ER 8
UD6, CT4, US1

Prototype Testing:

Engineering Metric Being Tested: Number of Components the Customer Directly Interacts With

Purpose:
This protocol will have the intention of identifying the toilet components the customer interacts with during typical use. Typical use can be defined as both use for waste containment, and use during cleaning.

Goals:
The target for the customer requirement decided upon by our team with input from our customer, is to limit the components to less than or equal to five. The marginal limit is less than or equal to eight, this was decided in the case that we add additional components to the toilet during the design phase.

Conclusions:
For use of the toilet, the customer directly interacts with a minimal amount of components. A lot of interaction occurs when cleaning the toilet, especially when there is a lot of spillage. Further improvements should include ways to not have to interact with the toilet base when cleaning spillage, as the toilet base is fairly heavy.

Materials:
- Complete toilet prototype with waste containers
- Gender-neutral restroom facilities fully stocked with toilet paper
- Working faucet and hand drying equipment
- Instructions for typical use for waste containment
- Instructions for typical cleaning procedures
- Clorox wipes
- Paper towels
- Gloves

Procedure:
**Note: It was decided that members of the project team will randomly take turns collecting this data by following the following procedure so that the subjects are experienced with using the toilet. This allows for the test results to better reflect expected real world results.*

1. Assemble the toilet prototype in accordance to the instructions for assembly provided by SOIL.
2. Follow the steps for typical use for waste containment, without actually using the toilet.
3. For each separate component interacted with, record a tally.
4. Find the sum of the tallies and record in the provided spreadsheet.
5. Follow the steps for typical cleaning measures without actually cleaning the toilet.

6. For each separate component interacted with, record a tally.
7. Find the sum of the tallies and record in the provided spreadsheet.

Results:

Typical Use	Total Number of Components Per Trials 1-10									
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Waste Containment	2	2	2	2	2	2	2	2	2	2
Cleaning	4	4	6	7	4	7	4	7	4	6

Typical Use	Total Number of Components Per Trials 11-20									
	11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Waste Containment	2	2	2	2	2	2	2	2	2	2
Cleaning	7	6	4	6	4	4	6	6	4	4

Typical Use	Total Number of Components Per Trials 11-20									
	21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Waste Containment	2	2	2	2	2					
Cleaning	6	4	6	6	4					

Analysis:
For waste containment, there were only two components that the user interacted with at all times; the toilet lid and toilet seat.

For cleaning, the amount of interaction changed with respect to how much cleanup was necessary. For the typical cleanup without having to clean spillage on the floor, there were four components that the user interacted with; the toilet lid, seat, urine diverter, and urine jug. For cleanup of minimal to moderate amounts of spillage, the number of components was 6; the lid, seat, diverter, urine jug, wet paper towels, and dry paper towels. For complete spillage, the number of components was 7; all components mentioned prior plus the toilet base.