MANAGEMENT OF GOODS AND SERVICES

“Look for your choices, pick the best one, then go with it”
Peter Drucker

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Executive Summary

As a manager, decisions need to be made on a daily basis; fortunately there are tools to help us out along the way. Some of these tools are a House of Quality and a Decision Tree. Other managers are concerned with production, shipping and taking orders, to help provide a service, Bill of Material and Assembly Charts need to be constructed. The following are just small examples of what may be encountered in our world of business.

The company needs to make a decision in the wristwatch design and make comparisons to the watches of the competition; a house of quality is going to be the best solution to the dilemma.

In order for a company in the inventory control, ordering and shipping of parts a bill of material is needed. This will also help the consumers order replacement parts in order to save them money. A bill of material is needed for a pair of eyeglasses with a case.

An assembly chart for a table lamp is needed in order to ensure all items are present and inspected before packaging. The assembly chart is designed to help the company and manufacturer succeed in this task. Along with the assembly chart more often than not, an assembly drawing and a set of detailed instructions will accompany the assembly chart.

Residents of Mill River have fond memories of ice skating at a local park. An artist has captured the experience in a drawing and is hoping to reproduce it and sell framed copies to current and former residents. He needs to make a decision tree to see which route he will take.
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Wristwatch House of Quality (5.1)

A house of quality is needed to give the consumer’s a better product based on characteristics they feel that is important. The House of Quality, shown in figure 1.6 is all based on not only the consumers wants, but an evaluation of the competition as well. But before the house can be constructed, several steps need to be addressed;

1. What the consumer wants.
2. What the company can do to meet the consumers wants.
3. How well the company can meet the consumers wants.
4. An assessment of the competition.
5. Find the targets values (Technical attributes).
6. Find the technical evaluation.

1. The customer’s wants are surveyed from an importance rating scale. Figure 1 shows this from a (1-5 rating), 1 being low and 5 being high.

<table>
<thead>
<tr>
<th>Customer Importance Rating Scale:</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bad</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fair</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What the consumer wants in a rating scale.

Reasonable Prices | 5
Comfort           | 4
Durability        | 5
Sleek Design      | 3
Weight            | 1

Figure 1 - What the customer wants.
Wristwatch House of Quality (5.1)

Once the consumers' wants are identified, the next step is to figure out what the company can do to meet those needs. Figure 1.1 shows how the company is going to do this.

![Figure 1.1 - What the company can do.](image)

2. Once the company has decided what they can do to meet the needs of the consumer, now it is time to grade themselves as shown in figure 1.2.

![Figure 1.2 - How well the company can meet the customers' wants.](image)

3. Now that the company has graded themselves, another important task is to grade their competition. Again, a numbering scale is shown for the competition in figure 1.3.
Wristwatch House of Quality (5.1)

<table>
<thead>
<tr>
<th>Company A</th>
<th>Company B</th>
<th>Competition Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
<td>5 = Good</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>3 = Fair</td>
</tr>
<tr>
<td>2</td>
<td>5</td>
<td>1 = Poor</td>
</tr>
<tr>
<td>5</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Figure 1.3** - Assessment of the competition

4. The target values are what changes to the wristwatch will be acceptable, (weights: minimum or maximums) changes in dimensions and changes in materials. This is shown in figure 1.4.

[Figure 1.4: Company target values]

5. At the bottom of the house is specific data that will show the company’s focus, this is the technical data, as well as the competition. As seen in figure 1.5, the technical evaluation will show the distinct values pertaining to the product.
Wristwatch House of Quality (5.1)

The last step is to put everything together. Now that all the steps are together, we can now add the roof, the relationship between the things we can do. Figure 1.6 will show all steps put together and how decisions are made in an organization.

Figure 1.5 -Technical evaluation

Figure 1.6 -Wristwatch House of Quality
Eye Glasses and Case Bill of Material (5.5)

When a general repair of eyeglasses is needed, it is cheaper to simply replace one or more single parts versus purchasing a new pair of eyeglasses. Below, in Table 1 is a bill of material for a pair of eyeglasses and a case. This information is also significant for inventory control and ordering and shipping parts.

<table>
<thead>
<tr>
<th>Item #</th>
<th>National Stock # (NSN)</th>
<th>Description</th>
<th>Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8412-01-249-0016</td>
<td>Glasses, eye, metal, gold</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>6721-00-428-3147</td>
<td>Case, plastic, black, eye glasses</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>8412-01-249-0017</td>
<td>Frame, metal, gold</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>8401-01-249-0021</td>
<td>Bracket, temple, metal, gold / L</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>8401-01-249-0022</td>
<td>Bracket, temple, metal, gold /R</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>8401-01-249-0031</td>
<td>Lens, left, poly, unfinished</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>8401-01-249-0032</td>
<td>Lens, right, poly, unfinished</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>8401-01-245-1313</td>
<td>Pad, nose, “D” shape, silicone, L/R</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>6952-00-346-0198</td>
<td>Screw, temple, metal gold</td>
<td>2</td>
</tr>
<tr>
<td>11</td>
<td>6952-00-346-0020</td>
<td>Screw, Pad nose, metal gold</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 1 - Bill of material eyeglasses with container case
As more and more products are being purchased and sold, necessary procedures are needed for the product to make it onto the shipping trucks and into the stores with no mistakes. One document that helps the packers and inspectors accomplish this is an assembly chart, seen in Figure 2. This is nothing more than a diagram that shows how the product is packed prior to shipping and assembled.

