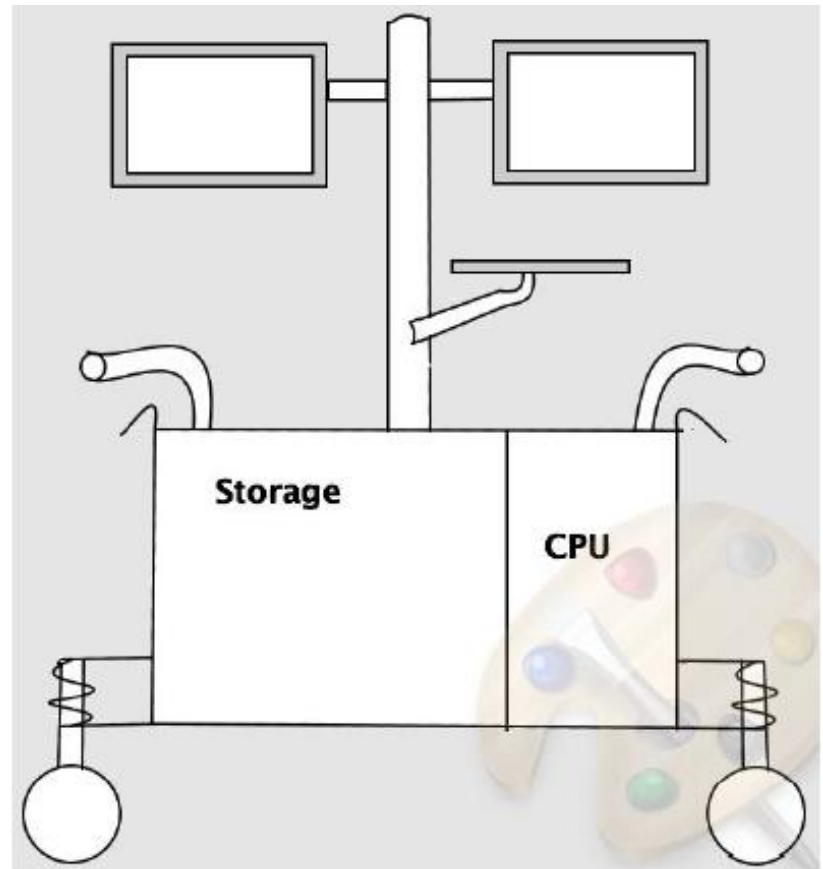


# Concepts 5-6

**Design #5**

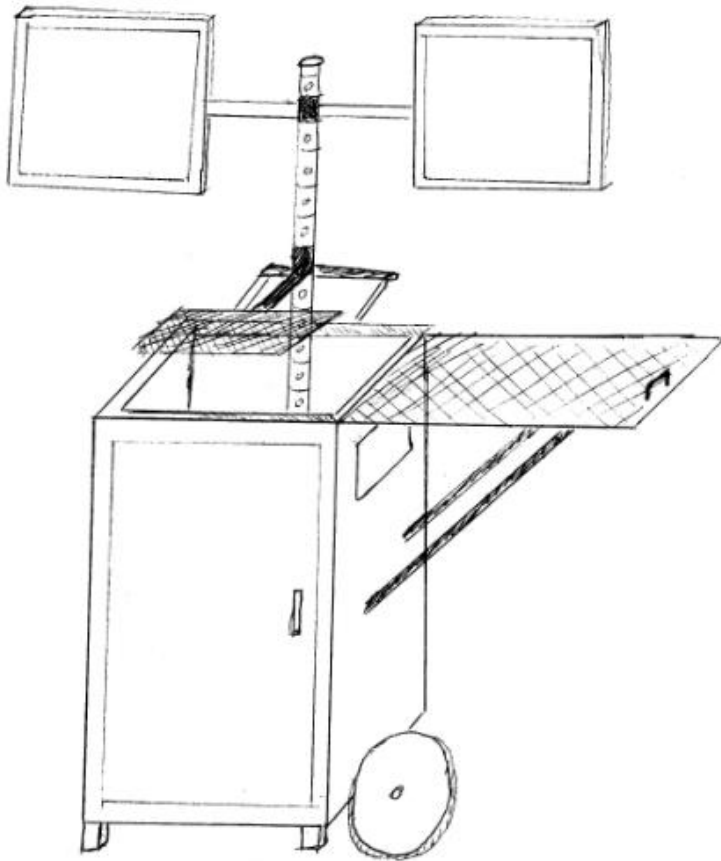


**Design #6**

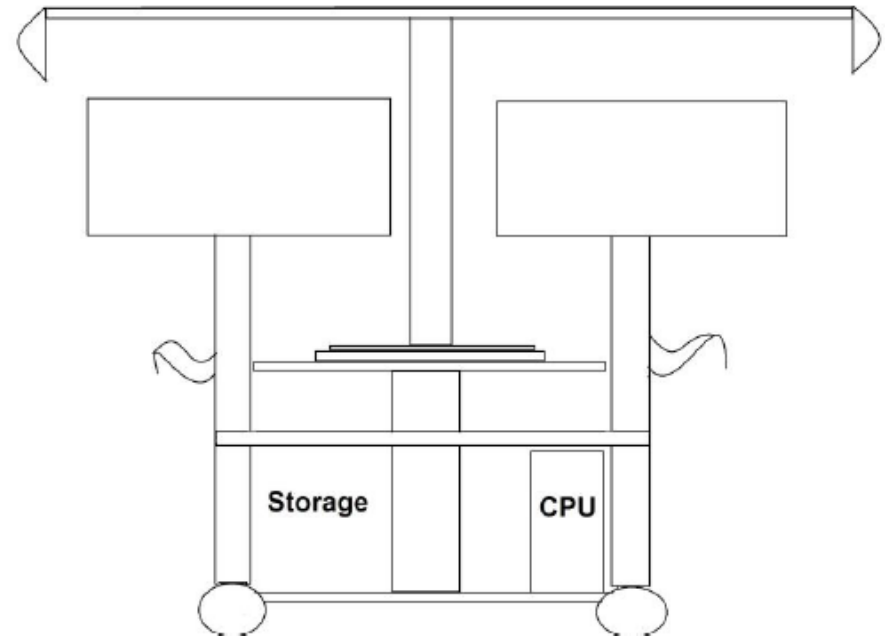


# Concepts 7-8

**Design #7**

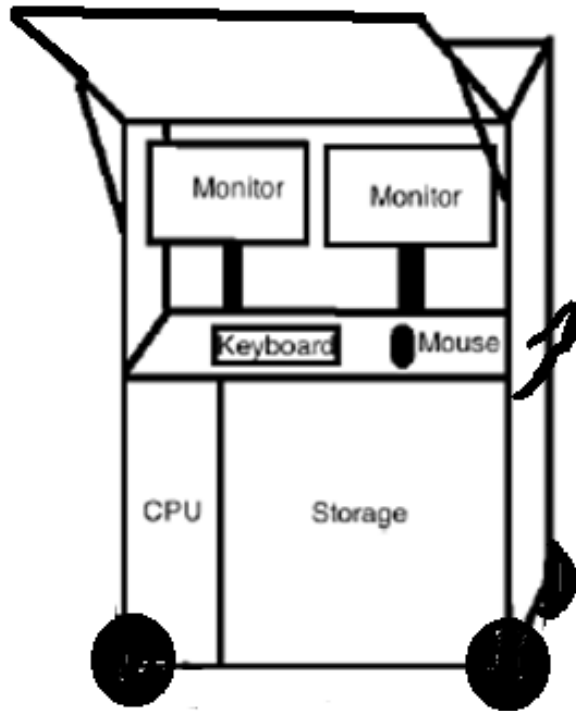


**Design #8**

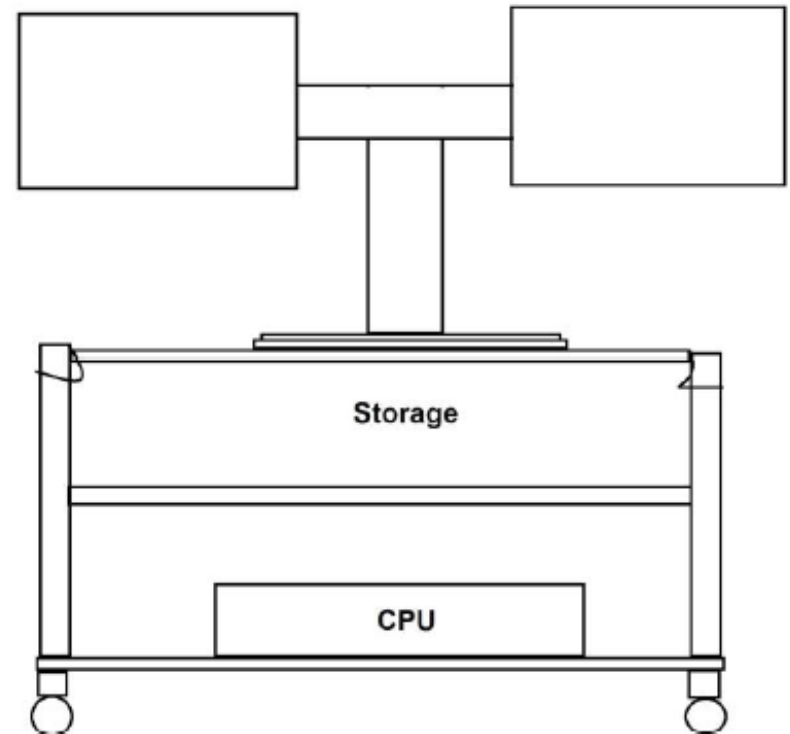


# Concepts 9-10

**Design #9**



**Design #10**





# Decision Matrix #1

Decision Matrix # 1				
Concepts	Criteria			Score
	Cost	Ease to Manufacture	Aesthetics	
Design #1	6.8	7.4	7.4	21.6
Design #2	4.8	6.8	6.6	18.2
Design #3	6	5.8	6.2	18
Design #4	4.8	6.6	7	18.4
Design #5	6	6	7.4	19.4
Design #6	5.8	6.4	6.2	18.4
