In this Business and Engineering Collaborative Project we were given the task to design a product that would make dorm life safer, more enjoyable, or more productive. Our design was driven by our desire to meet customers’ needs, which would correspond to the ability to make a profit. We will show you all the steps it took to make our product marketable. Finally, we would like to thank everyone for coming and we hope that you agree with us that our product is marketable and of course a masterpiece.
Idea Generation

Here are some of our best ideas....

1. Insulated rooms (sound proof)
2. Loft (size and cost efficient)
3. Air Freshener (Make dorms more livable)
4. Universal tack board (Tack board, phone holder, etc)
5. Fan and light that doubles as one
6. Improving air conditioning unit (Make rooms colder and warmer)
7. Universal Bathroom carrier (Holds toothpaste, vitamins, floss, etc.)
8. Fold down ironing board (Ironing board that folds down with covey behind it)
9. Fold up coffee table (Coffee table that folds up and stores easily)
10. Trash Compactor (Compacts trash so that students don’t have to empty trash as often)
11. Black-out shades (Shades that blocks out all light)
12. Safe (Portable and light weight safe that makes storing valuables easy)
13. Better Lighting (More lights and in better locations)
14. Larger laundry bags (Some kind of bag that stores more clothes, but takes up less space)
15. Door Bell (Some kind of portable and cheap door bell)

In our next step we took all the ideas that we had come up with and narrowed them down to a select three. The reason all the others were thrown out is because some of them already existed on the market, some of them would be too complex to the manufacturer, and some of them we didn’t think that we had technical expertise needed to produce them. The three products we chose are....

1) A cheap and size efficient loft
2) A Universal cabinet designed to combine all bathroom tasks to one
3) A fold down ironing board with storage for cleaning supplies
Concept 1 (Loft)

Concept 2 (Universal Sink Cabinet)
The next step was to form a focus group. So we decided to gather six people together and ask them their opinions on all three products. The focus group consisted of one engineer, one technology human resources development major, two biology majors, and two business majors. What they told us greatly helped us make our decision in our product.
As you can tell from the focus group, everyone thought that our loft concept had the most appealing appearance, it would be easy to use, store and assemble, and it would save the most space. We agreed, and decided selected the loft as our concept to move into the next stage of product development.
Customer Analysis

Who are the potential customers?
- All college students, specifically incoming freshman and sophomore students.

Where do they buy similar products now?
- They buy them online or from company catalogs, as well as from the school itself.

When do they buy?
- They buy them at the beginning of each semester or each quarter.

How do they choose products?
- They choose them by their price, appearance, and how much space they save.

How do they respond to marketing programs?
- Their decision on which loft to buy is made primarily by advertising and sales. Most incoming students don’t know much about lofts, so whoever advertises the most or has the best deal, gets the sale.

What encourages them to buy similar products?
- Students would be encouraged to buy similar products because dorm rooms are very small and anything that saves space is a good buy.

Marketing Programs

- Each person worked 40 hours per week
- Insurance is $800 per quarter
- 30 people were employed for the quarter at $9.00 per hour
- Assembly average completing 90 lofts a day
- Raw materials for the loft cost $15.00 wholesale each
- Circular saw (8” ½”) 168 per month = $2016.00 per year http://www.echorental.com/rental/products3.html
- Drill ½” 144 per month = $1728 per year http://www.echorental.com/rental/products3.html
- Palm Sander $75 per month = $900 per year http://www.eaglerentalcenter.com/equipment_listing.htm
- Miscellaneous tools and material expenses $5000 per year
- Supervisor is paid $9000 per quarter
- The rent on our building is $2000 per quarter
- Miscellaneous overhead expenses are $200 per quarter
- 12 weeks a quarter (1 week off/quarter)
Cost Structure

**Labor Cost: (Variable Cost)**

\[ (40 \text{ hr/week}) \times (12 \text{ weeks/quarter}) \times (4 \text{ quarters/year}) \times (30 \text{ emp.} \times $9.00/\text{hour}) = \$518,400 \]

**Materials and Parts Cost: (Variable Cost)**

\[ ($15.00/\text{loft}) \times (90 \text{ lofts/day}) \times (5 \text{ days/week}) \times (12 \text{ weeks/quarter}) \times (4 \text{ quarters/year}) = \$324,000 \]

**Operating Expenses: (Fixed Cost)**

\[ (($800/\text{quarter}) + ($2000/\text{quarter}) + ($200/\text{quarter}) + ($9000/\text{quarter}) \times (4 \text{ quarters/year}) + ($2016/\text{year}) + ($1728/\text{year}) + ($5000/\text{year}) + ($900/\text{year}) = \$57,644 \]

**Cost per Loft:**

\[
\text{Total Fixed and Annual Cost} / \text{Total Output} = \frac{($900,044/\text{year})}{(21,600 \text{ lofts/year})} = \$41.67 \text{ per loft}
\]

**Break Even Volume**

\[
\text{Selling Price (x)} = \text{Fixed Cost} + \text{Variable Cost (x)}
\]

Selling Price: = $49.95
Total Fixed Cost: = $57,644
Variable Cost: \( \frac{($518,400/21600) + ($324,000/21600)}{21600} = $39 \)
\[
49.95x = 49,644 + 39x
\]
\[
10.95x = 57,644
\]
\[
X = 5264
\]

**Break Even Volume: 5,264 Lofts**
1st: The wood comes off of the trucks and goes straight to cutting.

2nd: After the wood is cut, it is sent to be drilled.

3rd: Then all of the wood is sanded down, to make a nice surface.

4th: The loft is then put together by 5 employees.

5th: While the loft is still together it is tested for any flaws.

6th: The loft is then taken back apart by another 5 employees.

7th: The loft is then packaged and sent to be shipped.

8th: The last and final step, the loft is loaded into trucks.
### Equipment and Labor

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Wage Employees</th>
<th>Salary Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Circular Saw</td>
<td>30 total wage employees</td>
<td>One Supervisor gets paid $36,000 per year.</td>
</tr>
<tr>
<td>- Drill</td>
<td>-2 unload wood</td>
<td></td>
</tr>
<tr>
<td>- Sander</td>
<td>-4 cut wood</td>
<td></td>
</tr>
<tr>
<td>- 32 (3 inch ¼ inch bolts)</td>
<td>-4 drill wood</td>
<td></td>
</tr>
<tr>
<td>- 4 (4 inch ¼ inch bolts)</td>
<td>-5 assemble lofts</td>
<td></td>
</tr>
<tr>
<td>- 72 ¼ inch washers</td>
<td>-2 tests the lofts</td>
<td></td>
</tr>
<tr>
<td>- 36 ¼ nuts</td>
<td>-5 disassemble lofts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-2 package the lofts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-2 load the lofts</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-4 miscellaneous tasks</td>
<td></td>
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</tbody>
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**All wage employees make $9.00 an hour**

### Dimensions

Since all dorm and non-dorm rooms are different sizes we can have any dimensions that the customer demands (different schools have different bed frames). Production of this good isn’t very hard so changing the size does not affect the time or work which it takes to produce it.
Developing and introducing new products is frequently time-consuming, expensive, and risky. Thousands of new products are introduced annually but the failure rate is between 60 and 75 percent. If our product was put into production, we are confident that we would not be a part of that percentage. We think we have a feasible and well thought out marketing plan. We would like to thank you for coming and listening to our marketing pitch!

Conclusion

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