**Figure 2 - Table lamp assembly chart**

1. Lamp Base
2. ½” Hex Bolt
3. ½” Flat Washer
4. Lamp Post w/stud bolt
5. Lamp Harp
6. Lamp Shade
7. Lamp Finial
8. Pull Chain Socket
9. Electrical Cord
10. Part Number Tag
11. Box w/ packing Material

Schematic form of how a product is prepared
Table Lamp Assembly Chart (5.8)

Along with a product’s assembly chart is an assembly drawing, these are provided to help give the consumer a better idea how to properly put the product together in accordance with manufacturer’s specifications. Figure 2.1 shows an assembly drawing of the table lamp which corresponds to the assembly chart in Figure 2.

Figure 2.1 - Table lamp assembly drawing
Table Lamp Assembly Chart (5.8)

In order to ensure the product is assembled correctly, the manufacturer will attach a detailed set of instructions that correspond to the product assembly chart. Figure 2.2 shows the detailed assembly instructions associated to both assembly chart and assembly drawing.

WARNING: DO NOT EXCEED A 100 WATT LIGHT BULB, DOING SO MAY CAUSE INJURY TO SELF, LAMP OR CAUSE A FIRE.

Figure 2.2 -Table Lamp Assembly Instructions
Residents of Mill River have fond memories of ice skating at a local park. An artist has captured the experience in a drawing and is hoping to reproduce it and sell framed copies to current and former residents. He thinks that if the market is good he can sell 400 copies of the elegant version at $125 each. If the market is not good, he will sell only 300 at $90 each. He can make a deluxe version of the same drawing instead. He feels that if the market is good he can sell 500 copies of the deluxe version at $100 each. If the market is not good, he can sell only 400 at $70 each. In either case, production costs will be approximately $35,000. He can also choose to do nothing. If he believes there is a 50% probability of a good market, what should he do? Why?

**Figure 3 - Mill River Decision Tree**
Mill River (5.13)

Both elegant and deluxe options give the same profit of $15,000 in a good market; however in a bad market the elegant has a bigger loss. So he should automatically forget about the elegant drawing. No matter what the outcome, there is still a 50% chance of the market going either way. Figure 3.1 will show that he should go with the deluxe drawing based on a 50% bad or good market.

Deluxe good market: 50% x $15,000 = $7,500
Deluxe bad market: 50% x (-$7,000) = (-$3,500)

|$7,500| - |$3,500|
---|---|
|$4,000|

So, with a 50% market variable, the deluxe drawing has a very good chance of making a profit of $4,000.

Figure 3.1 - Mill River decision tree analysis

Based on the decision tree and the analysis, he should definitely dismiss the elegant drawing plan and move forward with the deluxe drawing plan.
Summary

When a problem needs to be solved, a company can use a decision tree to help the company make the right choices in order to satisfy the customer’s wants and keep ahead of the competition, all with an easy to design matrix that can be produced with various software applications most companies already have on hand.

Once a decision has been made to produce a product, it is rational to say, parts will break either from normal wear and tear or damaged from negligence, having a parts list will prove particularly useful for the purpose of ordering and shipping as shown from the eyeglasses and case, bill of material.

When large quantities of a product are being packed in preparation of shipping, an assembly chart is an excellent way to help inspectors ensure all materials are present and ultimately packed before sending it out for purchase. Along with the assembly chart if required, is an assembly drawing, an easy to read pictorial of how the manufacturer designed the product to be assembled.

When asking yourself, do I start a business, do I expand what I already have, do I just do nothing; a decision tree will help answer these questions. Once your decision tree is constructed, all that is left is to analyze the data; the decision tree will help with a difficult situation.
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**Assembly Chart** A graphic means of identifying how components flow into subassemblies and final products.

**Bill of Material** A list of components, their description, and the quantity of each item required to make one unit of a product.

**Decision Tree** A decision support tool that uses a tree-like graph or model of decisions and their possible consequences, including chance event outcomes, resource costs.

**House of Quality** is a diagram, resembling a house, used for defining the relationship between customer desires and the firm/product capabilities.
Reference

Figure 2 (Table Lamp) images courtesy of www.images.google.com.

Quote “Look for your choices, pick the best one, then go with it” -- Pat Riley.