Design #7	6.4	5.4	8.2	20
Design #8	7.4	7	6.2	20.6
Design #9	6.6	5	7.6	19.2
Design #10	8.2	8.4	6	22.6

Table 1 : Decision Matrix 1

**10 = High , 1 = Low**

# Decision Matrix #2

Decision Matrix # 2									
Concepts	Criteria							Score	Total : Matrix 1 and 2
	Weather Proof	Durability	Overall Adjustability	Storage Space	Maneuverability Inside / Outside	Weight	Overall Size		
Design #1	1	5.4	9	8.4	5.6	6.8	6.4	42.6	64.2
Design #2	9.4	8.8	4	7.8	6.6	4.8	5.8	47.2	65.4
Design #3	5.4	6	5	5	7.2	7.2	6.8	42.6	60.6
Design #4	9	8	5.2	9	6	4.2	5.4	46.8	65.2
Design #5	1	5.6	7	6.8	5.6	6.6	6.6	39.2	58.6
Design #6	2.2	6.2	7.4	7.6	6.6	6.2	6.6	42.8	61.2
Design #7	7.6	7.6	9.2	6.6	9	7.8	8.8	56.6	<b>76.6</b>
Design #8	4.8	5.6	4.8	5.8	5.4	7	5.8	39.2	59.8
Design #9	7.6	7.2	8.8	6.4	8.4	7.2	7.4	53	<b>72.2</b>
Design #10	0.8	5.4	4	6.6	5.4	7.6	6.8	36.6	59.2

10 = High , 1 = Low

Table 2 : Decision Matrix 2

# Final concept selection

- **Design #7 : Two wheeled dolly**
  - Adjustable monitors and keyboard
  - Large wheel for rough terrain
  - Interior storage space
  - Weather proof
    - Retractable lid
    - Collapse everything inside compartment
    - Window
  - Fits through doors
  - Handle for easy maneuverability

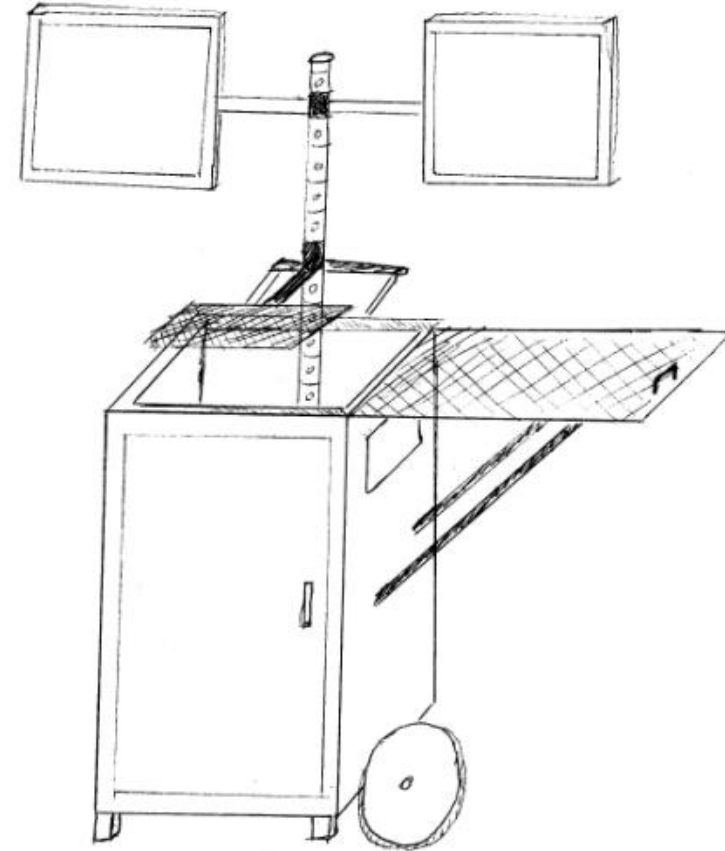


Figure 1 : Design # 7

# Two wheel Dolly

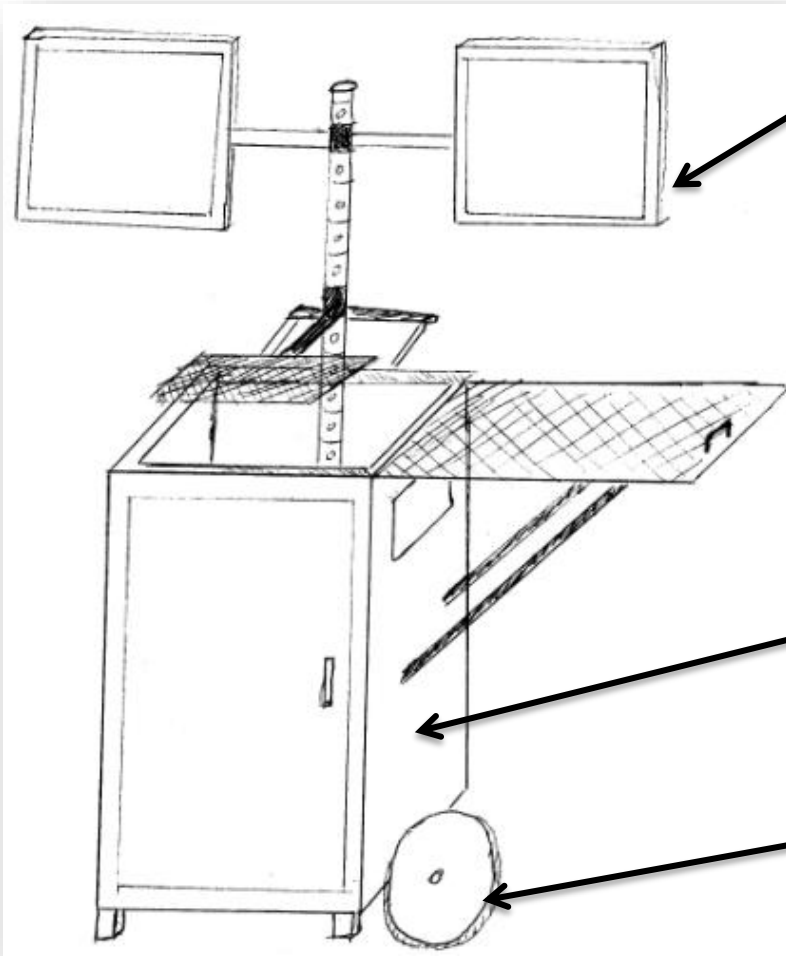


Figure 2: Design #7



Figure 3: Monitor mounts

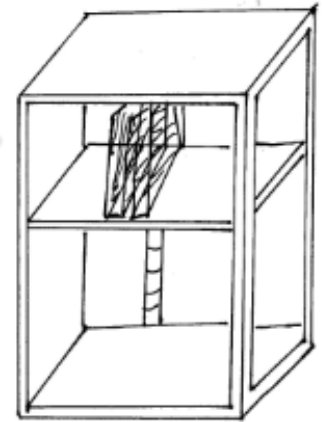


Figure 4: Design #7 frame



Figure 5: Wheel design

# Final concept selection

- **Design #9 : Four wheeled cart**

- Adjustable monitors
  - CPU and experimental equipment
- Large amount of storage space
  - Retractable door
- Stable transportation
- Four large wheels
- Weather proof

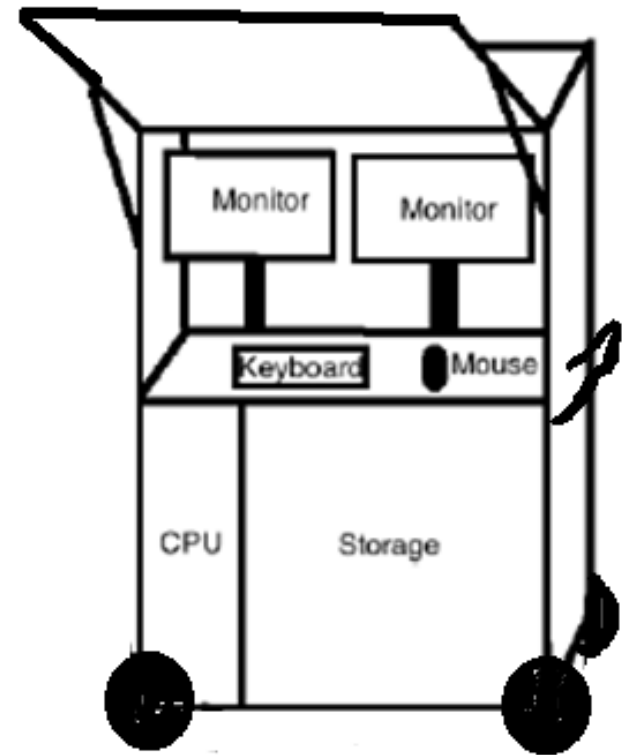


Figure 6: Design #9

# Four wheeled cart

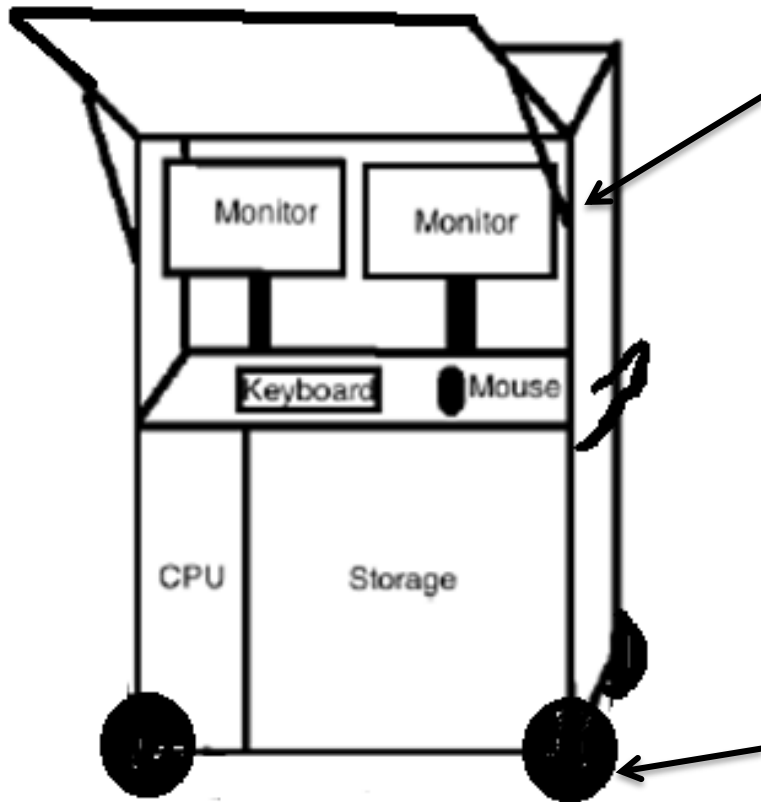


Figure 7: Design #9



Figure 8: Door hydraulics



Figure 9: wheel design

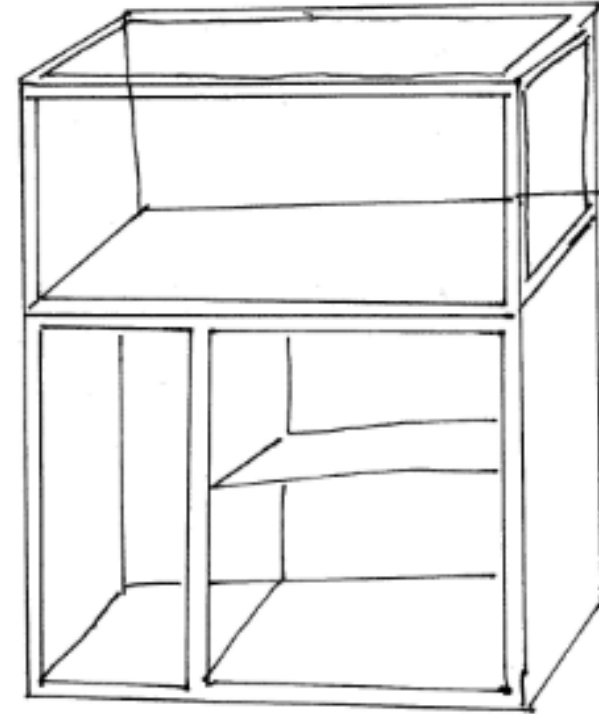


Figure 10: Design #9 frame

# Project Progression

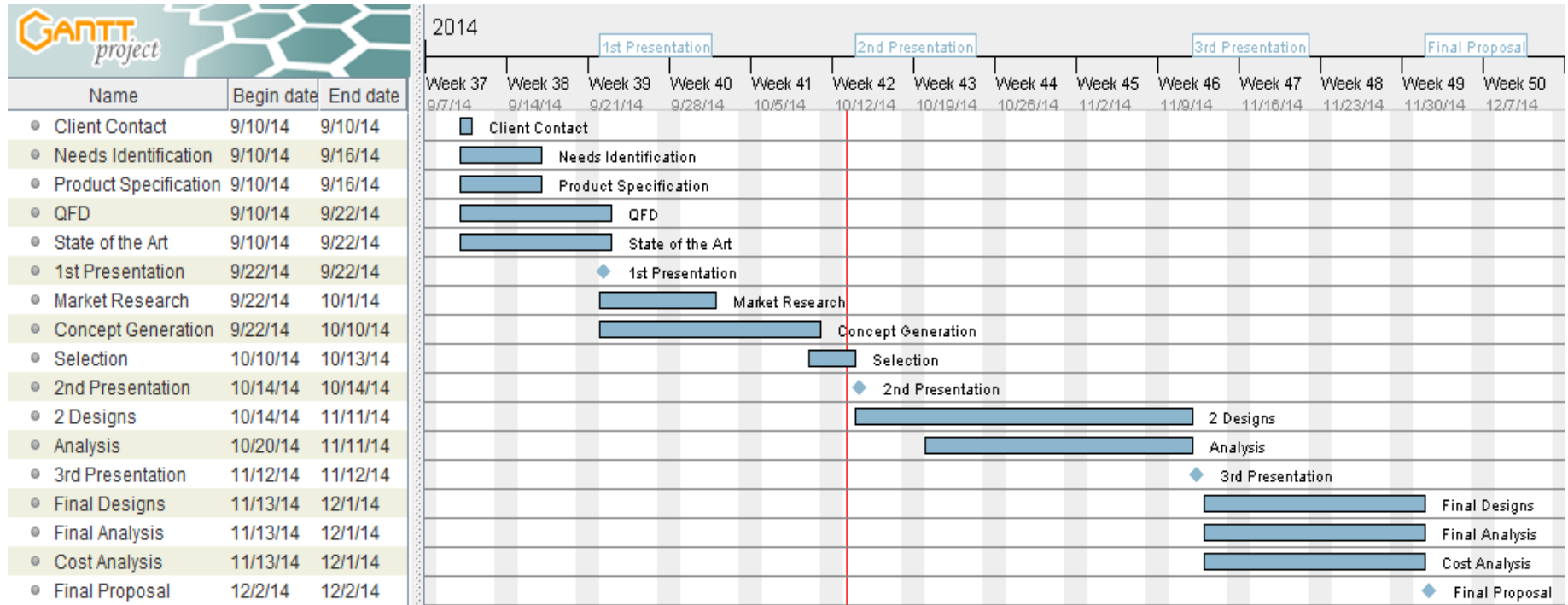


Figure 11: Gantt Chart

# Summary

- **Need:** The current available mobile computer carts are too expensive and are not designed for outside use.
- **Ten concepts**
  - Each team member came up with two different computer cart designs.
- **Decision Matrix**
  - Decided on ten different criteria to judge the ten concepts on.
- **Concept selection**
  - Design #7 with two wheels had the overall best score from the decision matrix and is the first cart we will be designing.
  - Design #9 with four wheels had the second overall best score and will be the second cart we will be designing.
- **Project Progression** – Two concepts have been picked and we are currently on the right track to start the engineering analysis.



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